

**Precast / Prestressed
Concrete
Accessories**



2015 Edition

763-428-8500

or

866-MIDSPEC

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Plastic Rebar Supports

Econo Chair



Econo Chair

The most economical and accurate reinforcement for standard mesh sizes. Arched footing design assures minimal contact with form and maximum bond.

Part No.	Code	Concrete Cover (in.)	Bar No.	Qty./Ctn.
1000901	ECONO	$\frac{3}{4}$ - 1	Mesh	5000

EAM-Chair



EA-Chairs

Patented design for exposed-aggregate or sand-blasted concrete. Fine points at leg base make it virtually invisible on the surface of the architectural concrete.

Part No.	Code	Concrete Cover (in.)	Bar No.	Qty./Ctn.
1000913	EAM75	$\frac{3}{4}$	MESH	2000
1000905	EAM10	1	MESH	1000
1000902	EAM15	1 $\frac{1}{2}$	MESH	1000
1000909	EAM20	2	MESH	500
1000907	EAM25	2 $\frac{1}{2}$	MESH	500
1000911	EAM30	3	MESH	250

** Mesh is easily snapped into slots*

EAR-Chair



MSI Mesh Chair



Part No.	Code	Concrete Cover (in.)	Bar No.	Qty./Ctn.
1000904	EAR10	1	ALL	1000
1000903	EAR15	1 $\frac{1}{2}$	ALL	1000
1000908	EAR20	2	ALL	500
1000906	EAR25	2 $\frac{1}{2}$	ALL	500
1000912	EAR30	3	ALL	250
1000910	EAR35	3 $\frac{1}{2}$	ALL	250
1000914	EAR40	4	ALL	250

** All of the above chairs are for use with rebar*

Stackable Mesh Chair



Stackable Mesh Chair

Cost effective stackable mesh support system.

Part No.	Code	Concrete Cover (in.)	Bar No.	Qty./Ctn.
XA100TAN	TAN PILOT	1	MESH	1000
XA100NAT	NAT PILOT	1	MESH	1000
XA100BASE	NAT BASE	1	MESH	1000



The Midspec AC Chair

is designed for Architectural Precast. Available in over 150 different colors, this chair is ideal for color matching and the legs are designed for minimal form contact.

Code	Concrete Cover (in.)	Bar No.
AC150	1 $\frac{1}{2}$	ALL
AC200	2	ALL
AC250	2 $\frac{1}{2}$	ALL

**Additional sizes available via special order.*

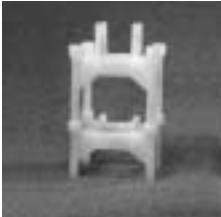
MSI E-ZEE



Hi-Stack Chairs

Heavy duty, stackable, rebar support system for a variety of cover requirements.

Hi-Stack Chair



Part No.	Code	Concrete Cover (in.)	Bar No.	Qty./Ctn.
1000922	HIC15	1 $\frac{1}{2}$	ALL	250
1000923	HIC20	2	ALL	160
1000924	HIC25	2 $\frac{1}{2}$	ALL	250
1000925	HIC30	3	ALL	200
1000984	HIC35	3 $\frac{1}{2}$	ALL	200
1000926	HIC40	4	ALL	200
E-ZEE	MSI	1 $\frac{1}{4}$	ALL	
E-ZEE	MSI	1 $\frac{1}{2}$	ALL	
E-ZEE	MSI	2	ALL	
E-ZEE	MSI	2 $\frac{1}{2}$	ALL	
E-ZEE	MSI	3	ALL	
E-ZEE	MSI	3 $\frac{1}{2}$	ALL	

Plastic Rebar Supports

Code	Concrete Cover (in.)	Bar No.	Qty./Ctn.
C16SN	1	M-5	3000
C20SN	1 1/2	M-7	1000
C34MX	1 1/2	2-8	500
C22SN	2	M-9	1000
C21SN	2 1/2	M-8	500

Barspan Clip

General purpose clip-on spacer accommodates larger range of bar diameters. Heavy duty design easily supports extra loads.

Barspan Clip

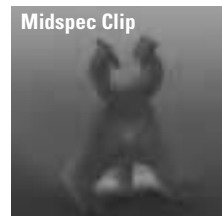


Part No.	Concrete Cover (in.)	Bar No.	Qty./Ctn.
C	1 1/2	3-7	3000
1000928	3/4	3-6	2500
1000930	1	2-6	2500
1000932	1 1/2	2-6	1500
1000932-01	1 3/4	3-6	1500
1000933	2	4-6	1000
1001933	2 1/2	4-6	750
1002933	3	4-6	500

Midspec Clips

For the positioning of horizontal reinforcement. Design allows for easy flow of concrete for maximum bond.

Midspec Clip



MSI Snap On



Code	Concrete Cover (in.)	Bar No.	Qty./Ctn.
BCCHS	1 1/2	3-4	250



Bumper Curb Chairs

Prevents deterioration of bumper curbs by accurately positioning and supporting rebar during casting.

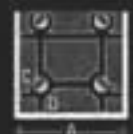
Bumper Curb Chair



Code	A (in.)	B (in.)	C (in.)	D (in.)	Concrete Cover (in.)	Bar No.	Qty./Ctn.
SPMAR	5	4	1	1	1	3	500

Sign Post Markers

Quickly and accurately positions rebar for sign posts



Sign Post Marker



Code	Size	Qty./Ctn.
78026	1" x 32"	275 feet
78036	1 1/4" x 32"	250 feet
78046	1 1/2" x 32"	200 feet
78056	1 3/4" x 32"	200 feet
78066	2" x 32"	150 feet
78086	2 1/2" x 32"	125 feet
78096	3" x 32"	125 feet

Bolster Chairs

Provides rebar and mesh support. Available in various heights, 32" long.



Rebar Spacers

Barspan Wheel



Barspan Wheel

General purpose circular spacer accommodates a large range of bar diameters. Heavy duty design easily supports extra loads.

MSI Cage



MSI Cage



MSI Cage



MSI Cage



Code	Concrete Cover (in.)	Bar No.	Qty./Ctn.	Diameter (in.)
W93MN	$\frac{3}{4}$	2-4	2000	2
W14MN	1	M-5	1000	$1\frac{1}{2}$
W84MN	$1\frac{1}{2}$	M-3	500	$3\frac{1}{4}$
W88MN	2	M-2	250	$4\frac{1}{4}$
W97MN	2	4-6	250	$4\frac{3}{4}$
W12MN	3	M-6	100	$6\frac{3}{4}$
W13MN	3	6-9	100	$6\frac{1}{2}$

Midspec Wheel



MSI Locking Wheel



Midspec Wheel

Suitable for spacing concrete reinforcement in columns, walls, piles and precast units.

V Spacer



Strand Spacer



V Spacer with Tab



The Midspec V Spacer is designed for Mesh Cage and Wire Cage coverage situations. The V Spacer is easy to clip on allowing for efficient form setup. The V Spacer also insures proper edge distance of wire and mesh from edge of forms.

Code	Concrete Cover (in.)	Bar No.	Qty./Ctn.	Diameter (in.)
W7523	$\frac{3}{4}$	2,3	2000	$1\frac{7}{8}$
W1023	1	2,3	1000	$2\frac{5}{8}$
W1004	1	4	1000	$2\frac{3}{4}$
W1534	$1\frac{1}{2}$	3,4	500	$3\frac{5}{8}$
W1556	$1\frac{1}{2}$	5,6	500	$3\frac{11}{16}$
W2004	2	3,4	500	$4\frac{1}{2}$
W2505	$2\frac{1}{2}$	5,6	250	$5\frac{3}{4}$
W3004	3	4	250	$6\frac{1}{2}$
W4005	4	5	100	$9\frac{3}{8}$
W5505	$5\frac{1}{2}$	5	50	$11\frac{1}{2}$
W6005	6	5	40	$12\frac{1}{2}$

Accessories

Econo Pad



Econo Pad

An economical way to protect architectural precast/prestressed units from discoloration, cracking, chipping and breakage during storage. **Panel Pads are not designed to help secure loads during transport.** The pads are scored and may be broken into two or they can be folded for greater clearance.

Part No.	Code	Size (in.)	Qty./Ctn.
1000896	ECOPD	$2\frac{1}{2} \times 6 \times \frac{3}{8}$	400

Panel Pad



Panel Pads

Protect architectural precast/prestressed units from discoloration, cracking, chipping and breakage during storage. **Panel Pads are not designed to help secure loads during transport.** These pads are scored and may be broken into two $2\frac{1}{2} \times 3$ units.

Part No.	Code	Size (in.)	Qty./Ctn.
123046	PPNAI	$2\frac{1}{2} \times 6 \times \frac{1}{2}$	250

Transportation Accessories

Part No.	Code	Size (in.)	Qty./Ctn.
1000960	CG425	4 ¹ / ₄ wide	200
	GCULT	12	EA

Chain Guards

Protect precast prestressed units during transportation. Prevents chains from slipping over panel face.

Chain Guard



Code	Shim Size (in.)	Qty./Ctn.
SH216	2 x 2 x 1 ¹ / ₁₆	2000
SH208	2 x 2 x 1 ¹ / ₈	2000
SH204	2 x 2 x 1 ¹ / ₄	1000
SH203	2 x 2 x 3 ³ / ₈	1000
SH202	2 x 2 x 1 ¹ / ₂	500
SH316	3 x 3 x 1 ¹ / ₁₆	1000
SH308	3 x 3 x 1 ¹ / ₈	1000
SH304	3 x 3 x 1 ¹ / ₄	500
SHWG1	3 ¹ / ₂ x 1 ¹ / ₂ x 1 ¹ / ₄ to 1 ¹ / ₆	1000

Shims

Non-corrosive, non-staining, color coded and non-slip textured surface shims. For leveling concrete units during erection.

A wedge shim and shim packs are also available.

Transportation Spacers



Forming Accessories

Radius Former



Concrete Formers

Flexible vinyl extrusions provide a smooth chamfer or radius to the edges of concrete.

** Sold in quantities of 5000 lineal ft. or more only.*

Chamfer



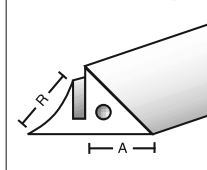
Drip Strip



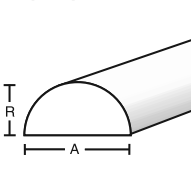
Double Chamfer



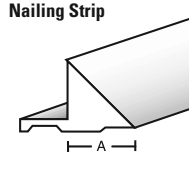
Double Chamfer Strip



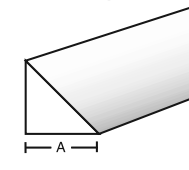
Drip Strip



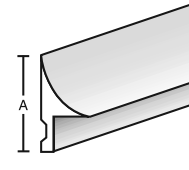
Chamfer with Nailing Strip



Chamfer Strip



Radius Former



Code	Size (in.)		Coil/Length (ft)	Qty./Ctn.	
RADIUS FORMER					
RF100	7/8	1	180	1	
RF075	5/8	1/2	300	1	
RF050	3/4	1/2	500	1	
CHAMFER WITH NAILING FLANGE					
CHN10		1	150	1	
CHN75		3/4	250	1	
CHN50		1/2	250	1	
CHAMFER					
CH100		1	170	1	
CH075		3/4	350	1	
CH050		1/2	100	5	
CH200		2	10	8	
DRIP STRIP					
DO500		1/2	3/8	100	5
DO750		3/4	1/2	100	6
DOUBLE CHAMFER					
VP663		3/4	1/2	100	4
3/16 in. Tapered Middle Slot					

3/16 in. Tapered Middle Slot

Clean



Form Clean

Aerosol cleaner quickly removes oil, dirt, and dust from wood, steel, or fiberglass forms for easy attachment of inserts.

Part No.	Code	Size	Qty./Ctn.
1001002	FORCL	14 fl. oz. ca	24 cans

Bond



Twin Bond

Double sided tape quickly and easily affixes inserts to forms. Eliminates the need for drilling holes, screwing or bolting inserts.

Part No.	Code	Thick (in.)	Width (in.)	Length (in.)	Qty./Ctn.
1001132	TWB05	1/16	1/2	108 ft/roll	24 rolls
1001134	TWB10	1/16	1	108 ft/roll	12 rolls
1001136	TWB20	1/16	2	108 ft/roll	6 rolls

Seam Strip



Seam Strip

An adhesive-backed foam tape for sealing joints in concrete formwork.

Part No.	Code	Size (in.)	Qty./Ctn.
1000980	SS438	1/4 x 3/8 x 1000 ft rbl	4 rolls
1000981	SS450	1/4 x 1/2 x 1000 ft rbl	4 rolls
1000982	SS550	1/2 x 1/2 x 660 ft rbl	4 rolls
	CLS51	1/2 x 1 (closed cell)	1000 ft.

Forming Accessories

Code	Tube Size (oz.)	Qty./Ctn.
White	10.3	24 tubes
Clear	10.3	24 tubes

Midspec Silicone Caulk

Rapid curing, durable, one component silicone rubber sealant designed specifically for sealing formwork.

Midspec Silicone Caulk



Code	Length (in.)	Qty./Ctn.
TIESD	4 1/4	2000

Double Panel Tie

Double pronged plastic anchoring device for holding void formers and/or sandwich panel foam insulation in place during casting of concrete.

Double Panel Tie



Part No.	Size (in.)	Thread Length (in.)	Total Length (in.)	Qty./Ctn.
1000961	1 Thread			300
1000957	3/4 Thread	3 1/4	4	500
1000958	1/2 Thread	2	2 1/2	1250
1000977	1 x 3/4 removal tool			

Coil Loop Insert Protectors

Provides complete protection to the helix of a Coil Loop Insert during pouring finishing and storage operations. Specially designed removal tool available for easy removal of insert protector.

Coil Loop Insert



Code	Size	Qty./Ctn.
23600	10 Length 5000 LF/Skid	

Dove Tail Anchor Slot

Midspec Dove Tail is the chief component part of the anchoring system. Maintains it's shape and form during the pouring process. Waterproof cellular filler and face sealer guarantees the shape during concreting. Stocked in 10' lengths and is easily customized in the field. Holes are provided in the back 4" on center (6d nails suggested). When nailing to the form, no more than 12" spacing is recommended.

Dove Tail Anchor Slot



Code	Size	Qty./Ctn.
727 - VOC	Drum	55 gallon
880 - VOC	Drum	55 gallon
880 - VOC	Tote	275 gallon

Crete - Lease

High quality release agent unsurpassed at reducing and / or eliminating concrete bug holes.

Crete - Lease



Forming Accessories

Code	Size	Qty./Ctn.
100	Drum	55 gallon

Spatter Cote

Halts and removes concrete build-up on equipment and forms.



Code	Size	Qty./Ctn.
117801	Pail	5 gallon

Spec - Cote

Spec - Cote is a premium high solids permanent protective polyurethane coating unsurpassed at protecting wood forms. It is fast drying making it ideal for efficient precast production.



Code	Size	Qty./Ctn.
RB395	N/A	1
RB650A	N/A	1

Tie Guns

Tie Guns provide stronger and faster tying than manual tying. One tie takes less than one second. Ideal for the following applications: Precast concrete products, building foundation, floors and walls, retaining walls and swimming pool walls.



Code	Size	Qty./Ctn.
Type L	4 3/4	1000
Type L	5 1/2	1000
Type M	6 1/4	1000
Type M	7	1000
Type M	8	1000

Connector Pin

The MidSpec Connector Pin is used to tie two wall panel wythes together. The pins work in tension and compression to resist wind pressure and suction. Bowing and separation of the wythes is also prevented. The pins are manufactured from stainless steel. This allows them to resist corrosion. The pins are also flexible to allow movement from thermal stresses that can build up in the wall panel.



Code	Size	Qty./Ctn.
16BATIEWIRE	16GA	20 Spools
16PVCTIEWIRE	16GA	20 Spools

Wire Ties and Tie Wire

MidSpec Rebar Tie Wire is made from the softest annealed wire available to assure you that it will consistently form the perfect tie every time. MidSpec green polyvinyl chloride coated Rebar Tie Wire and Double Loop Wire Ties were developed to be used in conjunction with epoxy-coated rebars. The use of P.V.C. coated Tie Wire will prevent damage to the surface of the epoxy coating on rebar. This helps eliminate the dangers caused by rusting of exposed metal.



Sandwich Panel Connectors



MSI-9 Precast Sandwich Panel Tie

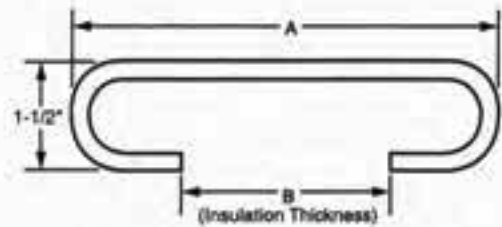
The MidSpec MSI-9 Precast Sandwich Panel Tie is manufactured to specifications from 3 gauge (0.243" diameter) stainless steel or galvanized wire.

Place the connectors at the edge of the foam insulation so the body of the tie is at the joint line between two pieces of foam. Next, the ends of the tie are rotated 90° so they bear against the foam insulation. Spacing of the panel connectors are per job requirements.

After the panel ties have been attached to the foam insulation, they are placed on the freshly placed bottom wythe of concrete. Later, the top wythe of concrete is placed.

The chart, below, lists the sizes of panel ties produced in the past for various precasters. Other sizes can be produced on special order.

MSI-9 Precast Sandwich Panel Tie								
A	3"	4"	4"	5"	6"	7"	8"	
B	1"	1"	2"	3"	3"	3"	3"	



MSI-9 Precast Sandwich Panel Tie

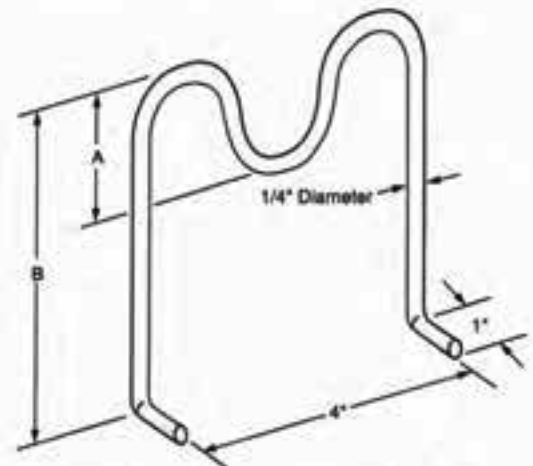
MSI-37 "M" Anchor Shear Connector

The MidSpec MSI-37 M Anchor Shear Connector is available in various sizes. Fabricated from 1/4" diameter galvanized wire, these connectors are designed for use as a shear connector in precast concrete sandwich panels. For proper use, place the connectors at the following maximum spacing:

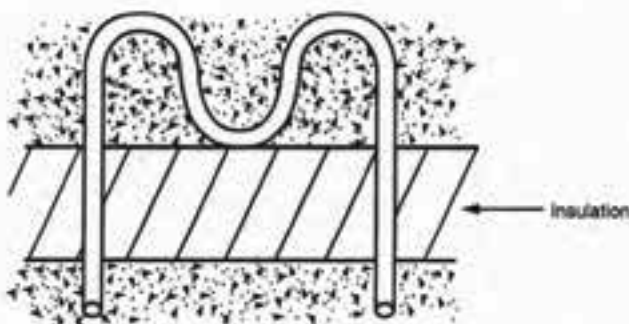
- 18" on center maximum across the width of the panel.
- 24" on center maximum along the length of the panel.
- Place additional connectors around the panel's lift points.

Edge distance requirements are 6" minimum center line to the panel end and 4" minimum center line to the panel's edge. Place connectors parallel to the length of the panel.

Minimum embedment at the open end is 2"



MSI-37 "M" Anchor Shear Connector



Typical Installation

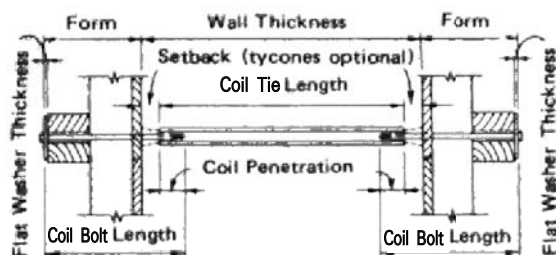
The MidSpec Coil Tie

The MidSpec Coil Tie is an extra strong, resistance welded tie designed to take the abuse encountered in medium and heavy concrete construction. An extremely simple tie, capable of many combinations and uses in the field, it may be used with or without Cones or combined with Continuous Threaded Coil Rod to form an Adjustable Coil Tie.

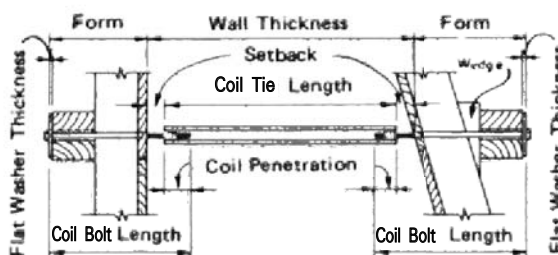


HOW TO FIGURE COIL TIE LENGTH

Coil Tie length is determined by subtracting each setback requirement from the wall thickness at the Coil Bolt location. Coil Bolt length is determined by adding the form thickness to the setback on one side plus the Coil Tie coil length plus 1/2". Coil Bolts are furnished standard in even inch lengths. Select the next higher full inch length over actual length figured. For extreme adjustment requirements, one or two more inches may be added.



Plumb Wall Form



Battered Wall Form

WALL THICKNESS:

Distance between the form facings at the Coil Tie location.

SETBACK:

Required distance of tie metal from the finished concrete face with or without the use of Cones. Setback may be req 1/2" (13 mm) and 3/4" (19 mm) diameter Coil Tie. A setback of 2" (51 mm) is normal for 1" (25 mm) and 1-1/4" (32 mm) Coil Tie, with or without Cones.

FORM THICKNESS:

Distance measured between the finished concrete surface to the outside face of the flat washer - includes plywood sheeting material, studs, wales and washer.

COIL PENETRATION:

Distance the Coil Bolt should penetrate the Coil Tie coil length plus 1/2" (13 mm).

GENERAL INSTRUCTIONS:

For extreme penetration or extended concrete curing requirements, Coil Bolt are ordinarily greased to facilitate removal. To break the bond and permit easy removal, it is a good practice to turn the Coil Bolt a quarter to one-half turn, in and out, eight to twelve hours after the concrete has been poured.

FORMING ACCESORIES

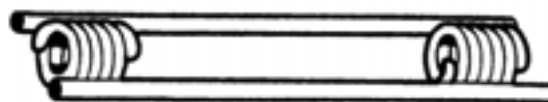
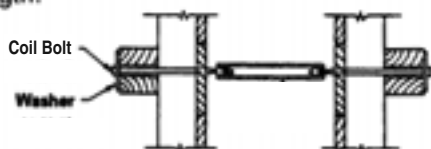
2 STRUT COIL TIE

MSI-1

The MidSpec **2 Strut Coil Tie** is available in 1/2" (13 mm), 3/4" (19 mm) and 1" (25 mm) nominal diameters and may be fabricated to required length to the nearest 1/8" (3 mm).

TO ORDER: give quantity, nominal diameter and actual Coil Tie length, product code and name.

EXAMPLE: 200, 1/2" diameter x 22" 2-Strut Coil Tie. See detail on Page 3 for determining required Coil Tie length.



2 Strut Coil Tie

Nominal Diameter in. (mm)	Safe Load* lbs. (Kn)
1/2 (13)	4,500 (20.1)
3/4 (19)	6,750 (30.0)
1 (25)	9,000 (40.5)

*Approx. 2:1 safety factor. Coil Tie for forming Applications

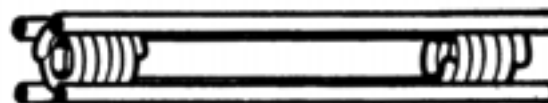
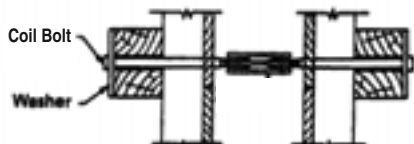
4 STRUT COIL TIE

MSI-1

The MidSpec **4 Strut Coil Tie** is available in 1" (25 mm) and 1-1/4" (32 mm) MSI-2 nominal diameters and may be fabricated to required length to the nearest 1/8" (3 mm).

TO ORDER: give quantity, nominal diameter and actual Coil Tie length, product code and name.

EXAMPLE: 200, 1" diameter x 30" MSI-2 4 Strut Coil Tie. See details on Page 3 for figuring Coil Tie length.



MSI-2
4 Strut Coil Tie

Nominal Diameter in. (mm)	Safe Load lbs. (Kn)
1 (25)	18,000 (80.1)
1-1/4 (32)	27,000 (120.1)

*Approx. 2:1 safety factor. Coil Tie for forming Applications



FORMING ACCESSORIES

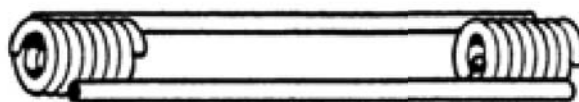
CONE-TIGHT COIL TIE

MSI-3

The MidSpec **Cone-Tight** Coil Tie has the same capacities as Standard Tyscru and is available in 1/2" (13 mm) MSI-3, 3/4" (19 mm) MSI-3, 1" (25 mm) MSI-3 and 1-1/4" (32 mm) MSI-3 nominal diameters. Cone-Tight Tycones are readily attached to the protruding coils. Coils protrude 5/16" (8 mm) on the 1/2" (13 mm) diameter and 1/2" (25 mm) on the larger sizes.

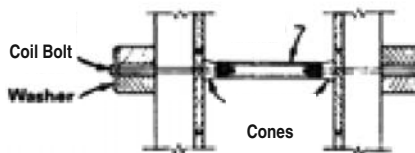
TO ORDER: give quantity, nominal diameter and Coil Tie length, product code and name.

EXAMPLE: 200, 1/2" diameter x 12" Cone-Tight Coil Tie.



MSI-3

Cone-Tight Coil Tie



FORMING ACCESORIES

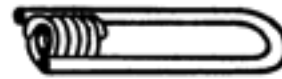
STANDARD 2-STRUT STRAIGHT COIL LOOP

MSI-16

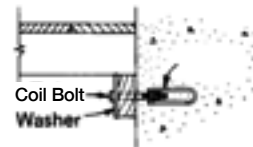
The MidSpec **Standard 2-Strut** Straight Coil Loop is made of a single looped wire welded to a helix coil in 1/2" (13 mm) and 3/4" (19 mm) nominal diameters. Suitable for light anchorage requirements or as emergency tie, tie down, corner tie, etc. Standard length is 4" (102 mm) for 1/2" (13 mm) diameter and 6" (152 mm) for 3/4" (19 mm) diameters. This unit may be fabricated in lengths to suit job.

TO ORDER: give quantity, nominal diameter, length, product code and name.

EXAMPLE: 200, 1/2" diameter x 4" MSI-16 Standard 2-Strut Coil Loop



Standard 2-Strut Coil Loop



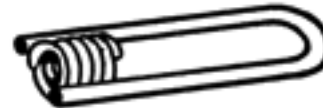
HEAVY 2-STRUT STRAIGHT COIL LOOP

MSI-16

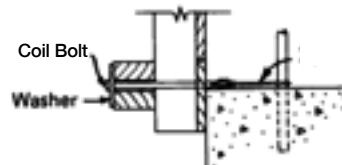
The MidSpec **Heavy 2-Strut** Coil Loop MSI-16 is fabricated similar to standard units with heavier strut wire. The unit is used for medium heavy construction. The standard unit is 6" (152 mm) long and is manufactured in the 3/4" (19 mm) diameter size. Longer lengths may be special ordered.

TO ORDER: give quantity, nominal diameter, length, product code and name.

EXAMPLE: 200, 3/4" diameter x 6" MSI-16 Heavy 2-Strut Straight Coil Loop



Heavy 2-Strut Coil Loop



SINGLE FLARED COIL LOOP INSERT

MSI-18

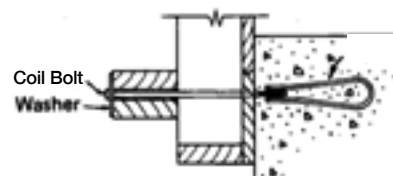
The MidSpec **Single Flared** Coil Loop MSI-18 is made with the loop end flared for greater anchorage in the concrete. Standard lengths are 9" (229 mm) for 1/2" (13 mm) diameters and 12" (304 mm) for 3/4" (19 mm) diameters. This unit may be supplied in special lengths and flares.

TO ORDER: give quantity, nominal diameter, length, product code and name.

EXAMPLE: 200, 1/2" diameter x 9" Flared 2-Strut Coil Loop



Flared 2-Strut Coil Loop

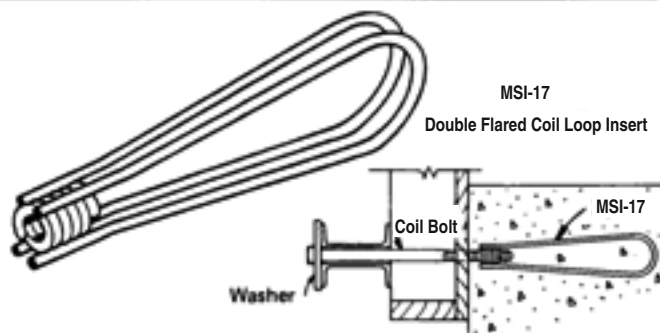


DOUBLE FLARED COIL LOOP INSERT

MSI-17

MidSpec Double Flared Coil Loop Insert MSI-17 is made with two looped wires welded to a helix coil. Suitable for heavy form anchorage in mass concrete construction. The standard length is 15" (378 mm) for 1" (25 mm) and 1-1/4" (32 mm) diameters with struts flaring to 3" (76 mm) diameters. The standard flare unit is supplied unless special size or shaped flares are requested.

TO ORDER: give quantity, nominal diameter, length, product code and name.

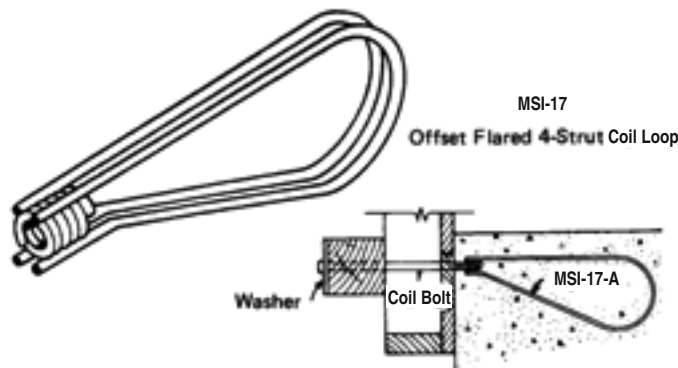


OFFSET FLARED 4-STRUT COIL LOOP

MSI-17-A

MidSpec Offset Flared 4-Strut Coil Loop MSI-17-A is made of two looped wires welded to a helix coil. The loops are flared and offset so that the center of anchorage is below the center line of the coil to distribute the load well into the concrete and still keep the coil at or near the top of the pour or other boundary restrictions. Standard sizes are: 1" X 18" (25 mm x 458 mm) with 6" (152 mm) flare, 1" x 24" (25 mm x 609 mm) and 1-1/4" x 24" (32 mm x 609 mm) with 9" (229 mm) flare, and 1- 1/4" x 36" (32 mm x 916 mm) with 12" (304 mm) flare.

TO ORDER: give quantity, nominal diameter, length, product code and name.



COIL LOOP WORKING LOADS

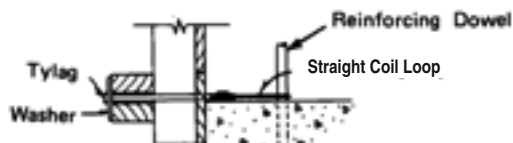
Chart is based on standard sizes shown and typical conditions with 1/4" (6 mm) minimum setback. Special Coil Loop can be designed for individual job conditions and/or low strength concrete.

Chart Notes: Minimum Safety factor approx. 2:1 at working loads shown.

*As a tie around a dowel (see sketch below).

**3,000 psi (20.7 MPa) concrete.

***Shear ratings specified are for mass concrete, not thin wall precast sections.



TYLOOP USED AS A TIE

For permanent connections refer to inserts in Bulletin No. 6, "Inserts/Anchorages for Concrete Construction". For lifting inserts for tilt-up refer to Bulletin No. 8, "Products for Tilt-Up Concrete Construction". For lifting inserts for precast concrete refer to Bulletin No. 9, "Products for Precast Concrete Construction".

Coil Loop Type	Size	Used as a Tie*	Used as an Anchor**	
			Tension	Shear***
Standard 2-Strut	1/2" x 4"	3,750 lbs.	2,250 lbs.	1,500 lbs.
	(13 x 102)	16.7 Kn	10.0 Kn	6.8 Kn
Standard 2-Strut	3/4" x 6"	5,625 lbs.	4,500 lbs.	3,000 lbs.
	(19 x 152)	25.0 Kn	20.1 Kn	13.3 Kn
Heavy 2-Strut	3/4" x 6"	6,750 lbs.	5,250 lbs.	3,750 lbs.
	(19 x 152)	30.0 Kn	23.4 Kn	16.7 Kn
Flared 2-Strut	1/2" x 9"	---	4,500 lbs.	1,500 lbs.
	(13 x 229)	---	20.1 Kn	6.8 Kn
Flared 2-Strut	3/4" x 12"	---	6,750 lbs.	3,750 lbs.
	(19 x 304)	---	30.0 Kn	16.7 Kn
Flared 4-Strut	1" x 15"	---	12,000 lbs.	6,750 lbs.
	(25 x 378)	---	53.4 Kn	30.0 Kn
Flared 4-Strut	1-1/4" x 15"	---	13,500 lbs.	9,000 lbs.
	(32 x 378)	---	60.1 Kn	40.5 Kn
Off. Flared 4-Strut	1" x 18"	---	7,000 lbs.	4,620 lbs.
	(25 x 458)	---	31.5 Kn	20.6 Kn
Off. Flared 4-Strut	1" x 24"	---	24,000 lbs.	15,840 lbs.
	(25 x 608)	---	106.8 Kn	70.5 Kn
Off. Flared 4-Strut	1-1/4" x 24"	---	24,000 lbs.	15,840 lbs.
	(32 x 608)	---	106.8 Kn	70.5 Kn
Off. Flared 4-Strut	1-1/4" x 36"	---	30,000 lbs.	19,800 lbs.
	(32 x 916)	---	135.0 Kn	88.1 Kn

FORMING ACCESSORIES

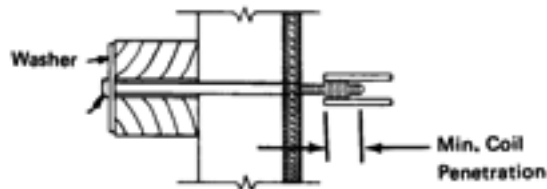
COIL BOLTS

MSI-14

The MidSpec Coil Bolt MSI-14 are threaded for the contour of the helical coil of the Coil Tie. Available in 1/2" (13 mm), 3/4" (19 mm), 1" (25 mm) and 1-1/4" (32 mm) diameters and lengths as required in 1" (25 mm) increments. All Coil Bolt have an integral washer head.

TO ORDER: give quantity, diameter, length, product code and name.

EXAMPLE: 200, 1/2" x 16" MSI-14 Coil Bolt



MSI-14
Coil Bolt

Nominal Diameter in. (mm)	Threads per inch	Thread Length in. (mm)	Min. Coil Penetration in. (mm)	Min.C.T.C. Penetration* in. (mm)
1/2 - 4.5 M (13)	6	4 (102)	1-1/2 (38)	1-7/8 (22)
1/2 - 6.75 M (13)	6	4 (102)	1-3/4 (45)	2-3/8 (61)
3/4 (19)	4-1/2	4-1/2 (115)	1-3/4 (45)	2-1/4 (57)
1 (25)	3-1/2	5 (127)	2-1/4 (57)	2-3/4 (70)
1-1/4 (32)	3-1/2	5 (127)	2-3/8 (61)	2-7/8 (73)

*C.T.C. denotes Cone-Tight Coil.

ADJUSTABLE COIL BOLTS

MSI-14-A

The MidSpec **Adjustable** Coil Bolt MSI-14-A are available in 1/2" (13 mm), 3/4" (19 mm) and 1" (25 mm) diameters in lengths of 24" (608 mm), 30" (760 mm) and 36" (912 mm). The length of thread on the adjustable end varies from 10" (254 mm) to 16" (406 mm). Adjustment is obtained by a free running nut. The Adjustable Coil Bolt is especially adaptable for engineering jobs at corners, batters, bridge decks, etc., where one Adjustable Coil Bolt may serve several length requirements.

TO ORDER: give quantity, diameter, length, product code and name.



Adjustable Coil Bolt

Nominal Diameter	Bolt Length	Adjustment Length
1/2", 3/4", 1"	24"	9"
13, 19, 25 mm	608 mm	229 mm
1/2", 3/4", 1"	30"	15"
13, 19, 25 mm	762 mm	381 mm
3/4", 1"	36"	15"
19, 25 mm	916 mm	381 mm

ADJUSTABLE COIL TIES

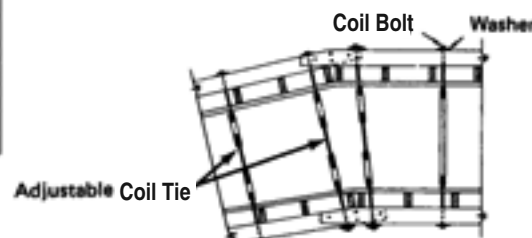
The MidSpec **Adjustable** Coil Tie, consisting of two standard Coil Tie and one Continuous Threaded Coil Rod, is available in 1/2" (13 mm), 3/4" (19 mm), 1" (25 mm) and 1-1/4" (32 mm) diameters.

TO ORDER: give quantity, nominal diameter, name and maximum adjustment required.

EXAMPLE: 200, 1/2" diameter Adjustable Coil Tie for 2'-0" to 3'-0" wall.



Adjustable Coil Tie



FORMING ACCESSORIES

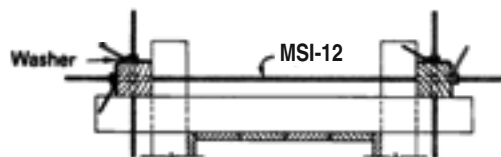
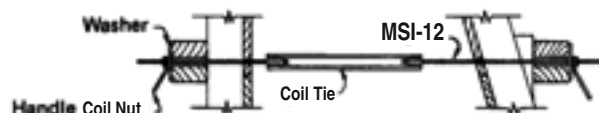
CONTINUOUS THREADED COIL ROD

MSI-12

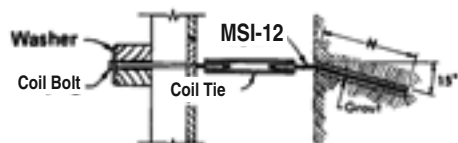
The MidSpec **Continuous Threaded** Coil Rod MSI-12 is perhaps the most versatile of all the members of the MidSpec Coil Tie family since it can be used in scores of combinations with any of the Coil Tie products or accessories. This material is stocked in 5, 10 and 12 ft. (1.52, 3.05 and 3.66 m) lengths. Field cutting may be accomplished with bolt cutters or Carborundum blades.

Coil Rod is particularly adaptable in combination with Coil Tie to make adjustable ties, embedded in concrete or rock as an adjustable anchorage for Coil Tie, or in combination with Handle Coil Nuts as emergency Coil Bolts.

TO ORDER: give quantity, diameter, length, product code and name.



Embedment Application



MSI-12

Continuous Threaded Coil Rod

Diameter in. (mm)	Safe Working Loads*	
	100,000 psi (689.5 MPa) lbs. (Kn)	125,000 psi (861.8 MPa) lbs. (Kn)
1/2 (13)	6,900 (30.7)	8,625 (8.4)
3/4 (19)	15,300 (68.1)	19,125 (85.1)
1 (25)	27,000 (120.1)	33,750 (150.1)
1-1/4 (32)	45,750 (203.5)	57,188 (254.4)

*Approximately 2:1 safety factor for forming Applications. Shaded area denotes stocked material.

Diameter in. (mm)	Safe Working Load*		Embedment "H"	
	lbs.	Kn	1,000 psi 6.9 MPa in. (mm)	2,000 psi 13.8 MPa in. (mm)
1/2 (13)	4,500	20.1	16 (408)	12 (304)
1/2 (13)	6,750	30.0	20 (508)	15 (378)
3/4 (19)	9,000	40.5	24 (609)	18 (458)
1 (25)	13,500	60.1	32 (816)	24 (609)
1 (25)	18,000	80.1	40 (1020)	30 (760)
1-1/4 (32)	27,000	120.1	40 (1020)	30 (760)

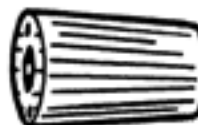
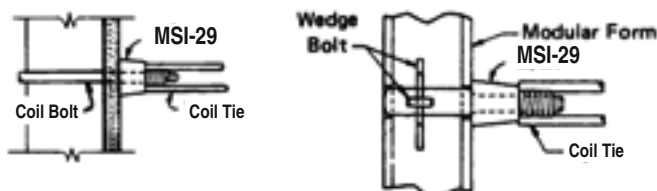
*Approximately 2:1 safety factor for forming Applications.

STANDARD WOOD CONES

MSI-29

Standard Wood Cones (MSI-29) are available to fit 2-Strut and 4-Strut Coil Ties. Cone length equals setback requirement.

TO ORDER: give quantity, nominal Coil Tie diameter and setback, product code and name.



MSI-29

Standard Wood Cone

Nominal Diameter x Depth		Taper	
in.	mm.	in.	mm.
1/2 x 1	13 x 25	1-3/16 x 1-3/8	30 x 35
1/2 x 1-1/2	13 x 38	1-3/16 x 1-3/8	30 x 35
1/2 x 2	13 x 51	1-3/16 x 1-3/8	30 x 35
3/4 x 1	19 x 25	1-5/8 x 1-3/4	41 x 45
3/4 x 1-1/2	19 x 38	1-5/8 x 1-3/4	41 x 45
3/4 x 2	19 x 51	1-5/8 x 2	41 x 51
1 x 2	25 x 51	2-1/16 x 2-5/16	53 x 59
1-1/4 x 2	32 x 51	2-1/4 x 2-9/16	57 x 65

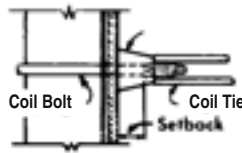
FORMING ACCESSORIES

PLASTIC CONE-TIGHT CONES

MSI-30

The MidSpec **Plastic Cone-Tight Cones MSI-30** are designed to engage the protruding coil of a Cone-Tight Coil Tie. Actual lengths are greater than the setback requirement. See accompanying chart for dimensions.

TO ORDER: give quantity, nominal diameter x depth, product code, name and setback.W



MSI-30
Plastic Cone-Tight
Cone

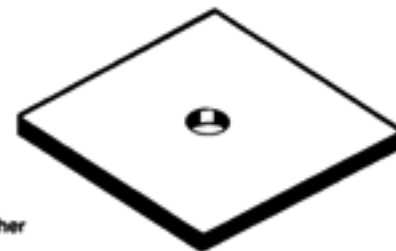
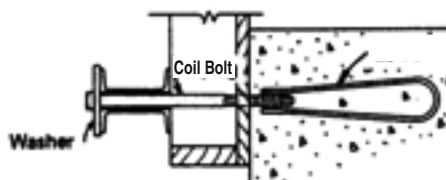
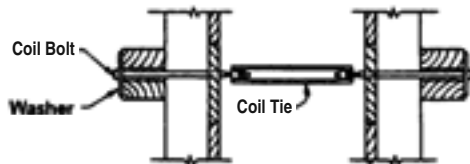
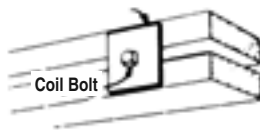
Nominal Diameter and Depth		Setback in. (mm)	Taper in. (mm)
in.	mm		
1/2" x 1-5/16"	13 x 33	1" (25)	1" to 1-1/4" (25 x 32 mm)
1/2" x 1-13/16"	13 x 46	1-1/2" (38)	
1/2" x 2-5/16"	13 x 59	2" (51)	
3/4" x 1-1/2"	19 x 38	1" (25)	1-1/2" x 1-3/4" (38 x 45 mm)
3/4" x 2-1/2"	19 x 64	2" (51)	
1" x 2-1/2"	25 x 64	2" (51)	1-13/16" x 2-1/16" (46 x 53 mm)
1-1/4" x 2-1/2"	32 x 64	2" (51)	
			2-1/4" x 2-1/2" (57 x 64 mm)

FLAT WASHERS

MSI-11

The MidSpec **Flat Washers MSI-11** are made from flat steel plate. For optimization, MidSpec washers are basically square. For best results the washer should be placed so that its length runs parallel to the walers and the gap or space spanned by the washer should not exceed the physical bolt diameter plus 1/4" (6 mm).

TO ORDER: give quantity, nominal Coil Tie diameter, product code, name and size.



MSI-11
Flat Washer

Tyrag Size	Size - in. (mm)	Hole Diameter
1/2" (13 mm)	1/4" x 3-1/2" x 3-1/2" (6 x 89 x 89)	9/16" (14 mm)
1/2" (13 mm)	5/16" x 4-1/2" x 3-1/2" (8 x 115 x 89)	9/16" (14 mm)
3/4" (19 mm)	5/16" x 4-1/2" x 4" (8 x 115 x 102)	13/16" (21 mm)
3/4" (19 mm)	3/8" x 5" x 5" (10 x 127 x 127)	13/16" (21 mm)
1" (25 mm)	1/2" x 6" x 6" (13 x 152 x 152)	1-1/8" (29 mm)
1" (25 mm)	5/8" x 7" x 7" (16 x 178 x 178)	1-1/8" (29 mm)
1-1/4" (32 mm)	3/4" x 5" x 5" (19 x 127 x 127)	1-3/8" (35 mm)
1-1/4" (32 mm)	3/4" x 8" x 8" (19 x 203 x 203)	1-3/8" (35 mm)

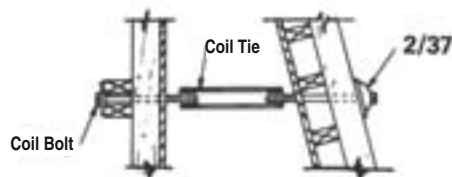
FORMING ACCESSORIES

BATTER WASHER

MSI-42

The MidSpec **Batter Washers** MSI-42 are designed to hold a **Coil Bolt** at any angle up to 45° without need for wedging. Nail holes are provided for attaching the washers to the walers or strongbacks. Multiple lumber grips on the underside prevent slippage when the washers are not nailed. Available for all Tylag sizes.

TO ORDER: give quantity, diameter, product code and name.



MSI-42
Batter Washer

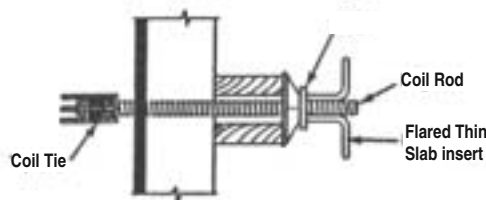
Bolt Diameter	Washer Dimensions	Height
1/2" (13 mm)	3-1/2" x 3-1/2" (89 mm x 89 mm)	1" (25 mm)
3/4" (19 mm)	5" x 5" (127 mm x 127 mm)	1-1/4" (32 mm)
1" (25 mm)	6-1/2" x 6-1/2" (164 mm x 164 mm)	1-1/2" (38 mm)
1-1/4" (32 mm)	6-1/2" x 6-1/2" (164 mm x 164 mm)	1-1/2" (38 mm)

STANDARD CUT WASHER

MSI-11

The MidSpec **Standard Cut Washers** MSI-11 are available in 1/2" (13 mm), 3/4" (19 mm), 1" (25 mm) and 1-1/4" (32 mm) nominal hole diameters. Cut washers have size proportions that minimize embedding and aid torquing. See chart for applicable dimensions.

TO ORDER: give quantity, nominal hole diameter, product code and name.



MSI-11
Standard Cut Washer

Nominal Hole Diameter in. (mm)	Dimensions	
	Inches	mm.
1/2 (13)	1-3/8" OD x 3/32" thick	35 x 2.5
3/4 (19)	2" OD x 5/32" thick	51 x 4
1 (25)	2-1/2" OD x 3/16" thick	64 x 5
1-1/4 (32)	3" OD x 3/16" thick	76 x 5



FORMING ACCESSORIES

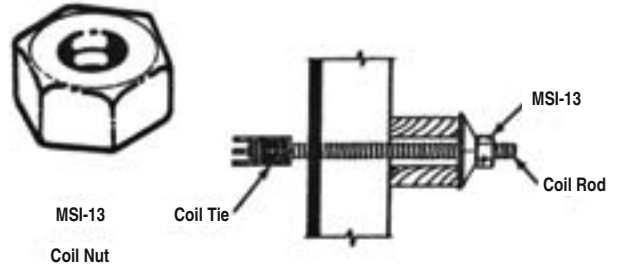
COIL NUTS

MSI-13

The MidSpec Coil Nut (MSI-13) are manufactured with contour thread and are available in 1/2" (13 mm) through 1-5/8" (41 mm) diameters. Acme thread is available on request.

TO ORDER: give quantity, diameter, product code and name.

WARNING: when utilizing Coil Nut on through-tie applications, such as Continuous Threaded Coil Rod, double nuts are required to develop ultimate loads.



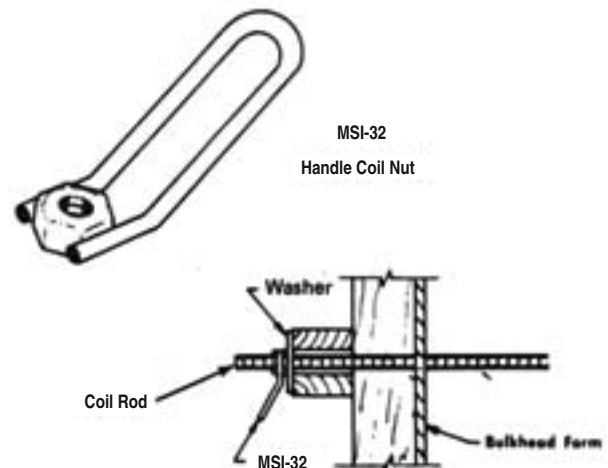
HANDLE COIL NUTS

MSI-32

The MidSpec Handle Coil Nuts (MSI-32) are made of hex nuts welded to substantial wire loops. Available in 1/2" (13 mm), 3/4" (19 mm), 1" (25 mm) and 1- 1/4" (32 mm) diameters with contour thread. The handle eliminates the need for using a wrench and makes installation and/or stripping fast and simple. Standard handle lengths, measured from center of hole, are 4-1/2" (115 mm) for 1/2" (13 mm) dia., 5" (127 mm) for 3/4" (19 mm) and 1" (25 mm) dia., and 6-1/2" (164 mm) for 1-1/4" (32 mm) dia. Other lengths available on special order.

TO ORDER: give quantity, diameter, product code and name.

WARNING: when utilizing Handle Coil Nuts on through-tie applications, such as Continuous Threaded Coil Rod, double nuts are required to develop ultimate loads.



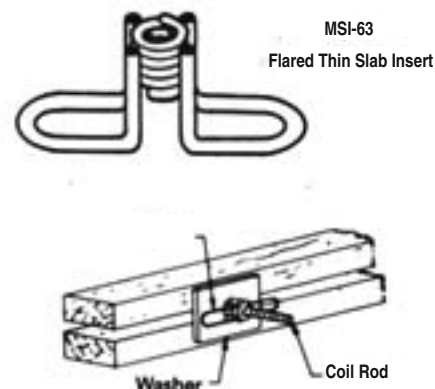
FLARED THIN SLAB INSERTS

MSI-63

The MidSpec Thin Slab Inserts (MSI-63) are made of helix coils welded to substantial wire loop handles. Handles eliminate the need for using a wrench and making installation and stripping fast and simple. Available in 1/2" (13 mm), 3/4" (19 mm), 1" (25 mm) and 1-1/4" (32 mm) diameters. Standard Thin Slab Inserts are 5" (127 mm) for 1/2" (13 mm) diameter, 5-1/2" (140 mm) for 3/4" (19 mm) diameter, 6" (152 mm) for 1" (25 mm) diameter and 8-1/4" (209 mm) for 1-1/4" (32 mm) diameter.

TO ORDER: give quantity, diameter, product code and name.

EXAMPLE: 200, 1/2" diameter MSI-63 Flared Thin Slab Inserts



FORMING ACCESSORIES

SHE-BOLT PRODUCTS

SHE-BOLT

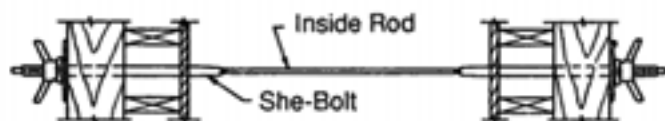
MSI-30

MidSpec She-Bolt System is an unique, heavy duty, reusable form-tying system for medium and heavy concrete construction.

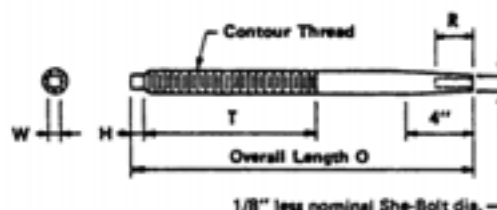
MidSpec She-Bolts MSI-30 are supplied with external and internal Contour threads to meet standard construction practices, but any combination of Contour, Acme or NC threads can be furnished on request. Details shown on page 4 illustrate some of the most common thread/hardware combinations. Numerous inside components are available for She-Bolt applications. These components include standard Inside Rods, High Tensile Continuous Threaded Coil Rod, Bow Lag Anchors, Crimped Anchors, etc. Inside Rods and Crimped Anchors are prefabricated units supplied with either Contour or NC machine threads. High Tensile Coil Rod may be furnished in 5, 10 or 12 feet (1.5, 3.0 and 3.7 meters) lengths for cutting in the field or may be fabricated to desired lengths with thread stops. MidSpec standard She-Bolts MSI-30 are manufactured according to the specifications identified in the adjacent data. The table reflects the most efficient She-Bolt Systems with respect to costs and strengths.

TO ORDER: give quantity, nominal diameter, overall length, product code, name, specify external thread type, nominal diameter and internal thread type.

EXAMPLE: 100, 1-1/4"x24" MSI-30 She-Bolt Contour external thread and 3/4" dia. internal Contour thread.



She-Bolt MSI-30



SHE-BOLT GEOMETRY						
Nom. Dia.	Internal Thread Diameter	O*	T	H	W	R**
3/4" (19)	1/2" (13 mm)	20" (508)	10" (254)	3/4" (19)	9/16" (14)	Two times the internal thread dia. plus 1/4" inch. (6 mm)
7/8" (22)	1/2", 5/8" (13, 16 mm)		12" (304)		5/8" (16)	
1" (25)	1/2", 5/8" (13, 16 mm)		12" (304)		3/4" (19)	
1-1/8" (29)	1/2", 5/8", 3/4" (13, 16, 19 mm)	20" (508)	10" (254)	1" (25)	7/8" (22)	
1-1/4" (32)	5/8", 3/4", 7/8" (16, 19, 22 mm)		12" (304)		7/8" (22)	
1-3/8" (35)	5/8", 3/4", 7/8", 1" (16, 19, 22, 25 mm)		18" (458)		1" (25)	
1-1/2" (38)	3/4", 7/8", 1", 1-1/8" (19, 22, 25, 29 mm)	30" (762)	18" (458)		1" (25)	
1-5/8" (41)	1", 1-1/8", 1-1/4" (25, 29, 32 mm)		18" (458)		1" (25)	

*Standard lengths, other lengths available on request.

**All inside male components must be fully engaged the distance of "R".

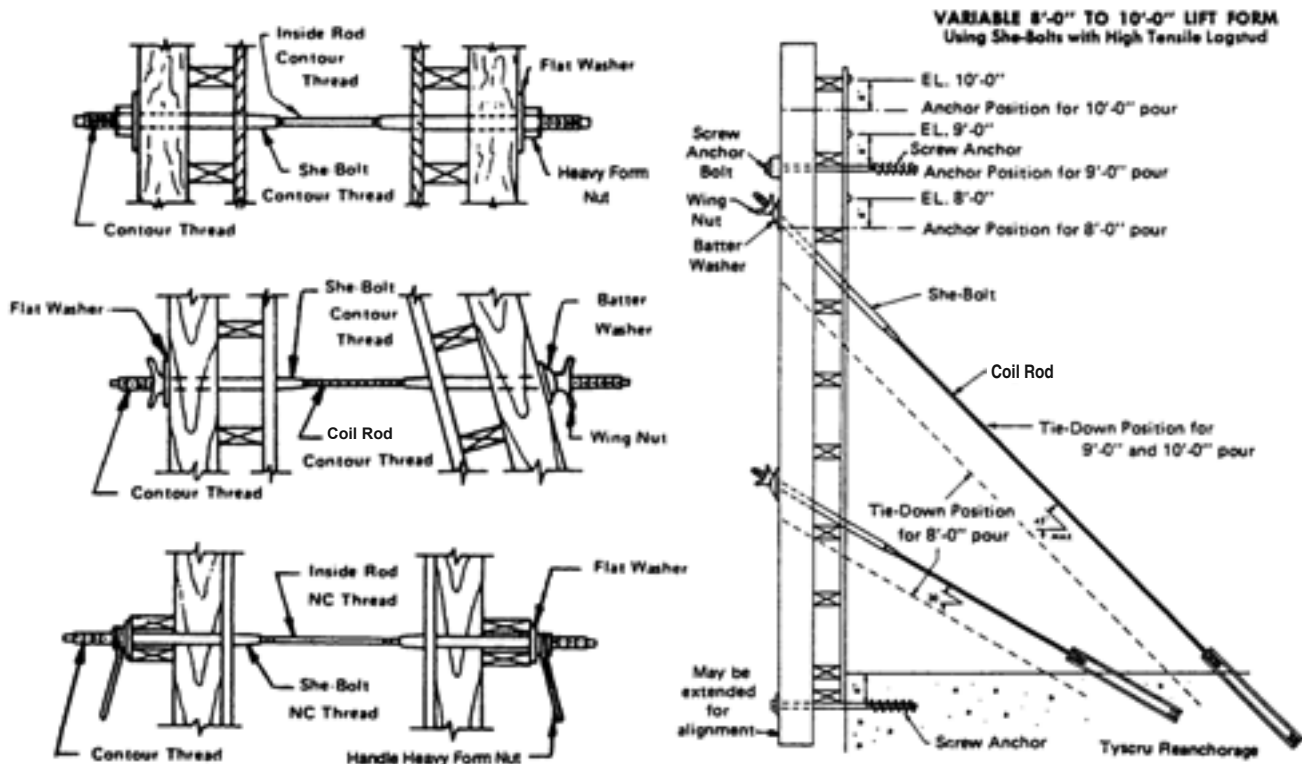
Table A: SAFE WORKING LOADS - She-Bolt Only

She-Bolt Nom. Dia.	INTERNAL THREAD DIAMETER						
	1/2" (13 mm)	5/8" (16 mm)	3/4" (19 mm)	7/8" (22 mm)	1" (25 mm)	1-1/8" (29 mm)	1-1/4" (32 mm)
3/4" (19)	8,750 (38.9)	---	---	---	---	---	---
7/8" (22)	17,500 (77.8)	11,250 (50.0)	---	---	---	---	---
1" (25)	28,000 (124.6)	21,750 (96.8)	---	---	---	---	---
1-1/8" (29)	39,875 (177.4)	33,750 (150.1)	26,125 (116.2)	---	---	---	---
1-1/4" (32)	---	47,250 (210.2)	39,750 (176.8)	32,500 (144.6)	---	---	---
1-3/8" (35)	---	62,375 (277.5)	54,875 (244.1)	45,875 (204.1)	35,375 (157.4)	---	---
1-1/2" (38)	---	---	72,250 (321.4)	54,875 (244.1)	52,250 (232.4)	40,375 (179.6)	---
1-5/8" (41)	---	---	---	---	70,750 (314.7)	58,875 (261.9)	45,500 (202.4)

She-Bolt safe working loads are based on 125,000 psi (862 MPa) material and approx. 2:1 safety factor. See Tables B and C on Page 5 for Inside Rod capacities and She-Bolt System capacities.

FORMING ACCESSORIES

TYPICAL SHE-BOLT APPLICATIONS



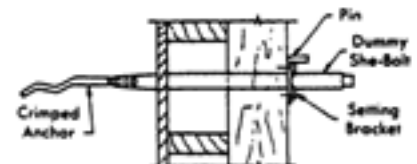
SETTING BRACKET

MidSpec **Setting Brackets** are used on wood forms to set Dummy She-Bolts and Dummy He-Bolts.

TO ORDER: give quantity, nominal diameter of She-Bolt, product code and name.



Setting Bracket



FORMING ACCESSORIES

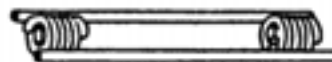
COIL TIE PRODUCTS

COIL TIE SYSTEM

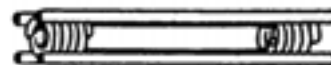
MSI-1, MSI-2

The Coil Tie System has proven through the years to be an adaptable, adjustable, practical and economical forming system. The System takes advantage of its inherent design features; such as, load capacities, anchorage capabilities and splicing ease to give the contractor the optimum in forming results without having to rely on "special" orders and/or handling. The basic Coil Tie Assembly consists of a Coil Tie, two Coil Bolt and two washer devices. The Adjustable Coil Bolt and Continuous Threaded Coil Rod can be substituted for the Coil Bolt in many different combinations to suit any job requirement.

TO ORDER: give quantity, nominal diameter, actual Coil Tie length, product code and name.



Standard 2 Strut



Standard 4 Strut

Diameter	Style	Safe Working Load
1/2" (13 mm)	2 Strut	4,500 lbs. (20 Kn)
	2 Strut	6,750 lbs. (30 Kn)
3/4" (19 mm)	2 Strut	9,000 lbs. (40 Kn)
	4 Strut	18,000 lbs. (80 Kn)
1" (25 mm)	2 Strut	13,500 lbs. (60 Kn)
	4 Strut	18,000 lbs. (80 Kn)
1-1/4" (32 mm)	4 Strut	18,000 lbs. (80 Kn)
	4 Strut	27,000 lbs. (120 Kn)

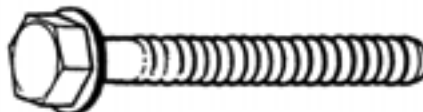
Chart based on approx. 2:1 safety factor.

COIL BOLTS

MSI-14

The MidSpec Coil Bolt is a long bolt manufactured from high strength steel with Contour threads. The Coil Bolt head is of hex configuration with integral washer face for improved bearing area.

TO ORDER: give quantity, diameter, length, product code and name.



MSI-14
Coil Bolt

ADJUSTABLE COIL BOLT

MSI-14-A

The MidSpec Adjustable Coil Bolt increases the versatility and adjustability of the Coil Bolt with the addition of a running nut. The running nut, adjusted to proper grip length, can accommodate many form grip depths.

TO ORDER: give quantity, diameter, length, product code and name.



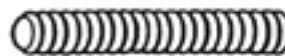
MSI-14-A
Adjustable Coil Bolt

CONTINUOUS THREADED COIL ROD

MSI-12

MidSpec Continuous Threaded Coil Rod is manufactured from high strength steel and is available in prefabricated length of 12 feet lengths for field cutting.

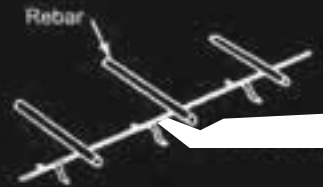
TO ORDER: give quantity, diameter, length, product code and name.



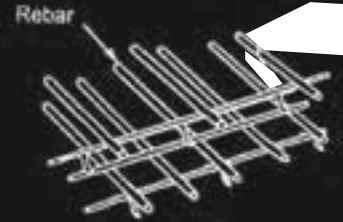
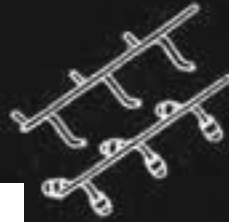
MSI-12
Continuous Threaded Coil Rod

Bar Supports

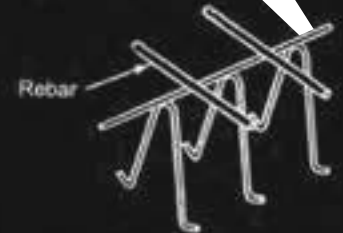
Available in $\frac{1}{2}$ " to 3" heights in 5' lengths and in bright basic, galvanized, plastic protected or stainless steel protected.



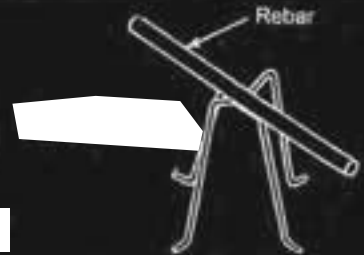
Available in $\frac{1}{2}$ " to 5" heights in 5' lengths. Manufactured in bright basic, plastic protected and stainless steel protected.



Available in bright basic, plastic protected, galvanized and stainless steel protected.



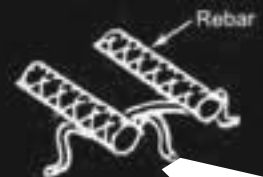
Available in 2" to 15" heights in bright basic, plastic protected, galvanized and stainless steel protected.



Available in $\frac{1}{2}$ " to 2" heights in bright basic, galvanized and stainless steel protected.



Available in 4", 5" and 6" overall widths; $\frac{1}{2}$ ", 1" and $1\frac{1}{2}$ " heights; and in bright basic, plastic protected, galvanized and stainless steel protected.



Reinforcing Bar Supports

Shown below are several reinforcing bar supports which are typically used in bridge construction.

MidSpec manufactures and stocks a complete line of rebar supports from slab bolster to high chairs in all heights from 1/2" to over 30" to custom specials, if needed. These rebar supports are manufactured to the requirements and specifications of the Concrete Reinforcing Steel Institute (CRSI); Class 1 Plastic Protected, Class 2 Type A Stainless Steel Protected, Class 2 Type B Stainless Steel Protected, Class 3 Bright Basic or Galvanized Wire and Entirely Plastic Coated. They are shipped in convenient cartons, bundles, or on skids and are clearly identified.



Baked On Plastic Feet



Entirely Plastic Coated



Plastic Tipped Feet



Stainless Steel Tips



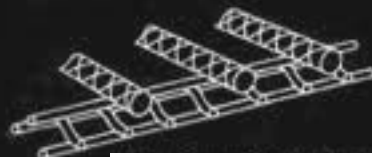
Available in heights of 1/4" to 3" in increments of 1/4" and stocked in 5 foot lengths. Legs are spaced at 5" on center.



Available in heights of 1/4" to 3" and stocked in 5 foot lengths.



Available in heights of 1 1/2" to 5" in 1/4" increments. Shipped in stock lengths of 5 foot and cut to beam width by the steel setter. Legs are spaced at 2 1/2" centers.



Available in heights of 1 1/2" to 5" in increments of 1/4". Shipped in 5 foot stock lengths and cut to required length in the field.



Available in heights of 2" and over in 1/4" increments. High Chairs are used, depending on their height, to support the bottom or top mat of reinforcing bars in bridge decks.

Special variations of this chair are available for use on Stay-In-Place Metal Decking.

Reinforcing Bar Supports



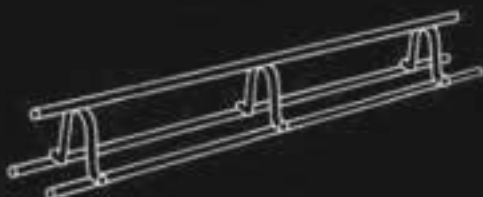
Available in heights of 3/4" to 2", in increments of 1/4".



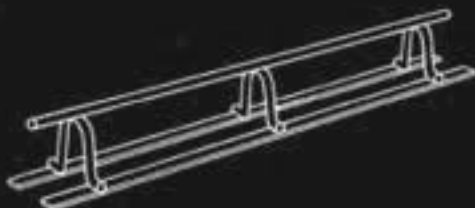
Available in 3/4", 1" and 1-1/2" heights.



Available in heights of 2" and over 1/4" increments.



Available in heights of 2" and over 1/4" increments.



Not recommended for use on decks.

Many states now require the use of epoxy coated reinforcing bars and epoxy coated reinforcing bar supports in their bridge decks. MidSpec is capable of furnishing Entirely Epoxy Coated Bar Supports to meet this requirement. This epoxy coating is not a protection against surface rust spots or other similar blemishes.

STRUCTURAL CONNECTION INSERTS

The MidSpec Structural Connection Inserts are fabricated from designs which distribute bolt stresses into the concrete for greater strength.



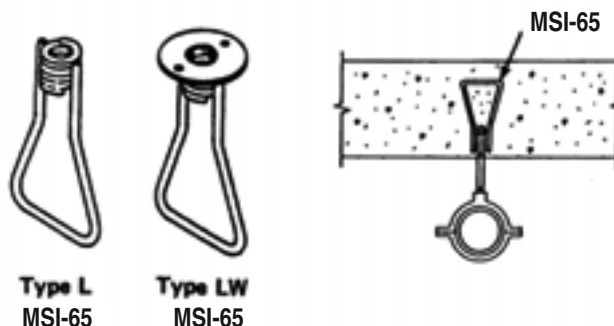
TYPE L AND LW INSERTS

MSI-65

The MidSpec **Type L Inserts** MSI-65 in 1/2" (12.7 mm) and 3/4" (19.0 mm) dia. are manufactured with coils to match the thread of MidSpec contour thread bolts. This insert can also be furnished with the appropriate coils internally tapped to accept standard NC thread machine bolts. See data chart on page 4.

The MidSpec **Type LW Inserts** MSI-65 are similar to above with the addition of a plated nailing washer for easy attaching to the form. See data chart on page 4.

TO ORDER: give qty., dia., product code and name.



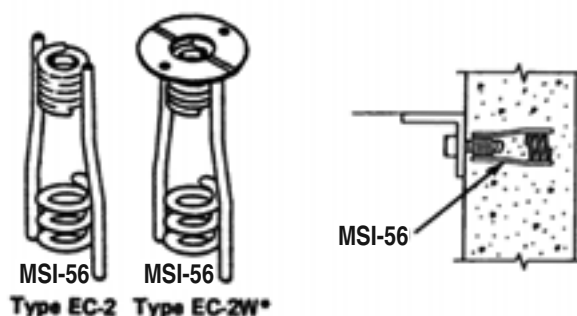
TYPE EC-2 AND EC-2W* INSERTS

MSI-56

The MidSpec **Type EC-2 Inserts** in 3/4" (19.0 mm) and 1" (25.4 mm) dia. are made with coils to match the MidSpec contour thread bolts. Insert can also be furnished with appropriate coils internally tapped to accept standard NC thread machine bolts. See chart on page 4.

The MidSpec **Type EC-2W Inserts** are similar to the 6/10 with the addition of a plated nailing washer for attaching to the form. See data chart on page 4.

TO ORDER: give qty., dia., product code and name.



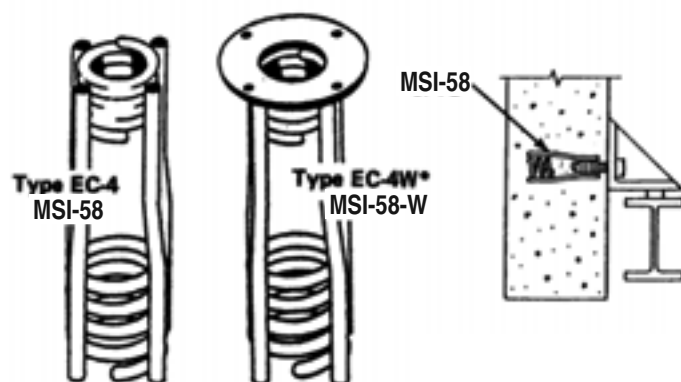
TYPE EC-4 AND EC-4W* INSERTS

MSI-58

The MidSpec **Type EC-4** MSI-58 and **EC-4W** MSI-58-W Inserts in 1-1/4" (31.7 mm) dia. are four strut inserts similar to EC-2 Inserts described above. See data chart on page 4.

TO ORDER: give quantity, diameter, product code and name.

*Setting methods for all inserts on this page are shown on page 4 of this bulletin.
 All Type L and EC Inserts are available in stainless steel.*



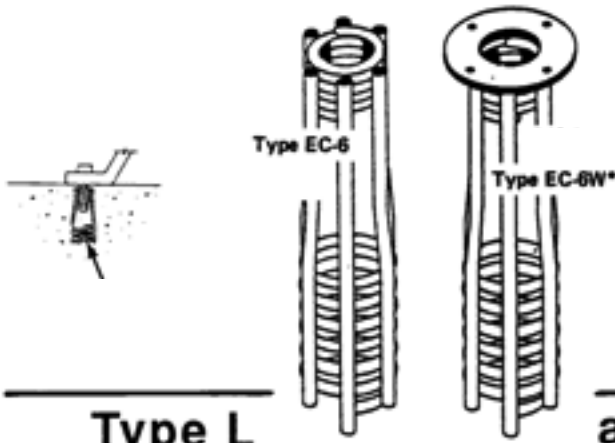
STRUCTURAL CONNECTION INSERTS

MSI-60

TYPE EC-6 AND EC-6W* INSERTS

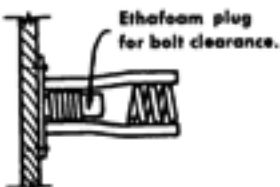
The MidSpec **TYPE EC-6** and **Type EC-6W** Inserts in 1-1/2" (38.1 mm) dia. are six strut inserts similar to EC-2 Inserts described on page 3. See data chart below.

TO ORDER: give quantity, diameter, product code and name.

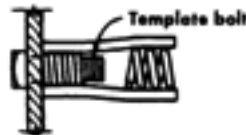


Type L

and Type EC Setting Methods



Setting EC - W Type Insert by nailing to wood form



Setting EC Type Insert by means of template bolt. Template bolt provides clearance for final bolt without necessity of plug.

Type L, EC-2, EC-4 and EC-6 Inserts can be set with template bolt (contour or NC thread). Template bolt provides clearance for final bolt without necessity of plug.

Type LW, EC-2W, EC-4W, and EC-6W Inserts have a flat galvanized washer face with nail holes for attaching to formwork and are furnished with an Ethafoam plug to provide clearance for the final bolt. Removal of Ethafoam plug clears insert for engagement of final holding bolt.

Type L. LF. EC. and EC-F Size and Strength Data

Bolt Diameter and Insert	Metric Diameter	Minimum Concrete Thickness	Insert Length	Insert Width	Washer Thickness (Type W Inserts only)	Safe Working Load	
						Shear	Tension
3/8" Type LF	9.5 mm	6" 152 mm	4" 102 mm	2-3/8" 60 mm	3/32" 2.4 mm	1,280 lbs.* 5.7 kn	1,920 lbs. 8.5 kn
1/2" Type L or LF	12.7 mm	6" 152 mm	4" 102 mm	2-3/8" 60 mm	3/32" 2.4 mm	2,200 lbs. 9.8 kn	2,820 lbs. 12.5 kn
5/8" Type LF	15.9 mm	6" 152 mm	4" 102 mm	3-3/8" 86 mm	3/32" 2.4 mm	3,000 lbs.* 13.3 kn	3,620 lbs. 16.1 kn
3/4" Type L or LF	19.0 mm	6" 152 mm	4" 102 mm	3-3/8" 86 mm	3/32" 2.4 mm	3,100 lbs.* 13.8 kn	3,660 lbs. 16.3 kn
3/4" EC-2 or EC-2F	19.0 mm	6" 152 mm	4-1/2" 114 mm	2" 51 mm	1/8" 3.2 mm	5,100 lbs. 22.7 kn	5,800 lbs. 25.8 kn
7/8" EC-2F	22.2 mm	6" 152 mm	5-1/2" 140 mm	2-5/8" 67 mm	3/16" 4.8 mm	6,000 lbs.* 26.7 kn	8,000 lbs. 35.6 kn
1" EC-2 or EC-2F	25.4 mm	6" 152 mm	5-1/2" 140 mm	2-5/8" 67 mm	3/16" 4.8 mm	8,000 lbs.* 35.6 kn	8,270 lbs. 36.8 kn
1-1/4" EC-4 or EC-4F	31.7 mm	8" 203 mm	7-1/2" 190 mm	3-1/8" 79 mm	7/32" 5.5 mm	13,200 lbs. 58.7 kn	16,300 lbs. 72.5 kn
1-1/2" EC-6 or EC-6F	38.1 mm	12" 304 mm	9-1/2" 241 mm	3-1/4" 83 mm	7/32" 5.5 mm	18,000 lbs.* 80.1 kn	21,670 lbs. 96.4 kn

* Denotes estimated working loads. Safe working loads shown reflect a 3:1 safety factor (ultimate working load) for concrete compressive strength of 3,000 psi (20.7 MPa).

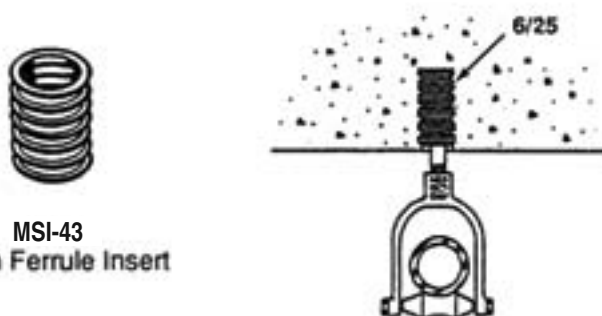
STRUCTURAL CONNECTION INSERTS

PLAIN FERRULE INSERT

MSI-43

The MidSpec **Plain Ferrule Insert** MSI-43 is an economical steel closed ferrule insert designed to take machine thread studs or bolts. Manufactured in 1/4" (6.3 mm), 3/8" (9.5 mm), 1/2" (12.7 mm), 5/8" (15.9 mm), 3/4" (19.0 mm), 7/8" (22.2 mm), 1" (25.4 mm) and 1-1/4" (31.7 mm) diameters. Open ferrules are available on special order.

TO ORDER: give qty., dia., product code and name.



MSI-43
Plain Ferrule Insert

Warning: Plain Ferrule Insert is NOT to be used for lifting purposes.

Bolt Diameter	Min. Conc. Thickness	Working Load	
		Shear (lbs.)	Tension (lbs.)
1/4" (6.3 mm)	3" 7.6 mm	300 1.3 kn	150 .7 kn
3/8" 9.5 mm	3" 7.6 mm	800 3.6 kn	200 .9 kn
1/2" 12.7 mm	3" 7.6 mm	1,000 4.5 kn	650 2.9 kn
5/8" 15.9 mm	3" 7.6 mm	1,250 5.6 kn	700 3.1 kn
3/4" 19.0 mm	4" 102 mm	1,600 7.1 kn	850 3.8 kn
7/8" 22.2 mm	6" 152 mm	2,000 8.9 kn	1,150 5.1 kn
1" 25.4 mm	6" 152 mm	2,400 10.7 kn	1,300 5.8 kn
1-1/4" 31.7 mm	6" 152 mm	3,000 13.3 kn	1,700 7.6 kn

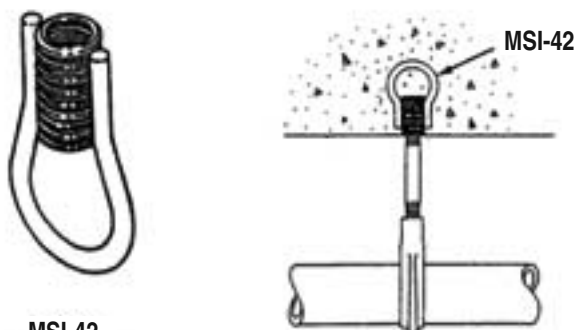
Working loads are based on tests in 3,000 psi (20.7 MPa) concrete and reflect a 5:1 safety factor.

FERRULE LOOP INSERT

MSI-42

The MidSpec **Ferrule Loop Insert** MSI-42 is a versatile ferrule insert available in 1/4" (6.3 mm), 3/8" (9.5 mm), 1/2" (12.7 mm), 5/8" (15.9 mm), 3/4" (19.0 mm), 7/8" (22.2 mm) and 1" (25.4 mm) diameters. The Ferrule Loop Insert is well suited for light structural connections and/or the suspension of equipment, ceilings, piping, etc.

TO ORDER: give qty., dia., product code and name.



MSI-42
Ferrule Loop Insert

Warning: Ferrule Loop Insert is NOT to be used for lifting purposes.

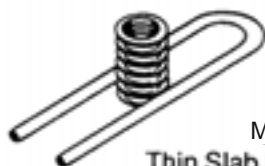
Bolt Diameter	Min. Conc. Thick.	Working Load		Overall Length
		Shear (lbs.)	Tension (lbs.)	
1/4" 6.3 mm	4-3/4" 122 mm	495 2.2 kn	750 3.3 kn	2-3/4" 70 mm
3/8" 9.5 mm	4-3/4" 121 mm	990 4.4 kn	1,500 6.7 kn	2-3/4" 70 mm
1/2" 12.7 mm	4-3/4" 121 mm	1,320 5.9 kn	2,000 8.9 kn	2-3/4" 70 mm
5/8" 15.9 mm	5-1/2" 140 mm	1,650 7.3 kn	2,500 11.1 kn	3-1/4" 83 mm
3/4" 19.0 mm	5-1/2" 140 mm	1,650 7.3 kn	2,500 11.1 kn	3-1/4" 70 mm
7/8" 22.2 mm	6-1/2" 165 mm	2,640 11.7 kn	4,000 17.8 kn	6" 152 mm
1" 25.4 mm	6-1/2" 165 mm	2,670 11.9 kn	4,040 18.0 kn	6" 152 mm

Chart based on 3:1 safe working load for for 3,000 psi (20.7 MPa) concrete.

STRUCTURAL CONNECTION INSERTS

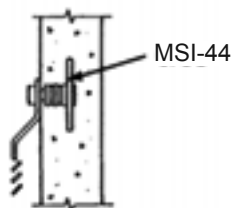
MSI-44

THIN SLAB FERRULE INSERT



MSI-44

Thin Slab Ferrule Insert



MSI-44

Warning: Thin Slab Ferrule Insert is NOT to be used for lifting purposes.

MidSpec **Thin Slab Ferrule Insert** is a special insert designed to develop good working loads in very thin slabs. Manufactured with 1/4" (6.3 mm), 3/8" (9.5 mm), 1/2" (12.7 mm), 5/8" (15.9 mm), 3/4" (19.0 mm), 7/8" (22.2 mm), 1" (25.4 mm) and 1-1/4" (31.7 mm) diameter closed ferrules. Open ferrules available on special order.

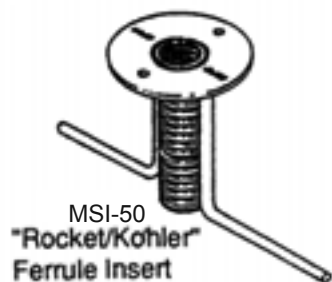
TO ORDER: give qty., dia., product code and name.

Diameter & Loop Length	Min. Conc. Thickness	Working Load	
		Shear (lbs.)	Tension (lbs.)
1/4" x 3-3/4" 6.3x95mm	3" 76 mm	500 2.2 kn	700 3.1 mm
3/8" x 4" 9.5x102mm	3" 76 mm	1,350 6.0 kn	800 3.6 mm
1/2" x 4" 12.7x102mm	3" 76 mm	2,150 9.6 kn	1,200 5.3 mm
5/8" x 6" 15.9x152mm	3" 76 mm	3,600 16.0 mm	1,250 5.6 mm
3/4" x 6" 19.0x152mm	3" 76 mm	3,800 16.9 mm	1,350 6.0 mm

Working loads reflect a 3:1 safety factor for 3,000 psi (20.7 MPa) concrete.

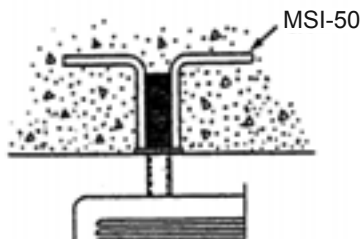
MSI-50

"ROCKET/KOHLER" FERRULE INSERT



MSI-50

"Rocket/Kohler"
Ferrule Insert



MSI-50

MidSpec **"Rocket/Kohler" Ferrule Insert** available in 1/4" (6.3 mm), 3/8" (9.5 mm), 1/2" (12.7 mm), 5/8" (15.9 mm), 3/4" (19.0 mm), 7/8" (22.2 mm), 1" (25.4 mm), 1-1/8" (28.6 mm), and 1-1/4" (31.7 mm) diameters, is designed for tensile loading using standard machine bolt or threaded rod to support hung ceilings, piping, conduits, etc.

TO ORDER: give qty., bolt dia., product code and name.

Bolt Diameter In. (mm)	Min. Conc. Thickness In. (mm)	Working Load		Insert Data		
		Shear lbs. (kn)	Tension lbs. (kn)	Overall Height In. (mm)	Overall Width In. (mm)	Min. Bolt Engagement
1/4 (6.3)	2-3/8 (60)	495 (2.2)	750 (3.3)	1-3/4 (44)	3-1/8 (79)	1/2 (13)
3/8 (9.5)	2-3/8 (60)	890 (4.0)	1,350 (6.0)	1-3/4 (44)	3-1/8 (79)	5/8 (16)
1/2 (12.7)	2-7/8 (73)	1,436 (6.4)	2,175 (9.7)	2-1/4 (57)	5-1/8 (130)	3/4 (19)
5/8 (15.9)	4 (102)	1,980 (8.8)	3,000 (13.3)	3-3/8 (86)	7-5/8 (194)	7/8 (22)
3/4 (19.0)	4 (102)	1,980 (8.8)	3,000 (13.3)	3-3/8 (86)	7-5/8 (194)	1 (25)
7/8 (22.2)	4-3/8 (111)	2,772 (12.3)	4,200 (18.7)	3-3/4 (95)	8-5/8 (219)	1-1/8 (29)
1 (25.4)	4-3/8 (111)	2,772 (12.3)	4,200 (18.7)	3-3/4 (95)	8-5/8 (219)	1-1/4 (32)
1-1/8 (28.6)	4-7/8 (124)	2,870 (12.8)	4,350 (19.4)	4-1/4 (108)	9-7/8 (251)	1-3/8 (35)
1-1/4 (31.7)	4-7/8 (124)	2,870 (12.8)	4,350 (19.4)	4-1/4 (108)	9-7/8 (251)	1-1/2 (38)

Working loads reflect a 3:1 safety factor (ultimate working load) for 3,200 psi concrete (22.1 MPa).

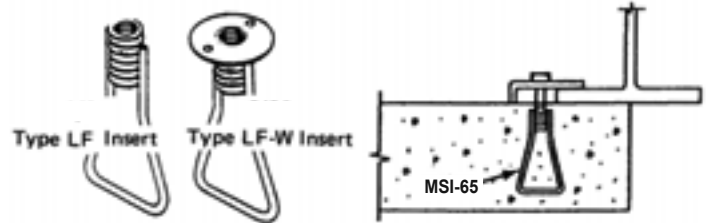
STRUCTURAL CONNECTION INSERTS

TYPE LF AND LF-W INSERTS

MSI-65

MidSpec **Type LF MSI-65 and Type LF-W MSI-65 Inserts** in 3/8" (9.5 mm), 1/2" (12.7 mm), 5/8" (15.9 mm), 3/4" (19.0 mm), 7/8" (22.2 mm) and 1" (25.4 mm) dia. are made with NC threaded closed ferrules. Open ferrules are available on special order. See data chart on page 4.

TO ORDER: give qty., dia., product code and name.

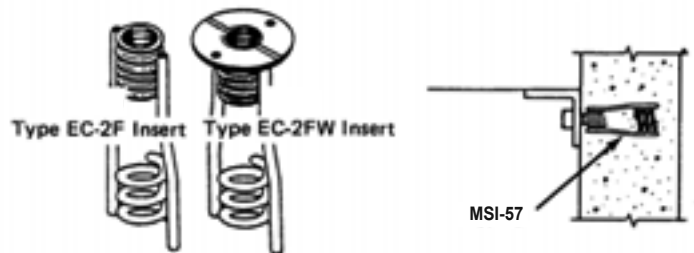


TYPE EC-2F AND EC-2FW INSERTS

MSI-57

MidSpec **Type EC-2F MSI-67 and Type EC-2FW MSI-67 Inserts** in 3/4" (19.0 mm), 7/8" (22.2 mm) and 1" (25.4 mm) dia. are manufactured with NC threaded closed ferrules. Open ferrules are available on special order. See data chart on page 4.

TO ORDER: give qty., dia., product code and name.

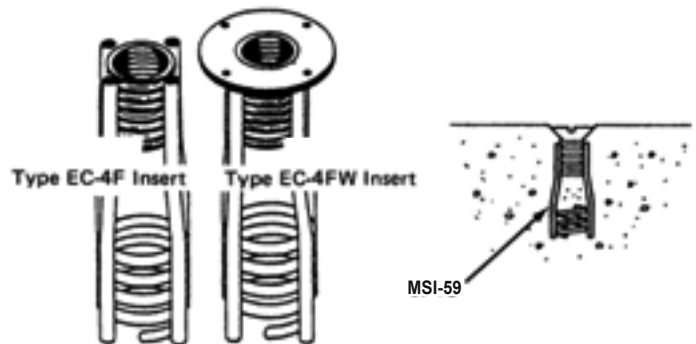


TYPE EC-4F AND EC-4FW INSERTS

MSI-59

MidSpec **Type EC-4F MSI-59 and Type EC-4FW MSI-59 Inserts**, in 1-1/4" (31.7 mm) diameter, are similar to EC-2F Inserts described above except are fabricated with four struts. Standard inserts furnished with closed ferrules, open ferrules available on special order. See data chart on page 4.

TO ORDER: give qty., dia., product code and name.



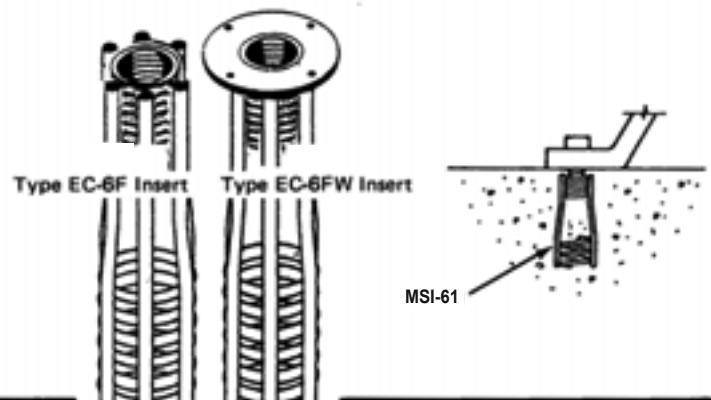
TYPE EC-6F AND EC-6FW INSERTS

MSI-61

MidSpec **Type EC-6F MSI-61 and Type EC-6FW MSI-61 Inserts**, in 1-1/2" (38.1 mm) diameter, are six strut inserts similar to EC-2F Inserts described earlier. Standard insert furnished with closed ferrule, open ferrule available on special order. See data chart on page 4.

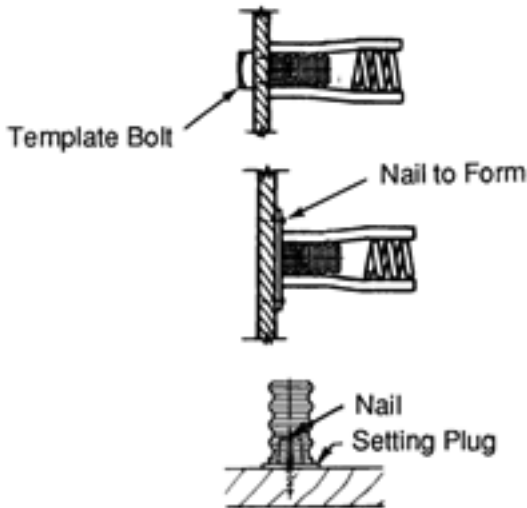
TO ORDER: give qty., dia., product code and name.

*See setting methods for the above inserts on page 8.
 All Type L and Type EC Inserts are available in stainless steel.*



STRUCTURAL CONNECTION INSERTS

FERRULE INSERT SETTING METHODS



Type LF, EC-2F, EC-4F and EC-6F Inserts can be set with template bolt.

Type LF-W, EC-2FW, EC-4FW, and EC-6FW Inserts have a flat galvanized washer face with nail holes for attaching to formwork.

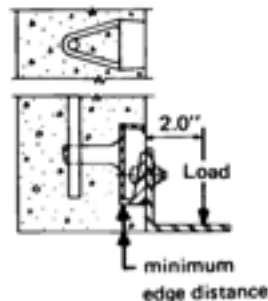
Type LF, EC-2F, EC-4F and EC-6F, Plain Ferrule or Thin Slab Ferrule Inserts can be set with a Steel Plug or Plastic Setting Plug. All closed end ferrule inserts can be furnished with a tapped hole for engaging a threaded setting bolt.

CAST METAL INSERTS

MSI



MSI Wedge Insert

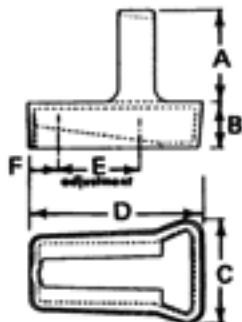


MSI WEDGE INSERT

MidSpec MSI Wedge Insert is a malleable iron casting with a wedge bearing face which works in conjunction with a special Askew Head Bolt. Designed to hold a shelf angle at an exact elevation for masonry veneer support, this wedge action prevents any possibility of slippage when the nut is drawn tight. The casting is provided with sufficient holes for nailing to the form. The anchor loop has adequate shape to accept reinforcing bar to assist anchorage.

TO ORDER: give quantity, diameter, product code and name.

Askew Head Bolt, washer and nut are ordered separately. The standard bolt length is 1-1/2" (38.1 mm), however, longer bolts may be requested on special order.



Bolt Diam. and Type	PHYSICAL DIMENSIONS						Min. Edge Distance	Applied Working Load (lbs.)
	A	B	C	D	E	F		
5/8" S 15.9 mm	1-13/16" 46 mm	1" 25 mm	2-1/4" 57 mm	3-5/8" 92 mm	1-3/8" 35 mm	7/8" 22 mm	1-1/2" 38 mm	2,100 9.3 kn
3/4" S 19.0 mm	2-3/8" 60 mm	1-1/8" 29 mm	2-3/8" 60 mm	4" 102 mm	1-3/8" 35 mm	7/8" 22 mm	2-7/8" 73 mm	2,600 11.6 kn
3/4" L 19.0 mm	2-3/4" 70 mm	1-1/4" 32 mm	2-3/8" 60 mm	5-1/2" 140 mm	2-5/8" 67 mm	7/8" 22 mm	1-1/2" 38 mm	3,100 13.8 kn

"S" denotes standard insert. "L" denotes long insert. Safe working loads reflect 4:1 safety factor for concrete compressive strength of 4,000 psi (27.6 MPa).

STRUCTURAL CONNECTION INSERTS

LONG MSI WEDGE INSERT

MidSpec **Long Peerless Wedge Insert** is a malleable iron casting with the same features as the standard Peerless Wedge Insert (shown on page 8) except the casting is longer providing more vertical adjustment. Manufactured for 3/4" (19.0 mm) dia. Askew Head Bolt only.

TO ORDER: give quantity, product code and name. Normally used with 1-1/2" (38.1 mm) long bolt, longer bolts available on special order.

See Physical Dimensions Chart on page 8.



Long MSI Wedge Insert

ASKEW HEAD BOLT For MSI Wedge Insert

Askew Head Bolt is fabricated to fit the adjustment angle and variable bearing width of the MSI Wedge Insert. This exact fit allows the shelf angle to be smoothly adjusted to its desired position. Available in 5/8" (15.9 mm) and 3/4" (19.0 mm) diameters. 1-1/2" (38 mm) length is standard, longer bolts available by special order. Bolt, washer and nut are sold separately.

TO ORDER: give quantity, diameter, length, product code and name.



ASKEW HEAD BOLT

WASHER

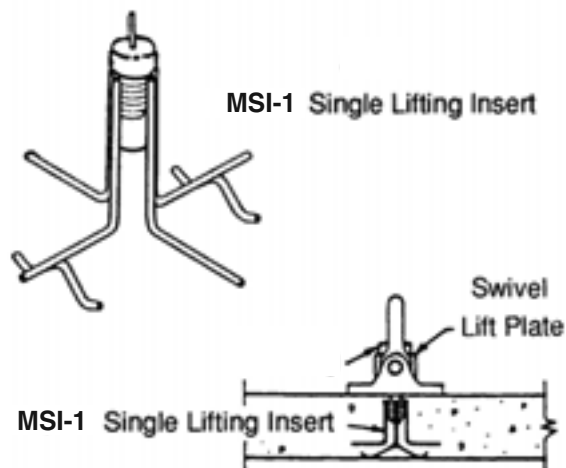
NUT

LIFTING AND HANDLING INSERTS

MSI-1 SINGLE LIFTING INSERT

The MidSpec MSI-1 **Single Lifting Insert** (MSI-1) is used for handling, erection and connection of concrete wall panels. MSI-1 is available only in 1-1/4" (32 mm) diameter and has the advantage of being somewhat less interfering with reinforcing steel than many other lifting inserts. In terms of performance, cost and labor, this is the most economical insert in MidSpec's line of coil type lifting inserts. The use of 1-1/4" (32 mm) Coil Bolt and the MSI-1 offers high shear loads and a small hole which can be easily grouted. MSI-1 is available with galvanized, stainless steel or plastic tipped wire support legs. Minimum height of the insert is 4" (102 mm) and is available with or without plastic setting plug.

TO ORDER: Give quantity, height (usually 1/2" (13 mm) less than panel structural thickness), product code and name.



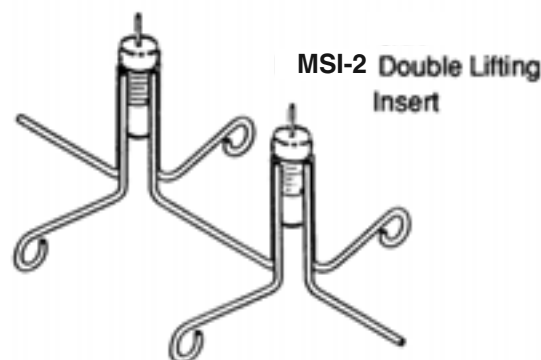
Insert Size	Minimum Height	Min. Conc. Thickness	Min. Base Length	Tension Working Loads in 2,500 psi (17.3 MPa) Conc.			
				5" (127 mm)	6" (152 mm)	7" (178 mm)	8" (203 mm)
1-1/4" (32 mm)	4" (102 mm)	4-1/2" (115 mm)	9-1/2" (242 mm)	9,000 lbs. (40.5 Kn)	13,000 lbs. (57.8 Kn)	17,000 lbs. (75.6 Kn)	23,000* (102.3 Kn)
				Shear Working Loads in 2,500 psi (17.3 MPa) Conc.			
				9,000 lbs. (40.5 Kn)	13,000 lbs. (57.8 Kn)	14,000 lbs. (62.3 Kn)	16,000 lbs. (71.2 Kn)

*Limited by Swivel Lift Plate. Approx. 2:1 safety factor (ultimate:dead weight). Safe working load may in some cases be modified when concrete compressive strength is other than 2,500 psi (17.3 MPa). MidSpec recommends increasing dead weight by 50% to compensate for initial bond (vacuum) release loads

MSI-2 DOUBLE LIFTING INSERT

The MidSpec MSI-2 **Double Lifting Insert** (MSI-2) is used for the same functions as the PUL-1 above. MSI-2 is manufactured with a standard coil spacing of 12" (304 mm) with galvanized looped legs. Base length is 21-3/4" (552.5 mm) and minimum height is 3-1/2" (89 mm). Stainless steel feet or plastic dipped feet can be furnished on special order. Available with or without plastic setting plugs.

TO ORDER: Give quantity, height (usually 1/2" (13 mm) less than panel structural thickness), product code and name. Give center to center spacing of coils if other than 12" (304 mm) standard for use with Lifting Brackets.



Insert Size	Minimum Height	Min. Conc. Thickness	Min. Base Length	Tension Working Loads in 2,500 psi (17.3 MPa) Conc.			
				5" (127 mm)	6" (152 mm)	7" (178 mm)	8" (203 mm)
1-1/4" (32 mm)	3-1/2" (89 mm)	4" (102 mm)	21-3/4" (552.5 mm)	12,500 lbs. (55.6 Kn)	18,000 lbs.* (80.1 Kn)	18,000 lbs.* (80.1 Kn)	18,000 lbs.* (80.1 Kn)
				Shear Working Loads in 2,500 psi (17.3 MPa) Conc.			
				9,000 lbs. (40.5 Kn)	10,000 lbs. (45.0 Kn)	10,000 lbs. (45.0 Kn)	10,000 lbs. (45.0 Kn)

*Limited by Lifting Bracket. Approx. 2:1 safety factor (ultimate:dead weight). Safe working loads may in some cases be modified when concrete compressive strength is other than 2,500 psi (17.3 MPa). MidSpec recommends increasing dead weight by 50% to compensate for initial bond (vacuum) release loads.

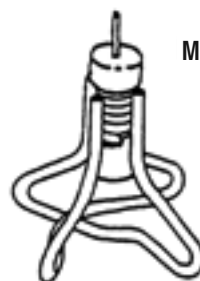
LIFTING AND HANDLING INSERTS

MSI-47

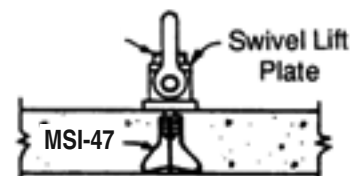
LCB-1 SINGLE LIFTING INSERT

The MidSpec **LCB-1 Single Lifting Insert** MSI-47 is an 1-1/4" (32 mm) diameter general use tilt-up insert for handling, erecting and connecting tilt-up concrete panels. LCB-1 Inserts are fabricated from galvanized wire with a minimum height of 4-1/2" (115 mm). Available with or without plastic setting plugs.

TO ORDER: Give quantity, height (usually 1/2" (13 mm) less than structural concrete panel thickness), product code and name.



MSI-47 Single Lifting Insert



Insert Size	Minimum Height	Min. Conc. Thickness	Min. Base Length	Tension Working Loads in 2,500 psi (17.3 MPa) Conc.			
				5" (127 mm)	6" (152 mm)	7" (178 mm)	8" (203 mm)
1-1/4" (32 mm)	4-1/2" (115 mm)	5" (127 mm)	4-3/4" (121 mm)	9,000 lbs. (40.5 Kn)	13,000 lbs. (57.8 Kn)	15,000 (67.5 Kn)	15,000 lbs. (67.5 Kn)
				Shear Working Loads in 2,500 psi (17.3 MPa) Conc.			
				6,000 lbs. (26.7 Kn)	8,500 lbs. (37.8 Kn)	10,000 lbs. (45.0 Kn)	10,000 lbs. (45.0 Kn)

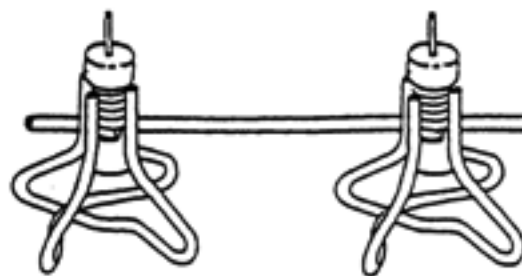
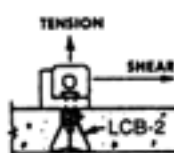
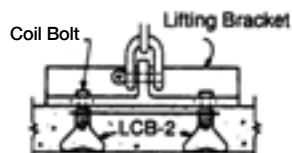
Approx. 2:1 safety factor (ultimate:dead weight). Safe working loads may in some cases be modified when concrete compressive strength is other than 2,500 psi (17.3 MPa). MidSpec recommends increasing dead weight by 50% to compensate for initial bond (vacuum) release loads.

MSI-48

LCB-2 DOUBLE LIFTING INSERT

The MidSpec **LCB-2 Double Lifting Insert** MSI-48 is used for handling and erecting tilt-up concrete panels when higher load values are required. Standard spacing of MSI-48 coils is 12" (304 mm) for use with Lifting Brackets. Minimum base length is 16-3/4" (425.5 mm). Available with or without plastic setting plugs.

TO ORDER: give quantity, height (usually 1/2" (13 mm) less than structural concrete panel thickness), product code and name. Give center to center spacing of coils if other than 12" (304 mm) standard.



MSI-48

MSI-48 Double Lifting Insert

Insert Size	Minimum Height	Min. Conc. Thickness	Min. Base Length	Tension Working Loads in 2,500 psi (17.3 MPa) Conc.			
				5" (127 mm)	6" (152 mm)	7" (178 mm)	8" (203 mm)
1-1/4" (32 mm)	4-1/2" (115 mm)	5" (127 mm)	16-3/4" (425.5 mm)	12,500 lbs. (55.6 Kn)	18,000 lbs.* (80.1 Kn)	18,000 lbs.* (80.1 Kn)	18,000 lbs.* (80.1 Kn)
				Shear Working Loads in 2,500 psi (17.3 MPa) Conc.			
				9,000 lbs. (40.5 Kn)	10,000 lbs. (45.0 Kn)	10,000 lbs. (45.0 Kn)	10,000 lbs. (45.0 Kn)

*Limited by Lifting Bracket. Approx. 2:1 safety factor (ultimate:dead weight). Safe working loads may in some cases be modified when concrete compressive strength is other than 2,500 psi (17.3 MPa). MidSpec recommends increasing dead weight by 50% to compensate for initial bond (vacuum) release loads.

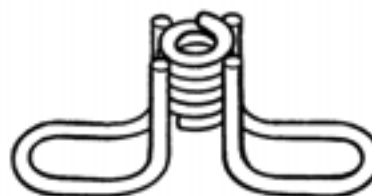
FLARED THIN SLAB INSERT MSI-63

The MidSpec Flared Thin Slab Insert is designed for use in thin slabs. It is manufactured with 1/2", 3/4" and 1" (13, 19 and 25 mm) diameter coils to engage MidSpec contour threaded Coil Bolt.

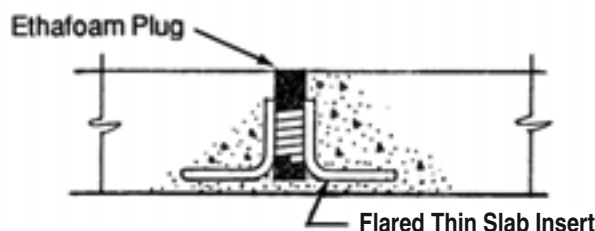
TO ORDER: Give quantity, diameter, height (usually 1/2" (13 mm) less than structural concrete thickness), product code and name.

Bolt Diameter	Insert Length	Insert Min. Hgt.	Working Load	
			Tension	Shear
1/2" (13 mm)	5" (127 mm)	1-3/4" (45 mm)	1,125 lbs. (5.0 Kn)	1,610 lbs. (7.2 Kn)
3/4" (19 mm)	5-1/2" (140 mm)	2" (51 mm)	1,500 lbs. (6.8 Kn)	2,700 lbs. (12.0 Kn)
1" (25 mm)	6" (152 mm)	2-1/2" (64 mm)	1,500 lbs. (6.8 Kn)	2,850 lbs. (12.7 Kn)

Chart based on 3,000 psi (20.7 MPa) concrete. Approx. 4:1 safety factor. Working loads shown are based on 9" (229 mm) edge distance and 3" (76 mm) concrete thickness.



Flared Thin Slab Insert



Flared Thin Slab Insert

COIL INSERT LOADING CONDITIONS

When possible, MidSpec verifies all insert capacities by physical testing. Insert tensile capacities can also be predicted, with reasonable accuracy, by use of empirical formulas. One such analytical approach is defined in "PCI Manual on Design of Connections for Precast-Prestressed Concrete". This analytical approach and the actual physical testing correlate reasonably well.

To completely analyze an insert under load, a freebody should be drawn to recognize and establish a suitable load path distribution. External tension loads are reacted directly through the lifting hardware. However, the exter-

nal shear loads must be reacted by shear and "heel and toe" reactions. An illustration of these reactions is shown.

Force F_h (horizontal force component) induces lateral movement and bolt bending. To minimize these undesirable effects, the bolt should be securely torqued but not over-tightened. When properly secured F_h is reacted by an opposing shear (R_h). The overturning moment ($F_h e$) is reacted by the components T and P_{brg} usually referred to as "heel and toe" forces.

$$\Sigma M = 0 \quad F_h(e) - P_{brg}(\ell - x) = 0$$

$$\text{Substitution: } F_h(e) = T(\ell - x)$$

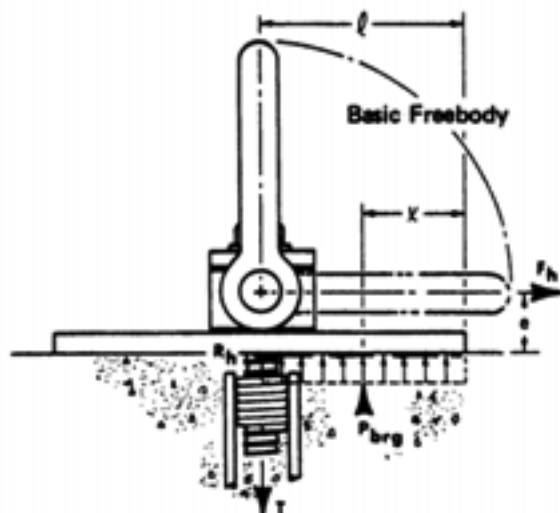
$$\Sigma F_x = 0 \quad T - P_{brg} = 0$$

$$T = \frac{F_h(e)}{(\ell - x)}$$

$(\ell - x)$ defines the center of pressure from the bolt center line. Several P_{brg} distributions are possible; however, a uniform distribution has proved to yield results comparable to test conditions. It is very important that lifting hardware bolt holes match anchor bolt diameters. Excessive tolerances (slop) will allow slippage and dynamic loading conditions.

For an uniform bearing distribution (P_{brg}):

$$(P_{brg}): \quad x = \frac{\ell}{2} \therefore T = \frac{2F_h(e)}{\ell}$$



LIFTING ACCESSORIES

SLOTTED COIL ROD

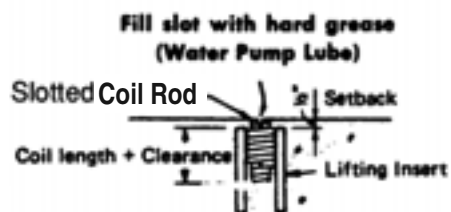
MSI-7

The MidSpec **Slotted Coil Rod MSI-7** is used as a steel setting bolt for any coil insert. Available in 3/4" (19 mm) diameter 3" (76 mm) long, 1" (25 mm) and 1-1/4" (32 mm) diameter 3-1/2" (89 mm) long and 1- 1/4" (32 mm) diameter 4" (102 mm) long. Longer lengths on special order. One end is slotted for screw driver removal.

TO ORDER: Give quantity, diameter, product code and name.



MSI-7
Slotted Coil Rod



MSI-21

COLLAPSIBLE SETTING PLUG

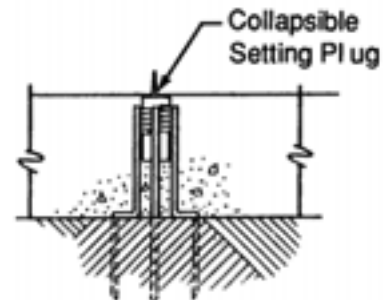
The MidSpec **Collapsible Setting Plug (8/62)** is a two piece plastic unit designed to engage the top and bottom of 3/4", 1" or 1- 1/4" dia. (19, 25 or 32 mm) insert coils. The top piece has a protruding stem which marks the insert location. Removal is accomplished with a screw driver or similar device. The bottom cavity cup forms the clearance for the final bolt. Available factory installed or can be installed in the field.

TO ORDER: Give quantity, diameter, product code and name.



MSI-21

Collapsible Setting Plug



MSI-21-E

ETHAFOAM PLUG

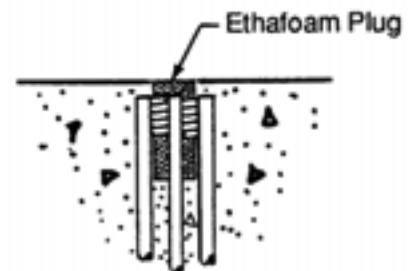
The MidSpec **Ethafoam Plug (8/64)** is available for 3/4", 1" and 1-1/4" (19, 25 and 32 mm) diameter inserts for use as setting studs. Plugs are easily removed before engagement of Lift Lag or Lifting Eye Bolt.

TO ORDER: Give quantity, diameter, product code and name.



MSI-21-E

Ethafoam Plug



MSI-14

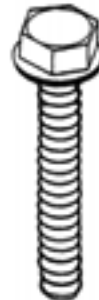
COIL BOLTS

The MidSpec **Coil Bolt MSI-14** is used for anchoring lifting fixtures, etc., and are available in the sizes shown in the chart on page 13. Bolts are threaded to within 1/2" (13 mm) of the bolt head.

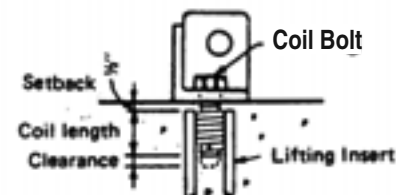
TO ORDER: Give quantity, diameter, length, product code and name.

NOTE:

Be sure there is proper setting clearance. Proper length is required to prevent "bottoming", which will not allow tightening. A tight connection is necessary to prevent hardware slippage, bolt bending and spalling of concrete. This should always be checked carefully, and especially when using adjustable bolts. When installing hardware for setting purposes make sure coil is fully penetrated by bolt. This insures adequate clearance for full bolt engagement when mounting lifting plate. Never use a bolt that has experienced loads in excess of the insert safe working load. (Ref. Page 3, Item 5)



MSI-21
Coil Bolt

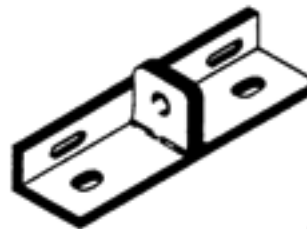


LIFTING BRACKET

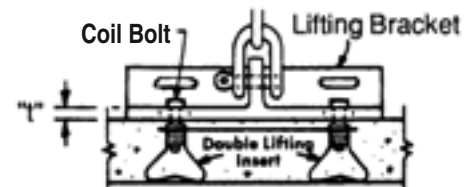
MSI-8

The MidSpec **Lifting Bracket MSI-8** consists of a heavy angle punched with holes for bolting to 3/4", 1" or 1-1/4" (19, 25 or 32 mm) tandem inserts with 12" (304 mm) c.c. spacing. A heavy plate is welded to the center of the angle and is equipped with a hole to engage the lifting shackle. Bracket dimensions are: 3/4" x 4" x 6" x 18" (19 x 102 x 152 x 457 mm) angle with 1-1/8" (29 mm) mid gusset. Safe working load is approximately 18,000 pounds (80.1 Kn).

TO ORDER: give quantity, bolt diameter, product code and name.



MSI-8
Lifting Bracket

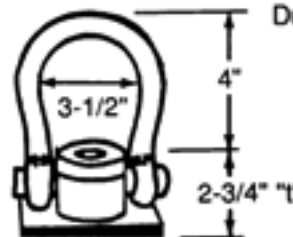


DUO SWIVEL LIFT PLATES

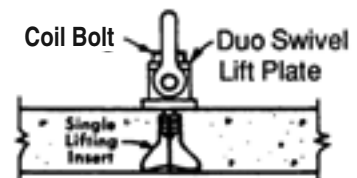
MSI-26

The MidSpec **Duo Swivel Lift Plate MSI-8** is available for either 3/4" or 1" (19 or 25 mm) diameter bolts and permits a full 360° rotation about the axis of the bolt. The duo feature is designed for use with a single bolt to engage any single lifting insert. Base plate is 3" x 5" (76 x 127 mm). Safe working load is approximately 13,000 pounds (57.8 Kn).

TO ORDER: give quantity, diameter of bolt, product code and name.



MSI-26
Duo Swivel Lift Plate

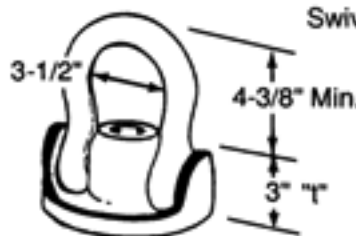


SWIVEL LIFT PLATE

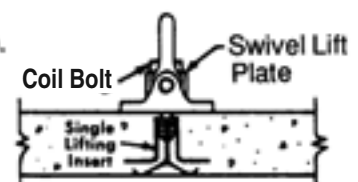
MSI-12

The MidSpec **Swivel Lift Plate MSI-8** consists of a heavy steel 6-1/2" (164 mm) diameter casting with a drop forged shackle riding on 1-1/8" (29 mm) dia. pins to permit a full 180° swing. Designed for use with any single lifting insert. Manufactured for either 1- 1/4" or 1-1/2" (32 or 38 mm) diameter bolts. Bushings available for 3/4" or 1" (19 or 25 mm) diameter bolts. Safe working load is approximately 23,750 pounds (105.7 Kn).

TO ORDER: give quantity, diameter of bolt, product code and name.



MSI-12
Swivel Lift Plate



SIZING CHART - COIL BOLTS, SLOTTED COIL ROD AND ETHAFOAM PLUGS											
Insert Dia.	Coil Length	Proper Clear.	Set Back	Lifting Bracket		Duo Swivel Lift		Swivel Lift		Slotted Coil Rod	Ethafom Plug
				T"	Coil Bolt	T"	Coil Bolt	T"	Coil Bolt		
3/4" (19 mm)	1-1/2" (38)	1/2" (13)	1/2" (13)	5/8" (16)	3" (76)	2-3/4" (70)	5-1/2" (140)	---	---	3" (76)	4" (102)
1" (25 mm)	2" (51)			5/8" (16)	3-1/2" (89)	2-3/4" (70)	6" (152)	---	---	3-1/2" (89)	
1-1/4" (32 mm)	2" (51)			3/4" (19)	3-1/2" (89)	---	---	3" (76)	6-1/2" (164)	3-1/2" (89)	
1-1/4" (32 mm)	2-9/16" (65)			3/4" (19)	4" (102)	---	---	3" (76)	6-1/2" (164)	4" (102)	
1-1/2" (38 mm)	2-9/16" (65)			3/4" (19)	4" (102)	---	---	3" (76)	6-1/2" (164)	4" (102)	

*Applies to 8/20 PUL-1 Single Lifting Insert only.

LIFTING AND HANDLING INSERTS

WARNING: *Improper, careless and/or haphazard use of products shown in this bulletin can expose workers to extreme danger, injury and death. If uncertain about installation or use of any MidSpec product, contact the nearest MidSpec Sales Office or Technical Department for explanations and/or recommendations. Negligence, in seeking clarification, may result in serious aftermath.*

GENERAL PRECAST OBSERVATION:

MidSpec Inserts for precast construction are manufactured according to strict specifications and are subject to numerous tests under a stringent quality control program. MidSpec feels, however, that the performance of any quality product can be affected by the manner in which it is used in the field. For this reason, MidSpec feels the following precautions should be taken by all persons involved in precast construction.

1. DESIGN LOADS:

Determine maximum tensile, shear or combined loads that will be imposed on each insert, including bond, impact and wind loads. Consider practical rigging methods to insure minimum loads on each insert. Figure normal weight of concrete at 150 pounds per cubic foot (23.6 kN/m^3).

2. SAFETY FACTOR:

Check for true and apparent safety factors due to unequal loads, angular loads, unusual edge distance, etc. Concrete strength at first lift is important. If same inserts are used for multiple handling, initial damage can cause subsequent failure.

3. SELECTION OF INSERTS:

MidSpec charts and information contained herein will help determine proper selection and use of inserts. When unusual shaped panels, high lifts or extremely hazardous procedures are anticipated or required, consult the MidSpec Technical Department.

NOTE: Inserts manufactured by a metal casting process are not recommended for lifting purposes or for applications where dynamic loading may exist.

4. SETTING OF INSERTS:

All inserts should be set perpendicular to the panel surface and securely tied to the rebar mat. All coil inserts should be set with either Ethafoam Plugs, Collapsible Setting Plugs, Slotted Coil Rod or Coil Bolt. All plugs, Coil Rod and/or bolts should be the proper length (see

Page 11). The height of the precast insert should be 1/2" (13 mm) less than the structural concrete thickness of the panel. Architectural aggregate is not included in the structural thickness of the panel. Legs of the insert must never extend into the architectural aggregate.

5. BOLT CLEARANCE:

Proper clearance is required to prevent "bottoming" of the Coil Bolt which will not allow tightening. A tight connection is necessary to prevent hardware slippage, bolt bending and spalling of the concrete. This should always be checked carefully, and especially when using adjustable bolts. When installing insert, for setting purposes, make sure coil is fully penetrated by bolt. This insures clearance for full bolt engagement when mounting lifting plates.

6. BOLT ENGAGEMENT:

All MidSpec inserts and/or anchors, fabricated with a contour threaded coil or an open end ferrule, must be fully engaged by the corresponding bolt to ensure safe working loads. A properly engaged bolt will extend beyond the end of the contour threaded coil or open end ferrule approximately 1/4 to 1/2 inch (6 to 13 mm).

7. BOLT INSPECTION:

Bolts should be continuously inspected for excessive wear and bending. Never straighten bent bolts, always replace them. Never use a bolt that has exceeded the safe working load of the insert or bolt. Such repeated abuse accelerates the fatigue life of the bolt. Under no circumstances use a bolt that has been loaded to within 70% of ultimate bolt capacity.

8. RIGGING:

Cranes of sufficient capacity should be used to minimize dynamic loads. Use bond breakers or other means to release panels from casting beds to reduce dynamic loading.



SPECIFICATIONS FOR INSERTS

MidSpec Inserts or an approved structural equal shall be used for precast walls, slabs, beams, columns, girders, piles, etc.

Proper care shall be exercised in setting and utilizing these inserts, and adequate compressive strength of the concrete must be maintained at time of application for proper anchorage of the inserts.

Unknown or extreme installations shall be tested in the field, under job conditions, prior to general use.

INSERT LOADING CONDITIONS

When possible, MidSpec verifies all insert capacities by physical testing. Insert tensile capacities can also be predicted with reasonable accuracy by using empirical formula. One such analytical approach is defined in "PCI Manual on Design of Connections for Precast-Prestressed Concrete". This analytical approach and the actual physical testing correlate reasonably well.

To completely analyze an insert under load a freebody should be drawn to recognize and established a suitable load path distribution. External tension loads are reacted directly through the lifting hardware. However, the external shear loads must be reacted by shear and "heel and toe" reactions. An illustration of these reactions is shown below.

Applied force F_h (horizontal force component) induces lateral movement and bolt bending. To minimize these undesirable effects, the bolt should be securely torqued but not over-tightened. When properly secured F_h is reacted by opposing shear (R_h). The overturning moment ($F_h e$) is reacted by the couple T and P_{brg} usually referred to as heel and toe forces.

$$\Sigma M = 0$$

$$F_h(e) - P_{brg}(y - x) = 0$$

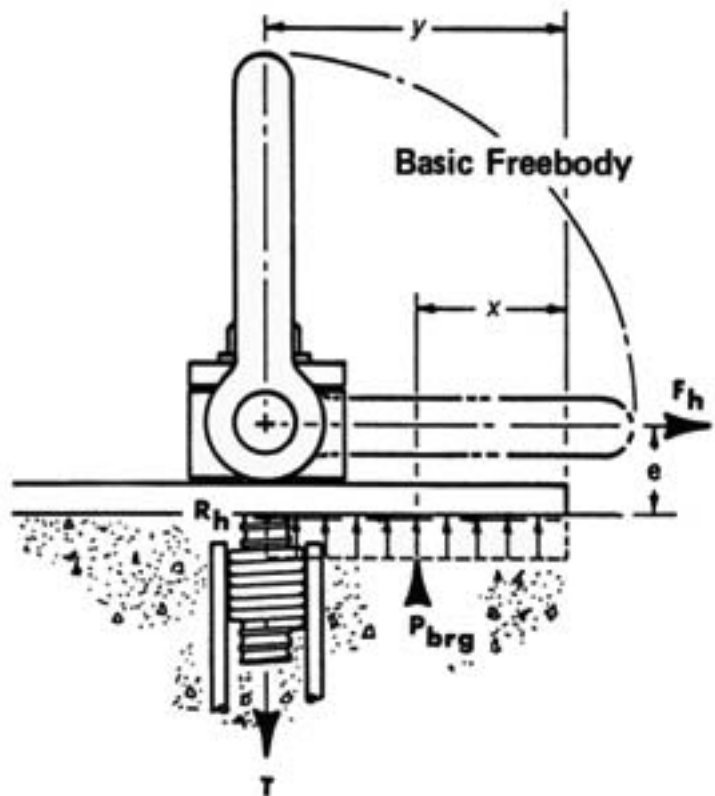
$$\Sigma F_v = 0$$

$$T - P_{brg} = 0$$

Substitution:

$$F_h(e) = T(y - x)$$

$$T = \frac{F_h(e)}{(y - x)}$$



$(y - x)$ defines the center of pressure from the bolt center line. Several P_{brg} distributions are possible; however, a uniform distribution has proved to yield results comparable to test conditions. It is very important that lifting hardware bolt holes match anchor bolt diameters. Excessive tolerances (slop) will allow slippage and dynamic loading conditions.

For an uniform bearing distribution (P_{brg}):

$$x = \frac{y}{2} \text{ therefore } T = \frac{2F_h(e)}{y}$$

SAFETY FACTORS

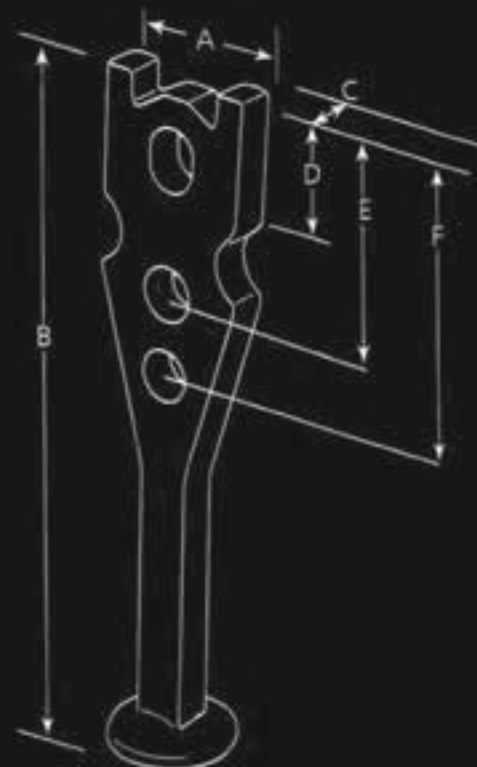
Lifting Inserts when used in precast construction should reflect a 4:1 safety factor (Ultimate: Dead weight). This degree of safety is recommended because of the numerous handling sequences a precast member may experience.

Steel inserts used as connections should be designed to reflect a safety factor of at least 3:1 (Ultimate: Dead weight). However, cast metal inserts should maintain a 4:1 safety factor.

MIDSPEC FORGED ERECTION ANCHOR

MidSpec Forged Erection Anchor is specifically designed to provide greater lifting capacities for horizontal to vertical edge lifts. Due to the anchor being forged, it does not depend on welds or thread engagement to develop its safe working load. Forging provides maximum safety with its advantageous material structure. This allows the anchor to easily meet the OSHA requirement of 4 to 1 factor of safety. The head of the anchor is designed with two protrusions or "ears" on the head of the anchor which provide protection against concrete spalling. These protrusions restrict the ring clutch rotation during lateral pulls. As a result, lateral forces are transmitted directly to the edge of the anchor instead of the concrete.

Forged Erection Anchors are available in plain or hot dipped galvanized or zinc electro plated.



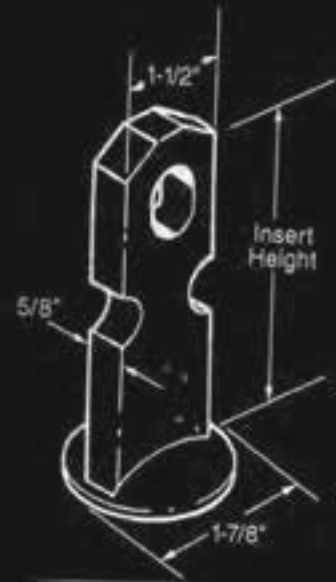
SAFE WORKING LOAD (TONS)	A	B	C	D	E	F
10	3-3/4"	12-3/4"	3/4"	3-1/8"	4"	6-1/8"

MidSpec Forged Erection Anchor

TON x LENGTH	SLAB THICKNESS	MINIMUM EDGE DISTANCE	MINIMUM CORNER DISTANCE	SHEAR SAFE WORKING LOAD W/SHEAR BAR	TENSION SAFE WORKING LOAD ANCHOR ONLY	TENSION SAFE WORKING LOAD W/TENSION BAR
10-Ton x 12-3/4"	7-1/2"	3-3/4"	19"	4,180 lbs	7,920 lbs	20,000 lbs
10-Ton x 12-3/4"	8"	4"	19"	4,420 lbs	8,440 lbs	20,000 lbs
10-Ton x 12-3/4"	9"	4-1/2"	19"	4,920 lbs	9,500 lbs	20,000 lbs
10-Ton x 12-3/4"	10"	5"	19"	5,430 lbs	10,560 lbs	20,000 lbs
10-Ton x 12-3/4"	11"	5-1/2"	19"	5,950 lbs	11,610 lbs	20,000 lbs
10-Ton x 12-3/4"	12"	6"	19"	6,490 lbs	12,670 lbs	20,000 lbs

MIDSPEC FORGED STRIPPING ANCHOR 6-TON

The MidSpec Forged Stripping Anchor is a high strength, hot forged anchor that can be "wet set" or used with the optional Plastic base in face-lift applications. When this anchor is used with the high capacity ring clutches, safe working loads up to 12,000 pounds can be realized. See the chart below for appropriate anchor lengths and concrete compressive strengths, anchors are available in plain and galvanized.



MidSpec Forged Stripping Anchor

<u>TON x LENGTH</u>	<u>MINIMUM EDGE DISTANCE</u>	<u>MINIMUM CORNER DISTANCE</u>	<u>SHEAR SAFE WORKING LOAD</u>	<u>TENSION SAFE WORKING LOAD</u>
6-Ton x 3-7/8"	18"	24"	5,000 lbs	5,000 lbs
6-Ton x 4-1/8"	18"	27"	5,370 lbs	5,370 lbs
6-Ton x 4-7/8"	20"	28"	6,560 lbs	6,560 lbs
6-Ton x 5-1/8"	21"	30"	6,970 lbs	6,970 lbs
6-Ton x 5-3/8"	22"	31"	7,250 lbs	7,250 lbs
6-Ton x 5-7/8"	24"	34"	8,250 lbs	8,250 lbs
6-Ton x 6-1/8"	24"	36"	8,700 lbs	8,700 lbs
6-Ton x 6-7/8"	26"	38"	10,070 lbs	10,070 lbs
6-Ton x 7-7/8"	30"	42"	12,000 lbs	12,000 lbs

Safe working load is based on approximate factor of safety of 4 to 1 in 3,500 psi normal weight concrete.

~SPECIALTIES FOR THE PRECAST CONSTRUCTION INDUSTRY~



MSI-92-FEW FORGED ERECTION ANCHOR WITH SHEAR PLATE



PRODUCT DESCRIPTION:

The MSI-92-FEW Forged Erection Anchor with Shear Plate is specifically designed to provide greater lifting capacities for horizontal to vertical edge lifts. By welding a solid shear pin opposite the shear plate, the anchor can resist shear loads in both directions. The anchors are forged to provide 20% greater safe working loads. The MSI-92-FEW eliminates the need for a shear bar.

Due to the anchor being forged, it does not depend on welds or thread engagement to develop its safe working load. Forging provides maximum safety with its advantageous material structure. This allows the anchor to easily meet the OSHA requirement of 4 to 1 factor of safety.

PRODUCT APPLICATION:

The MSI-92-FEW Forged Erection Anchor with Shear Plate is designed specifically for edge tilting precast concrete elements from the horizontal to vertical position. An integral shear plate eliminates any possibility of forgetting to install a required shear bar.

PRODUCT FEATURES AND BENEFITS:

The MSI-92-FEW has two steel protrusions or "ears" at the head of the anchor which provides protection against concrete spalling. These "ears" restrict the ring clutch rotation during lateral pulls. As a result, lateral forces are transmitted directly to the edge of the anchor instead of the concrete.

The MSI-92-FEW Forged Erection Anchor utilizes the Fleet MSI-91-S or Fleet MSI-91-NC lifting hardware and the MSI99 Recess Plugs.

The MSI-92-FEW Forged erection Anchors are available in a plain or galvanized finishes.

INSTALLATION:

The MSI-92-FEW anchor is set in the form with the shear plate in the down position to resist the shear load.

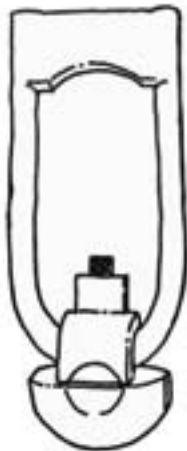
TON x LENGTH	PRODUCT CODE	SLAB THICKNESS	MINIMUM EDGE DISTANCE	MINIMUM CORNER DISTANCE	SHEAR SAFE WORKING LOAD W/SP	TENSION SAFE WORKING LOAD	TENSION SAFE WORKING LOAD W/TENSION BAR
3 Ton x 8"	129473	4"	2"	12"	1800 lbs	6000 lbs	6000 lbs
	129473	5"	2-1/2"	12"	2300 lbs	6000 lbs	6000 lbs
	129473	6"	3"	12"	2800 lbs	6000 lbs	6000 lbs
	129473	7"	3-1/2"	12"	3400 lbs	6000 lbs	6000 lbs
	129473	8"	4"	12"	4000 lbs	6000 lbs	6000 lbs
	129473	9"	4-1/2"	12"	4400 lbs	6000 lbs	6000 lbs
	129473	10"	5"	12"	4800 lbs	6000 lbs	6000 lbs
	129473	11"	5-1/2"	12"	5200 lbs	6000 lbs	6000 lbs
	129473	12"	6"	12"	5700 lbs	6000 lbs	6000 lbs
6 Ton x 10-3/8"	129474	5-1/2"	2-3/4"	16"	3100 lbs	10,000 lbs	12,000 lbs
	129474	6"	3"	16"	3250 lbs	10,500 lbs	12,000 lbs
	129474	7"	3-1/2"	16"	3700 lbs	11,500 lbs	12,000 lbs
	129474	8"	4"	16"	4040 lbs	12,000 lbs	12,000 lbs
	129474	9"	4-1/2"	16"	4600 lbs	12,000 lbs	12,000 lbs
	129474	10"	5"	16"	5000 lbs	12,000 lbs	12,000 lbs
	129474	11"	5-1/2"	16"	5500 lbs	12,000 lbs	12,000 lbs
	129474	12"	6"	16"	6100 lbs	12,000 lbs	12,000 lbs
10 Ton x 12-3/4"	129475	7-1/2"	3-3/4"	19"	4600 lbs	17,500 lbs	20,000 lbs
	129475	8"	4"	19"	4800 lbs	18,000 lbs	20,000 lbs
	129475	9"	4-1/2"	19"	5450 lbs	19,000 lbs	20,000 lbs
	129475	10"	5"	19"	6100 lbs	20,000 lbs	20,000 lbs
	129475	11"	5-1/2"	19"	6800 lbs	20,000 lbs	20,000 lbs
	129475	12"	6"	19"	7600 lbs	20,000 lbs	20,000 lbs

Safe working load provides a factor of safety approximately 4 to 1 in 3,500 psi normal weight concrete.

MSI LIFT SYSTEM

MSI-50

MSI LIFT HARDWARE



MSI-50
MSI Lift
Hardware

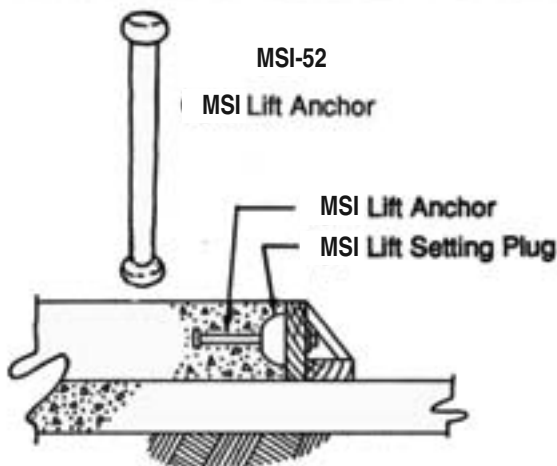
The MidSpec MSI Lift Hardware MSI-50 for lifting and handling precast concrete elements, is available in two sizes, one size to match the 9/16" (14 mm) diameter MSI Lift Anchor ("2 ton") and one to match the 3/4" (19 mm) diameter MSI Lift Anchor ("4 ton"). The hardware features quick connect, positive locking, free rotation on the head of the anchor, and quick disconnect.

TO ORDER: give quantity, anchor size, product code and name.

Additional MSI Lift System information is available in the MSI Lift product brochure, available from your nearest MidSpec Representative.

MSI-52

MSI LIFT ANCHOR



MSI-52
MSI Lift Anchor

MSI Lift Anchor
MSI Lift Setting Plug

The MidSpec MSI Lift Anchor is a high quality steel anchor

Available in two sizes, 9/16" (14 mm) diameter ("2 ton") and 3/4" (19 mm) diameter ("4 ton"), to match the MSI Lift Hardware shown above.

TO ORDER: give quantity, anchor diameter and length, product code and name.

Example - 100, 3/4" x 7", (9/07) MSI Lift Anchor.

MSI-56

MSI LIFT SETTING PLUG ASSEMBLY



MSI-56
MSI Lift Setting Plug Assembly

The MidSpec MSI Lift Setting Plug Assembly consists of a MSI Lift Setting Plug, a contour threaded stud and a cast washer-faced wing nut. Available in two sizes to match 9/16" (14 mm) diameter and 3/4" (19 mm) diameter MSI Lift Anchors.

TO ORDER: give quantity, system size, product code and name.

Example - 100, 3/4" diameter MSI-56 Lift Setting Plug Assemblies

MSI Lift System



MSI LIFT SETTING PLUG

MSI-56

The MidSpec **MSI Lift Setting Plug** MSI-56 is a rubber-like plug available in two sizes to accept the Gyro Lift Anchors. The reusable Setting Plug is a clam shell design which allows easy insertion of the anchor head for setting purposes and easy removal after the concrete has set.

TO ORDER: give quantity, system size, product code and name.



MSI-56

MSI Lift Setting Plug

MSI LIFT STUD/PLATE

MSI-63

The MidSpec **MSI Lift Contour Threaded Stud and Plate** is a 3/8" (10 mm) diameter threaded stud with attached plate that is used in conjunction with the MSI Lift Setting Plug to firmly attach the setting plug to the concrete formwork.

TO ORDER: give quantity, product code and name.



MSI-63

Contour Stud
and Plate

MSI LIFT WING NUT

MSI-64

The MidSpec **MSI Lift Wing Nut** MSI-64 is a cast 3/8" (10 mm) diameter, contour threaded wing nut with integral washer face. Used in conjunction with the Contour Threaded Stud, described above, to firmly affix the MSI Lift Setting Plug to the formwork.

TO ORDER: give quantity, product code and name.



MSI-64

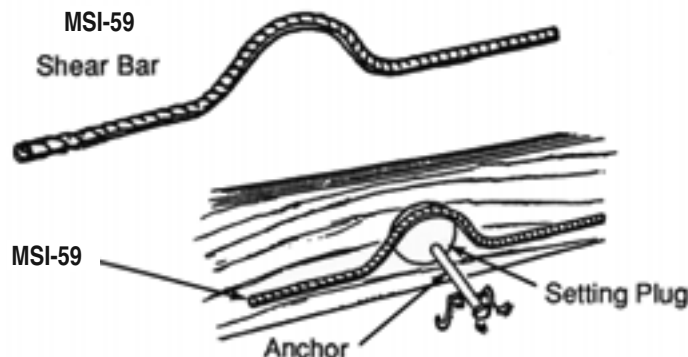
Wing Nut

MSI LIFT SHEAR BAR

MSI-59

The MidSpec **MSI Lift Shear Bar** MSI-59 is a special shaped length of #4 rebar that has been developed to provide adequate shear working loads when lifting or handling thin, horizontally cast concrete panels.

TO ORDER: give quantity, system size, product code and name.



MSI-59

Shear Bar

MSI-59

Anchor

Setting Plug

MSI LIFT ANCHOR SHEAR AND TENSION CAPACITIES

EDGE LIFT - MSI LIFT ANCHOR TENSION CAPACITIES

Anchor Diameter X Anchor Length	Effective Wall Thickness in. (mm)	Actual Edge Distance in. (mm)	Concrete Strength lbs. (MPa)	Anchor Spacing in. (mm)	Tensile Safe Working Load per Anchor* lbs. (Kn)
9/16" X 6-3/4" (14 X 172 mm)	4" (102)	2" (51)	3,500 (24.2)	24" (610)	2,450 (10.9)
	5-1/2" (140)	2-3/4" (70)		24" (610)	3,770 (16.8)
	7-1/4" (184)	3-5/8" (92)		24" (610)	4,000 (17.8)
3/4" X 9-1/2" (19 X 241 mm)	5-1/2" (140)	2-3/4" (70)	3,500 (24.2)	24" (610)	4,650 (20.7)
	7-1/4" (184)	3-5/8" (92)		24" (610)	5,760 (25.6)

EDGE LIFT - MSI LIFT ANCHOR SHEAR CAPACITIES

Anchor Diameter X Anchor Length in. (mm)	Wall Thickness in. (mm)	Top Edge Distance in. (mm)	Bottom Edge Distance in. (mm)	Concrete Strength lbs. (MPa)	Corner Distance in. (mm)	Shear Safe Load per Anchor* lbs. (Kn)
9/16" X 6-3/4" (14 X 172 mm)	4" (102)	2" (51)	2" (51)	3,500 (24.2)	24" (610)	900 (4.0)
	4-1/2" (114)	2-1/2" (63)	2" (51)		24" (610)	1,400 (6.2)
	5" (127)	2-3/4" (70)	2-1/4" (57)		24" (610)	1,700 (7.6)
	5-1/2" (140)	3" (76)	2-1/2" (63)		24" (610)	2,600 (11.6)
	6" (152)	3-1/2" (89)	2-1/2" (63)		24" (610)	2,900 (12.9)
	7-1/4" (184)	4" (102)	3-1/4" (83)		24" (610)	3,680 (16.4)
3/4" X 9-1/2" (19 X 241 mm)	5-1/2" (140)	3" (76)	2-1/2" (63)	3,500 (24.2)	24" (610)	2,460 (10.9)
	6" (152)	3-1/2" (89)	2-1/2" (63)		24" (610)	2,670 (11.9)
	7-1/4" (184)	4" (102)	3-1/4" (83)		24" (610)	3,200 (14.2)

FACE LIFT - MSI LIFT ANCHOR TENSION AND SHEAR CAPACITIES

MSI ("2 Ton") Insert					MSI Lift ("4 Ton") Insert				
Anchor Diameter	Anchor Length in. (mm)	Min. Edge Distance in. (mm)	Concrete Strength psi (MPa)	Safe Working Load* lbs. (Kn)	Anchor Diameter	Anchor Length in. (mm)	Min. Edge Distance in. (mm)	Concrete Strength psi (MPa)	Safe Working Load* lbs. (Kn)
9/16" (14 mm)	4" (102)	10" (254)	2,700 (11.7)	2,600 (11.6)	3/4" (19 mm)	5" (127)	15" (381)	2,700 (18.6)	5,100 (22.7)
	5" (127)	10" (254)	1,600 (8.9)	2,000 (8.9)		6" (152)	18" (457)	2,700 (18.6)	6,500 (28.9)
	6" (152)	18" (457)	2,700 (11.7)	4,000 (17.8)		7" (178)	21" (533)	2,700 (18.6)	8,000 (35.6)
	7" (178)	14" (356)	1,600 (8.9)	4,000 (17.8)		9" (229)	19" (483)	1,600 (11.0)	8,000 (35.6)
	8" (203)	10" (254)	1,600 (8.9)	2,000 (8.9)		14" (356)	19" (483)	1,600 (11.0)	8,000 (35.6)
	11" (279)	14" (356)	1,600 (8.9)	4,000 (17.8)		19" (483)	19" (483)	1,600 (11.0)	8,000 (35.6)

*Approx. 4:1 safety factor. Shear loads based on mandatory use of shear bar.

MSI LIFT SYSTEM



MSI LIFT APPLICATION CAPACITIES

EDGE LIFT - MSI LIFT "2 TON" ANCHOR IN SINGLE ANCHOR APPLICATIONS

Anchor Dia. x Length in. (mm)	Wall Thick. in. (mm)	Min. Edge Dist. in. (mm)	Conc. Strength psi (MPa)	MSI Lift Anchor Safe Working Loads in Tension* lbs. (Kn)											S.W.L. in Shear lbs. (Kn)
				ACTUAL CORNER DISTANCE in. (mm)											
				5" (127)	8" (203)	12" (305)	15" (381)	18" (457)	21" (533)	24" (610)	27" (686)	30" (762)	33" (838)	36" (914)	
9/16" (14) x 9-1/2" (241)	3-1/2" (89)	1-3/4" (44)	4,500 (31.1)	1,400 (6.2)	1,700 (7.6)	2,000 (8.9)	2,200 (9.8)	2,300 (10.2)	2,300 (10.2)	2,300 (10.2)	2,300 (10.2)	2,300 (16.4)	2,300 (10.4)	600 (2.7)	
	4" (102)	2" (51)		1,600 (7.1)	2,000 (8.9)	2,300 (10.2)	2,600 (11.1)	2,600 (11.6)	2,700 (12.0)	2,700 (12.0)	2,700 (12.0)	2,700 (12.2)	2,700 (12.2)	900 (4.1)	
	5" (127)	2-1/2" (63)		2,000 (8.9)	2,500 (11.1)	2,900 (12.9)	3,200 (14.2)	3,300 (14.7)	3,400 (15.1)	3,400 (15.1)	3,400 (15.1)	3,400 (15.3)	3,400 (15.3)	1,400 (6.2)	
	6" (152)	3" (76)		2,400 (10.7)	3,000 (13.3)	3,500 (15.6)	3,800 (16.9)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	2,600 (11.6)	
9/16" (14) x 11" (279)	3-1/2" (89)	1-3/4" (44)	4,500 (31.1)		2,200 (9.8)	2,700 (12.0)	3,000 (13.3)	3,200 (14.2)	3,400 (15.1)	3,500 (15.6)	3,600 (16.0)	3,700 (16.5)	3,700 (16.7)	600 (2.7)	
	4" (102)	2" (51)			2,500 (11.1)	3,100 (13.8)	3,400 (15.1)	3,700 (16.5)	3,900 (17.3)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	900 (4.1)	
	5" (127)	2-1/2" (63)			3,200 (14.2)	3,900 (17.3)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	1,400 (6.2)	
	6" (152)	3" (76)			3,800 (16.9)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	4,000 (17.8)	2,600 (11.6)	

Approx. 4:1 safety factor. Shear loads based on mandatory use of shear bar. See reduction factors for lower strength concretes, below.

EDGE LIFT - MSI LIFT "4 TON" ANCHOR IN SINGLE ANCHOR APPLICATIONS

Anchor Dia. X Length	Wall Thick.	Min. Edge Dist.	Conc. Strength	MSI Lift Anchor Safe Working Load in Tension* lbs. (Kn)											S.W.L. in Shear lbs. (Kn)
				Actual Corner Distance in. (mm)											
				5" (127)	10" (254)	15" (381)	20" (508)	24" (610)	30" (762)	36" (914)	42" (1066)	48" (1220)	54" (1372)	60" (1524)	
in. (mm)	in. (mm)	in. (mm)	psi (MPa)												
3/4" (19) X 9-1/2" (241)	4-1/2" (114)	2" (51)	4,500 (31.1)	1,900 (8.5)	2,600 (11.6)	3,200 (14.2)	3,500 (15.6)	3,700 (16.5)	3,800 (16.9)	3,800 (16.9)	3,800 (16.9)	3,800 (16.9)	3,800 (16.9)	2,000 (8.9)	
	5" (127)	2-1/2" (63)		2,400 (10.7)	3,300 (14.7)	4,000 (17.8)	4,400 (19.6)	4,600 (20.5)	4,700 (20.9)	4,700 (20.9)	4,700 (20.9)	4,700 (20.9)	2,250 (10.0)		
	6" (152)	3" (76)		2,900 (12.9)	4,000 (17.8)	4,800 (21.4)	5,300 (23.6)	5,500 (24.5)	5,700 (25.4)	5,700 (25.4)	5,700 (25.4)	5,700 (25.4)	2,460 (10.9)		
	7" (128)	3-1/2" (89)		3,300 (14.7)	4,700 (20.9)	5,600 (24.9)	6,200 (27.6)	6,500 (28.9)	6,600 (29.4)	6,600 (29.4)	6,600 (29.4)	6,600 (29.4)	2,670 (11.9)		
	8" (203)	4" (102)		3,800 (16.9)	5,300 (23.6)	6,400 (28.5)	7,000 (31.5)	7,400 (32.9)	7,600 (33.8)	7,600 (33.8)	7,600 (33.8)	7,600 (33.8)	7,600 (33.8)	2,600 (11.6)	
3/4" (19) X 19" (483)	4-1/2" (114)	2" (51)	4,500 (31.1)		3,800 (16.9)	4,600 (20.5)	5,300 (23.6)	5,700 (25.4)	6,200 (27.6)	6,700 (29.8)	7,000 (31.5)	7,200 (32.0)	7,300 (32.5)	2,000 (8.9)	
	5" (127)	2-1/2" (63)			4,700 (20.9)	5,700 (25.4)	6,600 (29.4)	7,100 (31.6)	7,800 (34.7)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	2,250 (10.0)	
	6" (152)	3" (76)			5,700 (25.4)	6,900 (30.7)	7,900 (35.1)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	2,460 (10.9)	
	7" (128)	3-1/2" (89)			6,600 (29.4)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	2,670 (11.9)	
	8" (203)	4" (102)			7,600 (33.8)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	8,000 (35.6)	3,200 (14.2)	

Approx. 4:1 safety factor. Shear loads based on mandatory use of shear bar. See reduction factors for lower strength concretes, below.

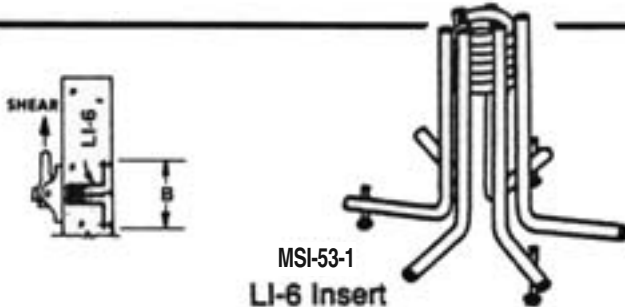
LOW STRENGTH CONCRETE REDUCTION FACTORS

Concrete Strength		Shear Reduction Factor	Tension Reduction Factor
Pounds per Square Inch (psi)	Mega Pascals (MPa)		
2,000	13.8	.70	.66
2,500	17.3	.79	.74
3,000	20.7	.86	.81
3,500	24.2	.93	.86
4,000	27.6	1.00	.94
4,500	31.1	1.00	1.00

LIFTING AND HANDLING

MSI-53-1

LI-6 LIFTING INSERT



The MidSpec **LI-6 Lifting Insert** MSI-53-1 is available only in 1-1/2" (38 mm) diameter and in applications requiring high working loads. LI-6 Inserts are supplied with either stainless steel feet or plastic tipped legs.

TO ORDER: give quantity, diameter, height (usually 1/2" (13 mm) less than concrete structural thickness), product code and name. Specify type of legs required.

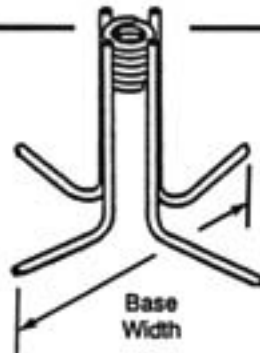
Bolt Diameter in. (mm)	Base Width (B) in. (mm)	Minimum Height in. (mm)	SLAB THICKNESS in. (mm)			
			4-1/2" (114)	6" (152)	8" (203)	10" (254)
			Tension lbs. (Kn)	Tension lbs. (Kn)	Tension lbs. (Kn)	Tension lbs. (Kn)
1-1/2" (38)	9-7/8" (197)	4" (102)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)
			4,190 (18.6)	7,450 (33.1)	13,240 (58.9)	20,680* (92.0)
			3,550 (15.8)	6,300 (28.0)	11,250 (50.0)	14,475* (64.4)

Table based on 3,000 psi (20.7 MPa) concrete and approx. 4:1 safety factor (Ultimate:Dead Weight). When edge distance is less than slab thickness, consult MidSpec Technical Department. *Indicates insert maximum load capacity.

MSI-53

LP-4 LIFTING INSERT

MSI-53
LP-4 Insert



The MidSpec **LP-4 Lifting Insert** MSI-53 is available with 3/4", 1", 1- 1/4" or 1-1/2" (19, 25, 32 or 38 mm) diameter coils and with 3/4", 1", 1-1/4" or 1- 1/2" (19, 25, 32 or 38 mm) open or closed ferrules. The LP-4 must be installed with at least 1/2" (13 mm) concrete cover beneath the base. Optional washer face, for nailing to formwork, is available.

TO ORDER: give quantity, diameter, height, product code and name.

Bolt Diameter in. (mm)	Base Width in. (mm)	Minimum Insert Height in. (mm)	SLAB THICKNESS in. (mm)			
			4" (102)	6" (152)	8" (203)	10" (254)
			Tension	Tension	Tension	Tension
3/4" (19)	7-3/4" (197)	3-1/2" (89)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)
			3,150* (14.0)	3,150* (14.0)	3,150* (14.0)	3,150* (14.0)
1" (25)	9" (229)	5-1/2" (140)	1,680* (7.5)	7,450 (33.1)	8,410* (37.4)	8,410* (37.4)
				4,480* (19.9)	4,480* (19.9)	4,480* (19.9)
1-1/4" (32)	9-1/2" (241)	5-1/2" (140)		7,450 (33.1)	8,410* (37.4)	8,410* (37.4)
				4,750* (21.1)	4,750* (21.1)	4,750* (21.1)
1-1/2" (38)	9-1/2" (241)	7-1/2" (191)			13,240 (58.9)	17,030* (75.8)
					9,650* (42.9)	9,650* (42.7)

3,000 psi (20.7 MPa) concrete. Approx. 4:1 Safety factor (Ultimate:Dead Weight). When edge distance is less than slab thickness, consult Technical Department for recommendations. *Denotes maximum insert load capacity.

LIFTING AND HANDLING INSERTS



EXPANDED COIL INSERT

MSI-56

The MidSpec Expanded Coil Insert MSI-56, originally developed for use as a heavy cantilever form anchorage system for low strength concrete, is quite suitable for handling heavy and/or bulky precast members such as beams and columns.



TO ORDER: give quantity, diameter, length, product code and name.

MSI-56
Expanded Coil Insert

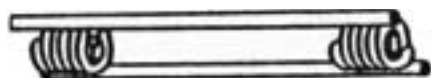
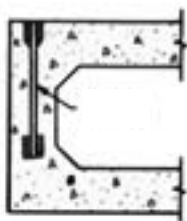
Expanded Coil Insert Two Strut and Four Strut Size and Type	EDGE DISTANCE - CENTERLINE OF INSERT TO NEAREST EDGE in. (mm)						
	3" (76)	4" (102)	5" (127)	6" (152)	7" (178)	8" (203)	9" (229)
	Tension	Tension	Tension	Tension	Tension	Tension	Tension
	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)
1" X 8" (2 Strut) (25 X 203 mm)	6,170 (27.4)	7,500* (33.4)	7,500* (33.4)	7,500* (33.8)	7,500* (33.4)	7,500* (33.4)	7,500* (33.4)
	1,500 (6.7)	2,250 (10.0)	3,375 (15.0)	4,500* (20.0)	4,500* (20.0)	4,500* (20.0)	4,500* (20.0)
1-1/4" X 12" (2 Strut) (32 X 305 mm)		10,000* (45.0)	10,000* (45.0)	10,000* (45.0)	10,000* (45.0)	10,000* (45.0)	10,000* (45.0)
		2,400 (10.7)	3,750 (16.7)	5,000 (22.2)	6,000* (26.7)	6,000* (26.7)	6,000* (26.7)
1-1/4" X 12" (4 Strut) (32 X 305 mm)		12,400 (55.2)	14,800 (65.8)	15,000* (66.7)	15,000* (66.7)	15,000* (66.7)	15,000* (66.7)
		2,400 (10.7)	3,750 (16.7)	5,625 (25.0)	6,300 (28.0)	8,250 (36.7)	9,000* (40.0)
1-1/2" X 15" (4 Strut) (38 X 381 mm)		15,610 (69.4)	19,380 (86.2)	20,000* (89.0)	20,000* (89.0)	20,000* (89.0)	20,000* (89.0)
		2,400 (10.7)	3,750 (16.7)	5,625 (25.0)	6,300 (28.0)	8,250 (36.7)	9,000* (40.0)

Table based on 3,000 psi (20.7 MPa) concrete and approx. 4:1 safety factor (Ultimate:Dead Weight). *Indicates maximum insert load capacity.

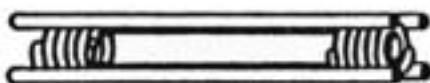
Lifting and Handling Inserts

MSI-1 & MSI-2

LIFTING COIL TIE INSERT



(MSI-1) Lifting Coil Tie - 2 Strut



(MSI-2) Lifting Coil Tie - 4 Strut Lifting Coil Tie

The MidSpec Lifting Coil Tie (MSI1/2) is used for lifting thin walled hollow prestressed girders or other thin walled structures. 2 strut Lifting Coil Tie is used for moderate loads and the 4 strut Lifting Coil Tie is used for heavier loads. See chart below for size and load information.

TO ORDER: give quantity, diameter, length, product code and name.

Size and Type	EDGE DISTANCE - CENTERLINE OF INSERT TO NEAREST EDGE In. (mm)								
	1-1/2" (38)	2" (51)	3" (76)	4" (102)	5" (127)	6" (152)	8" (203)	9" (229)	12" (305)
	Tension	Tension	Tension	Tension	Tension	Tension	Tension	Tension	Tension
	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)
3/4" X 6" (2 Strut) (19 X 152 mm)	1,125 (5.0)	2,250 (10.0)	3,150 (14.0)	3,750* (16.7)	3,750* (16.7)	3,750* (16.7)	3,750* (16.7)	3,750* (16.7)	3,750* (16.7)
	375 (1.7)	600 (2.7)	975 (4.3)	1,350 (6.0)	2,250 (10.0)	3,525* (15.7)	3,525* (15.7)	3,525* (15.7)	3,525* (15.7)
3/4" X 9" (2 Strut) (19 X 229 mm)	1,500 (6.7)	2,850 (12.7)	3,750 (16.7)	4,500 (20.0)	5,500* (24.5)	5,500* (24.5)	5,500* (24.5)	5,500* (24.5)	5,500* (24.5)
	375 (1.7)	600 (2.7)	975 (4.3)	1,350 (6.0)	2,250 (10.0)	3,525* (15.7)	3,525* (15.7)	3,525* (15.7)	3,525* (15.7)
1" X 6" (2 Strut) (25 X 152 mm)			3,375 (15.0)	4,125 (18.3)	5,250 (23.4)	6,000* (26.7)	6,000* (26.7)	6,000* (26.7)	6,000* (26.7)
			1,500 (6.7)	2,250 (10.0)	3,375 (15.0)	4,500 (20.0)	6,000* (26.7)	6,000* (26.7)	6,000* (26.7)
1" X 12" (2 Strut) (25 X 305 mm)			4,500 (20.0)	6,000 (26.7)	7,500 (33.4)	8,250* (36.7)	8,250* (36.7)	8,250* (36.7)	8,250* (36.7)
			1,500 (6.7)	2,250 (10.0)	3,375 (15.0)	4,500 (20.0)	6,000* (26.7)	6,000* (26.7)	6,000* (26.7)
1-1/4" X 12" (4 Strut) (32 X 305 mm)				7,500 (33.4)	9,000 (40.0)	10,500 (46.7)	13,500 (60.1)	16,500* (73.4)	16,500* (73.4)
				2,400 (10.7)	3,750 (16.7)	5,625 (25.3)	8,250 (32.1)	9,000* (40.5)	9,000* (40.5)
1-1/2" X 18" (4 Strut) (38 X 457 mm)						13,500 (60.1)	16,500* (73.4)	16,500* (73.4)	16,500* (73.4)
						6,750 (30.0)	9,750 (43.4)	12,000 (53.4)	12,750* (56.7)

Table based on 3,000 psi (20.7 MPa) concrete and approx. 4:1 safety factor. *Indicates maximum insert load capacity.

MSI-16, MSI-17 & MSI-18

COIL LOOP INSERTS



2 Strut

Coil Loop



MSI-18



MSI-17

The MidSpec Coil Loop Insert (MSI-16-8) is used when the available space envelope is limited due to concrete cover, rebar interference and other embedment obstructions. Lifting Inserts are available in special shapes to satisfy most conditions. Available with standard loop for light loads, flared loop for moderate loads and 4 strut flared loops for heavy loads.

TO ORDER: give quantity, diameter, length, product code and name.

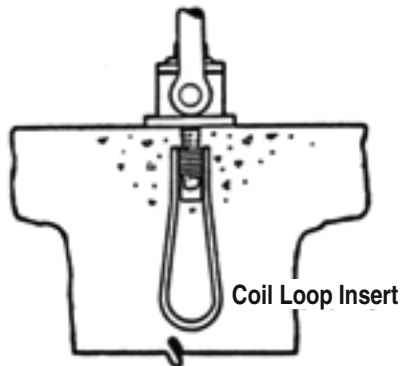
See Lifting Tyloop Insert Safe Working Load Table and Dimensions Table on next page.

LIFTING AND HANDLING INSERTS

COIL LOOP INSERTS

Lifting Tyloops Size and Type	EDGE DISTANCE - CENTERLINE OF INSERT TO NEAREST EDGE in. (mm)								
	1-1/2" (38)	2" (51)	3" (76)	4" (102)	5" (127)	6" (152)	8" (203)	9" (229)	12" (305)
	Tension	Tension	Tension	Tension	Tension	Tension	Tension	Tension	Tension
	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)
3/4" X 6" (2 Strut) (19 X 152 mm)	975 (4.3)	1,950 (8.7)	2,475 (11.0)	3,000 (13.3)	3,375* (15.0)	3,375* (15.0)	3,375* (15.0)	3,375* (15.0)	3,375* (15.0)
	375 (1.7)	600 (2.7)	975 (4.3)	1,350 (6.0)	2,250 (10.0)	3,525* (15.7)	3,525* (15.7)	3,525* (15.7)	3,525* (15.7)
3/4" X 9" (2 Strut Flared) (19 X 229 mm)	1,125 (5.0)	2,250 (10.0)	3,150 (14.0)	3,375* (15.0)	3,375* (15.0)	3,375* (15.0)	3,375* (15.0)	3,375* (15.0)	3,375* (15.0)
	375 (1.7)	600 (2.7)	975 (4.3)	1,350 (6.0)	2,250 (10.0)	3,525* (15.7)	3,525* (15.7)	3,525* (15.7)	3,525* (15.7)
1" X 12" (2 Strut Flared) (25 X 305 mm)			4,500* (20.0)	4,500* (20.0)	4,500* (20.0)	4,500* (20.0)	4,500* (20.0)	4,500* (20.0)	4,500* (20.0)
			1,500 (6.7)	2,250 (10.0)	3,375 (15.0)	4,000* (17.8)	4,000* (17.8)	4,000* (17.8)	4,000* (17.8)
1" X 15" (2 Strut Flared) (25 X 381 mm)			4,500 (20.0)	6,000 (26.7)	7,500 (33.4)	8,250* (36.7)	8,250* (36.7)	8,250* (36.7)	8,250* (36.7)
			1,500 (6.7)	2,250 (10.0)	3,375 (15.0)	4,500 (20.0)	6,000* (26.7)	6,000* (26.7)	6,000* (26.7)
1-1/4" X 15" (4 Strut Flared) (32 X 381 mm)				7,500 (33.4)	9,000 (40.0)	10,500 (46.7)	13,500 (60.1)	16,500* (73.4)	16,500* (73.4)
				2,400 (10.7)	3,750 (16.7)	5,625 (25.3)	8,250 (36.7)	9,000* (40.0)	9,000* (40.0)
1-1/2" X 18" (4 Strut Flared) (38 X 457 mm)						13,500 (60.1)	16,500* (73.4)	16,500* (73.4)	16,500* (73.4)
						6,750 (30.0)	9,750 (43.4)	12,000 (53.4)	12,750* (56.7)

Table based on 3,000 psi (20.7 MPa) concrete and approx. 4:1 safety factor (ultimate dead weight) *Indicates maximum insert load capacity.

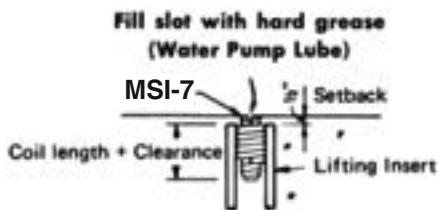


Tyloop Size and Type in. (mm)	Overall Length in. (mm)	Loop Dia. in. (mm)
3/4" (19 mm) 2 Strut	6" (152)	1" (25)
3/4" (19 mm) 2 Strut Flared	9" (229)	2" (51)
1", 1-1/4" (25, 32 mm) 2 Strut Flared	12" & 15" (305 & 381)	3" (76)
1-1/4" (32 mm) 4 Strut Flared	15" (381)	3" (76)
1-1/2" (38 mm) 4 Strut Flared	18" (457)	6" (152)

LIFTING ACCESSORIES

MSI-7

SLOTTED COIL ROD



MidSpec **Slotted Coil Rod MSI-7** are used as steel setting bolts. Available in 3/4" (19 mm) X 3" (76 mm), 1" (25 mm) and 1-1/4" (32 mm) X 3-1/2" (89 mm) long and 1-1/2" (38 mm) X 4" (102 mm). One end is slotted for screw driver removal. Longer lengths available.

TO ORDER: give qty, diameter, product code and name.

MSI-21

COLLAPSIBLE SETTING PLUG



MSI-21
Collapsible Setting Plug

MidSpec **Collapsible Setting Plug MSI-21** is a two piece plastic unit designed to engage top and bottom of 3/4", 1" or 1-1/4" (19, 25 or 32 mm) diameter insert coils. Top piece has a protruding bristle which marks the insert location. Removal is accomplished with a screw driver. The bottom cavity cup forms clearance for final bolt. Available factory installed or loose for field installation.

TO ORDER: give qty, diameter, product code and name.

MSI-7

ETHAFOAM SETTING PLUG

See Sizing
Chart on
Page 13.

Ethafoam Plug

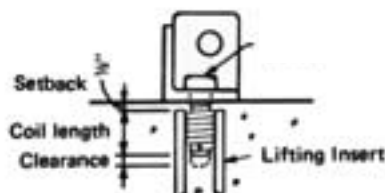


MidSpec **Ethafoam Plugs MSI-21-E** are available for 1/2", 3/4", 1" and 1-1/4" (13, 19, 25 and 32 mm) diameter inserts for use as setting studs. Plugs are easily removed before engagement of Coil Bolt or Lifting Eye Bolt.

TO ORDER: give qty, diameter, product code and name.

MSI-7

COIL BOLTS



See Sizing Chart and Coil
Bolt load Restriction Chart



MidSpec **Coil Bolts MSI-14**, threaded to 1/2" (13 mm) of the bolt head, are used to anchor lifting fixtures.

TO ORDER: give qty, diameter, product code and name.

NOTE: Be sure there is proper setting clearance. Proper length is required to prevent "bottoming", which will not allow tightening. A tight connection is necessary to prevent hardware slippage, bolt bending and spalling of concrete. This should always be checked carefully, especially when using adjustable bolts. When installing hardware be sure coil is fully penetrated by bolt. Never use a bolt that has experienced loads in excess of the safe working load of the bolt or the insert. (Reference Page 2, Item 5)

COIL BOLT SIZING AND LOAD RESTRICTIONS

COIL BOLT SIZING CHART Bracketed figures denote millimeter dimension.

Insert Diameter	Coil Length	Bolt Clearance	Setback	Lifting Bracket		Duo Swivel		Swivel Lift Plate		Ethafoam Plug	Slotted
				t		t			Lift Lag		
3/4" (19)	1-1/2" (38)	1/2" (13)	1/2" (13)	3/4" (19)	3" (76)	2-3/4" (70)	5-1/2" (140)			4" (102)	3" (76)
1" (25)	2" (51)	1/2" (13)	1/2" (13)	3/4" (19)	3-1/2" (89)	2-3/4" (70)	6" (152)			4" (102)	3-1/2" (89)
1-1/4" (32)	2" (51)	1/2" (13)	1/2" (13)	3/4" (19)	3-1/2" (89)			3" (76)	6-1/2" (165)	4" (102)	3-1/2" (89)
1-1/2" (38)	2-9/16" (65)	1/2" (13)	1/2" (13)	3/4" (19)	4" (102)			3" (76)	6-1/2" (165)	4" (102)	4" (102)

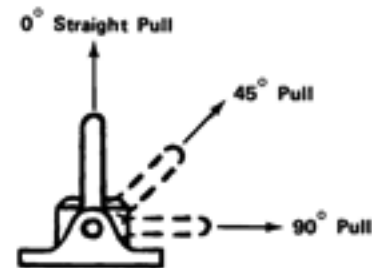
t = Product thickness, see product sketches on following pages.

COIL BOLT LOAD RESTRICTIONS*

LOAD RESTRICTIONS*			
Bolt Diameter in. (mm)	Straight Pull lbs. (Kn)	45° Pull lbs. (Kn)	90° Pull lbs. (Kn)
3/4" (19)	7,280 (32.4)	4,800 (21.4)	4,800 (21.4)
1" (25)	12,800 (56.9)	8,460 (37.6)	8,460 (37.6)
1-1/4" (32)	21,700 (96.5)	14,350 (63.8)	14,350 (63.8)
1-1/2" (38)	23,750** (105.6)	21,700 (96.5)	21,700 (96.5)

*Safety factor varies between 3:1 and 4:1 (ultimate:dead weight).

**Limited by Swivel Lift Plate load capacity.



NOTE: To prolong bolt life, bolts should not be overloaded beyond the values shown in the Table. If overload condition has been experienced, the bolts should not be used.

LIFTING EYE BOLTS

MSI-49

MidSpec **Lifting Eye Bolt MSI-49** made from drop forged steel and is available in the following sizes: 3/4" (19 mm) dia. x 3" (76 mm) shank with 2-1/2" (63 mm) of contour thread, 1" (25 mm) dia. x 3-1/2" (89 mm) shank with 3" (76 mm) of contour thread, 1-1/4" (32 mm) dia. x 4" (102 mm) shank with 3-1/2" (89 mm) of contour thread and 1-1/2" (38 mm) dia. x 4-1/2" (114 mm) shank with 4" (102 mm) of contour thread. The eye is designed to develop the full strength of the bolt in straight tension. Specify amount of thread required if other than standard lengths shown above.

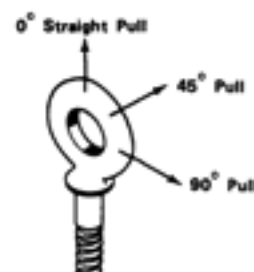
TO ORDER: give quantity, diameter, shank length, product code and name.

EYE BOLT LOAD RESTRICTIONS			
Bolt Diameter in. (mm)	Straight Pull lbs. (Kn)	45° Pull lbs. (Kn)	90° Pull lbs. (Kn)
3/4" (19)	4,050 (18.0)	900 (4.0)	670 (3.0)
1" (25)	7,500 (33.4)	1,500 (6.7)	1,100 (4.9)
1-1/4" (32)	11,600 (51.6)	2,600 (11.6)	1,900 (8.5)
1-1/2" (38)	16,900 (75.2)	4,100 (18.2)	3,000 (13.3)



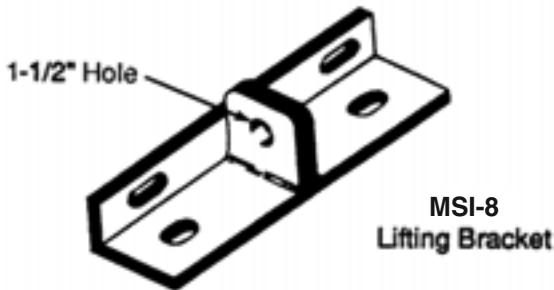
**MSI-49
Lifting Eye Bolt**

Note: Angle pull and working load limitations are shown in the chart below. Also, note Item 6 on Page 2 concerning bolt engagement.



MSI-8

LIFTING BRACKET

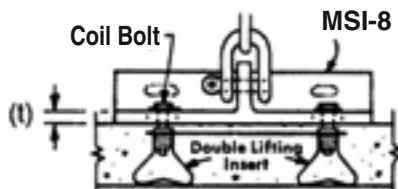


MidSpec **Lifting Bracket MSI-8** consists of a heavy angle punched with holes for bolting to 3/4", 1" or 1-1/4" (19, 25 or 32 mm) tandem inserts with 12" (305 mm) c.c. spacing. A heavy plate is welded to the center of the angle and is equipped with a hole to allow engagement of lifting shackles. Available in one size, 3/4" x 4" x 6" x 18" (19 x 102 x 152 x 457 mm) angle with 1-1/8" (29 mm) mid gusset.

TO ORDER: give quantity, product code and name.

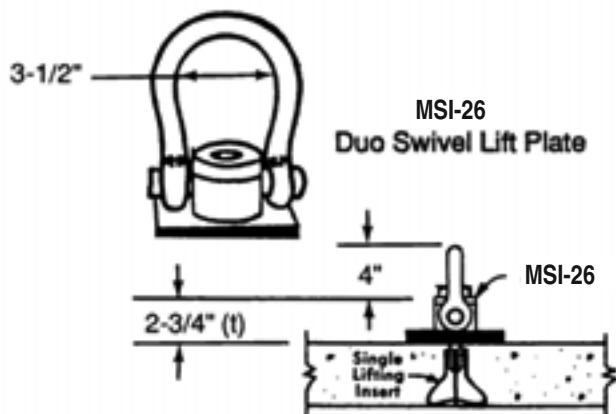
Safe working load 18,000 lbs. (80.1 Kn).

Note: Cut washers are required under heads of the bolts.



MSI-26

DUO SWIVEL LIFT PLATE



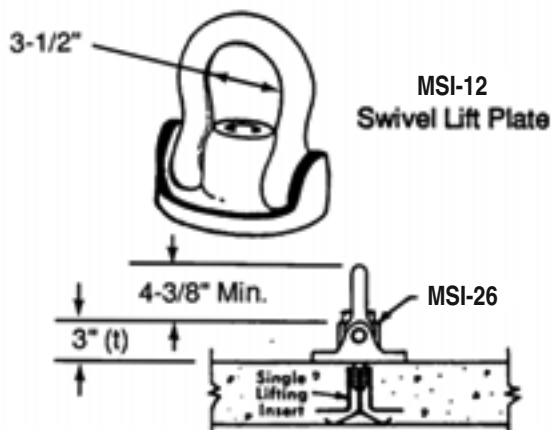
MidSpec **Duo Swivel Lift Plates MSI-26** are available for either 3/4" or 1" (19 or 25 mm) diameter bolts and permit a full 360° rotation about the axis of the bolt. Base plate is 3" x 5" (76 x 127 mm).

TO ORDER: give qty., diameter, product code and name.

Safe working load 13,000 lbs. (57.8 Kn).

MSI-12

SWIVEL LIFT PLATE



The MidSpec **Swivel Plate MSI-12** consists of a heavy steel casting, 6-1/2" (165 mm) dia. with a drop forged shackle riding on 1-1/8" (29 mm) dia. pins to permit a full 180° swing. Manufactured for either 1-1/4" or 1-1/2" (32 or 38 mm) diameter bolts. Bushings available for 3/4" or 1" (19 or 25 mm) diameter bolts.

TO ORDER: give qty., diameter, product code and name.

Safe working load 23,750 lbs. (105.6 Kn).

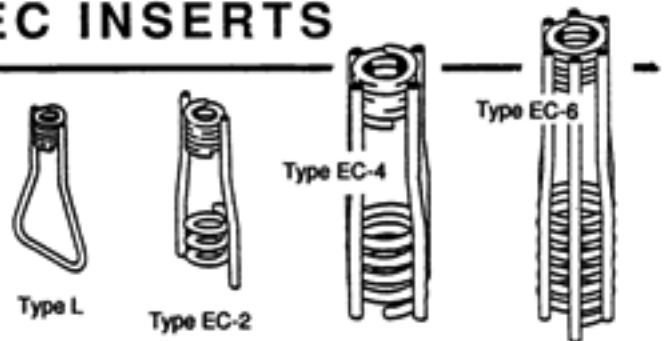
LIFTING AND HANDLING INSERTS



TYPE L AND EC INSERTS

Type L and Type EC Inserts may be employed for lifting and/or handling of precast concrete elements. Types L, LW, EC-2, EC-4, EC-6, EC-2W, EC-4W, and EC-6W are manufactured with coils to engage MidSpec Coil Bolts. Coils can be internally threaded to engage N.C. thread machine bolts for setting purposes, but tapped coil inserts should not be used for lifting purposes.

TO ORDER: give quantity, diameter, product code and name.



Size and Type	Length in. (mm)	Width in. (mm)
3/4" Type L (19 mm)	4" (102)	3-3/8" (86)
3/4" Type EC-2 (19 mm)	4-1/2" (114)	2" (51)
1" Type EC-2 (25 mm)	5-1/2" (140)	2-5/8" (67)
1-1/4" Type EC-4 (32 mm)	7-1/2" (191)	3-1/8" (79)
1-1/2" Type EC-6 (38 mm)	9-1/2" (241)	3-1/4" (83)

Type L and Type EC Inserts	EDGE DISTANCE - CENTERLINE OF INSERT TO NEAREST EDGE in. (mm)							
	1-1/2" (38)	2" (51)	3" (76)	4" (102)	5" (127)	6" (152)	8" (203)	9" (229)
	Tension	Tension	Tension	Tension	Tension	Tension	Tension	Tension
Size and Type	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)	Shear lbs. (Kn)
3/4" Type L (19 mm)	750 (3.3)	1,500 (6.7)	2,250 (10.0)	3,000 (13.3)	3,375* (15.0)	3,375* (15.0)	3,375* (15.0)	3,375* (15.0)
	375 (1.7)	600 (2.7)	975 (4.3)	1,350 (6.0)	2,250 (10.0)	3,525* (15.7)	3,525* (15.7)	3,525* (15.7)
3/4" Type EC-2 (19 mm)	1,125 (5.0)	2,250 (10.0)	3,150 (14.0)	3,975 (17.7)	4,500* (20.0)	4,500* (20.0)	4,500* (20.0)	4,500* (20.0)
	375 (1.7)	600 (2.7)	975 (4.3)	1,350 (6.0)	2,250 (10.0)	3,525* (15.7)	3,525* (15.7)	3,525* (15.7)
1" Type EC-2 (25 mm)			3,375 (15.0)	4,125 (18.3)	5,250 (23.4)	6,000* (26.7)	6,000* (26.7)	6,000* (26.7)
			1,500 (6.7)	2,250 (10.0)	3,375 (15.0)	4,500 (20.0)	6,000* (26.7)	6,000* (26.7)
1-1/4" Type EC-4 (32 mm)				6,000 (26.7)	7,500 (33.4)	9,000 (40.0)	11,250 (50.0)	12,000* (53.4)
				2,400 (10.7)	3,750 (16.7)	5,625 (25.0)	8,250 (36.7)	9,000* (40.0)
1-1/2" Type EC-6 (38 mm)						10,500 (46.7)	15,000 (66.7)	18,000* (80.1)
						6,750 (30.0)	9,750 (43.4)	12,000* (53.4)

Table based on 3,000 psi (20.7 MPa) concrete and approx. 4:1 safety factor. *indicates maximum insert load capacity.

SCREW ANCHOR SYSTEM

The MidSpec Screw Anchor System, available up to 2" (51 mm) in diameter, provides adequate anchorage for many precast handling and/or fastening applications. The flat helical coil of the Screw Anchor effectively transfers bolt loads into the surrounding concrete.



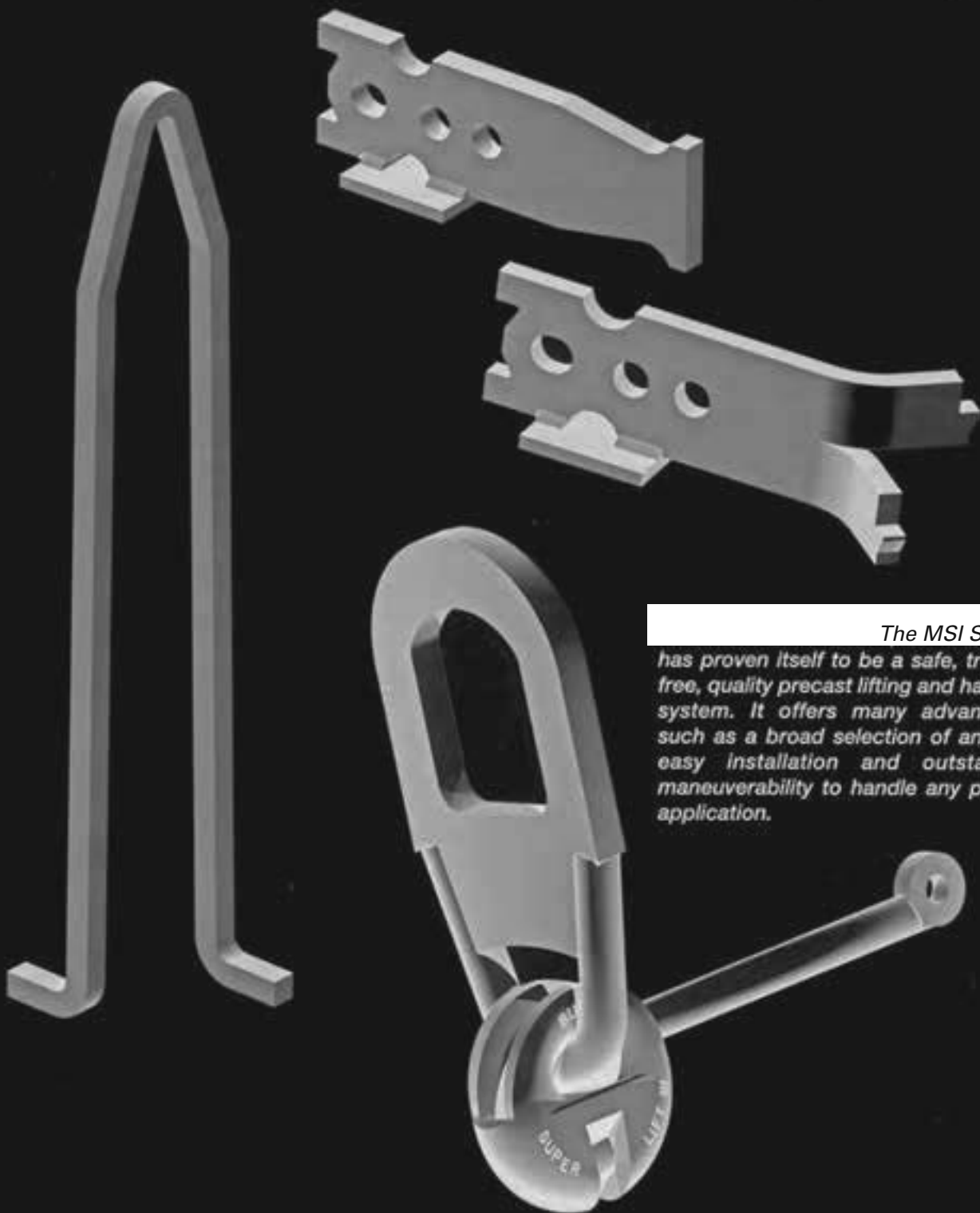
Screw Anchor

Screw Anchor Bolt

Screw Anchor Eye Bolt



MSI System



The MSI System

has proven itself to be a safe, trouble-free, quality precast lifting and handling system. It offers many advantages, such as a broad selection of anchors, easy installation and outstanding maneuverability to handle any precast application.

MSI Technical Information

INSPECTION/MAINTENANCE REQUIREMENTS

New Ring Clutch Inventory – Generally inspect for overall appearance. Make sure there are no bent parts, welds or sign of excessive heating on any parts. Make sure ring clutches have stop pins and bushings. Make sure the ring clutch handle does not come out of the casting when rotated to the open position. Make sure product date stamps are 1978 or newer.

Inventory returned from job site or other sources – Generally inspect for overall appearance. Make sure there are no bent parts, welds or sign of excessive heating on any parts. A clutch handle that is slightly bent (15° or less) can be straightened cold. Make sure ring clutches have stop pins and bushings. Make sure the ring clutch handles do not come out of the casting when rotated to the open position. Make sure the lifting ball is not bent. Check lanyard for fraying. Make sure product date stamps are 1978 or newer.

Additional inspections for cable bail clutches – Check the wire rope for bends, kinks, loosening of outer layers in the free length, squeezing in the free length, squeezing in the support area, tuberculation, damage or wear of the rope or end connectors and excessive wire ruptures (4 ruptures in 3 diameters of the rope, 6 in 6 diameters, 16 in 30 diameters, etc).

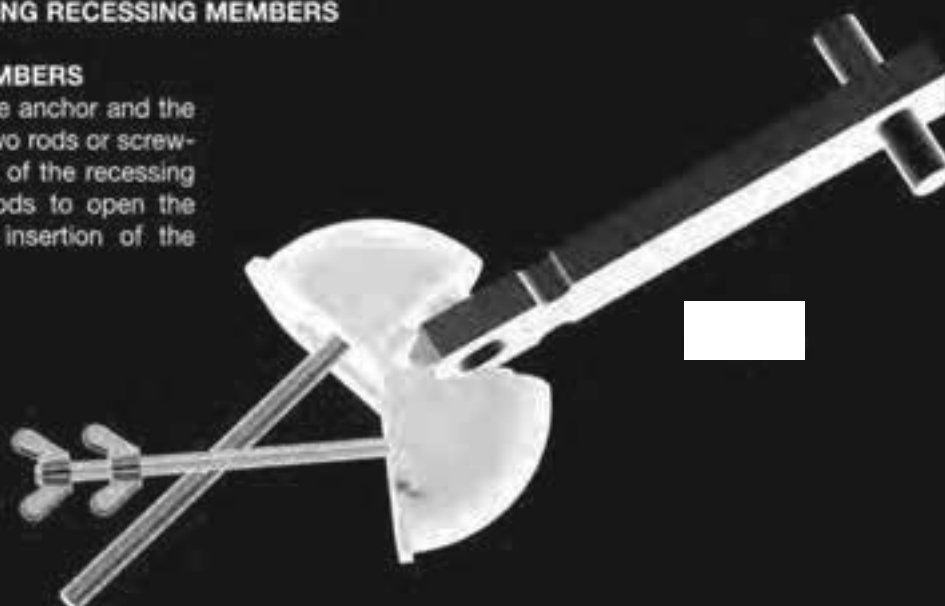
When to scrap ring clutch/handle – If the ball is bent more than 10° or shows evidence of having been straightened more than once, scrap the unit. If a weld cannot be repaired, the unit should be scrapped. If the clutch itself is bent, the clutch must be destroyed. Scrap the handle if it is bent more than 15°.

Cable bail clutches – If the wire rope is compromised according to the inspection criteria listed above, it must be replaced. The replacement wire rope shall be of a similar or larger size as the original. It should be replaced, spliced, tested and certified for load equal to 4 times the rated load stamped on the clutch casting by a company specializing in wire rope replacement.

INSTALLING AND REMOVING RECESSING MEMBERS

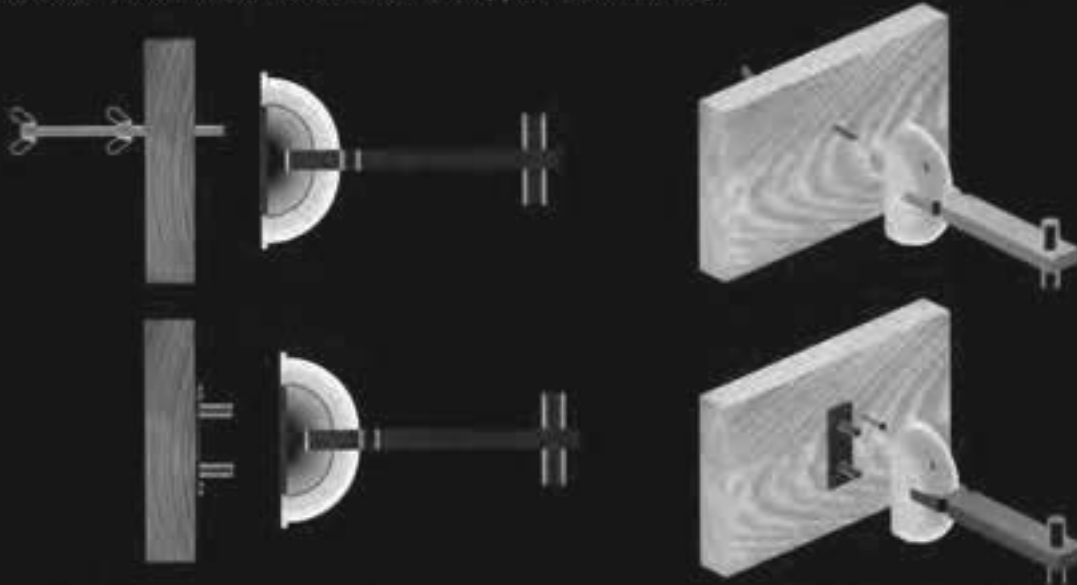
PLASTIC RECESSING MEMBERS

Assembly - To assemble the anchor and the Recessing Member, insert two rods or screwdrivers into the inside holes of the recessing member and scissor the rods to open the recess member to permit insertion of the anchor.



MSI Technical Information (cont.)

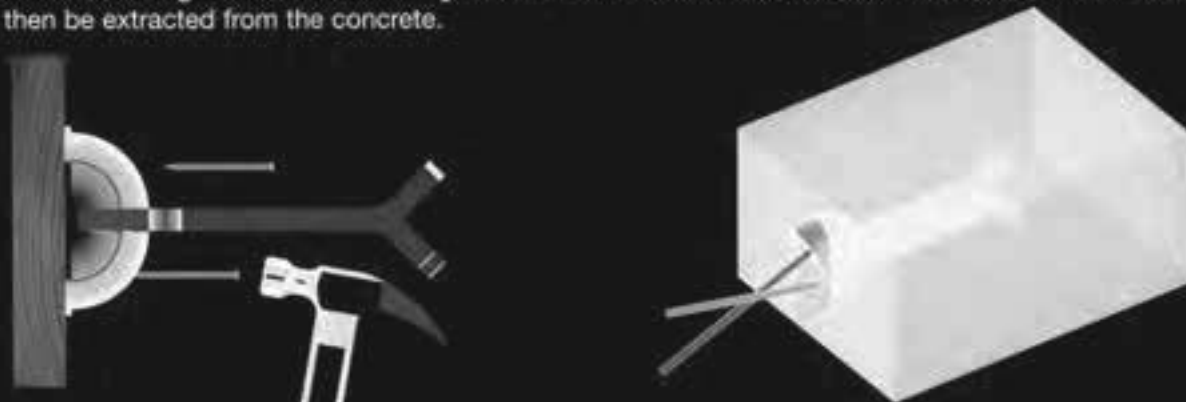
Nailing to formwork – Position the anchor/recessing member assembly in its assigned location and nail it to the formwork. The outside holes in the recessing member can be utilized for this purpose or a Holding Plate can be nailed to the formwork to support the assembly.



Holding Plate attachment – The anchor/recessing member assembly may be attached in four different methods using the Holding Plate: nailed, as noted above, bolted, welded or taped.

- Bolting the unit to the formwork requires a properly placed hole to be drilled in the formwork. A L-Rod or bolt/wing nut assembly is inserted through the drilled hole to securely attach the anchor/recess assembly to the form.
- On a multi-use metal form, the Holding Plate can be tack welded in its proper position to hold the anchor/recessing member.
- Taping the holding rod can be accomplished using a good quality, commercial grade double back tape.

Stripping – To strip a plastic recessing member, insert two rods or screwdrivers into the two innermost holes of the recessing member. A scissoring motion of the rods will lift one side of the recessing member and it can then be extracted from the concrete.



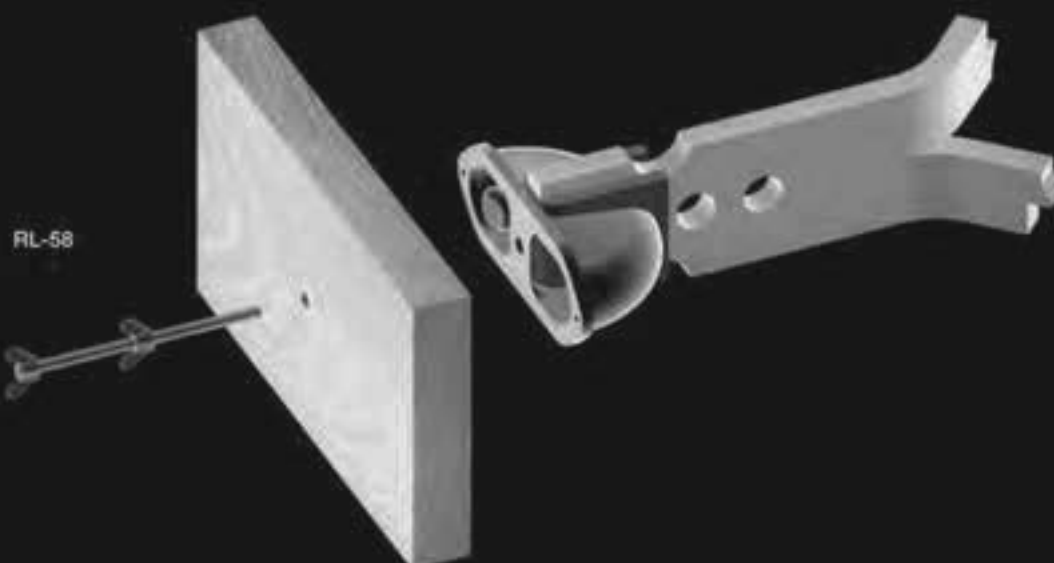
MSI Technical Information (cont.)

METAL RECESSING MEMBERS

Assembly – To assemble the anchor and metal recessing member, first fold the foam strip over the head of the anchor and then press the foam-covered head of the anchor into the recessing member slot. Insert the tapered end of the steel wedge into the top of the recessing member and through the eye of the anchor and wedge tightly.

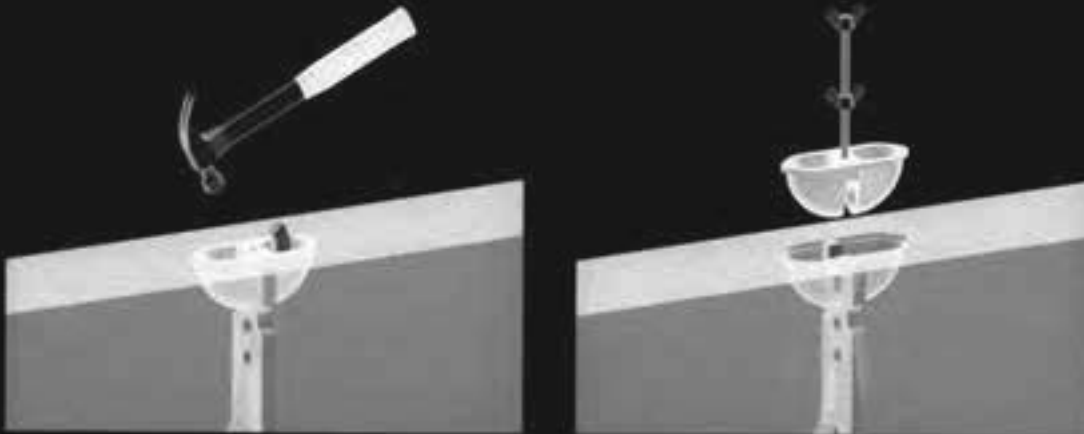


Metal recessing member placement – A wing nut assembly can be effectively used to secure the metal recessing member/anchor assembly to the form. Drill a properly placed hole in the form and thread the bolt assembly through the hole. Screw the bolt in the center hole of the recessing member until it is tight against the head of the anchor. Secure the assembly against the form by turning the loose-running wing nut. Nailing the recessing member, using the holes provided on both ends of the unit, will prevent the assembly from turning during concrete placement. In applications using multi-use metal forms, the metal recessing member can be tack welded to the form.



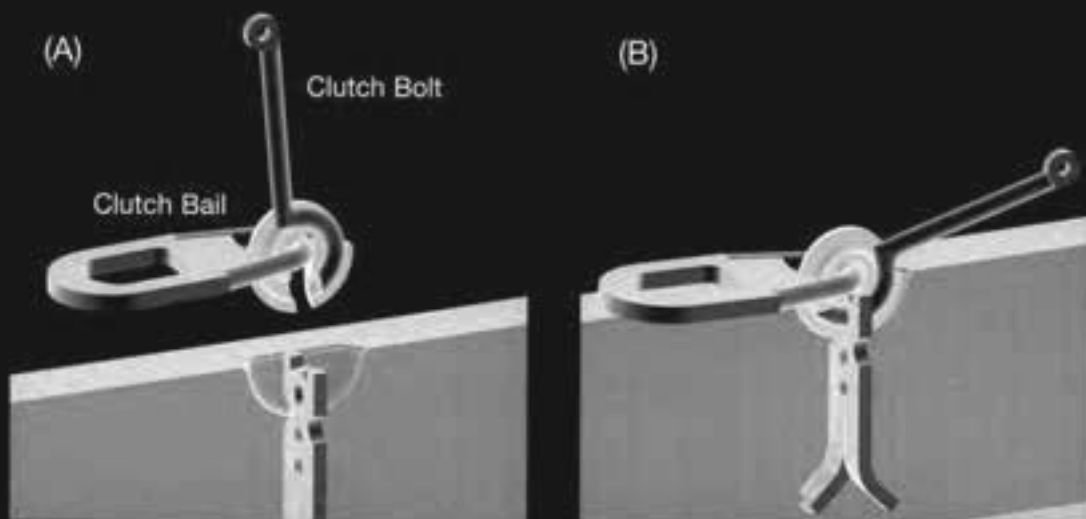
MSI Technical Information (cont.)

Stripping - Unscrew the bolt and strip the form to expose the recessing member. Tap the small end of the tapered wedge with a hammer to loosen the wedge so it can be withdrawn by hand. Now screw the setting bolt into the recessing member and continue screwing, using the fixed wing nut, until the recessing member is loosened from the anchor and can be removed.



RING CLUTCH INSTALLATION

Anchor attachment - Make sure that the curved bolt handle is in the open position. Position the ring clutch above, and centered over the head of the anchor. Drop the ring clutch down into the void formed by the recessing member. Rotate the curved bolt through the anchor engagement hole into its closed position. Installation is complete, ready to lift.



MSI Technical Information (cont.)

Bail positioning – Make sure that the bail does not get into a "locked" position under the ring clutch, as shown in the sketch. In this situation, the bail and/or ring clutch might bend under load and as the precast unit nears vertical, the bail can unlock itself and cause a severe impact load. Always position the lifting cable directly over the ring clutch to avoid alignment problems.

CORRECT

Correct - By not having the lift line directly over the Ring Clutch and a load is applied in a direction towards the bottom of the panel, the Clutch may bend over the panel edge.



WRONG

Wrong - The Clutch, if positioned below the ring clutch, as shown, may lock itself in a position preventing free movement of the unit. In this position the ball might bend during lift. As the panel is lifted the Clutch may bend. As the panel reaches a more vertical position, the Clutch will unlock itself resulting in an impact load.

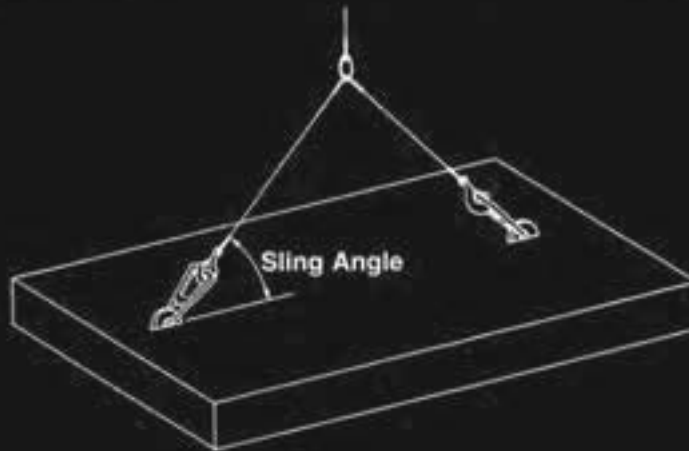


MSI Technical Information (cont.)

SLING ANGLE FACTOR

Additional forces come to bear on an anchor from oblique pulls caused by the sling angle. Sling angles at less than 90° from perpendicular, increase the load on the anchor. Angles less than 30° are not safe and must not be used. To calculate the load on the anchor, refer to the accompanying table. Move across the table to the sling angle being used and multiply the corresponding magnification factor by the dead load of the pre-cast element.

SLING ANGLE LOAD FACTORS					
Sling Angle	90°	75°	60°	45°	30°
Load Factor	1.00	1.04	1.16	1.42	2.00



ADJUSTING FOR CONCRETE STRENGTH

Note: These factors are for use with tension applications only. Do not use these factors for shear applications without consulting with the Engineering to make sure there are no other limitations.

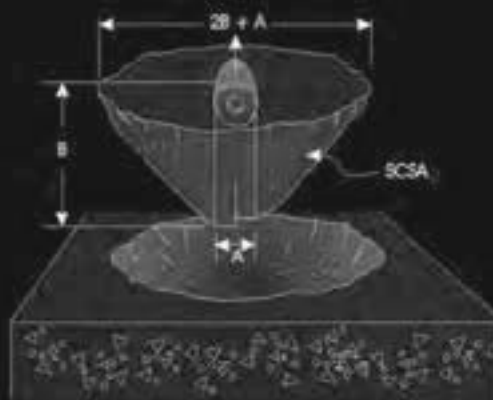
To convert the allowable tension load for an unreinforced anchor from listed concrete strength of 3,500 psi to a greater or lesser concrete strength, multiply 3,500 psi by the factor indicated below. Note: To maintain the needed 4:1 safety factor the new value must be less than 25% of the listed ultimate mechanical value of the selected anchor.

CONCRETE STRENGTH ADJUSTMENT FACTORS	
To Increase For Greater Concrete Strength	
CONVERT FROM	MULTIPLY BY
3,500 PSI TO 4,000 PSI	1.07
3,500 PSI TO 4,500 PSI	1.13
3,500 PSI TO 5,000 PSI	1.19
To Decrease For Lesser Concrete Strength	
CONVERT FROM	MULTIPLY BY
3,500 PSI TO 3,000 PSI	0.92
3,500 PSI TO 2,500 PSI	0.84
3,500 PSI TO 2,000 PSI	0.75

MSI Technical Information (cont.)

SHEAR CONE CONDITIONS

Condition 1: Full Shear Cone Condition – This applies to anchors located in a concrete panel at a distance of at least $2B + A$ (full shear cone width) from the edges. Determine the A (width) and B (length) dimensions of your anchor using the Anchor Embedment Data Table on page 19. Then go to the Table of SCSA Values on page 20. Move across the top row (Anchor Width A) to your anchor's width dimension. Drop down to the next row (Anchor Depth B) and find the length dimension of your anchor. Drop down one more row (SCSA Values) and the value under your "B" dimension is the SCSA value for your anchor.



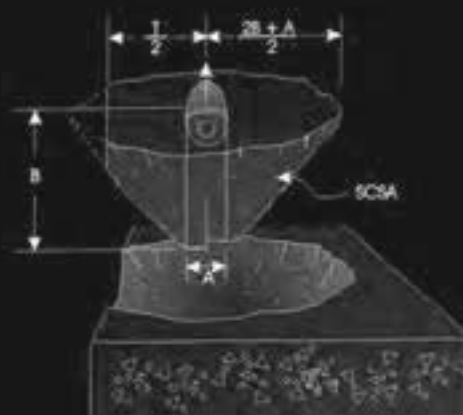
Plug the SCSA value and concrete strength into the appropriate formula on page 20 to determine anchor's ultimate pullout strength. Divide the pullout strength by four (4) to obtain the required 4:1 safety factor.

Condition 2: Partial Shear Cone – This applies to anchors located in a concrete panel at a distance of less than $(2B + A)/2$ from the edges. Determine the A (width), B (length) and T (panel thickness) dimensions. Then go to the Table of SCSA Values on page 20. Move across the top row (Anchor Width A) to your anchor's width dimension. Drop down to the next row (Anchor Depth B) and find the length dimension of your anchor. Drop down the column of SCSA Values to the value opposite your T dimension. This is the SCSA value for your anchor.



Plug the SCSA value and the concrete strength into the appropriate formula on page 20 to determine anchor's ultimate pullout strength. Divide the pullout strength by four (4) to obtain the required 4:1 safety factor.

Condition 3: Partial Shear Cone – This applies to anchors located in a concrete panel at a distance of more than $(2B + A)/2$ from one edge, but at a lesser amount from another edge. Determine the A (width), B (length) and T/2 dimensions from the anchor to the closest edge. Then go to the Table of SCSA Values on page 20. Move across the top row (Anchor Width A) to your anchor's width dimension. Drop down to the next row (Anchor Depth B) and find the length dimension of your anchor. Drop down the column of SCSA Values to the value opposite your T dimension. Read the value listed under the appropriate "T" column and the SCSA value under the $2B + A$ column. Add the two together and multiply by 0.5.



Plug the SCSA value and the concrete strength into the appropriate formula on page 20 to determine anchor's ultimate pullout strength. Divide the pullout strength by four (4) to obtain the required 4:1 safety factor.

MSI Technical Information (cont.)

EMBEDDED ANCHOR STRENGTH CALCULATIONS

The embedded strength of many of the MSI anchors can be calculated using the tables and formulas on the following pages. Note that the Plate Anchor and Flat Foot Anchor will not obtain full ultimate mechanical strength if the recommended additional reinforcement is not used. Also note that it is not necessary to apply these formulas and tables to Two-Hole Anchors, Erection Anchors or Tech Erection Anchors utilizing extra reinforcement. These anchor applications will achieve ultimate capacity at 1,500 psi.

The following tabular data and formulas are based on industry accepted Precast Concrete Institute (PCI) calculations for pullout strength of embedded anchors. Some modification to the formulas has been done to more closely agree with actual testing of MSI anchors.

TABLE DATA CALCULATION INFORMATION					
Ring Clutch System	Clutch I.D.	Anchor Item Number	Anchor "A" Dimension	Anchor "B" Dimension	2B + A
SPREAD ANCHOR					
1-Ton	1.25T	79050	1 1/4"	4 3/4"	10.75"
2-Ton	2.5T	79110	1 1/4"	4"	9.25"
2-Ton	2.5T	79059	1 1/4"	5 1/2"	12.25"
4-Ton	5T	79116	1 1/2"	6 1/4"	14.00"
4-Ton	5T	79115	1 1/2"	6 3/4"	15.00"
4-Ton	5T	79117	1 1/2"	9 1/2"	20.50"
8-Ton	10T	79319	2 3/8"	11"	24.375"
8-Ton	10T	79119	2 1/2"	11"	24.5"
22-Ton	22T	79172*	3 1/8"	15"	33.125"
22-Ton	22T	79174*	3 1/8"	18 7/8"	40.875"
ERECTION ANCHOR					
1-Ton	1.25T	79046	1 1/4"	4 3/4"	10.75"
2-Ton	2.5T	79047	2"	8"	18.00"
4-Ton	5T	79048	2 1/2"	10 1/2"	23.50"
8-Ton	10T	79049	3 3/4"	12 13/16"	29.375"
8-Ton	10T	79049	3 3/4"	12 13/16"	29.375"
TECH ERECTION ANCHOR					
2-Ton	2.5T	79527	2"	8"	18.00"
4-Ton	5T	79548	2 1/2"	10 1/2"	23.50"
8-Ton	10T	79589	3 3/4"	12 13/16"	29.375"
FLAT FOOT ANCHOR					
2-Ton	2.5T	79052	1 1/4"	2 3/4"	6.75"
2-Ton	2.5T	79053	1 1/4"	3 3/8"	8.00"
2-Ton	2.5T	79058	1 1/4"	2 3/4"	6.75"
2-Ton	2.5T	79400	1 1/4"	3 3/8"	8.00"
PLATE ANCHOR					
2-Ton	2.5T	79128	1 1/4"	2 1/4"	5.75"
4-Ton	5T	79044	1 1/2"	4 3/8"	10.25"
8-Ton	10T	79042	2 1/2"	7 1/8"	16.75"

*Available on special order or limited quantities on hand.

TABLE OF SCSA VALUES

ANCHOR WIDTH A	1-1/4				1-1/2				2	2-3/8		2-1/2		3-1/8		3-3/4
	2-1/4	2-3/4	3-3/8	4	4-3/8	4-3/4	5-1/2	5-3/4		7-1/8	11	8-1/4	10-1/2	15	18-7/8	12-13/16
ANCHOR DEPTH B	35	40	60	93	109	165	165	165	355	301	654	243	666	1338	1845	940
SCSA for T _{20H-A}	22	26	31	37	40	50	50	50	35	86	131	80	125			
Thickness "T"	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3	22	26	31	37	40	50	50	50	35	86	131	80	125			
3-1/2	25	30	36	43	46	58	58	58	34							
4	28	34	41	49	5	66	66	66	37	88	148	90	142			
4-1/2	31	38	46	55	59	74	74	74	109	88						
5	33	41	51	60	66	82	82	82	121	109	165	161	158	223		
5-1/2	35	44	55	66	72	90	90	90	133	121	182	111	174	246		
6	47	59	71	77	86	105	105	105	145	132	199	121	190	269	333	
6-1/2	48	62	76	83	93	113	113	113	157	142	215	131	206	292	365	
7	66	80	96	104	113	139	139	139	189	153	232	141	222	315	389	
7-1/2	68	84	93	104	113	139	139	139	181	164	248	151	238	338	421	291
8	88	97	107	114	128	154	154	154	192	174	265	160	254	360	447	310
8-1/2	91	101	111	128	133	159	159	159	204	184	281	170	269	383	476	329
9	93	104	114	139	144	176	176	176	215	194	297	179	285	406	505	349
9-1/2	107	114	124	139	144	176	176	176	226	204	313	187	300	428	535	369
10	109	114	128	139	144	176	176	176	236	214	329	196	315	451	561	389
10-1/2	134	139	154	164	164	196	196	196	247	223	344	204	330	473	588	409
11	159	159	164	164	164	196	196	196	257	232	360	212	345	495	618	429
11-1/2	162	162	164	164	164	196	196	196	267	240	375	220	359	517	646	447
12	164	164	164	164	164	196	196	196	277	249	390	227	374	539	673	466
13						201	221	221	285	264	420	240	402	582	728	504
14						216	233	242	312	278	448		429	625	786	540
15									327	289	476		455	667	837	576
16									340	298	503		480	709	888	612
17									350		528		504	749	943	645
18											552		526	789	985	679
19											574		547	826	1045	711
20											595		565	868	1098	743
21											614		581	902	1147	774
22											639		595	938	1198	799
23											643		604	972	1251	828
24											652			1005	1278	853

Ultimate Pullout Strength Equations:

- Normal weight concrete (over 135 pcf): $P = 1.84 \sqrt{f'_c}$ (SCSA)
- Lightweight concrete (less than 120 pcf): $P = 1.20 \sqrt{f'_c}$ (SCSA)
- Lightweight (sand) concrete (120 to 135 pcf): $P = 1.56 \sqrt{f'_c}$ (SCSA)

MSI Technical Information (cont.)



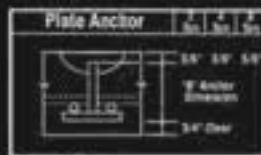
MSI-23

Ring Clutch System	Minimum Panel Thickness	Anchor Selection for Min Panel Thickness
2-ton	5-1/8"	79110
4-ton	7-3/8"	79116
8-ton	12-3/16"	79119



MSI-21

Ring Clutch System	Minimum Panel Thickness	Anchor Selection for Min Panel Thickness
2-ton	3-7/8"	79058



MSI-24

Ring Clutch System	Minimum Panel Thickness	Anchor Selection for Min Panel Thickness
2-ton	3-3/8"	79128
4-ton	5-1/2"	79044
8-ton	8-1/2"	79042



MSI-24

Ring Clutch System	Minimum Panel Thickness	Anchor Selection for Min Panel Thickness
2-ton	2-5/8"	79128
4-ton	4-3/4"	79044
8-ton	7-3/4"	79042



MSI-25

Ring Clutch System	Minimum Panel Thickness	Anchor Selection for Min Panel Thickness
2-ton	3-5/8"	79523
4-ton	4-3/8"	79544



MSI-25

Ring Clutch System	Minimum Panel Thickness	Anchor Selection for Min Panel Thickness
2-ton	3-5/8"	79523
4-ton	4-3/8"	79544

GUIDE TO MINIMUM PANEL THICKNESS

Minimum Panel Thickness: The minimum thickness of concrete that is required to properly install **MSI** Anchors (dimensions vary with anchor selection).

The minimum Panel Thickness is the sum of the following dimensions: The anchor length ("B" dimension), the surface to anchor dimension (3/8" for 2 and 4-ton series anchors, and 5/8" for the 8-ton series anchors) and the 3/4" minimum of concrete cover below the bottom of the anchor.

3/4" concrete cover beneath the feet of all types of spread anchors is required to obtain listed working loads.

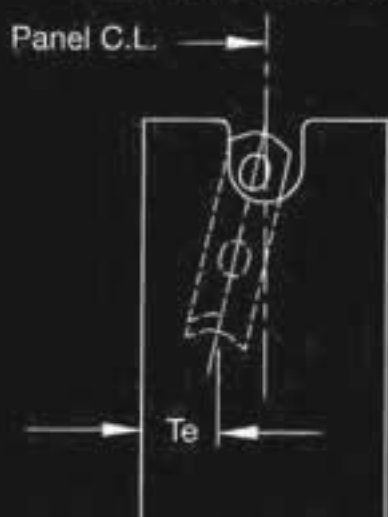
The **MSI-25** Tech Anchor and **MSI-24** Plate Anchor may be placed directly on the form. These are the **ONLY** Rapid-Lift Anchors that may be installed in this manner. However, the anchor base plate will be visible and exposed after the precast member is removed from the form. Rust may occur if not galvanized.

MSI Technical Information (cont.)

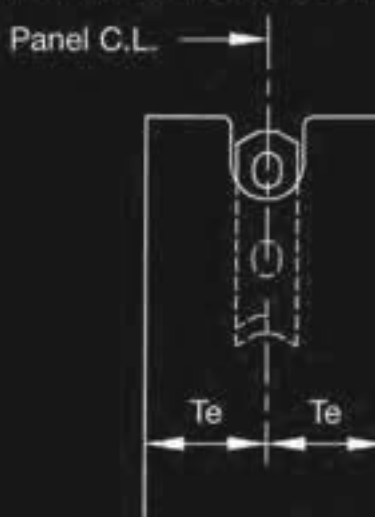
MSI ANCHORS USED IN THIN WALL SECTIONS

Care must be taken when locating anchors in thin wall sections. Improper installation and/or misalignment can seriously reduce the safe working load of the anchor.

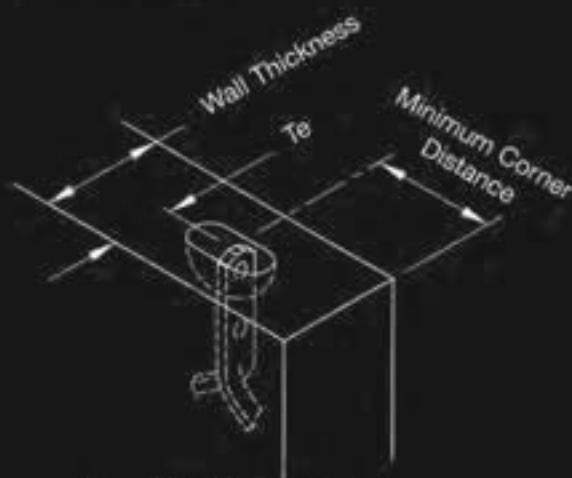
- Anchors must be positioned on the centerline of the panel.
- Use supports, spacers or tie the anchor to the rebar mat to make certain of proper positioning.



This sketch shows a misaligned, improperly positioned anchor. The actual edge distance (T_e) is considerably reduced so there must be a corresponding reduction in the safe working load of the anchor.



This sketch shows proper positioning of the anchor on the centerline of the panel. This allows the full wall thickness to be used in the safe working load selection.



T_e = Edge Thickness
(1/2 Wall Thickness)

The sketch above shows an anchor application and corner relationship. Safe working loads for indicated corner distances are displayed in the table on page 34.

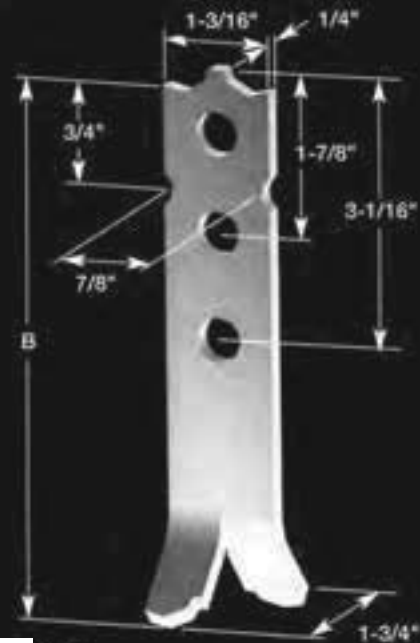
MSI System Anchors

MSI-2 ONE TON ANCHOR 1-Ton Only

The **MSI-2 One Ton Anchor** is specifically designed to lift and handle thin-wall precast concrete elements, such as architectural panels. The One Ton Anchor is designed to restrict the rotation of the ring clutch to prevent spalling of the concrete during the lifting process. Refer to the table below for One Ton Anchor lengths and safe working loads. **Hot dip galvanize is the only finish available on this anchor.**

See the One Ton Ring Clutch on page 46, the One Ton Recessing Member on page 48.

Note: In order to achieve the shear values shown in the table, the use of an optional shear bar is required.



MSI-31 Shear Bar (.375 Ø) provides additional shear strength to prevent spalling.



Tension Bar Size	79169
MSI-32	.306" Dia.
Concrete Strength	"L" Dim.
1,500-3,000psi	2'-4"

MSI-32 Tension Bar provides simple and economical reinforcement for the erection anchor during tension lifts.

MSI-2 RAPID LIFT ONE TON ANCHOR DATA

Nominal Anchor Load	Clutch I.D.	Item Number	B (in.)	Minimum Panel Thickness (in.)	Shear 2.66:1 Safety Factor (lbs)	Tension w/o Tension Bar 4:1 Safety Factor (lbs)	Tension w/ Tension Bar 4:1 Safety Factor (lbs)	Weight Per Piece (lbs)
1T	1.25T	790466	4 3/4	3	920	1160	2000	36
1T	1.25T	790456	8	3	920	1600	2000	57

Table is based on dead load only and a concrete compressive strength of 3,500 psi.

- 1) The 2.66:1 safety factor is commonly used for back stripping operations. Unusual live loads or cable magnification may require a higher safety factor to be applied. To obtain the working loads shown, the shear bar shown above must be used.
- 2) Given full embedment, reinforcement and 3,500 psi concrete, the One Ton Anchor should achieve pullout strength equal to its ultimate mechanical strength.
- 3) The 8" unit is available on special order or limited supply on hand. It may be ordered galvanized or plain.

To order, specify: quantity, name, item number and finish.

MSI System Anchors

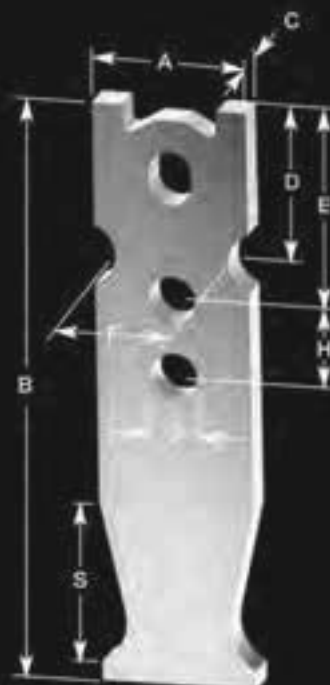
MSI-3 TECH ERECTION ANCHOR 2-Ton, 4-Ton and 8-Ton

MSI-3 Rapid Lift Tech Erection Anchor is designed for safe edge lifting and rotation of thin-wall precast elements. The anchor is designed with two ears on the head of the anchor to restrict the rotation of the ring clutch. As a result, lateral forces are transmitted directly to the anchor instead of to the concrete to prevent spalling.

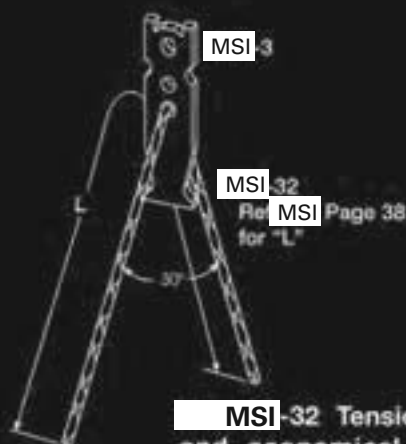
Due to the stress caused by the shear lift on the concrete; it is necessary to add reinforcement in the direction of the lift. The RL-31 Rapid Lift Shear Bar is designed for this purpose and is available. See sketch below. See additional Shear Bar information on page 51.

Anchor dimensions are shown in the table below. Safe working loads and other pertinent information is displayed in the table on the next page. MSI-3 Tech Erection Anchor is available in plain or hot dip galvanize finish.

See Ring Clutches on page 45, 46, and 47, the Recessing Members on 48, 49 and 52, and the Tension Bars on page 38.



MSI-3 RAPID LIFT TECH ERECTION ANCHOR DIMENSIONS												Ultimate Mechanical Load (lbs)	Weight Each Piece (lbs)
Ring Clutch System	Clutch I.D.	Item Number	A	B	C	D	E	F	G	H	S		
2T	2.5T	79527	2"	8"	3/8"	1 13/16"	2 1/4"	1 3/8"	9/16"	1 1/8"	2"	18,000	1.59
4T	5T	79548	2 1/2"	9 1/2"	5/8"	2 1/2"	3 3/16"	1 13/16"	3/4"	1 1/4"	2 5/8"	32,000	4.21
8T	10T	79569	3 3/4"	12 1/2"	3/4"	3 1/8"	4"	2 7/16"	1"	1 3/4"	3 5/8"	64,000	9.17



MSI-31 Shear Bar (.375 Ø) provides additional shear strength to prevent spalling.



MSI-32 Tension Bar provides simple and economical reinforcement for the erection anchor during tension lifts.



MSI System Anchors

MSI TECH ERECTION ANCHOR

MSI-3 2-TON, 4-TON, 8-TON							
Rig Ditch System	Ditch I.D.	Item Number	Panel Thickness in Inches	SHEAR w/ Shear Bar 2.66:1 Safety Factor (lbs)	SHEAR w/ Shear Bar 4:1 Safety Factor (lbs)	TENSION w/o Tension Bar 4:1 Safety Factor (lbs)	TENSION w/ Tension Bar 4:1 Safety Factor (lbs)
2T	2.5T	79527	4" min.	2,250	1,490	3,190	4,000
2T	2.5T	79527	5"	3,160	2,110	3,900	4,000
2T	2.5T	79527	5 1/2"	3,460	2,130	4,000	4,000
2T	2.5T	79527	6"	3,780	2,520	4,000	4,000
2T	2.5T	79527	7"	4,000	2,870	4,000	4,000
2T	2.5T	79527	8"	4,000	3,160	4,000	4,000
2T	2.5T	79527	9"	4,000	3,420	4,000	4,000
2T	2.5T	79527	10"	4,000	3,640	4,000	4,000
2T	2.5T	79527	11"	4,000	3,840	4,000	4,000
2T	2.5T	79527	12"	4,000	4,000	4,000	4,000
4T	5T	79548	5 1/2" min.	4,020	2,870	4,970	8,000
4T	5T	79548	6"	4,490	2,990	5,170	8,000
4T	5T	79548	7"	4,670	3,170	6,030	8,000
4T	5T	79548	8"	5,140	3,430	6,910	8,000
4T	5T	79548	9"	5,490	3,650	7,750	8,000
4T	5T	79548	10"	5,790	3,860	8,000	8,000
4T	5T	79548	11"	5,910	3,930	8,000	8,000
4T	5T	79548	12"	6,030	4,010	8,000	8,000
8T	10T	79589	7 1/2" min.	6,030	4,010	7,220	16,000
8T	10T	79589	8"	6,030	4,010	7,890	16,000
8T	10T	79589	9"	6,190	4,120	8,640	16,000
8T	10T	79589	10"	6,430	4,280	9,580	16,000
8T	10T	79589	11"	6,650	4,420	10,610	16,000
8T	10T	79589	12"	6,850	4,550	11,680	16,000

Table is based on a concrete compressive strength of 3,500 psi.

- 1) The 2.66:1 safety factor is commonly used for back stripping operations. Increased safety factor may be required for unusual live loads or cable magnification.
- 2) To obtain the shear values shown, it is necessary to use the appropriate MSI shear bar or equal.
- 3) Given full embedment, reinforcement and minimum compressive strength concrete; Tech Erection Anchors should achieve a pull out strength equal to their ultimate mechanical strength.

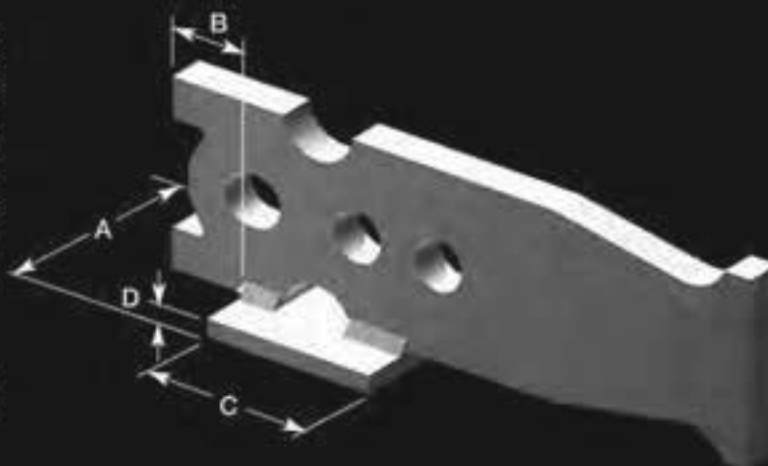
To order, specify: quantity, name, item number and finish.

MSI System Anchors

MSI-4 LIFT TECH ERECTION ANCHOR WITH PLATE 2-Ton, 4-Ton and 8-Ton

The MSI-4 Tech Erection Anchor with Plate is similar in design and use to the MSI-3 Tech Erection Anchor, but has the added shear plate to eliminate the need for a shear bar. This design feature gives the anchor a smaller height envelope allowing it to be used in thinner concrete panels. This anchor is available in the sizes shown in the table and in plain or hot dip galvanized finish.

See Ring Clutches on page 45, 46, and 47, the Recessing Members on 48, 49 and 52, and the Tension Bars on page 38.



MSI-4 TECH ERECTION ANCHOR WITH PLATE								
Ring Clutch System	Clutch I.D.	Item Number	A	B	C	D	Weight (lbs)	Minimum Panel Thickness
2T	2.5T	79527SP	2 1/2"	3/4"	3"	1/4"	2.12	3 1/2"
4T	5T	79548SP	2 1/2"	1 1/4"	3"	3/8"	4.93	4"
8T	10T	79589SP	3"	1 5/8"	3 1/2"	3/8"	10.33	7"

See Standard RL-3 Tech Erection Anchor for all other dimensions.

MSI-4 2-TON, 4-TON, 8-TON							
Ring Clutch System	Clutch I.D.	Item Number	Panel Thickness in inches	SHEAR 2.66:1 Safety Factor (lbs)	SHEAR 4:1 Safety Factor (lbs)	TENSION w/o Tension Bar 4:1 Safety Factor (lbs)	TENSION w/ Tension Bar 4:1 Safety Factor (lbs)
2T	2.5T	79527SP	3 1/2" min.	2150	1430	2640	4000
2T	2.5T	79527SP	4"	2930	1950	3190	4000
2T	2.5T	79527SP	4 1/2"	3040	2020	3550	4000
2T	2.5T	79527SP	5"	3180	2100	3900	4000
4T	5T	79548SP	4" min.	2710	1800	3400	6000
4T	5T	79548SP	4 1/2"	3210	2470	3860	6000
4T	5T	79548SP	5"	4000	2660	4730	8000
4T	5T	79548SP	5 1/2"	4160	2770	4970	8000
4T	5T	79548SP	6"	4290	2860	5170	8000
8T	10T	79589SP	7" min.	6030	4010	7100	16,000
8T	10T	79589SP	7 1/2"	6030	4010	7220	16,000
8T	10T	79589SP	8"	6030	4010	7690	16,000

Table is based on a concrete compressive strength of 3,500 psi.

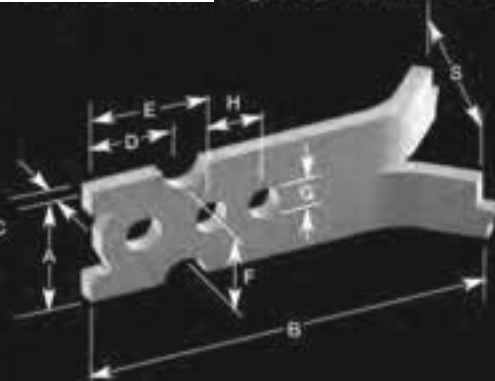
- 1) The 2.66:1 safety factor is commonly used for back stripping operations. Increased safety factor may be required for unusual live loads or cable magnification.
- 2) Given full embedment, reinforcement and minimum compressive strength concrete, Tech Erection Anchors should achieve a pull out strength equal to their ultimate mechanical strength.

To Order, Specify: quantity, name, item number and finish.

MSI System Anchors

MSI-6 ERECTION ANCHOR 2-Ton, 4-Ton and 8-Ton

The MSI-6 Erection Anchor is similar in design and use to the standard MSI-3 Tech Erection Anchor, but has a "split-foot" design to widely disperse applied loads and to enhance pull-out capability. Refer to the accompanying Tables for size, availability and safe working loads. The MSI-6 Erection Anchor is available in plain and hot dip galvanize finish.



See Ring Clutches on page 45, 46, and 47, the Recessing Members on 48, 49 and 52, and the Tension Bars on page 38.

MSI-6 ERECTION HEAD ANCHOR

Ring Clutch System	Clutch I.D.	Item Number	A	B	C	D	E	F	G	H	S	Ultimate Mechanical Load (lbs)	Weight Each Piece (lbs)
2T	2.5T	79047	2"	8"	3/8"	1 13/16"	2 1/4"	1 3/8"	8/16"	1 1/8"	2 3/4"	16,000	1.59
4T	5T	79048	2 1/2"	10 1/2"	5/8"	2 1/2"	3 3/16"	1 13/16"	3/4"	1 1/4"	3 3/8"	32,000	4.21
8T	10T	79349	3 3/4"	12 13/16"	5/8"	3 1/8"	4"	2 7/16"	1"	1 3/4"	5"	48,000	7.64
8T	10T	79049	3 3/4"	12 13/16"	3/4"	3 1/8"	4"	2 7/16"	1"	1 3/4"	5"	64,000	9.17

MSI-6 2-TON, 4-TON, 8-TON

Ring Clutch System	Clutch I.D.	Item Number	Panel Thickness in Inches	SHEAR w/ Shear Bar 2.66:1 Safety Factor	SHEAR w/ Shear Bar 4:1 Safety Factor	TENSION w/ Tension Bar 4:1 Safety Factor	TENSION w/ Tension Bar 4:1 Safety Factor
2T	2.5T	79047	4" min.	2250 lbs.	1490 lbs.	3190 lbs.	4000 lbs.
2T	2.5T	79047	5"	3160	2110	3900	4000
2T	2.5T	79047	5 1/2"	3460	2130	4000	4000
2T	2.5T	79047	6"	3780	2520	4000	4000
2T	2.5T	79047	7"	4000	2870	4000	4000
2T	2.5T	79047	8"	4000	3160	4000	4000
4T	5T	79048	5 1/2" min.	4020	2670	4970	8000
4T	5T	79048	6"	4490	2990	5170	8000
4T	5T	79048	7"	4670	3170	6030	8000
4T	5T	79048	8"	5140	3430	6910	8000
4T	5T	79048	9"	5490	3650	7750	8000
4T	5T	79048	10"	5790	3860	8000	8000
4T	5T	79048	11"	5910	3930	8000	8000
4T	5T	79048	12"	6030	4010	8000	8000
8T	10T	79349	7 1/2" min.	6030	4010	7220	12,000
8T	10T	79349	8"	6030	4010	7690	12,000
8T	10T	79349	9"	6190	4120	8640	12,000
8T	10T	79349	10"	6430	4290	9580	12,000
8T	10T	79349	11"	6650	4420	10,610	12,000
8T	10T	79349	12"	6850	4550	11,680	12,000
8T	10T	79049	7 1/2" min.	6030	4010	7220	16,000
8T	10T	79049	8"	6030	4010	7690	16,000
8T	10T	79049	9"	6190	4120	8640	16,000
8T	10T	79049	10"	6430	4290	9580	16,000
8T	10T	79049	11"	6650	4420	10,610	16,000
8T	10T	79049	12"	6850	4550	11,680	16,000

Table is based on a concrete compressive strength of 3,500 psi.

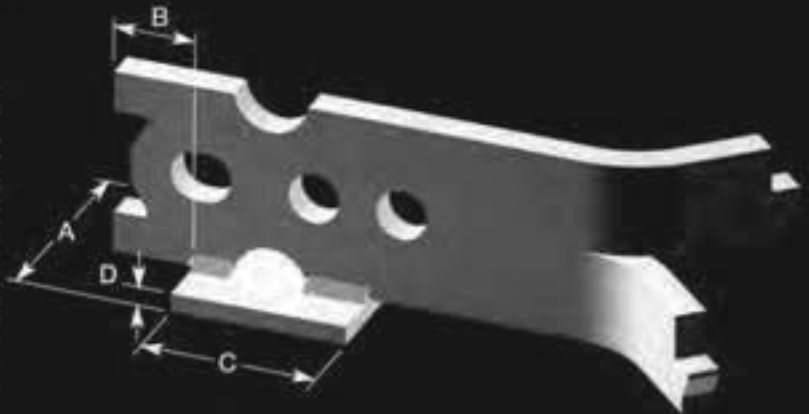
- 1) The 2.66:1 safety factor is commonly used for back stripping operations. Increased safety factor may be required for unusual live loads or cable magnification.
- 2) To obtain the shear values shown, it is necessary to use the appropriate Meadow Burke Shear Bar or equal.
- 3) Given full embedment, reinforcement and minimum compressive strength concrete: Erection Anchors should achieve a pullout strength equal to their ultimate mechanical strength.

To order, specify: quantity, name, item number and finish.

MSI System Anchors

MSI-7 ERECTION ANCHOR WITH PLATE 2-Ton, 4-Ton and 8-Ton

The MSI-7 Erection Anchor with Plate is similar in design and use to the MSI-6 Erection Anchor, but has the added shear plate to eliminate the need for a shear bar. This design feature gives the anchor a smaller height envelope allowing it to be used in thinner concrete panels. The anchor is available in the sizes shown in the table in plain or hot dip galvanize finish. See Ring Clutches on page 45, 46, and 47, the Recessing Members on 48, 49 and 52, and the Tension Bars on page 38.



MSI-7 ERECTION ANCHOR WITH PLATE								
Ring Clutch System	Clutch I.D.	Item Number	A	B	C	D	Weight (lbs)	Minimum Panel Thickness
2T	2.5T	79147	2 1/2"	3/4"	3"	1/4"	2.12	3 1/2"
4T	5T	79148	2 1/2"	1 1/4"	3"	3/8"	4.93	4"
8T	10T	79449	3"	1 5/8"	3 1/2"	3/8"	8.30	7"
8T	10T	79149	3"	1 5/8"	3 1/2"	3/8"	10.33	7"

See standard RL-23 Erection Anchor for all other applicable dimensions.

MSI-7 2-TON, 4-TON, 6-TON, 8-TON							
Ring Clutch System	Clutch I.D.	Item Number	Panel Thickness in Inches	SHEAR 2.66:1 Safety Factor (lbs)	SHEAR 4:1 Safety Factor (lbs)	TENSION w/o Tension Bar 4:1 Safety Factor (lbs)	TENSION w/ Tension Bar 4:1 Safety Factor (lbs)
2T	2.5T	79147	3 1/2" min.	2,150	1,430	2,540	4,000
2T	2.5T	79147	4"	2,930	1,950	3,190	4,000
2T	2.5T	79147	4 1/2"	3,040	2,020	3,550	4,000
2T	2.5T	79147	5"	3,160	2,100	3,900	4,000
4T	5T	79148	4" min.	2,710	1,800	3,490	8,000
4T	5T	79148	4 1/2"	3,710	2,470	3,860	8,000
4T	5T	79148	5"	4,000	2,660	4,730	8,000
4T	5T	79148	5 1/2"	4,160	2,770	4,970	8,000
4T	5T	79148	6"	4,290	2,860	5,170	8,000
8T	10T	79449	7" min.	6,030	4,010	7,100	16,000
8T	10T	79449	7 1/2"	6,030	4,010	7,220	16,000
8T	10T	79449	8"	6,030	4,010	7,390	16,000
8T	10T	79149	7" min.	6,030	4,010	7,100	16,000
8T	10T	79149	7 1/2"	6,030	4,010	7,220	16,000
8T	10T	79149	8"	6,030	4,010	7,390	16,000

Table is based on a concrete compressive strength of 3,500 psi.

- 1) The 2.66:1 safety factor is commonly used for back stripping operations. Increased safety factor may be required for unusual live loads or cable magnification.
- 2) Given full embedment, reinforcement and minimum compressive strength concrete, Erection Anchors should achieve a pullout strength equal to their ultimate mechanical strength.

To Order, Specify: quantity, name, item number and finish.

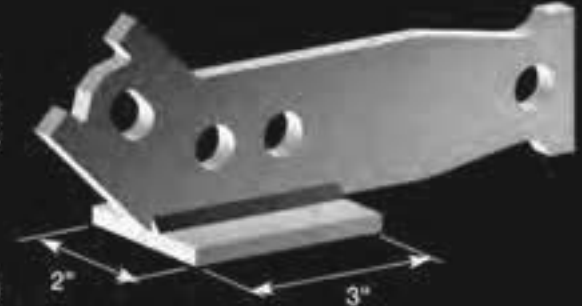
MSI System Anchors

MSI-9 45° TECH ERECTION ANCHOR 2-Ton and 4-Ton

The MSI-9 Tech Erection Anchor - 45° is an adaptation of the regular Tech Erection Anchor for use with panels where the lifting edge is cast at a 45° angle. The anchor is available in the sizes shown in the table and in plain or hot dip galvanize finish.

NOTE: A MS-32 Tension Bar is required with this anchor.

See Ring Clutches on page 45, 46, and 47, the Recessing Members on 48, 49 and 52, and the Tension Bars on page 38.



MSI-9 45° TECH ERECTION ANCHOR - 45° DATA

Ring Clutch System	Clutch I.D.	Item Number	Panel Thickness in Inches	Shear 4:1 Safety Factor	Tension w/ Tension Bar 4:1 Safety Factor
2-Ton	2.5T	79527SP-45	6 1/2"	2150	3400
2-Ton	2.5T	79527SPG-45	6 1/2"	2150	3400
4-Ton	5T	79548SP-45	8"	3500	5400
4-Ton	5T	79438SPG-45	8"	3500	5400

Table is based on a concrete compressive strength of 3,500 psi.

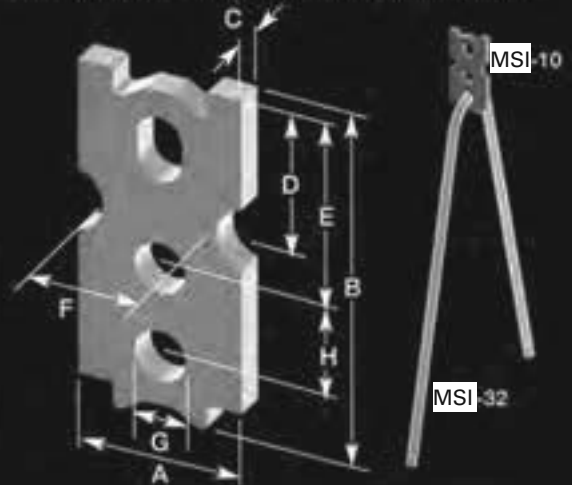
- Given full embedment, reinforcement and minimum compressive strength concrete; Erection Head Anchors should achieve a pull out strength equal to their ultimate mechanical strength.
- This insert requires 2" concrete below or underneath the shear plate.

To Order, Specify: quantity, name, item number and finish.

MSI-10 ERECTION HEAD ANCHOR 2-Ton, 4-Ton and 8-Ton

The MSI-10 Erection Head Anchor is designed to be used in conjunction with the Tension Bar in thin-wall sections. It is an ideal choice for spall-free performance in A-frame or tilt table applications.

See Ring Clutches on page 45, 46, and 47, the Recessing Members on 48, 49 and 52, and the Tension Bars on page 38.



MSI-10 ERECTION HEAD ANCHOR

Ring Clutch System	Clutch I.D.	Item Number	A	B	C	D	E	F	G	H	Allowable Reinforced Tension Load SF 4:1 (lbs)	Ultimate Mechanical Load Tension (lbs)	Weight Each Piece (lbs)
2T	2.5T	79403	2"	4 1/4"	3/8"	1 13/16"	2 3/8"	1 3/8"	5/8"	1 3/32"	4000	16,000	0.70
4T	5T	79075	2 1/2"	7 7/16"	5/8"	2 1/2"	3 3/16"	1 7/8"	3/4"	1 1/4"	8000	32,000	2.76
8T	10T	79385	3 3/4"	13 1/4"	5/8"	3 1/8"	4"	2 7/16"	1"	1 3/4"	12,000	48,000	7.64
8T	10T	79185	3 3/4"	13 1/4"	3/4"	3 1/8"	4"	2 7/16"	1"	1 3/4"	16,000	64,000	9.17

Table is based on a concrete compressive strength of 3,500 psi.

- To obtain the shear values shown, it is necessary to use the appropriate Meadow Burke shear bar or equal.
- Given full embedment, reinforcement and minimum compressive strength concrete; Erection Head Anchors should achieve a pull out strength equal to their ultimate mechanical strength.

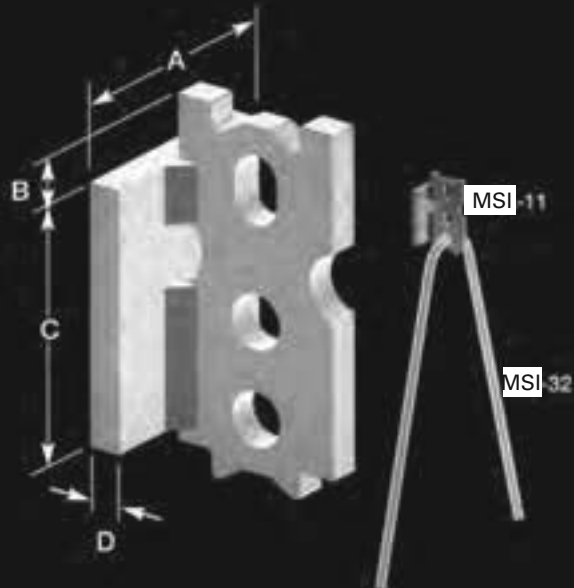
To Order, Specify: quantity, name, item number and finish.

MSI System Anchors

MSI-11 ERECTION HEAD ANCHOR WITH PLATE 2-Ton, 4-Ton and 8-Ton

The MSI-11 Erection Head Anchor with Plate is similar in design and use to the MSI-10 Erection Head Anchor, but has the added shear plate to provide additional shear capability and eliminate the need for a shear bar. This design feature gives the anchor a smaller height envelope allowing it to be used in thinner concrete panels. The anchor is available in the sizes shown in plain or hot dip galvanize finish.

See Ring Clutches on page 45, 46, and 47, the Recessing Members on 48, 49 and 52, and the Tension Bars on page 38.



MSI-11 RAPID LIFT ERECTION HEAD WITH PLATE ANCHOR								
Ring Clutch System	Clutch I.D.	Item Number	A	B	C	D	Minimum Panel Thickness	Shear Sq Ft = 2.86
2T	2.5T	79403SP	2-1/2"	3/4"	3"	1/4"	3-1/2"	1150"
4T	5T	79075SP	2-1/2"	1-1/4"	3"	3/8"	5-1/2"	2460"
8T	10T	79185SP	3"	1-5/8"	3-1/2"	3/8"	7"	6030"

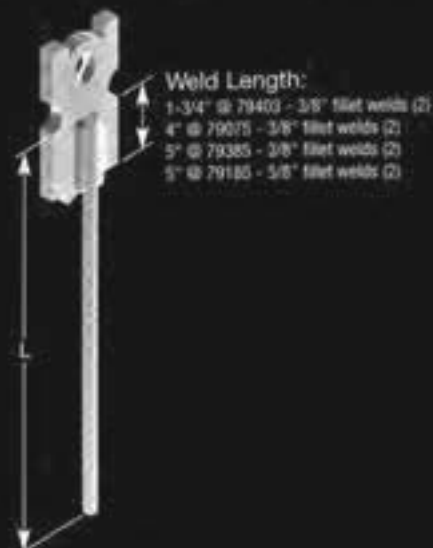
Table is based on a concrete compressive strength of 3,500 psi.

- 1) To obtain the shear values shown, it is necessary to use the appropriate Meadow Burke shear bar or equal.
 - 2) Given full embedment, reinforcement and minimum compressive strength concrete; Erection Head Anchors should achieve a pullout strength equal to their ultimate mechanical strength.
 - 3) Standard weight concrete with a minimum compressive strength as shown below.
 - 4) The 2.66:1 safety factor is a 2:1 safety factor which is commonly used with back stripping increased by 33% to compensate for initial bond and impact. Additional increases due to unusual live loads or cable magnification may be required for some applications. To obtain the shear values shown, it is necessary to use the Burke Shear Bar or equivalent. A welded Shear Plate is available for the 4 and 8-ton anchor.
- * Shear capacity is less than the standard erection anchor due to the shorter length. The 8-ton erection head two-hole anchor loads are equal to the standard erection anchor due to length.

MSI-10 ERECTION HEAD ANCHOR with WELDED REBAR					
Item Number	79403	79075	79385	79185	
Rebar Size	Inch	#5"	#7"	#8"	#10"
	Metric	#16"	#22"	#25"	#32"
Concrete Strength	"L" Dimension				
1,500 psi	30"	46"	79"	104"	
2,000 psi	26"	42"	69"	90"	
3,000 psi	21"	34"	57"	74"	

* Grade 60 Rebar

To Order, Specify: quantity, name, item number and finish.



MSI System Anchors

MSI-21 FLAT FOOT ANCHOR 2-Ton

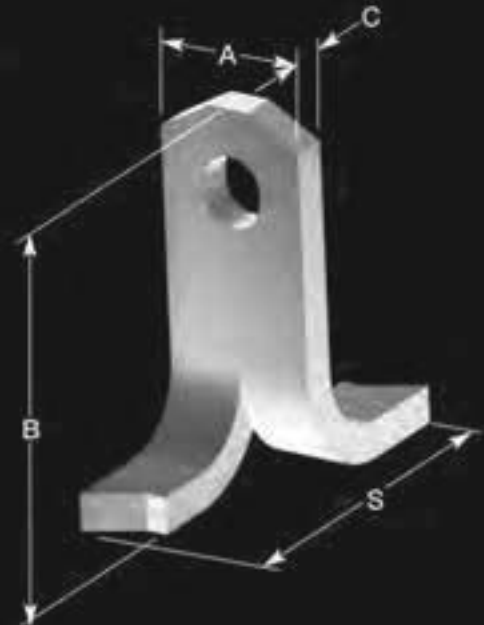
The MSI-21 Flat Foot Anchor is designed for back stripping and lifting thin-wall precast elements. The legs of the anchor extend out sufficiently to accommodate recommended additional reinforcing steel. See recommended reinforcing method and sketch below. Refer to the table for anchor dimensions and safe working loads. The Flat Foot Anchor is available in the sizes shown in the table and in plain or hot dip galvanize finish.

See Ring Clutches on page 45, 46, and 47, the Recessing Members on 48, 49 and 52, and the Tension Bars on page 38.

Reinforcing Recommendation:

Crisscross the legs of the anchor with four (4) 18" lengths of #4 rebar as shown in the sketch.

NOTE: A minimum 3/4" concrete cover below the anchor is required to achieve posted working loads.



MSI-21 FLAT FOOT ANCHOR DATA										
Ring Clutch System	Clutch I.D.	Item Number	A	B	C	S	Allowable Unreinforced Tension Load 4:1 SF (lbs)	Allowable Reinforced Tension Load 4:1 SF (lbs)	Ultimate Mechanical Load Tension (lbs)	Weight Per Piece (lbs)
2T	2.5T	79052	1 1/4"	2 3/4"	3/16"	4"	1,325	2,000	8,000	0.32
2T	2.5T	79053	1 1/4"	3 3/8"	3/16"	4"	1,893	2,000	8,000	0.36
2T	2.5T	79058	1 1/4"	2 3/4"	3/8"	4"	1,325	4,000	16,000	0.46
2T	2.5T	79490	1 1/4"	3 3/8"	3/8"	4"	1,893	4,000	16,000	0.56
4T	5T	79157	Discontinued: See Plate Anchor Item 45847, page 36.							
8T	10T	79055	Discontinued: See Plate Anchor Item 79054, page 36.							

1) Tension values shown are based on 3,500 psi standard weight concrete and a minimum edge distance of $(2B+A)/2$.

2) Tension values shown are based on 3,000 psi standard weight concrete, a minimum edge distance of 10" and #4 rebar cut to 18" lengths reinforcing the anchor as shown in the sketch.

To Order, Specify: quantity, name, item number and finish.

The "flat feet" of the anchor extend 2" or more on each side of the anchor to accommodate the recommended reinforcing steel.

NOTE: The flat foot anchor has allowable face shear loads that are equal to or greater than unreinforced face tension loads for anchors located in a panel or concrete unit at a distance of at least $2B+A$ from the edges.



MSI Lift System Anchors

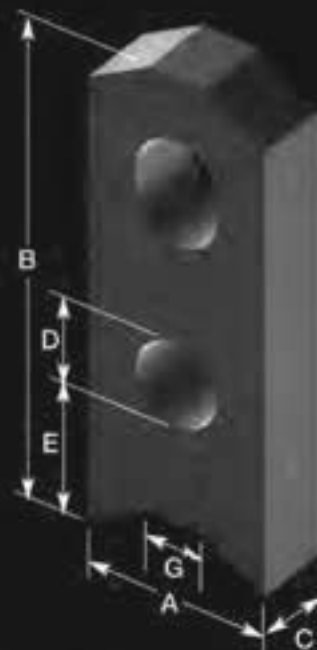
MSI-22 TWO HOLE ANCHOR

2-Ton, 4-Ton, 8-Ton and 22-Ton

The MSI-22 Two Hole Anchor is effectively used for stripping panels from tilt tables and transporting panels. It is also a good choice in applications where spread-type anchors can't be used and in panels constructed with lightweight concrete. It is designed with a secondary hole that can accept additional rebar or a Tension Bar to increase lifting capacity and to distribute lifting loads deep into the concrete. The Two Hole Anchor is available in the sizes shown in the table and in plain or hot dip galvanize finish.

Minimum reinforcing length (L) is needed to develop the full strength of the anchor.

See Ring Clutches on page 45, 46, and 47, the Recessing Members on 48, 49 and 52, and the Tension Bars on page 38.



MSI RAPID LIFT TWO HOLE ANCHOR											
Ring Clutch System	Clutch I.D.	Item Number	A	B	C	D	E	G	Allowable Reinforced Tension Load 4:1 SF (lbs)	Ultimate Mech. Load Tension (lbs)	Weight Each (lbs)
2T	2.5T	79122	1 1/4"	4"	3/8"	3/4"	9/16"	9/16"	4,000	16,000	0.46
2T	2.5T	79190	1 1/4"	2 3/4"	3/8"	9/16"	5/8"	9/16"	4,000	16,000	0.40
4T	5T	79192	1 1/2"	4"	5/8"	1 1/16"	7/16"	1 1/16"	8,000	32,000	1.00
4T	5T	79124	1 1/2"	5 1/2"	5/8"	1 3/16"	1 3/16"	1 1/16"	8,000	32,000	1.30
8T	10T	79125	2 1/2"	7"	3/4"	1 3/16"	1 7/16"	1"	16,000	64,000	3.06
22T	22T	79176	3 1/8"	11 3/4"	1"	1 13/16"	1 13/16"	1 3/8"	44,000	176,000	8.80

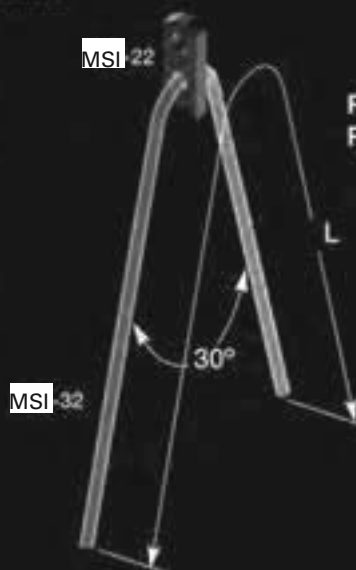
Table is based on standard weight 3,500 psi.

To Order, Specify; quantity, name, item number and finish.

TYPICAL TWO HOLE ANCHOR REINFORCEMENT

MSI-32 Tension Bar

MSI-32 TENSION BAR					
Load Group	2-Ton	4-Ton	8-Ton	22-Ton	
Rebar Size	#3	#4	#6	#9	#9
Concrete Strength (psi)	#10	#12	#18	#29	#29
"L" Dimension					
1,500	2'-0"	4'-0"	8'-0"	12'-0"	
2,500	2'-0"	3'-0"	5'-0"	9'-0"	
2,500	2'-4"	2'-0"	5'-0"	9'-0"	
3,000	2'-4"	2'-0"	4'-0"	8'-0"	
4,000	1'-10"	2'-0"	3'-0"		
5,000	1'-4"	2'-0"	3'-0"		



Reinforcement using the Rapid Lift Tension Bar.

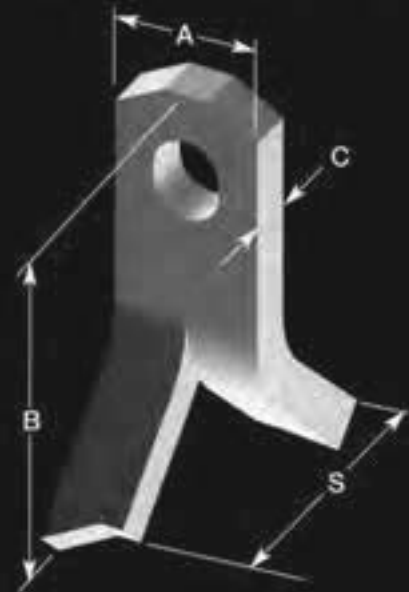
MSI Lift System Anchors

MSI-23 SPREAD ANCHOR

2-Ton, 4-Ton, 8-Ton and 22-Ton

The MSI-23 Spread Anchor is designed with a spread-foot that produces exceptional pull out capacity. This versatile anchor can be used in the face, back or edge of panels for back stripping and rotation from horizontal to vertical. This anchor can be pulled in any direction as long as minimum edge distance is maintained. However spalling may occur when pulling in shear perpendicular to the anchor. A minimum 3/4" concrete cover below the anchor is recommended. The Spread Anchor is available in the sizes shown in the table and in plain or hot dip galvanize finish.

See Ring Clutches on page 45, 46, and 47, the Recessing Members on 48, 49 and 52, and the Tension Bars on page 38.



MSI-23 SPREAD ANCHOR DATA

Ring Clutch System	Clutch I.D.	Item Number	Additional Hole	A	B	C	S	Allowable Unreinforced Tension Load 4:1 SF (lbs)	Ultimate Mechanical Load Tension (lbs)	Weight Per Piece (lbs)
2T	2.5T	79090	No	1 1/4"	4 3/4"	3/16"	2 3/4"	2,000	8,000	0.32
2T	2.5T	79110	No	1 1/4"	4"	3/8"	2 3/4"	2,530	16,000	0.49
2T	2.5T	79099	No	1 1/4"	5 1/2"	3/8"	2 3/4"	4,000	16,000	0.73
4T	5T	79113	No	1 1/2"	4"	1/2"	3 3/8"	2,670	24,000	0.96
4T	5T	79114	No	1 1/2"	4 3/4"	1/2"	3 3/8"	3,690	24,000	1.12
4T	5T	79115	No	1 1/2"	6 3/4"	1/2"	3 3/8"	6,720	32,000	1.40
4T	5T	79116	No	1 1/2"	6 1/4"	5/8"	3 3/8"	5,850	32,000	1.61
4T	5T	79117	Yes	1 1/2"	9 1/2"	5/8"	3 3/8"	8,000	32,000	2.48
8T	10T	79019	Yes	2 1/2"	11"	5/8"	5 1/4"	12,000	48,000	4.48
8T	10T	79119	Yes	2 1/2"	11"	3/4"	5 1/4"	16,000	64,000	5.37
22T	22T	79172	Yes	3 1/8"	15"	3/4"	6 1/4"	32,800	136,000	9.59
22T	22T	79174	Yes	3 1/8"	18 7/8"	1"	6 1/4"	44,000	176,000	16.07

Table based on standard weight 3,500 psi concrete.

To Order, Specify: quantity, name, item number and finish.

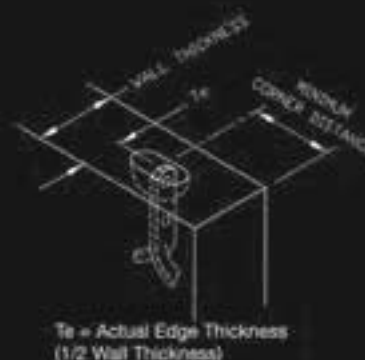
MSI Lift System Anchors

MSI SPREAD ANCHORS USED IN THIN WALL SECTIONS

Care must be taken when locating anchors in thin wall sections. Improper installation and/or misalignment can seriously reduce the safe working load of the anchor.

- Anchors must be positioned on the centerline of the panel.
- Use supports, spacers or tie the anchor to the rebar mat to make sure of proper positioning.

This sketch shows proper positioning of the anchor on the centerline of the panel. This allows the full wall thickness to be used in the safe working load selection.



SINGLE MSI-23 SPREAD ANCHOR TENSILE CAPACITIES IN THIN WALLS (cont.)

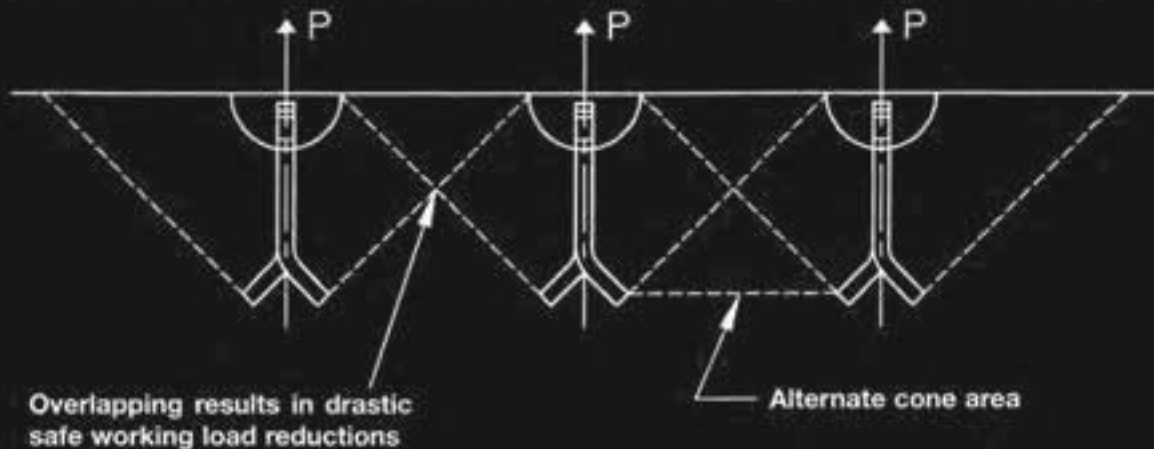
MSI-23 TENSILE CAPACITY							
MSI Anchor Ton & Length	Critical Wall Thickness inches	Actual Edge Thickness (Ta) inches	Tensile Safe Working Load Per Anchor				
			Actual Corner Distance				
			8 inches	12 inches	18 inches	24 inches	30 inches
2 Ton X 4"	4	2"	1,400 lbs	1,600 lbs	1,600 lbs	1,600 lbs	1,600 lbs
	5	2 1/2"	1,700	2,000	2,000	2,000	2,000
	6	3"	2,000	2,200	2,300	2,300	2,300
	7	3 1/2"	2,200	2,500	2,600	2,600	2,600
	8	4"	2,400	2,700	2,800	2,800	2,800
2 Ton X 5 1/2"	9	4 1/2"	2,500	2,700	2,800	2,800	2,800
	4	2"	1,800	2,000	2,200	2,200	2,200
	5	2 1/2"	2,300	2,500	2,600	2,600	2,600
	6	3"	2,700	2,900	3,300	3,300	3,300
	7	3 1/2"	3,100	3,400	3,700	3,700	3,700
4 Ton X 6 1/4"	8	4"	3,400	3,800	4,000	4,000	4,000
	9	4 1/2"	3,600	4,000	4,000	4,000	4,000
	4	2"	2,100	2,300	2,500	2,500	2,500
	5	2 1/2"	2,600	2,900	3,200	3,200	3,200
	6	3"	3,200	3,500	3,800	3,800	3,800
4 Ton X 9 1/2"	7	3 1/2"	3,600	4,000	4,400	4,400	4,400
	8	4"	4,100	4,500	4,900	4,900	4,900
	9	4 1/2"	4,500	5,000	5,400	5,400	5,400
	4	2"	3,000	3,200	3,400	3,600	3,800
	5	2 1/2"	3,600	4,000	4,300	4,500	4,800
6 Ton or 8 Ton X 11"	6	3"	4,500	4,800	5,200	5,400	5,800
	7	3 1/2"	5,200	5,600	6,000	6,300	6,700
	8	4"	6,000	6,400	6,800	7,200	7,600
	9	4 1/2"	6,700	7,200	7,600	8,000	8,000
	5	2 1/2"	4,000	4,500	4,800	5,100	5,400
	6	3"	4,800	5,500	5,800	6,100	6,500
	7	3 1/2"	5,600	6,500	6,800	7,100	7,600
	8	4"	6,400	7,400	7,800	8,200	8,700
	9	4 1/2"	7,100	8,300	8,800	9,200	9,700
	10	5"	7,900	9,200	9,700	10,000	10,500

Safety Factor is approximately 4:1 in 4500 psi concrete.

MSI System Anchors

MULTIPLE SPREAD ANCHOR TENSILE CAPACITIES IN THIN WALLS

When multiple anchors are placed in a thin wall panel, caution must be exercised to prevent the anchor shear cone planes from overlapping. If overlapping is unavoidable, the anchor safe working load must be reduced. If a spacing of six times the length of the anchor or more is maintained, the anchor shear cones will not overlap and maximum tensile capacities can be achieved. Reference the following sketch and accompanying table.



MSI-23 TENSILE CAPACITY							
MSI Anchor Ton & Length	Critical Wall Thickness inches	Actual Edge Thickness (T_e) inches	Tensile Safe Working Load Per Anchor				
			Anchor Spacing				
			18 inches	24 inches	30 inches	36 inches	48 inches
2 Ton X 4"	4	2"	1,300 lbs	1,500 lbs	1,600 lbs	1,600 lbs	1,600 lbs
	5	2 1/2"	1,600	1,900	2,000	2,000	2,000
	6	3"	1,900	2,200	2,300	2,300	2,300
	7	3 1/2"	2,100	2,500	2,600	2,600	2,600
	8	4"	2,200	2,600	2,700	2,700	2,700
2 Ton X 5 1/2"	9	4 1/2"	2,500	2,700	2,800	2,800	2,800
	4	2"	1,600	1,800	2,000	2,200	2,200
	5	2 1/2"	2,000	2,200	2,500	2,700	2,700
	6	3"	2,300	2,600	3,000	3,200	3,200
	7	3 1/2"	2,600	3,000	3,400	3,700	3,700
4 Ton X 6 1/4"	8	4"	2,900	3,400	3,800	4,000	4,000
	9	4 1/2"	3,200	3,700	4,000	4,000	4,000
	4	2"	1,700	1,900	2,400	2,500	2,500
	5	2 1/2"	2,100	2,400	3,000	3,200	3,200
	6	3"	2,500	2,800	3,500	3,800	3,800
4 Ton X 9 1/2"	7	3 1/2"	2,900	3,300	4,100	4,400	4,400
	8	4"	3,300	3,700	4,600	4,900	4,900
	9	4 1/2"	3,600	4,100	5,100	5,400	5,400
	4	2"	2,100	2,500	2,900	3,400	3,900
	5	2 1/2"	2,600	3,100	3,700	4,300	4,800
6 Ton or 8 Ton X 11"	6	3"	3,100	3,700	4,400	5,100	5,800
	7	3 1/2"	3,600	4,300	5,100	5,900	6,700
	8	4"	4,100	4,900	5,800	6,700	7,700
	9	4 1/2"	4,600	5,500	6,500	7,500	8,000
	5	2 1/2"	2,400	3,500	4,000	4,500	5,100
	6	3"	2,800	4,200	4,800	5,500	6,200
	7	3 1/2"	3,300	4,900	5,600	6,400	7,200
	8	4"	3,800	5,600	6,400	7,300	8,200
	9	4 1/2"	4,200	6,300	7,200	8,200	9,200
	10	5"	4,700	6,800	8,000	9,000	10,200

Safety Factor is approximately 4:1 in 4500 psi concrete.

MSI Lift System Anchors

MSI-24 PLATE ANCHOR 2-Ton, 4-Ton and 8-Ton

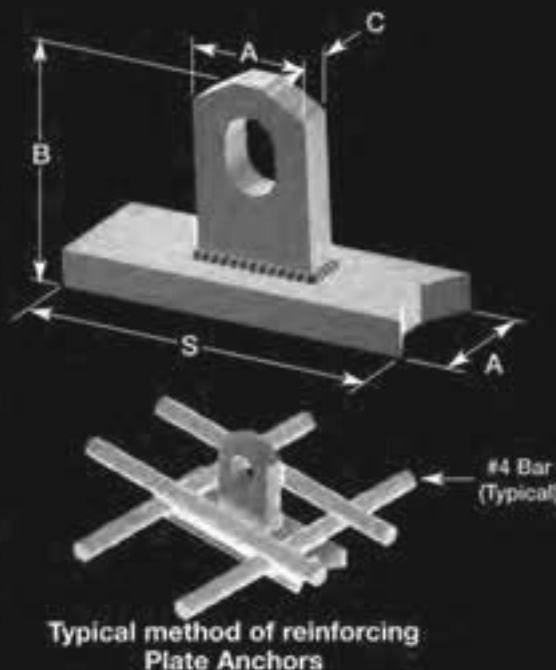
The MSI-24 Plate Anchor is designed with a plate welded to the bottom to provide high pullout strength with a low profile. This design makes the anchor ideal for face and back lifts of thin-wall units and stripping, handling and erection applications. The Plate Anchor is available in the sizes shown in the table and in plain or hot dip galvanize finish.

See Ring clutches on page 45, 46, and 47, and the Recessing Members on page 47, 48 and 52.

Reinforcing Recommendation:

Crisscross the lower plate of the anchor with four (4) 18" long #4 rebar as shown in the sketch.

NOTE: A minimum 3/4" concrete cover below the anchor is required to achieve posted working loads.



NOTE: The Plate Anchor has allowable face shear loads that are equal to or greater than unreinforced face tension loads for anchors located in a panel or concrete unit at a distance of at least $2B+A$ from the edges.

MSI-24 MSI LIFT PLATE ANCHOR DATA										
Ring Clutch System	Clutch I.D.	Item Number	A	B	C	S	Allowable Unreinforced Tension Load 4:1 SF (lbs)	Allowable Reinforced Tension Load 4:1 SF (lbs)	Ultimate Mechanical Load Tension (lbs)	Weight Per Piece (lbs)
2T	2.5T	79128	1 1/4"	2 1/4"	3/8"	3 3/4"	952	4,000	16,000	0.71
4T	5T	45846	1 1/2"	3"	1/2"	3"	3,574	8,000	32,000	1.21
4T	5T	45847	1 1/2"	3 1/2"	1/2"	3"	4,700	8,000	32,000	1.31
4T	5T	79044	1 1/2"	4 3/8"	5/8"	3 7/8"	4,732	8,000	32,000	1.91
8T	10T	79054	2 1/2"	6 1/4"	3/4"	5"	6,350	12,000	64,000	4.29
8T	10T	79043	-	7 1/8"	-	-	Discontinued. See Plate Anchor Item 79042			
8T	10T	79042	2 1/2"	7 1/8"	3/4"	5"	10,000	16,000	64,000	5.55

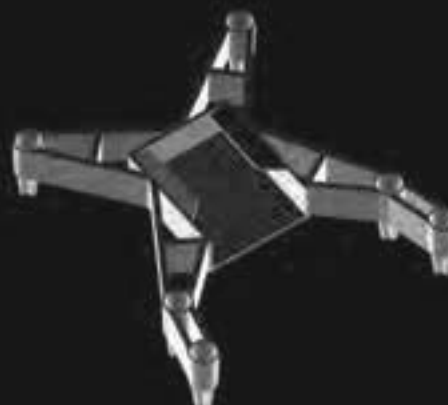
- 1) Tension values shown are based on 3,500 psi standard weight concrete and a minimum edge distance of $(2B+A)/2$.
- 2) Tension values shown are based on 3,000 psi standard weight concrete, a minimum edge distance of 10" and #4 rebar cut to 18" lengths reinforcing the anchor as shown in the sketch.
- 3) Available with plate anchor base. See page 51.

To Order, Specify: quantity, name, item number and finish.

MSI-60 PLATE ANCHOR BASE 4-Ton

The MSI-60 Plate Anchor Base is a plastic base designed for use with specific MSI-24 Plate Anchor 4-Ton units (item numbers 45846 and 45847) to hold and position the anchors in face lift applications.

To Order, Specify: quantity, name and item number.



MSI System Anchors

MSI-25 TECH ANCHOR 2-Ton and 4-Ton

The MSI-25 Tech Anchor has been developed with a unique foot design to increase tension capacity without adding extra reinforcement. Longer sizes of the anchor are supplied with a secondary hole to accommodate the addition of a tension bar for use when required. The Tech Anchor is available in the sizes shown in the table and in plain or hot dip galvanize finish.

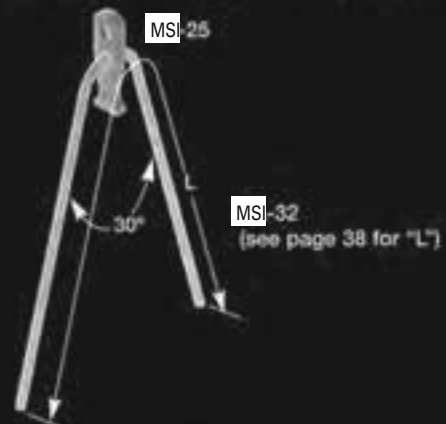
See Ring Clutches on page 45, 46, and 47, the Recessing Members on 48, 49 and 52, and the Tension Bars on page 38.



MSI-25 TECH ANCHOR - FACE TENSION DATA											
Ring Clutch System	Clutch I.D.	Item Number	Extra Hole	A	B	C	Minimum Panel Thickness	Tension Load 2:1 SF (lbs)	Tension Load 4:1 SF (lbs)	Ultimate Mechanical Strength (lbs)	Weight Each (lbs)
2T	2.5T	79523	No	1 1/4"	2 7/16"	3/8"	3"	4,955	2,480	16,000	0.17
2T	2.5T	79524	No	1 1/4"	3 7/16"	3/8"	4"	5,770	2,885	16,000	0.3
2T	2.5T	79525	Yes	1 1/4"	4 15/16"	3/8"	5.5"	8,000	4,000	16,000	0.5
4T	5T	79544	No	1 1/2"	3 7/16"	5/8"	4"	8,610	4,305	32,000	0.6
4T	5T	79545	No	1 1/2"	4 7/16"	5/8"	5"	10,885	5,445	32,000	0.9
4T	5T	79546	Yes	1 1/2"	5 7/16"	5/8"	6"	14,430	7,215	32,000	1.1

Tension values are based on 3,500 psi concrete and a minimum edge distance of 2B+A. Anchors in edge tension that are reinforced with a tension bar will achieve the full rated load in 1,500 psi concrete.

To Order, Specify: quantity, name, item number and finish.



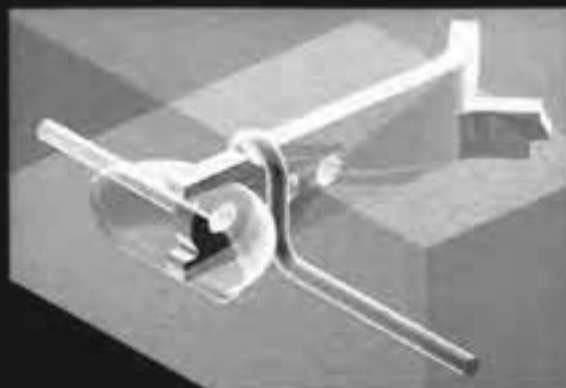
MSI-25 TECH ANCHOR IN EDGE TENSION DATA											
Ring Clutch System	Clutch I.D.	Item Number	Extra Hole	A	B	C	Minimum Panel Thickness	Tension Load 2:1 SF (lbs)	Tension Load 4:1 SF (lbs)	Ultimate Mechanical Strength (lbs)	Weight Each (lbs)
2T	2.5T	79529	Yes	1 1/4"	9 1/2"	3/8"	3.5"	6,560	3,280	16,000	1.1
2T	2.5T	79529	Yes	1 1/4"	9 1/2"	3/8"	4.5"	7,600	3,800	16,000	1.1
2T	2.5T	79529	Yes	1 1/4"	9 1/2"	3/8"	5.5"	8,000	4,000	16,000	1.1
4T	5T	79549	Yes	1 1/2"	9 1/2"	5/8"	4"	5,340	2,670	32,000	2.2
4T	5T	79549	Yes	1 1/2"	9 1/2"	5/8"	5"	8,960	4,475	32,000	2.2
4T	5T	79549	Yes	1 1/2"	9 1/2"	5/8"	6"	12,660	6,330	32,000	2.2

MSI System Anchors

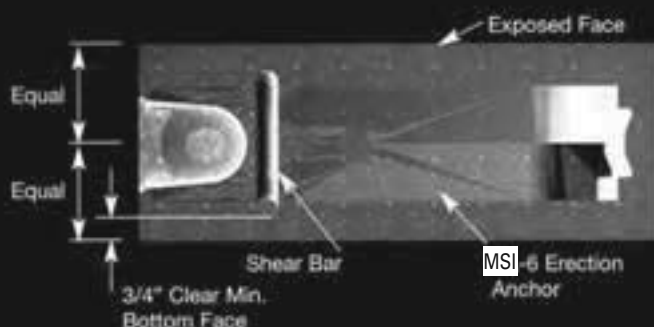
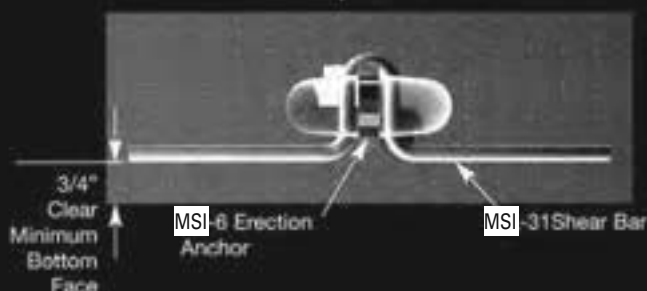
MSI-31 SHEAR BAR

1-Ton, 2-Ton, 4-Ton and 8-Ton

The MSI-31 Shear Bar is used to provide simple and economical reinforcement for erection anchors during the rotation of edge-lifted panels. The unit fits over the anchor to spread the shear stress and prevent spalling of the concrete.



Top View



MSI-31 SHEAR BAR DATA

Ring Clutch System	Clutch L.D.	Item Number	A	Minimum Panel Thickness	Weight (lbs)
1T	1.25T	79139	1 5/8"	3"	0.44
2T	2.5T	79140	2 1/2"	4"	0.98
4T	5T	79141	3 5/16"	5 1/2"	1.07
8T	10T	79142	4 15/16"	7 1/2"	1.23

To Order, Specify: quantity, name and item number.

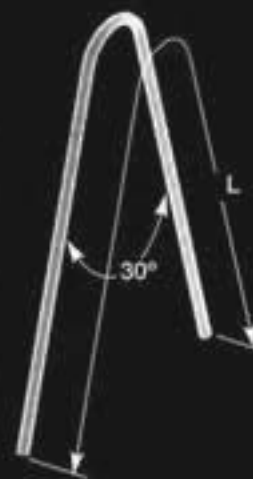
MSI-32 TENSION BAR

2-Ton, 4-Ton, 8-Ton and 22-Ton

The MSI-32 Tension Bar is used in conjunction with an erection anchor to increase tension-lifting capacity by transferring the tension loads deeply into the concrete member.

To Order, Specify: quantity, name, rebar size (inch) and length "L."

MSI-32 TENSION BAR					
Load Group	2-Ton	4-Ton	8-Ton	22-Ton	
Rebar Size	Inch	#3	#4	#5	#9
	Metric	#10	#12	#19	#29
Concrete Strength (psi)	"L" Dimension				
1,500	3'-0"	4'-0"	6'-0"	12'-0"	
2,000	2'-0"	3'-0"	5'-0"	9'-0"	
2,500	2'-0"	3'-0"	5'-0"	9'-0"	
3,000	2'-0"	3'-0"	4'-0"	9'-0"	
4,000	1'-10"	2'-0"	3'-0"		
5,000	1'-6"	2'-0"	3'-0"		



MSI System Anchors

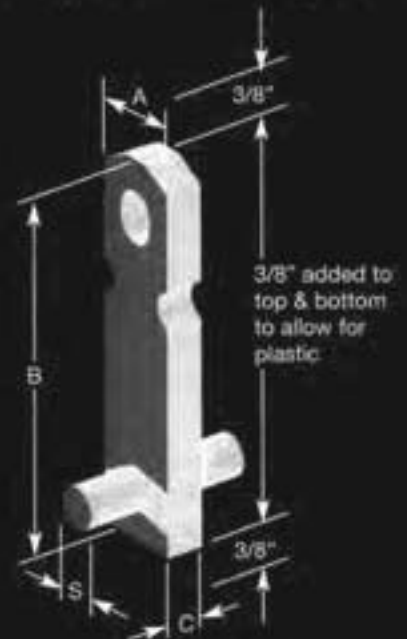
MSI-26 T-BAR ANCHOR 4-Ton

The MSI-26 T-Bar Anchor gets its name from the horizontal bar running through the bottom portion of the anchor to form an inverted T. This design produces exceptional pullout strength for use in back-stripping and panel rotation applications. The T-Bar Anchor is available in the sizes shown in the table and in plain or hot dip galvanize finish. This anchor uses the standard 4-Ton recess members and for face lift applications can be furnished assembled with the T-Bar Anchor Base/Void/Cover as seen below.

Note: The Base/Void/Cover package mentioned above can be purchased as a separate package or can be ordered and installed at the factory. If you want the package installed at the factory, it must be specified at the same time the anchor order is placed.

The T-Bar Anchor uses MSI 4-Ton or Super Lift II (Tilt-Up system) accessories. To use the T-Bar Anchor with the Anchor Base/Void/Cover package, order the anchors by panel thickness. For example: for a six-inch panel use a 5-1/4" anchor. The anchor plus 3/8" setback and the 3/8" for the base equals 6" for the slab thickness.

See Ring Clutches on page 45 and Recessing Members on 48, 49, and 52.



MSI-26 T-BAR ANCHOR DATA											
Ring Clutch System	Clutch I.D.	Item Number w/o Plastic RL-26	Item Number Assembled RL-26	A	B	C	S	Allowable Unreinforced Tension Load 4:1 SF (lbs)	Ultimate Mechanical Strength (lbs)	Weight Per Piece (lbs)	Weight Per Piece w/Plastic (lbs)
4T	5T	45848	459L050	1 1/2"	4 1/4"	5/8"	11/16"	3,500	32,000	1.6	1.48
4T	5T	45850	459L060	1 1/2"	5 1/4"	5/8"	11/16"	8,000	32,000	1.38	1.71
4T	5T	45852	459L070	1 1/2"	6 1/4"	5/8"	11/16"	8,000	32,000	1.64	1.97
4T	5T	45854	459L080	1 1/2"	7 1/4"	5/8"	11/16"	8,000	32,000	1.91	2.24

Tension values are based on 3,500 psi concrete and a minimum edge distance of (2B+A)/2.

To Order, Specify: quantity, name, item number and finish.

MSI-29 T-BAR 4-TON ANCHOR ASSEMBLY

- The total assembly (MSI-29) is available with the plastic installed at the factory.
- The plastic package (MSI-41) base/void/cover is available without anchor.
- Each item (MSI-26, MSI-27, MSI-28) is separately available from the factory.

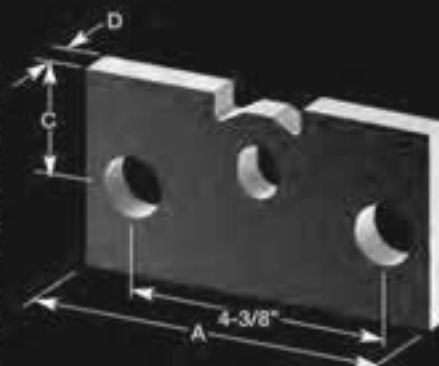
To Order, Specify: quantity, name and item number.



MSI System Anchors

MSI-14 SANDWICH PANEL ERECTION ANCHOR 4-Ton and 8-Ton with Minimum 8" Panel Thickness

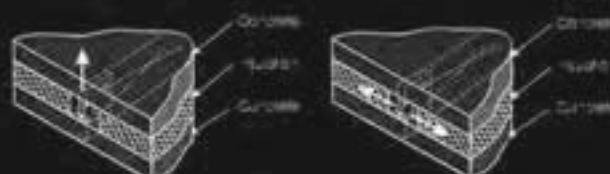
The MSI-14 Sandwich Panel Erection Anchor is designed to effectively lift and handle precast concrete sandwich panels. The Sandwich Panel Erection Anchor is easy to install and requires no special lifting equipment, only the standard 4 or 8-Ton ring clutch. Its unique design distributes the lifting loads evenly into both wythes of the panel and absorbs shear loads without spalling the concrete. The Sandwich Panel Erection Anchor is available in the sizes shown in the table and in plain or hot dip galvanize finish. The Sandwich Panel Erection Anchor requires proper reinforcement, as shown in the product sketch. Refer to Sandwich Panel Erection Anchor Reinforcement Details on page 41.



See Ring Clutches on page 45, 46, and 47, the Recessing Members on 48, 49.

MSI-14 SANDWICH PANEL ERECTION ANCHOR DATA

Ring Clutch System	Clutch I.D.	Item Number	A	B	C	D	Ultimate Mech. Load Tension (lbs)	Weight Per Piece (lbs)
4T	5T	79077	6"	3 1/4"	1 13/16"	5/8"	32,000	2.86
8T	10T	79154	6"	4 3/4"	3 3/8"	3/4"	64,000	5.05



MSI-14 8" SANDWICH PANEL (3" X 2" X 3")

Ring Clutch System	Tension (lbs)	Shear Parallel to Anchor Width SF = 2.66:1 (lbs)	Shear Perpendicular to Anchor Width SF = 4:1 (lbs)
4T	8,000	5,176	8,000
8T	16,000	4,500	9,400



MSI-14 8" SANDWICH PANEL (4" X 2" X 2")

Ring Clutch System	Tension (lbs)	Shear Parallel to Anchor Width SF = 2.66:1 (lbs)	Shear Perpendicular to Anchor Width SF = 4:1 (lbs)
4T	8,000	4,950	8,000
8T	16,000	5,200	10,000



The 2.66:1 safety factor is commonly used for back stripping operations. Increased safety factor may be required for unusual live loads or cable magnification.

4-Ton anchor - Given full embedment, reinforced with two #3 rebar 2'-6" long bent as shown on page 41 and minimum compressive strength of 3,300 psi concrete; the 4-Ton Sandwich Anchor should achieve a pullout strength equal to their ultimate mechanical strength.

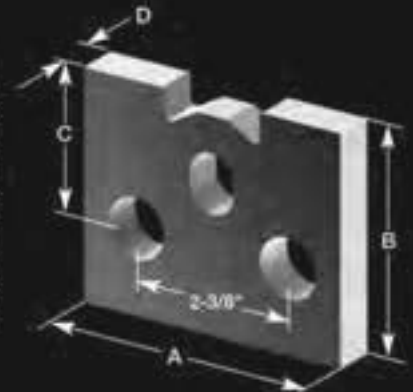
8-Ton anchor - Given full embedment, reinforced with two #5 rebar 3'-6" long bent as shown on page 41 and minimum compressive strength of 4,500 psi concrete; the 8-Ton Sandwich Anchor should achieve a pullout strength equal to their ultimate mechanical strength.

To Order, Specify: quantity, name, item number and finish.

MSI System Anchors

MSI-15 SANDWICH PANEL ERECTION ANCHOR 4-Ton with 2" Maximum Insulation Thickness

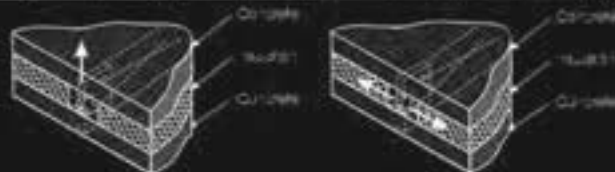
The MSI-15 Sandwich Panel Erection Anchor is a smaller version of the sandwich anchor designed to effectively lift and handle precast concrete sandwich panels with a maximum insulation thickness of 2". It is easy to install and requires no special lifting equipment, only the standard 4-Ton ring clutch. Its unique design distributes the lifting loads evenly into both wythes of the panel and absorbs shear loads without spalling the concrete. The Sandwich Panel Erection Anchor is available in the sizes shown in the table and in plain or hot dip galvanize finish. The Sandwich Panel Erection Anchor requires proper reinforcement, as shown in the product sketch. Refer to Sandwich Panel Erection Anchor Reinforcement Details below.



See Ring Clutches on page 45, 46, and 47, the Recessing Members on 48, 49.

MSI-15 SANDWICH PANEL ERECTION ANCHOR DATA

Ring Clutch System	Clutch I.D.	Item Number	A	B	C	D	Ultimate Mech. Load Tension (lbs)	Weight Per Piece (lbs)
4T	5T	79217	4"	3 1/4"	2 1/16"	5/8"	32,000	1.95

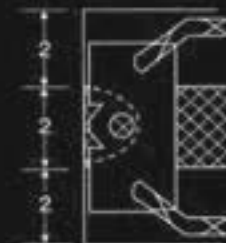


6" SANDWICH PANEL (2" X 2" X 2")

Ring Clutch System	Tension (lbs)	Shear Parallel to Anchor Width SF = 2.66:1 (lbs)	Shear Perpendicular to Anchor Width SF = 4:1 (lbs)
4T	6,500	1,125	3,750

The 2.66:1 safety factor is commonly used for back stripping operations. Increased safety factor may be required for unusual live loads or cable magnification.

To Order, Specify: quantity, name, item number and finish.



SANDWICH PANEL ERECTION ANCHORS REINFORCEMENT DETAILS FOR MSI-14 & MSI-15

Item Number	Ring Clutch System	Panel Thickness			Minimum Panel Thickness	Reinforcement Required		
		Bottom Wythe	Insulation	Top Wythe		Rebar Size & Length	Band Required Bottom	Band Required Top
79077	4T	3"	2"	3"	8"	#3 X 2'-6"	NO	NO
79077	4T	4"	2"	2"	8"	#3 X 2'-6"	NO	YES
79217	4T	2"	2"	2"	8"	#3 X 7'-6"	YES	YES
79184	8T	3"	2"	3"	8"	#5 X 3'-6"	NO	YES
79184	8T	4"	2"	2"	8"	#5 X 3'-6"	NO	YES

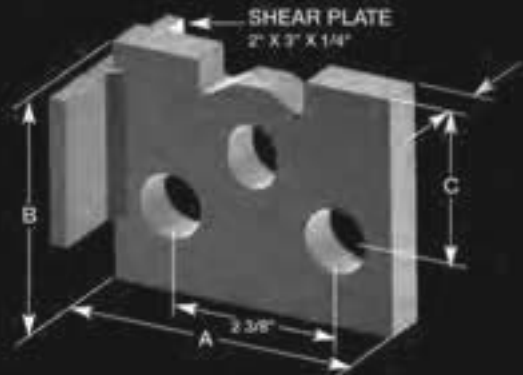


MSI System Anchors

MSI-16- SANDWICH PANEL ERECTION ANCHOR WITH PLATE 4-Ton with 2" Maximum Insulation Thickness

The MSI-16 Sandwich Panel Erection Anchor with Plate is designed to effectively lift and handle 2" x 2" x 2" prestressed sandwich panels. Two shaped reinforcement bars distribute the tension stress evenly into both concrete wythes and the shear plate absorbs the shear stress without spalling the concrete. Refer to the reinforcement bar information shown below. The Sandwich Panel Erection Anchor with Plate is available in plain or hot dip galvanize finish.

See Ring Clutches on page 45, 46, and 47, the Recessing Members on 48, 49.



MSI-16 SANDWICH PANEL ERECTION ANCHOR W/PLATE DATA

Ring Clutch System	Clutch I.D.	Item Number	A	B	C	D	Ultimate Mech. Load Tension (lbs)	Weight Per Piece (lbs)
4T	5T	79220	4"	3 3/4"	2 1/16"	5/8"	32,000	2.38

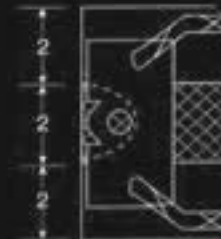


6" SANDWICH PANEL (2" X 2" X 2")

Ring Clutch System	Concrete Strength (psi)	Tension (lbs)	Shear Parallel to Anchor With SF = 2.66:1 (lbs)	Shear Perpendicular to Anchor With SF = 4:1 (lbs)
4T	3,000	7,580	2,500	4,520
4T	3,500	7,580	2,700	4,890
4T	4,000	7,580	2,890	5,230

The 2.66:1 safety factor is commonly used for back stripping operations. Increased safety factor may be required for unusual live loads or cable magnification.

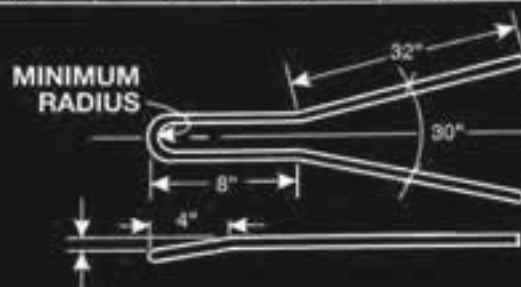
To Order, Specify: quantity, name, item number and finish.



RL-16 SANDWICH PANEL ERECTION ANCHORS W/PLATE REINFORCEMENT DETAILS

Item Number	Ring Clutch System	Panel Thickness			Minimum Panel Thickness	Reinforcement Required		
		Bottom Wythe	Insulation	Top Wythe		Rebar Size & Length	Band Required Bottom	Band Required Top
79220	4T	2"	2"	2"	6"	#3 X 7'-0"	YES	YES

Reinforcement detail for 79217 & 79220

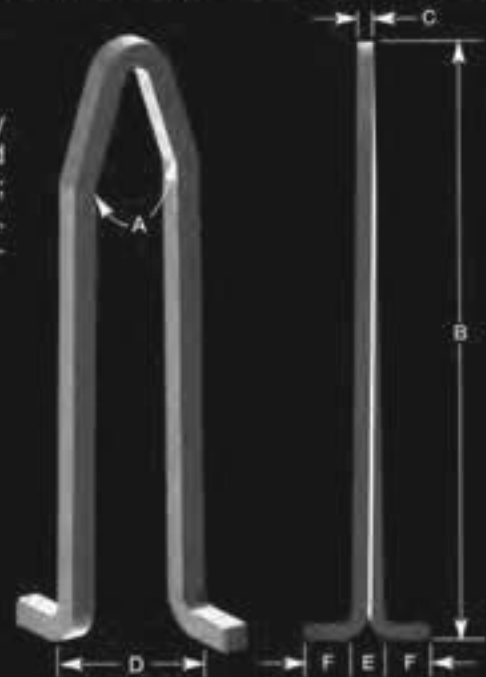
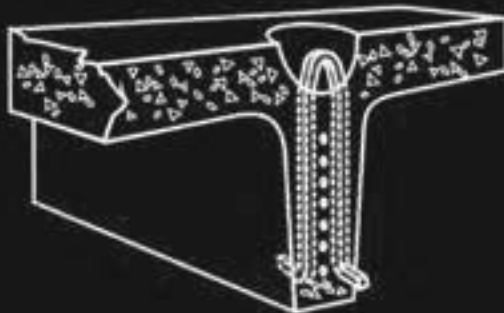


MSI System Anchors

MSI-62 DOUBLE-T ANCHOR 7.5-Ton

The MSI-62 Double-T Anchor – 7.5 Ton is simple in design, but very effective in its function of lifting and handling precast Single and Double Tees. The recessed anchor allows quick and easy finishing; no lifting strands to cut or burn off, only a simple patch of the recess. The anchor is available in plain finish only. Longer lengths are available on special order.

See Ring Clutch on page 47, and the Double-T Void below.



MSI-62 DOUBLE-T ANCHOR - 7.5 TON DATA

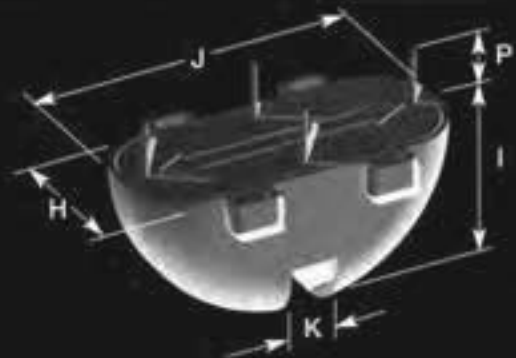
Ring Clutch System	Clutch I.D.	Item Number	A	B	C	D	E	F	Allowable Tension Load 4:1 SF (lbs)	Ultimate Mechanical Load Tension (lbs)	Weight Per Piece (lbs)
Super Lift III	10T	45SL3126	35"	22 7/8"	5/8"	3 1/2"	1 1/4"	1 3/4"	15,000	60,000	5.40
Super Lift III	10T	45SL31296	35"	22 7/8"	5/8"	4 1/4"	1 1/4"	1 3/4"	15,000	60,000	5.40
Super Lift III	22 KPS	45SL3011	35"	22 7/8"	3/4"	4"	1 1/4"	2"	20,000	80,000	7.50

Tension values are based on 3,500 psi standard weight concrete.

To Order, Specify: quantity, name, item number and finish.

MSI-65 DOUBLE-T VOID – 7.5 TON 8-Ton

The MSI-63 or MSI-65 Double-T Void – 7.5 Ton is a disposable plastic recess member furnished for use with the 8-Ton Double-T – 7.5 Ton Erection Anchor.



7.50-TON DOUBLE-T VOID

Ring Clutch System	Clutch I.D.	Item Number	Description	K	H	J	I	P	Weight Per Piece
S-L III	22K	45891	S-L III Double-T Void	5/8"	2 1/2"	5 1/4"	2 1/8"	3/4"	0.30 lbs

To Order, Specify: quantity, name and item number.

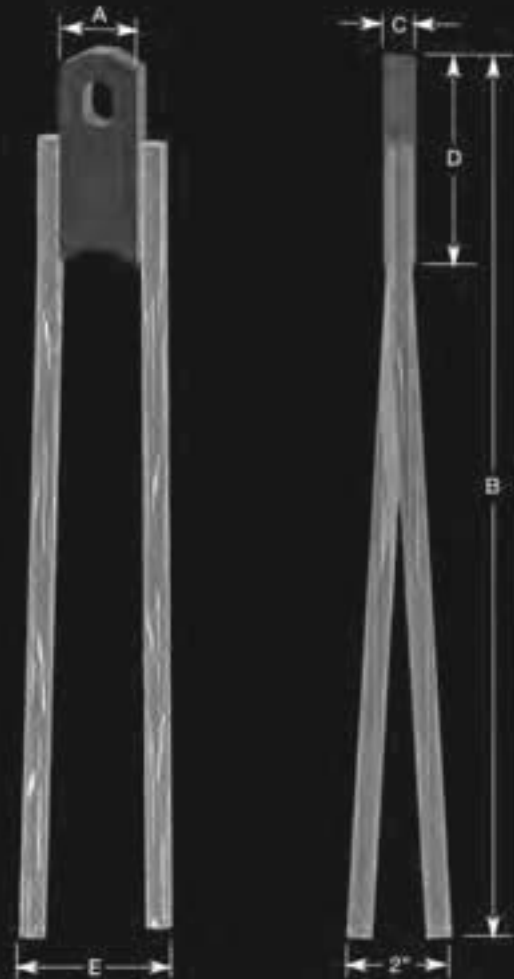
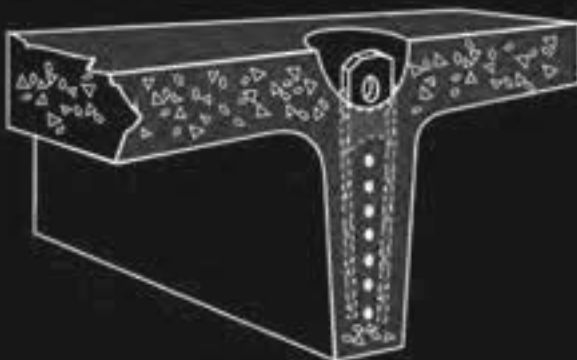
MSI System Anchors

MSI-61 DOUBLE-T ANCHOR 4-Ton, 8-Ton and 22-Ton

The MSI-61 Double-T Anchor is designed mainly to lift and handle precast single or double tees, but can also be used effectively on columns, beams, girders, etc. The recessed anchor allows quick and easy finishing; no lifting strands to cut or burn off, only a simple patch of the recess. The Double-T Anchor is available in plain and hot dip galvanize finish. Refer to the table for standard sizes and safe working loads. Longer lengths are available on special order.

See Ring Clutches on page 45, 46, and 47, the Recessing Members on 48, 49.

Double-T Anchors are designed for use on 18" and deeper precast concrete Tee sections. Reference the table for standard sizes and dimensions. Longer legs can be provided on special order, but will not increase the allowable tension load of the anchor.



MSI-61 RAPID LIFT DOUBLE-T ANCHOR DATA

Ring Clutch System	Clutch I.D.	Item Number	A	B	C	D	E	Allowable Tension Load 4:1 SF (lbs)	Ultimate Mechanical Load Tension (lbs)	Weight Per Piece (lbs)
4T	5T	79132	1 1/2"	16 5/8"	5/8"	4"	2 1/4"	8,000	32,000	3.00
8T	10T	79126	2 3/8"	22 1/4"	3/4"	4"	3 1/2"	16,000	64,000	7.00
22T	22T	79179	3 1/8"	22 5/8"	1"	4"	5 1/4"	28,000	112,000	9.00

Tension values are based on 3,500 psi standard weight concrete.

To Order, Specify: quantity, name, item number and finish.

Optional Bullet T-Caps are available in bulk for field assembly or can be ordered installed on the anchor. For factory installation, it must be specified when ordering the anchors.



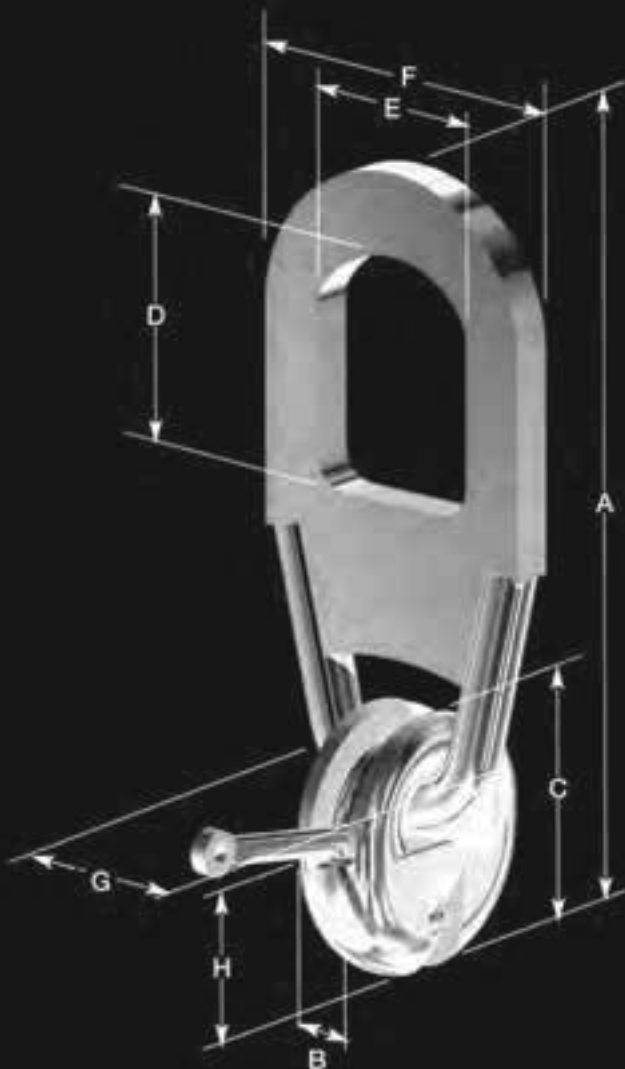
Optional Bullet T-Cap
Item no. 79030

MSI System Ring Clutches

MSI-35 RING CLUTCH

2-Ton, 4-Ton, 8-Ton and 22-Ton

The MSI-35 Ring Clutch is an assembly consisting of a main clutch body, a curved bolt/handle and bail. The design of the ring clutch allows a full 360° rotation of the bail around the main body. The installation of the unit is quick and easy; simply rotate the curved bolt/handle to the open position, drop the main body into the anchor recess and rotate the bolt/handle to the closed position. See page 47 for ring clutch bolt. See page 12 for ring clutch maintenance information.



MSI-35 RAPID LIFT RING CLUTCH DATA

Ring Clutch System	Clutch I.D.	Item Number	A	E	C	D	E	F	G	H	Weight Per Piece (Lbs)
2T	2.5T	79001	10 5/16"	1 1/16"	2 3/4"	3 1/4"	2 5/8"	3 3/4"	2 3/8"	1 1/2"	3.65
4T	5T	79002	13 1/4"	1 7/16"	3 11/16"	4 1/2"	2 5/8"	4 5/8"	3"	2"	8.65
8T	10T	79003	16 1/2"	2"	5 5/16"	5 3/8"	3 5/8"	5 7/8"	4"	2 3/4"	19.87
22T	22T	79170	23 7/8"	2 13/16"	8 1/4"	7 1/4"	4 3/4"	7 7/8"	6 1/2"	4"	55.0

1) Super Lift II Ring Clutch may be used, if a longer handle is required.

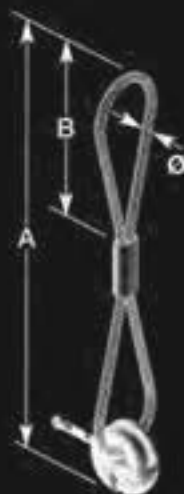
2) Available on special order or limited to quantity on hand. Special orders take 8 to 10 weeks.

To Order, Specify: quantity, name and item number.

MSI System Ring Clutches

MSI-38 CABLE RING CLUTCH 1-Ton, 2-Ton, 4-Ton and 8-Ton

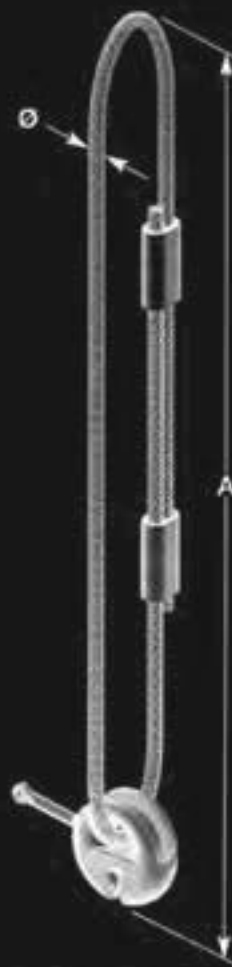
The MSI-38 Ring Clutch – Cable is identical in use to the standard ring clutch, but is fabricated with a wire cable bail for more versatility. It is often an effective answer for difficult lifting and rotation challenges. See page 15 and 16 for additional ring clutch installation information. See page 12 for ring clutch maintenance information.



MSI-38 Cable Ring Clutch
1-Ton, 2-Ton, 4-Ton
and 8-Ton

MSI-39 CABLE RING CLUTCH 22-Ton

The MSI-39 Ring Clutch – Cable is a heavy duty version of the cable ring clutch for use where high loads are present. See page 15 and 16 for additional ring clutch installation information.



MSI-39 Cable Ring Clutch
22-Ton

MSI-38 & MSI-39 CABLE RING CLUTCH DATA

Item	Ring Clutch System	Clutch L.D.	Item Number	A	B	Cable Diameter Ø	Weight per Piece
RL-38	1T	1.25T	79216	12 1/2"	8 1/4"	8 mm	2.0 lbs
RL-38	2T	2.5T	79001CB	22"	11 7/8"	14 mm	5.0
RL-38	4T	5T	79002CB	23 5/8"	11 3/4"	18 mm	8.0
RL-38	8T	16T	79003CB	27 3/4"	12 3/4"	22 mm	19.0
RL-39	22T (B130)*	22T	79170CB	62"	N/A	32 mm	67.0

* Available on special order or limited quantity on hand. Special orders take 8 to 10 weeks.

To Order, Specify: quantity, name and item number.

MSI System Ring Clutches

MSI-36 RING CLUTCH BOLT

1-Ton, 2-Ton, 4-Ton, 8-Ton and 22-Ton

The MSI-36 Ring Clutch Bolt is available for replacement purposes, when required. Refer to the table for size and item number. Refer to page 12 for additional ring clutch maintenance information.

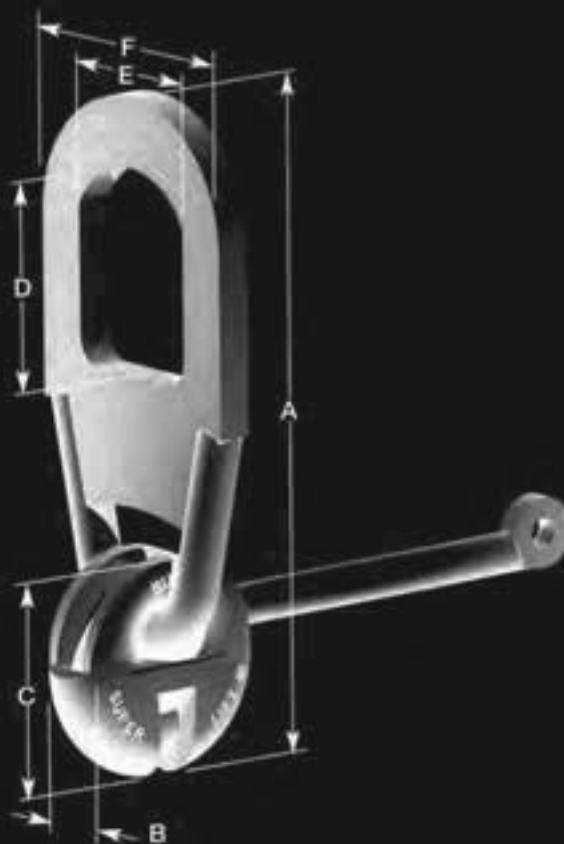


MSI-36 RING CLUTCH BOLT DATA		
Nominal Anchor Load	Clutch I.D.	Item Number
1T	1.25T	79165
2T	2.5T	79005
4T	5T	79006
8T	10T	79007
22T	22T	79009

To Order, Specify: quantity, name and item number.

MSI III RING CLUTCH

MSI III Ring Clutch is an assembly consisting of a main clutch body, a curved bolt/handle and bail. It is very similar to the Rapid Lift Ring Clutch, but has a much longer handle. The installation of the unit is quick and easy; simply rotate the curved bolt/handle to the open position, drop the main body into the anchor recess and rotate the bolt/handle to the closed position. See pages 15 and 16 for additional ring clutch installation information. See page 12 for ring clutch maintenance information.



MSI-36 RING CLUTCH BOLT DATA								
Ring Clutch System	Clutch I.D.	Item Number	A	B	C	D	E	F
SI-III	22-T	45803	14"	1-7/8"	9"	3-3/8"	2-3/4"	5"

To Order, Specify: quantity, name and item number.

MSI System Recessing Members

MSI-40 RECESS MEMBER - 2 HOLE 1-Ton only - Blue Color

The MSI-40 Recess Member - 2 Hole is a reusable plastic unit furnished for use with the 1-Ton Rapid Lift. Erection methods are designed for architectural precasters. As with all Recess Members, it functions to attach the anchor to the form, protect the anchor recess during concrete placement and form a void to allow the lifting clutch to engage the head of the anchor.

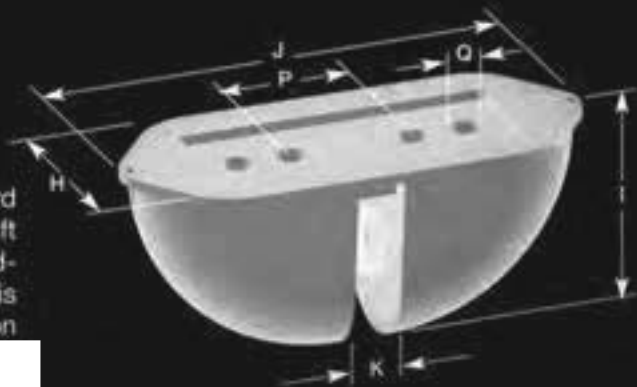


MSI-40 RECESS MEMBER - 2 HOLE										
Ring Clutch System	Clutch I.D.	Item Number	Recess Color	H	I	J	K	P	Q	Weight Per Piece (lbs)
1T	1.251	79056	Blue	1 1/8"	1 3/8"	2 3/8"	1/4"	1"	8 mm	0.1

To Order, Specify: quantity, name and item number.

MSI-45 RECESS MEMBER - 4 HOLE 2-Ton, 4-Ton, 8-Ton and 22-Ton

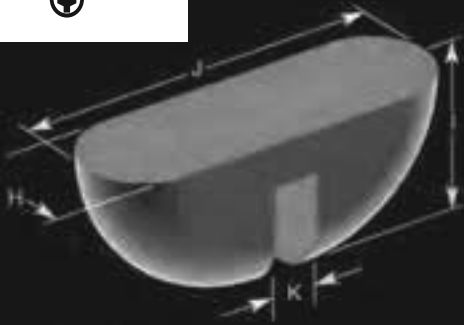
The MSI-45 Recess Member - 4 Hole is the standard reusable plastic recess plug used in most Rapid Lift applications. Refer to the table for sizes and color-coding. Note that the 2-Ton narrow (Red) recess member is for use only with the 2-Ton Spread Anchor and the 2-Ton Flat Foot Anchor.



MSI-45 RECESS MEMBER - 4 HOLE										
Ring Clutch System	Clutch I.D.	Item Number	Recess Color	H	I	J	K	P	Q	Weight Per Piece (lbs)
2T	2.5T	79050	Yellow	1 11/16"	1 3/4"	4 1/16"	3/8"	1 3/16"	10 mm	0.18
2T	2.5T	79051	Red	1 11/16"	1 3/4"	4 1/16"	3/16"	1 3/16"	10 mm	0.19
4T	5T	79052	Orange	2 1/16"	2 5/16"	5 3/16"	5/8"	1 11/32"	10 mm	0.44
8T	10T	79121	Green	3 1/8"	3 5/16"	7 13/32"	3/4"	1 31/32"	12 mm	1.43
22T	22T	79166	Blue	4 9/16"	4 5/8"	9 3/16"	1"	2 3/4"	12mm/16mm	3.96

- 1) Available on special order or limited quantity on hand.
- 2) Use with the 2-Ton Spread Anchor (79050), 2-Ton Flat Foot Anchors (79052) and (79053).

To Order, Specify: quantity, name and item number.



MSI System Recessing Members

MSI-50 RECESS MEMBER – DISPOSABLE 4-Ton and 8-Ton

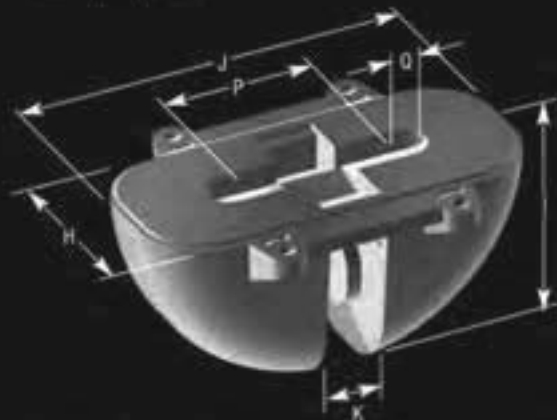
The MSI-50 Recess Member-Foam is available for use with the 4 and 8-Ton Rapid Lift applications and is simply nailed in place on the form.

MSI-50 Foam Disposable Recess Member 4-Ton & 8-Ton

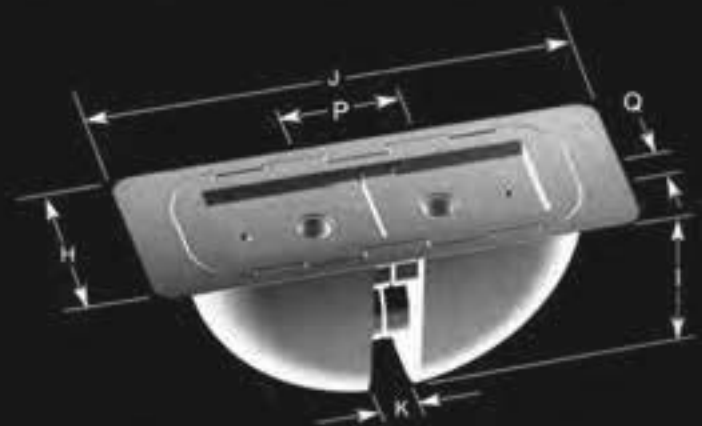
MSI-50 FOAM DISPOSABLE RECESSING MEMBER DATA							
Ring Clutch System	Clutch I.D.	Item Number	H	I	J	K	Weight Per Piece (lbs)
4T	5T	79767	1 3/4"	2 3/8"	4 1/4"	5/8"	0.05
8T	10T	79768	2 1/4"	3 1/4"	6 1/2"	3/4"	0.06

MSI-53 RECESS MEMBER – DISPOSABLE 2-Ton, 4-Ton and 8-Ton

The MSI-53 Recess Member – Disposable is available for use with the 2, 4 and 8-Ton Rapid Lift applications. All plastic disposable recess members utilize a 3/8" diameter coil nut embedded in the member for attachment purposes.



MSI-53 Plastic Disposable Recess Member 2-Ton & 4-Ton



MSI-53 Plastic Disposable Recess Member 8-Ton - with 3/8" coil attachment nut and magnetic holding plate.

MSI-53 PLASTIC DISPOSABLE RECESSING MEMBER DATA											
Item	Ring Clutch System	Clutch I.D.	Item Number	Recess Color	H	I	J	K	P	Q	Weight Per Piece (lbs)
53	2T	2.5T	79766	Yellow	2"	1 1/2"	3 5/16"	3/8"	1 1/2"	5/16"	0.13
53	4T	5T	79057	Yellow	2 1/2"	2 1/4"	4 5/16"	5/8"	2"	1/2"	0.20
53	4T	5T	79065	Yellow	2 7/8"	2"	4 1/4"	5/8"	N/A	N/A	0.30
53	8T	10T	79068	Green	3 1/8"	3 1/4"	7 7/8"	13/16"	1 31/32"	1/2"	0.47

To Order, Specify: quantity, name and item number.

MSI Lift System Accessories

MSI-46 HOLDING PLATE

1-Ton, 2-Ton, 4-Ton, 8-Ton and 22-Ton

The MSI-46 Holding Plate can be used in various ways to attach and firmly hold a recess member to the form. It can be nailed or screwed to the form utilizing the furnished holes in the plate. For a permanent, reusable application involving metal forms, the holding plate can be welded in place. For a quick once-off application, the holding plate can be held in place with a good commercial grade double-back tape.

Centering it over the protruding pins of the holding plate and sliding the recess member onto the pins, easily accomplishes recess member installation. See additional installation and stripping information on pages 12 and 13.



MSI-46 HOLDING PLATE DATA

Ring Clutch System	Clutch I.D.	Item Number	Q	Weight Per Piece
1T	1.25T	79152	8 mm	0.15 lbs
2T	2.5T	79150	10 mm	0.16
4T	5T	79144	10 mm	0.26
8T	10T	79111	12 mm	0.50
22T	22T	79177	16 mm	1.30

To Order, Specify: quantity, name and item number.

MSI HOLDING PLATE – MAGNETIC

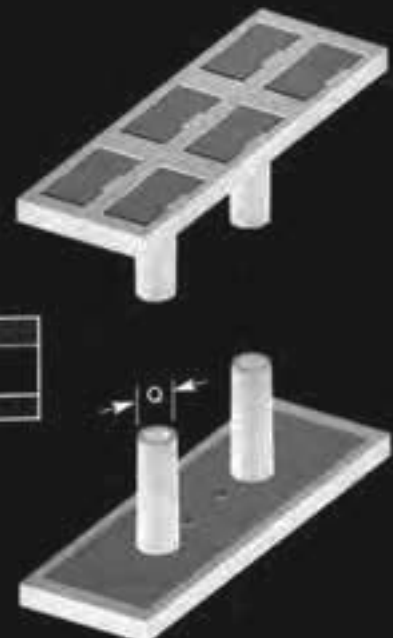
8-Ton

The Holding Plate – Magnetic is available to quickly set and securely hold a Rapid Lift anchor in a metal form without hole drilling or welding.

RAPID LIFT HOLDING PLATE - MAGNETIC

Ring Clutch System	Clutch I.D.	Item Number	Q	Material	Weight (lbs)
8T	10T	79155P	3/8"	Plastic	0.5

To Order, Specify: quantity, name and item number.



MSI System Accessories

MSI BOTLS/WING NUTS

The Rapid Lift System provides various types of attachment bolts for attaching recess members to the form. Selection depends on application and/or personal preference.

MSI-47 L-Rod Style is available for use with 1, 2, 4, 8 and 22-Ton plastic recess members. It functions much the same as the wing nut style above, but utilizes an "L" shaped handle to thread the unit. Refer to the table for applicable thread size.



MSI-48 Wing Nut Style Bolt is available for use with 1, 2, 4, 8 and 22-Ton plastic recess members. It is installed by inserting the bolt through the form and threaded into the recess member. It also draws the recess member tight to the form utilizing the free-running wing nut. Refer to the table for applicable thread size.



MSI-47 & MSI-48 L-ROD/BOLT & WING NUT ASSEMBLY					
Ring Clutch System	Clutch I.D.	Item Number	L	D	Weight Per Piece (lbs)
1T	1.5T	79022	6 3/8"	8MM	0.15
2T	2.5T	79202	5 7/8"	3/8 coil	0.15
4T	5T	79202	5 7/8"	3/8 coil	0.15
8T	10T	79202	5 7/8"	3/8 coil	0.48
22T	22T	79088	6 9/16"	16MM	0.86

To Order, Specify: quantity, name and item number.

MSI-49 Bayonet Style Bolt is available for use with 2-, 4-, 8- and 22-Ton plastic recess members. It is installed by inserting the bolt through the form into the back of the recess member. It is given a 90° turn with the fixed wing nut at the end of the bolt and the recess member is drawn tight to the form with the free-running wing nut. Refer to the table for applicable thread size.



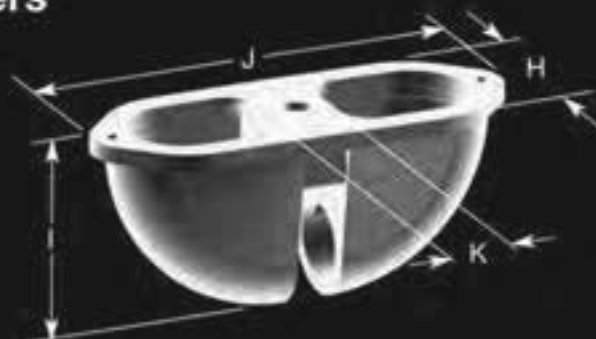
MSI-49 BOLT & WING NUT BAYONET ASSEMBLY					
Ring Clutch System	Clutch I.D.	Item Number	L	D	Weight Per Piece (lbs)
2T	2.5T	79102	6"	8MM	0.18
4T	5T	79102	6"	8MM	0.18
8T	10T	79129	6 5/8"	12MM	0.50
22T	22T	79129	6 5/8"	12MM	0.50

To Order, Specify: quantity, name and item number.

MSI System Recessing Members

MSI-55 RECESS MEMBER – STEEL 2-Ton, 4-Ton, 8-Ton and 22-Ton

The MSI-55 Recess Member – Steel is designed for high re-use applications and/or where heavy pressure and temperatures are encountered. Each recess member comes with a wedge and a foam strip (packed separately). Replacement wedges and foam strips are available, see below.



MSI-55 RAPID LIFT STEEL/IRON RECESSING MEMBERS

Ring Clutch System	Clutch I.D.	Item Number	H	I	J	K	Weight Per Piece (lbs)
2T	2.5T	79078	1 7/16"	1 11/16"	4"	1/2" coil	0.69
4T	5T	79100	1 7/8"	2 1/4"	4 15/16"	1/2" coil	1.25
8T	10T	79015	2 3/4"	3 1/4"	7 1/4"	16 mm	3.50
22T	22T	79171	4 1/2"	4 3/4"	8 7/8"	16 mm	13.0

To Order, Specify: quantity, name and item number.

MSI-57 STEEL RECESS MEMBER WEDGE 2-Ton, 4-Ton, 8-Ton and 22-Ton

The MSI-57 Wedge is available when replacement is required. It is used in conjunction with the steel recess member to firmly capture and hold the anchor in the recess member. See data below.

MSI-57 RECESS MEMBER WEDGE DATA

Ring Clutch System	Clutch I.D.	Item Number	Weight Per Piece (lbs)
2T	2.5T	79017	0.13
4T	5T	79084	0.38
8T	10T	79085	0.94
22T	22T	79173	2.16



To Order, Specify: quantity, name and item number.

MSI-59 STEEL RECESS MEMBER FOAM STRIP 2-Ton, 4-Ton, 8-Ton and 22-Ton

The MSI-59 Foam Strip is available in bulk for use in conjunction with the steel recess member.

MSI-59 RECESS MEMBER FOAM STRIP DATA

Ring Clutch System	Clutch I.D.	Item Number	Pkg./Ctn.	Weight Per Package (lbs)
2T	2.5T	79087	1000	5.00
4T	5T	79089	1000	5.00
8T	10T	79091	500	10.00
22T	22T	79175	100	20.00

To Order, Specify: quantity, name and item number.

MSI BOTLS/WING NUTS

MSI Wing Nut Coil Bolt is used with 2, 4, 8 and 22-Ton steel recess members. It functions the same as the wing nut bolt above. Refer to the table on the following page for applicable thread size.



MSI-58

MSI-67 L-Rod Coil Bolt is used with 2, 4, 8 and 22-Ton steel recess members. It functions the same as the Wing Nut Coil Bolt above. Refer to the table on the following page for applicable thread size.



MSI-67

MSI-58 & MSI-67 COIL BOLT & BOLT WING NUT ASSEMBLY

Ring Clutch System	Clutch I.D.	Item Number	Type	L	D	Weight Per Piece (lbs)
2T	2.5T	79131	1/2" coil	5 3/4"	1/2" coil	0.40
4T	5T	79131	1/2" coil	5 3/4"	1/2" coil	0.40
8T	10T	79088	16MM	6 9/16"	16MM	0.85
22T	22T	79088	16MM	6 9/16"	16MM	0.85

To order, specify: quantity, name and item number.

MSI PRECAST PATCH

2-Ton, 4-Ton and 8-Ton

The Precast Patch is designed as a simple alternative to patching the recess formed by the anchor void. The plastic patch installs quickly and gives a long-lasting seal with a matte finish, in case painting is required. One size fits all, Item Number – 45612.

To Order, Specify: quantity, name and item number.



MSI SEALING COVER

2-Ton, 4-Ton, 8-Ton and 22-Ton

MSI Sealing Cover is a strong, lightweight plug available as a temporary cover for cast in place Rapid Lift anchors.

To Order, Specify: quantity, name and item number.



Prestressed Accessories

Prestress Sheathing



Prestress Sheathing

Designed to debond $1\frac{1}{2}$ in or $\frac{6}{10}$ in. prestressed strand easily and economically

Part No.	Code	Size (in.)	Qty.	Lineal ft.
	NSS20 (Non-Slit)	.67 x 10 tf	175	1750
1020903	PRS30 (Slit)	$\frac{1}{2}$ x 10 tf	250	2500

Recess Plug



Recess Plug

For forming voids quickly and easily around ends of prestressed concrete units.

Part No.	Code	Size (in.)	Qty./Ctn.
1001137	REPLU	$1\frac{1}{8}$ x $1\frac{1}{8}$ x $\frac{3}{4}$	6000

Graphite Spray



Midspec Graphite Spray

For lubricating strand chucks for re-use. The graphite spray is a dry film lubricant aerosol spray ideal for on-the-job use.

Part No.	Code	Size	Qty./Ctn.
1000998	GSPRA	12 fl. oz. can	24 cans

Galvanized Compound



Galvanized Compound

ZRC Galvanizing Compound is ideal for fast application and corrosion protection of mill finish steel. ZRC Galvanizing is stocked in gallon containers, quart containers, and aerosol 24 ounce spray cans.

Code	Size	Qty./Ctn.
ZRC	Quart	6
ZRC	Gallon	2
ZRC	Spray Can	24

Structural Components / Lifting and Handling Inserts

Lifting Insert



Lifting Insert

Lifting inserts are engineered from high strength steel. All lifting inserts inherent design prevents the ring clutch from bearing on the concrete eliminating spalling and cracking during edge lifting.

Code	Size	Qty./Ctn.
FLO47	2 Ton	N/A
FLO48	4 Ton	N/A
FLO49	8 Ton	N/A
FLI47	2 Ton w/ shear plate	N/A
FLI48	4 Ton w/ shear plate	N/A
FLI49	8 Ton w/ shear plate	N/A

Shelf Angle Insert



Shelf Angle Insert

MidSpec Shelf Angle Inserts are manufactured from ductile iron. The wedge shaped track allows for vertical adjustment of the askew bolt and eliminates slippage. Shelf Angle Inserts are used for secondary connections.

Structural Components

Code	Size	Qty./Ctn.
6UA444	0.444" x 4.75"	N/A
6UA671	0.671" x 4.75"	N/A
8UA671	0.671" x 6.75"	N/A

Utility Anchor

The MidSpec Utility Anchor is ideal for economical lifting and handling of precast concrete pieces. It is easy to use and simple to install. With utility anchors, no special lifting devices are required; a standard hook or clevis can be used.



Code	Size	Qty./Ctn.
COIL ROD	1/2" x 12' long	100 pcs./bundle
COIL ROD	3/4" x 12' long	50 pcs./bundle
COIL ROD	1" x 12' long	50 pcs./bundle
COIL ROD	1 1/4" x 12' long	25 pcs./bundle
COIL NUT	1/2"	1000/box
COIL NUT	3/4"	500/box
COIL NUT	1"	150/box
COIL NUT	1 1/4"	70/box
COIL BOLT	1/2", 3/4", 1", 1 1/4"	varies

Coil Rods, Bolts and Coil Nuts

Coil Rods are High Strength continuous coil threaded steel rods. They are ideal for use with concrete because of the self-cleaning coil thread design. Coil Rods are stocked in 1/2", 3/4", 1" and 1-1/4" diameters. All rods are stocked 12" long. Rods can be cut to any specified length less than 12 feet long.

MidSpec Coil Bolts are available in 1/2", 3/4", 1", 1-1/4", and 1-1/2" diameters. Coil bolts have the same fast-acting and self-cleaning threads as coil rod making them ideal for use with concrete.

MidSpec Coil Nuts are available in 1/2", 3/4", 1", 1-1/4", and 1-1/2" diameters.

Coil nuts are designed to be used with coil rod or coil bolts.



MSI ROF PHYSICAL PROPERTIES

TENSILE STRENGTH (Per ASTM D412 die C)

Parallel to grain-flow —————1000 Psi Min
 Perpendicular to grain-flow —————450 Psi Min
 Ultimate Strength —————up to 10000 Psi

ELONGATION

Parallel to grain-flow —————15% Min
 Perpendicular to grain-flow —————40% Min

TEAR STRENGTH (Per ASTM D624 die B)

Parallel to grain-flow —————400 Pi Min
 Perpendicular to grain-flow —————175 Pi Min

HARDNESS

Shore A —————80 +/-5

HEAT AGING (After 70 hours at 158(F)

Change in tensile strength —————25% Max
 Change in elongation —————-25% Max
 Change in hardness shore A —————10 Points Max

OZONE RESISTANCE (After 50 hours at 100(F) in an ozone)

Concentration of 80 parts per hundred million
 Tear Strength perpendicular to grain-flow —150 Pi Min



MSI ROF Pads are used in precast construction, prestressed concrete bridges and buildings, concrete parking decks, and machinery and equipment foundations. MSI ROF Pads are designed to distribute vertical loads uniformly over bearing areas, allow horizontal/rotational movements at the bearing surface, isolate shock loads on structural members and minimize vibration between contacting surfaces.

MSI XL ROF Pads are commonly used in the same applications as MSI ROF Pads where a higher load requirement exists.

MSI XL ROF SPECIFICATIONS



1. HARDNESS

Shore A _____ 75+/- 5

2. COMPRESSION

Minimum Ultimate Strength _____ 8000 psi

3. SHEAR MODULUS (G)

(G) _____ 230 +/- 30 psi
G is constant in all directions parallel to the bearing plane.

4. TENSILE STRENGTH

(ASTM D412, Die C) _____ 1000 +/- 100 psi

5. TEAR STRENGTH

(ASTM D624, Die B) _____ 400 lb/in minimum

6. HEAT AGING

a. Change in Elongation (per ASTM D573)

70 hrs@ 212° F, % Change _____ 25% max.

b. Change in Tensile Strength (per ASTM D1149)

70 hrs@ 212° F, % change _____ 25% max

c. Change in Hardness (per ASTM D573)

70 hrs@ 212° F, Point Change _____ 10 point max

7. OZONE RESISTANCE

Ozone Resistance (per ASTM D1149)

Exposed 50 hrs@100 pphm @ 100°

8. OIL IMMERSION

Oil Immersion (per ASTM D471)

70 hrs@ 212° F in ASTM #3 oil

Volume Change, % _____ 120% max.

MSI SPECTECH PADS

HARDNESS

Shore A _____ 90 +/- 5

COMPRESSION

Minimum Ultimate Strength _____ 10,000 psi

SHEAR MODULUS

G _____ 450 psi

Based on tests conducted according to ASTM D4014-87, Annex A1 at pure shear strain of 33 percent

APPARENT SHEAR MODULUS

G_A _____ 400, 850, 1150 & 1325 psi

At compressive stresses of 500, 1000, 2000 and 3000 psi. Based on shear stress measurements made at 70 °F to 80 °F at a shear plus slip strain of 50 percent

PERMANENT SET

Permanent Set _____ 2 +/- 1%

VOLUME

Volume swell per FED-STD-601(Ref.) _____ 25% max

Volume Resistivity, ASTM D257 (ohm^o cm x 10¹⁰) _____ 3.3

STRENGTH

Dielectric Strength, ASTM D149 (VDC/mil.) _____ 155

THICKNESS

Thickness tolerance _____ 5% of thickness

PLAN SIZE

Plan Size tolerance _____ +/- 1/8 in.



Rebar Supports & Spacers
Prestressed/Forming Accessories
Transportation Accessories

Accessories

Plastic Rebar Supports



Econo Chair



Econo Chair - The most economical and accurate reinforcement for standard mesh sizes. Arched footing design assures minimal contact with form and maximum bond.

Code	Cover	Bar No.	Qty./Ctn.
1000901	3/4" - 1"	Mesh	5000

Stackable Mesh Chair



Stackable Mesh Chair - Cost effective stackable mesh support system.

Code	Cover	Bar No.	Qty./Ctn.
TAN PILOT	1"	MESH	1000
NAT PILOT	1"	MESH	1000
NAT BASE	1"	MESH	1000

Barspan Clip



Barspan Clip - General purpose clip-on spacer accommodates larger range of bar diameters. Heavy duty design easily supports extra loads.

Code	Cover	Bar No.	Qty./Ctn.
C16SN	1"	M-5	3000
C20SN	1-1/2"	M-7	1000
C34MX	1-1/2"	2-8	500
C22SN	2"	M-9	1000
C35MX	2"	2-7	500
C21SN	2-1/2"	M-8	500

Midspec Clip



MIDSPECCLIPS - For the positioning of horizontal reinforcement. Design allows for easy flow of concrete for maximum bond.

Code	Cover	Bar No.	Qty./Ctn.
C	1/2"	3-7	3,000
1000928	3/4"	3-6	2500
1000930	1"	2-6	2500
1000932	1-1/2"	2-6	1500
1000932-01	1-3/4"	3-6	1500
1000933	2"	4-6	1000
1001933	2-1/2"	4-6	750
1002933	3"	4-6	500

EAM-Chair

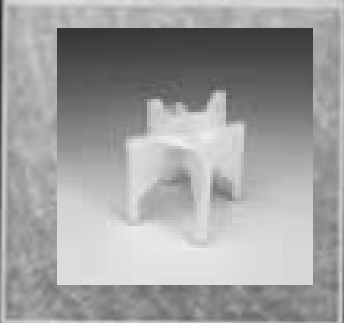


EA-Chairs - (PATENT) Designed for exposed aggregate or sand-blasted concrete. Fine points at leg base make it virtually invisible on the surface of the architectural concrete. Special colors are available upon request. Minimum 10 ctn order for special colors.

Part No.	Code	Cover	Bar No.	Qty./Ctn.
1000913	EAM75	3/4"	MESH	2000
1000905	EAM10	1"	MESH	1000
1000902	EAM15	1-1/2"	MESH	1000
1000909	EAM20	2"	MESH	500
1000907	EAM25	2-1/2"	MESH	500
1000911	EAM30	3"	MESH	250

* Mesh is easily snapped into slots

EAR-Chair



Part No.	Code	Cover	Bar No.	Qty./Ctn.
1000904	EAR10	1"	ALL	1000
1000903	EAR15	1-1/2"	ALL	1000
1000908	EAR20	2"	ALL	500
1000906	EAR25	2-1/2"	ALL	500
1000912	EAR30	3"	ALL	250
1000910	EAR35	3-1/2"	ALL	250
1000914	EAR40	4"	ALL	250

* All of the above chairs are for use with rebar

Hi-Stack Chair



Hi-Stack Chairs - Heavy duty, stackable, rebar support system for a variety of cover requirements.

Part No.	Code	Cover	Bar No.	Qty./Ctn.
1000922	HIC15	1-1/2"	ALL	250
1000923	HIC20	2"	ALL	250
1000924	HIC25	2-1/2"	ALL	250
1000925	HIC30	3"	ALL	200
1000984	HIC35	3-1/2"	ALL	200
1000926	HIC40	4"	ALL	200

Plastic Rebar Supports

Hog/Cattle Chair

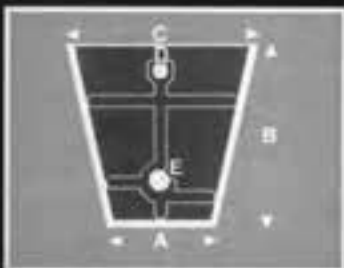


Hog/Cattle Slat Chair - Exclusive design quickly and accurately positions both bottom and top rebars in one step.

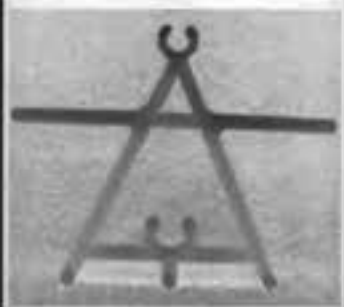
Code	A	B	C	Cover	Bar No.	Qty
RIGHT SIDE UP CASTING						
SLATS	3"	4"	5"	3/4"	3,4	500
SLATW	3"	4"	5"	1"	3,4	500
SLATL	3"	5"	5"	3/4"	3,4	500
SLATX	5"	5"	7"	3/4"	3,4	500
SLATB	4"	4"	6"	3/4"	3,4	500
SLATB	4"	4"	6"	3/4"	3,4	500
SLAWS	5"	4"	5"	3/4"	3,4	500

UPSIDE DOWN CASTING

SLCS5	5"	4"	4"	3/4"	3,4	500
SLATH	6"	4"	4"	3/4"	4,5	500



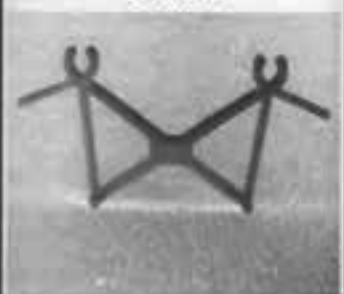
Median Barrier Chair



Median Barrier Chairs - Accurately positions and supports rebar during the casting of median barriers.

Code	Cover	Bar No.	Qty./Ctn.
MEDBR	5" Top	3,4	
	3/4" Bottom	4,5,6	200
MEDBA	2"	4GA Mesh	500

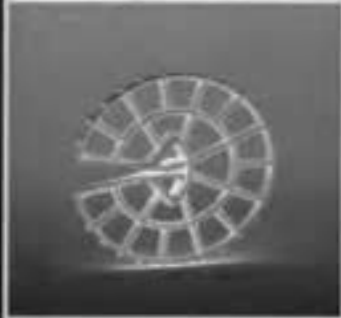
Bumper Curb Chair



Bumper Curb Chairs - Accurately positions and supports rebar during the casting of bumper curbs.

Code	Cover	Bar No.	Qty./Ctn.
BOCHS	1-1/2"	3,4	250

Barspan Wheel



Barspan Wheel - General purpose circular spacer accommodates a large range of bar diameters. Heavy duty design easily supports extra loads.

Code	Cover	Bar No.	Qty./Ctn.
W93MN	3/4"	2-4	2000
W14MN	1"	M-5	1000
W84MN	1-1/2"	M-3	500
W88MN	2"	M-2	250
W97MN	2"	4-6	250
W12MN	3"	M-6	100
W13MN	3"	6-9	100

MidSpec Wheel

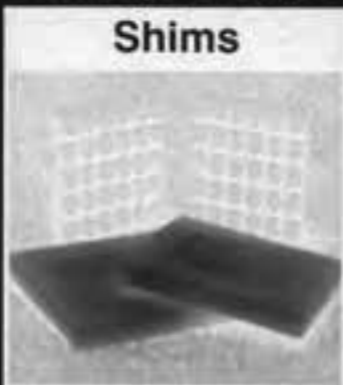


MidSpec Wheel - Suitable for spacing concrete reinforcement in columns, walls, piles and precast units.

Code	Cover	Bar No.	Qty./Ctn.
W7523	3/4"	2,3	2000
W1023	1"	2,3	1000
W1004	1"	4	1000
W1534	1-1/2"	3,4	500
W1556	1-1/2"	5,6	500
W2004	2"	4	500
W2505	2-1/2"	5,6	250
W275M	2-3/4"	Mesh	250
W3004	3"	4	250
W4005	4"	5	100
W5505	5-1/2"	5	50
W6005	6"	5	40

Shim Spacers

Shims

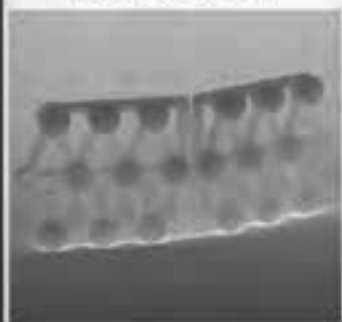


Shims - Non-corrosive, non-staining, optional color coded and non-slip textured surface shims. For leveling concrete units during erection. A wedge shim is also available.

Code	Size	Qty.
SH216	2" x 2" x 1/16"	2000
SH208	2" x 2" x 1/8"	2000
SH204	2" x 2" x 1/4"	1000
SH203	2" x 2" x 3/8"	500
SH202	2" x 2" x 1/2"	500
SH316	3" x 3" x 1/16"	1500
SH308	3" x 3" x 1/8"	1000
SH304	3" x 3" x 1/4"	500
SHWG1	3-1/2" x 1-1/2" x 1/4" to 1/6"	1000

Transportation Accessories

Econo Pad



Econo Pad - An economical way to protect architectural precast/prestressed units from discoloration, cracking, chipping and breakage during storage, packing and shipping. The pads are scored and may be broken into two or they can be folded for greater clearance.

Code	Size	Qty.
1000896	2-1/2" x 6" x 3/8"	400

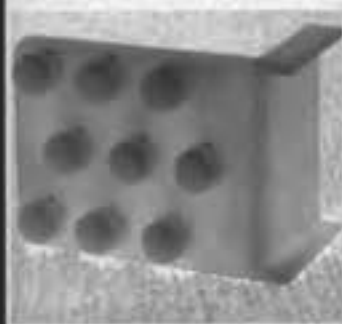
Panel Pad



Panel Pad - Protect architectural precast/prestressed units from discoloration, cracking, chipping and breakage during storage, packing and shipping. These pads are scored and may be broken into two 2-1/2" x 3" units.

Code	Size	Qty.
123046	2-1/2" x 6" x 1/2"	250

Corner Panel Pad



Corner Panel Pad - Protects architectural precast and prestressed units during transport. Prevents straps from slipping over panel surface.

Code	Size	Qty.
COPAD	2" x 3"	500

Chain Guard



Chain Guard - Protect precast prestressed units during transportation. Prevents chains from slipping over panel face.

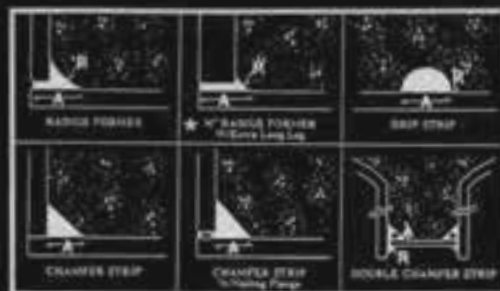
Code	Size	Qty.
CG175	1-3/4" wide	300
1000960	4-1/4" wide	200
CGULT	12" long	Each

Forming

Concrete Formers



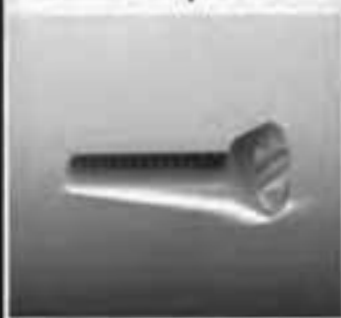
Concrete Formers - Flexible vinyl extrusions provide a smooth chamfer or radius to the edges of concrete.



* Sold in quantities of 5000 lineal ft or more only.

Code	Size		Length (ft)	Qty
	A	R		
<i>Radius Former</i>				
RF100	7/8"	1"	10	200
RF075	5/8"	3/4"	10	400
RF050	1/2"	1/2"	10	500
<i>Chamfer with nailing flange</i>				
CHN10	1"		10	180
CHN75	3/4"		10	200
CHN50	1/2"		10	500
<i>Chamfer</i>				
CH100	1"		100	400
CH075	3/4"		100	500
CH050	1/2"		100	500
<i>Drip Strip</i>				
DO500	1/2"	3/8"	100	400
<i>Double Chamfer</i>				
VP663	3/4"	1/2"	100	400
3/16" Tapered Middle Slot				

Coil Loop Insert



Coil Loop Insert Protector - Provides complete protection to the helix of a Coil Loop Insert during pouring finishing and storage operations.

Code	Size	Qty.
1000961	1" Thread	300
1000957	3/4" Thread	500
1000958	1/2" Thread	1250
1000977	1" x 3/4" removal tool	
REM50	1/2" removal tool	

Seam-Strip

Seam-Strip - An adhesive-backed foam tape for sealing joints in concrete formwork.

Code	Size	Qty.
1000980	1/4" x 3/8" x 1M ft roll	4 rolls
1000981	1/4" x 1/2" x 1M ft roll	4 rolls
1000982	1/2" x 1/2" x 660' roll	4 rolls
CLS51	1/2" x 1" (closed cell seam-strip)	1000 ft

Prestressed Accessories

Prestress Sheathing

Prestress Sheathing - Designed to debond 1/2" or 6/10" prestressed strand easily and economically.

Code	Size	Qty.
NSS20 (Non-Slit)	1/2" x 10 ft	2000 ft
1020903 (Slit)	1/2" x 10 ft	2500 ft

Recess Plug

Recess Plug - For forming voids quickly and easily around ends of prestressed strands.

Code	Size	Qty.
1001137	1-1/8" x 1-1/8" x 3/4"	6000

Graphite Spray/ Chuck Release

MIDSPEC Graphite Spray and Chuck Release Agent - For lubricating strand chucks for re-use. The graphite spray is a dry film lubricant aerosol spray ideal for on-the-job use.

Code	Size	Qty.
1000998	12 oz. can	24 cans
CRSCL	1 gallon	6 gallons

Miscellaneous Accessories

Form Clean

Form Clean - Aerosol cleaner quickly removes oil, dirt, and dust from wood, steel, or fiberglass forms for easy attachment of inserts.

Code	Size	Qty.
1001002	12 oz. can	24 cans

Twin Bond

Twin Bond - Double sided tape quickly and easily affixes inserts to forms. Eliminates the need for drilling holes, screwing or bolting inserts.

Code	Thick	Wide	Length	Qty/Ctn.
1001132	1/16"	1/2"	108 ft/roll	24 rolls
1001134	1/16"	1"	108 ft/roll	12 rolls
1001136	1/16"	2"	108 ft/roll	6 rolls

Miscellaneous Accessories

Threaded Insert



Threaded Inserts - Non-corrosive, mineral filled, nylon threaded insert for securing hundreds of objects to precast concrete.

The following tests were made by using 7000 lb. concrete. Below are the results of ultimate loads in tension for samples tested.

CODE	Bolt Dia.	Working Loads	Ultimate Strength	Top Width	Base Width	Height	Pcs/Ctn.
THC14	1/4"	1200 lbs	3600 lbs	3/4"	1"	1-1/2"	1000
THC38	3/8"	1300 lbs	3900 lbs	3/4"	1"	1-1/2"	1000
THC50	1/2"	3000 lbs	9100 lbs	3/4"	1 3/8"	2 5/8"	500
THC58	5/8"	4000 lbs	12,000 lbs	7/8"	1 1/2"	3"	250
THC75	3/4"	4300 lbs	13,300 lbs	1"	1 5/8"	3 1/4"	200
THS50	1/2"	3000 lbs	9100 lbs	3/4"	1 3/8"	1 5/8"	500

Test reports & cap plugs available upon request.

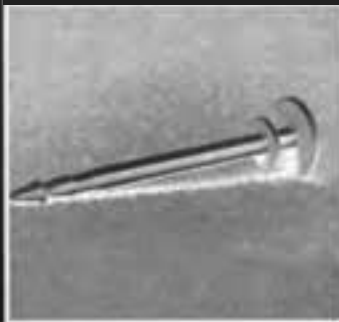
Midspec Silicone Caulk



Midspec Silicone Caulk- Rapid curing, durable, one component silicone rubber sealant designed specifically for sealing formwork. Also available is **Midspec Econo Caulk**.

Code	Size	Qty.
1000999	10.3 oz. tube	24 tubes
ECOCA	10.3 oz. tube	24 tubes

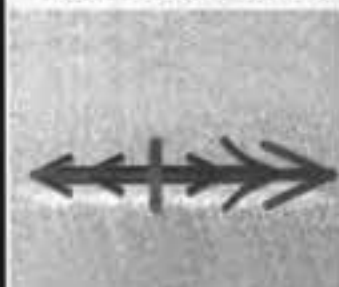
Midspec - Panel Ties



Midspec Panel Ties- Anchors for insulating foam in wall panels. Reduces heat transmission caused by galvanized or stainless steel hairpin anchor.

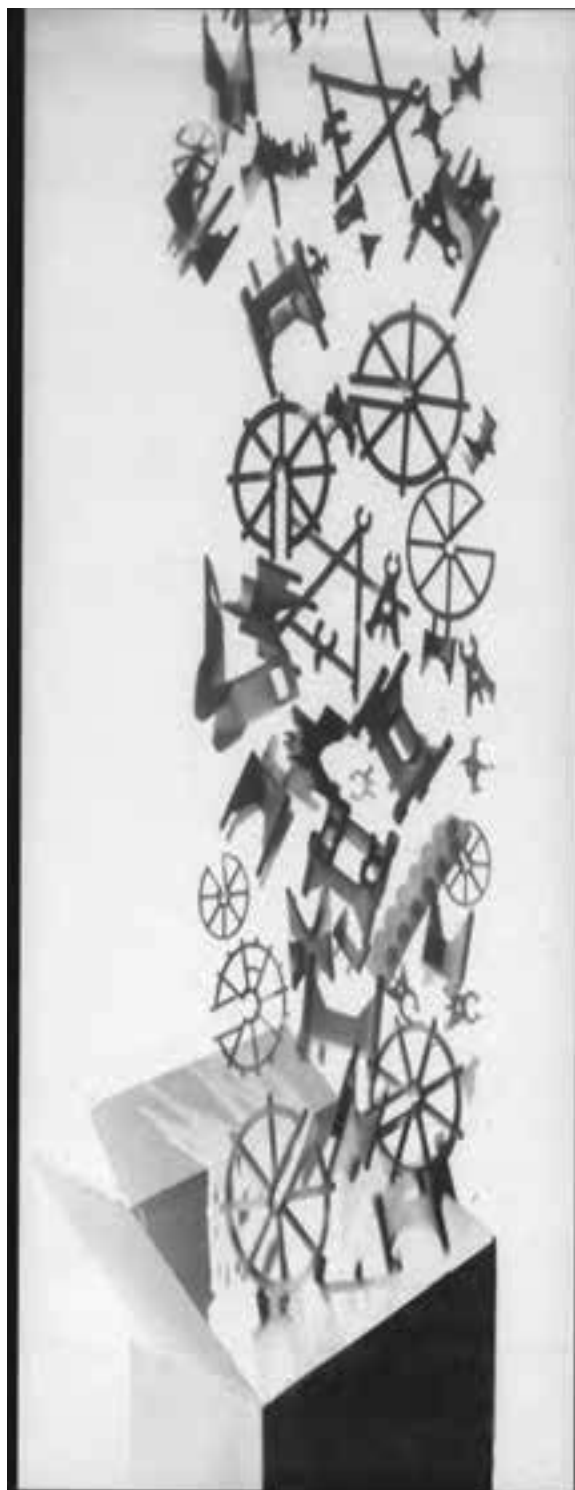
Code	Size	Qty.
1001123	5-3/8" long	1000
1001187	3-3/8" long	2500

Double Panel Tie



Double Panel Tie - Double pronged plastic anchoring device for holding void formers and/or sandwich panel foam insulation in place during casting of concrete.

Code	Size	Qty.
TIESD	4-1/4" Long	2000



Rebar Supports & Spacers
Prestressed/Forming Accessories
Transportation Accessories

Technical Data Sheets



MIDSPEC SHIMS

Aid in leveling formwork, panels and architectural members while casting and erecting

USES

MIDSPEC SHIMS, made from a high-density, high compressive strength polymer plastic, are used to level panels and other architectural/structural members during erection.

MIDSPEC SHIMS can be color coded by special request, minimum quantities apply.

ADVANTAGES

- MIDSPEC SHIMS will never rust
- Non-corrosive, non-staining
- Easy to use
- Lighter in weight than metal shims
- Strong ASTM rating of 5,000 psi compressive strength
- Rough surface gives high coefficient of friction
- Non-reactive to acids, alkalis, weather
- Can be placed on one another without slipping
- Combination of thickness can accommodate any requirement
- Thickness is marked on each MIDSPEC SHIM
- Economical

AVAILABLE SIZES AND PACKAGING

SIZE	THICKNESS	PCS./CARTON	OPTIONAL COLOR
2" X 2"	1/16"	2,000	Blue
2" X 2"	1/8"	2,000	Red
2" X 2"	1/4"	1,000	White
2" X 2"	3/8"	500	Green
2" X 2"	1/2"	500	White
3" X 3"	1/16"	1500	Blue
3" X 3"	1/8"	1000	Red
3" X 3"	1/4"	500	White
3 1/8" x 1 1/2" Wedge	1/4"-1/16"	1,000	



ENGINEERING DATA:

The pertinent physical properties of MidSpec plastic bearing strips are presented as follows:

- Compressive strength of 8 to 9,000 psi with no fracture even at 26,000 psi.
- Classed as slow burning with no toxic fumes.
- Negligible cold flow characteristics; i.e., less than 1% at 1,000 psi and 73° F. for 10,000 hrs.
- Coefficient of linear expansion is $3 \text{ to } 5 \times 10^{-5}$ inches/inch/°C.

Plastic Bearing and Shimming Material

MidSpec Bearing and Shimming Material is an engineered multipolymer plastic specifically formulated for use by the construction industry.

The use of **MidSpec Bearing and Shimming Material** benefits contractors and owners because it:

- Supports progress.
- Supports excellence.
- Supports profits.
- Means faster erection and earlier occupancy.
- Eliminates expensive clean-ups and call-backs because it will not leach, stain or rust. It is waterproof!
- Gives permanent support—is not affected by alkali, ground chemicals, micro-organisms and rot.
- Has easier to use features—lightweight and multiple snap-off—mean less handling and lower inventories.
- Insures damage free installation.
- Allows for thermal motion without damage caused by fractures and spalling.
- Has high compressive strength—non-fibrous composition maintains uniform reliability.
- Is easy to put in place under all climatic conditions.

MSI-80 Shim Strips

The **MSI-80 Shim Strips** insures accurate placing and levelling of precast panels and other architectural and structural components because it:

- Is made in convenient thicknesses, lengths and widths allowing precise levelling and alignment.
- Permits field changes in load bearing requirements with stock on hand.
- Is less expensive and safer than steel. It has extreme stability and eliminates rust, stained concrete and spalling.
- Sized and scored for convenience of application. Prevents waste—material can be readily picked up and stored in the open for future use.
- Will not fracture under load.
- Thicknesses of 1/16" (1.5 mm), 1/8" (3 mm) and 1/4" (6 mm) in lengths of 3" (75 mm) and 4" (100 mm) are available from stock. The widths of 3" (75 mm) x 24" (600 mm) are scored every 3" (75 mm) and the widths of 4" (100 mm) x 24" (600 mm) are scored every 2" (50 mm). This allows for easy snap off as needed. Additional sizes available on request.
- Impervious to liquids and ground chemicals, alkalis and micro-organisms. The continuing performance characteristics are stable and predictable.
- Will not rust, rot or leach when exposed to wet surfaces, and it has no odor.
- Arrives at the job site in precise thicknesses and lengths.
- Eliminates the need for saws, hand tools or cutters. A definite saving in time, labor and money is realized. The strips are easily applied and lie flat.
- Point projection of aggregate is absorbed without fracture or effect on the load-bearing characteristics, decreasing damage potential to the adjacent concrete components.

MSI-81 Shimpaks

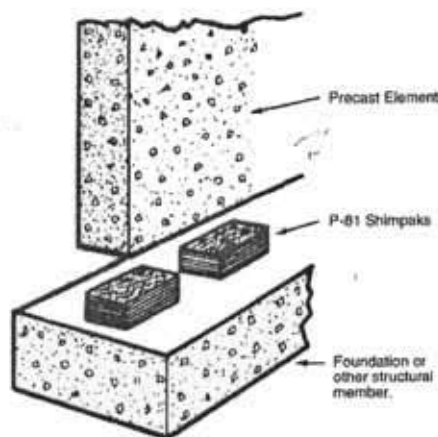
Pre-assembled packages of heavy duty shims are designed for large load bearing of precast units.

- Shimpaks are very advantageous in precise placing and levelling of large panels.
- Their use eliminates time consuming correction of elastomeric drift and makes alignment safer and easier.
- Shimpaks can be compressed sufficiently at post tensioning to allow load transfer to the grout.
- Popular sizes are 4" (100 mm) x 6" (150 mm) and 4" (100 mm) x 4" (100 mm) paks which are 1 1/16" (27 mm) thick. Shimpaks are made up of Shims in the following thickness sequence; one 1/16th (1.5 mm), three 1/4ths (6 mm) and two 1/8ths (3 mm). Any precast component can be levelled within 1/16" (1.5 mm) by removing or adding one or more elements.
- Shimpaks are held together with a resilient band for easy removal or addition of elements.
- Alternate sizes available on request.

General: Our shimming materials are an engineered multipolymer plastic material which provides an optimum combination of physical properties for a shim in applications where high compressive strength and load bearing are important. They facilitate the placement of structural and architectural members.

Engineering Data: The pertinent physical properties of **MidSpec** plastic shims and bearing strips are presented as follows:

- Compressive strength of 8,000 to 9,000 psi (55 to 62 MPa) with no fracture even at 26,000 psi (179 MPa).
- Classed as slow burning with no toxic fumes.
- Negligible cold flow characteristics; i.e., less than 1% at 1,000 psi (6 MPa) and 73° F (22° C) for 10,000 hrs.
- Coefficient of linear expansion is 3 to 5 x 10⁻⁴ inches/inch/°C.



Specify: Precast elements will be levelled before grouting with Shim Strips, Shimpaks or Bearing Strips as manufactured by

MidSpec

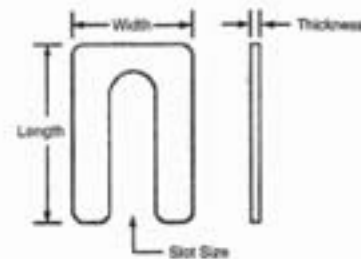
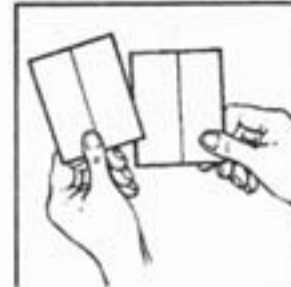
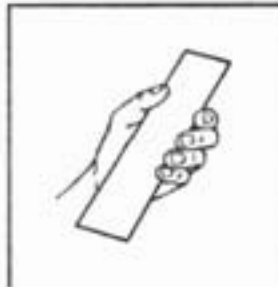
Plastic Bearing and Core Plugs

Reglet, Bearing and Shimming Materials

MSI-82 Bearing Strips

- Designed for use with prestressed concrete plank between the plank and any surface such as poured or precast concrete, steel or masonry.
- Absorbs projecting aggregate stress preventing plank or sill damage without effect on the load bearing characteristics.
- Allows faster erection because of easier positioning.
- Non-slip surface insures positive placement.
- Permits thermal motion and point rotation without an elastomeric layer.
- Test data available on request.

Thicknesses of 1/8" (3 mm) and 1/4" (6 mm) in stock. Lengths of 40" (1000 mm) and 48" (1200 mm) in stock. Widths of 24" (660 mm), scored at 2" (50 mm) or 3" (75 mm) intervals for easy snap off and flexibility in use. Alternate sizes or scorings available on request.



MSI-83 Horseshoe Spacers

- No staining, no rust, no corrosion, even with aluminum.
- Less expensive than steel—no plating required.
- Lightweight and precise—easy to handle and transport.
- Cut to size or pre-scored for easy on site snap-off.

MSI-83 Horseshoe Washer Selection Chart			
Width	Length	Thickness	Slot Size
2" 50 mm	3" 75 mm	1/8" 1.5 mm, 1/4" 3 mm or 1/2" 6 mm.	1 3/16" 20 mm x 2 1/16" 61 mm
3" 75 mm	4" 100 mm	1/8" 1.5 mm, 1/4" 3 mm or 1/2" 6 mm.	1 3/16" 20 mm x 2 1/16" 74 mm

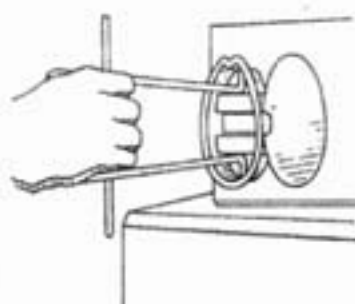
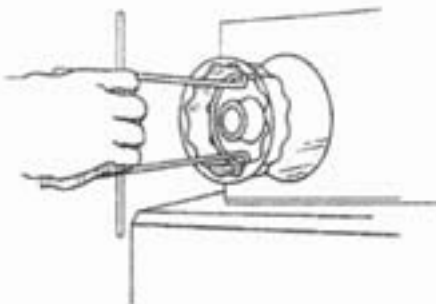
Available with holes, other slot sizes or different width, length or thickness on special order.

MSI-84 Core Plugs

Core Plugs are designed for the manufacturers of prestressed hollow core planks. They are lightweight, easy to insert and effectively block off grout flow to insure bearing through the ends of the planks onto the sill and foundation. The exclusive "wall" taper design of these plastic core plugs assures a tight interference fit.

Pushers are provided to facilitate insertion to an exact pre-indicated depth, usually five inches. Core Plugs are available for most sizes of spancrete, flexicore, spirofil, dycore and dynaspan. Other shapes and sizes are being developed.

Plug numbers refer to the diameter of the core holes and not to the thickness of the plank. For example, the numbers 600 and 638 are 6" (152 mm) and 6 3/8" (162 mm) in diameter and fit core holes in an 8" (203 mm) thick plank.



MSI-84 Core Plug Selection Chart	
No.	Diameter
400	4" 100 mm
412	4 1/8" 114 mm
600	6" 152 mm
638	6 3/8" 162 mm
758	7 1/2" 193 mm
800	8" 203 mm
958	9 1/2" 244 mm
1000	10" 250 mm

MIDSPEC PANEL PADS/CORNER PANEL PADS

Protect architectural precast/prestressed units during storage or shipping

ADVANTAGES

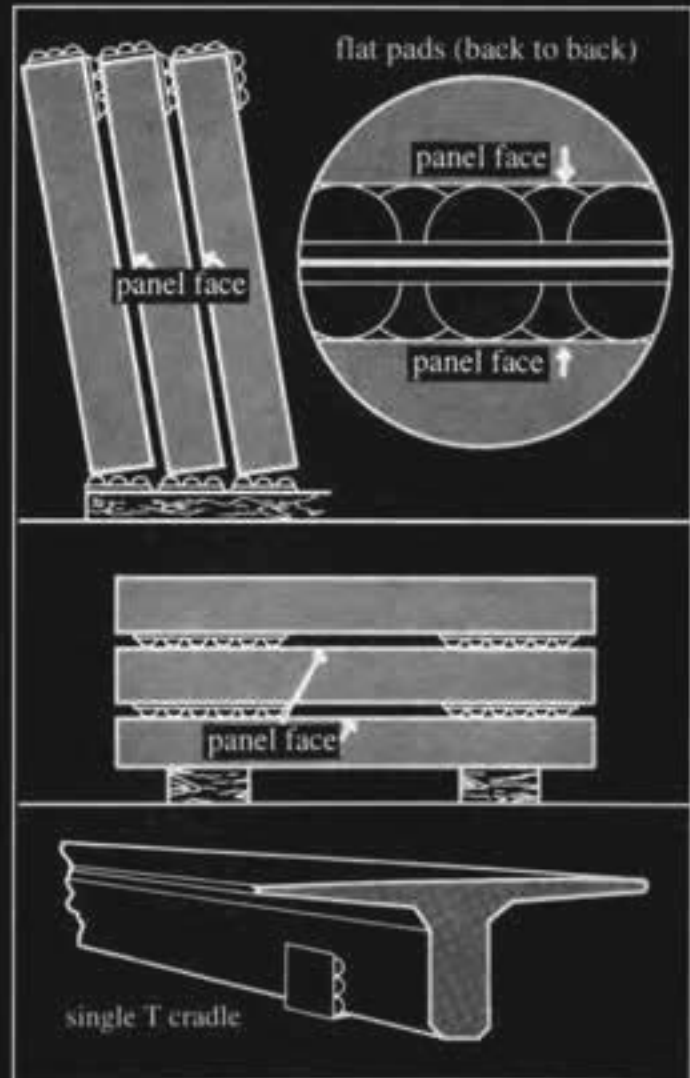
MIDSPEC PANEL PADS, manufactured from a super-strong polymer, protect architectural precast/prestressed units from discoloration, cracking, chipping, and breakage during storage, packing and shipping. **MIDSPEC** CORNER PANEL PADS are specially designed high density polymer right angle units which provide vertical edge protection to cargo. **MIDSPEC** CORNER PANEL PADS are placed on the top edges of cargo, and secured with straps placed through 2" wide slots.

MIDSPEC PANEL PADS

- Revolutionary air vent design permits air circulation against the panel face, preventing curing stains
- Reusable, can withstand loads in excess of 20 tons
- For small panels, the 6" x 2 1/8" pad is scored down the middle which, when snapped, provides two 3" x 2 1/8" pads
- Pre-drilled holes for nailing to weak frames
- Three connected pads are available for big jobs

MIDSPEC CORNER PANEL PADS

- Right angle design features protective "bumps" to protect cargo
- Accepts 2" wide strap for securing pads to cargo
- Provides vertical edge protection of cargo during transport



INSTRUCTIONS FOR USE

Place **MIDSPEC** PANEL PAD, with rounded "bumps" against the face of concrete which should be protected. (See illustrations above) **MIDSPEC** PANEL PADS contain convenient holes for nailing to wood. For **MIDSPEC** CORNER PANEL PADS, place smooth edge on top of cargo, rounded "bumps" on the side of the cargo. Straps are placed through slots to secure cargo.

PACKAGING

250 **MIDSPEC** PANEL PADS per carton
500 **MIDSPEC** CORNER PANEL PADS per carton



MIDSPEC ECONO PADS

An economical way of protecting architectural precast/prestressed units during storage or shipping

ADVANTAGE

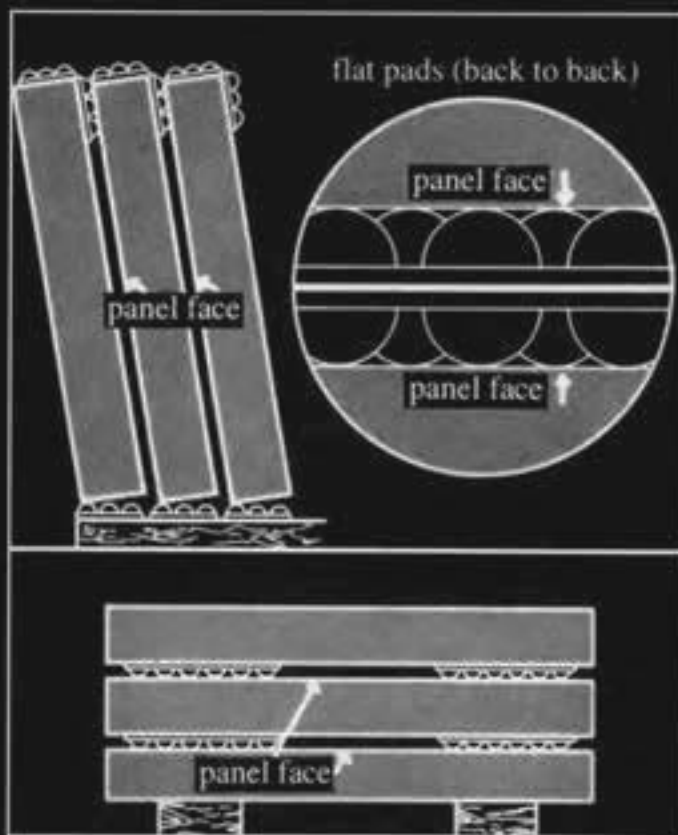
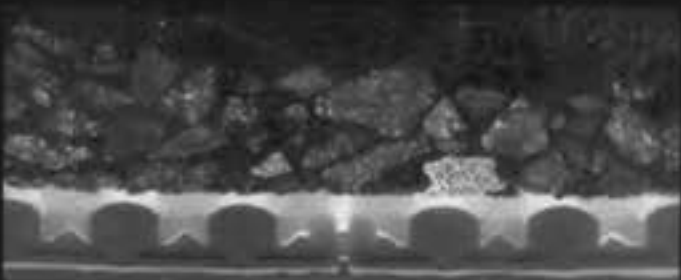
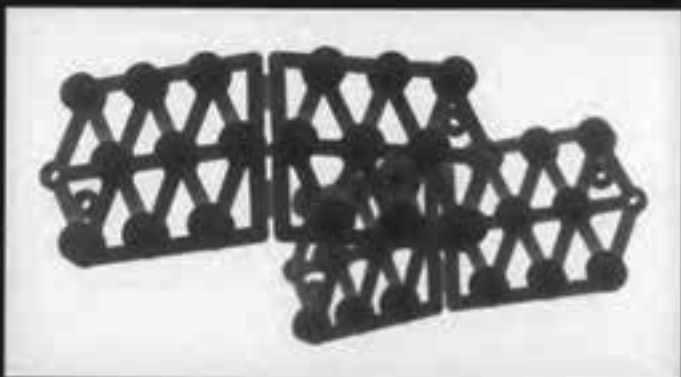
- Economical
- Pre-drilled holes for nailing to wood
- Reusable
- Revolutionary air vent design permits air circulation against the panel face, preventing curing stains
- For small panels, the 6" x 2 1/2" pad is scored down the middle which, when snapped, provides two 3" x 2 1/2" pads
- The pad can also be easily folded in half to create a thicker pad

INSTRUCTIONS FOR USE

Place the MIDSPEC ECONO PADS, with rounded "bumps" against the face of the concrete to be protected. (See illustrations)

PACKAGING

400 MIDSPEC ECONO PADS per carton



MIDSPEC CHAIN GUARDS & ULTIMATE CORNER PROTECTORS

Protect cargo from damage by straps or chains during transportation

DESCRIPTION

MIDSPEC CHAIN GUARDS AND CORNER PROTECTORS are made of a super-strong polymer which protects cargo from damage during transportation. They have a unique design which allows them to be used with either chains or straps.

ADVANTAGES

- High strength, polymer material insures maximum service life
- Low in cost, non-staining, reusable, uncrushable, unbreakable
- Impervious to all weather conditions
- Unique design cushions chain or strap, preventing them from slipping onto the cargo being shipped
- Resists abrasion and will not crack or break under the abuse of chains



FLARED EDGE
Protects material from gouges

PRESSURE RIDGE
Distributes pressure evenly to protect material edges

STRAP LOBES
Protects straps from sliding

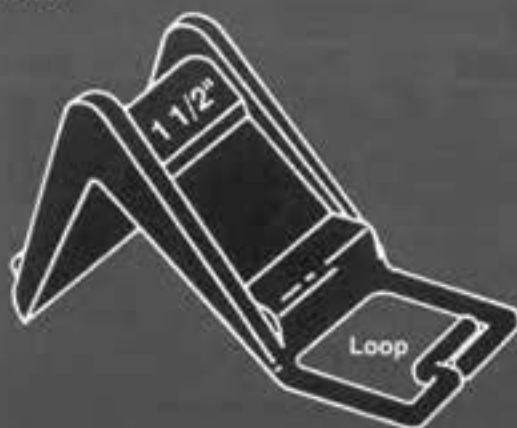
PACKAGING

MIDSPEC CHAIN GUARDS A - 300 per carton
MIDSPEC CHAIN GUARDS B - 200 per carton
MIDSPEC ULTIMATE CORNER PROTECTOR - available in quantities greater than 25

MIDSPEC ULTIMATE CORNER PROTECTOR

- 12" Corner Protector

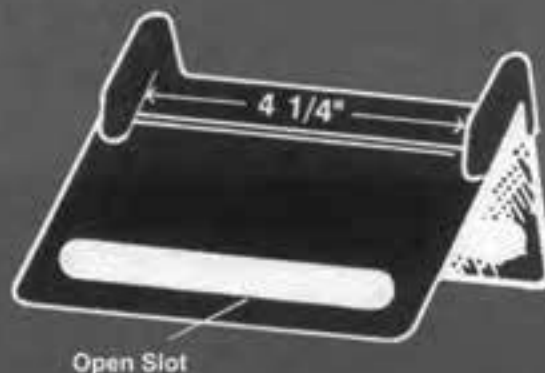
Model A



MIDSPEC CORNER PROTECTOR A

- 1 1/4" Corner Protector
- Designed specifically for chains
- Loop attachment on Model A keeps chains on protector, preventing loss

Model B



MIDSPEC CORNER PROTECTOR B

- 4 1/4" slot accepts wide straps
- Ideal for both straps and chains

MIDSPEC CONCRETE FORMERS

Chamfers and radius formers for creating smooth edges on concrete

DESCRIPTION

MIDSPEC CONCRETE FORMERS are flexible polyvinyl extrusions designed to provide a smooth edge to the corners of cast concrete. MIDSPEC CONCRETE FORMERS can be used in precast, prestressed, cast-in-place or tilt-up concrete.

ADVANTAGES

- Provides attractive edges to corners of concrete
- Prevents grout leakage
- Made of reusable flexible polyvinyl chloride
- Not affected by cement alkalinity
- Easily affixed and removed from formwork
- Will not expand - cured concrete strips easily
- Available with or without nailing flange
- Moisture proof - will not warp or dry out
- Special shapes are available in large quantities

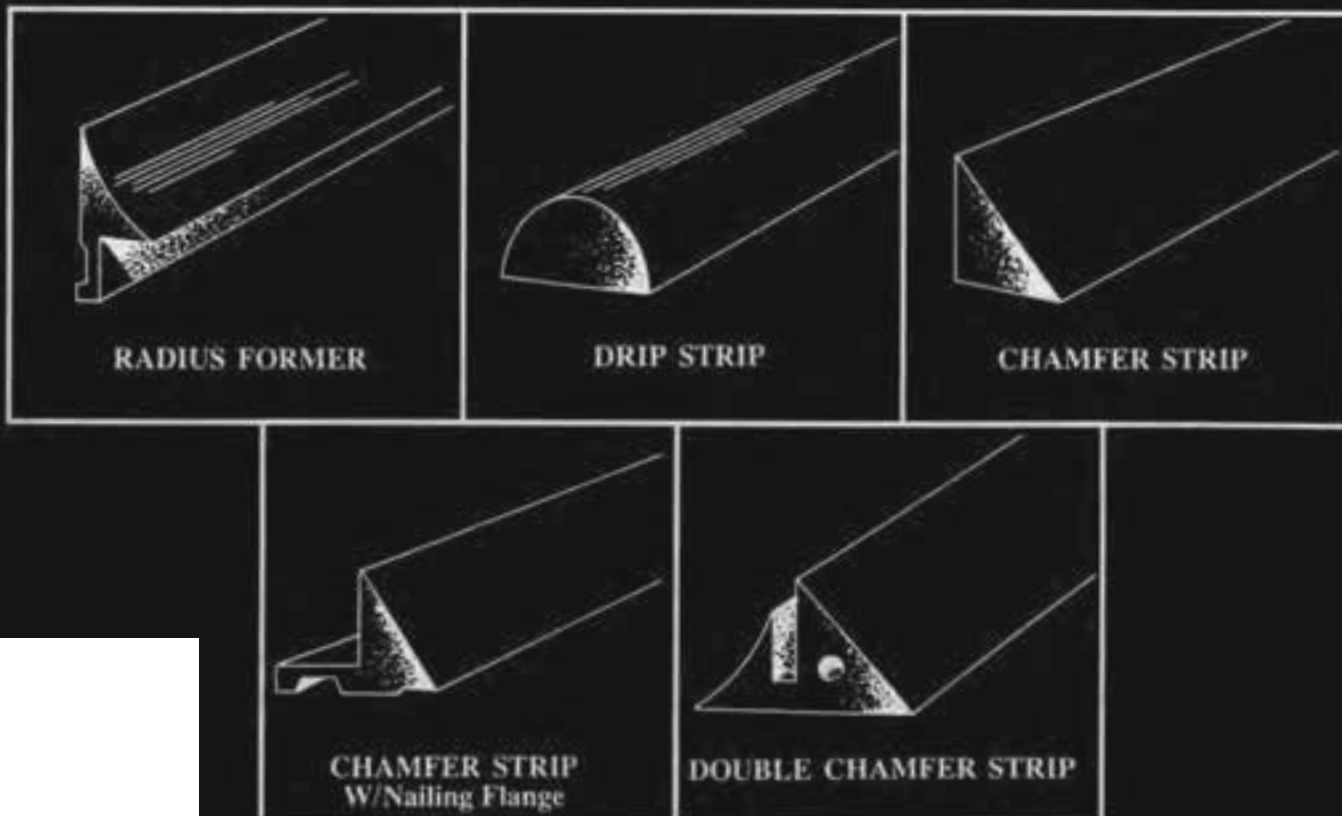
PHYSICAL PROPERTIES

Chemical Resistance	Excellent
Abrasion Resistance	Excellent
Fire Rating	Self-Extinguishing
Specific Gravity	1.35
Tensile Strength	Over 2000 psi

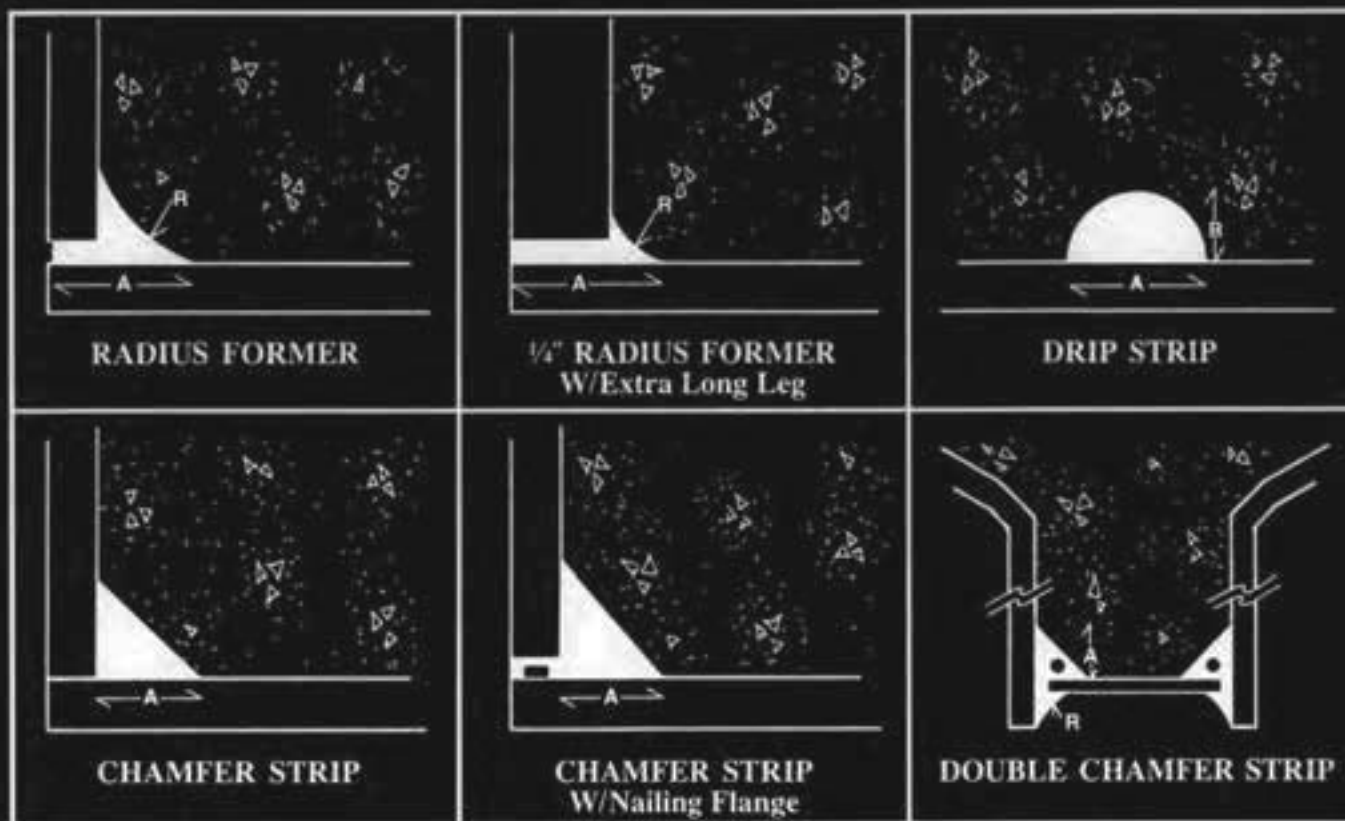
APPLICATION INSTRUCTIONS

Typical installations are illustrated on the back page.

- The tail is pinched between the forms at their junction to hold the strip in place as well as to insure a tight joint.
- The vinyl former can also be screwed, nailed or glued to the form if desired. A length of the concrete former is nailed or stapled at opposite ends first, with between 1" and 2" stretch per 10' section. The in between area is then nailed or stapled on 6" centers for best results. On steel forms a contact cement or MIDSPEC double sided tape, MIDSPEC TWIN-BOND, is recommended for adhesion.
- Double chamfer strip is fixed as shown gripping a baseplate.



PACKAGING



	Stock No.	Size"		Lengths	lbs/Carton	Packaging ft/Carton
		A	R			
Radius Former	RF 100	7/8"	1"	180 ft coil	34	120
	RF 075	3/4"	1/2"	300 ft coil	40	300
	RF 050	3/4"	1/2"	500 ft coil	34	500
Chamfer strip w/ Nailing Flange	CHN 10	1"		80 ft coil	61	180
	CHN 75	3/4"		1250 ft coil	55	250
	CHN 50	1/2"		250 ft coil	50	250
	GS614	1 1/8"		10 ft coil	70	100
Chamfer Strip	CH100	1"		170 ft coil	55	70
	CH 075	3/4"		350 ft coil	60	350
	CH 050	1/2"		100 ft coil	351	500
Drip Strip	D 0750	3/4"	1/2"	100 ft coil	99	600
	D 0500	1/2"	3/8"	100 ft coil	48	500
Double Chamfer Strip	VP663	3/4" Tapered	1/2"	100 ft coil	96	400

MIDSPEC COIL LOOP INSERT PROTECTOR

Provides positive protection to the Helix of Coil Loop Inserts

DESCRIPTION

These patented plastic **MIDSPEC COIL LOOP INSERT PROTECTORS** provide complete protection to the helix of a coil loop insert during pouring, finishing and storage operations. At the same time, they position and hold the Insert in place giving the precaster a complete product - nothing else needed. During finishing and storage, foreign matter can enter the coil loop insert, making it difficult to screw in the lifting device. Also, frozen rain water, or acid from cleaning can seriously damage the coil loop insert. For these reasons, the **MIDSPEC COIL LOOP INSERT PROTECTOR** stays with the unit until shipping or erection, virtually eliminating this problem. The **MIDSPEC COIL LOOP INSERT PROTECTOR** is also used to plug insert holes after erection - eliminating the need for patching - with no rust stains problems.

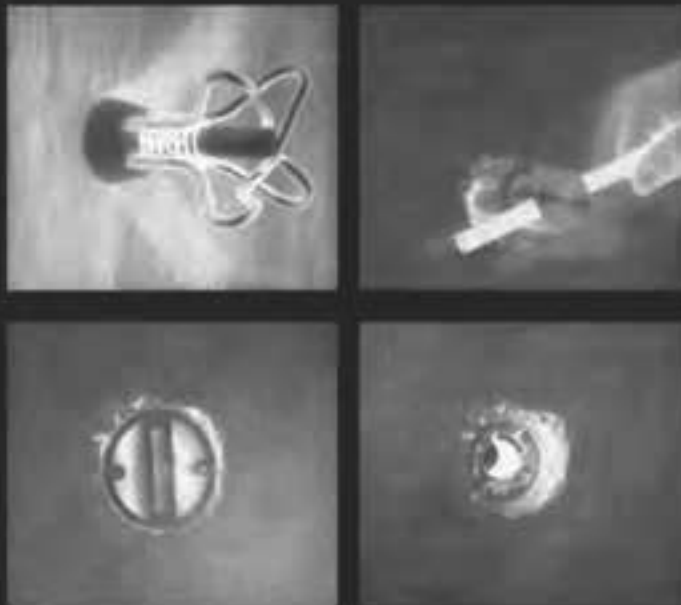
INSTRUCTIONS FOR USE

MIDSPEC COIL LOOP INSERT PROTECTOR is easily screwed into the helix of a coil loop insert. It is first recommended that the **MIDSPEC COIL LOOP INSERT PROTECTOR** be coated with retarder or grease in order to be assured of quick removal with the Removal Tools available from **MIDSPEC**. The **MIDSPEC COIL LOOP INSERT PROTECTOR** can then be tacked on to wooden forms with small finishing nails through the 2 holes provided on the **MIDSPEC COIL LOOP PROTECTOR** head.

FEATURES

- Maintains the required insert depth below the concrete surface
- Eliminates wrapping the insert with tape to prevent leakage
- Positions, holds and protects the coil loop insert during pouring, finishing and storage operations
- Easy to install - nailing holes are provided
- Easy to remove - specially designed tool available
- Reusable
- Several sizes available

Having been nailed to the form using small finishing nails, the coil loop inserts are then screwed onto **MIDSPEC COIL LOOP INSERT PROTECTORS** which have been coated with retarder or grease just before placement of concrete. After the cured concrete panel has been lifted, the **MIDSPEC COIL LOOP INSERT PROTECTOR** is easily identified and located. The specially machined **MIDSPEC PROTECTOR REMOVAL TOOL** fits snugly into the grooves and indentations of the **MIDSPEC COIL LOOP INSERT PROTECTOR**. After removal, of the **MIDSPEC COIL LOOP INSERT PROTECTOR**, the helix of the coil loop insert is left perfectly clean.



Typical Coil Loop Insert and Midspec Coil Loop Insert Protector

LIMITATIONS

MIDSPEC COIL LOOP INSERT PROTECTORS left in inserts over an extended period of time may become difficult to remove due to concrete shrinkage. This problem will also occur if the protectors are left uncoated (no retarder, grease, or form oil).

PACKAGING

1" Protectors are packaged **300** to a carton
 3/4" Protectors are packaged **500** to a carton
 1/2" Protectors are packaged **1250** to a carton

MIDSPEC SEAM STRIP

Foam tape to prevent leakage in formwork

DESCRIPTION

MIDSPEC SEAM STRIP is an open cell polyether adhesive backed foam tape for sealing joints in concrete formwork.

ADVANTAGES

- Economically prevents mortar from seeping through joints of forms
- Compresses to tiny fraction of original thickness
- Does not alter form dimensions
- Special adhesive secures to any sealed wood, concrete, steel or plastic surface
- Unaffected by acids, alkalis and most solvents
- Flexible...can be stretched over and around complete shapes and corners
- Provides positive seal even when overlapped
- Conveniently packaged in handy feed-out reels
- Non-porous vinyl foam material (VFT) also available

APPLICATION INSTRUCTION

Form should be clean and dry; greasy areas should be cleaned or avoided. Simply peel off the protective backing, exposing the adhesive and press firmly on desired area.

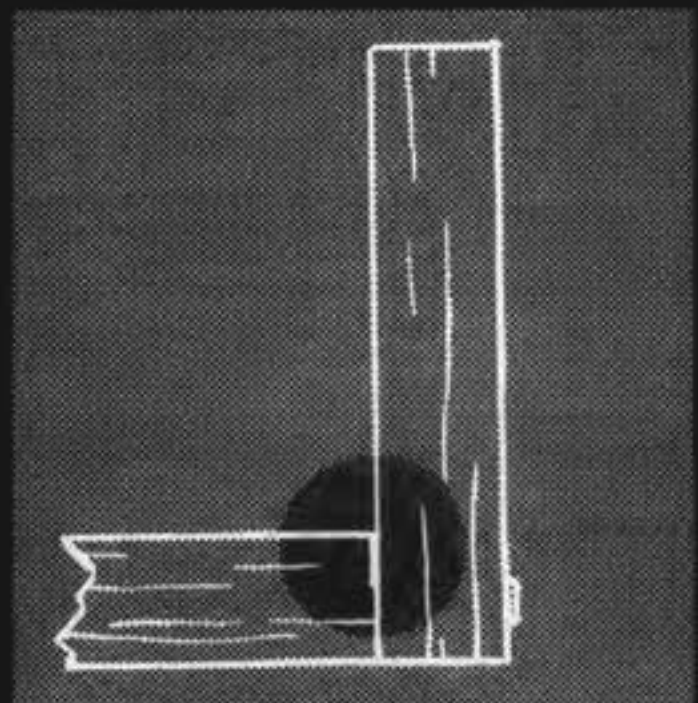
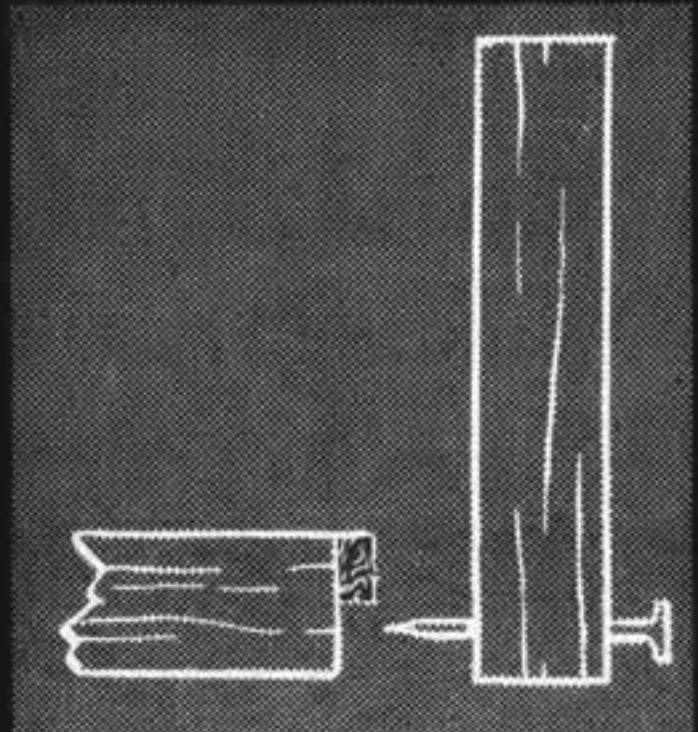
MIDSPEC SEAM STRIP will not alter form dimensions; unlike other gasketing materials tested for precasting concrete.

MIDSPEC SEAM STRIP compresses to a tiny fraction of its original thickness when the form is assembled, so that the size of the panel produced from the form is exactly as designed. Other gasketing material may increase the size of the panel by $\frac{1}{4}$ " or more.

PACKAGING

$\frac{1}{4}$ " thick x $\frac{3}{8}$ " wide	1000' per reel
$\frac{1}{4}$ " thick x $\frac{1}{2}$ " wide	1000' per reel
$\frac{1}{2}$ " thick x $\frac{1}{2}$ " wide	660' per reel

All sizes packaged 4 reels per carton



MIDSPEC PRESTRESSED SHEATHING

Debonds prestressed strand easily and economically

DESCRIPTION

MIDSPEC PRESTRESSED SHEATHING is extruded $\frac{1}{2}$ " or $\frac{3}{8}$ " diameter tubing made of an alkaline resistant flexible plastic polymer. MIDSPEC PRESTRESSED SHEATHING is available both slit and non-slit.

ADVANTAGES

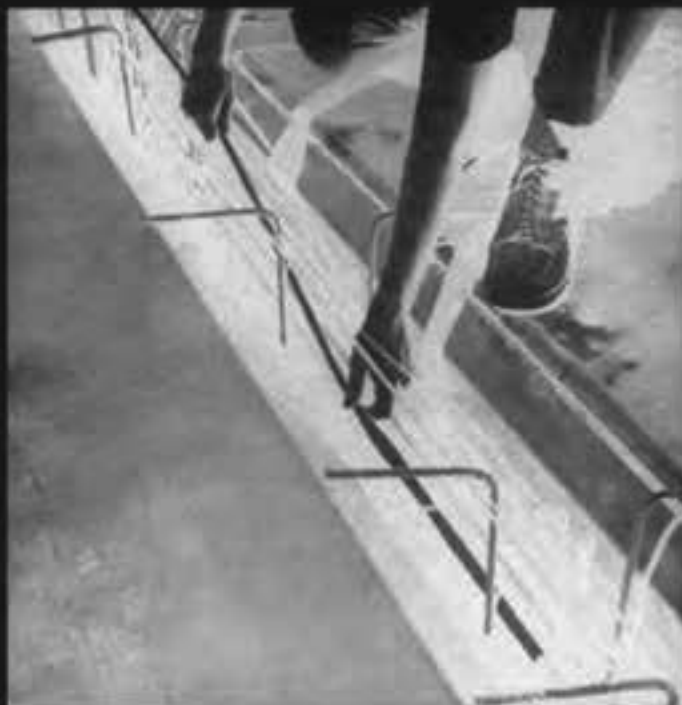
- Economically prevents prestressed strand from bonding to concrete
- Easy, quick and dependable
- Equally effective on plant, tees and box beams
- 25% overlap on MIDSPEC SLIT SHEATHING prevents grout leakage
- Replaces thin tapes which can be damaged by vibrators and lack stiffness
- Eliminates use of chemical compounds
- No messy grease needed
- Decreases turnaround time on prestressed forms
- Can be used to eliminate costly, time-consuming draping

APPLICATION INSTRUCTION

MIDSPEC SLIT SHEATHING is quickly and easily slipped over strand. Prestressed strand is readily threaded in MIDSPEC NON-SLIT SHEATHING.

PACKAGING

Slit - $\frac{1}{2}$ " : 300 - 10' lengths per carton (3000' total)
 Non-Slit - $\frac{1}{2}$ " : 10' lengths per carton (2000' total)
 Slit - $\frac{3}{8}$ " : 10' lengths per carton (3000' total)



Slit Sheathing



Non-slit Sheathing



MIDSPEC RECESS PLUG

Void former for ends of prestressed concrete units

DESCRIPTION

MIDSPEC RECESS PLUGS are uniquely designed to allow placement to ends of prestressed strand. Finger tip pressure quickly locks MIDSPEC RECESS PLUG into place.

USES

Closed cell, alkaline - resistant polyethylene foam especially designed to form voids around prestressed strand.

ADVANTAGES

- Attaches quickly and easily...in seconds
- Prevents unsightly rust stains at ends of prestressed units
- Eliminates laborious chipping
- Economical-costs pennies per Plug
- Fits all standard sizes
- Saves torch tips
- Provides cavity to hold patching grout

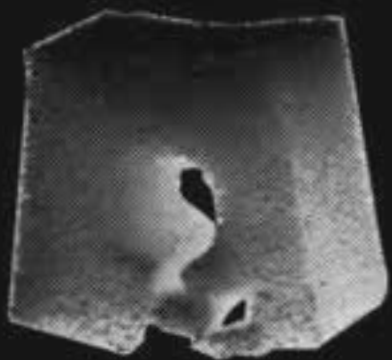
PACKAGING

6000 MIDSPEC RECESS PLUGS per carton

Dimensions: 1 1/8" x 1 1/8" x 3/4"



Recess Plug is easily spread open and securely attached to steel strand before concrete is poured.





MIDSPEC FORM-CLEAN

An aerosol cleaner for removing oil, dirt, or dust from forms

USES

MIDSPEC FORM-CLEAN quickly removes oil, dirt and dust from wood, steel or fiberglass forms to improve attachment of inserts.

APPLICATION INSTRUCTIONS

Shake aerosol can well, hold 6" from the surface and spray with a sweeping motion. Immediately the Double-Action of MIDSPEC FORM-CLEAN goes to work. First MIDSPEC FORM-CLEAN solvent penetrates the grimy deposit, dissolving the grease and grime. Secondly, MIDSPEC FORM-CLEAN dries to a powdery film, absorbing the grease, dirt and dust. Brushing or wiping off the white film takes with it all oil, dirt and dust.

PACKAGING

24 - 14 oz. cans per case

Drawing at right represents form with coating of oil, dirt and dust, to which MIDSPEC FORM-CLEAN has been sprayed.



Action-one - the solvent penetrates the grimy deposit, dissolving the grease and grime.



Action-two - MIDSPEC FORM-CLEAN dries to a powdery film absorbing grease, dirt, dust etc.



MIDSPEC SPEC COTE

Permanent protective polyurethane coating

USES

MIDSPEC SPEC COTE was developed to coat porous wood forms used for concrete construction, whether precast, tilt-up, slip form or cast-in-place. Unlike factory prepared, plastic-coated wood forms, MIDSPEC SPEC COTE builds up a thick protective film on both the backs and edges of the grain.

MIDSPEC SPEC COTE forms a tough chemical, water abrasion-resistant coating over forms to protect and preserve them. The coating also makes concrete cast against it easy to release, resulting in a smoothness equivalent to the finish obtained when plastic panels are used as forms. MIDSPEC

SPEC COTE is a one component lacquer with a moisture curing polyurethane component for permanently protecting wood.

ADVANTAGES

- Costs pennies per square foot
- One component in one container - no mixing required - no chance for error
- Easily applied with brush or roller
- Non-stick polyethylene spout prevents lid from sticking
- Forms coated are dry, cured, and ready for use the next day
- MIDSPEC SPEC COTE is so durable, it outlast the forms
- Keeps end grain in wood form from cracking and chipping
- Remarkable chemical and abrasion-resistant film defies wear
- MIDSPEC SPEC COTE is hard and tough, and does not chip like mill overlaid panels
- Contains no oils, waxes, or silicones

APPLICATION INSTRUCTIONS

Surface Preparation

All surfaces must be clean and dry before application. Surface preparation should provide for a porous surface to maximize adhesion. If the wood already has a coating on it, the MIDSPEC SPEC COTE may delaminate after drying. While application in this situation is not recommended, be sure to first roughen the existing coating thoroughly (with rough sand paper, etc.). Sand rough wood to a smooth surface. If wood grain rises after the first coat, sand it lightly before applying the second coat.

APPLICATION

Apply MIDSPEC SPEC COTE by brush or roller. Two coats are recommended for maximum protection.

First Coat: Thinning should be unnecessary; apply directly from the container, allowing the first coat to cure two to four hours. However, if thinning is desired, thin with Xylene a maximum of 25%.

Second Coat: Apply the MIDSPEC SPEC COTE directly from can with no thinning. Do not wait more than 24 hours to re-coat, because MIDSPEC SPEC COTE becomes so hard it will not stick to itself unless heavily abraded. Forms are ready for use the next day.

CLEAN UP

Clean all equipment with MIDSPEC SOLVENT 106, a high grade lacquer thinner or a citric based degreaser immediately after use.

Caution: Withdraw only enough MIDSPEC SPEC COTE from the original container which can be used in one day. Close container immediately to prevent contact with air. Material taken from the original container for use should never be returned to it, but stored separately and used within 24 hours.

CHEMICAL TEST

Excellent resistance to alkaline concrete in all concentrations, all temperatures and water/cement ratios.

PHYSICAL PROPERTIES

Solids (%)	40
Viscosity (Brookfield, CPS)	120
Color (Gardner)	1
Weight/Gallon (lb)	8.0
Flash Point, 80 °F	8.1
Drying Characteristics @ Air Dry 3 mils wet 50% R.H., 70 °F Set to touch (hrs)	1/2
Surface dry (hrs)	1
Hard Dry (hrs)	1
Film Properties	
Abrasion Resistance ASTM 501 (Taber SC 10 Wheel, GM/1000 Rev)	16-20
Hardness (Sward)	45
Impact Resistance (in/lb.)	
Direct	160
Reverse	140
Flexibility (1/8" mandrel)	Pass
Tensile Strength (psi), ASTM D-412	4800
Elongation, ASTM D-412	100%
Weathering U.V. Resistance	
Atlas Weather-O-Meter (200 hrs)	
Gloss Retention	Moderate
Color Retention	Slight Ambering

PACKAGING AND COVERAGE

MIDSPEC SPEC COTE is available in 5 gal pails and covers approximately 350 ft²/gal per coat.

MIDSPEC TWIN BOND

Double-sided tape for affixing inserts, blockouts, chamfer, and more to precast forms

DESCRIPTION

With **MIDSPEC** TWIN-BOND, inserts can be secured to wood, metal or fiberglass forms quickly and easily. This closed cell, vinyl foam is pressure sensitive on both sides. It joins two dissimilar surfaces, forming a complete bond, without voids. It has excellent shock and vibration resistance and is ideally suited for positioning weld plates, power struts, reglets, etc., to precast forms.

USES

MIDSPEC TWIN-BOND is a double-sided tape excellent for adhering chamfer strips, inserts & blockouts to forms.

ADVANTAGES

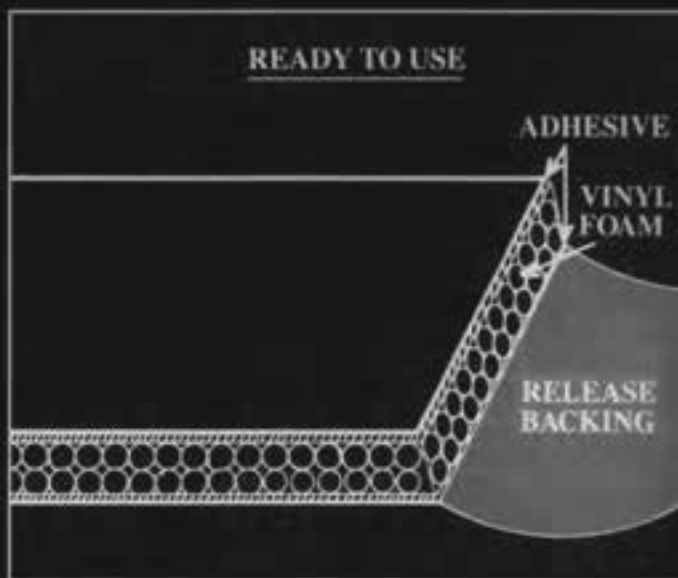
- Eliminates drilling holes, screwing or bolting inserts
- Tacky adhesive is excellent for malleable iron inserts
- Tape's non-porous properties prevents concrete seepage into insert area
- Vinyl foam designed for easy removal of concrete from form
- Forms a complete bond, without voids, regardless of surface irregularities

APPLICATION INSTRUCTIONS

Clean the insert to be used and the surface area to which it will be attached, with **MIDSPEC** FORM-CLEAN. Cut the desired length of tape and attach to the insert. Then remove the protective lining. Position the taped insert on the cleaned surface of the form. No tools are needed. The insert will remain firmly in place, unaffected when concrete is vibrated, no matter where positioned.

PACKAGING

108' x 1/2" wide - 24 rolls per carton
 108' x 1" wide - 12 rolls per carton
 108' x 2" wide - 6 rolls per carton



CONNECTING SYSTEMS THREADED INSERTS

Mineral-filled nylon threaded insert for securing a variety of objects to precast concrete

USES

Connecting Systems Threaded Inserts are a cost effective means of securing many types of objects to precast concrete

ADVANTAGES

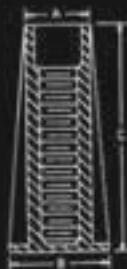
- Economical
- Easy to Use
- Can be used in hundreds of applications
 - Lifting inserts for lightweight precast pieces
 - Secure handles to burial vaults
 - Secure air conditioners and telephone booths to concrete pads
 - Secure cable holders on utility poles
 - Fasten benches, picnic tables and other landscapes items to concrete bases
 - Suspend pipes and conduits from concrete panels
- Lightweight
- Five sizes to accommodate $\frac{1}{4}"$, $\frac{3}{8}"$, $\frac{1}{2}"$, $\frac{5}{8}"$ and $\frac{3}{4}"$ bolt diameters
- Can sustain working loads up to 4,300 pounds
- Connector form adapter plugs are available for all sizes
- Will shrink & expand equally to concrete with temperature changes - prevents cracking of the concrete



AVAILABLE SIZES/PACKAGING

CODE	BOLT DIA.	WORKING LOADS	ULTIMATE STRENGTH	A	B	C	PCS/CTN
THC14	$\frac{1}{4}"$	1,200	3,600	$\frac{3}{4}"$	1"	1 $\frac{1}{2}"$	1000
THC38	$\frac{3}{8}"$	1,300	3,900	$\frac{3}{4}"$	1"	1 $\frac{1}{2}"$	1000
THC50*	$\frac{1}{2}"$	3,000	9,100	$\frac{3}{4}"$	1 $\frac{3}{8}"$	2 $\frac{5}{8}"$	500
THC58	$\frac{5}{8}"$	4,000	12,000	$\frac{7}{8}"$	1 $\frac{1}{2}"$	3"	250
THC75	$\frac{3}{4}"$	4,300	13,000	1"	1 $\frac{5}{8}"$	3 $\frac{1}{4}"$	200

*Available in shorter length of C = 1 $\frac{1}{2}"$ Test reports available upon request.



MIDSPEC SILICONE CAULK

Multi purpose form sealant and adhesive

DESCRIPTION

MIDSPEC SILICONE CAULK is a durable, one component silicone rubber sealant designed specifically for sealing formwork. Because of its excellent adhesive qualities, it is also ideal for securing blockouts or other materials to forms.

ADVANTAGES

- Cures to 100% silicone rubber
- Prevents grout leakage
- Unaffected by form oils and retarders
- May be shaped as a chamfer
- Leaves smooth finish on concrete units
- Tack free within minutes
- Rapid cure time
- Outstanding durability
- Excellent adhesion to form surfaces
- Will not shrink
- Will not crack or chalk under normal conditions
- Abrasion, temperature and chemical resistant
- Will not stain precast units
- Will not stick to wet concrete
- Easily Removed

APPLICATION INSTRUCTIONS

Cut nozzle tip to the width desired and puncture the inner seal. Apply and tool immediately after the application. Solvents such as MIDSPEC SOLVENT 106 may be used as tooling aids. Uncured sealant may be cleaned from tools and non-porous substrates using solvents such as MIDSPEC SOLVENT 106.

PROPERTIES

Color	White
Consistency	Gun Grade
Tack Free	10 min @ room temperature
Vertical Sag	None
Adhesion in peel	15 lb/in.
Shelf-life	6 months minimum

PACKAGING

24 - 10.3 fl oz tubes per carton

SPECIAL PRECAUTIONS

Contact with uncured sealant may irritate eyes and skin. Contact lens wearers should use appropriate caution. In case of eye contact, flush eyes with water and call a physician. May be harmful if swallowed. Use in well ventilated area. Sealant releases acetic acid (vinegar like odor) during cure. Keep out of reach of children. Store at room temperature.



Form joint securely sealed with MIDSPEC SILICONE CAULK

MIDSPEC DOUBLE PANEL TIES

Anchoring device for securing foam to concrete during production of insulated panels

DESCRIPTION

Double pronged plastic anchoring device specifically designed to hold void formers and/or sandwich panel foam insulation in place during casting of concrete. The unique twin-arrow design secures lightweight foam to freshly placed concrete preventing it from floating.

ADVANTAGES

- Easily and securely attached to foam
- Unique design locks tie into concrete
- Perfect for filigree panel system
- Prevents void former/insulation from floating
- Economical - saves time and labor
- Made of non-staining plastic
- Eliminates hand-tied method



APPLICATION INSTRUCTIONS

Insert larger size arrows into foam at approximately 2 ft on center. Place foam into freshly placed concrete and press into position.

PACKAGING

2000 per carton



MIDSPEC DOUBLE PANEL TIE easily inserts into foam



Worker places foam blockout onto fresh concrete of filigree panel. MIDSPEC DOUBLE PANEL TIE eliminates hand tied methods.



Finished filigree panel awaits shipment to job site.



MIDSPEC PANEL TIE

A more efficient panel tie for anchoring polystyrene or urethane in insulated wall panels

ADVANTAGES

The MIDSPEC PLASTIC PANEL TIE is an innovation designed to reduce heat transmission in insulated panels caused by galvanized or stainless steel hairpin anchors. The tie is used in non-composite sandwich panels with polystyrene or urethane foam bonded to both layers of concrete. The tie is composed of a special plastic polymer which will withstand extreme temperatures. Designed to be used in a 12 - 2 1/2" - 1 1/2" sandwich panel, it is the ideal anchor because the tie just barely touches the inside surface.

MIDSPEC PLASTIC PANEL TIE can also be used in a 3-2-3 sandwich panel.

MIDSPEC PLASTIC PANEL TIE is designed so the lower head supports the tie on the surface of the insulation, and provides proper embedment for the upper head in the concrete. The top disc is handy to push the pointed tie through the foam easily by hand.

The combination of heads gives good support when finished panels are stockpiled to prevent crushing to the top face. The plastic is colored to blend with grey concrete.

ADVANTAGES OF THE MIDSPEC PANEL TIE OVER A STEEL TIE

If a dew point forms within the insulation, the special plastic eliminates any corrosion potential which may exist. The plastic won't cut or scratch a worker's hands or tangle in a bin. If dropped on the ground, a plastic tie will not puncture a worker's foot or the tires of wheeled vehicles.

INSTRUCTIONS FOR USE

Typically, the pins are inserted on 2' centers in a panel. Extra pins should be inserted along the edges of the panel.

HISTORY AND ENGINEERING DATA

The inventor of this panel tie used a standard 1/4" diameter U-shaped galvanized steel tie in their insulated sandwich panels from 1974 until 1982. During that time, they manufactured and erected seven million square feet of these panels with either two or two-and-a-half inches of insulation. In taking a series of thermal heat loss photos of sandwich panels, it became obvious that heat was being lost through the metal hairpin. The probability of a dew point within the sandwich panel seemed to indicate it would be a good idea to convert to a plastic tie which was non-corrosive and would obviously transmit much less heat.

Dies were developed and an extensive testing program was conducted by the Twin City Testing and Engineering Laboratory of St. Paul, MN to evaluate the ties. After a series of small scale tests proved that the plastic pin had strengths similar to steel ties, large scale tests were run as shown in the accompanying shear drawing and photographs. The test were run on standard sandwich panels 8' wide and 8' high. There were 36 PANEL TIES in this particular panel.

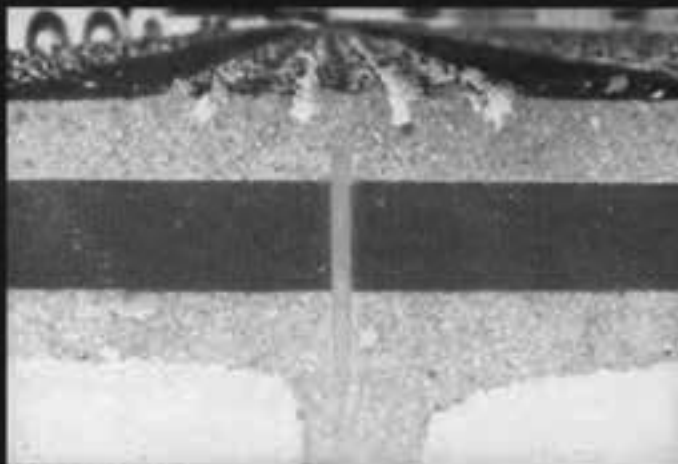
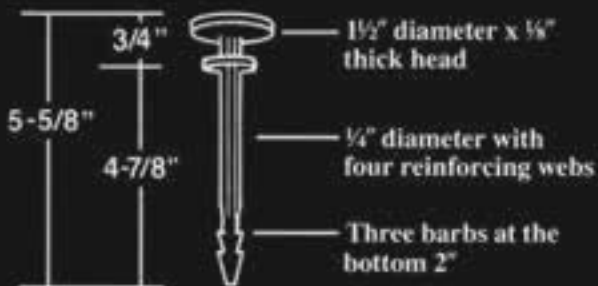
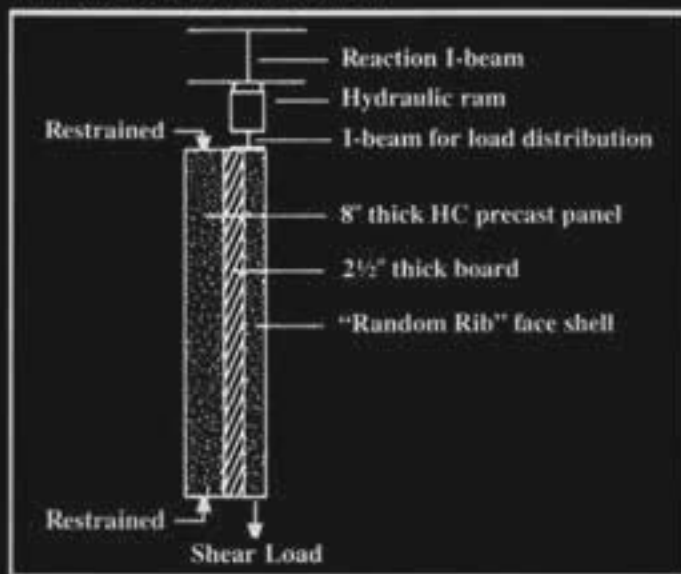
Test were loaded until the facing concrete and the foam moved downward relative to the panel backing and the loading started to decrease. With polystyrene insulation, this load averaged 85,000 lbs at ultimate. With urethane board, which is smoother, the ultimate load averaged 91,000 lbs. These tests provided values between 1,200 and 1,600 lbs psf. of panel face per tie. Considering that the face shell weighs approximately 20 psf, this is a very safe and conservative safety factor. Test results are available upon request. This system has now been successfully used in several million square feet of sandwich panels.



MIDSPEC PANEL TIE

Continued

SHEAR LOAD TEST SET-UP



PACKAGING

MIDSPEC PANEL TIE's are available in boxes of 1,000 units.



MIDSPEC HOG/ CATTLE SLAT CHAIRS

For accurately positioning the top and bottom rebars in a hog/cattle slat form

DESCRIPTION

MIDSPEC HOG/CATTLE SLAT CHAIRS were specially designed for quick and easy placement of rebars. Their exclusive design accurately positions and supports both bottom and top rebars.

In the past, the bottom rebar was often displaced during the placing of the concrete. In addition, the top rebar often failed to meet concrete cover requirements.

With the MIDSPEC HOG/CATTLE SLAT CHAIRS, both rebars are supported and exactly placed in one fast and easy step.

MIDSPEC HOG/CATTLE SLAT CHAIRS are designed to insure easy flow of concrete around them, thereby producing better castings, saving time and money. They are made of high quality, non-corrosive, non-staining, light weight plastic.



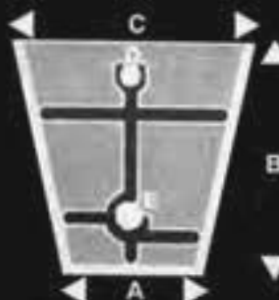
UPSIDE DOWN CASTING

A:	B:	C:	Cover	Bar Size (D,E)	Catalog Code
6"	4"	4"	3/4"	4,5	SLATH

All MIDSPEC HOG/CATTLE SLAT CHAIRS are packaged 500 per carton.

ADVANTAGES

- Accurately positions and places bottom and top rebars
- Fast placement saves time and money
- Made of high-grade/non-corrosive plastic
- Non-staining, lightweight
- Available for right-side-up or upside-down placement



RIGHT SIDE UP CASTING

A:	B:	C:	Cover	Bar Size (D,E)	Catalog Code
3"	4"	5"	3/4"	3,4	SLATS
3"	4"	5"	1"	3,4	SLATW
3"	5"	5"	3/4"	3,4	SLATL
5"	5"	7"	3/4"	3,4	SLATX
4"	4"	6"	3/4"	3,4	SLATB
5"	4"	5"	3/4"	3,4	SLAWS

MIDSPEC BUMPER CURB CHAIR

Prevents deterioration of bumper curbs by properly positioning the rebar within the concrete bumper curb

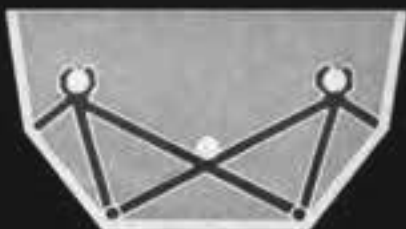
DESCRIPTION

MIDSPEC BUMPER CURB CHAIRS will accurately position and support rebar during the casting of bumper curbs. Proper cover of steel is always assured, preventing spalling.

Made of high-quality, non-staining plastic polymer, MIDSPEC BUMPER CURB CHAIRS will help prevent deterioration of bumper curbs caused by improper placement of rebar.

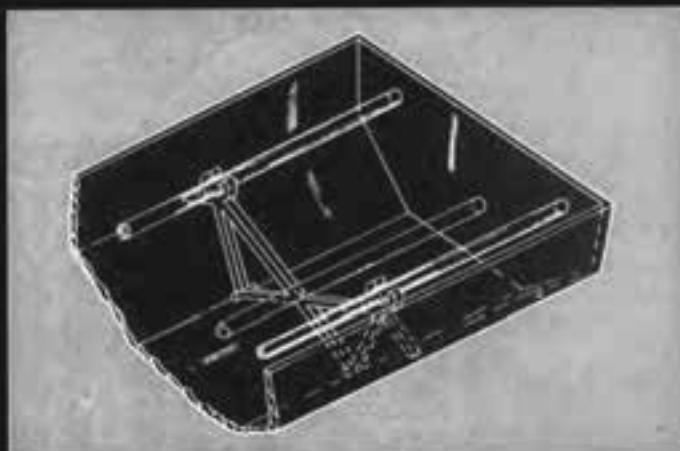
MIDSPEC BUMPER CURB CHAIRS save time and money by eliminating labor intensive hand placement of rebar and re-troweling of the disturbed concrete surface. All rebars are properly placed in one easy step.

250 pieces per carton



ADVANTAGES

- Accurately positions and places bottom and top rebar
- Fast placement saves time and money
- Made of high-grade/non-corrosive plastic
- Non-staining, light weight
- Maintains a cover of 1 1/2"
- Holds #3 or #4 rebar





PRECAST CONCRETE ANCHORS

PROFESSIONAL PRODUCTS FOR PROFESSIONAL RESULTS



MidSpec's Insert is designed for use in precast, prestressed or poured-in-place concrete. This precast zinc alloy (ZAMAK 5) insert provides rustproof threaded holes in concrete. The insert itself provides excellent resistance to atmospheric conditions and will never mar or stain finished installations.

FREQUENT AND RECOMMENDED USES:

- Heavy machinery
- Railings
- Park benches
- Utility poles
- Line machinery



BULK				
Catalog Number	Size	Type	Pieces Per Carton	List Price Per 100
<i>Precast Concrete Inserts</i>				
9410-00003	10-24x11/16	P10T	1,000	25.80
9415-00003	1/4x1-1/2	P15T	1,000	50.80
9424-00003	3/8x1	P24T	500	74.10
9425-00003	3/8x1-3/8	P25T	500	80.50
9435-00003	1/2x1-1/2	P35T	250	154.70
9436-00003	1/2x2-7/8	P36T	100	328.70
9445-00003	5/8x1-11/16	P45T	250	220.30
9446-00003	5/8x2-7/8	P46T	100	380.30
9455-00003	3/4x1-11/16	P55T	50	312.60
9456-00003	3/4x3	P56T	50	496.30
9435-00013	1/2x1-1/2	P35 Roll Back	250	154.70
9445-00013	5/8x1-11/16	P45 Roll Back	250	220.30
9455-00013	3/4x1-11/16	P55 Roll Back	50	312.60
9425-00103	3/8x1-3/8	P25T Open Bottom	500	71.70
9435-00103	1/2x1-1/2	P35T Open Bottom	250	140.80
2535-00003	1/2	Holzlin Insert	125	107.60
9315-00003	1/4 x 7/8	ISG Insert	1,000	32.70
9325-00003	3/8 x 1-1/4	ISG Insert	500	41.00
<i>Adapter Plugs</i>				
9525-00003	3/8	P25A	500	55.70
9535-00003	1/2	P35A	100	75.10
9545-00003	5/8	P45A	100	119.20
9555-00003	3/4	P55A	50	122.40

PRECAST CONCRETE ANCHORS

PROFESSIONAL PRODUCTS FOR PROFESSIONAL RESULTS



PD CONCRETE INSERT



ADAPTER PLUG



APPROVALS:

9400 Series meets
A.S.T.M. B86 XXV S.A.E.
Designation 925 XXV
U.L. Listed

SPECIFICATIONS

Catalog Number	Anchor Size	Type	Full Threaded Engage.	Bolt Size	A	B	C	Torque	3500 psi Ultimate Tensile (lbs)	5000 psi Ultimate Tensile (lbs)
9410-00003	10-24 x 11/16"	P10T	5/8"	10-24	11/16"	3/16"	7/16"	10" / lbs	n/a	850
9415-00003	1/4 x 1-1/2"	P15T	7/8"	1/4-20	1-1/2"	1/4"	13/16"	32" / lbs	2,250	n/a
9424-00003	3/8 x 1"	P24T	31/32"	3/8-16	1"	3/8"	7/8"	10" / lbs	n/a	4,100
9425-00003	3/8 x 1-3/8"	P25T†	1-1/8"	3/8-16	1-3/8"	3/8"	7/8"	100" / lbs	2,990	4,800
9435-00003	1/2 x 1-1/2"	P35T†	1-1/4"	1/2-13	1-1/2"	1/2"	1-1/4"	19" / lbs	5,056	5,435
9436-00003	1/2 x 2-7/8"	P36T	2-1/2"	1/2-13	2-7/8"	1/2"	1-3/8"	19" / lbs	10,800	n/a
9445-00003	5/8 x 1-11/16"	P45T†	1-3/8"	5/8-11	1-11/16"	5/8"	1-3/8"	40" / lbs	6,672	6,835
9446-00003	5/8 x 2-7/8"	P46T	2-1/2"	5/8-11	2-7/8"	5/8"	1-9/16"	40" / lbs	13,375	n/a
9455-00003	3/4 x 1-11/16"	P55T†	1-1/2"	3/4-10	1-11/16"	3/4"	1-9/16"	56" / lbs	6,910	8,205
9456-00003	3/4 x 3"	P56T	2-1/2"	3/4-10	3"	3/4"	1-3/4"	56" / lbs	n/a	16,375

Safe working load = 1/4 maximum test load.

† UL approved.

* Open bottom.

HOLZIN® CONCRETE INSERTS

CATALOG NO. 2535-00003

Anchor Diameter	1/2"
Insert Length A	2-3/8"
Insert Length B	7/8"
Insert Length C	1-1/4"
Insert Length D	11/16"
Thread Length T	1-1/8"
Total Depth L	2-5/32"
Torque (ft/lbs)	19
3500 psi Ultimate Tensile (lbs)	5000

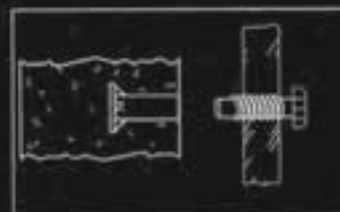


Holzins® are precision die-cut inserts, made of zinc alloy, which provide pre-planned rustproof threaded metal holes permanently embedded in concrete, allowing fastening after construction is complete.

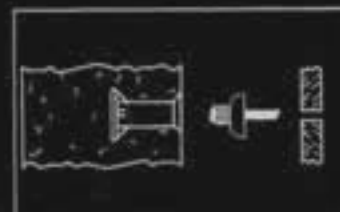


Safe Working Load =
1/4 Maximum Test Load.

INSTALLATION

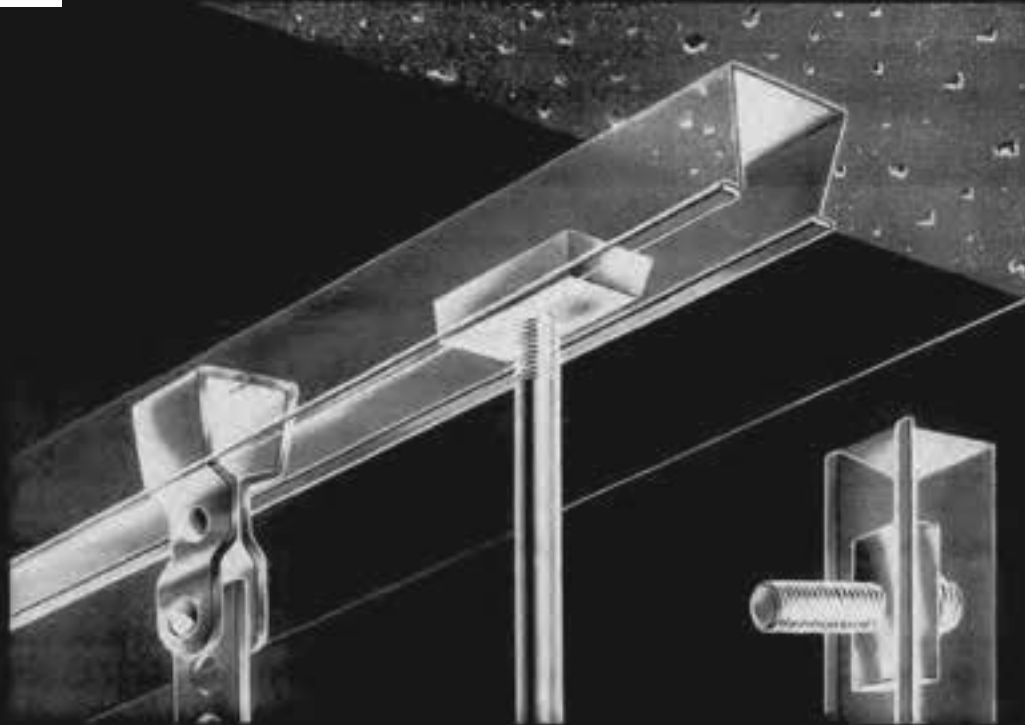


Precast Concrete Inserts can be secured directly to steel form with a standard machine screw or bolt, which is easily removed when form is stripped.



Precast Concrete Inserts can be easily secured to wood form with one stronghold nail. Precast Adapter is easily removed after form is stripped.

BEE-HIVE DOVETAIL ANCHOR SLOT



MidSpec "BEE-HIVE" Dovetail Anchor Slot is the chief component part of the "BEE-HIVE" Anchoring System. It is made by special machinery - true to shape and form and maintains its positive shape during concreting. The water-proof cellular filler and face sealer guarantees this positive shape. "BEE-HIVE" Dovetail Anchor Slot is stocked in lengths of 10 feet and can be cut quickly and easily to any desired length on the job. Dovetail Slot can also be fabricated to any length under 10 feet. The Dovetail Slot is attached to the forms with 6d nails. Holes have been provided in the back of the slot at 4 inch intervals. When nailing the slot to the form the recommended spacing of nails should be 12 inches.



Code Number	Material	Wt. Per 1000 ft.
DAS-Std.	Standard Galvanized	280 lbs.
DAS-G24	24 Ga. Galvanized	340 lbs.
DAS-G22	22 Ga. Galvanized	390 lbs.
DAS-G20	20 Ga. Galvanized	500 lbs.
DAS-S26	26 Ga. Stainless Steel	240 lbs.

*Stocked in 10' lengths.
Packaged 2,000' to a bundle.*



MidSPEC

DOVETAIL BRICK ANCHORS

Code	Length	Material Type	Wgt. Per 1000 Pcs.
DBA-G16	3 1/2"	16 Ga. Galvanized	80 lbs.
DBA-G14	3 1/2"	14 Ga. Galvanized	100 lbs.
DBA-G12	3 1/2"	12 Ga. Galvanized	140 lbs.
DBA-HD16	3 1/2"	16 Ga. HD Galv.	80 lbs.
DBA-HD14	3 1/2"	14 Ga. HD Galv.	100 lbs.
DBA-HD12	3 1/2"	12 Ga. HD Galv.	140 lbs.



DOVETAIL CORRUGATED BRICK ANCHORS

Code	Length	Material Type	Wgt. Per 1000 Pcs.
DCBA-G16	3 1/2"	16 Ga. Galvanized	90 lbs.
DCBA-G14	3 1/2"	14 Ga. Galvanized	110 lbs.
DCBA-G12	3 1/2"	12 Ga. Galvanized	160 lbs.
DCBA-HD16	3 1/2"	16 Ga. HD Galv.	90 lbs.
DCBA-HD14	3 1/2"	14 Ga. HD Galv.	110 lbs.
DCBA-HD12	3 1/2"	12 Ga. HD Galv.	160 lbs.



DOVETAIL CAVITY WALL ANCHORS

Code	Length	Material Type	Wgt. Per 1000 Pcs.
DCWA-G16	5"	16 Ga. Galvanized	120 lbs.
DCWA-G14	5"	14 Ga. Galvanized	150 lbs.
DCWA-G12	5"	12 Ga. Galvanized	210 lbs.
DCWA-HD16	5"	16 Ga. HD Galv.	120 lbs.
DCWA-HD14	5"	14 Ga. HD Galv.	150 lbs.
DCWA-HD12	5"	12 Ga. HD Galv.	210 lbs.



DOVETAIL CORRUGATED FURRING ANCHORS

Code	Length	Material Type	Wgt. Per 1000 Pcs.
DCFA-G16	1 1/2"	16 Ga. Galvanized	50 lbs.
DCFA-G14	1 1/2"	14 Ga. Galvanized	60 lbs.
DCFA-G12	1 1/2"	12 Ga. Galvanized	80 lbs.
DCFA-HD16	1 1/2"	16 Ga. HD Galv.	50 lbs.
DCFA-HD14	1 1/2"	14 Ga. HD Galv.	60 lbs.
DCFA-HD12	1 1/2"	12 Ga. HD Galv.	80 lbs.



DOVETAIL STONE ANCHORS

Code	Length	Material Type	Wgt. Per 1000 Pcs.
DSA 1/2" x 1"	3 1/2"	HD Galv.	190 lbs.
DSA 3/4" x 1"	3 1/2"	HD Galv.	290 lbs.
DSA 1/2" x 1 1/2"	3 1/2"	HD Galv.	380 lbs.
DSA 3/4" x 1 1/2"	3 1/2"	HD Galv.	450 lbs.



DOVETAIL BEE-NUTS

Code	Material Type	Wgt. Per 1000 Pcs.
DBN-1/2 Z	Electro-galvanized	140 lbs.
DBN-3/4 Z	Electro-galvanized	140 lbs.
DBN-1/2 P	Electro-galvanized	140 lbs.
DBN-3/4 P	Plain Steel	140 lbs.
DBN-1/2 P	Plain Steel	140 lbs.
DBN-3/4 P	Plain Steel	140 lbs.
DBNS-1/2 SZ	Electro-galvanized	140 lbs.
DBNS-3/4 SZ	Electro-galvanized	140 lbs.
DBNS-1/2 SP	Electro-galvanized	140 lbs.
DBNS-3/4 SP	Plain Steel	140 lbs.
DBNS-1/2 SP	Plain Steel	140 lbs.
DBNS-3/4 SP	Plain Steel	140 lbs.



DBN



DBNS



BEE-SNAPS AND BEE-CLIPS

The "Bee-Clip" has numerous applications for suspending such things as lath and acoustical ceilings with wire hangers or perforated strap. It locks in position when bolt or wire is put through holes provided in the clip.

The "Bee-Snap" offers an economical means of anchoring light loads to concrete walls and ceilings. The 1/4" - 20 screw locks the Snap in place. The screw and snap are furnished as a unit.

Code	Material
DBC-G13	13 Ga. Galvanized Steel
DBS-25	25 Ga. Steel

DBS



DBC



MSI SPEC GROUT

Non-shrink, Non-metallic grout

DESCRIPTION

MSI SPEC GROUT is a non-shrink, non-metallic multi-purpose cement-based grout. MSI SPEC GROUT is formulated for a wide variety of grouting applications, from damp pack to flowable through a controlled, positive expansion.

USE

Recommended applications include grouting of pump and equipment based column base plates, anchor bolts, pre-cast and tilt-up walls.

FEATURES / BENEFITS

- Controlled positive expansion for maximum effective bearing
- Non-metallic / non-corrosive
- Pourable / pumpable versatility
- Excellent freeze / thaw resistance
- Can be extended with pea stone for deep applications
- Natural concrete gray
- Can contribute to LEED credits
- Easy to use, simple add water
- Chloride and gypsum free
- USDA Accepted

SPECIFICATIONS / COMPLIANCES

Corp of Engineers CRD-C-621 Grade A, B & C
ASTM C-1107, Grade A, B & C

APPLICATION

Preparation: Remove all dirt, oil, and loose or foreign material. Any metal in contact with grout must be free of rust, oil, grease, and other foreign matter which would limit bond. Concrete surface must be sound and roughened to insure proper bonding. Prior to placing grout, surface must be saturated surface dry (SSD), if possible for a minimum of an hour. Remove all excess water before placement of grout. Bolts, base plates and equipment must be secure and rigid before placement of grout. All materials and surfaces in contact with the grout should be conditioned between 50°-80°F for proper performance. Provide heating or cooling, as necessary, to compensate for temperature extremes and changes in cure time.

Forms: Allow for the continuous placement of grout. Provisions for venting to avoid air entrapment must be made. Placing from one side, provide a 45° angle in the forms to a height suitable to provide a head of grout during placement. On all sides, provide a minimum 1" (2.54 cm) horizontal clearance between the base plate and forms. Forms should be at least 1" (2.54 cm) higher than the bottom of the base plate.

Mixing: Small quantities of grout may be hand mixed in a concrete mixing pan until lump free. For large quantities and continuous pours, mix using a mortar mixer with rubber tipped blades or appropriate grout pump for a minimum of 5 minutes. Start with minimum water requirements.

Always add water to mixer first, then slowly add powder. Use only the amount of water required for the desired placement consistency. Mix in two steps: Add 2/3 of the water, add grout, after partial mixing add the remaining 1/3 of the water for desired consistency. Thoroughly mix total quantity for an additional 2 to 3 minutes. Do not mix more than can be placed in 30 minutes.

Placing: Place continuously and quickly. Start from one side to avoid air entrapment. Be sure grout fills spaces and remains in contact with plate. **DO NOT VIBRATE.**

TYPICAL PERFORMANCE DATA

	Plastic	Flowable	Fluid
Water / 50 lb.	6.30-6.65 pints	6.85-7.75 pints	7.75-8.35 pints

Compressive Strength (ASTM C-109)

	Plastic	Flowable	Fluid
1 day	4,000 psi	3,100 psi	1,450 psi
3 days	5,500 psi	5,000 psi	3,700 psi
7 days	8,100 psi	6,900 psi	6,200 psi
28 days	10,200 psi	8,400 psi	8,100 psi

Expansion Percentage (ASTM C-1090)

	Plastic	Flowable	Fluid
1 day	0.07	0.03	0.02
3 days	0.07	0.03	0.02
14 days	0.07	0.03	0.02
28 days	0.07	0.03	0.02

Flexural Strength (ASTM C-78) = 1415 psi @ 28 days

Tensile Strength (ASTM C-190) = 620 psi @ 28 days

Split Tensile Strength (ASTM C 469) = 735 psi @ 28 days

Note: The data shown is based on controlled laboratory testing. Reasonable variation from test results shown can be expected. Field and laboratory testing should be controlled on the basis of the desired placing consistency, rather than strictly on water content.



MidSpec Inc.

19180 Linden Drive | Rogers, MN 55374

Revised 08/24/12

MidSpec, Inc.

763-428-8500 or 866-MIDSPEC

www.midspecinc.com

APPLICATION (cont.)

A minimum of 1" (2.48 cm) vertical clearance should be maintained for base plate grouting applications. Thinner vertical clearances may require the use of another type of grout.

Curing: Grouts must be cured. Immediately water cure or cover with clean, wet rags and keep moist until final set. After final set, remove water cure or wet rags and apply an ASTM-C-309 curing compound, such as The manufacturer Cure & Seal 25.

Special Conditions:

Deep application: Pre-washed and graded 3/8" (1 cm) pea gravel should be used in large applications (greater than 1' x 1') and thicker than 3" (7.62 cm) as follows:

- 3'-5" (7.62-12.7 cm): Add 25% of 3/8" (1 cm) pea gravel per 50 lb bag of grout.
- 5" (12.7 cm) and over: Add 50% of 3/8" (1 cm) pea gravel per 50 lb bag of grout.
- Place in 6" lifts with proper reinforcement

Hot weather conditions: Accelerates setting time and causes premature drying of the grout. Keep the grout cool. Provide shade for area to be grouted. Use cool or chilled mixing water. Protect grout from direct sun exposure for up to 24 hours after grouting. For additional information, refer to ACI 305 (Recommended Practices for Hot Weather Concreting).

Cold weather conditions: Retards strength gain and set time. Warm the grout material above 50°F. Raise the temperature of the area to be grouted with space heaters or steam. Warm the mixing water. Cover and insulate the grout to retain warmth. The minimum temperature (ambient, substrate, and grout) for grouting is 40°F (5°C). For additional information, refer to ACI 306 (Recommended Practices for Cold Weather Concreting).

PACKAGING / YIELD

50 lb (22.7Kg) multiple plastic lined bag will yield approximately 0.45 cu. ft. in a fluid condition.

50% by weight extension (25 lbs) of 3/8" pea stone will yield approximately 0.59 cu. ft.

LIMITATIONS / PRECAUTIONS

DO NOT place at temperatures below 40°F (5°C) or if the temperature is expected to fall below 40°F (5°C) in the next twenty four hour period unless special provisions are followed. At low temperatures, water requirement should be field tested.

When nearby equipment causes vibration of the grout, such equipment should be shut down for a period of 24 hours (at 73°F (23°C)). DO NOT mix over 5 minutes. DO NOT over water; this can cause bleeding or separation. DO NOT retemper. DO NOT add cement, sand, or admixtures.

Avoid hazards by following all precautions found in the Material Safety Data Sheets (MSDS), product labels, and technical literature

SHELF LIFE / STORAGE

MSI SPEC GROUT should be stored in a cool, dry interior area. At no time should material be exposed to high moisture, rain, or snow conditions. When stored in the original, tightly closed container, the shelf life is one year from the date of manufacture.

TECHNICAL SERVICES

For assistance, contact technical services at:

763.428.8500

www.midspecinc.com

24 HOUR EMERGENCY CONTACT:

CHEMTREC - 800-424-9300

WARRANTY

NOTICE-READ CAREFULLY CONDITIONS OF SALE

The manufacturer offers this product for sale subject to and limited by the warranty which may only be varied by written agreement of a duly authorized corporate officer of The manufacturer. No other representative of or for The manufacturer is authorized to grant any warranty or to waive limitation of liability set forth below.

WARRANTY LIMITATION

The manufacturer warrants this product to be free of manufacturing defects. If the product when purchased was defective and was within use period indicated on container or carton, when used, The manufacturer will replace the defective product with new product without charge to the purchaser. The manufacturer makes no other warranty, either expressed or implied, concerning this product. There is no warranty of merchantability. NO CLAIM OF ANY KIND SHALL BE GREATER THAN THE PURCHASE PRICE OF THE PRODUCT IN RESPECT OF WHICH DAMAGES ARE CLAIMED.

INHERENT RISK

Purchaser assumes all risk associated with the use or application of the product



MSI SPEC PATCH 5

Fast setting polymer-modified concrete repair material

DESCRIPTION

MSI Spec Patch 5 is a general purpose polymer-modified, concrete repair mortar for concrete floors, walls, precast, tilt-up and masonry surfaces. MSI Spec Patch 5 can be used for horizontal and vertical applications to provide a durable repair that can be shaped by shaving or sanding.

FEATURES/BENEFITS

- Can be featheredged
- Lifts up to 1" in thickness
- 5 minute set time for quick turn around
- Can be shaped
- Excellent durability and adhesion
- Dries to color of concrete

APPLICATION

Applications:

- Interior & exterior
- Vertical, overhead & horizontal repairs
- Used at no slump consistency
- Outstanding repair material for concrete pipe, curbs, sidewalks, formed and precast concrete

Surface Preparation: The concrete must be sound and free of all foreign material, including oil, grease, dust, laitance or other surface contaminants. Saw cut the perimeter of the repair to a maximum depth of $\frac{1}{2}$ ". Mechanically abrade the surface by an engineered approved method, such as grinding, abrasive blasting, or scarifying. All surfaces to be repaired should be in a saturated-surface-dry (SSD) condition with no standing water on the surface.

MSI Spec Patch 5 takes its initial set in 5 minutes.

Mixing: Mix 6.75 – 7.25 pints (depending on desired consistency) of clean water per 50 pound bag of material. Mix with a low speed drill. Add recommended amount of clean water into the container, followed by the MSI Spec Patch 5. Mix 2 to 3 minutes. Mix only what can be applied within the setting period.

MSI Spec Patch 5 may be used with The manufacturer Acrylic Bonder neat or mixed 1 to 1 with water per 50 pounds of powder to increase durability, abrasion resistance and bond strength. The addition of Acrylic Bonder is recommended when using MSI Spec Patch 5 in thin, horizontal applications subjected to heavy traffic or wear.

Bond/Scrub Coat: Use the properly mixed MSI Spec Patch 5 as a bond or scrub coat by scrubbing a thin layer into the pre-dampened substrate with a stiff brush. Place the MSI Spec Patch 5 mortar immediately before the

Placement: Trowel MSI Spec Patch 5 firmly into the prepared area, ensuring intimate contact with the bonding surface. Use slightly more material than is needed and roughly shape during placement. After the initial set, when MSI Spec Patch 5 is surface hard, shave the material to the desired final shape using a steel trowel. Maximum depth of neat repair mortar is 1" for each lift. Additional lifts can be placed after the original lift has achieved set. The original lift should be left with a rough surface to improve bond between lifts.

Finishing/Curing: Finish the repair material to the desired texture to match the surrounding concrete. MSI Spec Patch 5 is self-curing under most conditions. In severe drying conditions, use an ASTM C-309 compliant, water based The manufacturer curing compound.

Coverage: approx 20 sq-ft @ 1/4"

CLEAN UP

Tools and equipment may be cleaned with water before MSI Spec Patch 5 hardens.

TYPICAL TEST DATA

Set Time at 70°F (ASTM C-266)	
Initial Set	5 min
Final Set	8 min
Compressive Strength (ASTM C-109)	
1 day	3150 psi
7 days	5000 psi
28 days	6500 psi
Freeze-Thaw (ASTM C-672)	
Scaling Resistance	25 cycles=0% loss
Flexural Strength (ASTM C-348)	
7 days	500 psi
28 days	650 psi
Yield	
Yield Per Bag	.43 cu-ft



MidSpec Inc
19180 Linden Drive | Rogers, MN 55374

Revised 2/21/13

SHELF LIFE

Shelf life of unopened bags stored in a dry facility is 12 months. Excessive temperature differential and/or high humidity can shorten the shelf life expectancy. Store in a cool, dry area away from direct sunlight.

LIMITATIONS/PRECAUTIONS

Minimum thickness for repair is 1/8" to achieve maximum durability in heavy wear applications. Do not retemper after initial mixing. Do not add other cements or additives to this product. MSI Spec Patch 5 is a fast setting product, so mixing equipment should be cleaned with water as soon as possible.

Do not allow repairs to freeze until the material has reached a minimum of 1000 psi compressive strength. In adverse temperatures, follow ACI recommendations for hot/cold weather concreting practices. Use only potable water for mixing.

Minimum surface and ambient temperature of 45°F and rising is required at the time of application.

For optimum results, condition material to between 65°F and 85°F.

Caution: Contains Portland Cement and sand. Cement will cause irritation. Avoid contact. A dust respirator, safety goggles, and rubber gloves are recommended. Avoid prolonged contact with clothing. In case of contact with eyes, immediately flush with water for at least 15 minutes. Get prompt medical attention. Do not wear contact lenses when working with this product. DO NOT take internally. Keep out of reach of children.

Avoid hazards by following all precautions found in the Material Safety Data Sheet (MSDS), product labels, and technical literature. Please read this information prior to using the product.

WARRANTY

NOTICE-READ CAREFULLY CONDITIONS OF SALE

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WARRANTY LIMITATION

The manufacturer warrants this product to be free of manufacturing defects. If the product when purchased was defective and was within use period indicated on container or carton, when used. The manufacturer will replace the defective product with new product without charge to the purchaser. The manufacturer makes no other warranty, either expressed or implied, concerning this product. There is no warranty of merchantability. NO CLAIM OF ANY KIND SHALL BE GREATER THAN THE PURCHASE PRICE OF THE PRODUCT IN RESPECT OF WHICH DAMAGES ARE CLAIMED.

INHERENT RISK

Purchaser assumes all risk associated with the use or application of the product.





MSI SPEC PATCH 20

Fast setting polymer modified concrete repair material

DESCRIPTION

MSI Spec Patch 20 is a general purpose polymer-modified concrete repair mortar for concrete floors, walls, precast, tilt-up and masonry surfaces. MSI Spec Patch 20 can be used for horizontal and vertical applications to provide a durable repair that can be shaped by shaving.

FEATURES/BENEFITS

- Can be featheredged
- Lifts up to 1" in thickness
- Designed for interior & exterior repairs
- Can be shaped
- Excellent durability and adhesion
- Dries to color of concrete
- One component - Just add water

APPLICATION

Applications:

- Interior & exterior
- Vertical, overhead & horizontal repairs
- Used at no slump consistency
- Outstanding repair material for concrete pipe, curbs, sidewalks, formed and precast concrete

Surface Preparation: The concrete must be sound and free of all foreign material, including oil, grease, dust, laitance or other surface contaminants. Mechanically abrade the surface by an engineered approved method, such as grinding, abrasive blasting, or scarifying. All surfaces to be repaired should be in a saturated-surface-dry (SSD) condition with no standing water on the surface.

MSI Spec Patch 20 takes its initial set in 15 minutes.

Mixing: Mix 6.75 – 7.25 pints (depending on desired consistency) of clean water per 50 pound bag of material. Mix with a low speed drill. Add recommended amount of clean water into the container, followed by the MSI Spec Patch 20. Mix 2 to 3 minutes. Mix only what can be applied within the setting period.

MSI Spec Patch 20 may be used with The manufacturer Acrylic Bonder neat or mixed 1 to 1 with water per 50 pounds of powder to increase durability, abrasion resistance and bond strength. The addition of Acrylic Bonder is recommended when using MSI Spec Patch 20 in thin, horizontal applications subjected to heavy traffic or wear.

Bond/Scrub Coat: Use the properly mixed MSI Spec Patch 20 as a bond or scrub coat by scrubbing a thin layer into the pre-dampened substrate with a stiff brush. Place the MSI Spec Patch 20 mortar immediately before the bond coat dries.

Placement: Trowel MSI Spec Patch 20 firmly into the prepared area, ensuring intimate contact with the bonding surface. Use slightly more material than is needed and roughly shape during placement. After the initial set, when MSI Spec Patch 20 is surface hard, shave the material to the desired final shape using a steel trowel. Maximum depth of neat repair mortar is 1" for each lift. Additional lifts can be placed after the original lift has achieved set. The original lift should be left with a rough surface to improve bond between lifts.

Finishing/Curing: Finish the repair material to the desired texture to match the surrounding concrete. MSI Spec Patch 20 is self-curing under most conditions. In severe drying conditions, use an ASTM C-309 compliant, water based The manufacturer curing compound.

CLEAN UP

Tools and equipment may be cleaned with water before MSI Spec Patch 20 hardens.

TYPICAL TEST DATA

Set Time at 70°F (ASTM C-266)	
Initial Set	15 – 30 min
Final Set	60 min
Compressive Strength (ASTM C-109)	
3 hour	1100psi
1 day	2000 psi
7 days	4500 psi
28 days	6000 psi
Freeze-Thaw (ASTM C-672)	
Scaling Resistance	25 cycles = 0% loss
Flexural Strength (ASTM C-348)	
7 days	500 psi
28 days	650 psi
Yield	
Yield Per Bag	.43 cu-ft



SHELF LIFE

Shelf life of unopened bags stored in a dry facility is 12 months. Excessive temperature differential and/or high humidity can shorten the shelf life expectancy. Store in a cool, dry area away from direct sunlight.

LIMITATIONS/PRECAUTIONS

Minimum thickness for repair is 1/4" to achieve maximum durability in heavy wear applications. Do not retemper after initial mixing. Do not add other cements or additives to this product. MSI Spec Patch 20 is a fast setting product, so mixing equipment should be cleaned with water as soon as possible.

Do not allow repairs to freeze until the material has reached a minimum of 1000 psi compressive strength. In adverse temperatures, follow ACI recommendations for hot/cold weather concreting practices. Use only potable water for mixing.

Minimum surface and ambient temperature of 45°F and rising is required at the time of application.

For optimum results, condition material to between 65°F and 85°F.

Caution: Contains Portland Cement and sand. Cement will cause irritation. Avoid contact. A dust respirator, safety goggles, and rubber gloves are recommended. Avoid prolonged contact with clothing. In case of contact with eyes, immediately flush with water for at least 15 minutes. Get prompt medical attention. Do not wear contact lenses when working with this product. DO NOT take internally. Keep out of reach of children.

Avoid hazards by following all precautions found in the Material Safety Data Sheet (MSDS), product labels, and technical literature. Please read this information prior to using the product.

WARRANTY

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INHERENT RISK

Purchaser assumes all risk associated with the use or application of the product.





MSI SPEC BOND

Acrylic bonding agent and admixture

DESCRIPTION

MSI Spec Bond is an acrylic admixture and bonding agent designed to improve the adhesion and durability of concrete, masonry, stucco, terrazzo and Portland cement-sand mixes to horizontal and vertical concrete and other surfaces. May contribute to LEED credits.

FEATURES/BENEFITS

- Improves the flexural strength, bond strength and impact resistance of mortars and concrete.
- Concrete and mortar fortified with MSI SPEC BOND exhibit excellent resistance to cycles of freezing and thawing and to penetration of chloride ions.
- Minimizes cracks in concrete, stucco and plaster when used as an admixture

SPECIFICATIONS/COMPLIANCES

Meets specifications:

- ASTM C 1042 - Bond Strength of Latex Systems Used With Concrete - Type 2
- ASTM C 1059 Latex Agents for Bonding Fresh to Hardened Concrete - Type II

APPLICATION

Surface Preparation: Mechanically abrade existing substrate to remove all unsound concrete. Substrate must be structurally sound and free of grease, oil, dirt or any other contaminants that may adversely affect the bond. Prepared surface must be dust-free and must have sufficient profile to ensure adequate mechanical lock. Substrate must be saturated, surface dry (SSD) and free of standing water.

Mixing and Application Guidelines: Mix designs vary with specific job requirements. Proportioning of sand, cement and MSI SPEC BOND (diluted or neat) ratios achieve different physical properties. The application instructions highlight typical conditions. (When in doubt, always apply a test patch).

Admixture: Typically, blend one part cement to three parts sand then add enough MSI SPEC BOND until a desired consistency is achieved. To avoid trapping air, do not over-mix. Place modified mortar/repair material and finish appropriately, taking care not to overwork the material. Once the finishing process is completed, immediately cure work zone with undiluted MSI SPEC BOND.

Bond Coat: Mix one part cement to two parts sand, then add enough undiluted MSI SPEC BOND to make a slurry consistency. Work slurry into repair area or concrete substrate with a stiff masonry brush, coating the entire area, paying special attention to the corners, sides and any exposed rebar. Place concrete or mortar material before the MSI SPEC BOND bond coat becomes tack-free.

Bonding Agent (Neat): Apply undiluted MSI SPEC BOND to the prepared surface by brush, roller or garden type sprayer. Place concrete or mortar before applied surface dries.

CLEAN UP

Tools and equipment may be cleaned with water before MSI Spec Patch 5 hardens.

TYPICAL TEST DATA

Compressive Strength of MSI SPEC BOND modified mortar (ASTM C-109)	
3 day	3150 psi
7 days	4250 psi
28 days	5500 psi
Bond Strength (ASTM C 1042)	
28 days	2250 psi
Freeze-Thaw (ASTM C-672)	
Scaling Resistance	25 cycles=0% loss
Flexural Strength (ASTM C-348)	
28 days	1285 psi

SHELF LIFE

Shelf life of unopened bags stored in a dry facility is 12 months. Excessive temperature differential and/or high humidity can shorten the shelf life expectancy. Store in a cool, dry area away from direct sunlight.

LIMITATIONS/PRECAUTIONS

Minimum thickness for repair is 1/8" to achieve maximum durability in heavy wear applications. Do not retemper after initial mixing. Do not add other cements or additives to this product. MSI Spec Patch 5 is a fast setting product, so mixing equipment should be cleaned with water as soon as possible.

Do not allow repairs to freeze until the material has reached a minimum of 1000 psi compressive strength.

In adverse temperatures, follow ACI recommendations for hot/cold weather concreting practices.

Use only potable water for mixing.

Minimum surface and ambient temperature of 45°F and rising is required at the time of application.

For optimum results, condition material to between 65 °F and 85°F.

Caution: Contains Portland Cement and sand. Cement will cause irritation. Avoid contact. A dust respirator, safety goggles, and rubber gloves are recommended. Avoid prolonged contact with clothing. In case of contact with eyes, immediately flush with water for at least 15 minutes. Get prompt medical attention. Do not wear contact lenses when working with this product. DO NOT take internally. Keep out of reach of children.

Avoid hazards by following all precautions found in the Material Safety Data Sheet (MSDS), product labels, and technical literature. Please read this information prior to using the product.

WARRANTY

NOTICE-READ CAREFULLY

CONDITIONS OF SALE

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INHERENT RISK

Purchaser assumes all risk associated with the use or application of the product.





MSI SPEC POXY

ASTM 881 compliant hi-mod, gel viscosity epoxy

DESCRIPTION

MSI SPEC POXY is a two component, moisture insensitive, high modulus, structural epoxy bonding gel. MSI SPEC POXY is 100% solids, solvent free, low odor, high strength, and non-sag. VOC content= 0 grams/liter

- Anchors bolts, dowels, and reinforcing steel
- Vertical and overhead structural bonding and patching
- Sealing of cracks and the setting of injection ports
- For use in concrete, block, brick, or stone
- Extended working time

FEATURES/BENEFITS

- Improves the flexural strength, bond strength and impact resistance of mortars and concrete.
- Concrete and mortar fortified with MSI SPEC BOND exhibit excellent resistance to cycles of freezing and thawing and to penetration of chloride ions.
- Minimizes cracks in concrete, stucco and plaster when used as an admixture
- Eliminates the need for separate air entraining agents
- V.O.C. compliant

SPECIFICATIONS/COMPLIANCES

Meets specifications:

- ASTM C 1042 - Bond Strength of Latex Systems Used With Concrete - Type 2
- ASTM C 1059 Latex Agents for Bonding Fresh to Hardened Concrete - Type II

APPLICATION

Mixing Instructions: Air, material and surface temperatures must be a minimum of 60°F prior to mixing or installation. To assist with mixing and dispensing, precondition material to 75°F. For bulk applications, mix equal volumes of Part A and Part B for three minutes with a low speed drill motor using a Jiffy mixer or paddle. Mix only as much material as can be used within the pot life. For cartridges, the resin and hardener are uniformly dispensed and mixed simultaneously through a mixing nozzle.

Surface Preparation: Surfaces to be bonded must be clean and structurally sound. Remove all oil, grease, dirt, laitance, curing compounds, and any other foreign matter by sandblasting, mechanical abrasion or hydro blasting. All drilled holes must be cleaned out with a nylon brush removing all dust and loose material. Use clean, oil free compressed air to blow out any remaining water, dust, or debris prior to application. Bolts, rebar or threaded rod should be free of dirt, grease, oil of other foreign material.

Bonding: As a structural adhesive, apply the MSI SPEC POXY

neat and work into the substrate. The glue line should not exceed 1/8".

Anchoring: For use in anchoring dowels, bolts, reinforcing steel, etc. the depth of the hole should be approximately 9 times the bolt diameter. The hole diameter should be approximately 1/8" larger than the threaded rod diameter. Ensure the holes are properly prepared, (drilled, brushed and blown out) prior to preparing the epoxy cartridge. Insert the cartridge into the dispensing gun. Remove the plastic caps and dispense a small amount of material until an even flow of black and white material is achieved. Place the mixing nozzle onto the cartridge then slide the nut over the nozzle and thread the nut onto the cartridge. To achieve maximum flow, break off the tip of the mixing nozzle to the largest diameter that will fit into the hole or screen. No nut is necessary on mixers with built-in nuts. Dispense into a disposable container until a uniform grey is achieved with no streaks.

Into Concrete: Dispense the material from the bottom of the hole. Fill approximately 5/8 of the hole depth while slowly withdrawing the nozzle. Insert the bolt, or dowel by turning it slowly during insertion. After insertion, the hole should be completely filled with MSI SPEC POXY and devoid of all air pockets or voids. Do not disturb or bolt up until cured.

TYPICAL TEST DATA

Mix Ratio	1 to 1
Mixed Color:	Gray
Viscosity:	Gel/Paste
Gel time (ASTM 881):	45 minutes

TYPICAL CURED PROPERTIES

Initial Cure	24 hours
Final Cure	7 days
Compressive Strength (ASTM D-695)	11,950 psi
Compressive Modulus (ASTM D-695)	326,500 psi
Bond Strength at 2 days (ASTM 882)	1,950 psi
Bond Strength at 14 days (ASTM 882)	2,550 psi
Elongation (ASTM D-638)	2.5%
Water Absorption (ASTM D-570)	< 0.5%
Heat Deflection (ASTM D-648)	133°F

Into Hollow Block: The cartridge is prepared as for concrete. The mixing nozzle is inserted into the bottom of the screen. Completely fill the screen while withdrawing the nozzle. Insert the epoxy filled screen into the hole. Insert the threaded rod to the bottom of the screen while turning slightly clockwise. Do not disturb or bolt up until cured.

CLEAN UP

Tools and Equipment: Uncured material can be removed with SpecChem Citrus Cleaner or other approved solvent. Dispose of in accordance with local, state, and federal disposal regulations. Mechanical removal is necessary for cured material.

SHELF LIFE

Store MSI SPEC POXY in its original containers and keep tightly closed. Do not allow the accumulation of water, dirt or other contaminants. The shelf life of properly stored MSI SPEC POXY is two years from date of manu-

LIMITATIONS/PRECAUTIONS

Always test a small amount of MSI SPEC POXY to verify that the product has been thoroughly mixed and will harden properly before proceeding. Do not thin with any solvent. Surface and air temperatures must be a minimum of 40°F for application.

Prolonged or repeated skin or eye contact may cause irritation. If contact occurs, wash immediately and seek medical help. Use safety glasses and wear protective rubber gloves. In case of ingestion, call a physician. Contact with skin may cause chemical burns. Wash immediately with soap and water. Avoid eye contact. If eye contact occurs, flush immediately with water. Product is a strong sensitizer. Avoid breathing vapors. Use safety glasses and wear protective rubber gloves.

INDUSTRIAL USE ONLY

Additional precautions, safety and first aid information are contained in the Material Safety Data Sheet.

1 gallon units • 2 gallon units • 10 gallon units
22 oz. dual cartridge

STANDARDS

MSI SPEC POXY meets ASTM C-881, Type I, II, IV, and V Grade 3, Class C.

WARRANTY



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INHERENT RISK

Purchaser assumes all risk associated with the use or application of the product.



MSI SPEC FILM

Ready To Use Evaporation Retardant/Finishing Aid

DESCRIPTION

MSI SPEC FILM is designed to be used as an evaporation retardant and finishing aid on concrete flatwork of all types. When sprayed over fresh concrete, MSI SPEC FILM forms a thin, continuous film which prevents rapid moisture loss from the concrete surface. MSI SPEC FILM is especially effective when concreting operations must be performed in direct sun, wind, high temperatures, or low relative humidity.

BENEFITS:

- Significantly reduces plastic shrinkage and cracking caused by evaporation in low humidity, high temperatures and high winds
- Allows use of lower slump and lower water to cement ratio concrete
- Reduces wind crusting, stickiness, and sponginess, which often cause poor and uneven surface texture.
- Dyed pink as visual application aid. VOC compliant
- Helps minimize surface cracking due to early water loss of silica fume concrete
- Already formulated to an optimum dilution of 5 to 1 for maximum effectiveness
- Aids in finishing concrete and repair mortars that produce little or no bleed water such as micro silica or mixes containing no air entrainment.

APPLICATION

Agitate prior to using. MSI SPEC FILM should be spray applied to freshly placed concrete immediately after screeding or bullfloating to prevent plastic shrinkage. When used as an evaporation retardant during dry-shake hardener applications, one or more applications may be required to prevent premature drying.

If necessary, use during and after bullfloating and troweling applications

MSI SPEC FILM should be applied under normal weather conditions at the rate of 300-500 sq. ft./gal. As drying conditions or wind become more severe, increase the amount of material used to 150-300 sq. ft./gal.

Do not over apply.

STANDARDS

As recommended by ACI 302: "Evaporation Retardant/Monomolecular Film"

PACKAGING

MSI SPEC FILM is packaged in 55 gallon drums, 5 gallon pails, and cases of four 1 gallon jugs.

CLEANING

Application equipment should be cleaned immediately with soap and water.

SHELF LIFE

Shelf life of MSI SPEC FILM in the original tightly closed containers is one year from date of manufacture. Do not allow the accumulation of water, dirt, or other contaminants.

LIMITATIONS

MSI SPEC FILM is not a curing compound. Proper curing methods must be used to assure quality concrete. Do not allow MSI SPEC FILM to freeze. Thawed material will not go back into solution.

MSI SPEC FILM is most effective when concrete is in the plastic state. Immediately wipe up any MSI SPEC FILM spilled on hardened concrete. MSI SPEC FILM, if allowed to dry on hardened concrete, may stain and must be removed with an approved solvent.

Product literature provides general information applicable in some conditions. Contact The manufacturer technical services for specific application instructions and limitations.

PRECAUTIONS

DO NOT CUT OR WELD CONTAINER INDUSTRIAL USE ONLY PROTECT FROM FREEZING

Keep out of reach of children. Do not take internally. Avoid prolonged contact with skin. If swallowed, call a physician. Wear rubber gloves, goggles, and protective clothing. Additional precautions, safety information and first aid are contained in the Material Safety Data Sheet.

WARRANTY

NOTICE-READ CAREFULLY

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INHERENT RISK

Purchaser assumes all risk associated with the use or application of the product.



MidSpec Inc

19180 Linden Drive | Rogers, MN 55374

Midspec, Inc.

763-428-8500 or 866-MIDSPEC

www.midspecinc.com

MSI SPEC PATCH 20 LIGHT



Fast setting polymer modified concrete repair material

DESCRIPTION

MSI Spec Patch 20 LIGHT is a general purpose polymer-modified concrete repair mortar for concrete floors, walls, precast, tilt-up and masonry surfaces. MSI Spec Patch 20 can be used for horizontal and vertical applications to provide a durable repair that **can be shaped by shaving**

FEATURES/BENEFITS

- Can be featheredged
- Lifts up to 1" in thickness
- Designed for interior & exterior repairs
- Can be shaped
- Excellent durability and adhesion
- Dries to color of concrete
- One component - Just add water

APPLICATION

Applications:

- Interior & exterior
- Vertical, overhead & horizontal repairs
- Used at no slump consistency
- Outstanding repair material for concrete pipe, curbs, sidewalks, formed and precast concrete

Surface Preparation: The concrete must be sound and free of all foreign material, including oil, grease, dust, laitance or other surface contaminants. Mechanically abrade the surface by an engineered approved method, such as grinding, abrasive blasting, or scarifying. All surfaces to be repaired should be in a saturated-surface-dry (SSD) condition with no standing water on the surface.

MSI Spec Patch 20 Light takes its initial set in 15 minutes.

Mixing: Mix 6.75 – 7.25 pints (depending on desired consistency) of clean water per 50 pound bag of material. Mix with a low speed drill. Add recommended amount of clean water into the container, followed by the MSI Spec Patch 20 Light. Mix 2 to 3 minutes. Mix only what can be applied within the setting period.

MSI Spec Patch 20 Light may be used with The manufacturer Acrylic Bonder neat or mixed 1 to 1 with water per 50 pounds of powder to increase durability, abrasion resistance and bond strength. The addition of Acrylic Bonder is recommended when using MSI Spec Patch 20 in thin, horizontal applications subjected to heavy traffic or wear.

Bond/Scrub Coat: Use the properly mixed MSI Spec Patch 20 Light as a bond or scrub coat by scrubbing a thin layer into the pre-dampened substrate with a stiff brush. Place the MSI Spec Patch 20 Light mortar immediately before the bond coat dries.

Placement: Trowel MSI Spec Patch 20 LIGHT firmly into the prepared area, ensuring intimate contact with the bonding surface. Use slightly more material than is needed and roughly shape during placement. After the initial set, when MSI Spec Patch 20 is surface hard, shave the material to the desired final shape using a steel trowel. Maximum depth of neat repair mortar is 1" for each lift. Additional lifts can be placed after the original lift has achieved set. The original lift should be left with a rough surface to improve bond between lifts.

Finishing/Curing: Finish the repair material to the desired texture to match the surrounding concrete. MSI Spec Patch 20 LIGHT is self-curing under most conditions. In severe drying conditions, use an ASTM C-309 compliant, water based The manufacturer curing compound.

CLEAN UP

Tools and equipment may be cleaned with water before MSI Spec Patch 20 Light hardens.

TYPICAL TEST DATA

Set Time at 70°F (ASTM C-266)	
Initial Set	15 – 30 min
Final Set	60 min
Compressive Strength (ASTM C-109)	
3 hour	1100psi
1 day	2000 psi
7 days	4500 psi
28 days	6000 psi
Freeze-Thaw (ASTM C-672)	
Scaling Resistance	25 cycles = 0% loss
Flexural Strength (ASTM C-348)	
7 days	500 psi
28 days	650 psi
Yield	
Yield Per Bag	.43 cu-ft



MidSpec Inc
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Revised 2/27/12

Midspec, Inc.

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www.midspecinc.com



SHELF LIFE

Shelf life of unopened bags stored in a dry facility is 12 months. Excessive temperature differential and/or high humidity can shorten the shelf life expectancy. Store in a cool, dry area away from direct sunlight.

LIMITATIONS/PRECAUTIONS

Minimum thickness for repair is 1/4" to achieve maximum durability in heavy wear applications. Do not retemper after initial mixing. Do not add other cements or additives to this product. MSI Spec Patch 20 is a fast setting product, so mixing equipment should be cleaned with water as soon as possible.

Do not allow repairs to freeze until the material has reached a minimum of 1000 psi compressive strength.

In adverse temperatures, follow ACI recommendations for hot/cold weather concreting practices.

Use only potable water for mixing.

Minimum surface and ambient temperature of 45°F and rising is required at the time of application.

For optimum results, condition material to between 65°F and 85°F.

Caution: Contains Portland Cement and sand. Cement will cause irritation. Avoid contact. A dust respirator, safety goggles, and rubber gloves are recommended. Avoid prolonged contact with clothing. In case of contact with eyes, immediately flush with water for at least 15 minutes. Get prompt medical attention. Do not wear contact lenses when working with this product. DO NOT take internally. Keep out of reach of children.

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INHERENT RISK

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MidSpec Inc

19180 Linden Drive | Rogers, MN 55374

MSI SPEC PATCH V/O



Single component polymer-modified concrete repair mortar with corrosion inhibitor

DESCRIPTION

MSI Spec Patch V/O is a single component, polymer modified, fiber reinforced concrete repair mortar with integral corrosion inhibitor for use in a variety of vertical and overhead repair applications. MSI Spec Patch V/O incorporates the latest in polymer technology offering superior durability, performance and ease of application in industrial, commercial, and infrastructure (D.O.T.) applications.

FEATURES/BENEFITS

- One component dry polymer-modified, just add water
- Dry polymer technology for excellent freeze thaw durability
- Hand-applied or spray applied for large projects
- Easy to apply/finish consistency up to 2"
- Concrete-gray in color
- Designed for vertical and overhead repairs
- Fiber-reinforced for added strength
- Contains integral corrosion inhibitor

APPLICATION

Surface Preparation: The concrete must be sound and free of all foreign material, including oil, grease, dust, laitance or other surface contaminants. Mechanically abrade the surface by an engineered approved method, such as grinding, abrasive blasting, or scarifying. All surfaces to be repaired should be in a saturated-surface-dry (SSD) condition with no standing water on the surface.

Mixing: Mix 6.25 – 6.75 pints (depending on desired consistency) of clean water per 50 pound bag of material. Mix with a low speed drill. Add recommended amount of clean water into the container, followed by the MSI Spec Patch V/O. Mix 2 to 3 minutes. Mix only what can be applied within the setting period.

Bond/Scrub Coat: Use the properly mixed MSI Spec Patch V/O as a bond or scrub coat by scrubbing a thin layer into the pre-dampened substrate with a stiff brush. Place the MSI Spec Patch V/O mortar immediately before the bond coat dries.

Placement: Trowel MSI Spec Patch V/O firmly into the prepared area, ensuring intimate contact with the bonding surface. Use slightly more material than is needed and roughly shape during placement. After the initial set, when MSI Spec Patch V/O is surface hard, shave the material to the desired final shape using a steel trowel. Maximum depth of neat repair mortar is 2" for each lift. Additional lifts can be placed after the original lift has achieved set. The original lift should be left with a rough surface to improve bond between lifts.

Finishing/Curing: Finish the repair material to the desired texture to match the surrounding concrete. MSI Spec Patch V/O is self-curing under most conditions. In severe drying conditions, use an ASTM C-309 compliant, water based SpecChem curing compound.

Packaging

50 lb bag (also available in a 50 lb plastic pail)
Yield per 50 lb unit = .43 cu-ft

CLEAN UP

Tools and equipment may be cleaned with water before MSI Spec Patch V/O hardens.

TYPICAL TEST DATA

Set Time at 70°F (ASTM C-266)	
Initial Set	50 min
Final Set	90 min
Compressive Strength (ASTM C-109)	
1 day	3550 psi
7 days	5020 psi
28 days	6480 psi
Bond Strength (ASTM C-882)	
14 days	1860 psi
Flexural Strength (ASTM C-348)	
7 days	650 psi
28 days	1200 psi
Length Change (ASTM C-157)	
Wet Cure @ 28 days	+.01%
Air Cure @ 28 days	-.07%
Freeze-Thaw (ASTM C 666 Procedure A)	
Relative Durability Factor @ 28 days = 95.7	
Rapid Chloride Permeability (ASTM C 1202)	
28 days	3420 coulombs



MidSpec Inc
19180 Linden Drive | Rogers, MN 55374

Revised 2/27/13



SHELF LIFE

Shelf life of unopened bags stored in a dry facility is 12 months. Excessive temperature differential and/or high humidity can shorten the shelf life expectancy. Store in a cool, dry area away from direct sunlight.

LIMITATIONS/PRECAUTIONS

Minimum thickness for repair is 1/4" to achieve maximum durability in heavy wear applications. Do not retemper after initial mixing. Do not add other cements or additives to this product. MSI Spec Patch 20 is a fast setting product, so mixing equipment should be cleaned with water as soon as possible.

Do not allow repairs to freeze until the material has reached a minimum of 1000 psi compressive strength. In adverse temperatures, follow ACI recommendations for hot/cold weather concreting practices. Use only potable water for mixing. Minimum surface and ambient temperature of 45°F and rising is required at the time of application. For optimum results, condition material to between 65°F and 85°F.

Caution: Contains Portland Cement and sand. Cement will cause irritation. Avoid contact. A dust respirator, safety goggles, and rubber gloves are recommended. Avoid prolonged contact with clothing. In case of contact with eyes, immediately flush with water for at least 15 minutes. Get prompt medical attention. Do not wear contact lenses when working with this product. DO NOT take internally. Keep out of reach of children. Avoid hazards by following all precautions found in the Material Safety Data Sheet (MSDS), product labels, and technical literature. Please read this information prior to using the product.

WARRANTY

NOTICE-READ CAREFULLY CONDITIONS OF SALE

The manufacturer offers this product for sale subject to and limited by the warranty which may only be varied by written agreement of a duly authorized corporate officer of The manufacturer. No other representative of or for The manufacturer is authorized to grant any warranty or to waive limitation of liability set forth below.

WARRANTY LIMITATION

The manufacturer warrants this product to be free of manufacturing defects. If the product when purchased was defective and was within use period indicated on container or carton, when used, The manufacturer will replace the defective product with new product without charge to the purchaser. The manufacturer makes no other warranty, either expressed or implied, concerning this product. There is no warranty of merchantability. NO CLAIM OF ANY KIND SHALL BE GREATER THAN THE PURCHASE PRICE OF THE PRODUCT IN RESPECT OF WHICH DAMAGES ARE CLAIMED.

INHERENT RISK

Purchaser assumes all risk associated with the use or application of the product.



MidSpec Inc
19180 Linden Drive | Rogers, MN 55374

MSI Precision Grout

Non-shrink, Non-metallic grout



DESCRIPTION

MSI PRECISION GROUT is a non-shrink, non-metallic, high-flow, cement-based grout. MSI PRECISION GROUT is formulated for a wide variety of grouting applications, from plastic to fluid through a controlled, positive expansion. Designed to provide effective load bearing for high flow precision grouting applications.

USE

MSI PRECISION GROUT is an ideal product for interior or exterior grouting of architectural and structural precast concrete components, structural column base plates, machinery bases, anchoring bolts, cable anchorages, dowels, bearing pads, keyway joints, crane rails etc.

MSI PRECISION GROUT is used in power plants, steel mills, paper mills, oil refineries, food plants, sewage and water treatment plants or anywhere a high quality engineered grout is required.

FEATURES / BENEFITS

- High flow/High early compressive strength capability
- Minimize project downtime
- Controlled positive expansion for maximum effective bearing
- Non-metallic / non-corrosive
- Pourable / pumpable versatility
- Excellent freeze / thaw resistance
- Can be extended with pea stone for deep applications
- Resistant to thermal shock

SPECIFICATIONS / COMPLIANCES

Corp of Engineers CRD-C-621 Grade A, B & C
ASTM C-1107. Grade A, B & C (formerly known as CRD-C-621)

APPLICATION

Preparation: Remove all dirt, oil, and loose or foreign material. Any metal in contact with grout must be free of rust, oil, grease, and other foreign matter which would limit bond. Concrete surface must be sound and roughened to insure proper bonding. Prior to placing grout, surface must be saturated surface dry (SSD), if possible for an hour. Remove all excess water before placement of grout. Bolts, base plates and equipment must be secure and rigid before placement of grout. All materials and surfaces in contact with the grout should be conditioned between 50°- 80°F for proper performance. Provide heating or cooling, as necessary, to compensate for temperature extremes and changes in cure time

Forms: Allow for the continuous placement of grout. Provisions for venting to avoid air entrapment must be made. Placing from one side, provide a 45° angle in the

forms to a height suitable to provide a head of grout during placement. On all sides, provide a minimum 1" (2.54 cm) horizontal clearance between the base plate and forms. Forms should be at least 1" (2.54 cm) higher than the bottom of the base plate.

Mixing: Small quantities of grout may be hand mixed in a concrete mixing pan until lump free. For large quantities and continuous pours, mix using a mortar mixer with rubber tipped blades or appropriate grout pump for a minimum of 5 minutes. Start with minimum water requirements.

Always add water to mixer first, then slowly add powder. Use only the amount of water required for the desired placement consistency. Mix in two steps: Add 2/3 of the water, add grout, after partial mixing add the remaining 1/3 of the water for desired consistency. Thoroughly mix total quantity for an additional 2 to 3 minutes. Do not mix more than can be placed before in 40 minutes.

Placing: Place continuously and quickly. Start from one side to avoid air entrapment. Be sure grout fills spaces and remains in contact with plate. DO NOT VIBRATE.

TYPICAL PERFORMANCE DATA

	Plastic	Flowable	Fluid
Water / 50 lb.	6.5 - 6.8 pints	6.8 - 7.8 pints	7.8 - 8.4 pints
Compressive Strength			
	Plastic	Flowable	Fluid
1 day	4,300 psi	3,500 psi	3,000 psi
3 days	5,800 psi	5,300 psi	4,600 psi
7 days	8,700 psi	7,600 psi	5,900 psi
28 days	11,000 psi	10,275 psi	8,800 psi
Expansion Percentage			
	Plastic	Flowable	Fluid
1 day	0.07	0.03	0.03
3 days	0.07	0.03	0.02
14 days	0.07	0.03	0.02
28 days	0.07	0.03	0.02
Note: the data shown is based on controlled laboratory testing. Reasonable variation from test results shown can be expected. Field and laboratory testing should be controlled on the basis of the desired placing consistency, rather than strictly on water content.			



MidSpec Inc

19180 Linden Drive | Rogers, MN 55374

Revised 7/9/12

Midspec, Inc.

763-428-8500 or 866-MIDSPEC

www.midspecinc.com



APPLICATION (cont.)

A minimum of 1" (2.48 cm) vertical clearance should be maintained for base plate grouting applications. Thinner vertical clearances may require the use of another type of grout.

Curing: Immediately cover with clean, wet rags and keep moist until final set. After final set, remove rags and apply an ASTM-C-309 curing compound, such as The manufacturer Cure & Seal 25 or The manufacturer Cure & Seal 25 WB.

Special Conditions:

Deep application: Pre-washed and graded 3/8" (1 cm) pea gravel should be used in large applications (greater than 1' x 1') and thicker than 3" (7.62 cm) as follows:

- 3"-5" (7.62-12.7 cm): Add 25% of 3/8" (1 cm) pea gravel per 50 lb bag of grout.
- 5" (12.7 cm) and over: Add 50% of 3/8" (1 cm) pea gravel per 50 lb bag of grout.
- Place in 6" lifts with proper reinforcement

Hot weather conditions: Accelerates setting time and causes premature drying of the grout. Keep the grout cool. Store unopened bags in the shade. Provide shade for area to be grouted. Use cool or chilled mixing water. Protect grout from direct sun exposure for up to 24 hours after grouting. For additional information, refer to ACI 305 (Recommended Practices for Hot Weather Concreting).

Cold weather conditions: Retards strength gain and set time. Warm the grout above 50°F. Raise the temperature of the area to be grouted with space heaters or steam. Warm the mixing water. Cover and insulate the grout to retain warmth. The minimum temperature (ambient, substrate, and grout) for grouting is 40°F (5°C) unless special provision are followed. For additional information, refer to ACI 306 (Recommended Practices for Cold Weather Concreting).

PACKAGING / YIELD

50 lb (22.7Kg) multiple plastic lined bag will yield approximately 0.45 cu. ft. in a fluid condition.
50% by weight extension (25 lbs) of 3/8" pea stone will yield approximately 0.59 cu. ft.

LIMITATIONS / PRECAUTIONS

DO NOT place at temperatures below 40°F (5°C) unless special provisions are followed. At low temperatures, water requirement should be field tested.

When nearby equipment causes vibration of the grout, during set, such equipment should be shut down for a period of 24 hours (at 73°F (23°C)). DO NOT mix over 5 minutes. DO NOT over water; this can cause bleeding or separation. DO NOT retemper. DO NOT add cement, sand, or admixtures.

Avoid hazards by following all precautions found in the Material Safety Data Sheets (MSDS), product labels, and technical literature

SHELF LIFE / STORAGE

MSI PRECISION GROUT should be stored in a cool, dry interior area. At no time should material be exposed to high moisture, rain, or snow conditions. When stored in the original, tightly closed container, the shelf life is one year from the date of manufacture.

TECHNICAL SERVICES

For assistance, contact technical services at:
866-791-8700 913-371-8700
www.the.manufacturerllc.com

24 HOUR EMERGENCY CONTACT:

CHEMTREC - 800-424-9300

WARRANTY

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