



PRODUCT CATALOG

COAL & HARD ROCK MINING, TUNNELING, AND CIVIL CONSTRUCTION

REV 04-20

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Frank Calandra Inc. and Calandra Group, LLC. companies set the bar in every industry they serve. Our companies invest heavily in Research and Development. The well being of our 4,000 employees is paramount in our business model. We appropriate a vast portion of our profits back into our property, plant, and equipment keeping our stakeholders' best interests in mind. Our employees are held to their value pledge, and are to complete their tasks with integrity and stewardship for the environment. Our products enhance productivity levels for our clients and make modern life possible. We commit to our customers that our products will embody SAFETY, SERVICE, and INNOVATION.

For more than 40 years, our mission has been focused on developing and manufacturing quality ground control products. Today, JENNMAR makes a broad range of reliable products, from bolts and beams, to channels and trusses, to resin and rebar. We're proud to make products that make the industries we serve safer and more efficient.




Quality Products
from Quality People

100% Proudly Made
in the U.S.A.

JENNMAR Industry Affiliates



In addition to more than twenty strategically located manufacturing facilities, our network of affiliates includes engineering services, resin manufacturing, rolled-steel and drill-steel manufacturing, custom steel fabrication, roof, miner and a full line of road planing, soil stabilization, reclaiming, grading, trenching and foundation drilling bits, chemical roof support and sealing products, and even includes staffing solutions and our own trucking company. From bolts and beams, to channels and trusses, to resin and rebar, JENNMAR is proud to manufacture products that make Coal & Hard Rock Mining safer and more efficient. Safely keeping the ground above under control. Our network of industry affiliates ensure quality, compliance, efficiency, availability and safety providing reliable products and engineering solutions for the tunneling industry.

In addition to engineering services, our research and development of new ground control products and systems ensure continuous product improvements making our products the best solution in the most challenging of underground and geotechnical environments.

We've been the innovative leader in ground control for the mining industry for more than forty years. Over the past decade, our growth has led us to above ground for structural buildings, implementing the same vigor and detailed processes. Our arch systems, girders, liner plates and Impact Resistant Laggings® are backed by experienced engineers and technicians who are with you every step of the way, from initial consultation to qualified instruction and on-going technical support. For more information please visit www.jennmar.com.



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Color Codes for Threaded Bolts, Cable Bolts and Inflatable Bolts

Threaded Bolts

Length (in)	Color Code	
30	Purple	
36	Yellow	
42	Green	
48	No Color	NC
60	Red	
72	Blue	
84	Orange	
96	White	

Note:

Color code schematic per ASTM F432-12 tables 11 and 12.

Approved by: D.Woodward V1 Rev: 03/31/16

R:\ISO\PGH Approved Manufacturing Documents and Forms\ASTM F32-13 Color Codes - Bolts -V1.doc

Cable Bolts

Length (ft)	Color Code	
5	Red	
6	Dark Blue	
7	Orange	
8	White	
9	Fluorescent Green	
≥10, <12	Safety Yellow	
≥12, <14	Dark Green	
≥14, <16	Brown	
≥16, <18	No Color	NC
≥18, <20	Light Blue	
≥20, <22	Black	
≥22, <24	Pink	
≥24, <26	Purple	

M3 Bolts

Length (ft)	Color Code	
5	Red	
6	Dark Blue	
7	Orange	
8	White	
9	Fluorescent Green	
≥10, <12	Safety Yellow	
≥12, <14	Dark Green	
≥14, <16	Brown	
≥16, <18	No Color	NC
≥18, <20	Light Blue	
≥20, <22	Black	
≥22, <24	Pink	
≥24, <26	Purple	

Note: Color codes may change per customer upon request

Bolt Markings - Cable Bolts

Cable Bolt Markings

Cable housings and/or drive nut will be marked with a 4–7 character alpha-numeric identification.



Plant Identity	
KW	West Virginia
KK	Kentucky
KV	Virginia
KU	Utah
K	Pennsylvania
KC	East Virginia
KE	West Kentucky

Type of Bolt	
C	INSTAL with Expansion Shell on Stiffener Tube
P	Post Installation Tensioned System (no expansion shell)

Cable Diameter, in. (mm)	
5	0.5 (13)
6	0.6 (15)
7	0.7 (18)
8	0.8 (20)

Bolt Length, ft. (m)	
08	8 (2.4)
10	10 (3.0)
12	12 (3.7)
14	14 (4.2)
16	16 (4.9)

*Typical Bolt Lengths

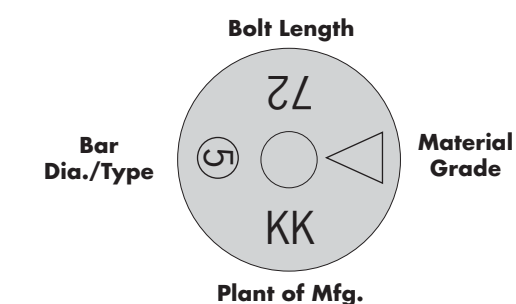
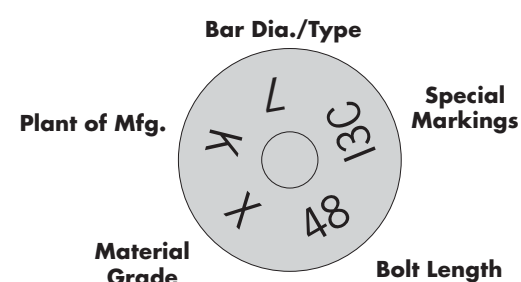
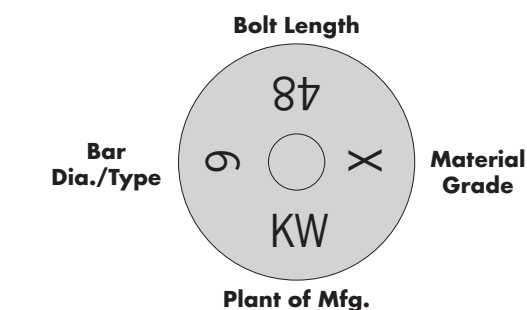
Note:

An additional character "G" will be added at the end to designate galvanized cable or an "E" if epoxy coated (CABLEOX™).

No character will be shown for regular (bright) cable bolts.

Bolt Head Markings and Recommended Torque Ranges

Bolt Head Markings



Bar Diameter/Type		
Code	Bar Diameter, in. (mm)	Bar Type
5	5/8 (16)	Smooth
(5)	5/8 (16)	Rebar
6	3/4 (19)	Smooth
(6)	3/4 (19)	Rebar/J-BAR
7	7/8 (22)	Smooth
(7)	7/8 (22)	Rebar/J-BAR
8	1 (25)	Smooth
(8)	1 (25)	Rebar/J-BAR
9	1-1/8 (29)	Smooth
(9)	1-1/8 (29)	Rebar/J-BAR

Special Markings	
Code	Description
A	w/ Paddle or Paddle Wedge
C	Compression
I	INSTAL®
P	Combination
I2	INSTAL® II
I3	INSTAL® III
IB	INSTAL® B
N	Notch

Manufacturing Plant	
Code	Description
KK	Kentucky
KE	West Kentucky
K	Cresson, PA
KU	Utah
KV	Virginia
KC	East Virginia
KW	West Virginia
S	Sudbury

Material Grade	
Code	Grade
	GR 40
*	GR 55
△	GR 60
X	GR 75
XS	GR 90
	GR 100
2	GR 120
4	GR 140

Recommended Torque

Bolt Type	Bolt Diameter, in. (mm)				
	5/8 (16)	3/4 (19) gr40	3/4 (19) gr60	7/8 (22)	0.914 (23)
Recommended Torque Ranges, ft.-lbs (N-m)					
Torque/Tension	150-250 (203-339)	150-250 (203-339)	150-300 (203-407)	150-300 (203-407)	150-300 (203-407)
INSTAL II	----	150-250 (203-339)	150-300 (203-407)	150-300 (203-407)	150-300 (203-407)
INSTAL III	----	150-250 (203-339)	150-300 (203-407)	150-300 (203-407)	150-300 (203-407)
INSTAL B	150-250 (203-339)	----	----	----	----
Combination	----	150-250 (203-339)	150-300 (203-407))	150-300 (203-407)	150-300 (203-407)
Conventional/Mechanical Bolts	150-250 (203-339)	150-250 (203-339)	150-300 (203-407)	150-300 (203-407)	150-300 (203-407)

Note:

Torque up to 400 ft.-lbs. may be used on .804 diameter and greater bolts based on site specific conditions.

Headed Rebar Bolts

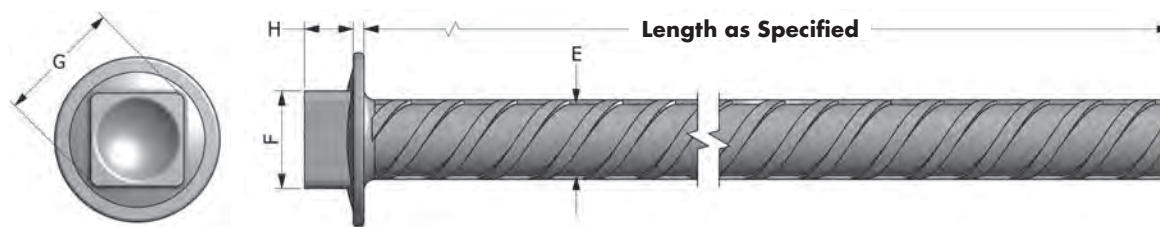
Forged Head, 1-1/8" (29 mm) Square

Dimensions — Rebar and J-BAR

	Bar Type	Bolt Size, in. (mm)			
		5/8 (16)	3/4 (19)	7/8 (22)	1 (25)
Body Diameter (E), Nominal, in. (mm)	Rebar	0.625 (16)	0.750 (19)	0.875 (22)	1.000 (25)
	J-BAR	NA	0.677 (17)	0.804 (20)	0.914 (23)
Head Across Flats Nominal (F), in. (mm)	1.125 (28.58)				
Head Height (H), in. (mm)	0.476 (12.09)				

All dimensions in accordance with ASTM F432.

Rebar

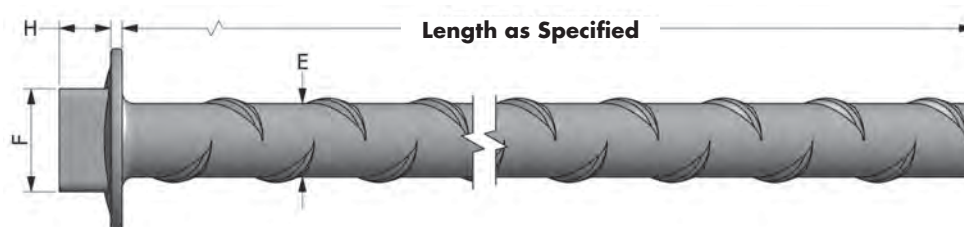


Technical Data — Rebar

Grade	Gr40	Gr60			Gr90
Bolt Size, in. (mm)	3/4 (19)	5/8 (16)	3/4 (19)	7/8 (22)	5/8 (16)
Yield Strength, min., lb (kN)	17,600 (78)	18,600 (83)	26,400 (117)	36,000 (160)	27,900 (124)
Tensile Strength, min., lb (kN)	30,800 (137)	27,900 (124)	39,600 (176)	54,000 (240)	37,200 (165)

All mechanical and physical properties in accordance with ASTM F432.

J-BAR®



Technical Data — J-BAR

Grade	Gr75		
Nominal Size, in. (mm)	3/4 (19)	7/8 (22)	1 (25)
Actual Size, in. (mm)	0.677 (17)	0.804 (20)	0.914 (23)
Yield Strength, min., lb (kN)	27,300 (121)	38,100 (169)	49,200 (219)
Tensile Strength, min., lb (kN)	36,400 (161)	50,800 (225)	65,600 (292)

All mechanical and physical properties in accordance with ASTM F432.

Bendable Bolts

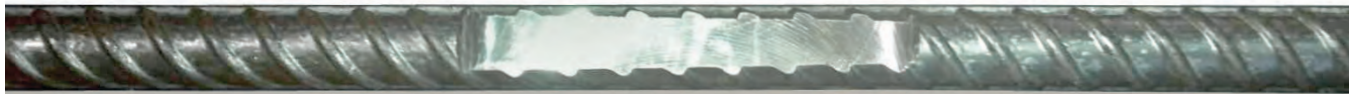
JENNMAR's Bendable Bolts are available where bending is necessary to permit installation of bars that are longer than the mine opening height. These bendable bolts can be furnished with or without an altered or notched section at a designated location at which the bar will bend.

Notched Bendable Bolts

Notched Bendable Bolts are available as single or double notched with notch location and bolt length designated by the customer. Bolts are available in the following sizes/grades:

- #6 rebar, grades 40 & 60
- #7 rebar, grade 60

Fully grouted non-tensioned bendable bolts shall have reached a load of 23,000 lbf before breaking. Tensioned bendable bolts shall exceed the minimum yield loads in accordance with ASTM Specification F432, or both, for the grade and diameter of bolt used, plus 6000 lbf.



Technical Data — Notched Bendable Bolts

Grade	Gr40 Rebar Non-Tensioned	Gr40 Rebar Tensioned	Gr60 Rebar	Gr75 J-Bar	Gr75 J-Bar
Bolt Size, in. (mm)	3/4 (19)	3/4 (19)	3/4 (19)	.677 (17)	.804 (20)
Tensile Strength, min., lb (kN)	23,000 (102.3)	23,700 (105.4)	32,500 (144.5)	33,400 (148.5)	46,200 (205.5)



Non-Notched Bendable Bolts

Non-Notched Bendable Bolts are available in the following sizes and grades:

Technical Data — Non-Notched Bendable Bolts

Grade	Gr40	Gr60
Bolt Size, in. (mm)	3/4 (19)	5/8 (16)
Yield Strength, min., lb (kN)	17,600 (78)	18,600 (83)
Tensile Strength, min., lb (kN)	30,800 (137)	27,900 (124)
Elongation, min., in 8 in. (203 mm)	12%	9%

All mechanical and physical properties in accordance with ASTM F432.

Tensioned Rebar Bolts

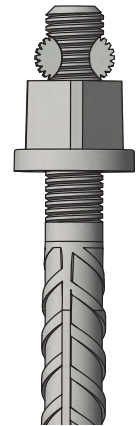
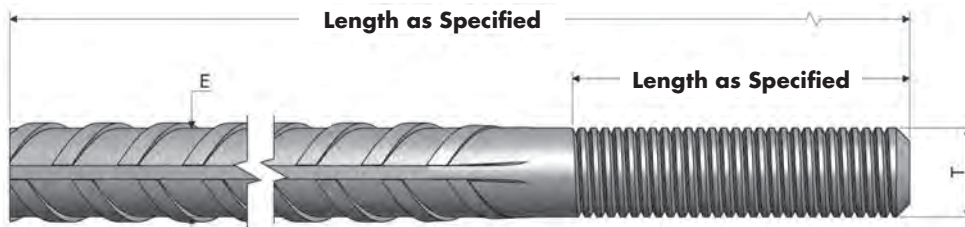
JENNMAR's tensioned rebar bolts have threaded ends and can be used as fully grouted or point anchored systems.

Dimensions — Rebar and J-BAR

	Bar Type	Bolt Size, in. (mm)			
		5/8 (16)	3/4 (19)	7/8 (22)	1 (25)
Body Diameter (E), Nominal, in. (mm)	Rebar	0.625 (16)	0.750 (19)	0.875 (22)	1.000 (25)
	J-BAR	—	0.677 (17)	0.804 (20)	0.914 (23)
Thread Size (T), LH or RH		5/8 in. – 11 UNC	3/4 in. – 10 UNC	7/8 in. – 9 UNC	1 in. – 8 UNC

All dimensions and thread sizes in accordance with ASTM F432.

Rebar

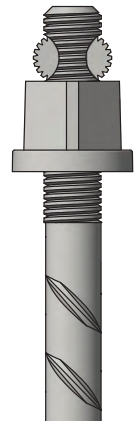
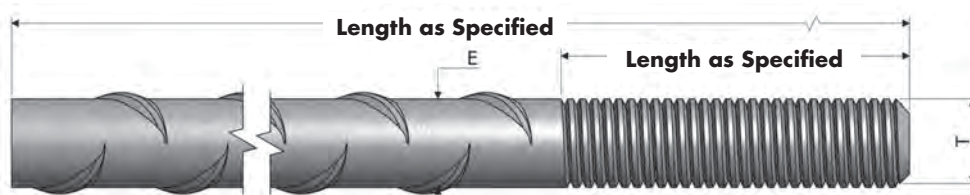


Technical Data — Rebar

Grade	Gr60				Gr90
Bolt Size, in. (mm)	5/8 (16)	3/4 (19)	7/8 (22)	1 (25)	5/8 (16)
Thread Yield Strength, min., lb (kN)	13,600 (60)	20,000 (89)	27,700 (123)	36,400 (162)	20,300 (90)
Thread Tensile Strength, min., lb (kN)	20,300 (90)	30,100 (134)	41,600 (185)	54,500 (242)	27,100 (121)

All mechanical and physical properties in accordance with ASTM F432.

J-BAR®



Technical Data — J-BAR

Grade	Gr75		
Bolt Size, in. (mm)	3/4 (19)	7/8 (22)	1 (25)
Thread Yield Strength, min., lb (kN)	25,200 (112)	34,700 (154)	45,500 (202)
Thread Tensile Strength, min., lb (kN)	33,500 (149)	46,250 (205)	60,600 (270)

All mechanical and physical properties in accordance with ASTM F432.

Tensioned Rebar Bolts/TT Anti-Friction Washer

JENNMAR offers the following variations of tensioned rebar systems for specific mining applications:

- JENNMAR SUPER TWIST®
- Torque Tension Dome Nut
- TT Nut Technology

JENNMAR's SUPER TWIST® is the most efficient and cost effective torque tension system on the market. Simply reverse spin to mix the resin, and then torque the nut. The nut never leaves the bolt due to JENNMAR's specially designed crimped bar. This system provides uniform tensioning, consistent torque and high installed loads.

Other benefits include:

- Minimum amount of bolt protrusion
- Low residual torque

Torque Tension Dome Nut system provides the mining industry with a simple, inexpensive tensioned rebar system utilizing bottom threaded rebar. Resin mixing and torquing is in the same direction.

JENNMAR's TT Nut Technology can provide the following benefits over other conventional torque tension systems:

- No external delay mechanism (shear pin, plug, etc.)
- Special thread design in TT Nut provides uniform resin mixing and bolt tensioning
- Minimum amount of bolt protruding from roof
- System can be used fully grouted or point anchored bolts

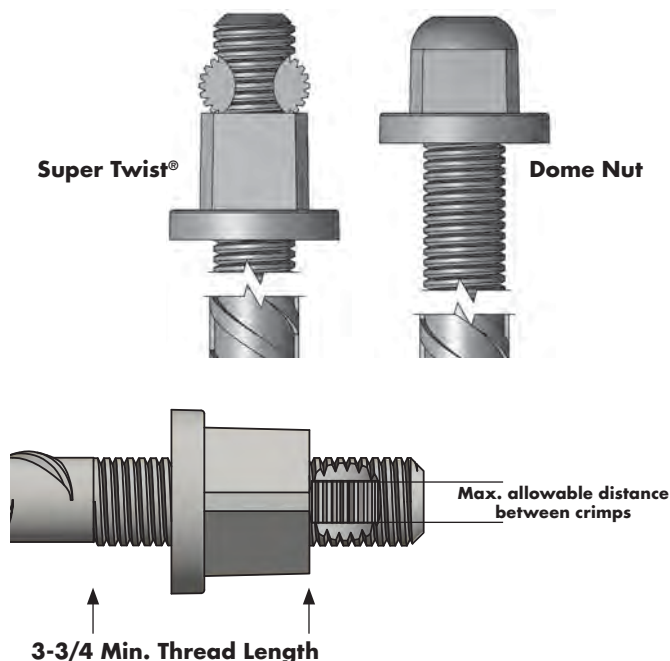
JENNMAR Engineering has developed the TT Anti-Friction Washer for various roof bolting applications to provide higher and more uniform tension and improve the beaming effect and roof stability. The TT Anti-Friction Washer consists of two zinc coated hardened steel washers joined together with an exclusive polymer. The zinc coating provides a smooth clean surface to apply the polymer which then allows for an optimum bond between washers. The zinc coating also enhances the lubricating effect and prevents corrosion. The combination of zinc coating and hot melt lubricant provides a much improved friction reducing medium.

Features

- Increase in tension/torque ratio
- Increase in install load
- Available in (2 in. O.D. x 1 in. I.D.) or (2-1/4 in. O.D. x 1-1/8 in. I.D.)

Advantages

- Improve beaming effect and roof stability
- Especially effective in weak, laminated strata
- Polymer acts as improved anti-friction agent
- Zinc coating minimizes washer corrosion
- Eliminates sparking during bolt rotation
- Zinc corrosion protection allows for outdoor or underground storage
- Not affected by exposure to sunlight or extreme temperatures



Combination Bolt System

System Overview

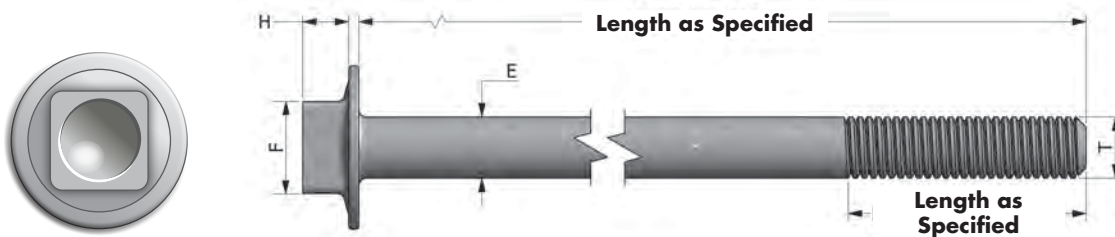
JENNMAR offers the industry's most proven combination bolt system in the mining industry. The Combination Bolt is a two-piece bolt. The upper piece, available in additional combinations, consists of JENNMAR's exclusive J-BAR® for better mixing, stronger threads, and greater anchorage capacity. The lower piece (a headed smooth bar) is connected to the top bolt by a coupler. The Combination Bolt provides ultimate tension in weak strata. The top portion (J-BAR) is encapsulated with resin, while the lower anchor is tensioned to the roof with our bearing plate.

Advantages

- The ultimate tension resin system for all seam heights
- No need to bend for insertion
- Proven Shear Pin system with coupler
- Proven usage in longwall headgate and tailgate entries as supplemental or primary support
- Prevent roof sag and lateral roof movement



Forged Head, 1-1/8" (29 mm) Square



Dimensions

	Bar Type	Bolt Size, in. (mm)		
		3/4 (19)	7/8 (22)	1 (25)
Body Diameter (E), Nominal, in. (mm)	Smooth	0.680 (17)	0.797 (20)	0.906 (23)
Head Across Flats Nominal (F), in. (mm)		1.125 (28.58)		
Head Height (H), min., in. (mm)		0.476 (12.09)		
Thread Size (T), LH or RH, in.		3/4-10 UNC	7/8-9 UNC	1-8 UNC

All dimensions and thread sizes in accordance with ASTM F432.

continued

Combination Bolt System

Forged Head, 1-1/8" (29 mm) Square continued

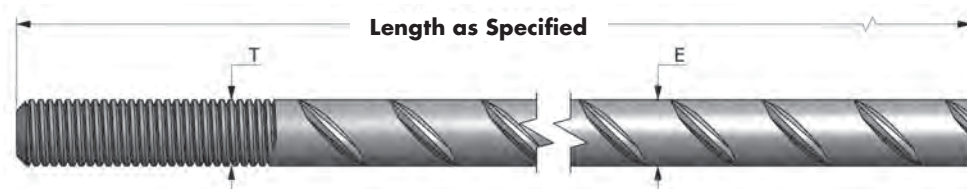
Smooth Bar

Technical Data — Smooth Bar

Grade	Gr75		
Bolt Size, in. (mm)	3/4 (19)	7/8 (22)	1 (25)
Thread Yield Strength, min., lb (kN)	25,200 (112)	34,700 (154)	45,500 (202)
Thread Tensile Strength, min., lb (kN)	33,500 (149)	46,250 (205)	60,600 (270)

All mechanical and physical properties in accordance with ASTM F432.

J-BAR®

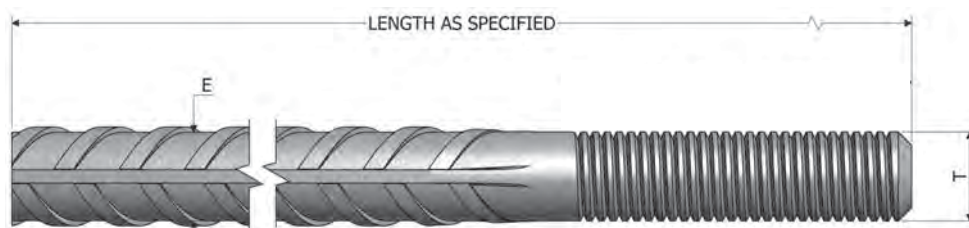


Technical Data — J-BAR

Grade	Gr75		
Bolt Size, in. (mm)	3/4 (19)	7/8 (22)	1 (25)
Thread Yield Strength, min., lb (kN)	25,200 (112)	34,700 (154)	45,500 (202)
Thread Tensile Strength, min., lb (kN)	33,500 (149)	46,250 (205)	60,600 (270)

All mechanical and physical properties in accordance with ASTM F432.

Rebar



Technical Data — Rebar

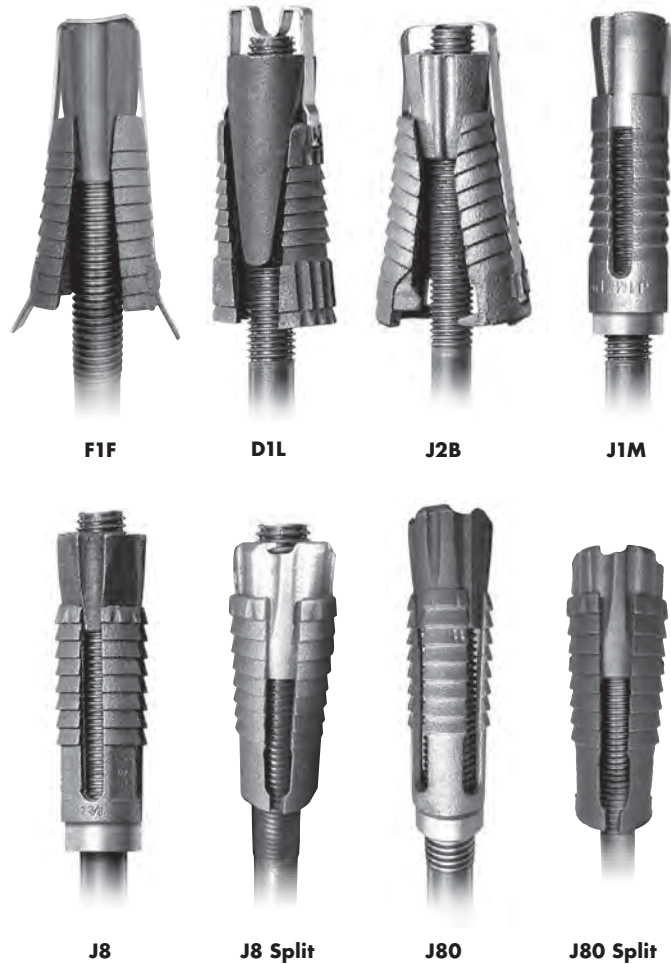
Grade	Gr60		
Bolt Size, in. (mm)	3/4 (19)	7/8 (22)	1 (25)
Thread Yield Strength, min., lb (kN)	20,000 (89)	27,700 (123)	36,400 (162)
Thread Tensile Strength, min., lb (kN)	30,100 (134)	41,600 (185)	54,500 (242)

All mechanical and physical properties in accordance with ASTM F432.

Anchor Products



JENNMAR'S line of expansion anchors provide strong, consistent tension and anchorage for a wide range of strata conditions. Expansion anchors can be used with smooth bar for a high performance conventional bolting system. JENNMAR'S expansion anchors can be combined with deformed bar and J-LOK resin to make an INSTAL bolt system, a high performance primary bolting system.

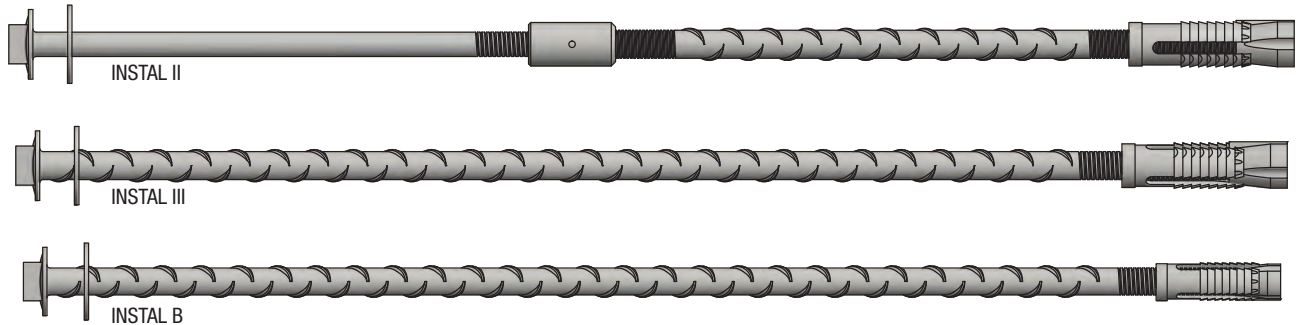


Technical Data — Expansion Anchors

JM	Bar Size	Drill Hole Size	Shell Length	Wedge Length	Non-Seizure Load
F1F	9/16"	1-1/16" to 1-1/32"	2-1/8"	1-5/8"	18000
	5/8"	1-1/16" to 1-1/32"	2-1/8"	1-5/8"	18000
F11/4B	5/8"	1-1/4"	3.25"	1.75"	22500
	3/4"	1-1/4"	3.25"	1.75"	30000
D5-1	5/8"	1-3/4"	3"	3-1/8"	22500
	3/4"	1-3/4"	3"	3-1/8"	30000
	7/8"	1-3/4"	3"	3-1/8"	38000
	1"	1-3/4"	3"	3-1/8"	36500
JSB	5/8"	1-3/8"	3.25	2-7/8"	
	3/4"	1-3/8"	3.25	2-7/8"	30000
J1M	5/8"	1"			
J80	3/4"	1-3/8"			
D1L	5/8"	1-1/2" to 1-3/8"	3"	3-1/8"	22500
	3/4"	1-1/2" to 1-3/8"	3"	3-1/8"	25000
J2B	5/8"	1-3/8"	2.875"	1.375"	17000
	3/4"	1-3/8"	2.875"	1.375"	30000
J8	7/8"	1-3/8"			
J15	1"	1-1/2"			

INSTAL® Bolt Anchor System

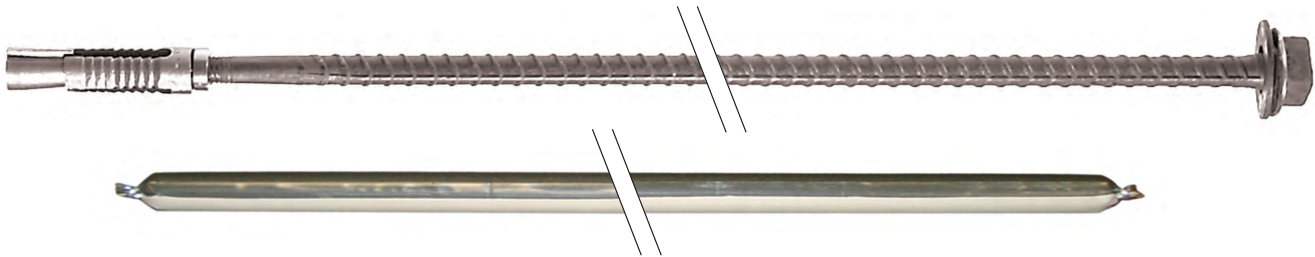
JENNMAR's advanced line of INSTAL Bolt Anchor Systems is the industry's most efficient resin point anchor system, offering quick installation and superior anchorage capacity when compared to other resin point anchored products. They provide the support power and fast installation cycle of mechanical bolts with added anchorage capacity by utilizing resin.



INSTAL Bolt Specifications

	Hole Diameter, in. (mm)	Bar Diameter, in. (mm)	Grades
INSTAL II	1-3/8 (35)	5/8, 3/4, 7/8 (16, 19, 22)	40, 60, 75
INSTAL III	1-3/8 (35)	3/4, 7/8 (19, 22)	40, 60, 75
INSTAL B (only INSTAL system for true 1 in. diameter hole)	1 (25)	5/8 (16)	60, 90
INSTAL II or III (with J15 Expansion Shell)	1-1/2, 1-5/8 (38, 41)	1 (25)	60, 75

Fully-Grouted INSTAL® Bolt Anchor System



The Fully-Grouted INSTAL® Bolt is the ideal high tension bolt due to the resin that locks bolt tension within the system, while significantly slowing down the weathering process around the bolt hole. The Fully-Grouted INSTAL Bolt combines the benefits of fully-grouted and tensioned bolts, providing the best of both worlds.

The fully-grouted, high-tension bolt is a 7/8", 6 ft. special grade 75 rebar that is tensioned to nearly 20,000 lb via a mechanical shell before the fully grouted resin column cures. A 60 x 1-1/4" J-LOK INSTAL resin cartridge is used to fully grout the 7/8" bolt in a 1-3/8" hole. Wider and deeper grooves on the shell plug facilitate the initial resin flow around the shell and reduce insertion pressure. Underground observations and laboratory tests indicate that the flow around the shell plug allows the resin to be mixed effectively. Since the shell and hole have an annulus thickness of less than 0.0625", glove fingering is not possible.

Advantages

Fully-Grouted INSTAL bolts have improved performance due to superior anchorage and stiffness that develops as a result of a full length resin anchor.

Significant resistance to rock movement is developed both axially and laterally because of the superior stiffness of the fully-grouted INSTAL bolts.

If roof separation or horizontal shearing forces occur, bolt loads that are developed are quickly transferred back to the rock, and roof separation and shearing are resisted.

Note

Since fully grouted INSTAL system is a tensioned primary bolting system, checks for resin return are not required. Torque range is 150-300 ft.-lbs.

INSTAL® Bolt Anchor System



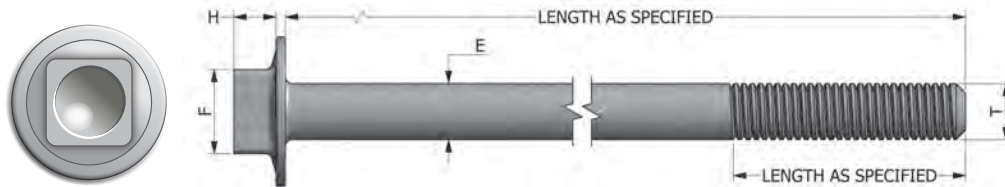
Forged Head, 1-1/8" (29 mm) Square

Dimensions

	Bar Type	Bolt Size, in. (mm)			
		5/8 (16)	3/4 (19)	7/8 (22)	1 (25)
Body Diameter (E), nominal, in. (mm)	Smooth	0.563 (14)	0.680 (17)	0.797 (20)	0.906 (23)
	Rebar	0.625 (16)	0.750 (19)	0.875 (22)	1.000 (25)
	J-BAR	NA	0.677 (17)	0.804 (20)	0.914 (23)
Head Across Flats Nominal (F), in. (mm)		1.125 (28.58)			
Head Height (H), min., in. (mm)		0.476 (12.09)			
Thread Size (T), LH or RH, in.		5/8-11 UNC	3/4-10 UNC	7/8-9 UNC	1-8 UNC

All dimensions and thread sizes in accordance with ASTM F432.

Smooth Bar

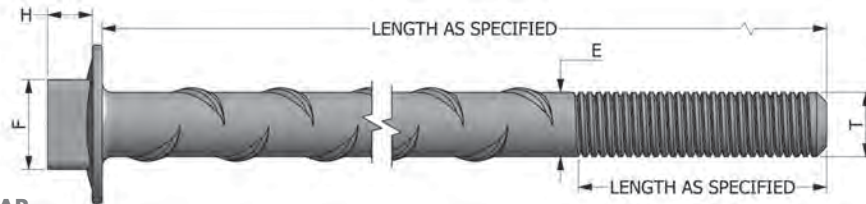


Technical Data – Smooth Bar

Grade	Gr55	Gr75			
Bolt Size, in. (mm)	5/8 (16)	5/8 (16)	3/4 (19)	7/8 (22)	1 (25)
Thread Yield Strength, min., lb (kN)	12,400 (55)	17,000 (76)	25,200 (112)	34,700 (154)	45,500 (202)
Thread Tensile Strength, min., lb (kN)	19,200 (85)	22,600 (101)	33,500 (149)	46,250 (205)	60,600 (270)

All mechanical and physical properties in accordance with ASTM F432.

J-BAR®



Technical Data – J-BAR

Grade	Gr75			
Bolt Size, in. (mm)	3/4 (19)	7/8 (22)	1 (25)	
Thread Yield Strength, min., lb (kN)	25,200 (112)	34,700 (154)	45,500 (202)	
Thread Tensile Strength, min., lb (kN)	33,500 (149)	46,250 (205)	60,600 (270)	

All mechanical and physical properties in accordance with ASTM F432.

Rebar



Technical Data – Rebar

Grade	Gr60				Gr90
Bolt Size, in. (mm)	5/8 (16)	3/4 (19)	7/8 (22)	1 (25)	5/8 (16)
Thread Yield Strength, min., lb (kN)	13,600 (60)	20,000 (89)	27,700 (123)	36,400 (162)	20,300 (90)
Thread Tensile Strength, min., lb (kN)	20,300 (90)	30,100 (134)	41,600 (185)	54,500 (242)	27,100 (121)

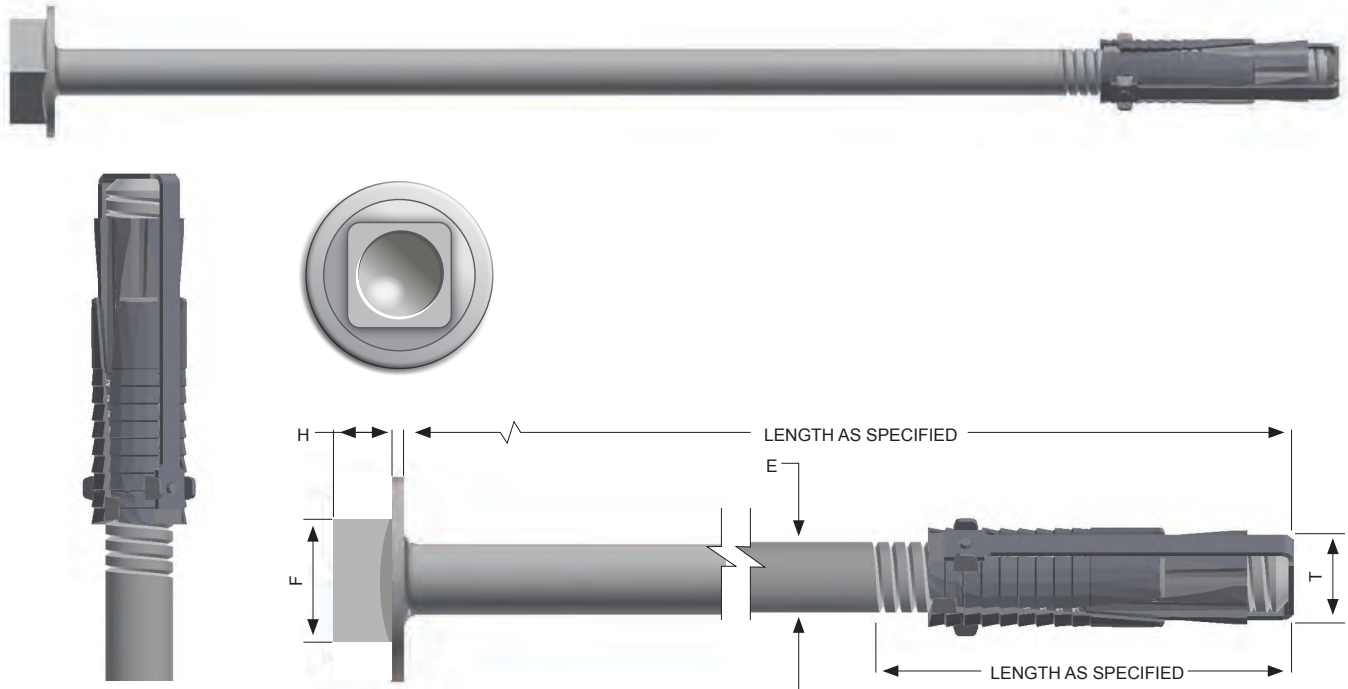
All mechanical and physical properties in accordance with ASTM F432.

Conventional/Mechanical Bolts

Forged Head, 1-1/8" (29 mm) Square

All systems are configured with high strength bar:

- Grade 55 (55,000 psi minimum yield)
- Grade 75 (75,000 psi minimum yield)



Dimensions

	Bar Type	Bolt Size, in. (mm)			
		5/8 (16)	3/4 (19)	7/8 (22)	1 (25)
Body Diameter (E), Nominal, in. (mm)	Smooth	0.563 (14)	0.680 (17)	0.797 (20)	0.906 (23)
Head Across Flats Nominal (F), in. (mm)		1.125 (28.58)			
Head Height (H), min., in. (mm)		0.476 (12.09)			
Thread Size (T), LH or RH, in.		5/8-11 UNC	3/4-10 UNC	7/8-9 UNC	1-8 UNC

All dimensions and thread sizes in accordance with ASTM F432.

Technical Data — Smooth Bar

Grade	Gr55	Gr75			
Bolt Size, in. (mm)	5/8 (16)	5/8 (16)	3/4 (19)	7/8 (22)	1 (25)
Thread Yield Strength, min., lb (kN)	12,400 (55)	17,000 (76)	25,200 (112)	34,700 (154)	45,500 (202)
Thread Tensile Strength, min., lb (kN)	19,200 (85)	22,600 (101)	33,500 (149)	46,250 (205)	60,600 (270)

All mechanical and physical properties in accordance with ASTM F432.

JENN-TENSION



JENNMAR offers the JENN-TENSION roof bolt re-tensioning system for a quick and economical alternative to replacement of loose roof plates. The JENN-TENSION system fits up to #7 rebar. JENN-TENSION is capable of re-tensioning roof plates with a minimum 1 in. gap between the plate and roof

Each JENN-TENSION unit consists of the following items:

- Spherical Washer
- Threaded Spacer (0.5 or 1.0")
- Nut
- Extra Spacers



Installation is simple!

1. Clean loose material from the roof to ensure that the plate will fit firmly against the roof.
2. Slide the spherical washer on to the bolt with the slot opening away from you.
3. Select the proper size of threaded spacer (1/2 or 1 in.) dependent upon the gap between the plate and roof. Slide the threaded spacer on to the bolt with the slot facing towards you. If using a spherical washer, make sure that the tab on the washer is in the slot of the threaded spacer.
4. Add blank spacers until the plate is as close to the roof as possible.
5. Slide the nut over the head/washer of the bolt and up to the threaded spacer.
6. Tighten the nut by hand until the plate comes in contact with the roof. Limit rotation of spherical washer by placing a screwdriver in slot of spherical washer.
7. Use channel locks or a wrench to tighten the nut until the plate is firmly against the roof.

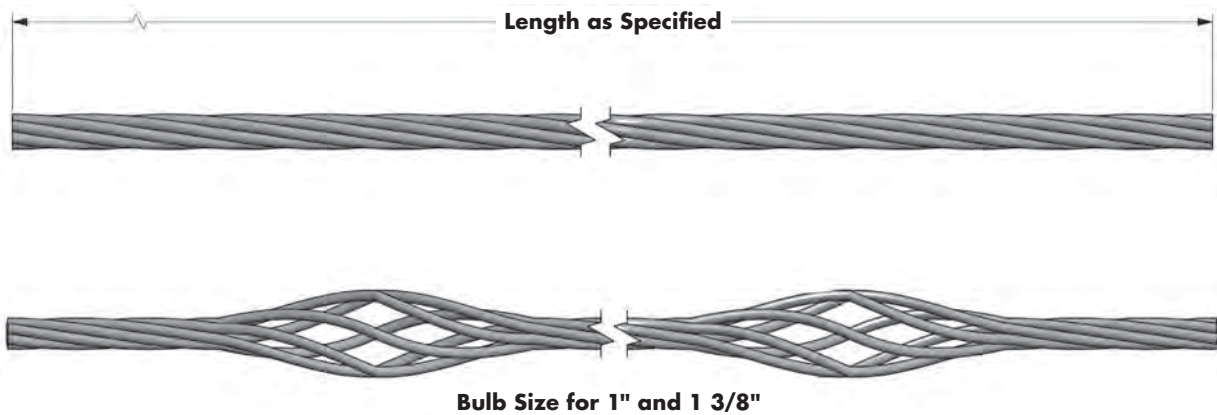
Technical Data – JENN-TENSION

Description	Material	Nominal Dimensions	
		in.	mm
Spherical Washer	Cast Ductile Iron	3 dia × 1-1/4 H	76 dia × 32 H
JENN-TENSION Nut		3-1/2 Hex w/ 2-1/4 × 8 UNC Thread	89 Hex w/ 57 × 8 UNC Thread
Threaded Spacer, 1/2 in. (13 mm)		1/2 H w/ 2-1/2 × 8 UNC Thread	13 H w/ 57 × 8 UNC Thread
Threaded Spacer, 1 in. (25 mm)		1 H w/ 2-1/4 × 8 UNC Thread	25 H w/ 57 × 8 UNC Thread
Spacer, 1/2 in. (13 mm)		2 dia × 1/2 H	51 dia × 13 H
Spacer, 1 in. (25 mm)		2 dia × 1 H	51 dia × 25 H
Spacer, 2 in. (51 mm)		2 dia × 2 H	51 dia × 51 H

Cable Products



JENNMAR offers a complete line of cable support products. These products are based on 7-strand, high-strength cable. JENNMAR offers an industry-leading line of cable products including: non-tensioned cables, post-tensioned cables, tensionable cables for primary roof support, and fully-grouted cables. With J-LOK resins and JENNCHEM grouts and pumpable resins, a fully-customized solution can be provided.



Technical Data – Bright Cable

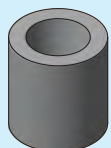
	0.6 in. (15 mm) Cable Bolt	0.7 in. (18 mm) Cable Bolt
Cable Description*	Uncoated 7-Strand Low-Relaxation Strand	
Grade	270K–270,000 psi (1862 MPa) Ultimate Strength	
Ultimate Strength, min., lbs (kN)	58,600 (261)	79,400 (353)
Load @ 1% Extension, min., lbs (kN)	52,740 (235)	71,500 (318)
Elongation, min.	3.5%	
Specification	ASTM A416	

*Galvanized cable also available.

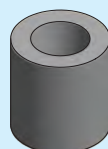
Dimensions – Bright Cable

	0.6 in. (15 mm) Cable Bolt	0.7 in. (18 mm) Cable Bolt
Strand Diameter (A), in. (mm)	0.600 (15)	0.700 (18)

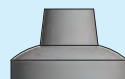
Cable Bolt Housings



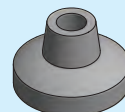
0.6 in. Barrel



0.7 in. Barrel



0.6 in. Low Profile



0.7 in. Low Profile





Non-Tensioned Cable Bolt (NT) is manufactured using 0.6 or 0.7" cable with pre-set housing and wedge and 1-1/8" square drive nut. Stiffener tube and resin mixing bulbs suitable for desired borehole diameter are incorporated. Various lengths are available to suit mine conditions.

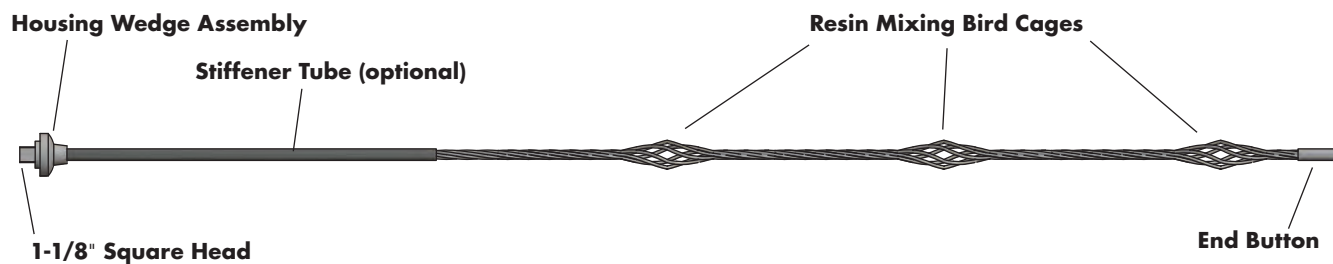
Conditions

New mining, old works, outby, generally anywhere cable support is needed.

Locations

Entries, belt rehabilitations, intersection support, intersections for pillar recovery, longwall recovery and set-up entries, and longwall headgate entries.

JM CABLE Non-Tensioned Cable Bolts



JM CABLE® Non-Tensioned Cable Bolt (NT)

	0.6 in. (15 mm)	0.7 in. (18 mm)
JENNMAR I.D. No.	KW608*	KW708*
Strand Diameter, in. (mm)	0.6 (15)	0.7 (18)
Number of Strands	7	
Strand Grade	270	
Cable Length, min., ft. (m)	8 (2.4)	
Resin Type	J-LOK™	

* This code will be on samples made in WV.

JM CABLE® INSTAL® CC Tensionable Cable Bolt



INSTAL® CC Tensionable Cable Bolt is manufactured using 0.6 or 0.7" cable with pre-set housing and wedge and 1-1/8" square drive nut. A threaded stiffener tube with attached shell is set on the cable at the housing end and resin mixing bulbs are incorporated at the opposite end. Bolt rotation engages shell with borehole and sets tension on the bolt.

Function

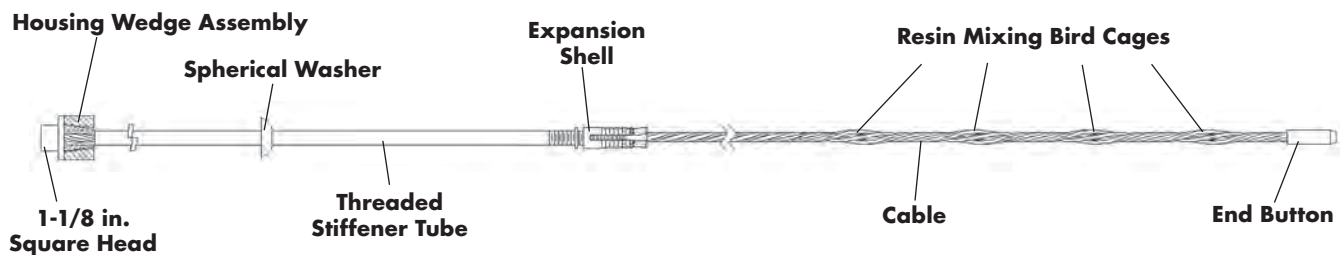
INSTAL® CC Cable Bolt is used for primary and secondary support. The CC cable bolt is part of the INSTAL family of tensionable cable bolts and is the only tensionable system approved by MSHA as primary support. It is most

commonly used when primary system is supplemented with cable bolts in the normal bolting pattern. Using CC bolts, the normal primary support can be replaced and no additional secondary bolting is needed. The INSTAL® CC Tensionable Cable Bolt is available in fully grouted cable bolt configuration.

Locations

Longwall headgate entries, intersections, belt entries.

JM CABLE® INSTAL® CC Cable Bolt



JM CABLE® INSTAL® CC Tensionable Cable Bolt

	0.6 in. (15 mm)	0.7 in. (18 mm)
Jennmar I.D. No.	KWC610*	KWC710*
Strand Diameter, in. (mm)	0.6 (15)	0.7 (18)
Number of Strands	7	
Strand Grade	270	
Cable Length, min., ft. (m)	8 (2.4)	
Thread Strength on Stiffener Tube Shell, min., lb (kN)	19,000 (85)	
Shell	Expansion Shell for 1-3/8 in. (35 mm)	
Tension Range, min., lbs (kN)	6000 (27)	
Resin Type	J-LOK™	

* This code will be on samples made in WV.

JM CABLE® Post-Tensioned Cable Bolt (PT)



Post-Tensioned Cable Bolt (PT) is manufactured using 0.6 or 0.7" cable and incorporates resin mixing bulbs and a stiffener tube. The housing and wedge is inserted onto the cable but is not set. A pigtail extends below the housing to allow mixing and attachment of the tensioning unit which sets the housing and wedge.

Function

Post-Tensioned Cable Bolt (PT) is normally utilized when high tensionable loads are required in highly unstable and fractured strata. The PT bolt is installed by applying direct tension to the cable pigtail and the load is normally the highest applicable among the cable bolt systems. It stiffens the bolted horizon to allow little movement of the system and has normally been utilized as a secondary bolting system.

Installation is more time consuming and not recommended for full time installation during normal production. A 6–12" protrusion from the roof, including the barrel, wedge and cable pig tail occurs for all installations. Height restraints should be considered when implementing this system.

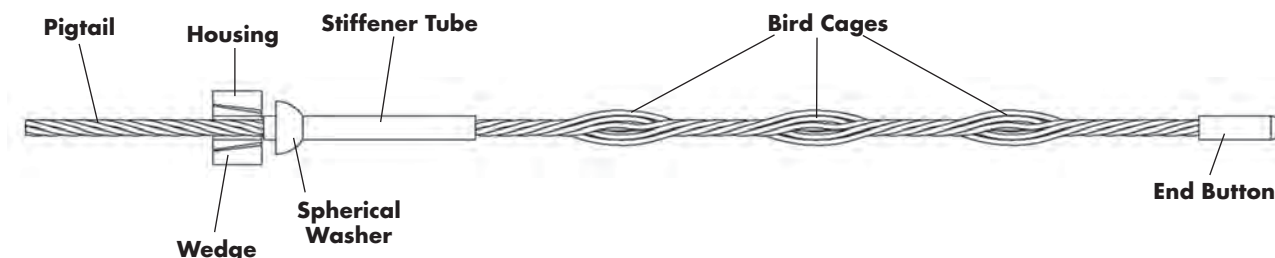
Conditions

Old works, outby, after areas have set, highly fractured and broken strata, areas that require stiff systems with little room for movement.

Locations

Outby areas, belt entries, belt rehabilitations, intersection support, longwall recovery and set-up entries, and longwall headgate entries.

JM CABLE® Post-Tensioned Cable Bolt (PT)



JM CABLE® Post-Tensioned Cable Bolt (PT)

	0.6 in. (15 mm)	0.7 in. (18 mm)
Jennmar I.D. No.	KWP610*	KWP710*
Strand Diameter, in. (mm)	0.6 (15)	0.7 (18)
Number of Strands	7	
Strand Grade	270	
Cable Length, min., ft. (m)	8 (2.4)	
Tension Range, min., lbs (kN)	6000 (27)	
Resin Type	J-LOK™	

* This code will be on samples made in WV.

JM CABLE® Fully-Grouted Cable Bolt (FGCB)



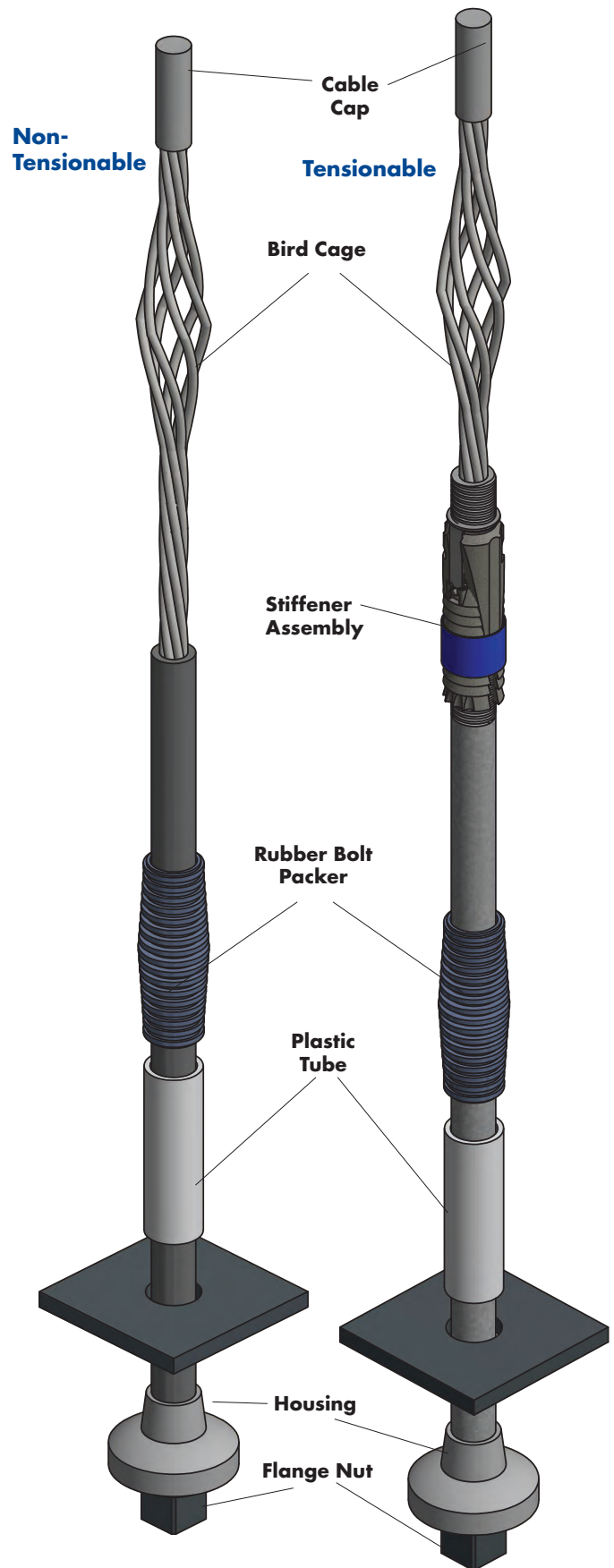
The Fully-Grouted Cable Bolt (FGCB) was developed by the JENNMAR Sales Team after extensive field testing. The FGCB allows for a standard cable bolt to be fully encapsulated during installation or post-installation with polyurethane (PUR). A fully encapsulated cable bolt is better protected than a traditional bolt from corrosive elements that may be in a mine roof which could affect the cable bolt's structural properties, especially if the cable bolt is subjected to these elements for prolonged periods of time. FGCB is available as a non-tensioned and INSTAL® CC Tensionable Cable Bolt models.

Function

Although initially developed for corrosion protection, field trials demonstrated that the FGCB can act as a traditional PUR injectable bolt. The FGCB is proven to be a very versatile roof support due to its ability to control many different ground conditions, from increasing the lifespan of standard cable bolt supports in long-term main entry systems to stopping the ingress of water and allowing access to previously unattainable reserves. The FGCB is a very effective and economical roof support option.

Locations

Outby areas, belt entries, belt rehabilitations, intersection support, intersections for pillar recovery, longwall recovery and set-up entries, and longwall headgate entries.



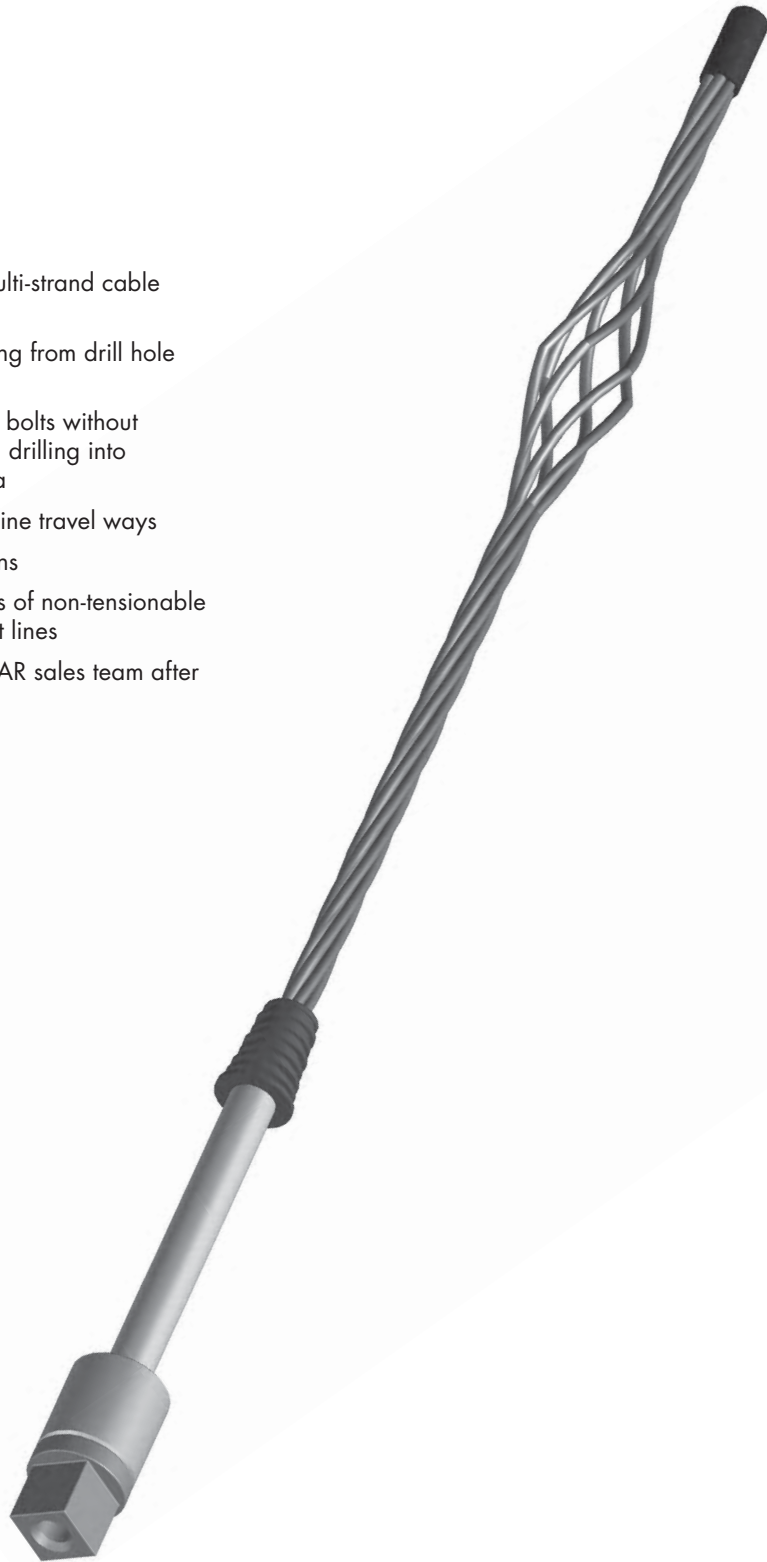
JM CABLE® Fully-Grouted Cable Bolt (FGCB)

	0.6 in. (15 mm) 30 Ton Nominal	0.7 in. (18 mm) 40 Ton Nominal
Jennmar I.D. No.	KW608*	KW708*
Strand Diameter, in. (mm)	0.6 (15)	0.7 (18)
Number of Strands	7	
Strand Grade, ksi (MPa)	270 (1862)	
Cable Length, min., ft. (m)	8 (2.4)	
Stiffener Tube Length, min., in. (mm)	18 (457)	
Resin Type	J-LOK	

* This code will be on samples made in WV.

Advantages

- Water stoppage
- Creates a seal between multi-strand cable and drill hole wall
- Prevents water from traveling from drill hole into mine entry
- Allows use of longer cable bolts without concerns about water from drilling into aquifers in the above strata
- Reduces deterioration to mine travel ways
- Improves working conditions
- Compatible with all lengths of non-tensionable cable bolt Jennmar Product lines
- Developed by the JENNMAR sales team after extensive field testing





JM CABLE® SUMO® Cable Bolts provide a very high strength steel wire strand, with metallurgy designed for applications in both coal and hard rock mining, as well as civil and tunneling projects. Compared with 0.6 and 0.7 in. diameter, grade 270 cables commonly used in U.S. coal mines, the SUMO cable has a larger diameter of 1.10 in. and a minimum 66.2 ton strand ultimate tensile strength (UTS), which is much higher than the 28 and 38 ton respective capacities of 0.6 and 0.7 in. cables.



Features

- Installation into drill holes ranging from 1.5 – 1.8 in. (38 – 45 mm) diameter to achieve very high load transfer
- Bulbed along the entire grouted length of the strand for maximum load transfer
- Anchored with J-LOK post-grout resin cartridges for mixing in larger drill holes
- Flexible central corrosion protected steel hollow tube 0.55 in. (14 mm) diameter for grout injection
- Grout adaptor with locking fitting for fast, easy and safe attachment
- Tensioning jacks available up to 33 tons (30 metric tons)
- Plated with high capacity 0.55 in. (14 mm) thick “Volcano” plates with grout indicator holes
- Typical lengths are 16 & 25 ft (5 & 8 m).
- Can be tensioned or non-tensioned.

Technical Data – JM CABLE® SUMO® Cable Bolt

Strand Details

Strand Diameter, in. (mm)	1.10 (28)	
Typical Strand Breaking Load with B&W, ton (metric ton)	60.7 (55)	
Steel Area, in.2 (mm2)	0.53 (342)	
	Minimum	Typical
Strand Yield, ton (metric ton)	55.2 (50)	64.0 (58)
Strand UTS, ton (metric ton)	66.2 (60)	71.7 (65)
Elongation at Strand Failure, %	3.5	5 – 7

Bulbing Details

	Bulb Diameter	Bulb Spacing
Top 3.3 ft. (1 m) Resin Anchor Section, in. (mm)	1.38 (35)	10 (254)
Remaining Grouted Section, in. (mm)	1.38 (35)	20 (508)

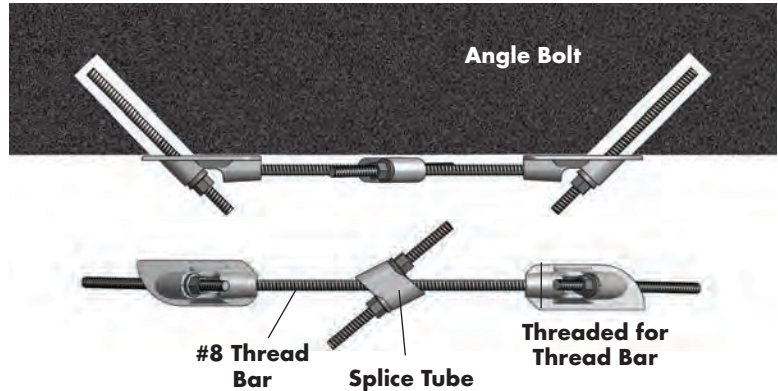
Truss Systems

JENNMAR offers the mining and tunneling industries the most reliable, high strength truss systems available. Truss systems can eliminate cribbing expense and labor.

BYTM® Thread Bar Truss System

- Utilizes the #8 threaded rebar as the horizontal tensioning member
- Used in conjunction with our #8 or #9 splice tube
- Rebar is engaged directly into an internally threaded truss shoe

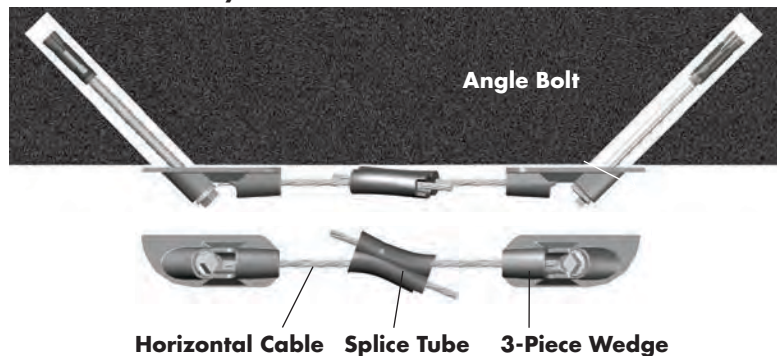
BYTM Thread Bar Truss System



BYTM® Cable Truss System

- Fast installation
- 0.6" cable (30 tons)
- Tensioned from center of entry
- Minimum components
- Can be part of primary support

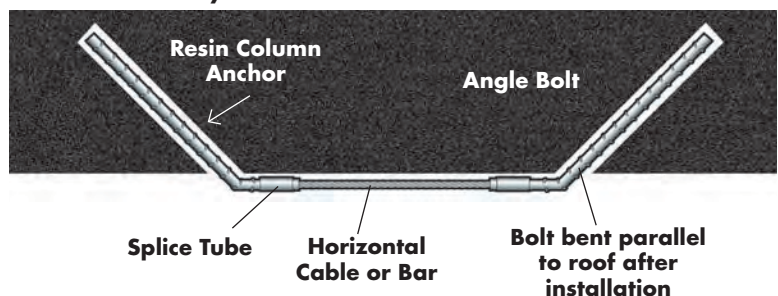
BYTM Cable Truss System



Sling Truss (#8 Bar or Cable)

- Economical and easy to install off the miner
- Utilizes JENNMAR's unique J-Bar (angle bolts) for better mixing
- Fewer parts than competition

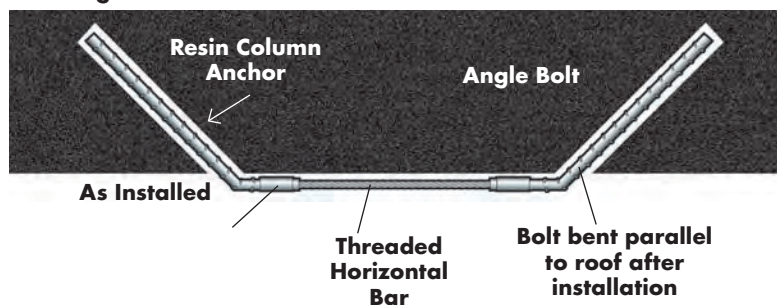
JMB Cable Truss System



Bar Sling

- Full Load Truss coupler
- Torque wrench to tension truss at coupler

Bar Sling



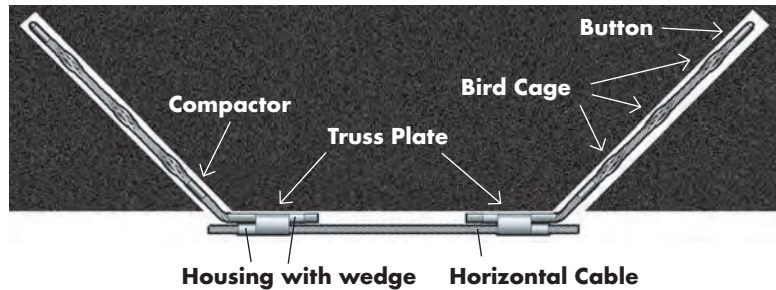
*Patented

Truss Systems

JMS Cable® Truss

- Great for low seams
- Eliminates cribbing
- Flexibility helps handle lateral shear
- Easily tensioned
- Custom designed for entry width

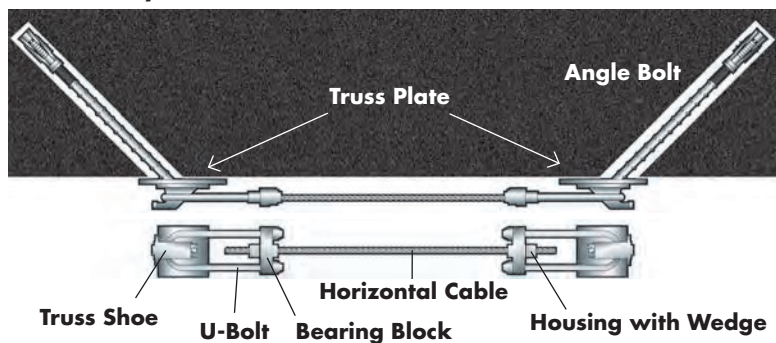
JMS Truss System



JMM Cable Truss

- System provides uplifting force to reduce roof sag
- Less cribbing needed in tailgates, reduces mine cost, and increases ventilation

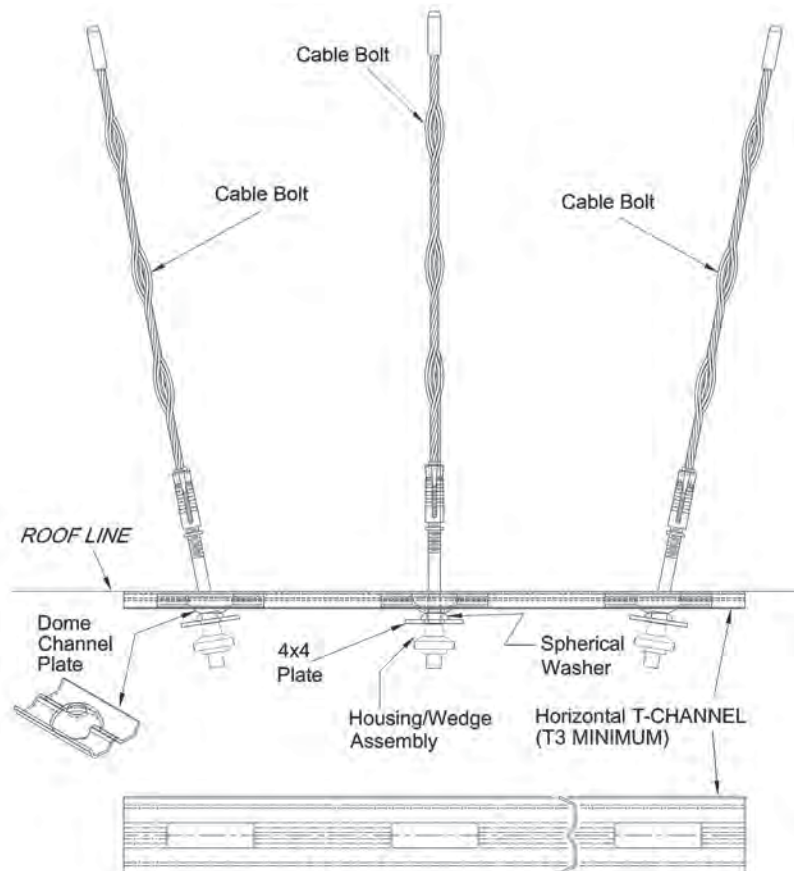
JMM Truss System



B-Rigid Truss

Widely used and user-friendly truss system especially in extremely adverse conditions such as:

- Extremely laminated conditions
- Highly fractured materials at various anchorage horizons
- Conditions that require higher stiffness with minimal roof movement
- Low profile ensures maximum floor to roof clearance
- Requires no additional tensioning devices
- Standard channels and cable bolts are used
- Short learning curve

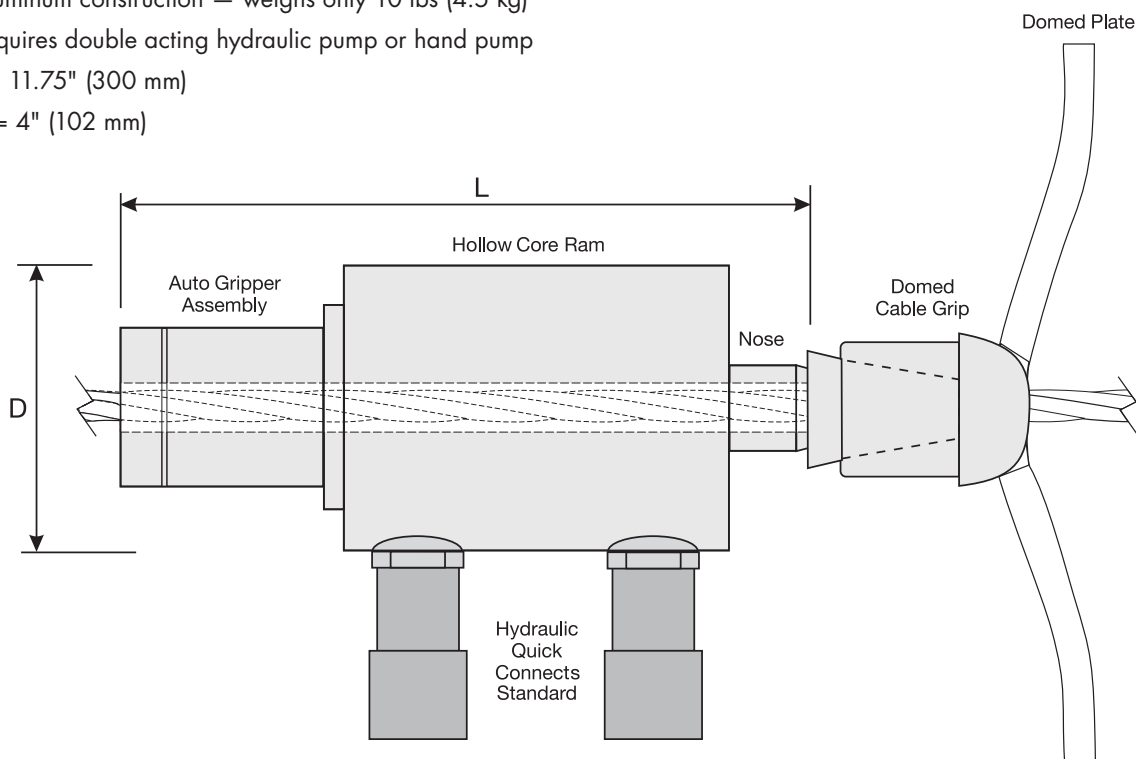


CBJ-1 Cable Bolt Tensioning Unit (CTU)

For Installation of Bearing Plates

Specifications

- For 0.6" (15.2 mm) or 0.7" (17.8 mm) cable bolts
- Maximum load 25 ton @ 10,000 psi (225 kN @ 70 MPa)
- Stroke = 3" (75 mm)
- Double acting hollow core ram
- Aluminum construction — weighs only 10 lbs (4.5 kg)
- Requires double acting hydraulic pump or hand pump
- L = 11.75" (300 mm)
- D = 4" (102 mm)

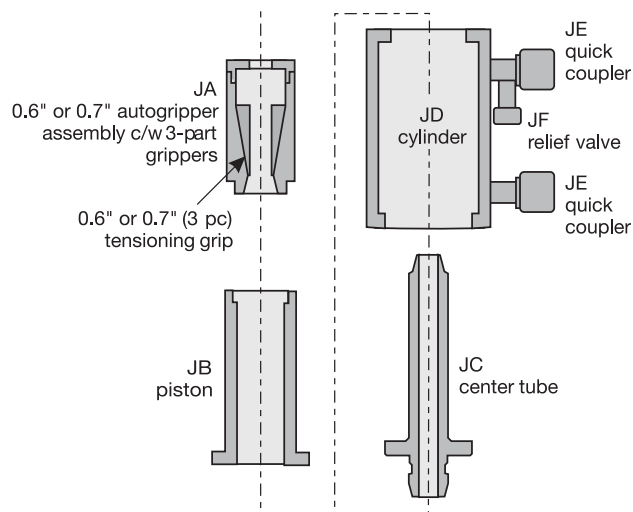


Parts

- 1) Regularly ensure autogripper is screwed hand tight into the hollow core ram.
- 2) Ensure the cable strand is free from mud and dust. Also regularly clean the autogripper wedges.

Seal Kit includes:

- 1-2.25" AN wiper
- 1-2.25" x 2.75" x 3.75" rod seal
- 1-1.25" x 1.75" x 0.250" rod seal
- 1-2.31" O-ring
- 1-2.875" T-seal



Cable Tensioning Unit (CTU)



Specifications

A Cable Tensioning Unit (CTU) is portable device that will pre-stress various size cables. The CTU will tighten the cable by stretching, once stretched to desired load the CTU will set the wedges in its permanent fixed location.

- Cable diameters from 0.6" (15.2mm) to 0.7" (17.8mm)
- Operating Pressure of 2,500 psi
- Pre-stress cables up to 20,000 lbs. (90 kN)
- Air/Hydraulic source to power CTU
- Ergonomic two handle design
- Used on PT Cable Bolts and JM Cable Truss Systems
- Twin hydraulic ports – Quick change staple lock
- Easy maintenance with replaceable wear parts
- Elongated and short interchangeable nose



CABLE-LOK™ Shell



The CABLE-LOK™ Shell is a spring-loaded shell that can be automatically set on installation. The CABLE-LOK Shell can be used for the following medium soft to very hard rock applications:

- Pre-stressed cable bolting in large span areas
- Pre-stressed cable bolting in hanging wall
- Cable lacing anchors and others.

Features

- Cable can be tensioned immediately
- Easy & quick installation
- Tensioned cable provides immediate long tendon ground support
- Cable can provide pre-tensioned active support throughout its length
- Greatly improves installation & cycle time, whether pre or post grouted.



Technical Data – CABLE-LOK Shell

Applications	Medium soft to very hard rocks
Shell Diameter, in. (mm)	2 (51)
Shell Length, in. (mm)	10 (254)
Cable Diameter, in. (mm)	0.6 or 0.7 (15.24 or 17.78)
Drill Hole Diameter, in. (mm)	2 – 2-1/2 (51 – 64)
Anchoring Capacity	Exceeds ultimate strength of cable

Cable Reels



With our heavy-duty coiling machine, Jennmar can produce coil reels to fit mechanized cable bolting machines which increase productivity due to concurrent drilling and cable installation.



Cable Reels

- 0–13" width
- 33.5" I.D. x 48" width
- 2500 lb capacity

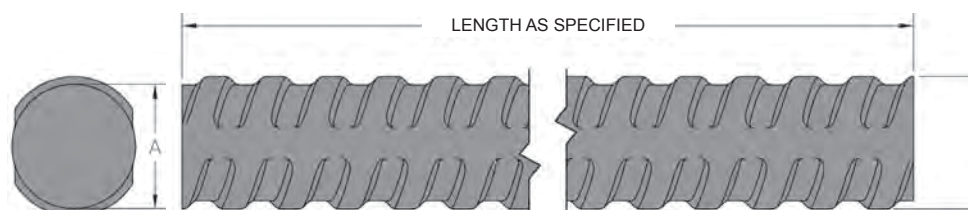
NOTE: Width/I.D./O.D. dimensions can vary based on total length of strand needed.

Features

- Grade 75 rebar
- All mechanical and physical properties in accordance with ASTM A615 and CSA G30.18
- Blunt or tapered ends are available
- Available in galvanized (ASTM A123) or epoxy coated (ASTM A775 or ASTM A934)
- Grade 150 is manufactured to ASTM A722 or ASTM A722 physical and mechanical properties only, depending on diameter

Advantages

- Wide range of applications including rock bolts, rock dowels, rock spiles, soil nails, micropiles, etc.
- Suitable for use with either resin cartridges or cement grout
- Resin shredder design actively promotes shredding of film, mixing of resin components and allows for centralizing of bolt within borehole
- Minimum parts and wrenches required for mixing resin and tensioning plate.
- Both domestic and non-domestic products available



Technical Data - Grade 75 JM Hot Rolled Thread Bar

Bar	Nominal Diameter, in. (mm)	Minimum Net Area Through Threads, in. ² (mm ²)	Yield Strength, Minimum, kips (kN)	Tensile Strength, Minimum, kips (kN)	Nominal Weight, lb/ft (kg/m)	Major Thread Diameter, Approx, in. (mm)
#6	3/4 (19)	0.44 (284)	33 (147)	44 (196)	1.50 (2.24)	0.86 (21.8)
#7	7/8 (22)	0.60 (387)	45 (200)	60 (267)	2.04 (3.04)	0.99 (25.1)
#8	1 (25)	0.79 (510)	59 (264)	79 (351)	2.67 (3.97)	1.12 (28.4)
#9	1-1/8 (29)	1.00 (645)	75 (334)	100 (449)	3.40 (5.06)	1.26 (32)
#10	1-1/4 (32)	1.27 (819)	95 (423)	127 (565)	4.30 (6.40)	1.43 (36.3)
#11	1-3/8 (36)	1.56 (1006)	117 (520)	156 (694)	5.31 (7.91)	1.61 (40.9)
#14	1-3/4 (43)	2.25 (1452)	168.8 (751)	225 (1001)	7.65 (11.38)	1.86 (47.2)

All dimensions, mechanical and physical properties in accordance with ASTM A615. No markings per A615.

Technical Data - Grade 150 JM Thread Bar

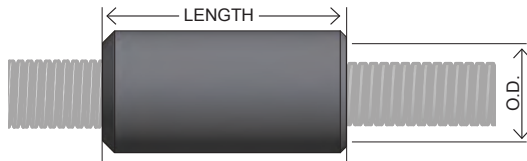
	Nominal Diameter, in. (mm)	Minimum Net Area Through Threads, in. ² (mm ²)	Yield Strength Minimum, kips (kN)	Tensile Strength Minimum, kips (kN)	Nominal Weight lb/ft (kg/m)	Major Thread Diameter, Approx, in. (mm)
	1 (26)	0.85 (548)	102 (452)	128 (569)	3.1 (4.6)	1.200 (30.50)
	1-1/4 (32)	1.25 (806)	150 (667)	188 (836)	4.5 (6.7)	1.429 (36.30)
	1-3/8 (36)	1.58 (1019)	190 (845)	237 (1054)	5.7 (8.5)	1.626 (41.30)
	1-5/8 (40)	1.95 (1258)	268 (1192)	297 (1321)	6.9 (10.3)	1.81 (46.0)
	1-3/4 (46)	2.58 (1664)	320 (1423)	390 (1725)	9.1 (13.5)	2.075 (52.70)
	1-7/8 (47)	2.96 (1910)	371 (1650)	409 (1819)	9.5 (14.1)	2.09 (53.1)
	2-1/4 (57)	4.00 (2581)	480 (2135)	600 (2669)	13.6 (20.2)	2.465 (62.60)
	2-1/2 (65)	5.16 (3331)	619 (2753)	774 (3443)	18.3 (27.2)	2.811 (71.40)
	3 (75)	6.85 (4419)	822 (3656)	1028 (4573)	24.0 (35.7)	3.209 (81.50)

Grade 150 bar available hot or cold rolled threads. *1- 5/8 & 1- 7/8 bar hot rolled only.

JM Hot Rolled Thread Bar Accessories

- Various types and sizes of plates can be used in conjunction with JM Thread Bar
- Can be used in conjunction with hex style nut and washer setup or with one piece cast anchor nut
- Couplers are available for applications requiring a coupling device to connect multiple pieces of JM Thread Bar
- All accessories made in USA.

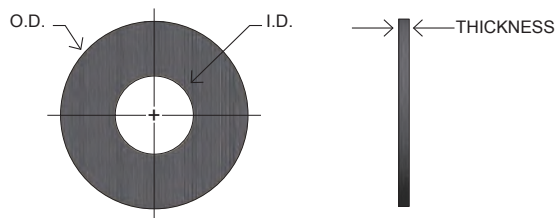
Stop-Type Couplings (ASTM A47 or A536)



Stop-Type Couplings (ASTM A47 or A536)

Bar	Nominal Diameter, in. (mm)	Outside Diameter, in. (mm)	Overall Length, in. (mm)
#6	3/4 (19)	1.50 (38)	4.13 (105)
#7	7/8 (22)	1.50 (38)	4.33 (110)
#8	1 (25)	1.63 (41)	4.53 (115)
#9	1-1/8 (29)	1.75 (44)	4.92 (125)
#10	1-1/4 (32)	2.00 (51)	5.57 (140)
#11	1-3/8 (36)	2.50 (64)	5.91 (150)
#14	1-3/4 (43)	3.00 (76)	7.62 (193.5)

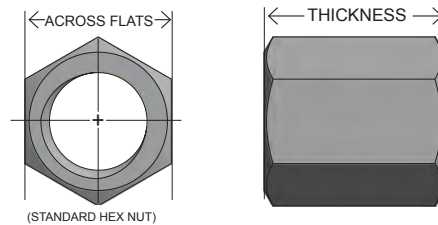
Hardened Washers (ASTM F436)



Hardened Washers (ASTM F436)

Bar	Nominal Diameter, in. (mm)	Outside Diameter, in. (mm)	Inside Diameter, in. (mm)	Thickness, in. (mm)
#6	3/4 (19)	1.75 (45)	0.94 (24)	0.156 (4)
#7	7/8 (22)	2.00 (51)	1.13 (29)	0.156 (4)
#8	1 (25)	2.25 (57)	1.25 (32)	0.156 (4)
#9	1-1/8 (29)	2.25 (57)	1.25 (32)	0.156 (4)
#10	1-1/4 (32)	2.75 (70)	1.53 (39)	0.156 (4)
#11	1-3/8 (35)	3.00 (76)	1.63 (41)	0.156 (4)
#14	1-3/4 (45)	3.25 (83)	1.77 (45)	0.156 (4)

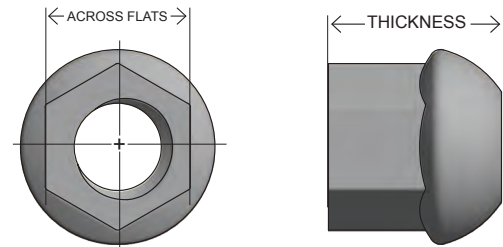
Hex Nuts (ASTM A47 or A536)



Hex Nuts (ASTM A47 or A536)

Bar	Nominal Diameter, in. (mm)	Across Flats, in. (mm)	Across Corners, in. (mm)	Thickness, in. (mm)
#6	3/4 (19)	1.50 (38.1)	1.44 (37)	1.69 (43)
#7	7/8 (22)	1.50 (38.1)	1.66 (42)	1.77 (45)
#8	1 (25)	1.75 (44.5)	1.88 (48)	1.97 (50)
#9	1-1/8 (29)	2.00 (50.8)	2.16 (55)	2.36 (60)
#10	1-1/4 (32)	2.25 (57.2)	2.50 (64)	2.56 (65)
#11	1-3/8 (36)	2.50 (63.5)	2.75 (70)	2.87 (73)
#14	1-3/4 (43)	3.00 (76.2)	3.60 (91)	3.70 (94)

Spherical Nuts (ASTM A47 or A536)



Spherical Nuts (ASTM A47 or A536)

Bar	Nominal Diameter, in. (mm)	across Flats, in. (mm)	Thickness, in. (mm)
#6	3/4 (20)	1.26 (32)	1-1/2 (38.1)
#7	7/8 (22)	1.38 (35)	1-11/16 (42.9)
#8	1 (25)	1.61 (41)	1-13/16 (46)
#9	1-1/8 (29)	1.81 (46)	2-1/4 (57)

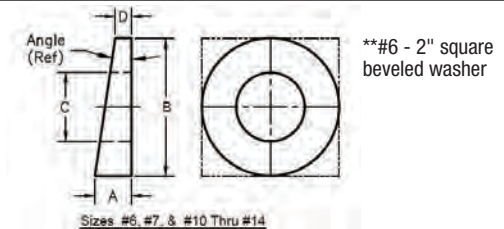
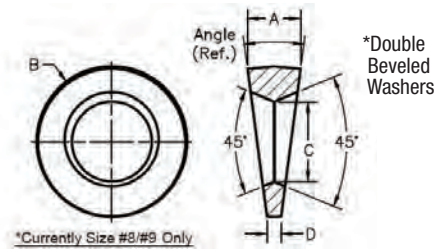
JM All Thread Bar Accessories



Beveled Washers (ASTM A47 or A536)

Beveled Washers (ASTM A47 or A536)

Bar	Degree of Bevel, °	B- Outside Diameter, in. (mm)	C- Inside Diameter, in. (mm)	Thickness, in. (mm)	
				A - Maximum	D- Minimum
#8	15	2.81 (71)	1.31 (33)	1.00 (25)	0.31 (8)
#9	15	2.81 (71)	1.31 (33)	1.00 (25)	0.31 (8)
#6	9	2.00 (50)	1.00 (25)	0.53 (13)	0.26 (6)
#7	9	2.00 (50)	1.19 (30)	0.56 (14)	0.25 (6)
#10	15	3.375 (85)	1.56 (39)	1.23 (55)	0.375 (9)
#11	15	3.5 (88)	1.75 (44)	1.25 (56)	0.375 (9)
#14	15	5.00 (127)	2.13 (54)	1.81 (82)	0.375 (9)



Plates

JENNMAR mining plates shown below according to ASTM A1011, A1018 (adheres to requirements and testing per F432). Plates per ASTM A36, A572, A588 available upon request. All plates made in USA.

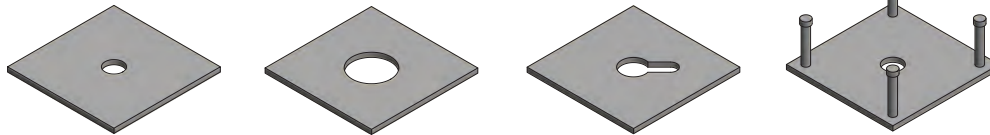


Plate Style		Dimensions, in. (mm)		
		Nominal Sizes, Square	Nominal Thickness, T	Hole Diameter, H
Flat		4 x 4 (102 x 102) 5 x 5 (127 x 127) 6 x 6 (152 x 152) 8 x 8 (203 x 203)	1/4 (6.4) 5/16 (8.0) 3/8 (9.5)	1 - 1-5/8 (25.4 - 41.3)
Dome		5 x 5 (127 x 127) 6 x 6 (152 x 152) 8 x 8 (203 x 203)	5/32 (4.0) 3/16 (4.8) 1/4 (6.4) 5/16 (8.0)	7/8 - 1-15/16 (22.2 - 49.2)
Volcano		6 x 6 (152 x 152) 8 x 8 (203 x 203)	1/4 (6.4) 5/16 (8.0) 3/8 (9.5)	1-3/8 - 1-5/8 (34.9 - 41.3)

JM Thread Bar Hardware (Black & Galvanized)

	#6	#7	#8
7/8" Hex Socket (or Shank) Note the oval shape of the cross section Oval or Threaded End	Oval Spinner x 7/8" Hex Socket x 7/8" Hex Shank	Stock	Stock
7/8" Hex Socket (or Shank)	Threaded Spinner x 7/8" Hex Socket x 7/8" Hex Shank	Special Order	Special Order
7/8" Hex Socket (or Shank)	Nutrunner x 7/8" Hex Socket x 7/8" Hex Shank	Stock	Stock

Other sizes available by Special Order. T-thread, rope thread, 1" hex, etc. bar spinners and nutrunners available by Special Order.

FRICION-LOK® Stabilizer System



The JENNMAR® FRICION-LOK® Stabilizer System is a strata control system designed to firmly control hard or soft rock. As lateral ground movement increases, the system increases its superior holding power.



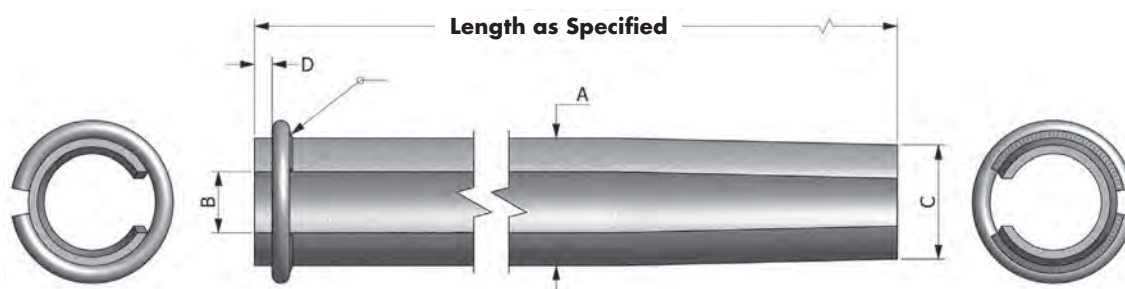
Advantages

- The radial compression of the slotted steel tube inside the borehole provides both radial and axial restraint to rock movement
- Requires no resin mixing or torquing
- Maintains consistent plate load
- Quick and easy installation
- Manufactured by JENNMAR and stocked at company's various strategically located warehouses to provide prompt availability.

Selection

The JENNMAR FRICION-LOK Stabilizer System is available in Bright or Galvanized steel in the following sizes:

- 1.3" (33 mm)
- 1.4" (35 mm)
- 1.5" (39 mm)
- 1.8" (46 mm)



FRICION-LOK Stabilizer System

	FL-33	FL-35	FL-39	FL-46
Recommended Nominal Bit Size, in. (mm)	1-3/16 to 1-5/16 (30 to 33)	1-1/4 to 1-3/8 (32 to 35)	1-3/8 to 1-1/2 (35 to 38)	1-5/8 to 1-3/4 (41 to 44)
Typical Breaking Capacity, Ton (metric ton)	12 (10.88)	12 (10.88)	14 (12.70)	20 (18.14)
Minimum Breaking Capacity, Ton (metric ton)	8 (7.26)	8 (7.26)	10 (9.07)	15 (13.61)
Nominal Tube Lengths, ft. (m) (available to any specified length)	1.5 to 10 (0.5 to 3.1)	1.5 to 10 (0.5 to 3.1)	1.5 to 10 (0.5 to 3.1)	5 to 16 (1.5 to 4.9)
Recommended Initial Anchorage, Ton (metric ton)	3 to 6 (2.72 to 5.44)	3 to 6 (2.72 to 5.44)	3 to 6 (2.72 to 5.44)	6 to 10 (5.44 to 9.07)

Dimensions

	FL-33	FL-35	FL-39	FL-46
Tube Diameter (A), in. (mm) ± 0.030 in.	1.330 (33)	1.400 (35)	1.530 (39)	1.815 (46)
Slot Width (B), in. (mm)	0.440 to 0.640 (11 to 16)	0.600 to 0.750 (15 to 19)	0.560 to 0.760 (14 to 19)	0.820 to 0.920 (21 to 23)
Taper End Diameter (C), max., in. (mm)	1.180 (30)	1.180 (30)	1.180 (30)	1.620 (41)
Ring Standoff (D), in. (mm)	0.085 ± 0.035 (2 ± 1)			

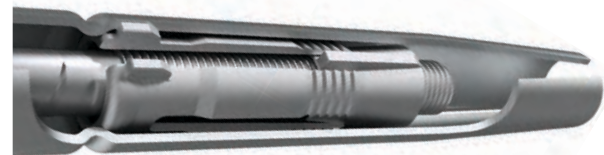
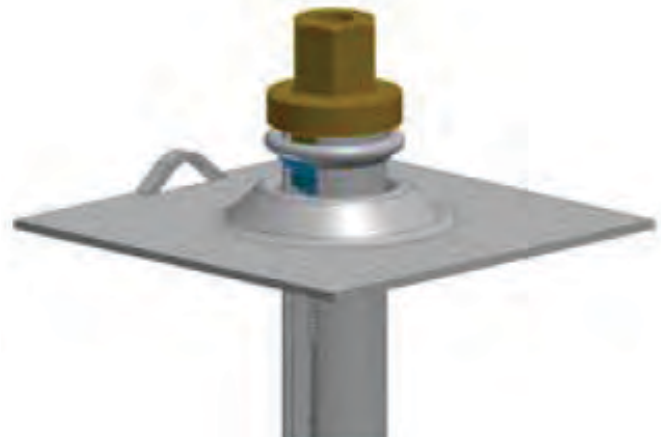
All dimensions in accordance with ASTM A615.



The patented Mech-Lok bolt with Energy Absorbing Ring is designed to be easily installed in poor ground conditions, but maximise load capacity.

Features

- Easy installation in very poor ground
- Increased system capacity compared to standard 47mm Friction Loks
- Improved load transfer due to combination of the Friction Lok and mechanical anchor bolt working together
- Improved corrosion performance compared to standard Friction Loks
- Improved shear performance of installed system
- Energy absorbing ring included with bolts to prevent the bar from ejecting in failure mode



Technical Data – Mech Lok Bolt

Grade Description	M24 Bar Properties Minimum		M24 Bar Properties Typical	
	MPa	kN	MPa	kN
Yield Strength of steel	500	171	550	190
Tensile Strength of steel	660	250	700	265
Standard Elongation	Min	15%	Typ	27%
Shear Strength (0.7 x UTS)	185		223	

Grade Description	47mm Friction Lok Properties Minimum		47mm Friction Lok Properties Typical	
	MPa	kN	MPa	kN
Yield Strength of steel	345	120	445	160
Tensile Strength of steel	460	165	510	200
Standard Elongation	Min	15%	Typ	27%
Shear Strength (0.7 x UTS)	185		223	
Cross Sectional Area (mm²)	355			
Mass Per Metre (kg/m)	6.01			
Drill Hole Size (mm)	42.1 - 45			

M3® Expandable Rock Bolt

M3® expandable rock bolts offer superior quality that responds to the most demanding roof support applications. Its high load capacity and excellent elongation properties ensure safer working conditions and faster excavation cycles.

This latest generation of rock bolt includes these improvements:

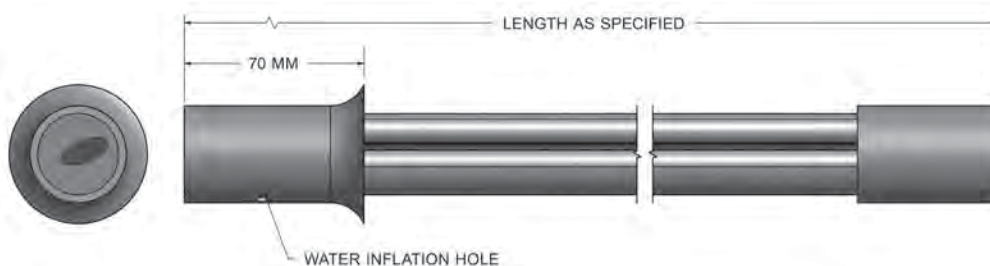
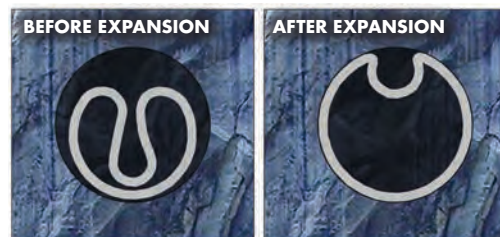
- **Redesigned Tooling** to reduce the thinning in the tongue area of the profile and prevent premature failures.
- **Improved Steel Chemistry** means full strength is achieved during our forming process avoiding any detrimental effects of cold working.
- **Improved Profile** to minimize stress concentration during roll forming and maximizing ability for surface preparation and coating application.
- **Modernized Equipment** (cold saw, tube end former, automatic sizing section, robotic welding, accumulator, etc.) for superior quality control.

M3 bolts tie and join fractures because they can withstand high loads and have excellent elastic properties, allowing the bolt to remain intact after rock movement without cutting. It is a versatile bolting solution for variable ground conditions.

Improved design and tooling means greater consistency and reliability.
Our best expandable rock bolt yet!

Advantages

- Immediate full length support for faster excavation cycles and safer working conditions
- Simple and clean installation
- Adjusts to borehole irregularities
- Excellent elongation properties and flexibility allow for variations in drill diameter
- M3 bolts can be manufactured to any length up to a maximum of 20 ft (240 in.).



Technical Data – M3 Expandable Rock Bolts

	Standard	Midi	Super
Typical Breaking Strength, ton (kN)	13.5 (120)	18.0 (160)	27 (240)
Typical Elongation (Parent Material)	25%	25%	25%
Profile Diameter, nominal, in. (mm)	1.05 (27)	1.42 (36)	1.42 (36)
Material Thickness, nominal, in. (mm)	0.078 (2)	0.078 (2)	0.118 (3)
Hole Diameter Range, in. (mm)	1.25 – 1.50 (32 – 38)	1.70 – 2.05 (43 – 52)	1.70 – 2.05 (43 – 52)
Optimal Hole Diameter, in. (mm)	1.38 – 1.50 (35 – 38)	1.75 – 2.00 (44 – 51)	1.75 – 2.00 (44 – 51)
Inflation Pressure, psi (bar)	4350 (300)	3481 (240)	4350 (300)

M3[®] Custom Protective Coating

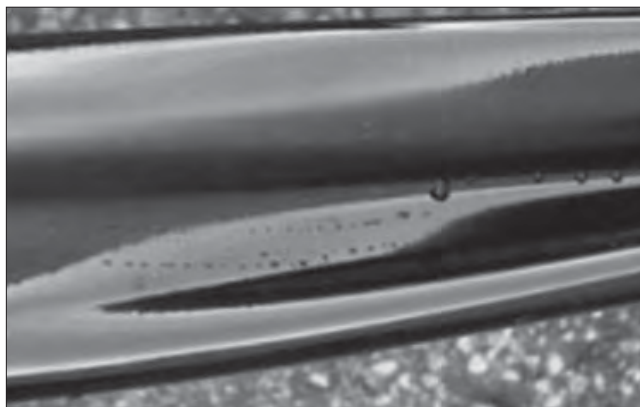
In general, regular expandable rock bolts are not resistant to corrosive environments. To alleviate this problem in mining and tunneling applications, JENNMAR is using a special coating that isolates and actively protects the steel. The coating does not interfere with normal installation procedures.

Zinc Epoxy Coating

Zinc Epoxy is an economic yet effective coating material for rock bolts against corrosion in challenging geotechnical environment, where resistance to abrasion and electrochemical corrosion is required. The innovative zinc epoxy coating system applied on JENNMAR rock bolts.

Features

- An optimal zinc content: The zinc epoxy is specially formulated with an optimal zinc content that provides an excellent cathodic protection (CP) of metal substrate with greatly improved mechanical properties (crack resistance), cohesion, and adhesion.
- A self-healing effect: The corrosion byproduct of the zinc blocks microcracks on the coating and creates an inhibitor effects by collecting insoluble complexes of zinc, oxygen, and chlorides and trapping these species in the coating so they don't reach the surface of the steel substrate.
- A good scratch damage resistance: The Zinc epoxy coating has a good surface hardness against scratch damage during bolt installation.
- An excellent corrosion resistance: The zinc epoxy coating has an exceptional corrosion resistance to acids (pH 4 - 7), alkalis (pH up to 13), fuels and salt solvents. Laboratory test indicates that the zinc epoxy coated M3 expandable rock bolts withstood more than 1,000 hours of salt spray exposure without red or white corrosion products that are normally found after 72 hours on uncoated rock bolts.



K2 ThermoPlastic

Excellent flexibility, adhesion and hardness are the hallmark characteristics of this familiar, single layer plastic bolt coating. Very good resistance to humidity, acids, alkalinity and salts, it remains a top coating choice for many mining sites.

M3® Pump

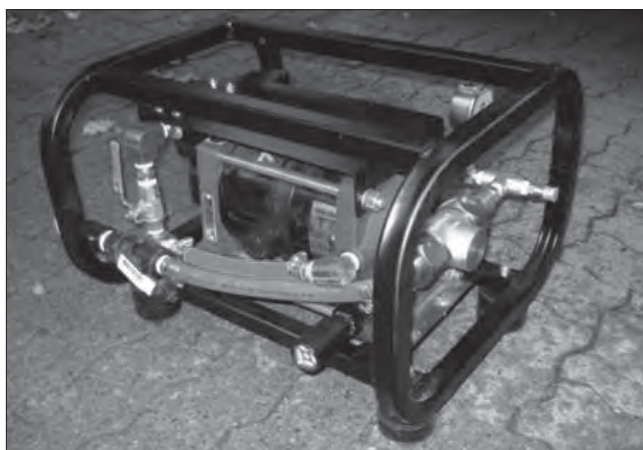


Hydraulic Pump



Inlet Air Pressure Range	Outlet Water psi
70 to 100 psi	280 to 300 bar (4060 to 4350 psi)

Electric Pump



Specifications Electric Pump Type 300E (SI Units)

Characteristics	Unit	Value
Dimensions (L x W x H)	(mm)	800x400x445
Weight	(kg)	90
Max. flow rate	(l/min)	21
Operating pressure*	(bar)	300
Max. operating pressure	(bar)	320
Power supply**	(V)	3-400
Nominal power**	(kW)	11
Electrical connection**	(A)	25
Pumping rotation speed	(rpm)	1,400

*Required tube connection 3/4", water connection pressure: 2 [bar]

**According to IEC 60309 (not CSA approved). Other electric pumps are available on request
All values are subject to change



MPA Bolt System™

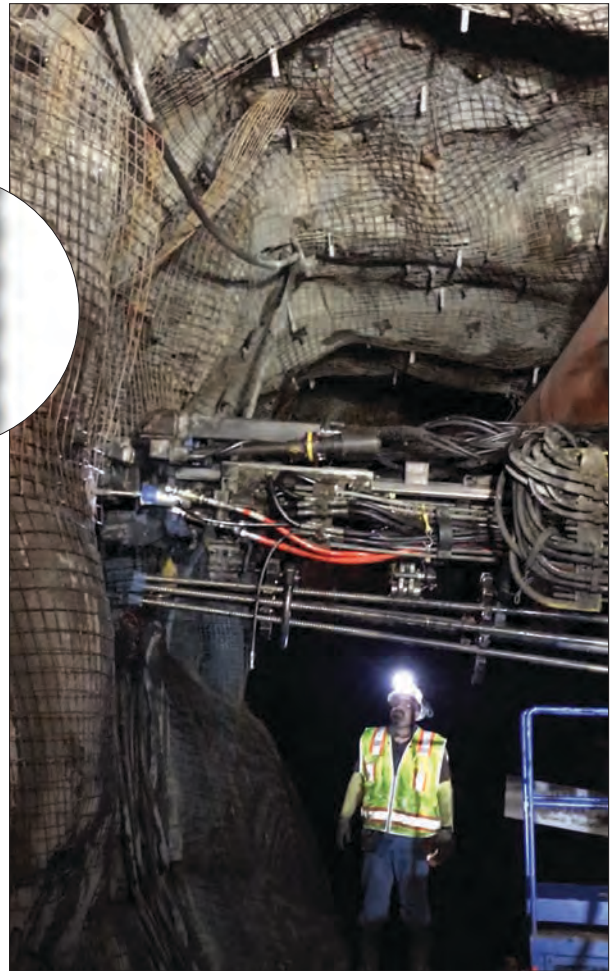
Fast, single-step anchoring system using standard equipment. Efficient installation since drilling and grouting can be performed in a single operation, saving both time and money.

- **32 mm, Self-Drilling, Hollow-Core Bolt**
- Threaded both ends (39 in. & 24 in.)
- 39" yield zone with up to 20% elongation
- Multiple ranges of drill bits available for most rock & soil conditions
- 60,000 lbf capacity
- Corrosion protection systems available upon request

The MPA Bolt System is specially designed for use with J-LOK P™ Pumpable resin, eliminating the capsule and injecting directly into the hollow-core bolt.

* The MPA Bolt System and Pumpable J-LOK P System (including resin) are both the subject of pending U.S. patent applications issued to FCI Holdings Delaware, Inc.

The smooth de-bond zone allows for up to 6 inches of elongation and can be covered with PVC for added corrosion protection.



Features

J-Lok P is a two part resin to provide a mechanical link with the wall of a borehole and the surface of the tendon.

- Significantly decreases bolting cycle time.
- Provides true, long term, single pass ground support in poor or collapsing drill hole conditions.
- Decreases stope access down time for increased production.
- Immediate tension can be applied.
- Customizable and reliable set times from seconds to hours.
- Quality Control reassurance to geotechnical engineers and underground personnel.



Pump SYSTEMS

- Skid/Light Vehicle Mounted or Machine Mounted System. Available for Mechanized bolters, Cable Bolters, Jumbos, Scissor-Lift Bolters, etc.
- Power: 480V, 600V, 1000V or Remote Hydraulic PTO with 24VDC.
- Cab mounted push button station with 7" touch screen.
- Loading station complete with manual hatches to ease loading.

Installation Methods

- Resin-into-bolt rock bolting at all angles.
- Bolt-into-resin rock bolting at all angles.

Application	Typical Resin Speed for Application	Gel Time ¹	12" Short Encapsulation Pull Test (Time to 20 tons) ^{1,2}
Solid Rebar Bolts	J-Lok P 10	5 - 7 Minutes	10 Seconds
	J-Lok P 60	15 - 25 Minutes	60 Seconds
Hollow Core Bolts (SDA, MPA,...)	J-Lok P 120	60 - 75 Minutes	120 Seconds
	J-Lok P 180	140 - 200 Minutes	3 Minutes
Long Tendons (Cables, Strand...)	J-Lok P 250	4 - 6 Minutes	10 Minutes
	J-Lok P 700	15 - 30 Minutes	1 - 2 Hours

Note:

- 1.) Gel time is temperature dependent and will be faster when temperatures exceed 55°F and slower when below 55°F.
- 2.) Pull tests conducted following ASTM F432 guidelines.



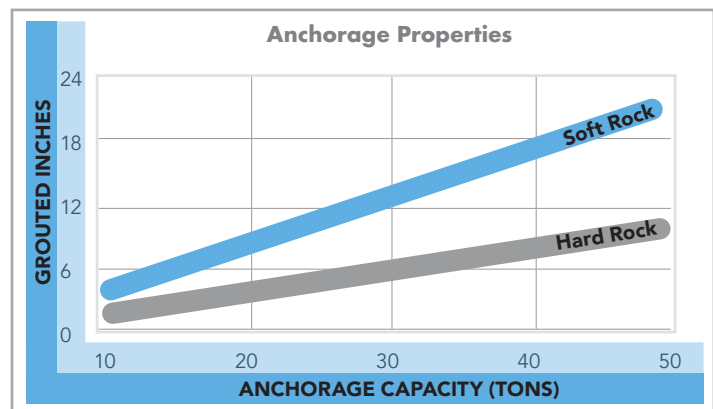
J-Lok P is packaged in easy to handle 42 lb resin and catalyst kits.

Bolting Applications

J-Lok P has been formulated for anchoring and sealing rock bolts in mining and tunneling applications. It is designed to instantly thicken after injection retaining a thixotropic nature within the rock bolt hole to avoid resin loss and allow sufficient time for complete installation of the rock bolt. It is especially effective in vertical bolting applications, and can also be injected through SDA's (Self-Drilling Anchors). There are several versions of J-Lok P available, in order to meet the requirement for different application conditions and processes.

J-Lok P is composed of 80% inert limestone particles and a proprietary resin formula. The J-Lok P composite has an unconfined compressive strength of 6,500 psi, 45 MPa (ASTM D 790-02). The resin used to manufacture J-Lok P has a flexural strength of 16,500 psi, 114 MPa (ASTM D 790-02).

Any anchorage system performance varies with surrounding strata strength. J-Lok P can provide as high as 5.2 tons per grouted inch pull out resistance in Hard Rock and 2.2 tons per grouted inch in Soft Rock.



Fast Anchor™ 3 Bolt System



The Fast Anchor 3 is a double corrosion resistant steel bolt for strata control that provides quick assembly and secure installation due to its expansion shell that provides immediate anchorage and generates superior grip upon application. Fast Anchor 3 is designed within the highest quality standard for this type of bolt and performs accordingly.

The injection system allows for a quick and easy grouting operation, where grout enters through the center hole of the bolt from the bottom and fully encapsulates the bolt.

Features

- Improved advance cycles
- Easy and fast installation
- Immediate anchorage
- Suitable for pre-or post-grouting
- Improved reinforcement cycles
- Improved savings in time and workmanship
- Provide both mechanical and chemical anchorage
- Galvanized option under ASTM 123-9 Standard for corrosion protection
- Plastic sleeve provides additional corrosion protection



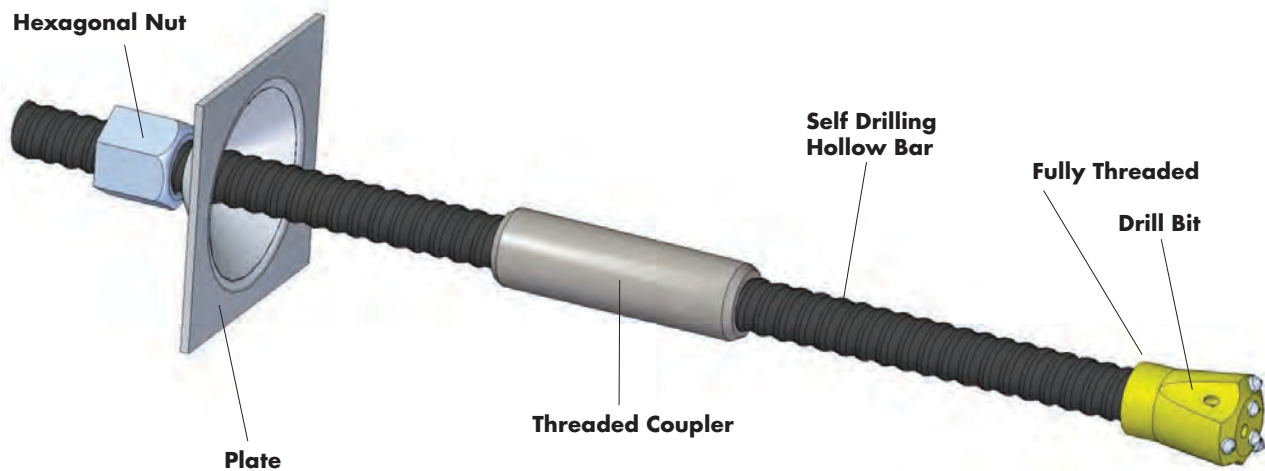
Installation Procedure

1. Drill specified hole diameter. The drill hole length must be longer than the bolt by approx. 2 in.
2. Domed Bearing Plate is fitted to Fast Anchor
3. Insert Fast Anchor into the hole.
4. After placing the bolt in the hole, the bolt is then rotated to anchor the expansion shell to the required tension.
5. Attach grouting adaptor to anchorage.
6. Mix 0.33 to 0.35 W/C grout. Pump grout. Grout is pumped through inner annulus to the bolt end and returns along outer annulus.
7. Terminate grouting with visible grout return.
8. Detach adaptor and proceed to next bolt.

Technical Data - Fast Anchor 3

Grade		Gr75			
Bolt Size, in. (mm)		.677 (17)	.804 (20)	.914 (23)	#10 (32)
Steel Specification		ASTM F432	ASTM F432	ASTM F432	ASTM A615
Yield ksi (MPa)		83 (572)	83 (572)	75 (517)	75 (517)
Tensile ksi (MPa)		108 (744)	108 (744)	100 (698)	100 (698)
Young's Modulus ksi (GPa)		29000 (200)	29000 (200)	29000 (200)	29000 (200)
Point Anchored Capacity	Yield kip (kN)	27.8 (123)	38.3 (170)	45.4 (201)	72.6 (322)
	Ultimate kip (kN)	36.1 (160)	49.9 (221)	60.5 (269)	96.9 (431)
Fully Grouted Capacity	Yield kip (kN)	30.1 (133)	42 (186)	49.2 (218)	95.2 (423)
	Ultimate kip (kN)	39.2 (174)	54.8 (243)	65.6 (291)	127 (564)
Bar Cross-Sectional Area in ² (mm ²)		0.363 (234)	0.508 (327)	0.656 (423)	1.27 (819)
Thread Size/ Spec - in (mm)		3/4"-10 UNC	7/8"-9 UNC	1"-8 UNC	1-1/4"-7 UNC
Nominal Bar Diameter - in (mm)		0.677 (17)	0.804 (20)	0.914 (23)	1.27 (32)
Typical Drill Hole Diameter - in (mm)		2" (51)	2" (51)	2" (51)	2.5" (65)

Self-Drilling Hollow Bar Anchor System



The Self-Drilling bolt is a fully threaded hollow bar that initially serves as a drill rod, utilizing a lost bit. The thread is made to comply to ISO 10208. For use in unconsolidated ground or other difficult ground conditions

- Excellent for spiling (fore-poling)
- Bolt is drilled in and grout is pumped through the center hole with pumpable resin or cement grouts
- The couplers are designed to exceed the ultimate load of the bar by 20%. The couplers are designed to minimize the loss of drill energy
- Several drill bits are available. Most widely used is the EXX Tungsten carbide chisel bit
- Standard length is 3 m (9 ft–10 ft) — Longer lengths are available: 4 m, 6 m
- Galvanized option under ASTM A123

Installation

The Hollow Bar System is typically installed using rotary percussive drilling. This technique enables high rates of installation, good directional stability and also helps to consolidate the grout within the borehole.

Rotation speeds should be sufficient to cut a true borehole (120–150 RPM for soil nails; 100–130 RPM for mini piles), as opposed to displacement of the soil with the drill bit through

percussion and heavy feed pressures (driven installation). Drilled boreholes ensure enlarged grout bodies together with better permeation of the grout into the surrounding ground. Feed pressures on the drill rods should be regulated in accordance with the cutting performance of the drill bit.

Simultaneous Drilling and Grouting

Suitable for granular soils and fills. This installation method utilizes a Grout Swivel, grout pump and drifter. The technique combines drilling and grouting as a single operation, ensuring that grout is placed over the full length of the borehole. For ground conditions where borehole collapse is anticipated or where subsequent grout injection down the center of the bar is problematic, simultaneous drilling and grouting is the preferred solution.

Grouting pressures should be regulated to maintain circulation at all times (typically up to 100 psi), with a small amount of grout return visible at the mouth of the borehole. Pressures in excess of 100 psi are generally only required for specialist applications (i.e. anchors in cohesive soils or mining applications).

The choice of grout pump varies between applications, but basic requirements are; thorough mixing of the grout – to avoid blockages at the drill bit; delivery of a continuous volume – to ensure consistent grouting; and maintenance of sufficient pressure.

Bar Size	R25N	R32N	R32S	R38N	R51N
Diameter Over Threads, in. (mm)	0.984 (25)	1.260 (32)	1.260 (32)	1.496 (38)	2.008 (51)
Cross Sectional Area Of Bar a), in ² . (mm ²)	0.378 (244)	0.614 (396)	0.756 (488)	1.111 (717)	1.455 (939)
Ultimate Strength, kips	45.0	62.9	71.9	112.4	179.8
Yield Strength, kips	33.7	51.7	49.4	89.9	141.6
Weight, lbs/ft. (kg/m)	1.5 (2.3)	2.3 (3.4)	2.8 (4.1)	4.0 (6.0)	5.6 (8.4)
Maximum Drilling Depths c), ft. (m)	39.4 (12)	52.5 (16)	65.6 (20)	78.7 (24)	98.4 (30)

Galvanized & Coated Products

JENNMAR is capable of providing the following types of coated products:

- Galvanized Products
- Powder Coated Products
- Epoxy Coated Products
- Galvanized Products

Galvanized products use zinc coatings that serve as a sacrificial metal corroding preferentially to steel. Galvanized products have excellent bond characteristics to grout or concrete and do not require as much care in handling as epoxy coated products. However, galvanization of some products such as anchor rods is more expensive than epoxy coating and often has greater lead time. Hot dip galvanizing bars and fasteners should be done in accordance with ASTM A153. Typical galvanized coating thickness for steel bars and components is between 3 and 4 mils. High strength steel bars (150 ksi) must be mechanically cleaned and never acid washed to avoid problems associated with hydrogen embrittlement.

Powder Coated Products

Powder coated products use a free-flowing dry powder that does not require a solvent to keep the binder and filler parts in a liquid suspension form. The powder may be a thermoplastic or a thermoset polymer. The coating is applied electrostatically and cured under heat to allow it to flow and form a hard finish that is tougher than conventional paint. Powder coat finishes utilize an extensive pre-treatment process that cleans the metal using iron phosphate to ensure superior performance and adhesion of the powder coating. Durable Powder Coating services are available out of our Jennmar Conveyors facility. For more information call (276) 883-5200.

Epoxy Coated Products

Fusion bonded epoxy coating of steel bars has been successfully employed in many applications to prevent corrosion due to the chemical stability of epoxy resins. Epoxy coating of bars and fasteners should be performed in accordance with ASTM A775 or ASTM A934. Coating thickness is generally specified between 7 to 12 mils. Epoxy coated bars and components are subject to damage if dragged on the ground or mishandled. Heavy plates and nuts are often galvanized even though the bar may be epoxy coated since they are difficult to protect against abrasion in the field. Epoxy coating patch kits can be made available in the field for repairing nicked or scratched epoxy surfaces.

Galvanized & Coated Products

Product	Coating Type		
	Galvanized	Powder Coated	Epoxy Coated
Cable Bolts	X		
CABLEOX™ Cable Bolts			X
Thread Bar	X		X
Friction-LOK Stabilizer System	X		
Channels		X	
Roof, Rib and Channel Plates	X	X	
Roof Mats	X		
Rib Mats	X	X	
Wire Mesh	X		
Rail Ties	X		
V-Deck Lagging	X		

YIELD-LOK® Bolt is a new generation of yielding rock bolt that provides reliable ground control in both seismic and convergence ground conditions. YIELD-LOK Bolt is fully grouted with resin or cement in application. Resin mixing is facilitated by deformations on the head of bolt similar to rebar. The bolt provides immediate primary support on installation.

The YIELD-LOK Bolt can be configured to yield either in dynamic condition (YL-Dynamic Bolt) or yield at specified loads in static condition (YL-Static Bolt).

YL-Dynamic Bolt

In static condition, YL-Dynamic Bolt provides stiff support similar to rebar bolt, while in dynamic condition, the bolt yields at a constant load to absorb dynamic energy by pulling the upset through the polymer (i.e. plough effect).

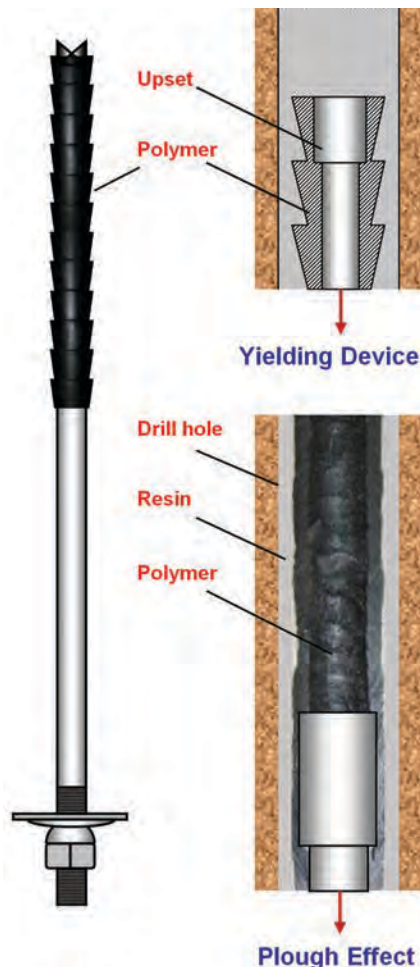
YL-Static Bolt

In convergence condition, YL-Static Bolt provides consistent yield at specified load by pulling upset through the polymer. Static yielding load of bolt is controlled by varying the dimension of upset.

It is recommended to apply the YIELD-LOK Bolt with mine meshes and straps together to build up a yielding support system to reinforce and retain the rock mass that is subjected to large convergence from dynamic or static loads.

Features

- Suitable in static and dynamic load conditions
- Applicable as primary support
- Provides stiff shear resistance in both dynamic and static conditions
- Compatible with existing ground control system and installation machines
- Performance independent of drill hole diameter and resin properties
- Performance characteristics are consistent through multiple and varying amplitude of impacts
- Engineered polymer coating performs down to -94°F (-70°C).



Technical Data – YIELD-LOK Bolt

Steel Grade & Type	Grade 75 Round Bar
Diameter, Nominal, in. (mm)	3/4 (19)
Yield Strength, min., lb (kN)	30,000 (133)
Tensile Strength, min., lb (kN)	40,000 (178)
Elongation	8%
Drill Hole Diameter, Recommended, in. (mm)	1-1/4 to 1-1/2 (32–38)
Resin Cartridge Diameter, Recommended, in. (mm)	1-1/8 to 1-3/16 (28.6–30.2)
Polymer Coating	
Diameter, Average, in. (mm)	1 (25)
Length, Standard or as Specified, in. (mm)	30 (762)
YL — Dynamic Bolt	
Dynamic Yield Load, lb (kN)	16,000–20,000 (71–89)
Dynamic Yield Displacement	7.87 in. (200 mm) per Impact with Standard Energy Input 16.4 kJ
Energy Absorption Capacity, kJ	Single Impact: 42.6, Accumulative: 50.0
Displacement Capacity, max., in. (mm)	30 (762)
YL — Static Bolt	
Static Yield Load, lb (kN)	26,000–30,000 (116–133)
Displacement Capacity, in. (mm)	19.69 (500) or More, up to Length of Polymer Coating

Cuttable and Corrosion-Resistant Products

FiReP FRP Bolts

JENNMAR offers the FiReP Fiber Reinforced Polymer (FRP) Bolt for environments that require high corrosion resistance, high tensile strength, durability and cuttability. FiReP Bolts have double the strength of normal steel, but only one quarter of the weight. They are highly corrosion resistant and can be manufactured in many shapes and forms.

FiReP Bolts can provide the necessary support in coal mines, but are easily cut and do not impede the excavation of coal. FiReP Bolts are supplied with plastic nuts, pans and plates for cuttable rib support and are ideal for pillaring and other coal mining applications.

Advantages

- GRN coating injected at top of bolt allows enhanced mixing of resin and improved anchorage
- Durability
- High corrosion resistance
- Cuttability
- High tensile strength
- Low weight provides easy handling

Technical Data – FiReP Bolts

Capacity, min., Ton (metric ton)	5 (4.5)
Length, ft. (m)	3 (0.9) to 10 (3)
Specific Gravity	1.95
Nominal Diameter, in. (mm)	0.9 (23)
Drill Hole Size with GRN, in. (mm)	1-3/8 (35)
Drill Hole Size without GRN, in. (mm)	1 (25)



Plastic Nut

JENNMAR offers a reinforced high-strength plastic nut for environments requiring corrosion resistance. The nut contains a blind breakout which allows the bar to penetrate through the nut at approximately 90 ft.-lb of torque without damaging the bolt threads or main body of the nut.

Advantages

- Designed at 1.7 specific gravity for coal processing plants
- Large conical bearing end for angled installation



Technical Data – Plastic Nut

Nominal Capacity, Ton (metric ton)	5 (4.5)
Nominal Break Out, ft.-lb (N-m)	90 (122)
Drive Size, in. (mm)	1.42 (36)

Cuttable and Corrosion Resistant Products

Fiberglass Rib Pan and Plates

JENNMAR offers a cuttable high strength molded fiberglass rib pan and plates for environments requiring corrosion resistance. Sinkable and non-sinkable plates are available according to customer requirements.

Advantages

- Lightweight
- Conical hole for angled bolt installation

Technical Data - Fiberglass Rib Pan and Plates

Rib Pan	
Dimensions, square, in. (mm)	18 (457)
Hole Diameter, in. (mm)	2 (51)
Nominal Capacity, ton (metric ton)*	5 (4.5)
Plates	
Outside Diameter, in. (mm)	10 (254)
Hole Diameter, in. (mm)	1-3/8 (35)
Nominal Capacity - Sinkable, ton (metric ton)	10 (9.1)
Nominal Capacity - Non-Sinkable, ton (metric ton)	6 (5.4)

* This test is a compression test centered over a 4 inch diameter hole



Rib Pan

- 18 in. (457 mm) square for additional coverage
- Center plate design for additional strength
- Easily packed and stored



Sinkable Plate

- Specific Gravity: 1.70
- Nominal Capacity: 10 tons
- Color: Black
- Hangers molded into plate design



Non-Sinkable Plate

- Specific Gravity: < 1
- Nominal Capacity: 6 tons
- Color: Brown
- Hangers molded into plate design

Fiberglass Rib Strap

- Cuttable and sinkable rib strap
- Single bolt installation
- Provides increased strength
- Custom sizes available.

Technical Data - Fiberglass Rib Strap

Length, ft. (m)	3, 4, 5 (0.9, 1.2, 1.5)
Width, in. (mm)	8 (203)
Hole Diameter, in. (mm)	1.5 (38)
Nominal Capacity, ton (metric ton)	5 (4.5)



Pourable Resin Grout



Pourable Resin Grout

- Fine aggregate filled liquid resin supplied in a mixing pail with a tube of cream hardener.
- Once cured, the product forms an effective corrosion barrier from a pH of 2 through a pH of 11.
- Uses include grouting dowels and anchor bolts in concrete, rock or masonry.



Specifications:

Compressive strength	ASTM C578-01: At 2 hours - 55 MPa (8,000 psi); At 7 days - 83 MPa (12,000 psi)
Tensile strength	ASTM C307-03: At 7 days - 7.5 MPa (1,100 psi)
Typical pull strength	305 mm (12") of grouted #7 bar in a 32 mm hole has a pull strength of 13.6 metric tons (30,000 lbs.)
Shelf Life	Four months under good storage conditions
Packaging	Pail of resin grout, tube of cream hardener, mixing paddle
Kit Size	3.3 L (200 cubic inches) of grout
Pot Life	20 minutes at 25 degrees C . (Lower temperatures slow pot life)



J-LOK equipment is the most modern and technologically advanced in the resin business, equipped with the most accurate system for ratio control of the resin/limestone mixture ensuring that resin/catalyst proportions are consistent. The entire plant is interconnected to provide coordinated control of the entire process. Operators utilize PLC touch screens to enter product recipes and to make operational adjustments. Quality control testing encompasses everything from raw material testing, in-process testing and final product quality and performance testing.

The labs at J-LOK have custom designed equipment such as the automated gel time tester that takes all the technician variation out of the test providing consistent results every time. Both J-LOK plants as well as the R&D lab in Pittsburgh have modified roof bolting machines to measure parameters such as pull strength and insertion force allowing products to be customized as necessary.

J-LOK personnel work with key suppliers to optimize raw material specifications. J-LOK has created many innovations such as TWIN-LOK® 2-speed resin cartridges for torque-tension applications, J-LOK LIF, Low Insertion Force resin where bolter thrust is an issue and J-LOK P™, pumpable resin for grouting from a distance. Several of these products have been patented.



*J-LOK produces resin products to complement JENNMAR products and provide an optimum system of bolt and resin. J-LOK's R&D capability utilizing product formulation expertise from the resin plants in conjunction with the mining expertise of JENNMAR's engineering affiliate, **JENNMAR Engineering** is unmatched.*

J-LOK® Resin Cartridges

Polyester Resin Anchoring System



The J-LOK® resin in the cartridge is used to anchor bolts to the surrounding strata. This unification of the resin, bolt and strata layers provides the necessary strength and rigidity to prevent sag by acting as a reinforcement which anchors the individual stratified layers of rock into a single high strength beam.

The two-compartment cartridge shown in illustration A above consists of a heat-sealed tube of polyester film clipped at both ends. One compartment contains a dark gray resin; the other, a light gray catalyst. A cross section of the cartridge is shown in illustration B.

A film barrier of heat sealed polyester film prevents migration between the resin and the catalyst to provide optimum shelf life. The excellent chemical resistance of the film minimizes migration from the inside and the absorption of contaminants from the outside.

The lightweight, dimensionally stable casing of film is strong enough to withstand rough handling, but shreds quickly and thoroughly during the installation procedure.

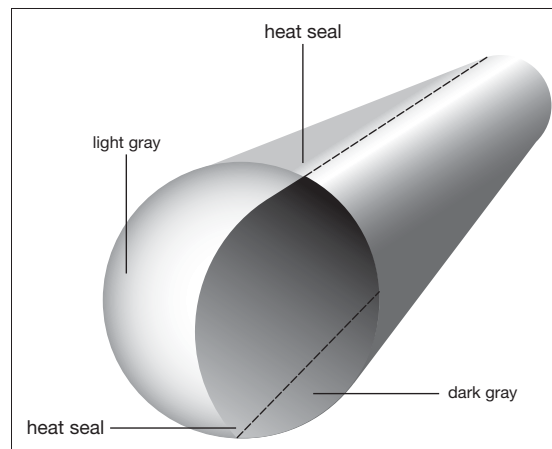
J-LOK is thixotropic and fast setting. This reduces viscosity during insertion of the bolt and permits relatively low installation force and torque. The results are fast installation, rapid achievement of full strength, and a minimum tendency for ungelled resin to drip from the holes during installation.

Storage Recommendations

For maximum shelf life, J-LOK cartridges should be stored away from direct sunlight in a reasonably cool, well-ventilated, dry area. Storage life is up to 1 year, depending on ambient temperature conditions. Under adverse conditions shelf-life is reduced. To ensure proper storage, the product should not be subjected to temperatures in excess of 90°F for prolonged periods. Storage is recommended under cover, on original pallets with adequate ventilation. If stored in trailers in hot weather, door should be left ajar or a sun screen erected over the trailer. Conversely, while cold storage does not adversely affect the shelf-life of J-LOK, it should be warmed to a range of 50°–60°F before using to assure gel times within the specified range (see Figure 2).

The time required for cases of J-LOK to warm or cool to ambient temperature is dependent on both the initial temperature and how the cases are stacked. Where the initial temperature is anywhere between 25° and 85°F, cases will come within 5° of ambient temperature in 48 hours when stacked in single columns with 4 sides of each case exposed to the air. Multiple columns should be separated by at least 2" to assist air circulation between columns.

The Cartridge



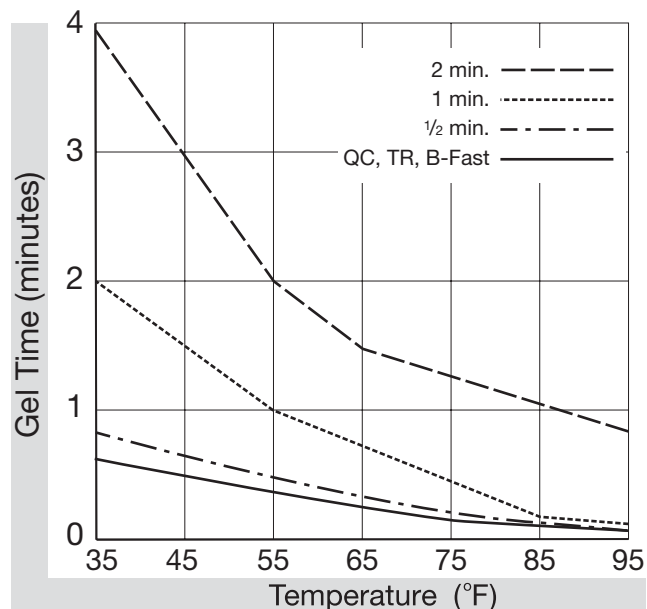
Cross Section

Advantages

The proprietary J-LOK® package has a distinct advantage over other resin systems due to:

- High catalyst/resin ratio
- Uniform installation time
- Mixing efficiency

Fig. 2. Gel time



GEL, Spin and Hold Times

Gel Time

Generally, the sum of the Spin Time and Hold Time is the Gel Time. The time from the start of mixing until the resin starts to harden is the Gel Time. Gel Time is influenced by temperature of resin, strata and bolt. Additionally, the amount of heat generated in mixing during the spin time also affects Gel Time. Field trials are recommended.

Spin Time

Cartridge contents should be completely mixed to achieve maximum anchorage. The generally accepted mix standard is a minimum of 30 revolutions of the bolt. Spin Time is the time required, at typical bolter rotation of 400–600 rpm, to achieve the complete mix.

Hold Time

After the cartridge contents are mixed, the resin must harden to achieve strength. The time required after mixing is completed and the bolt has achieved a firm anchorage is referred to as Hold Time.

Gel, Spin and Hold Times

Gel Time, Seconds	Spin Time, Seconds	Hold Time, Seconds	Color Code
10	3 to 5	3 to 8	Pink
20	3 to 6	4 to 8	Orange
30	3 to 7	8 to 15	Blue
45	4 to 9	8 to 20	White
60	5 to 10	18 to 28	Green
75 & 90	5 to 10	20 to 40	Green/White
120	5 to 10	25 to 75	Yellow
120–240 & Higher	5 to 15	45 to 240	Yellow/White
TWIN-LOK, 10	3 to 5	3 to 5	Pink/White
TWIN-LOK, 20	3 to 6	3 to 6	Orange/White

Resin Cartridge Size

The diameter and length of the J-LOK cartridge depends on the dimensions of the specific bolt and borehole. Cartridges are available in lengths from 12" to 60". The diameter and length of cartridges employed in USA coal mines are specified by ASTM F-432-10. The systems developed by J-LOK engineers following ASTM F-432-10 are summarized in the following table:

Technical Data – J-LOK Resin Cartridges

Cartridge Diameter, in. (mm)	Hole Diameter, in. (mm)	Bolt Type	Bolt Diameter, in. (mm)	J-Lok System*	Product Use Class	Strength Index
0.9 (23)	1 (25)	#6 Rebar	3/4 (19)	A	I, II, III	10
0.9 (23)	1 (25)	Point Anchor #6 Tension	3/4 (19)	A-TA	I, II, III	10
0.9 (23)	1 (25)	#5 Rebar	5/8 (16)	B	I, II, III	10
0.9 (23)	1 (25)	Cable	0.5, 0.6, 0.7 (13, 15, 18)	CA, A, B	I, II, III	10
0.9 (23)	1 (25)	INSTaL Resin	5/8 (16)	BI	I, II, III	10
1.25 (32)	1-3/8 (35)	#7 Rebar	7/8 (22)	J, CJ, JI	I, II, III	10
1.25 (32)	1-3/8 (35)	Cable	0.5, 0.6, 0.7 (13, 15, 18)	CJ	I, II, III	10
1.25 (32)	1-3/8 (35)	INSTaL Resin	3/4–7/8 (19–22)	JI	I, II, III	10
1.25 (32)	1-3/8 (35)	Combination	7/8 (22)	CBJ, J	I, II, III	10
0.9 (23)	1 (25)	#6 Rebar	3/4 (19)	TA	I, II, III	10
0.9 (23)	1 (25)	#5 Rebar	5/8 (16)	TB	I, II, III	10

* Designated J-LOK Systems are shown for typical applications and can be used for other bolt types and sizes.

J-LOK® Resin Cartridge Drill Hole and Fill Charts



Mining Applications

The required diameter and length of J-LOK cartridges for civil and tunneling applications, not governed by ASTM F-432-10, is calculated by estimating the volume of the annulus between the bolt and the borehole. J-LOK cartridges are manufactured in diameters of 23, 28, 32, 35, and 40 mm. Cartridges may be manufactured in lengths to suit specific bolt and borehole combinations. However, it is generally more efficient to employ multiple standard one foot (305 mm) long cartridges to anchor each bolt.

The following English and metric tables, with 15% excess for borehole irregularities, assist in the selection and ordering J-LOK cartridges. The English unit table estimates the inches grouted by a standard one foot long cartridge. The metric unit table estimates the millimeters grouted by a standard 305 mm long cartridge.

Metric

Nominal Rebar Diameter, mm	Drill Hole Diameter, mm					
	25	28	33	35	42	51
	Resin Cartridge Diameter, mm					
	23	23	28	32	35	40
16	380					
18	466	305				
20	624	365	302			
22		468	344	367		
25			448	453		
28				616	332	
32					439	
35					603	308

English

Nominal Rebar	Diameter, in.	Drill Hole Diameter, in.						
		1	1-1/4	1-3/8	1-1/2	1-3/4	2	2-1/4
		Resin Cartridge Diameter, in.						
Rebar	Diameter, in.	0.9	1-1/8	1-1/4	1-1/4	1-3/8	1-9/16	1-9/16
#6	3/4	19.6	12.7					
#7	7/8		15.9	14.7				
#8	1		22.5	18.6	13.2			
#9	1-1/8			26.5	16.8			
#10	1-1/4				24.1	13.2		
#11	1-3/8					16.9	12.3	
#12	1-1/2					24.4	14.8	9.2
#13	1-5/8						19	10.7
#14	1-3/4							12.9

For Example: a project requires a 3 meter long 22 millimeter diameter rebar, anchored with a one meter long resin anchor. The metric table indicates that this rebar may be installed in a 28, 33, or 35 mm borehole. Assume available equipment is best suited to drill a 33 mm borehole. A 28 mm diameter cartridge is best suited for this rebar and borehole combination. A 305 mm long 28 mm cartridge grouts 344 mm. Therefore, three 305 mm cartridges would be required per bolt. Typically a fast cartridge would be followed by two slow set cartridges, to provide for efficient insertion and rapid tensioning.

Civil & Tunneling Applications

Metric & English

Grade 75 All-Thread Rebar Grade 60 Solid Rebar	Drill Hole Diameter, in. (mm)									
	1 (25)	1-1/4 (32)	1-1/2 (38)	1-9/16 (40)	1-1/2 (38)	1-9/16 (40)	1-3/4 (44)	1-7/8 (48)	2 (51)	2-1/4 (57)
	Resin Cartridge Diameter, in. (mm)									
	15/16 (24)	1-1/8 (29)	1-1/4 (32)	1-1/4 (32)	1-3/8 (35)	1-3/8 (35)	1-9/16 (40)	1-9/16 (40)	1-9/16 (40)	1-3/4 (44)
#6, 3/4 in. (19 mm)	20 (508)	13 (330)								
#7, 7/8 in. (22 mm)		16 (406)								
#8, 1 in. (25 mm)		23 (584)	13 (330)		16 (406)	15 (381)				
#9, 1-1/8 in. (29 mm)			16 (406)	14 (356)	20 (508)	16 (406)				
1-3/16 in. (30 mm)			19 (483)	15 (381)	23 (584)	18 (457)	15 (381)			
#10, 1-1/4 in. (32 mm)				18 (457)		22 (559)	17 (432)			
#11, 1-3/8 in. (35 mm)							21 (533)	15 (381)	12 (305)	
#14, 1-3/4 in. (44 mm)										14 (356)
150 KSI All-Thread Bar										
1 in. (25 mm)			15 (381)	12 (305)	18 (457)	15 (381)				
1-1/4 in. (32 mm)							23 (584)	16 (406)	12 (305)	
1-3/8 in. (35 mm)								19 (483)	14 (356)	
1-3/4 in. (44 mm)										18 (457)

The Resin Cartridge Drill Hole Fill Chart shows the length of drill hole that will be encapsulated by a 12 in. (305 mm) resin cartridge. This chart can be used as a guide for the most common combinations of hole, bolt, and resin diameters. Other combinations are possible as long as the annular space does not exceed 1/4 to 3/8 in. (6 to 10 mm). Due to difficulty in overcoming drag of the bar through the resin cartridges during insertion, encapsulated resin drill holes are most practical with shorter anchorages.

Technical Data — Plate Products

		Nominal Sizes, in. (mm)	Typical Thicknesses, in. (mm)	Hole Diameters, in. (mm)
Donut Plate		5 × 5 (127 × 127) 6 × 6 (152 × 152) 8 × 8 (203 × 203) 9 × 9 (229 × 229) 12 × 12 (305 × 305)	5/32 (4.0) 3/16 (4.8) 7/32 (5.6) 1/4 (6.4)	13/16–1-9/16 (20.7–39.7)
Flat Plate		4 × 4 (102 × 102) 5 × 5 (127 × 127) 6 × 6 (152 × 152) 8 × 8 (203 × 203)	1/4 (6.4) 5/16 (8.0) 3/8 (9.5) 1/2 (12.7)	7/8–1-15/16 (22.2–49.21)
Dome Plate		5 × 5 (127 × 127) 6 × 6 (152 × 152) 8 × 8 (203 × 203)	5/32 (4.0) 3/16 (4.8) 1/4 (6.4) 5/16 (8.0) 3/8 (9.5)	7/8–1-15/16 (22.2–49.2)
Volcano Plate		6 × 6 (152 × 152) 8 × 8 (203 × 203)	1/4 (6.4) 5/16 (8.0) 3/8 (9.5)	1-3/8–1-5/8 (34.9–41.3)
Donut Channel Plate		5 × 7-3/8 (127 × 187)	7/32 (5.6)	1 (25.4)
Domed Channel Plate		5 × 7-3/8 (127 × 187)	7/32 (5.6)	1-3/8 (34.9)
Header Plate Bell Style		6 × 16 (152 × 406)	3/16 (4.8) 7/32 (5.6)	1–1-1/2 (25.4–38.1)
Header Plate Race Track Style		6 × 10 (152 × 254) 6 × 16 (152 × 406)	5/32 (4.0) 1/4 (6.4)	1–1-3/8 (25.4–34.9)

*All plate styles except channel plates are available with hanger openings.

**Customized sizes are available upon request.

*** We recommend the plate capacity to always match the bolt manufacturer recommendation

Surface Control Plates



Features

JENNMAR plate products feature high strength, light weight and a low profile, effectively distributing roof bolt load evenly in all directions. Manufactured under rigid quality-control conditions in accordance with ASTM F432, plate ratings range from 20,000 to 60,000 lbs. Customized sizes and coatings are available upon request.

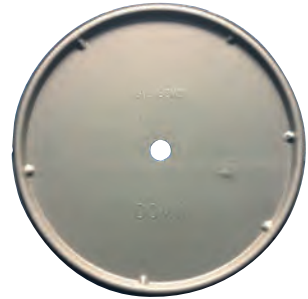
JENNMAR Roof & Rib Plate

- Increased surface area 18" x 18"
- Double rib design for extra high strength
- New rolled edge for increased safety, handling and strength
- Lightweight for handling and stacks easily
- Provides increased surface support when used with 6" x 6" or 8" x 8" plate
- Standard center hole is 1-3/8" diameter with optional 1" diameter hole



19" Surface Control Plate

- All plates have the "rolled edge" to provide for safe handling
- Large diameter plates for surface control
- These plates are to be used in conjunction with a roof bolt and roof plate
- 19" diameter with a 1" center hole
- Mill thicknesses of 0.022" cold rolled or coated steel



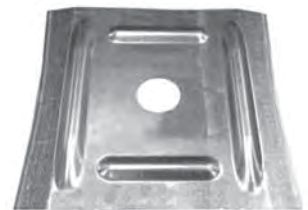
Push Plate

- Used to secure welded wire mesh without additional nut and plate
- Fast installation of mesh by using previously installed threaded bolts
- Push plate for 5/8"-11, 3/4"-10 or 7/8"-9 Standard, inflatable and super bolts



SHADOW PLATE®

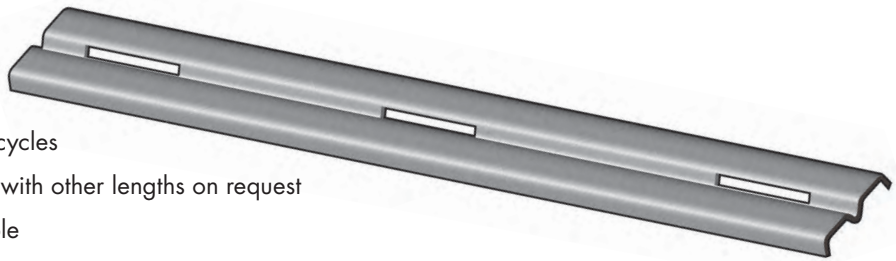
- Galvanized or black
- Controlled edge shearing to eliminate sharp, jagged edges
- Ideal for added surface coverage with added strength
- Lightweight with large surface area
- 12" x 12", 14 Gauge thickness
- Maximum 2" hole diameter
- Can be welded to other plates to form combination plate



Channels and Roof Mats

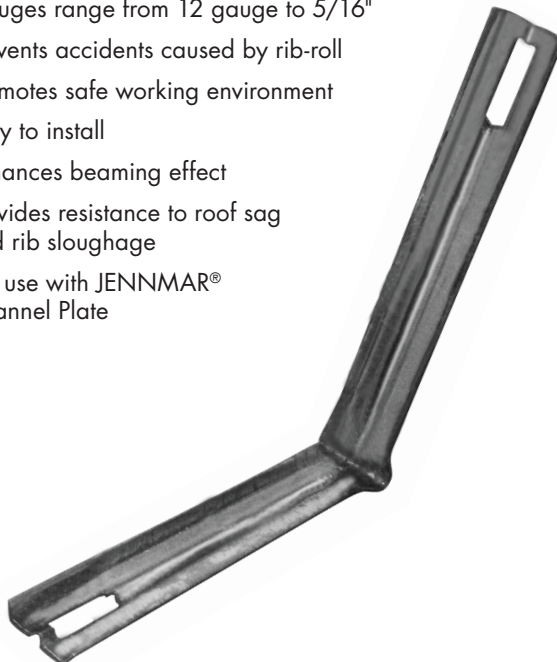
T-Channels

- Increased strength, compared with roof mats
- Easily installed with regular bolting cycles
- Available in 4' through 20' sections with other lengths on request
- T2, T3, and T5 channels are available
- Gauges range from 12 gauge to 5/16" Channels
- High beam strength resists roof sag
- Use with JENNMAR Advanced Channel Plates



Roof/Rib Safety Channel

- Gauges range from 12 gauge to 5/16"
- Prevents accidents caused by rib-roll
- Promotes safe working environment
- Easy to install
- Enhances beaming effect
- Provides resistance to roof sag and rib sloughage
- For use with JENNMAR® Channel Plate

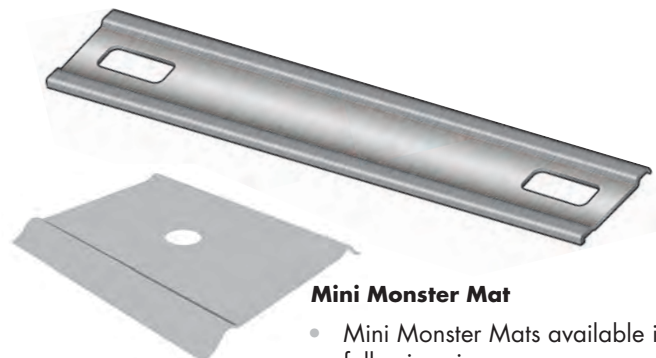


Roof/Rib Safety Channel

- Controls roof/rib sloughage
- Controls "cutter" roof
- Enhances performance of wire mesh
- Easy installation
- Provides active support to roof and rib
- Prevents accidents caused by rib-roll and sloughage
- Promotes safe working environment

Roof Mats

- Temporary or permanent preventive for roof deterioration, as addition to roof bolt plan
- Lengths 54" to 240"; seven widths from 4-1/2" to 10-1/2"
- Gauges 10, 12, 14, 16
- Hot rolled, cold rolled, galvanized
- Strong and flexible; bolt holes punched to suit your roof bolt plan
- Custom sizes available



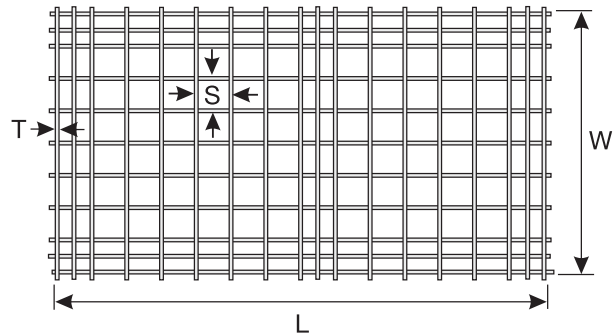
Mini Monster Mat

- Mini Monster Mats available in following sizes:
13" x 16", 13" x 24", 10" x 24"

Custom sizes and/or galvanizing available on request.

Welded Wire Mesh

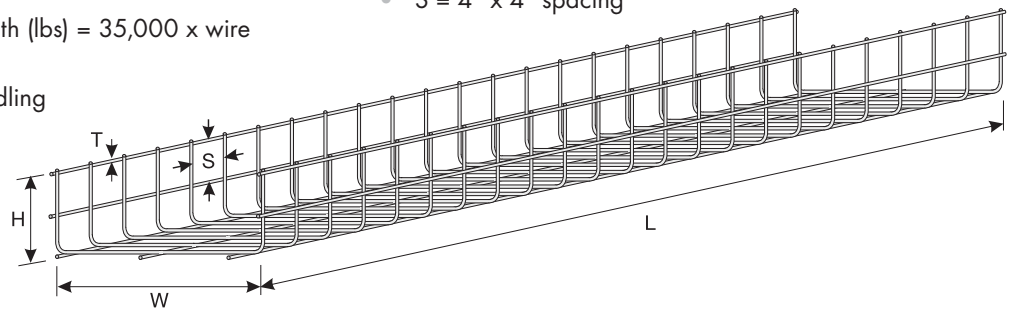
- To ASTM 1064 specifications
- Wire to ASTM 1064 specs (75,000 psi tensile)
- Minimum weld shear strength (lbs)
 - = 35,000 x wire cross sectional area (in.²)
- Ends flush cut for safer handling
- Available galvanized
- T = 4 (0.232"), 6 (0.192"), 8 (0.160"), 9 (0.144") and 10 (0.128") gauge
- W = 48" to 96" wide
- L = 48" to 24' long sheet or to 100' long roll
- S = 4" x 4" spacing typical but variable (as shown)



Mesh Channels

For construction of shotcrete barricades and fill fences

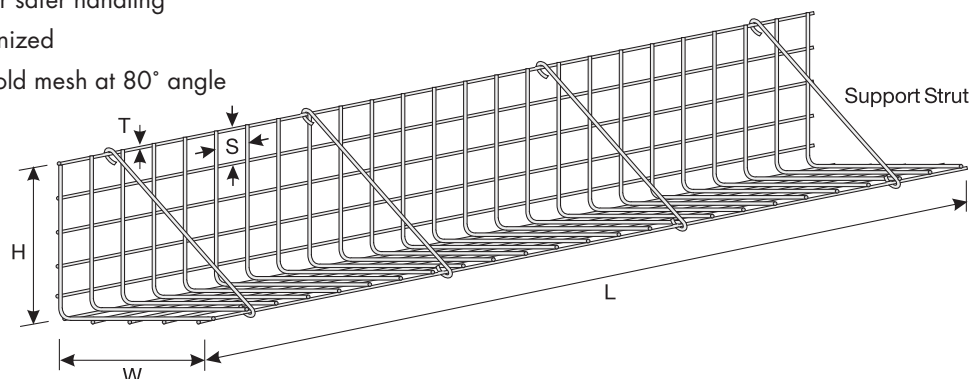
- Mesh to ASTM 1064 specifications
- Wire strand to ASTM 1064 specifications (75,000 psi tensile minimum)
- Minimum weld shear strength (lbs) = 35,000 x wire cross sectional area (in.²)
- Ends flush cut for safer handling
- T = 6 gauge (0.192")
- H/W = 3" x 3", 6" x 7.5", 7.5" x 9"
- L = 10'
- S = 4" x 4" spacing

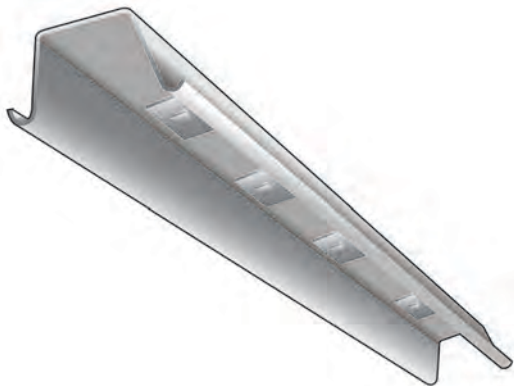


Mesh Retainers

For construction of soil retaining walls

- Mesh to ASTM 1064 specifications
- Wire strand to ASTM 1064 specifications (75,000 psi tensile minimum)
- Minimum weld shear strength (lbs) = 35,000 x wire cross sectional area (in.²)
- Ends flush cut for safer handling
- Available galvanized
- Support struts hold mesh at 80° angle
- T = mesh and support struts 4 gauge (0.225")
- H/W = 18" x 18", 18" x 22", 18" x 24" and 20" x 22"
- L = 10'
- S = 4" x 4" spacing





J-Channel Beams

J-Channel uses 3/16" high strength steel with 50,000 psi yield strength and can replace wooden timber beams from 3 x 6" up to 3 x 10"

- Lightweight, weighing only 9.58 lb/ft. Easy to handle, reducing handling injuries
- Choice of steels and thicknesses provide a variety of strength
- Compact dimensions allow larger quantities to be easily stored in mine
- Tabs on each end provide better support of mine props or timbers if required
- Can be installed in mining cycle; other shifts can install yieldable legs or props where needed
- INSTAL® or Combination bolts and resin with flat plates are recommended for cost saving
- Available in 8 through 18' sections with other lengths on request



Wide Flange Beams

JENNMAR will fabricate lengths of Wide Flange Beams (W Beams) to customer's individual needs. Wide Flange Beams are available in the following material dimensions:

Wide Flange Beams (W Beams)

Nominal Dimensions		Nominal Weight	
in.	mm	lb/ft.	kg/m
W 14 x 6-3/4	356 x 171	30, 34, 38	45, 51, 57
W 14 x 5	356 x 127	22, 26	33, 39
W 12 x 8	305 x 203	40, 45, 50	60, 67, 74
W 12 x 6-1/2	305 x 165	26, 30, 35	39, 45, 52
W 12 x 4	305 x 102	14, 16, 19, 22	21, 24, 28, 33
W 10 x 8	254 x 203	33, 39, 45	49, 58, 67
W 10 x 5-3/4	254 x 146	22, 26, 30	33, 39, 45
W 10 x 4	254 x 102	12, 15, 17, 19	18, 22, 25, 28
W 8 x 8	203 x 203	48	71
W 8 x 8	203 x 203	31, 35, 40	46, 52, 60
W 8 x 6-1/2	203 x 165	24, 28	36, 42
W 6 x 4	152 x 102	9, 12, 16	13, 18, 24
W 6 x 4	152 x 102	8.5	13
W 5 x 5	127 x 127	16, 19	24, 28
W 4 x 4	102 x 102	13	19
W 8 x 5-1/4	203 x 133	18, 21	27, 33
W 8 x 4	203 x 102	10, 13, 15	15, 19, 22
W 6 x 6	152 x 152	15, 20, 25	22, 30, 37

Heat Treated Serrated Steel Beams (Waffle)

The IB-100 and GI-120 were designed to provide the mining and tunneling industries with a lightweight, low-profile alternative to standard wide-flange beam. The heat treated nature of these beams allows for greater elasticity, preventing the beam from yielding after minimal deflection. Ideal when maximum strength and critical clearance are needed.

Heat Treated Serrated Steel Beams				
	Dimensions		Weight	
	in.	mm	lb/ft.	kg/m
IB-100	W 3.15 x 3.94	80 x 100	13.92	20.71
GI-120	W 3.62 x 4.72	92 x 120	19.84	29.52



IB-100 Beam



GI-120 Beam

Belt and Utility Hangers

JENNMAR offers a complete line of belt hangers to be used for hanging belt structures within the mine.

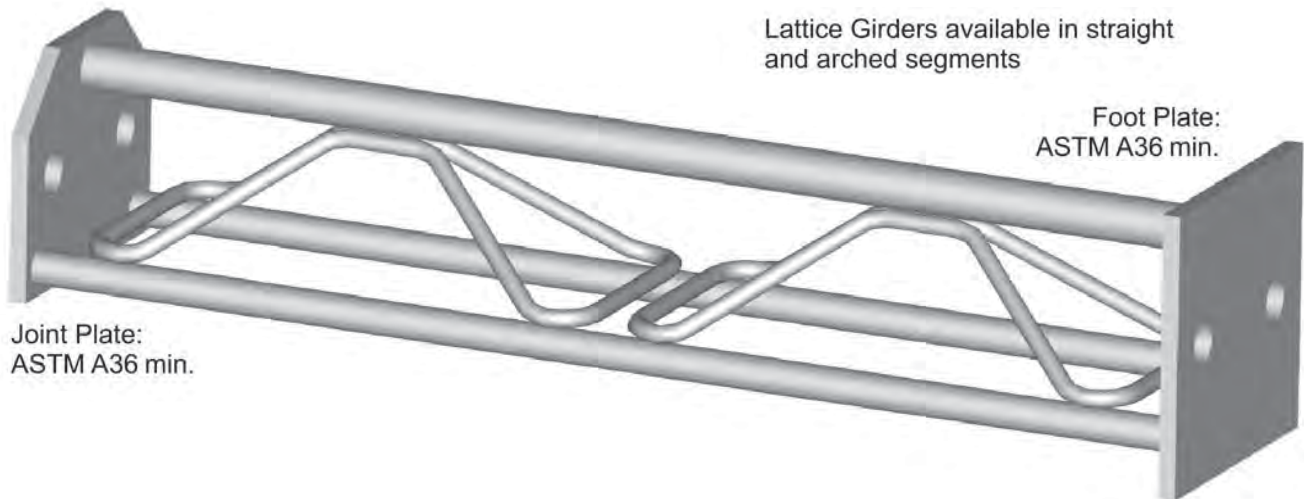
The following table shows some typical belt hanger assemblies that are available and used throughout the mining industry. If you require a specific or customized assembly, our experienced team of engineers can design a belt hanger assembly that meets your specific needs.

Model No./Type		Typical Dimensions, in. (mm)				
		Material Thickness	Legs	Length	Thru Hole Diameter	Key Hole Size
J-16		3/16–3/8 (5–10)	4-1/4 × 4-1/4 (108 × 108)	4 (102)	1-1-5/8 (25–41)	Length: 2-1/4 (57) Slot: 3/8 (10) Hole: 1-3/8 (35)
Optional J-16 Designs						
J-9	 (bendable)	1/8 (3)	4 × 6 (102 × 152)	4 (102)	1-1-1/2 (25–38)	Length: 2-3/8 (60) Slot: 3/8 (10) Hole: 1-3/8 (35)
Rabbit Ear	 (bendable)	1/4–3/8 (6–10)	4 × 4 (102 × 102)	4 (102)	1-1-9/16 (25–40)	Slot: 3/8–1/2 (10–13) Hole: 1-1/2 (38)
Angle		3/8–1/2 (10–13)	5 × 5 (127 × 127)	4–8 (102–203)	1-1-5/8 (25–41)	Length: 3 (76) Slot: 9/16 (14) Hole: 1-5/8 (41)
Belt Hanger for Steel Sets		Two-Piece Clamp Style Belt Hanger to Be Used with Steel Sets. Design Can Be Modified to Fit a Variety of Beam Sizes.				

Lattice Girders and Steel Arches



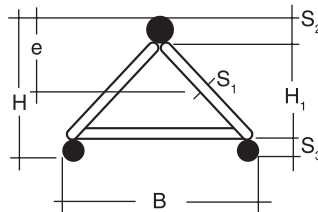
3-Bar Type



Lattice Girders available in straight and arched segments

Foot Plate:
ASTM A36 min.

Joint Plate:
ASTM A36 min.



Lattice Girder Bar Material:
Tensile Strength 80ksi (550 MPa) min.
Yield Strength 70ksi (480 MPa) min.
Elongation 10% minimum

Connecting Bolts:
ASTM A 325N $\phi 3/4"$ minimum

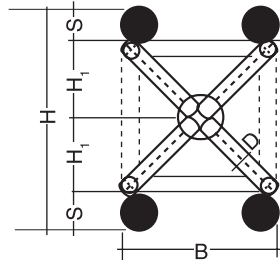
Dimensions

O.P. Type	Bar Size			Weight (lbs/ft.)	H (in.)	B (in.)	e (in.)	H1 (in.)	Ix (in. ²)	Sx (in. ²)	Iy (in. ²)	By (in. ²)	Joint Plate			Foot Plate	
	S3	S2	S1										Size (in.)	Length (in.)	Unit Wt (lbs)	Size (in.)	Unit Wt (lbs.)
50	6	8	0.39	6.72	3.70	3.94	2.01	2.75	3.441	1.716	2.324	1.180	L4 x 3 x 3/8	4 9/16	3.2	3/8 x 5 x 5	2.7
	6	10		8.26	3.94		1.88		4.676	2.226	2.395	1.216		4 9/16	3.2		
70	6	8	0.39	6.95	4.50	5.60	2.42	2.75	5.544	2.295	5.064	1.846		5 5/16	3.5	3/8 x 6 x 6	3.8
	6	10		8.59	4.77		2.20		7.376	2.886	5.135	1.867		5 1/2	3.7		
	8	11		11.83	5.16		2.69		12.108	4.465	8.226	2.991		5 3/4	3.9		
95	6	8	0.39	7.07	5.50	7.09	2.94	3.76	8.937	3.036	8.950	2.526		5 9/16	4.4	3/8 x 7 x 8	6.0
	6	10		8.70	5.77		2.59		11.741	3.751	9.028	2.548		6 3/4	4.6		
	8	11		12.05	6.16		3.18		18.883	5.854	14.840	4.188		7 1/16	4.8		
115	6	8	0.47	7.94	6.25	8.66	3.37	4.50	12.182	3.636	13.906	3.21	L5 x 3 x 1/2	7 11/16	8.0	3/8 x 8 x 9-1/2	8.1
	6	10		9.58	6.52		2.91		15.849	4.416	13.985	3.229		7 13/16	8.1		
	8	11		12.92	6.91		3.69		25.208	6.953	23.342	5.390		8 1/8	8.4		
130	6	8	0.47	7.76	6.87	8.66	3.69	5.12	15.015	4.068	13.906	3.211		8 1/8	8.4	3/8 x 8 x 9-1/2	8.1
	6	10		9.39	7.14		3.15		19.379	4.929	13.977	3.229		8 5/16	8.6		
	8	11		12.73	7.53		3.93		30.623	7.794	23.342	5.390		8 3/4	9.3		

continued

Lattice Girders and Steel Arches continued

4-Bar Type



Lattice Girder Bar Material:
Tensile Strength 80ksi (550 MPa) min.
Yield Strength 70ksi (480 MPa) min.
Elongation 10% minimum

Connecting Bolts:
ASTM A 325N $\phi 3/4$ " minimum

Dimensions

O.P. Type	D (mm)	S Bar Size	Weight (lbs/ft.)	H (in.)	B (in.)	A Bars (in. ²)	I _x (in. ²)	S _x (in. ²)	I _y (in. ²)	S _y (in. ²)	Joint Plate			Foot Plate	
											Size (in.)	Length (in.)	Unit W (lbs)	Size (in.)	Unit Wt (lbs)
100	10	5	7.61	5.19	3.94	1.2	6.42	2.47	3.40	1.72	L5 x 3 x 1/2	51/4	5.6	1/2 x 5 x 7	5.0
		6	8.88	5.44		1.8	9.77	3.59	4.56	2.31		51/2	5.9		
		7	10.23	5.69		2.4	10.04	4.94	5.75	2.92		53/4	6.1		
		8	13.43	5.94		3.1	19.34	6.52	6.97	3.54		6	6.4		
		10	17.16	6.44		4.9	33.50	10.41	9.34	4.75		61/2	6.9		
140	10	5	7.88	6.76	5.51	1.2	11.54	3.42	7.32	2.66		63/4	7.2	1/2 x 7 x 9	8.3
		6	9.14	7.01		1.8	17.32	4.95	10.03	3.65		7	7.5		
		7	10.51	7.26		2.4	24.55	6.77	12.98	4.72		71/4	7.7		
		8	13.71	7.51		3.1	33.38	8.90	16.10	5.66		71/2	8		
		10	17.42	8.01		4.9	56.39	14.10	22.65	8.24		8	8.5		
180	10	5	8.51	8.34	7.09	1.2	20.28	4.64	12.85	3.63		83/8	8.9	1/2 x 8 x 10-1/2	11.9
		6	9.78	8.59		1.8	30.13	6.70	17.82	5.03		85/8	9.2		
		7	11.51	8.84		2.4	42.29	9.14	23.34	6.58		87/8	9.6		
		8	14.35	9.09		3.1	56.94	11.99	29.32	8.27		81/8	9.7		
		10	18.06	9.59		4.9	94.44	18.89	42.33	11.94		85/8	10.3		
220	12	5	9.80	9.91	6.66	1.2	28.45	5.55	19.84	4.58		915/16	10.6	5/8 x 10 x 12	21.2
		6	11.06	10.16		1.8	42.06	8.01	27.71	6.40		103/16	10.9		
		7	12.43	10.41		2.4	58.75	10.93	36.57	8.44		107/8	11.1		
		8	15.63	10.66		3.1	78.74	14.32	46.29	10.65		1011/16	11.8		
		10	19.34	11.16		4.9	129.41	22.51	67.88	15.68		118/16	11.9		

Steel Sets and Tunnel/Shaft Rings

JENNMAR Specialty Products, in conjunction with our sister affiliate engineering company, JENNMAR Engineering can custom design arch and square set support systems as well as tunnel and shaft rings. We use 3-D modeling and finite element analysis to determine beam sizing and spacing as well as orientation and configuration of fasteners and butt plates.

Advantages

- Sound structural design
- Advanced steel design according to American Institute of Steel Construction (AISC) national standards
- Reliable moment connection, bolt and welding design
- Computerized steel manufacture equipment to ensure quality cutting, drilling and welding
- Complete accessories including V-decking lagging panel, tie rod, beam extension, leg extension, belt hanger, etc.
- Optimal design according to actual engineering requirements
- JENNMAR and JENNMAR Engineering can quickly turn conceptual designs into actual products within a designated time period
- Full technical support by JENNMAR Engineering including design customization
- Field installation training services



Square Sets

Square Sets consist of a straight cross member and two legs, manufactured from a W-section beam selected to meet load requirements. Square sets are shipped complete with gussets, bolts, nuts and tension rods. Our steel V-Deck lagging panels and C-Channel runners are optional.

Impact-Resistant Arch Sets

Impact Resistant Arch Sets are used for immediate roof support. We also manufacture JENNMAR's RIP® 50- and 100-ton steel props that can be used with JENNMAR's lightweight high-strength beam.

Mobile Recovery Arches

Mobile Recovery Arches are used as a mobile canopy recovery unit in the event of a mine roof fall. The recovery units are assembled outby the fall area and are pushed forward under the unsupported top to provide a pathway for workers in the unsupported area.

Long-Radius Arch Sets

Long-Radius Arches consist of a slightly bent cross member on two straight legs. Long-radius arches are shipped complete with gussets, bolts, nuts and tension rods. Steel paneled V-Deck lagging and C-Channel runners are optional.

Shaft and Tunnel Rings

Shaft and tunnel rings are used to shore large, deep vertical and horizontal excavations. The steel liner is a series of flanged plates bolted together to form a ring that provides structural support necessary to stabilize the excavation. Lagging can then be placed between the rings to hold the surround soil in place.



Impact Resistant Lagging® (IRL®)

To protect mine personnel, belts, moving vehicles and other facilities, mine operators typically install steel structures such as square or arch sets in roof fall areas. Wood lagging is usually installed between the steel sets to enclose the area and protect the entry from recurring falls. JENNMAR, along with JENNMAR Engineering our affiliate engineering company, have designed, tested and developed the Impact Resistant Lagging® (IRL®) system to protect steel sets. Various steel sets that are protected with IRL panels have been approved by MSHA and installed in several underground roof fall rehabilitation projects.

The IRL panel consists of the following components:

V-Deck Panel

Galvanized V-Deck Panel (18 x 46" x 12 gage) is used to provide primary flexural strength. Two clips are attached to facilitate easy installation of the lagging panel to the upper flange of the beam.

Special Lagging Block (SLB)

Special Lagging Blocks are comprised of two pieces of medium-soft wood (6 x 6 x 46") that are attached to the V-deck panel. The blocks provide additional flexural strength to the system, absorb impact energy, distribute impact load over a larger area of the V-deck panel and extend the duration of impact.

Cushion Inserts

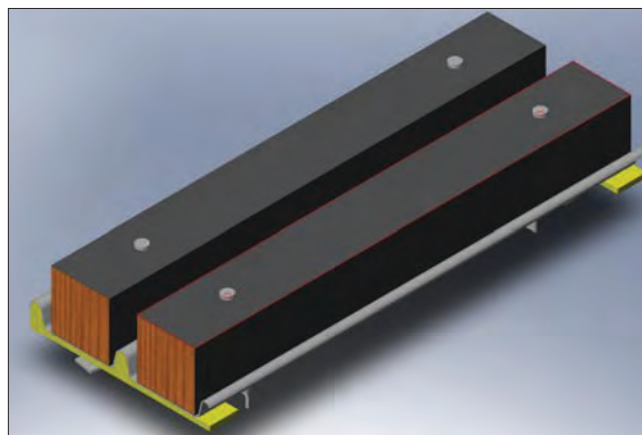
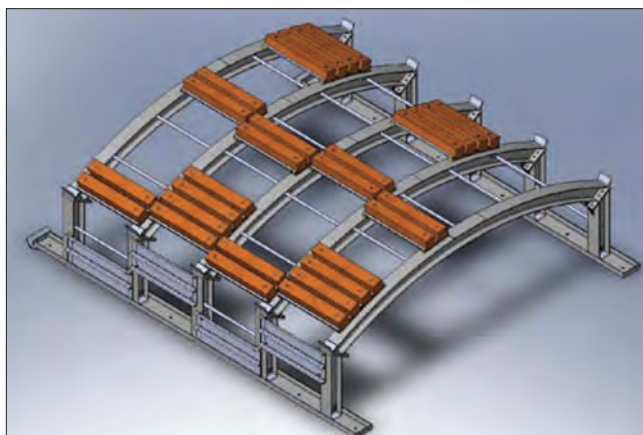
Two pieces of hard foam strip (0.5" thick) are installed between the V-deck panel and the flange of the W-beam. The foam strips act as a cushion, increase impact duration and reduce the magnitude of the instantaneous impact load on the system.

Surface Coating

A thin layer of water-proof bonding coating is applied to the surface of the Special Lagging Blocks. The tough-textured coating provides necessary protection against water, acid, chemicals, UV exposure, salt water, abrasion, fire and freeze-thaw. This coating dramatically extends the life span of the SLB when compared with plain wood blocks.

Advantages

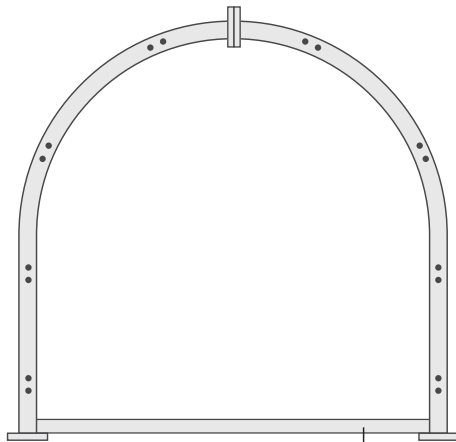
- Provides sufficient flexural strength and acceptable cushioning effect
- Corrosion resistant
- Cost effective
- Easy material handling and installation



Impact Resistant Lagging Panel

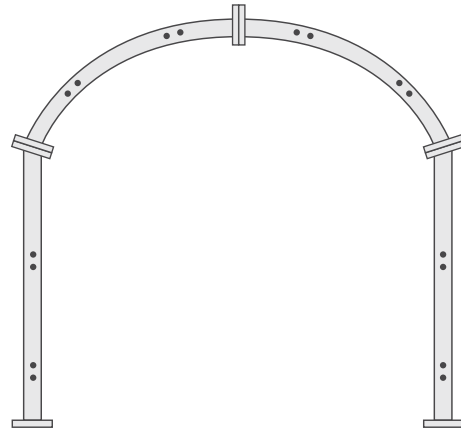


**Impact Resistant Arch Set Design
for Roof Fall Rehabilitation**

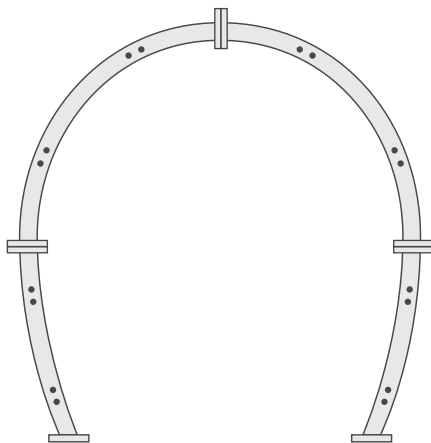


TYPE 1
2-PC. HORSESHOE

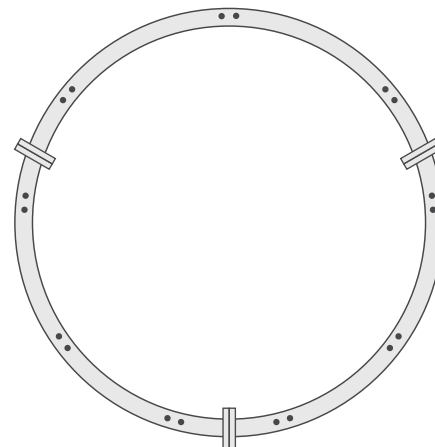
Optional
Invert Strut



TYPE 2
4-PC. MODIFIED HORSESHOE



TYPE 3
4-PC. HORSESHOE



TYPE 4
3-PC. CIRCULAR

*Other variations available on request.

JENNMAR Specialty Products can bend I, WF, H sections ranging from 4" to 27" in depth (JENNMAR Specialty Products has formed W14 x 287 lb ft. with 2" flanges).

Curvatures range from a minimum radius of 10 times the beam depth for 4" and 6" sections to 14 times the depth of section for larger beams. While JENNMAR Specialty Products has worked with 30' sections, it is recommended the sections not exceed 22'. JENNMAR Specialty Products also recommends against the use of lighter-weight sections when the radius of curvature is less than 25 times the depth of section.

JENNMAR Specialty Products also fabricates straight beams, forepoling sheets, steel lagging, tie rods, foot plates and pipe spacers.

Accessories Used with Ribs

Butt Joint

- Butt plate height: rib depth plus 1"
- Width: flange width plus 1"
- Thickness: 4" and 5" sections — 3/8"
 - 6" sections — 1/2"
 - 8" sections — 5/8"
 - 10" sections — 3/4"
 - 12" sections — 1"
- Bolt size (A325) and quantity:
 - 4" sections: (2) 3/4" dia
 - 5" and 6" sections: (2) 1" dia
 - 8" and 10" sections: (4) 1" dia
 - 12" sections: (6) 1" dia

The above are for normal loading conditions. For extreme conditions, a full-moment strength joint may be required.

Foot Plate

- 4" sections: 1/2" x 7" x 7"
- 5" sections: 5/8" x 9" x 9"
- 6" sections: 5/8" x 9" x 9"
- 8" sections: 3/4" x 12" x 12"
- 10" sections: 1" x 14" x 14"
- 12" sections: 1-1/4" x 16" x 16"

Tie Rods

- A529 rod stock with 4" N.C. thread each end
- Length = rib spacing + 6"
- With 4" and 6" sections: 3/4" dia.
- With 8" and 10" sections: 3/4" dia.
- With 12" and above: structural spreaders are recommended

Pipe Spacers

- Schedule 40 pipe stock
- Length = rib spacing — web thickness
- With 3/4" dia. tie rods: 2" dia.

TH Arch System

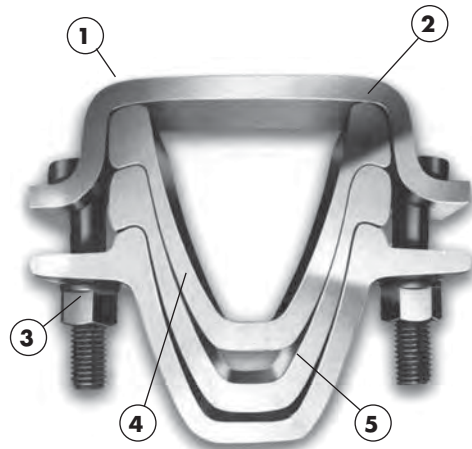
The TH Arch system has quickly gained wide market acceptance by uniting high resistance to load along with dynamic behavior that is unseen in other arches in the industry. Due to its section type design, the TH Arch produces a relation of transversal and longitudinal force that is nearly one, which in turn means that it works evenly in any direction of support. The TH Arch systems are frequently used in European, North American and Latin American markets.

Applications

- Civil works in general
- Development and mining projects
- Tunnel projects
- Split-offs
- Machine shops
- Adequate for any type of terrain

Advantages

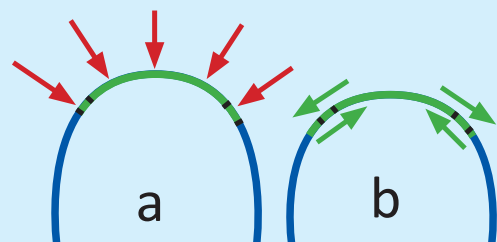
- Manganese-enriched steel guarantees better quality
- Equal stress resistance in all directions
- Fast and easy installation
- Dynamic system allows for improved energy absorption
- Adequate for large convergence areas
- Total functionality even in variable inclination areas
- Adaptable to any excavation
- Inverted curve if desired
- Can couple to other ground support systems



1. The Joint braces the profile, making it highly resistant to bend.
2. Its shape eliminates any movement between columns and clamps.
3. Application of recommended torque on bolts avoids slippage.
4. The friction between profiles and between profiles and clamps is performed on a large surface area for support.
5. Static characteristics of buckling:
 - High resistance to buckling
 - High resistance to deformation in deformation area



TH Arches are assembled by overlapping one beam to another. They are then connected to one another using a special joint. With this revolutionary assembly technique, the beams slide between each other at the overlapping joints and dissipate the load, energy and friction from the rock mass without suffering any deformation and still maintaining balance.



2-Flange Liner Plate

JENNMAR Civil now offers Contech® 2-Flange Liner Plate that provides optimum shaft stability and protection when constructing new utility tunnels, relining structures under highways and railroads, and lining vertical shafts. 2-Flange Liner Plate has the highest continuous ring stiffness and high compression joint strength, along with an effective stiffness that is more than twice that of the same gage (thickness) of 4-Flange Liner Plate.

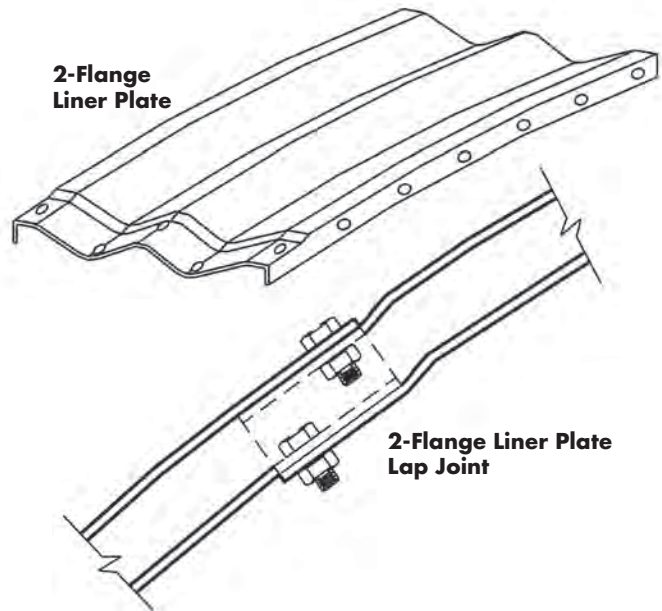
Applications

- New utility tunnels and enclosures
- Relining and rehabilitation of bridges and large culverts
- Vertical shafts

Advantages



- Stiffest plate available – usually does not require ring-beam stiffeners
- Minimizes installation expense
- Optimizes shaft stability
- Unsurpassed in strength and safety
- Available in black (uncoated) or galvanized steel
- Made in USA.



Deep, full length corrugations and lapped joints for more effective stiffness and ring compression.

Technical Data - 2-Flange Liner Plate

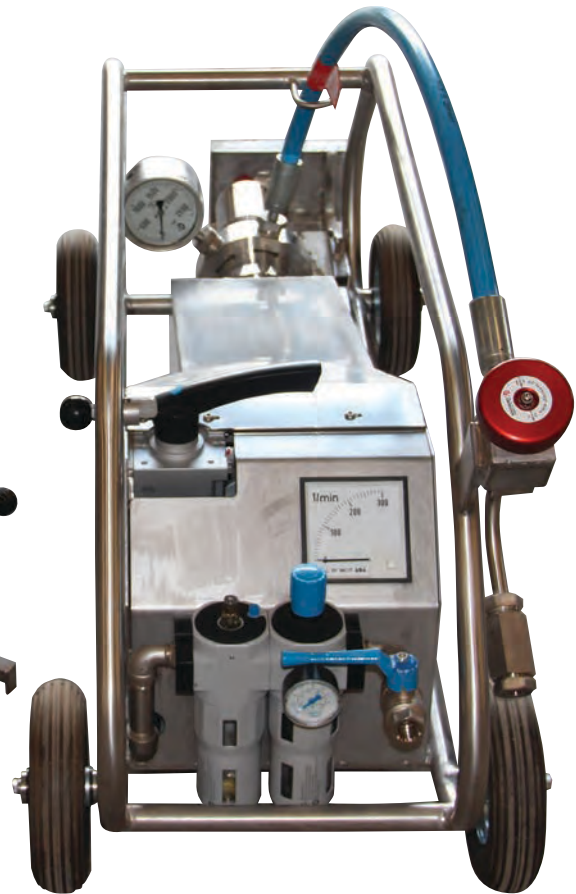
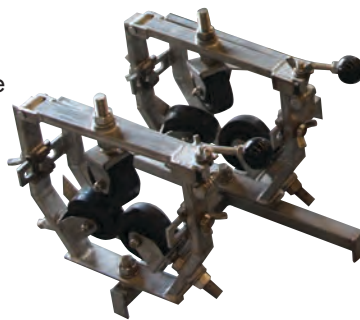
Uncoated Nominal Thickness, in.	Area, in. ² /ft	Section Modulus, in. ³ /in.	Moment of Inertia, in. ⁴ /in.	Radius of Gyration, in.	Approx. Plate Weights including Bolts, lb		
					12 Pi. Plate	14 Pi. Plate	16 Pi. Plate
0.0747 (14 ga)	1.149	0.0323	0.0345	0.600	25	28	31
0.1046 (12 ga)	1.618	0.0457	0.0491	0.604	33	37	42
0.1345 (10 ga)	2.086	0.0590	0.0640	0.607	41	47	52
0.1644 (8 ga)	2.559	0.0726	0.0795	0.610	49	56	63
0.1793 (7 ga)	2.796	0.0798	0.0877	0.613	53	61	68
0.2092 (5 ga)	3.263	0.0928	0.1031	0.616	61	70	79
0.2391 (3 ga)	3.740	0.1065	0.1193	0.619	70	80	90

Super Hurricane

The "Super Hurricane" can clean as far as 1,500 feet through ten 90° elbows, inside or outside corners, even irregular surfaces such as weld beads without stopping. The "Super Hurricane" Rotating Pipe Cleaning System process is completely environmentally friendly.

Features:

- Overall Weight: 190 Pounds
- Overall Size:
Length: 48 Inches Width: 20 Inches Height: 20 Inches
- Water Use: 50 Gallons Per Minute
- Water Pressure: 300 to 1,450 Bar (21,000 psi)
- Air Consumption: 72.5 psi (30 liters per second)
- Aluminum Air Motor
- Motor Output: 3.5 kW
- Operating Pressure Gauge
- Nozzle RPM Gauge
- Pneumatic Tires



A Better, Safer Cleaning Method

All industrial cleaning is not created equal. The Super Hurricane can clean installed pipe systems ranging in diameters from 2" up to 120", traverse multiple directional changes within a single piping system and clean up to 1,500 ft. of pipe from a single entry point. Some of the pipe material that The Hurricane can effectively clean include:

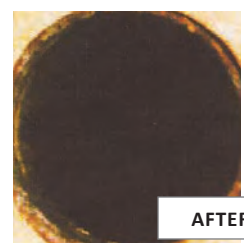


- Admiralty Alloy Types
- Aluminum
- Black Iron
- Bronze
- Carbon
- Copper
- Copper-Nickel Alloys
- Inconel
- Mild Steel
- Stainless Steel (all types: 304, 404, etc.)

Fast & Easy Corrosion Removal

The Super Hurricane effectively removes a wide range of corrosion build-ups, including:

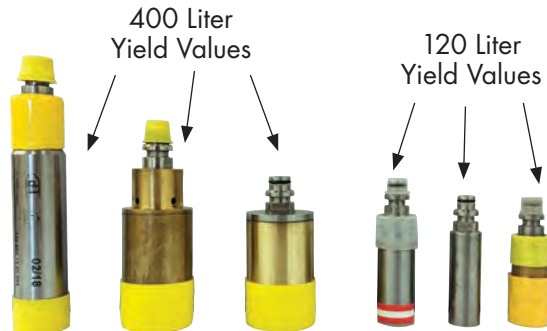
- Aluminum
- Hydrate,
- Silicate
- Calcide
- Bauxite
- Calcium Oxide
- Cement
- Ferrum Oxide
- Hard Nickel Coke
- Magnesium Oxide
- Polystyrene
- Slag And Mill Scale
- Titanium 2-Oxide
- Silicium Oxide
- Sodium Chroderust
- Or Any Other Corrosion Build-Up



Longwall Replacement Parts

Yield Values

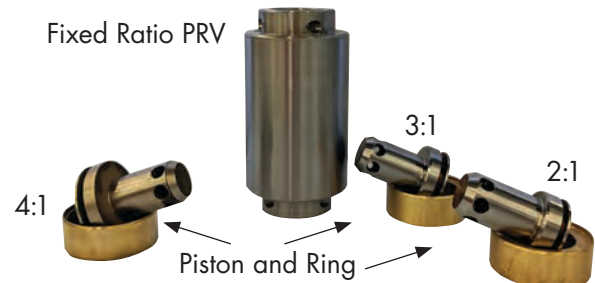
From 120 to 5000 L/min. Save all cylinders from overload, even against rock bursts.



Pressure Reducing Values

1" Stecko standard opening.

- Also available in 3/8", 1/2", 3/4" and 1" NPT
- Fixed ratios of 2:1, 3:1, 4:1, 5:1



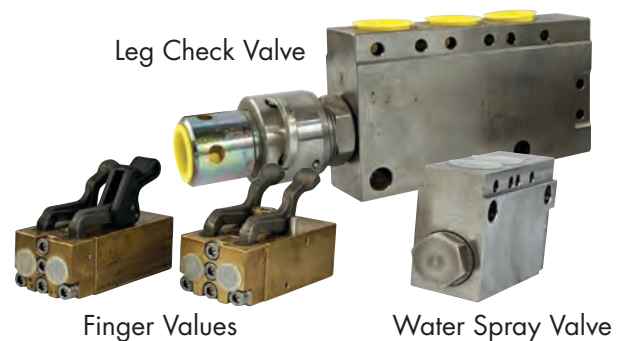
Inline Check Values

From 3/8" to 2" For pressure and returns.



Pilot Operated Values

Leg check valves, pilot operated check valves, and system controls with DN10 (3/8") TO DN20 (3/4") ports, carry every load.



Emulsion Tools

Operate with emulsion or hydraulic oil without a pressure reducing valve inline. Can handle pressures up to 4640 psi.

Emulsion Chain Saw

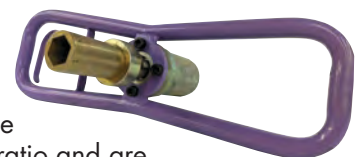
Our hydraulic chain saw is driven by emulsion-run SM motor and equipped with a dual control valve assures a stable job during a two-handed hold.



Emulsion Mining Drill

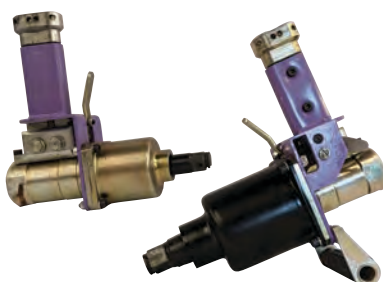
Our hydraulic drills have a low weight-to-power ratio and are provided with two different control systems:

- the switching lever
- the rotational shifter



Emulsion Impact Wrenches

Our hydraulic impact wrenches are the lightest on the market in comparison to their power output.



Water Prop

Our hydraulic based, temporary roof support. The prop is designed for one-hand operation with automatic pressure relief during closing. The setting pistol can be modified to include an extension which allows the operator to extend the prop for a distance instead of directly at the prop.



Props

Quik Stik

The Quik Stik prop is a high-load, rigid steel frame, free standing support.

- 2 ft height extension (minimum)
- High load capacity (70 t)
- High strength gain
- Can be preloaded
- Can be fitted with different sized and shaped head and base plates
- No tools needed to set the props
- The props can be re-installed if not under load
- Single person installation
- Relatively light weight
- Very rapid and easy installation



Coal Mining Applications

- Tailgate supports
- Bleeder entries
- Maingate supports
- To support beams
- Belt line entries
- Intersection support

Hard Rock Mining Applications

- Trona mines
- Halite/potash mines
- Hard rock mines where cemented backfill is used
- To support brows



ACS props can easily be connected with struts for increased stability!

Technical Data - Quik Stik Prop

Height Range	Load	Weight
4 to 6 ft	70 t	±71 lbs (32 kg)
5 to 7 ft	70 t	±78 lbs (36 kg)
6 to 8 ft	70 t	±85 lbs (39 kg)
7 to 9 ft	70 t	±92 lbs (42 kg)

Alternative Crib Supports (ACS) 100 or 55 Ton

Featuring quick and easy installation, these mechanical type supports are manufactured to the height requirements of the customer, with a twelve inch height adjustment.

They are recoverable with no deterioration and create less air restriction than conventional wood cribbing.

Head plates include:

- Pizza Head plate (2 ft Diameter)
- **Canadian Head Plate** accomodates JENNMAR's serrated steel beams (IB-100, GI-120)
- 12" x 16" x 2" Head Plate
- Optional size head and base plates



25 Ton Quick Timber

- Lightweight and easily transported
- Manufactured to the height requirements of the customer with 4" height adjustment
- Resusable
- No deterioration

Head plates include:

- Pizza Head plate (2 ft Diameter)
- **Canadian Head Plate** accomodates JENNMAR's serrated steel beams (IB-100, GI-120)
- Custom size head plates available
- Optional size head and base plates



Props

Ball Buster

- 2 ft height extension (minimum)
- High load capacity (25 -50 t)
- Stable yield of 2 ft
- Can be preloaded
- Can be fitted with different sized and shaped head and base plates
- No tools needed to set the props
- The props can be re-installed if not under load
- Single person installation
- Relatively light weight
- Very rapid and easy installation



Coal Mining Applications

- Longwall recoveries
- Tailgate supports
- Maingate supports Belt line entries
- Bleeder entries
- To replace cribs
- To support beams
- Intersection support

Hard Rock Mining Applications

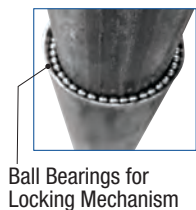
- Trona mines
- Halite/potash mines
- Hard rock mines where cemented backfill is used
- To support beams
- Where rock movement is expected

Technical Data - Ball Buster Prop

Height Range	Load	Weight
4 to 6 ft	50 t	±70 lbs (32 kg)
5 to 7 ft	50 t	±77 lbs (35 kg)
6 to 8 ft	50 t	±84 lbs (38 kg)
7 to 9 ft	50 t	±91 lbs (41 kg)

Stress Buster

- Ability to pre-stress through filling valve near base
- Once pre-stressing is complete, ball bearings lock the support with pre-stressed load into position
- Support can be manufactured with a fixed head and foot plate or removable head and foot plate
- Available in Rounded End or Flat End



Technical Data - Stress Buster Prop

Height Range	Load	Weight
5 to 8 ft - Rounded End	40 t	±82 lbs (37 kg)
5 to 8 ft - Flat End	40 t	±77 lbs (35 kg)

Mini Buster

- Lightweight and easily transported
- Supplied in any desired height with an extension of up to 24 in.
- No tools needed and single person installation
- Various head and foot plate configurations
- No deterioration



Props

J-SAND® and J-SANDY® Props

J-SAND® and J-SANDY® Props are lightweight, high capacity props that are easily installed with nominal capacities of 35–100 tons. Props are available in heights of 4 to 9 ft. with 2–3 ft. of height adjustment.

Applications

- Tailgate and bleeder support
- Cross-cut and intersection stabilization
- Belt line and headgate entry support
- Longwall shield recovery
- Longwall center entry
- CM pillar extraction
- Violation prevention

Advantages

- Requires no tools to set
- Two or three feet of height adjustment
- Light, quick and easy to install
- Cannot be over extended
- Optional header plates
- Handles provide ease of movement



J-SANDY® Yieldable Prop

The J-SAND prop is also available in a yieldable configuration, the J-SANDY Prop.

Advantages

- Lightweight yielding prop yields up to 8"

Technical Data — J-SANDY Yieldable Prop

Nominal Capacity: 60 Ton (54.4 Metric ton)

Size	Height, ft. (m)		Weight, lb (kg)
	Collapsed	Extended	
4–6	4 (1.2)	6 (1.8)	79 (36)
5–7	5 (1.5)	7 (2.1)	87 (39)
6–8	6 (1.8)	8 (2.4)	95 (43)
7–9	7 (2.1)	9 (2.7)	100 (45)
9–11	9 (2.7)	11 (3.4)	108 (49)

Technical Data — J-SAND Standard Prop

Size	Nominal Capacity, Ton (Metric ton)								
	35 (31.8)			60 (54.4)			100 (90.7)		
	Height, ft. (m)		Weight, lb (kg)	Height, ft. (m)		Weight, lb (kg)	Height, ft. (m)		Weight, lb (kg)
	Collapsed	Extended		Collapsed	Extended		Collapsed	Extended	
4–6	4 (1.2)	6 (1.8)	60 (27)	4 (1.2)	6 (1.8)	83 (38)	4 (1.2)	6 (1.8)	103 (47)
5–7	5 (1.5)	7 (2.1)	64 (29)	5 (1.5)	7 (2.1)	91 (41)	5 (1.5)	7 (2.1)	115 (52)
6–8	6 (1.8)	8 (2.4)	68 (31)	6 (1.8)	8 (2.4)	99 (45)	6 (1.8)	8 (2.4)	127 (58)
7–9	7 (2.1)	9 (2.7)	72 (33)	7 (2.1)	9 (2.7)	105 (48)	7 (2.1)	9 (2.7)	139 (63)
9–11	9 (2.7)	11 (3.4)	76 (34)	9 (2.7)	11 (3.4)	113 (51)	9 (2.7)	11 (3.4)	151 (68)

J-CRIB® Pumpable Crib

J-CRIB® is a specialized pumpable cement and containment bag that replaces conventional timber cribs in longwall tailgates and bleeder headings. The state-of-the-art mixing and pumping system, together with rapid gelling characteristics of the J-CRIB material ensure simple and fast installation. The rapid strength gain provides early resistance to mine roof convergence and bed separation.

J-CRIB is a two part system consisting of Part A and Part B, which when mixed together rapidly react to produce a load bearing mine roof support. J-CRIB (Part A) is a non-combustible grey powder that forms an easy to pump slurry when mixed with water. J-CRIB (Part B) is a non-combustible low viscosity easy to pump liquid accelerator. When mixed together, they gel in less than 30 seconds, allowing the top of the crib to be pressurized against a stiff base.

Advantages

- High efficiency mixing and pumping equipment
- High yield, approximately 60% by water volume
- Long distance pumping, up to 15,000' (4572 m)
- Long pumping life, minimum 12 hours
- Consistent performance with pressurization of bags ensuring good contact with mine roof and even load-bearing capacity
- Rapid gelling allows bags to be filled completely without additional form work

Standard J-CRIB Support Capacity

J-CRIB Diameter, in. (mm)	Support, Tons (metric tons)
24 (610)	150 (136)
27 (686)	200 (181)
30 (762)	230 (209)



Trailer mounted, electric powered operations.

Underground Installation



J-CRIB bag attached to wire mesh.



Powder and accelerator lines.



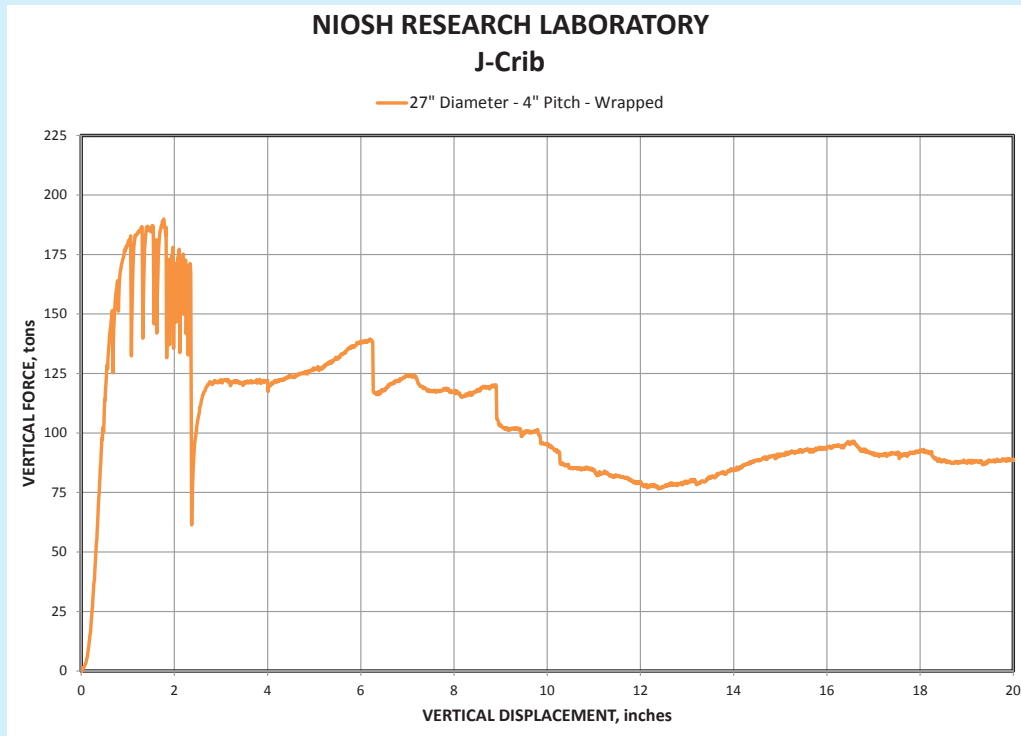
Pumped full and pressurized.

Surface Equipment



Liquid accelerator tanker, cement hopper, diesel powered mixer & pump system.

NIOSH Research Laboratory — J-CRIB Results



Response to Ground Pressure

Standing support response to ground pressure is critical to successful performance. Full scale NIOSH vertical load to failure testing has demonstrated the effectiveness of the J-CRIB system. The graph above was produced from such a test on a 72" high, 27" diameter, 4" steel pitch bag, plastic wrapped J-CRIB support. The near vertical loading over the initial in. of deformation is the loading of J-CRIB formulation. Controlled yield of the J-CRIB formulation loads the four in. pitch, continuous spiral wire reinforcement over the next two inches of deformation. The bag controls the load to approximately nine inches of deformation. The plastic wrap controls the load to over twenty inches of deformation. Stability of the standing support over the first three inches of deformation is the most critical aspect of longwall gateroad performance. The J-CRIB formulation provides this required consistent support, with significant installation and cost advantages.

J-PAK® Crib is a standing support product that utilizes a custom made steel shell filled with a specialized cement. J-PAK is designed to slowly yield under rock load.

Features

- Available in corrugated (J-PAK I) or smooth (J-PAK II) steel shells
- Easily installed in various mine conditions
- Designed to slowly yield under rock load
- Available in 18–36" (457–914 mm) diameter steel shells

Advantages

- Replaces conventional timber cribs in longwall tailgates and bleeders
- Sustains peak capacity during yielding
- Stable and high yield performance
- Withstands lateral displacement

Technical Data — J-PAK Crib

Shell Diameter, in. (mm)	Support, Ton (metric ton)
18 (457)	65 (59)
24 (610)	95 (86)
27 (686)	105 (95)
30 (762)	120 (109)
36 (914)	165 (150)



J-PAKs are available with corrugated or smooth shells.



Empty J-PAK shell being moved.

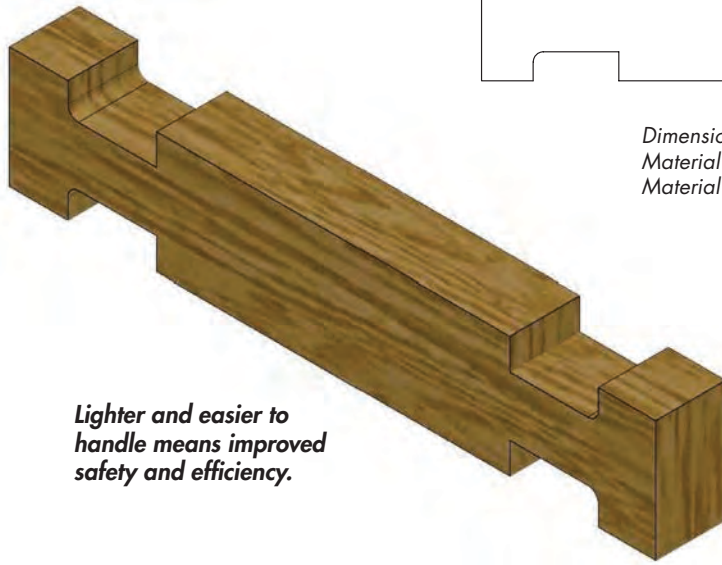


J-PAK plant in Marion, IL.

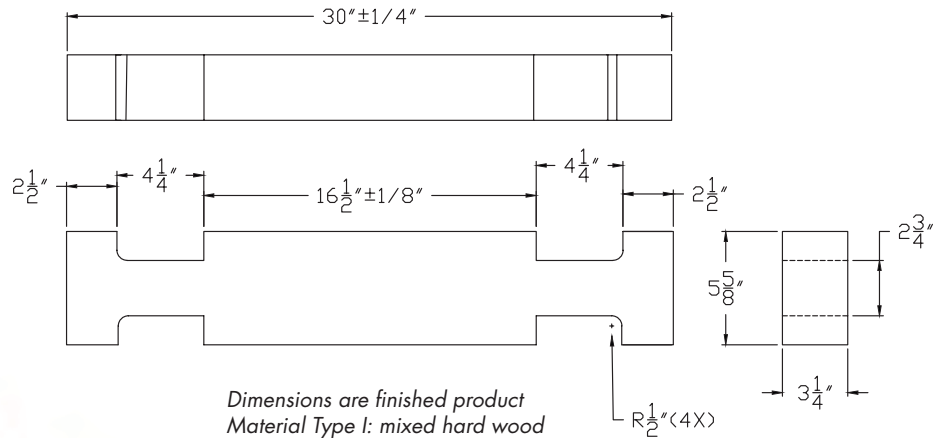
J-Latch™ Timber Crib



J-Latch™



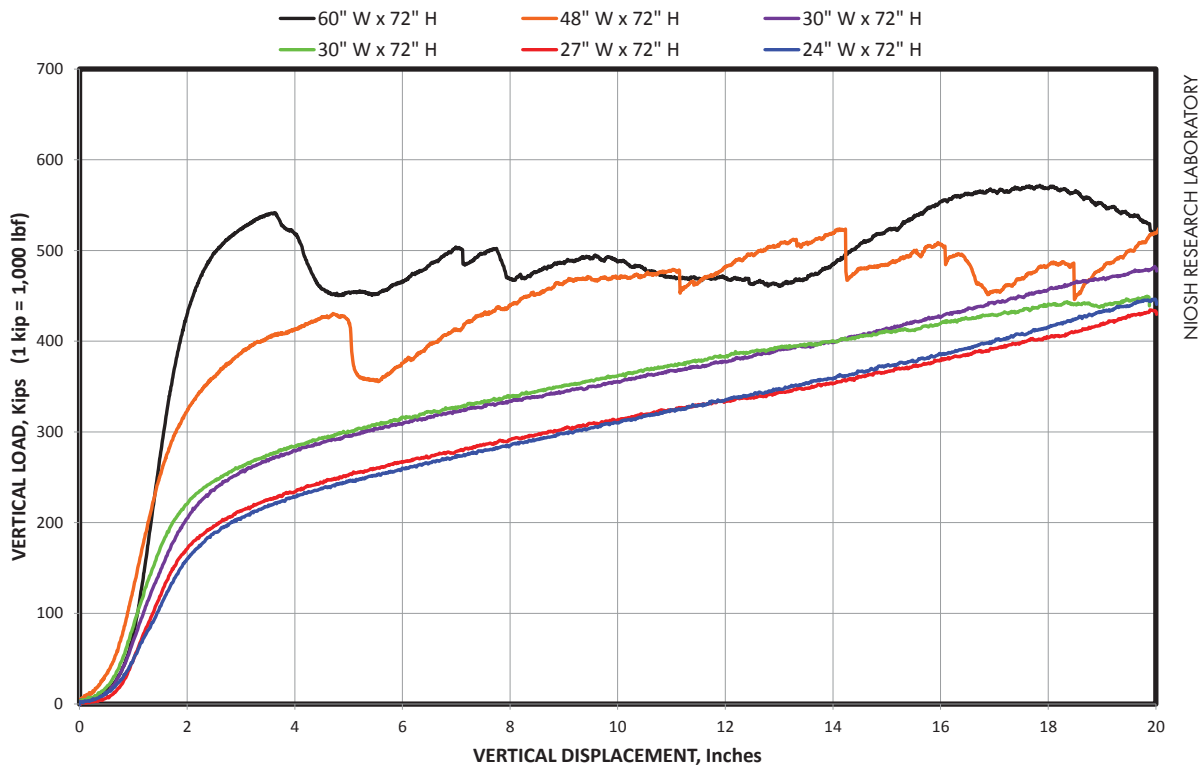
Lighter and easier to handle means improved safety and efficiency.



Dimensions are finished product
Material Type I: mixed hard wood
Material Type II: oak

J-Latch™ is designed to replace conventional timber cribs (4- and 9-point). Timbers are interlocked and there is 100% contact which greatly improves strength and stability, and also allows for higher aspect ratios. Increasing length/width of the block contributes even further to the strength and stability. Select timber species helps to ensure equal loading as well as consistency and predictability.

JENNMAR: J-LATCH - 4/5/2017



NIOSH RESEARCH LABORATORY

JENNMAR Metal Stoppings

JENNMAR's Metal Stoppings are an economical solution for underground mine ventilation control. This alternative to conventional block stoppings is comprised of a set of vertically telescoping steel panels that provide a safe, low-cost system to deliver positive control in all mining environments.

Safe & Efficient

JENNMAR Metal Stoppings is a cost-effective system of mine ventilation control that is safe, easy to handle and install, features a yieldable design and is reusable.

Safety

Each panel is designed to have a safety edge to eliminate hand injuries during installation. The Patent pending, Miners Safety Edge, combined with the ease of transport and installation, provide a safer work environment by eliminating accidents and lost man-hours.



Easy and Safe Material Handling

JENNMAR Metal Stoppings are packaged in lightweight bundles that provide a safer and more efficient means of transport than conventional block stoppings when transporting underground by rail or rubber tire. Conventional block stopping material typically requires four times the hauling capacity and comprises ten times the weight. When mines encounter areas that are inaccessible by machinery, the JENNMAR Metal Stoppings can provide a viable ventilation control solution due to their light weight and ease of transport.

Ease of Installation

Due to the size, extendibility and light weight of the metal panels, one experienced person can install four JENNMAR Metal Stoppings in the same amount of time it takes to install one conventional block stopping, thereby reducing cost and increasing the rate of mining.

Yieldable Design

JENNMAR Metal Stoppings are able to withstand changing mine floor and roof conditions due to their ability to yield and maintain positive ventilation control.

Reusability

Panels are constructed of galvanized steel that provides long life and unlike block stoppings which require a machine or sledge hammer for removal, JENNMAR Metal Stoppings can be easily removed due to their yieldable feature. They can also be disassembled in a matter of minutes by cutting the clips and then transporting them to a new location. Each stopping can be reused many times due to its quality galvanized construction.

Stoppings Sizes

JENNMAR offers a wide range of sizes of metal stoppings based on height and pressure requirements. Door kits to accommodate all sizes of stoppings are available and can include top and bottom panels. Available for both metal and block stoppings.

Stoppings can be ordered as a kit including all installation accessories or as individual components.

JENNMAR Metal Stoppings

Height, ft. (m)

3-5 (0.9-1.5)

4-7 (1.2-2.1)

5-9 (1.5-2.7)

6-10 (1.8-3.0)

7-12 (2.1-3.7)

8-14 (2.4-4.3)

10-17 (3.0-5.1)

12-20 (3.7-6.1)



The installation jack is used to fully extend the panels, which are then tied to the rib angles.

(Note: Three rib angles are used in higher mining heights).



JENNMAR Metal Stoppings



Ported Panels

Ported Panels are to be used in conjunction with our Jennmar seals. The Ported Panels will include penetrations from the factory for fill lines and penetrometer tests. Plugs will be included with the panels. Panels can be ordered as a kit, including all installation accessories, or as individual panels

Garage or Equipment Door Application

Cargill Salt used our stopping panels as surround material for a garage door application.



Fan Housing Application

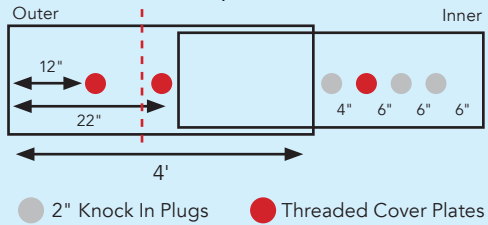
Cargill Salt used our stopping panels in the construction of an underground fan housing.



Ported Panel Sizes:

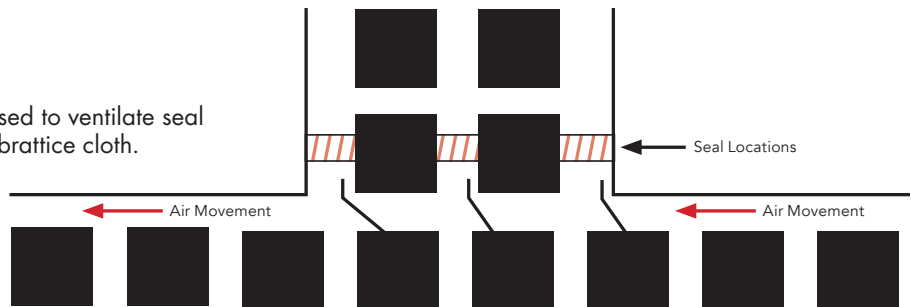
Ported Panels come in six standard sizes; 4 ft, 5 ft, 6 ft, 7 ft, 8 ft, and 10 ft.

4' Ported Panel Example



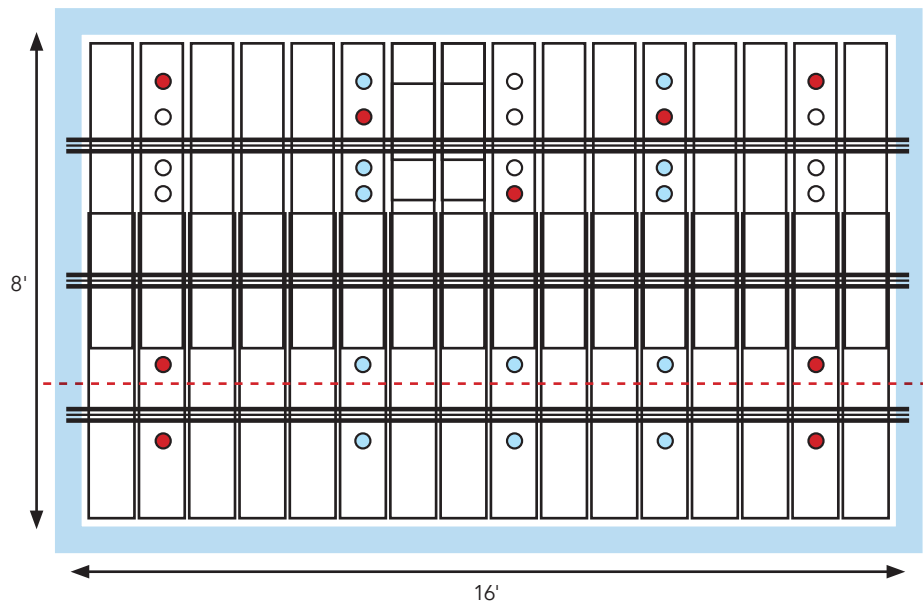
Seal Ventilation Application

JM Metal Stoppings are currently being used to ventilate seal locations as a more permanent option to brattice cloth.



Typical 8' X 16' Steel Stopping Seal Kit

- 27 6' Panels
- 5 6' Ported Panels
- 12 Filler Panels (Not Shown for Clarity)
- 12 2" Knock In Plugs
- 2 2' Panels (Optional)
- 200 Clips
- 12 Angle Iron
- 9 Threaded Cover Plates



JENNMAR Metal Stoppings



Ventilation Doors

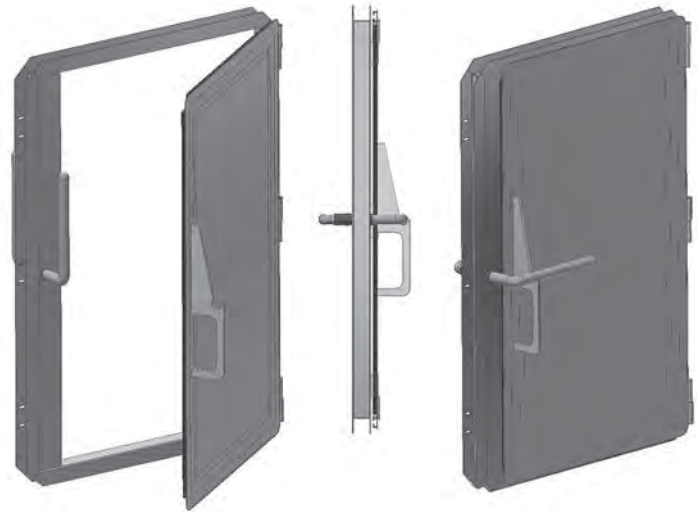
Door kits to accommodate all sizes of stoppings are available and can include top and bottom panels. Available for both metal and block stoppings.

Features:

- Heavy-gauge door construction
- Reinforced with secondary steel framing
- Sure-tight handles and gasketing
- Safe, user-friendly construction (no sharp edges)
- Made in the USA

Benefits:

- Durable and long lasting
- Tighter sealing that improves ventilation
- Quality door handles that prevent malfunction
- Cost effective doors that help eliminate citations and safety issues



Door assemblies typically require the use of one or two additional angles above and/or below the door for proper reinforcement.



Doors come separate or with door kits and include top and bottom panels.

Stopping Door Sizes

Width, in. (mm)	Height, in. (mm)
36 (914)	30.5 (775)
36 (914)	48 (1219)
36 (914)	60 (1524)
48 (1219)	48 (1219)
48 (1219)	60 (1524)

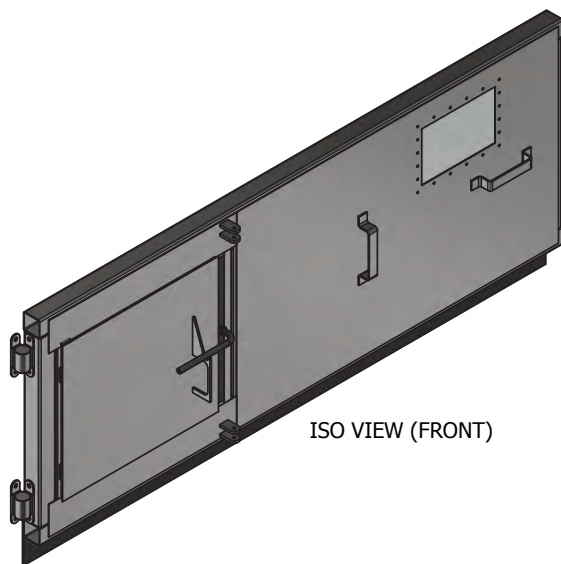
Construction Doors



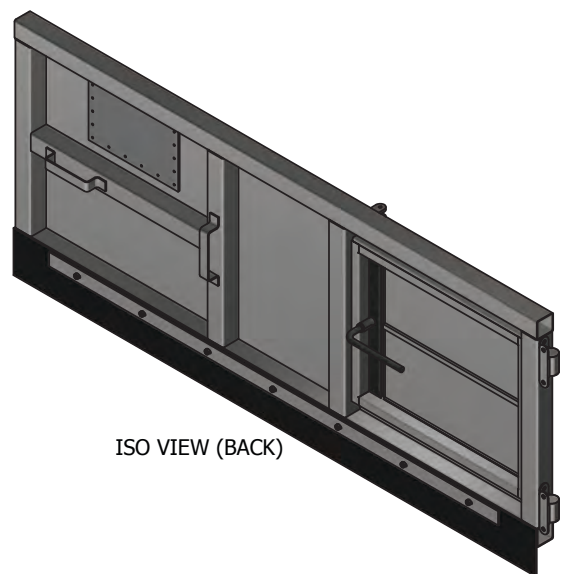
These construction doors were designed to help operators establish quick and easy access into other airways. No more long, tedious and cumbersome installations with doors that lack the features that you need. Our doors are easily customized to any mine specification with numerous feature options.

Features

- Safer to Operate
- Stronger Corrugated Design
- Less Weight. Greater Durability
- Fits into Your Budget
- Easy to Install
- A Better Alternative Equipment Door
- Manual or Power Operated



ISO VIEW (FRONT)

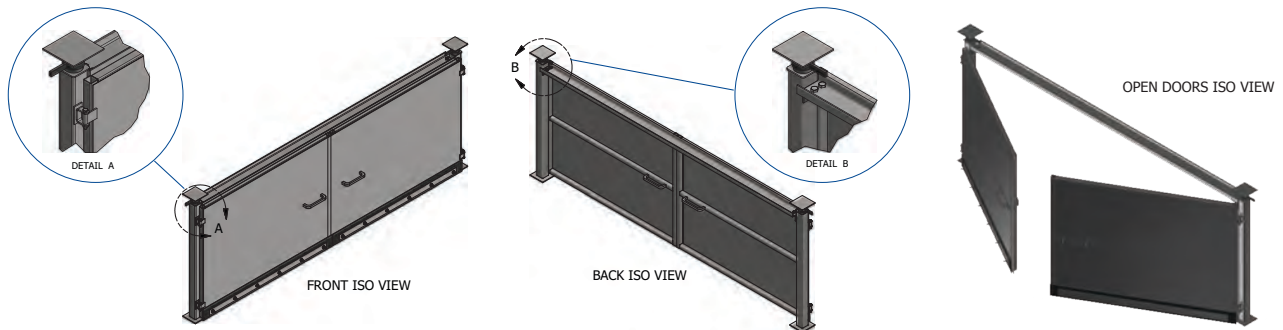
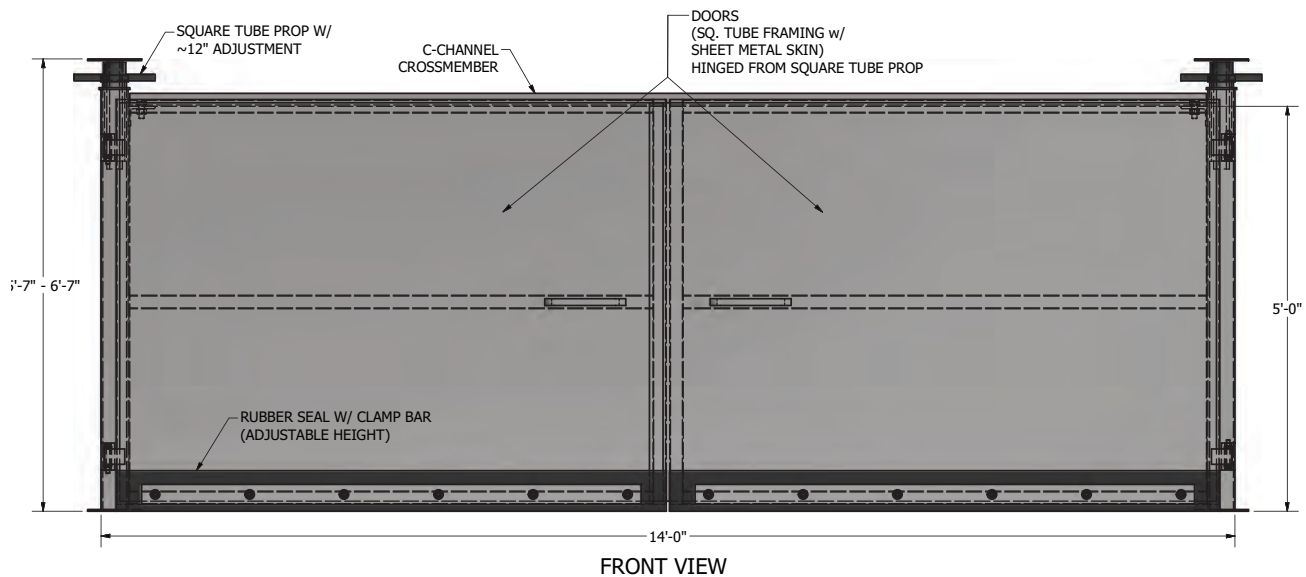


ISO VIEW (BACK)

Construction Doors

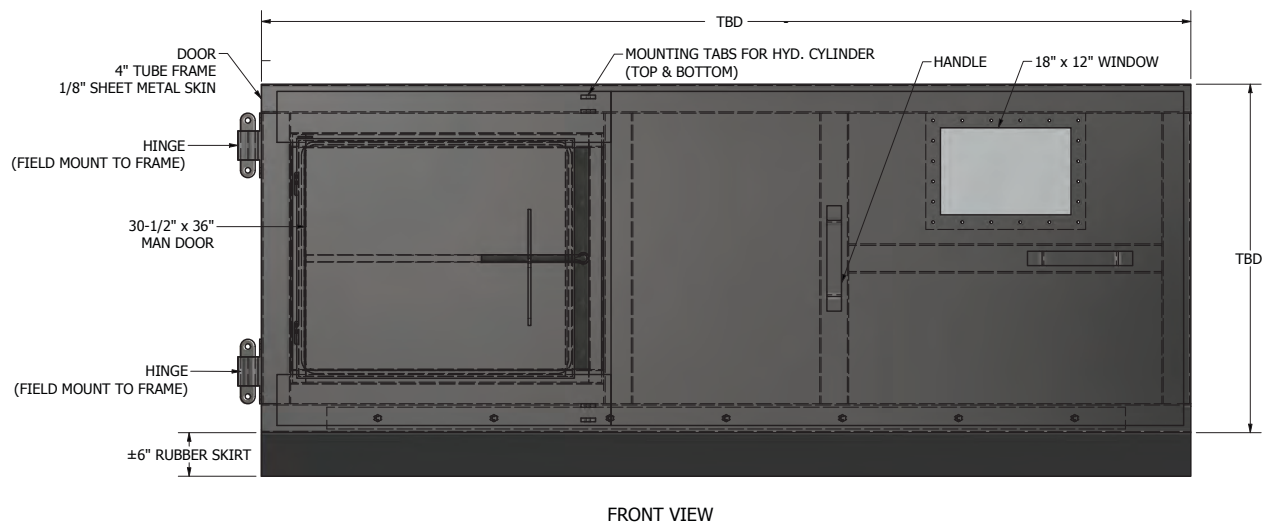


The simple design of JENNMAR's Construction Doors allow for a safe, quick and tight fit installation and removal this increases safety and productivity. Manufactured to withstand tough mining environments and repeated use. Manufactured in the U.S.A.



JENNMAR Construction Doors can be easily designed and customized to any mine specification:

- Size of Doors and Jacks
- Man Doors
- Windows
- Air Relief Sliders
- Hands-free Hydraulic Operation
- Manual Operation



FRONT VIEW

J-SEAL® Foam Cement



J-SEAL® is a specialized foaming cement that is used to build permanent coal mine ventilation seals. It is also used for general backfilling applications in coal or hard rock mining. J-SEAL is designed to be installed with a JENNCHEM continuous placer type pump. The rapid strength gain provides immediate ground support to the surrounding strata with quicker cure times to meet seal approval specifications in days rather than weeks.

MSHA Approved Designs

JENNCHEM has been granted four MSHA permanent coal mine ventilation approvals, a 50 and 120 psi explosion resistance for both mainline and gob seal applications:

- 50M-07.0 — JENNCHEM Mainline J-SEAL
- 120M-15.1 — JENNCHEM Mainline J-SEAL
- 50G-06.1 — JENNCHEM Gob Isolation J-SEAL
- 120G-16.0 — JENNCHEM Gob Isolation J-SEAL

J-CRIB® form bags filled with J-SEAL®, mixed and pumped from a nearby underground location, are an effective standing support, when a limited number of cribs are required or bulk surface facilities are not economically feasible.

Features

- Pre-blended, cementitious, non-flammable, powder product packaged in 45 lb, 3-ply, one-layer polyethylene bags
- Once mixed with water, the product develops foamed, uniform, pumpable grout for constructing plug-type mine seal structure underground
- The product is optimally formulated and the grout is chemically stable after cure
- One-part system, longer gel time, better viscosity and longer pumping distance
- Rigorously tested, premier engineering properties, better bonding with strata and higher shear strength against strata
- J-SEAL is MSHA approved and can be used with a variety of form designs, including wood, concrete block, props and mesh

The required thickness of the four JENNCHEM approvals are based on the superior shear strength of the J-SEAL material. When installed in a 7' high and 20' wide coal mine entry, within wood and brattice cloth forms, the required thicknesses are:

- 4.75 ft. for a 50 psi mainline seal
- 10.65 ft. for a 120 psi mainline seal
- 4.50 ft. for a 50 psi gob seal
- 5.58 ft. for a 120 psi gob seal
- J-SEALs superior mechanical properties results in a 21.7% reduction in seal thickness

Installation

- Calibration and pump set up needs to be carried out by qualified JENNCHEM personnel or authorized contractors
- A minimum of 600 ft. of 1-1/4" mine spray hose or slick line is required from the placer to the job site
- Underground requirements:
 - Water 20 gpm @ 50 psi (100 psi if water heater required)
 - AC Power @ 460 V
 - Requires only light form work and sealing of large gaps

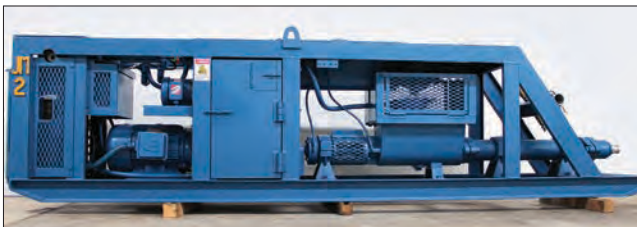


continued



J-SEAL features a patent-pending formulation that is significantly thinner than competing brands, yet still maintains greater shear strength!

Less material means less handling, an improved safety factor and greater pumping distances. And with its excellent viscosity and a placer pump that is specifically designed for J-SEAL, application is virtually trouble-free.



J-SEAL Placer Pump



J-SEAL Placer Pump Specifications

Motor, 20 HP	21 Amps @ 460 V, 18 Amps @ 575 V Cable Size #6
Water Heater	90 Amps @ 460 V, 110 Amps @ 575 V Cable Size #2

1-Day J-SEAL® Cement



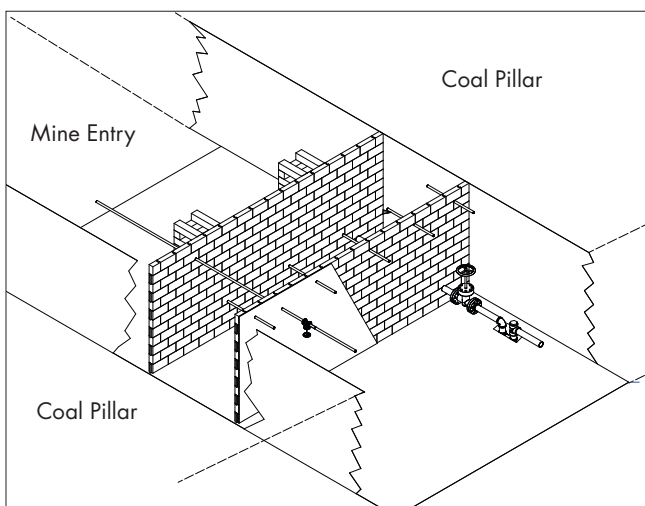
1-Day J-SEAL® is a specialized, highly pumpable cement that is designed to duplicate the engineering properties of standard J-SEAL within hours, permitting the rapid construction and approval of final 120 PSI main line seals. This product differs from traditional J-SEAL as the non-foamed formulation provides for extended pumping distances along with the quick strength gain required for an approved seal in less than 24 hours. It is also ideal as a single shot grout for pumpable cribs or general grouting applications in coal or hard rock mining. 1-Day J-SEAL is designed to be installed with a JENNCHEM continuous placer type pump into a variety of form designs including wood, concrete block, and metal.

MSHA Approved Design

JENNCHEM has been issued MSHA approval (120M-17.0 – JENNCHEM Main Line 1-Day J-SEAL) for seals requiring an early cure rating and/or long distance placement properties.

The required thickness of the two JENNCHEM 120 PSI Mainline approvals are based on the superior shear strength of both J-SEAL materials. When installed in a 7-foot high and 20 foot wide coal mine entry, the required thickness is 10.15 feet utilizing a steel stopping or concrete block form.

1-Day J-SEAL's superior mechanical properties results in a 21.7% reduction in seal thickness.



Installation

- Calibration and pump set up needs to be carried out by qualified JENNCHEM personnel or authorized contractors
- A minimum of 250 ft of 1-1/4 in. mine spray hose or slick line is required from placer to job site
- **Underground requirements:**
 - Water 25 gpm @ 50 psi (100 psi if water heater required)
 - 460/575 VAC @ 60 Amps (200 Amps if water heater required)
- Requires simple form work and sealing of gaps.

Advantages

- Compared to traditional J-SEAL, 1-Day J-SEAL's non-foamed design provides a stronger final product to result in a shorter amount of time
- Longer pumping distances are achieved when compared to traditional J-SEAL due to its low viscosity design
- Both J-SEAL formulations utilize the same chemistry, providing ideal engineering properties including low heat of hydration and non-shrink characteristics
- Rapid Application: up to 12 CY per hour
- Good flow properties allows material to penetrate and consolidate broken ground
- Rapid gel minimizes leakage in forming
- High Yield: up to seven times its dry volume
- Superior durability for life of mine installations
- Acid mine water resistant.

Features

- Pre-blended, cementitious, non-flammable, powder product packaged in 45-lb, 3-ply, one layer polyethylene bags
- The product is optimally formulated and the grout is chemically stable after cure
- Simple one-part system, longer gel time, better viscosity, and longer pumping distance
- Rigorously tested, premier engineering properties, better bonding with strata, and higher shear strength against strata
- 1-Day J-SEAL is MSHA approved and can be used with a variety of form designs including wood, concrete block, and metal.

JENNCHEM Underground Roadway Repair (JURR)

JENNCHEM Underground Roadway Repair is a specially formulated fast-setting concrete designed for the mining and tunneling industries. It is designed specifically for demanding applications where quick return-to-service is required, and where traditional concrete mixing equipment is unavailable or impractical. JURR is formulated to absorb mixing water and gain strength rapidly with little or no mixing. It is ideal for rehabilitating underground roadway and filling mud holes or puddles.

JENNCHEM Underground Roadway Repair is a safer, more permanent solution than temporary bridges or traditional fill methods. The specially graded aggregates are designed to provide traction for foot traffic and wheeled vehicles while limiting unnecessary tire wear. Use JURR to limit liability from slippery mud holes and to mop up nuisance water areas, returning your attention and time to maximizing production.

Instructions

Repaired area is only as durable as the underlying substrate. Remove mud or soft base if possible. Put down rock or ballast and compact to provide a solid base. Fill hole or depression with water until you have standing water up to where repair level is desired. Open packaging and dump material into standing water. Allow material to soak up water. Agitation with shovel or other suitable tool can be used to improve mixing. Finish to desired texture. This operation can be done in multiple levels if desired.

Packaging/Yield

- 60 lb bags ($\approx$ 0.6 cu ft),
- 2500 lb ($\approx$ 1.0 cu yd) super sacks

Shelf Life

One year when stored in cool, dry conditions.

Caution

JENNCHEM Underground Roadway Repair contains cementitious materials and may cause irritation to lungs, eyes, and skin. Avoid contact. Use only in adequate ventilation. Do not breathe dust. Wet mixture may cause burns. Wear suitable gloves, eye protection, and protective clothing. In case of skin contact, wash thoroughly with soap and water. In case of eye contact, flush immediately and repeatedly with large quantities of water and get prompt medical attention. In case of difficulty breathing, remove person to fresh air. If difficulty breathing persists, seek medical attention.

Set/Cure Time

Foot Traffic	2 hr
Light-duty Wheeled Traffic	6 hr
Heavy-duty Traffic (shuttle car, haul truck, roof bolter, jumbo)	18 hr
Extreme-duty (shield hauler, continuous miner, tracked vehicles)	24 hr

NOTE: Hot materials (and/or water) will accelerate set times and strength gain. Cold materials will slow set times and strength gain. PH and chemistry of water may affect set time and strength gain.



JENNMAR Overcast System



JENNMAR Overcast Systems are designed to be modular reusable structures that are used in underground high pressure situations to insure intake air is not contaminated with return air. Overcasts can be designed to be driven over with equipment such as man trips, continuous miners, bolters and/or haulage equipment.

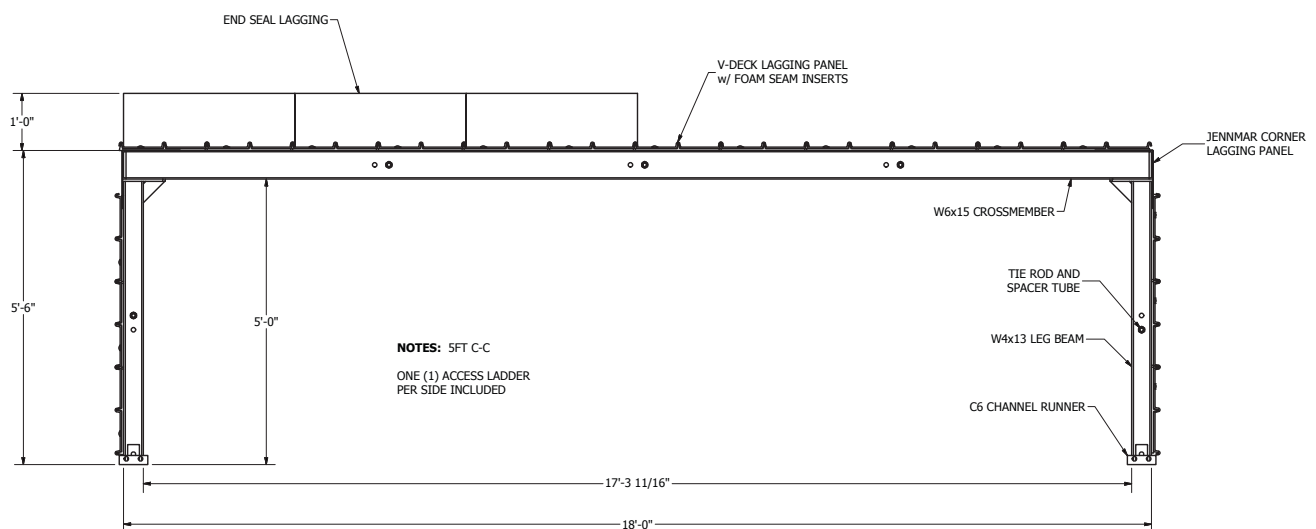
Utilization of wide flange beams and roll-formed V-Deck lagging allow for an air tight seal. Reusable lightweight materials are well suited for underground construction.

Advantages

- Lightweight and durable
- Easily transported and assembled
- Strong enough to resist rib rolls and minor roof material

JENNMAR Overcast Systems consist of the following components:

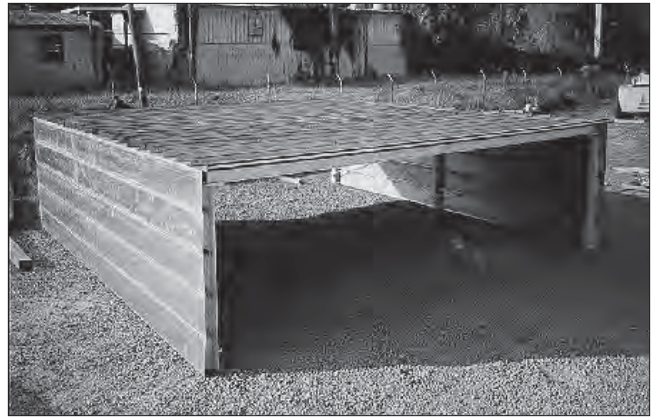
- Cross member, W6 × 15
- Leg member, W4 × 13
- Tie rods & spacer tubes
- Bolt-together assembly
- V-Deck lagging with foam
- Channel runner
- Man doors
- Overcasts can be designed and built with stairways, ladders and ramps complete with handrails to allow for travel over the top of the overcast. Access ways are constructed with 3 points of contact in mind



Mastercast and Traditional Overcasts

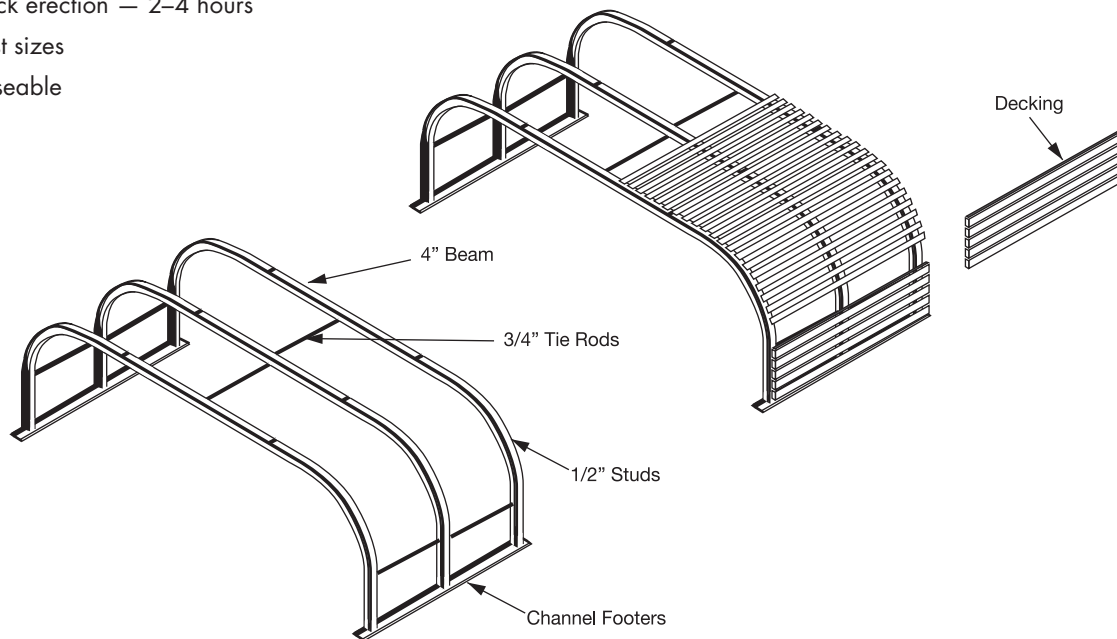
Mastercast

- Rapid assembly, as few as six major pieces
- All sizes available in 12" increments
- Reusable and galvanized panels
- Chancel ends for wingwalls
- Light and heavy duty versions
- Ships complete with all tools



Traditional Overcasts

- Strong — made with wide flange beam
- All steel — no aluminum
- Quick erection — 2–4 hours
- Most sizes
- Reuseable



Typical Overcast Assembly

PUR70 Polyurethane Resin



PUR70 Polyurethane Resin is a two-component polyurethane resin system. When properly mixed at a ratio of one to one, PUR70 cures to a rigid polymer with unique physical properties, resistance to water and chemical attack, and long term durability. The fast reactivity of PUR70 is used to control high water flows and consolidate loose rock strata.

The product's high adhesive strength, outstanding mechanical properties and flexibility create an excellent bond with the strata. When injected into the strata for preventive or curative purposes, the low viscosity mixture remains liquid for several seconds and penetrates into the smallest fissures. The polyurethane then expands, sets and effectively consolidates and seals the broken rock.

PUR70 can be applied with various types of dual piston pumps.

Applications

Typical applications include:

- Ground consolidation in the event of fractured and unstable ground
- Sealing against water ingress
- Injection of rock bolts, see the Fully Grouted Cable Bolt (FGCB)
- Ground stabilization
- Storm water systems, tunnels, manholes & underground vaults
- Concrete and earthen dams

Advantages

- Low viscosity product with good penetration into small fissures
- Non-flammable, non-toxic and does not contain any Volatile Organic Compounds (VOCs)
- Excellent adhesion, resistance and durability
- Ground cohesion quickly re-established under wet or dry conditions
- High flexibility, coherence maintained even in the event of strata movement
- Swells in the presence of water, suitable for stemming water ingress
- Full mechanical strength achieved very quickly, resulting in minimum disruption to workplace
- Storage and Shelf Life:
 - Product is moisture sensitive. Store product in original sealed containers at temperature range of 60–90° F (15–32°C). Opened containers must be handled properly to prevent moisture contamination. Shelf life is 12 months when properly stored



Technical Data — Solid Cured PUR70 Polymer Resin

		Test Method
Density, lb/ft. ³ (kg/m ³)	70 (1121)	ASTM D-1622
Compressive Strength, psi (MPa)	10,000+ (70+)	ASTM D-1621
Tensile Strength, psi (MPa)	5100 (35)	ASTM D-638
Shear Strength, psi (MPa)	10,000+ (70+)	ASTM D-732
Flexural Strength, psi (MPa)	10,000+ (70+)	ASTM D-790
Water Absorption (by volume)	<1%	ASTM D-2842
Elongation	8%	ASTM D-638

Gel Time (ratio of 1:1 by volume)

77°F (25°C)	45 seconds	—
50°F (10°C)	60 seconds	—

Technical Data — PUR70 Polyurethane Resin

Physical Properties — Liquid	Resin A	Resin B	Test Method
Viscosity, cps	250	500	ASTM D-1638
Specific Gravity	1.23	1.10	ASTM D-1475
Color	Dark Amber	Light Amber	—
Flash Point, °F (°C)	>250 (121)	>250 (121)	ASTM D-92

JSC Grout is JENNCHEM's series of single-component hydrophobic polyurethane grouts that are used for sealing leaking cracks or joints in a variety of applications.

Types of JSC Grout available are Flex, LV, Ultra and Classic.

Applications

- Mine seal grouting
- Rehab of older works
- Water control on slopes, shafts and all active underground areas
- Waste treatment plants and water related facilities
- Storm water systems and manhole facilities
- Concrete and earthen dams
- Tunnels
- Concrete and masonry repair
- Water control grouting

Advantages

- 100% solids
- Expands up to 30 times initial volume
- Pumps as single component
- Controllable reaction times
- Excellent resistance and durability
- Outstanding adhesion
- Non-hazardous shipping
- Non-flammable
- Cures inert, non-toxic permanent seal
- Closed cell/hydrophobic formula
- Low viscosity
- No shrinkage in wet/dry and freeze/thaw cycles

Use of Accelerator B Component

The reaction profile is adjusted prior to pumping by the addition of Accelerator B into the base resin and is affected by temperature and the amount of moisture encountered. At 2.5% (1 pint per five gallons), the expansion will start at 15 seconds and be complete at about 65 seconds. These reaction times were determined at 77°F with the addition of 2.5% water.

JSC Grout – Flex

JSC Grout – Flex Physical Properties

Liquid			
	Flex	Accelerator B	Test Method
Viscosity	500 cps	25 cps	ASTM D-2196A
Specific Gravity	1.15	0.95	ASTM D-1475
Color	Amber	Clear	
Flash Point	> 250°F	225°F	ASTM D-92
Solid Cured			
Density	4 lb/ft. ³		ASTM D-1622
Elongation	44%		ASTM D-638
Tensile	29 psi		ASTM D-638
Shear	17 psi		ASTM C-273
Water Absorption	< 1%		ASTM D-2842
Toxicity	Non-toxic		

JSC Grout – LV

JSC Grout – LV Physical Properties

Liquid			
	Flex	Accelerator B	Test Method
Viscosity	250 cps	25 cps	ASTM D-1638
Specific Gravity	1.1	0.9	ASTM D-1475
Color	Light Amber	Clear	
Flash Point	> 250°F	225°F	ASTM D-92
Solid Cured			
Density	4 lb/ft. ³		ASTM D-1622
Elongation	50%		ASTM D-638
Tensile	29 psi		ASTM D-638
Shear	17 psi		ASTM C-273
Water Absorption	< 1%		ASTM D-2842



Certified to NSF/ANSI 61
Manufacturing
Location: Canton, GA
For potable water applications, the minimum cure time is 12 hours at ambient temperature, with up to 2.5% accelerator.

continued

JSC Grout – Ultra

JSC Grout – Ultra Physical Properties

Liquid			
	Flex	Accelerator B	Test Method
Viscosity	650 cps	25 cps	ASTM D-1638
Specific Gravity	1.07	0.95	ASTM D-1475
Color	Pale Yellow	Clear	
Flash Point	> 250°F	225°F	ASTM D-92
Solid Cured			
Density	4 lb/ft. ³		ASTM D-1622
Elongation	300%		ASTM D-638
Tensile	300 psi		ASTM D-638
Toxicity	Non-Toxic		

JSC Grout – Classic

JSC Grout – Classic Physical Properties

Liquid			
	Flex	Accelerator B	Test Method
Viscosity	700 cps	25 cps	ASTM D-1638
Specific Gravity	1.13	0.95	ASTM D-1475
Color	Amber	Clear	
Flash Point	> 425°F	225°F	ASTM D-92
Solid Cured			
Density	4 lb/ft. ³		ASTM D-1622
Elongation	44%		ASTM D-638
Tensile	29 psi		ASTM D-638
Shear	17 psi		ASTM C-273
Water Absorption	< 1%		ASTM D-2842

JSC Gel Foam

JSC Gel Foam is a low viscosity, hydrophilic, polyurethane formulation with high elongation properties for sealing leaking cracks or joints in concrete structures with continuous moisture exposure. The single-component system reacts with water to form a foam or gel based on the amount of water encountered. This hydrophilic resin is a MDI based, solvent free formulation. The product may be pumped as a single component or as a dual component system with water.

Advantages

- 100% solids
- Expands up to 25 times initial volume
- Pumps as a single component
- Controllable reaction times
- Excellent resistance and durability
- Outstanding adhesion
- Non-hazardous shipping
- Non-flammable
- Cures inert, non-toxic permanent seal

Typical Application

- Water related facilities
- Waste treatment plants
- Storm water systems
- Underground vaults
- Manhole facilities
- Concrete dams
- Tunnels
- Earthen dams
- Parking garages

Typical Reaction Profile

When mixed at a one to one ratio with water at 77° F the typical initiation time is 30 seconds and full rise is about 6 minutes.

Standard Packaging

JSC Gel Foam is available in 250 gallon totes, 50 gallon drums and 5 gallon pails.

Physical Properties - JSC Gel Foam

Liquid		
	Gel Foam	Test Method
Viscosity	400 cps	ASTM D-4016
Specific Gravity	1.16	ASTM D-1475
Color	Pale yellow	
Flash Point	>200°F	ASTM D-93
Cured		
Elongation	450%	ASTM D-3574
Tensile Strength	1950 psi	ASTM D-3574
Toxicity	Non-toxic	

Read and understand the SDS prior to use.



US Foam

US Foam is a two-component grout that comprises a silicate and a modified polyisocyanate intended for:

- Strata consolidation
- Coal face reinforcement
- Large or small cavity filling
- Water control

The two-component resin is delivered by a pump unit and injected in a ratio of 1:1 by volume through a mixing gun. The resulting medium sets to produce an elastic, expanding mass with outstanding adhesive and compressive strength.

When injected into the strata, the medium flows into the cracks and fissures and rigidifies, thereby creating an elastic bond that is capable of retaining its integrity even after rock movement has occurred. US Foam remains unaffected by water, therefore it will always expand to completely fill any void without compromising strength and expansion ability. In addition, US Foam is fire-resistant.

The expansion ratio of US Foam is approximately 30:1. Its low exothermic reaction allows large cavities to be filled completely in one pumping session without overheating.

Technical Data – US Foam

Component Data		Resin	Catalyst
Density at 77°F (25°C), oz/in. ³ (g/cm ³)		0.68 (1.2)	0.88 (1.5)
Viscosity at 77°F (25°C), MPa.s		250	400
Mixing Ratio (in volume)		1	1
Shelf Life at 68°F (20°C), Months		12	12
Storage Temperature, °F (°C)		41–86 (5–30)	41–86 (5–30)
Reaction Data			
Rise Time (minutes)		1:50	
%NCO		24.77%	
Exotherm		177°F (81°C) at 3 min 50 sec	
Compressive Strength at Yield, psi (MPa)		7.5 (0.05)	
Expansion Ratio		30:1	



US Grout

US Grout is a two-component grout that comprises a silicate and a modified polyisocyanate intended for:

- Strata consolidation
- Coal face reinforcement
- Water control

The two-component resin is delivered by a pump unit and injected in a ratio of 1:1 by volume through a mixing gun. The resulting medium sets to produce an elastic non-foaming mass with outstanding adhesive and compressive strength.

When injected into the strata, the medium flows into the cracks and fissures and rigidifies, thereby creating an elastic bond that is capable of retaining its integrity even after rock movement has occurred. US Grout remains unaffected by water, is non-foaming and can even adhere to damp surfaces. In addition, US Grout is fire-resistant.

Technical Data – US Grout

Component Data		Resin	Catalyst
Density at 77°F (25°C), oz/in. ³ (g/cm ³)		0.68 (1.2)	0.88 (1.5)
Viscosity at 77°F (25°C), MPa.s		250	400
Mixing Ratio (in volume)		1	1
Shelf Life at 68°F (20°C), Months		12	12
Storage Temperature, °F (°C)		41–86 (5–30)	41–86 (5–30)
Reaction Data			
Set Time (minutes)		2:00	
Ultimate Tensile Strength, psi (MPa)		1400 (10)	
Compressive Strength at 50% Deformation, psi (MPa)		5800 (40)	

J-FIRM™ Soil Stabilization Grout



Jennchem's J-Firm Soil Stabilization Grout is a free flowing, low viscosity, sodium silicate grout and hardener that fully encapsulates and hardens loose soil in order to allow for safe excavation. Pumped at a 1:1 ratio, this product will permeate soil and sand to provide consolidation and support. Good for soils with very low void spacing.

Technical Data – J-FIRM

PHYSICAL PROPERTIES	JPH FOAM RESIN
Viscosity (cP, mixed)	5-8
Specific Gravity	1.6
Gel Time (minutes)	30
Compressive Strength (psi, 24 hours)	200

Applications

- Pre-Excavation Grouting
- Temporary Shoring

Advantages

- Pumped out of bulk containers from above ground
- Environmentally friendly
- Low viscosity
- Easy Clean up with water

Packaging

- Tote and truckload quantities

Storage and Shelf-Life

- Storage Temperature: 32-90°F (0-32°C)
- Shelf Life: 1 Year

Mixing

- Parts A and B are pumped at a 1:1 ratio. Part A should be mixed well prior to pumping. The components that comprise Part B should be combined and mixed 30 minutes prior to pumping and mixed again during the pumping process.

TDS-240 Urea Silicate Resin System

TDS-240 (or Top Down Silicate 240) is a two component urea silicate grout that comprises a silicate and a modified polyisocyanate intended for strata consolidation, water control and rock/cable bolt grouting.

This grout is designed to secure rock and cable bolts in tunnel and mine applications. It quickly develops a thixotropic characteristic that minimizes free flow but allows continuous, as well as interrupted, pumping overhead.



Typical Chemical Analysis	Part A (Isocyanate)	Part B (Silicate)
Viscosity @74°F, ASTM D-1638	400 cps	285 cps
Physical State	Liquid	Liquid
Color	Amber	Slightly Yellow
Specific Gravity	1.17	1.51
Hygroscopicity	Reacts with Water And Evolves CO ₂ Gas	Contains Water

Material Metering Ratios	Part A (Isocyanate)	Part B Silicate
Parts by Volume	50 Parts	50 Parts
Parts by Weight	40 Parts	50 Parts

Reaction Profile	(100 grams, 74°F)
Gel Time	4–6 Minutes

Typical Physical Properties	Results
Nominal Compressive Strength, 24 Hour Age	4100 psi

MSDS should be read before using JENNCHEM products.

J-PLUG Acrylate Grout

J-PLUG Acrylate Grout is a fast reacting, low viscosity, acrylate polymer that is used to seal water leaks in concrete structures and stabilize soils. J-PLUG utilizes environmentally safe acrylic resins in conjunction with catalysts and accelerators. The system is typically pumped at a ratio of 1:1 (catalyst & water : resin & promoter), when controlling active water leaks and at higher ratios with water when ultra-low viscosity is needed to penetrate fine soil particles. At 1:1 ratio, the resulting product is a flexible elastomer, while at higher ratios of water to catalyst, a pliable gel results.

Applications

J-PLUG is typically used to seal any leak below grade and applications include:

- Tunnels of all types
- Below grade parking garages
- Foundations
- Tanks, sewers, shafts
- Around large diameter pipes, cracked concrete and various failed construction joints.

Technical Data – J-PLUG Acrylate Grout

Physical Properties

Viscosity	5-8 cps mixed
Specific Gravity	1.2
Elongation	300%
Boiling Point	>212°F
Freezing Point	32°F
PH	6.5-7.5

Set Time

% of complete solution by weight		
Catalyst in Water	Promoter in Resin	Setting Time
0.25	0.25	40 Minutes
0.50	0.50	15 Minutes
1.00	1.00	3 Minutes
2.00	2.00	30 Seconds

Advantages

- Super low viscosity
- Easy clean up (soap and water)
- Non Hazardous for shipping
- Non Hazardous when cured
- Economical
- Non-flammable
- Reaction is site *adjustable*

Packaging, Storage and Mixing

J-PLUG Acrylate Grout is supplied in 275 gallon totes, 55 gallon drums and 5 gallon pails. The promoter and catalyst are supplied in plastic containers filled by weight as required. Materials should be stored above 40°F and below 80°F in plastic (or stainless steel) containers at all times and must be kept separated prior to use.

All equipment used to pump J-PLUG must be designed specifically for this acrylic formulation. Stainless steel pumps and equipment are required due to the corrosive nature of the materials. **Do not use aluminum components.** Catalyst and promoter components may form a toxic gas if mixed prior to field application.

Follow manufacturer's instructions carefully during mixing and application. Always wear protective clothing in accordance with current OSHA requirements. Avoid skin and eye contact. Do not ingest. Do not mix catalyst and promoter exclusively from other components.

Handling and Clean Up - Read MSDS and understand safety issues prior to use.

Grouts & Resins Usage

Cable Bolt Grouts

- **PUR70** is pumped (bottom up) into Fully-Grouted Cable Bolts (FGCB) to provide corrosion protection and improve bolt life.
- **TDS-240** is a urea silicate (top down) grout which is used when high early strength is required as in longwall recoveries. Full strength is achievable in 4 hours.

Cable Bolt Grouts

PUR70 (Bottom up grout)	Polyurethane grout for corrosion protection
TDS-240 (Top down grout)	Urea silicate grout for high early strength

Cavity Filling Grouts

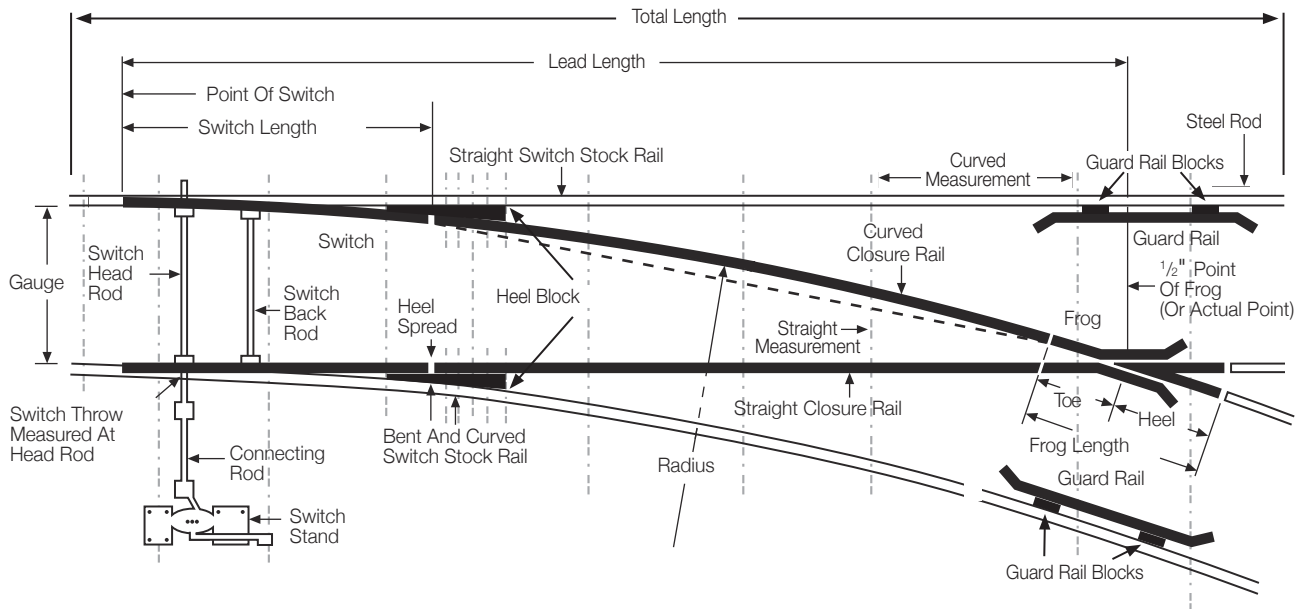
- **J-SEAL®** is a high strength foaming grout used primarily for rated seals. The J-SEAL placer pumps allow for control of the material density, so that lower strength mixes can be used for cavity fill applications such as behind steel sets.
- **JPH foam** is a phenolic foam (50:1) which can be used also to rapidly fill cavities with minimum construction of formwork. Because of the low exotherm, greater volumes of material can be more safely placed at any one time.
- **US foam** is a high expansion urea silicate foam (30:1) which can be used to rapidly fill cavities with minimum construction of formwork.

Cavity Filling

J-CRIB	2-part cement/silicate system pumped from surface
J-CRIB AP	all powder, 2-part cement system pumped from surface
J-SEAL	1 part foaming cement pumped from surface/ underground
US Foam	Urea silicate resin grout
JFill Pro	2-part foaming cement pumped from surface

Rail Switch Specifications

Diagram illustrates the principal elements of a turnout which consists of a frog, a switch, two guard rails, straight and curved closure rails, stock rails and a switch stand.



Rail Switch Specifications

Rail Weight	Turn Out Number	Track Gauge	Switch Point Length	Total Length	Lead Length	Curved Measurement	Straight Measurement
40 lb.	#3	42"	5'	Approx. 24' 7"	19'	13' 8.5"	13' 3.5"
60 lb.	#3	42"	5'	Approx. 24'-25'	19'	13' 8.5"	13' 3.25"
60 lb.	#3	44"	5'	Approx. 26'	20'	14' 8.5"	14' 3.5"
60 lb.	#4	44"	7.5'	Approx. 33'	28'	19' 10.25"	19' 6.75"
85 lb.	#3	42"	7.5'	Approx. 27'	21' 4.56"	13' 4.43"	12' 11.56"
85 lb.	#4	42"	7.5'	Approx. 30' 11.81"	25' 4.375"	16' 11.31"	16' 7.75"
85 lb.	#3	44"	7.5'	Approx. 27' 10"	22' 2.56"	14' 2.375"	13' 9.562"
85 lb.	#4	44"	7.5'	Approx. 33'	26' 5"	18' .125"	17' 8.375"
115 lb.	#4	47' 6.75"	11'	Approx. 47' 6.75"	33' 2.687"	19' 1"	18' 9.687"

Turnouts - Fully Erected and Knockdown Kits

Turnouts

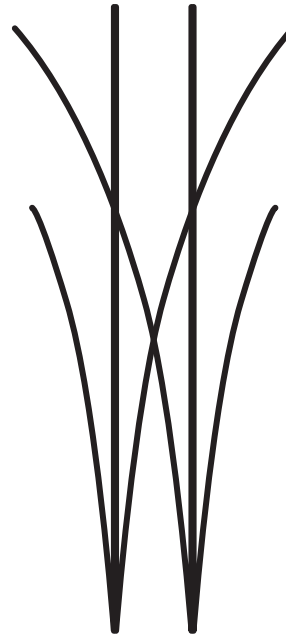
JENNMAR can supply fully erected turnouts, rails and accessories for 40 lb., 60 lb., 85 lb. and 115 lb. light rail trackwork in any gauge. We can also supply you with 60 lb. or 80 lb. knockdown turnout kits on skids. You can specify all individual components from switch points, fittings, switch rods, stands and replacement parts, to complete switches and turnouts, with any selection of combination slide plates and braces, plain plates and accessories.

Available Components

- Frogs
- Frog Bolts
- Switch Points
- Switch Point Protectors
- Gauge Rod 42 to 44 in 4 castings
- Heel Blocks
- Design 11 Switch Stand
- Design 9 Spring Connecting Rods
- Side Jaw Clips
- Guard Rail
- Wheel Stop
- De-railers
- Re-railers
- Rail Benders



Left Hand Turnout



Three-way Turnout



Right Hand Turnout



Fully Erected



Knockdown Turnout Kits on Skids

Turnouts - Fully Erected and Knockdown Kits

Material Components - 60 lb. #3 Erected Turnout at 42" Track Gauge on 3x8 Ironclad Ties

Quantity	Description
1	60 lb. #3 Solid Manganese frog
1	60 lb. 5' Right hand switch point
1	60 lb. 5' Left hand switch point
2	60 lb. Right hand side jaw clips
2	60 lb. Left hand side jaw clips
2	60 lb. Guard rails
4	60 lb. Flangeway blocks with bolts
1 Set	60 lb. Heel blocks with hardware
2	60 lb. Heel block rerailers (optional)
1	60 lb. #1 Switch throw rod for 42" track gauge
1	60 lb. #3 Curved closure rail for 42" track gauge
1	60 lb. #3 Straight closure rail for 42" track gauge
1	60 lb. #3 Curved stock rail
1	60 lb. #3 Straight stock rail
1	Design 11 Switch stand with reflector weight handle
1	Design 9 Spring connecting plates with riser (brace plates)
6	60 lb. Combination plates with riser (brace plates)
6	60 lb. Rail braces
1	60 lb. Switch point protector kit

Material Components - 60 lb. #3 Erected Turnout at 44" Track Gauge on 3x8 Ironclad Ties

Quantity	Description
1	60 lb. #3 Solid Manganese frog
1	60 lb. 5' Right hand switch point
1	60 lb. 5' Left hand switch point
2	60 lb. Right hand side jaw clips
2	60 lb. Left hand side jaw clips
2	60 lb. Guard rails
4	60 lb. Flangeway blocks with bolts
1 Set	60 lb. Heel blocks with hardware
2	60 lb. Heel block rerailers (optional)
1	60 lb. #1 Switch throw rod for 44" track gauge
1	60 lb. #3 Curved closure rail for 44" track gauge
1	60 lb. #3 Straight closure rail for 44" track gauge
1	60 lb. #3 Curved stock rail
1	60 lb. #3 Straight stock rail
1	Design 11 Switch stand with reflector weight handle
1	Design 9 Spring connecting plates with riser (brace plates)
6	60 lb. Combination plates with riser (brace plates)
6	60 lb. Rail braces
1	60 lb. Switch point protector kit

Turnouts - Fully Erected and Knockdown Kits

Material Components - 85 lb. #3 Erected Turnout at 42" Track Gauge on 3x8 Ironclad Ties

Quantity	Description
1	85 lb. #3 Solid Manganese frog
1	85 lb. 7.5' Right hand switch point
1	85 lb. 7.5' Left hand switch point
2	85 lb. Right hand side jaw clips
2	85 lb. Left hand side jaw clips
2	85 lb. Guard rails
4	85 lb. Flangeway blocks with bolts
1 Set	85 lb. Heel blocks with hardware
2	85 lb. Heel block rerailers (optional)
1	85 lb. #1 Switch throw rod for 42" track gauge
1	85 lb. #3 Curved closure rail for 42" track gauge
1	85 lb. #3 Straight closure rail for 42" track gauge
1	85 lb. #3 Curved stock rail
1	85 lb. #3 Straight stock rail
1	Design 11 Switch stand with reflector weight handle
1	Design 9 Spring connecting plates with riser (brace plates)
6	85 lb. Combination plates with riser (brace plates)
6	85 lb. Rail braces
1 Set	85 lb. Switch point protector kit

Material Components - 85 lb. #3 Erected Turnout at 44" Track Gauge on 3x8 Ironclad Ties

Quantity	Description
1	85 lb. #3 Solid Manganese frog
1	85 lb. 7.5' Right hand switch point
1	85 lb. 7.5' Left hand switch point
2	85 lb. Right hand side jaw clips
2	85 lb. Left hand side jaw clips
2	85 lb. Guard rails
4	85 lb. Flangeway blocks with bolts
1 Set	85 lb. Heel blocks with hardware
2	85 lb. Heel block rerailers (optional)
1	85 lb. #1 Switch throw rod for 44" track gauge
1	85 lb. #3 Curved closure rail for 44" track gauge
1	85 lb. #3 Straight closure rail for 44" track gauge
1	85 lb. #3 Curved stock rail
1	85 lb. #3 Straight stock rail
1	Design 11 Switch stand with reflector weight handle
1	Design 9 Spring connecting plates with riser (brace plates)
6	85 lb. Combination plates with riser (brace plates)
6	85 lb. Rail braces
1 Set	85 lb. Switch point protector kit

Turnouts - Fully Erected and Knockdown Kits

Material Components - 60 lb. #3 Knockdown Turnout at 42" Track Gauge for use on Steel Ties

Quantity	Description
1	60 lb. #3 Solid Manganese frog
1	60 lb. 5' Right hand switch point
1	60 lb. 5' Left hand switch point
2	60 lb. Side jaw clips
2	60 lb. Design 2 guard rails
4	60 lb. Flangeway blocks with bolts
1 Set	60 lb. Heel blocks with bolts (1 left hand and 1 right hand)
1	60 lb. Switch throw rod for 42" track gauge
1	60 lb. #3 Curved closure rail for 42" track gauge
1	60 lb. #3 Straight closure rail for 42" track gauge
1	Design 11 Switch stand with reflector weight handle
1	Design 9 Spring connecting rod
1 set	60 lb. Switch point protector kit

*Optional items may include: Heel block rerailers or steel ties sets

Material Components - 60 lb. #3 Knockdown Turnout at 42" Track Gauge for use on Wood Ties

Quantity	Description
1	60 lb. #3 Solid Manganese frog
6	60 lb. Flat twin tie plates (frog plates)
1	60 lb. 5' Right hand switch point
1	60 lb. 5' Left hand switch point
2	60 lb. Side jaw clips
2	60 lb. Design 2 guard rails
4	60 lb. Flangeway blocks with bolts
1 Set	60 lb. Heel blocks with hardware
1	60 lb. #1 Switch throw rod for 42" track gauge
1	60 lb. #3 Curved closure rail for 42" track gauge
1	60 lb. #3 Straight closure rail for 42" track gauge
2	60 lb. #3 Heel plates
2	60 lb. #4 Heel plates
1	Design 11 Switch stand with reflector weight handle
1	Design 9 Spring connecting plates with riser (brace plates)
6	60 lb. Combination plates with riser (brace plates)
6	60 lb. Rail braces
1 Set	60 lb. Switch point protector kit

*Optional items may include: Heel block rerailers

Turnouts - Fully Erected and Knockdown Kits

Material Components - 60 lb. #3 Knockdown Turnout at 44" Track Gauge for use on Steel Ties

Quantity	Description
1	60 lb. #3 Solid Manganese frog
1	60 lb. 5' Right hand switch point
1	60 lb. 5' Left hand switch point
2	60 lb. Side jaw clips
2	60 lb. Design 2 guard rails
4	60 lb. Flangeway blocks with bolts
1 Set	60 lb. Heel blocks with bolts (1 left hand and 1 right hand)
2	60 lb. Heel block rerailers (optional)
1	60 lb. Switch throw rod for 44" track gauge
1	60 lb. #3 Curved closure rail for 44" track gauge
1	60 lb. #3 Straight closure rail for 44" track gauge
1	Design 11 Switch stand with reflector weight handle
1	Design 9 Spring connecting plates with riser (brace plates)
1 Set	60 lb. Switch point protector kit

*Optional items may include: Heel block rerailers or steel ties sets

Material Components - 60 lb. #3 Knockdown Turnout at 44" Track Gauge for use on Wood Ties

Quantity	Description
1	60 lb. #3 Solid Manganese frog
6	60 lb. Flat twin tie plates (frog plates)
1	60 lb. 5' Right hand switch point
1	60 lb. 5' Left hand switch point
2	60 lb. Side jaw clips
2	60 lb. Design 2 guard rails
4	60 lb. Flangeway blocks with bolts
1 Set	60 lb. Heel blocks with hardware (1 left hand and 1 right hand)
2	60 lb. Heel block rerailers (optional)
1	60 lb. Switch throw rod for 44" track gauge
1	60 lb. #3 Curved closure rail for 44" track gauge
1	Design 11 Switch stand with reflector weight handle
1	Design 9 Spring connecting rod
6	60 lb. Combination plates with riser (brace plates)
6	60 lb. Rail braces
2	60 lb. #3 Heel plates
2	60 lb. #4 Heel plates
1 Set	60 lb. Switch point protector kit

*Optional items may include: Heel block rerailers

Turnouts - Fully Erected and Knockdown Kits

Material Components - 85 lb. #3 Knockdown Turnout at 42" Track Gauge for use on Wood Ties

Quantity	Description
1	85 lb. #3 Solid Manganese frog
6	85 lb. Flat twin tie plates (frog plates)
1	85 lb. 7.5' Right hand switch point
1	85 lb. 7.5' Left hand switch point
2	85 lb. Right hand side jaw clips
2	85 lb. Left hand side jaw clips
2	85 lb. Guard rails
4	85 lb. Flangeway blocks with bolts
1 Set	85 lb. Heel blocks with hardware
1	85 lb. #1 Switch throw rod for 42" track gauge
1	85 lb. #3 Curved closure rail for 42" track gauge
1	85 lb. #3 Straight closure rail for 42" track gauge
1	Design 11 Switch stand with reflector weight handle
1	Design 9 Spring connecting rod
6	85 lb. Combination plates with riser (brace plates)
6	85 lb. Rail braces
2	85 lb. #3 Heel plates
2	85 lb. #4 Heel plates
1 Set	85 lb. Switch point protector kit

*Optional items may include: Heel block rerailers

Material Components - 85 lb. #3 Erected Turnout at 44" Track Gauge on 3x8 Ironclad Ties

Quantity	Description
1	85 lb. #3 Solid Manganese frog
6	85 lb. Flat twin tie plates (frog plates)
1	85 lb. 7.5' Right hand switch point
1	85 lb. 7.5' Left hand switch point
2	85 lb. Right hand side jaw clips
2	85 lb. Left hand side jaw clips
2	85 lb. Guard rails
4	85 lb. Flangeway blocks with bolts
1 Set	85 lb. Heel blocks with hardware
2	85 lb. Heel block rerailers (optional)
1	85 lb. #1 Switch throw rod for 44" track gauge
1	85 lb. #3 Curved closure rail for 44" track gauge
1	85 lb. #3 Straight closure rail for 44" track gauge
1	Design 11 Switch stand with reflector weight handle
1	Design 9 Spring connecting plates with riser (brace plates)
6	85 lb. Combination plates with riser (brace plates)
2	85 lb. Plain switch plates
6	85 lb. Rail braces
2	85 lb. #3 Heel plates
2	85 lb. #4 Heel plates
1 Set	85 lb. Switch point protector kit

*Optional items may include: Heel block rerailers

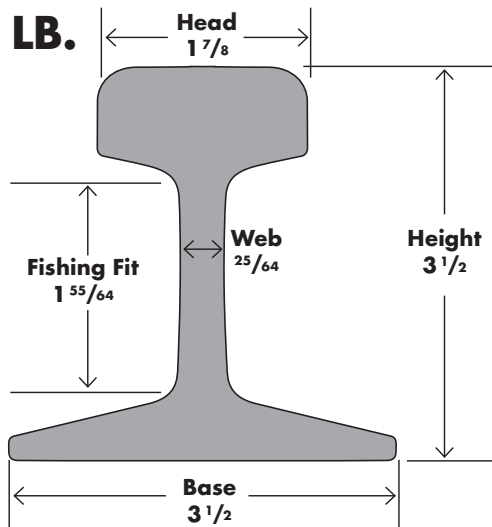
Rail Sections

Rail

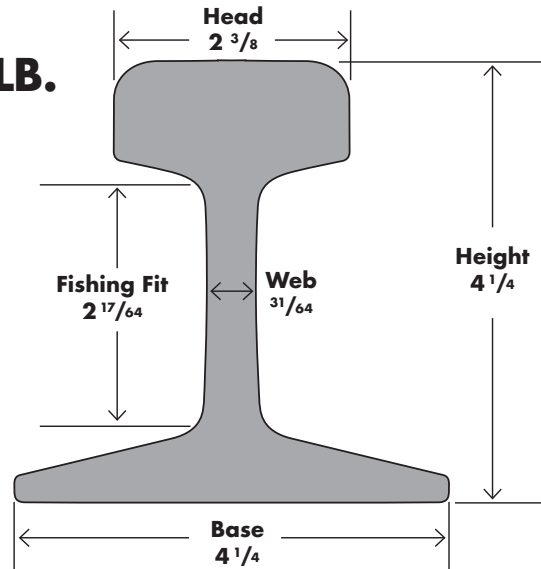
Technical Data — 40 lb, 60 lb, 85 lb and 115 lb Rail

	Standard Length, in.	Standard Drilling, in.	Joint Bar Length, in.	Bolt Diameter, in.	Height, in.	Base, in.	Head, in.	Web, in.	Fishing, in.
40 LB	30 in	2.5 in x 5 in	20 in	.75 in	3.5 in	3.5 in	1.875 in	.3906 in	1.8593 in
60 LB	30, 33, 39 in	2.5 in x 5 in	20 in	.75 in	4.25 in	4.25 in	2.375 in	.4843 in	2.2656 in
85 LB	30, 33, 39, 60 in	2.5 in x 5 in	24 in	.875 in	5.1875 in	5.1875 in	2.5625 in	.5625 in	2.75 in
115 LB	33, 39 in	2.5 in x 6x6 in	36 in	1 in	6.625 in	5.5 in	2.7187 in	.625 in	3.8125 in

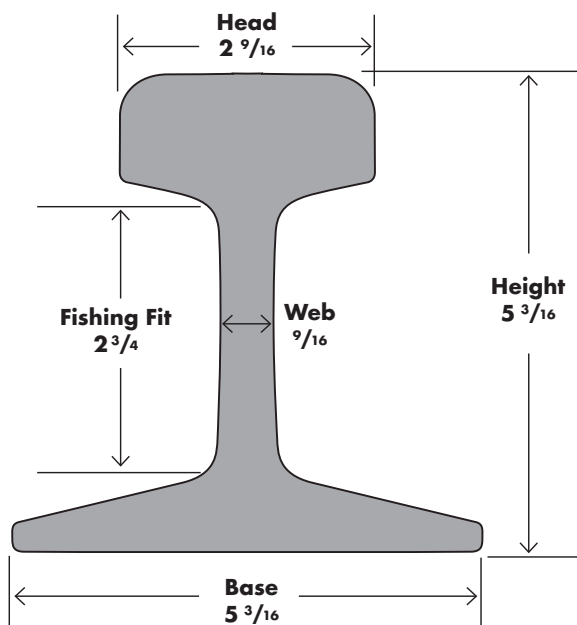
40 LB.



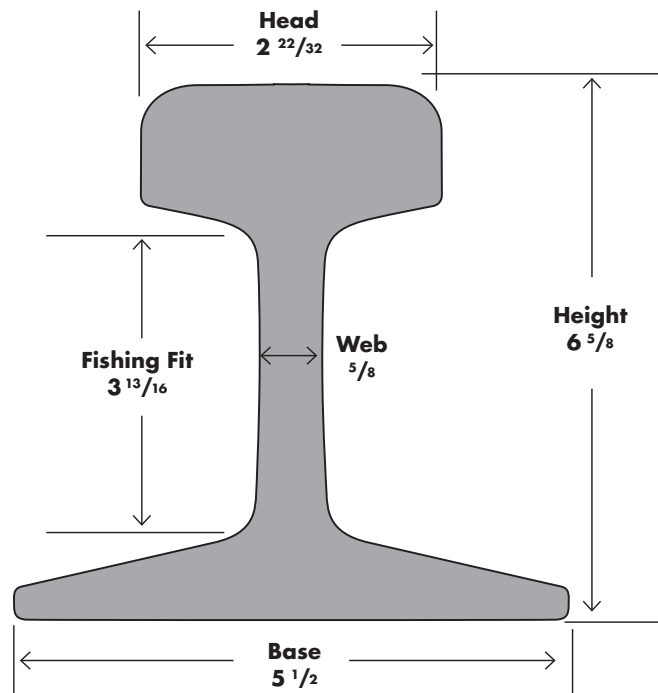
60 LB.



85 LB.



115 LB.

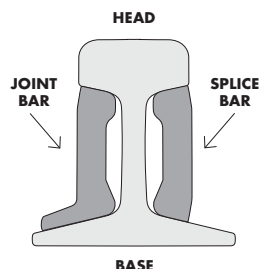


Joint and Compromise Bars

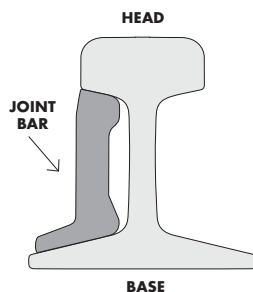
Joint and Splice Bars (Fish Plates)

JENNMAR offers a wide range of rail connector bars including compromise bars, splice bars, and joint bars. Our bars are hot formed with high quality steel for maximum strength.

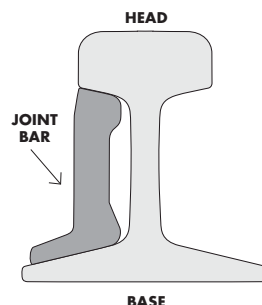
40 LB.



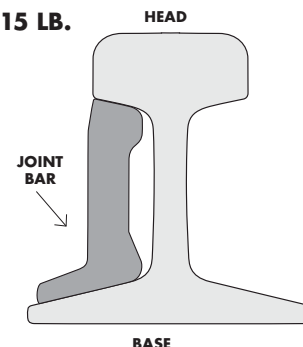
60 LB.



85 LB.

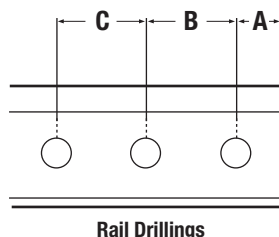


115 LB.

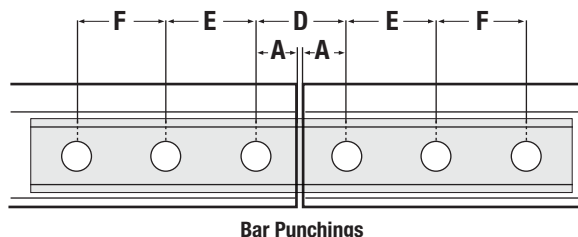


Technical Data — Joint Bar and Splice Bar

	Joint Bar Length, in.	Joint Bar Weight, lb.	Splice Bar Length, in.	Bolt Diameter
40 LB	20 in	15.2 lbs/pr	20 1/8 in	.75 in
60 LB	20 in	27.2 lbs	20 1/8 in	.75 in
85 LB	24 in	49.6 lbs/pr	20 1/8 in	.875 in
115 LB	36 in	105.5 lbs/pr	20 1/8 in	1 in



Rail Drillings



Bar Punchings

Technical Data — Joint Bar

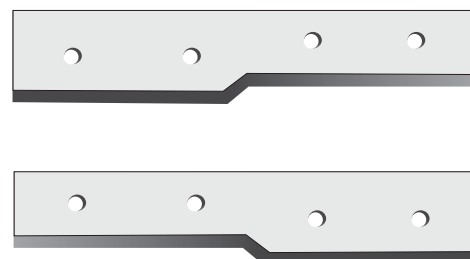
	Rail Drillings			Bar Punchings		
	A	B	C*	D	E	F*
40-85 lb	2 1/2 in	5 in	---	5 1/8 in	5 in	---
115 lb	3 1/2 in	6 in	6 in	7 1/8 in	6 in	6 in

*These dimensions to be omitted doe 4-hole bars.

Compromise Bars

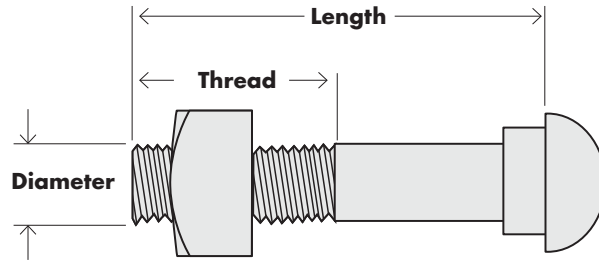
Compromise joint bar is a type of non-standard fish plate consisting of two separate bars— an outside joint bar and an inside joint bar, these bars are designed to smoothly match the gauge-head face of two rails. Each compromise joint bar will provide proper alignment of rails on gauge line and top of head and prevent excessive wear at the joint. They are easy to install and are available in sizes to join 60 lb to 85 lb and join 85 lb to 115 lb combinations of sections.

- Come in pairs
- Bolt holes are alternately round and oval
- Bolts are not provided



Track Bolts and Spikes

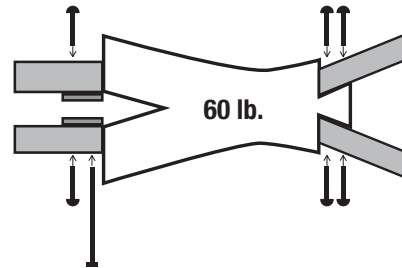
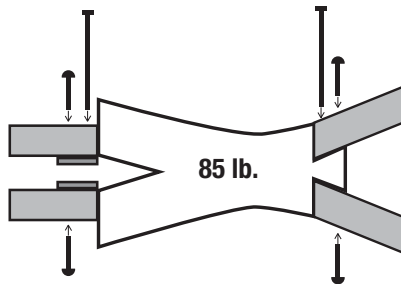
Track Bolts



Technical Data — Track Bolts Standard Size

Rail Weight	Diameter, in.	Length	Thread	Avg. Pieces 200 lb keg	Avg. Pieces 50 lb keg
115	1 in	5-1/2 in	2-1/4 in	111	27
85	7/8 in	4-1/2 in	2 in	163	40
60	3/4 in	4 in	1-3/4 in	272	68
40	3/4 in	3-1/2 in	1-3/4 in	293	73

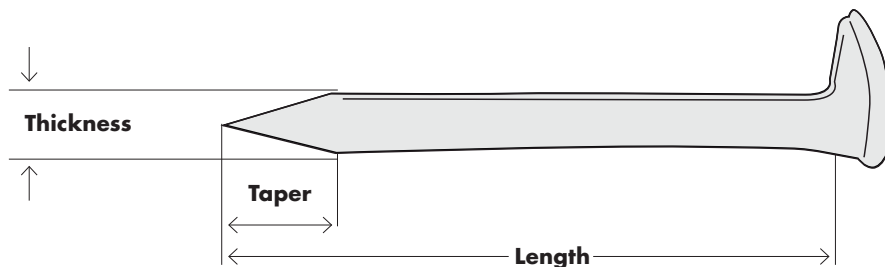
Frog Bolts & Heel Block Bolts



Technical Data — Frog and Heel Block Bolts

Rail Weight		Frog Bolt Length, in.	Pieces	Heel Block Bolt Length, in.	Pieces
85	Button Head	7/8 in x 4-1/2 in, 7/8 x 4 in or 7/8 x 11 in	4	7/8 in x 11 in	4
	Square Head	7/8 in x 9 in or 7/8 x 8-1/2 in	2		
60	Button Head	3/4 x 3-1/2 in, 3/4 x 4 in or 3-1/4 x 10 in	6	3/4 x 9 in	4
	Square Head	3/4 x 7 in	1		

Track Spikes



Technical Data — Track Spikes

Rail Weight	Thickness	Length	Taper	Avg. Pieces 200 lb keg	Avg. Pieces 100 lb keg
140-100 ¹	5/8 in	6 in	1-1/4 in	244	122
90-80	9/16 in	5-1/2 in	1-1/8 in	322	161
70-40	1/2 in	4-1/2 in	7/8 in	505	252

* Manufactured to AREA and ASTM specifications 1. Note: 100 lb AREA may require a 9/16 inch spike

Rail Ties

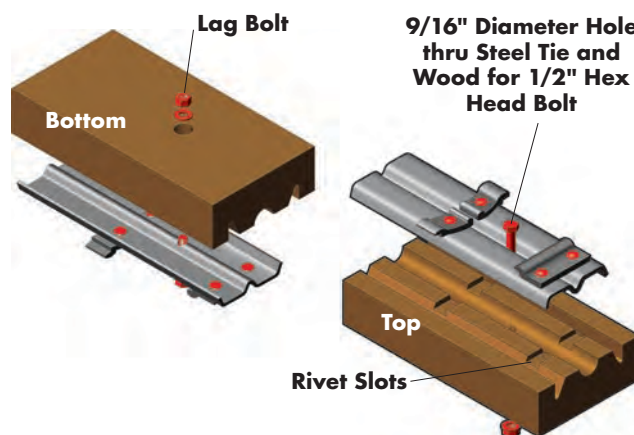
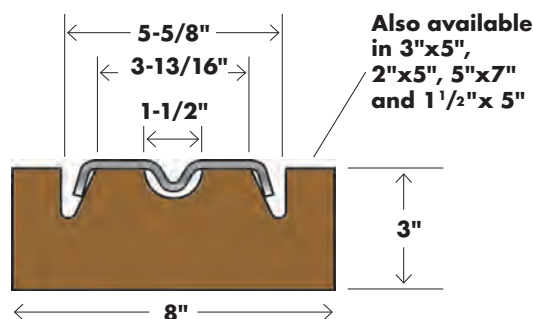
JENNMAR offers a complete line of steel and iron clad ties to the mining and tunneling industries. We can engineer our ties to meet your specific haulage application. Our ties can be designed for any type of rail and gauge.

Advantages

- Designed for easy installation
- Lend themselves to the most punishing main line haulage needs
- Do not require constant inspection and maintenance

Iron Clad Ties

JENNMAR's Iron Clad Ties have been redesigned to accommodate our new No. 6 shortleg steel tie. The flat section of the top of the tie mates perfectly with the flat section of the top of the wood providing crush resistance exceeding 20,000 lbs.



Steel Ties

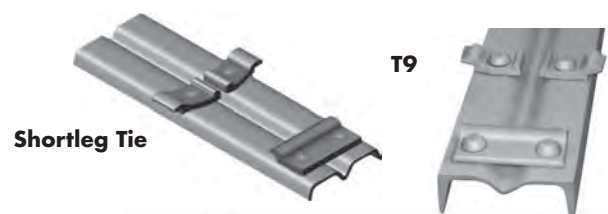
JENNMAR steel ties feature special riveted rail clips, are lightweight and easy to handle. Our quality control standards ensure consistent track gauging, and superior strength steel. Our T4, T5 and T6 Shortleg Ties add superior crush resistance.

JENNMAR also offers an exceptionally strong T-9 Steel Rail Tie. This design, can be manufactured for any special application. The T-9 is designed for mining and industrial applications such as: coal, hard rock, factories, mills, quarries, tunnel, and various construction projects. This heavy duty design provides long-life use.

- For 30 lb rail and heavier
- Easily installed; manufactured to fit any track gauge; assures exact and constant track gauge
- Readily available from all JENNMAR locations

Technical Data — Steel Ties

Tie Section	Weight, lb/ft. (kg/m)
T-4	3.85 (5.7)
T-5	5.0 (7.4)
T-6	6.0 (8.9)
T-9	10.5 (15.6)



Shortleg Tie

T9

Staggered Clips

Four movable clips and two stationary clips one on the outside end and one on the inside end.

Stationary Clips

Four movable clips and two stationary clips on the outside ends.

Clips

Large inventories of rail clips are available for most rail sections.



Tunneling Tie

Tunneling Ties

Our Tunneling Ties are specifically designed for use in tunnel projects where the bottom surface is not flat. These tunneling ties are designed to project specifications for tunnel diameter, wheel load and tie spacing. They can be used without blocking and provide engineering support while maintaining proper track gauge. Axle loads of 45,000 lbs on 30" tie spacing have been successfully implemented.

Frogs, Switch Stand and Spring Connectors

Frogs

Technical Data — Frogs

Rail Weight	No.	Toe, ft. in.	Heel, ft. in.	Total Length, ft. in.
40	#3	0' 9-1/8"	1' 6-3/16"	2' 3-5/16"
	#4	1' 1/16"	1' 8-1/8"	2' 8-3/16"
60	#3	0' 9-1/8"	1' 7"	2' 4-1/8"
	#4	1' 1/16"	2' 1-3/16"	3' 1-1/4"
85	#3	0' 10"	1' 10-1/2"	2' 8-1/2"
	#4	1' 1-1/2"	2' 6"	3' 7-1/2"



Switch Stand

Design 10 Switch Stand with optional reflector switch handle is recommended for use with rail weighing 60 lbs per yard and lighter. For rail weighing 60 lbs or more Design 11 is recommended.



Spring Connecting Rods

Design 8, 30" Long Spring Connecting Rods is for use with the Design 10 Switch Stand. Design 9, 38" Long Spring Connecting Rods is for use with the Design 11 Switch Stand.



Switch Rods, Points and Accessories

Switch Rods and Accessories

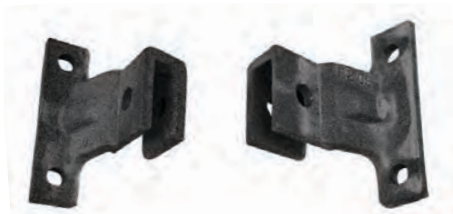
Illustrated are non-insulated head or No. 1 rods, for attachment to connecting rod of switch stand. Second or third rods are similar in construction but shorter in length. When ordering separately, specify Head Rod (No. 1) or Back Rod (No. 2 or 3), gauge of track, size of rail, and if used for double, single or non-reinforced switch points. All switch rods can be furnished insulated when required. Clips and vertical bolts are not furnished as part of rods and must be specified.



Switch Rods 44" and 42"

Technical Data — Switch Rod

Rail Weight	Track Gauge	Length, in.	Thickness, in.	Width, in.
60	42"	60"	0.75"	2"
	44"	62"	0.75"	2"
85	42"	63.5"	0.75"	2.5"
	44"	65.5"	0.75"	2.5"



Side Jaw Clips (above) are available for 60 lb and 85 lb rail.

Adjustable Side Jaw Clips (below) are available for 115 lb rail.



Adjustable Side Jaw Clips



Switch Protector



Switch Points with Side Jaw Clips

Combination Solid Riser Slide Plate and Rigid Brace



Combination Plate with Riser are available for 60 lb and 85 lb rail. This plate is machined from solid steel and is specified with heavy-duty switches used with heavier rail sections. A shoulder provides a solid seat for the stock rail. Plates are furnished 7" and 8" wide, and are 3/4" in thickness through the rail seat. Suitable braces 3/8" or 1/2" thick are furnished as shown.



Rigid Brace
nonadjustable, 3/8" or 1/2"

Heel Blocks

Heel Blocks

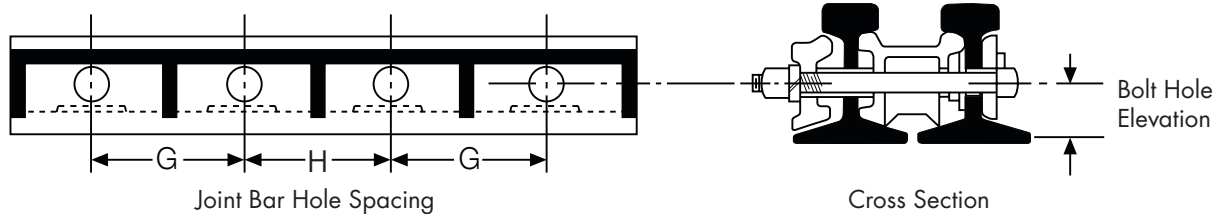
The heel block, welded together from tough rolled-steel components, can be made to fit switches of any length, and rail of any weight. A joint consists of the heel block and two splice plates and necessary long bolts.

This switch heel block joint does two things: (1) it adds safety to the switch; and (2) maintains gage at the heel end of a switch, keeping closure rail and switch point in correct alignment, both vertically and horizontally.

All bolts can be tightened without interfering with lateral movement of switch points.

When ordering switches, please specify:

- Number of joints (half RH, and half LH). If not ordered in pairs, specify if for right or left hand point.
- Length of point and switch design number.
- Weight and section of rail.
- Rail drilling (unless standard drilling is desired). Diameter, elevation and spacing of holes (G-H-G) in joint bar.



Left Hand Heel Block



Right Hand Heel Block

Rail Gauge Rods

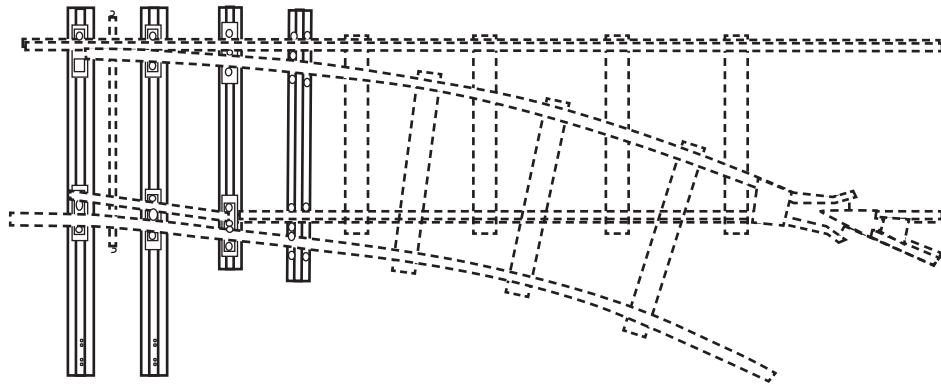
Double End Gauge Rod has two jaws, two nuts, and two washers on both ends of the rod.



Guardrails and Guardrail Blocks

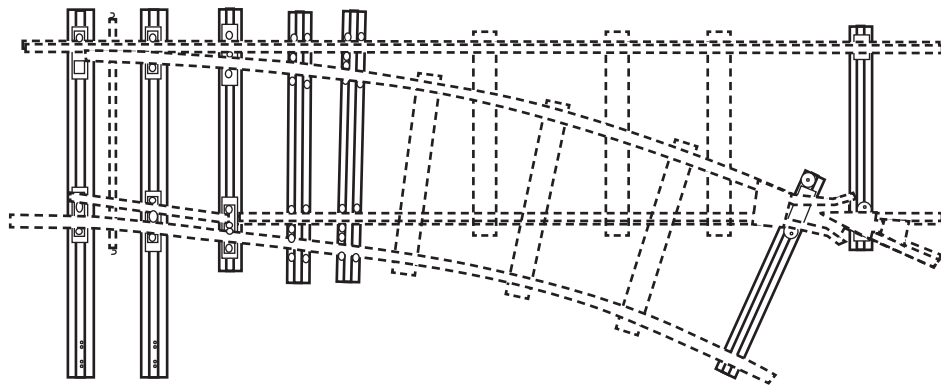
Guard Rails measure 4'6" in length for 40 lb, 60 lb, and 85 lb track gauge. Blocks, bolts and other mounting hardware required.





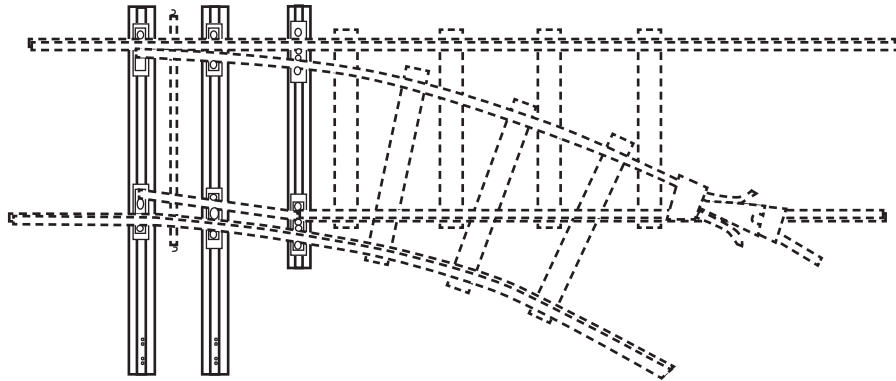
Switch Tie Set "C"

Switch Tie Set "C" may be used for 5 ft, or 6 ft switches. The tie set includes two long ties for the parallel-throw switch stand, one intermediate tie, and one tie under the switch heel.



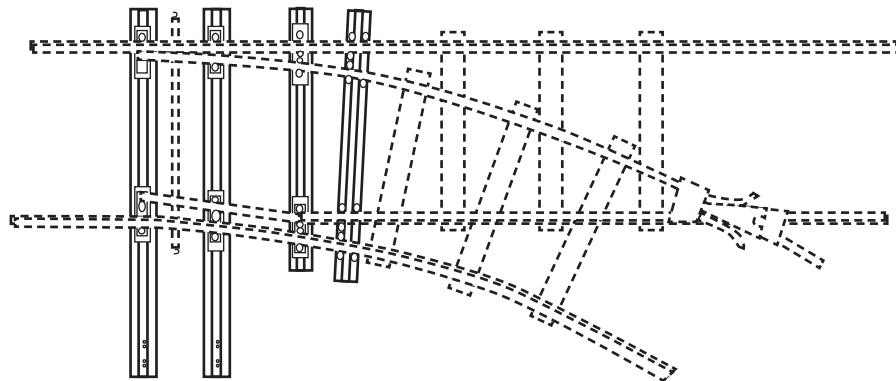
Switch Tie Set "H"

Turnout Tie Set "H" is shipped complete with riveted frog ties and is recommended for turnouts having 5 ft., or 6 ft. switches. The complete set includes two long ties for the parallel-throw switch stand, one intermediate tie, one tie under the switch heel, one tie beyond the switch heel, and two frog ties.



Switch Tie Set "A"

Switch Tie Set "A" may be used for 3 ft 6 in., and 4 ft switches. The tie set includes two long ties for the parallel-throw switch stand, and one tie under the switch heel.



Switch Tie Set "B"

Switch Tie Set "B" is recommended for 3 ft 6 in., and 4 ft switches. The tie set includes two long ties for the parallel-throw switch stand, one tie under the switch heel, and one tie beyond the switch heel.

Clamp

Clamp-type car stop is designed for permanent or temporary installation on exposed rails. Used when heavy and expensive bumping posts are not required, the stop is simple to handle and attach, and mounts with four 1" (25 mm) diameter bolts and two wedge-type clamping plates (no drilling needed). Car stops can be removed when not needed. As the car bumps the stop, the wedge design tightens its hold on the rail.

Hinged, Locking Type

Stops are bolted through web of rail. Stops fold outward when not needed. Lock casting grips head of rail and can be padlocked to prevent unauthorized use of stops. If load is too great, bolts can shear.

- Right Hand- Wt. 94 lbs.
- Left Hand - Wt. 94 lbs.
- 1-2 cars. - Light-duty side track.

Wedge

Wedge holds bolted-together car stop to rail. Stop stands 15 inches above rail. Can be used as chock as well as stopping device. Tighten bolts periodically and re-hammer wedge if loosened. Car stop is assembled on head of rail by tightening 5 bolts and driving wedge from the rear.

- Right Hand- Wt. 107 lbs.
- Left Hand - Wt. 107 lbs.
- 1-2 cars. - Light-duty side track.

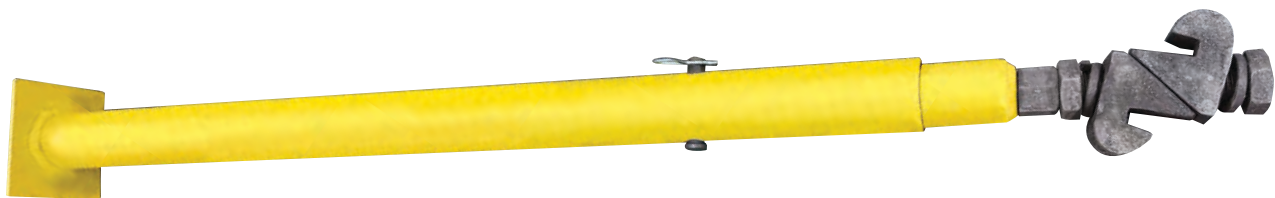


Track Stabilizers

Track stabilizers stabilize the track by applying force directly into the track structure to keep the track from sliding horizontally. Sold in pairs.

Technical Data — Track Stabilizers

Rail Weight	Max Length, ft.
60	5-1/2'
85	7-1/2'



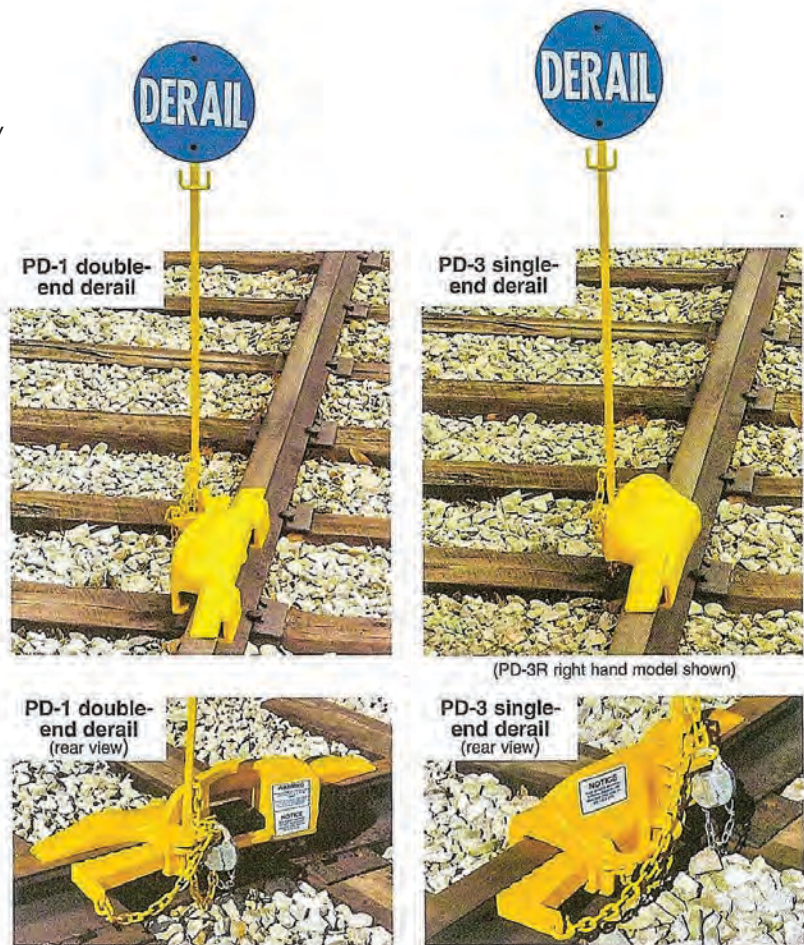
Portable Derails

Available in both double end and single end. Wedge-type clamp secures the derail and flag to the rail head. Lightweight, tough, easily and quickly installed, they provide protection for track crews anywhere. Clamp assembly accepts customer's padlock.

Technical Data — Portable Derails

Rail Weight	Item	Weight, lbs.	Length, in.
60-141	PD-1	71	32.5"
20-60	PD-2	43	19.75"
60-141	PD-3L*	73	21.125"
60-141	PD-3R*	73	21.125"

* The PD-3L is made specifically for the left rail; the PD-3R is made specifically for the right rail.



Hinged Derails

The HDF and HDH derail staff assemblies will fit all HD Series Derails. HDF is a manual assembly with no connecting rod. HDH includes a connecting rod and the staff automatically "flips up" when derail is thrown onto rail. Double sided derail rail flags are sold separately.

Technical Data — Hinged Derails

Rail Weight	Item	Weight, lbs.	Length, in.
60-133	HDH	108	30.625"
80-141	HDH-140	109	30.625"
60-141	HDF-Staff	6	49"
60-141	Target Stand	30	4"



Rail Benders

30 Ton Hydraulic Rail Bender

30 Ton Bender for conventional strength rail for switch point pockets and rail repairs. For 60-140 lbs. gauge track.

Single hook bender frame. Safety chain secures ram/pump unit to frame.

- Wt. 181 lbs. - 60-140 lb. Rail



Hydraulic Rail Bender

2H: Standard model bender for curving mine rail and bending switchpoint "knucks" in rails 25-70 lbs.

Quick ram retraction. Heavy-duty springs pull piston completely into cylinder in less than 5 seconds. No pry-bar needed to release ram from rail.

- Wt. 138 lbs. - 60-70 lb. Rail
- Wt. 95 lbs. - 40-60 lb. Rail
- Wt. 85 lbs. - 25-40 lb. Rail



Screw Type Rail Bender

2H50: Operator supplies a steel bar to turn the screw. The double hook style cast steel frame provides direct 90 degree bearing to the railhead.

- Wt. 75 lbs. - 25-60 lb. Rail
- Wt. 100 lbs. - 60-85 lb. Rail



Inside and Outside Rail Rerailers

- Designed to re-track all types of locomotives and rail cars smoothly and efficiently
- Cast in a special ductile alloy
- Lugs on the underside of the rerailers prevent sliding past the first tie
- Rerailers are sold per unit, but must be used in pairs — In and Out
- Can be spiked to the tie or clamped to the rail or by using the optional clamp for wedge-type locking system can also be purchased

Technical Data — Rerailers

Rail Weight	Item	Weight, lbs.	Load Capacity, tons
85-100	SWA-IN SWA-OUT	129	100
110-141	SWB-Inside SWB-Outside	181	200



Straddle-Style Rail Rerailers

- Designed specifically for mine, quarry, and industrial applications
- Special guide groove design permits re-tracking wheels from either or both sides simultaneously
- Steel cam tightens and locks against the rail head as the car wheel tries to push the rerailer
- Works efficiently even with unusually high or badly worn wheel flanges
- Rerailers are sold per unit, but must be used in pairs — Left and Right

Technical Data — Straddle-Style Rerailers

Rail Weight	Item	Weight, lbs.	Load Capacity, tons
40-85	CW-4L CW-4R	66	20
70-100	DW-Inside DW-Outside	180	100

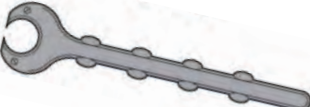
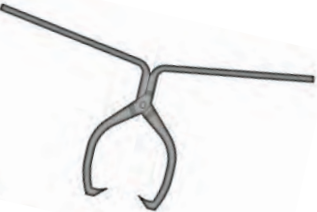


Rerailers Clamp

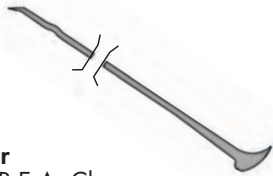
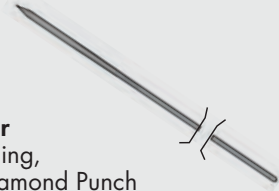
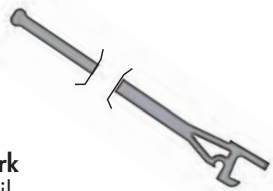
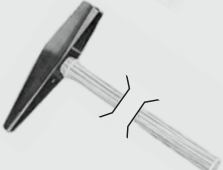
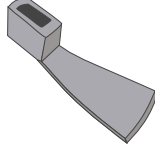
- If the SW rerailer is clamped to the rail, the SWC clamp is used. The SW rerailer can also be spiked to the tie, and then the optional SWC clamp is not needed.



Track Tools

Tool and Description	Weight, lbs	Length, Inch	Max. Jaw Opening, inch	Bolt Size, inch
 Track Wrenches Single End	8 lbs	30"	1-5/16"	3/4"
	10 lbs	36"	1-1/2"	7/8"
	12 lbs	42"	1-11/16"	1"
	14 lbs	48"	1-7/8"	1-1/8"
	16 lbs	48"	2-1/16"	1-1/4"
	18 lbs	54"	2-1/4"	1-3/8"
 Track Wrenches Double End	10 lbs	36"	1-5/16" - 1-1/2"	3/4" - 7/8"
	12 lbs	42"	1-1/2" - 1-11/16"	7/8" - 1"
	14 lbs	48"	1-11/16" - 1-7/8"	1" - 1-1/8"
	15 lbs	48"	1-7/8" - 2-1/16"	1-1/8" - 1-1/4"
	16 lbs	48"	2-1/16" - 2-1/4"	1-1/4" - 1-3/8"
 Puller Spike 4 Ball	2-1/2 lbs	12"	3/4"	
 Tong Rail	18 lbs	Distance across handles 44"	3-3/4"	
 Tong Timber	12 lbs	Distance across handles 41-3/4"	15-1/2"	
 Track Level	5 lbs	62"		

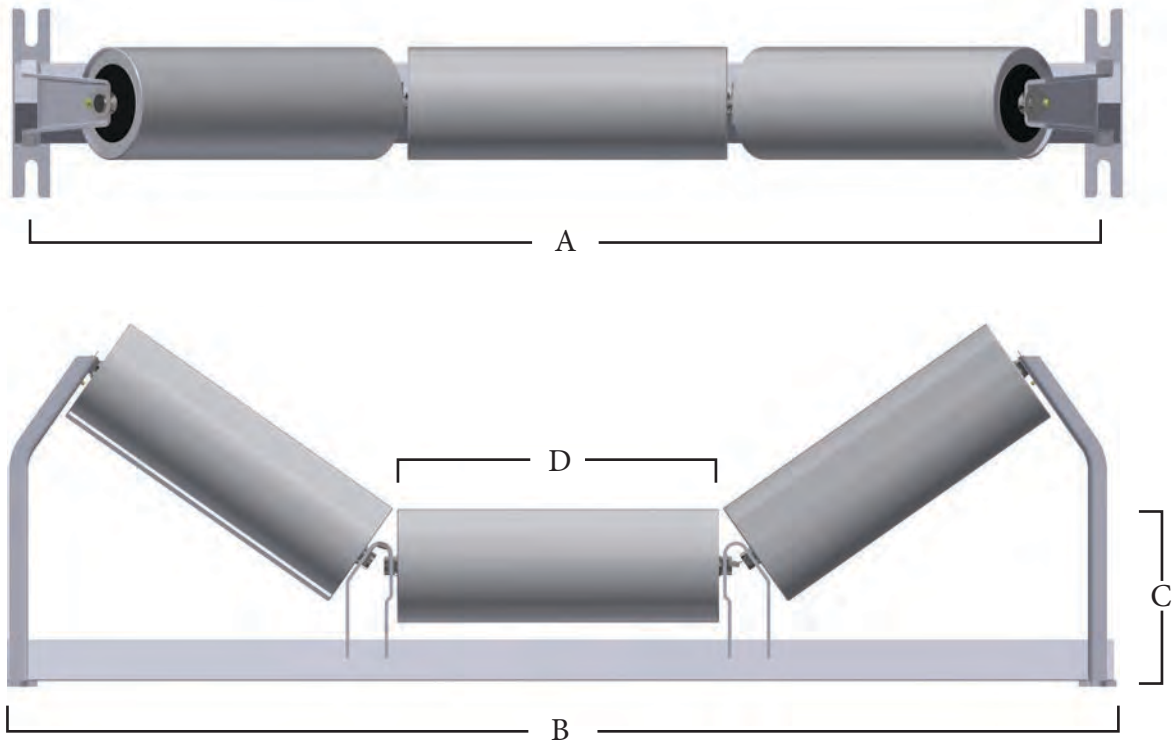
Track Tools

Tool and Description	Weight, lbs	Length, Inch	Eye No.	Eye Size, inch	Handle Length, inch	Size Blade or Bit, Inch	Small Face, Inch	Large Face, Inch	Spike Size, Inch
 Bar A.R.E.A. Claw	27 lbs	60"							9/16" or 5/8"
 Bar Lining, Diamond Punch	18 lbs 26 lbs	60" 66"							
 Fork Rail	13 lbs	40"							
 Maul Standard Pattern Spike	8 lbs 10 lbs	12" 12-3/4"	2 2	1"x3/8" 1"x3/8"	36" 36"		3/4" 1"	1-1/2" 1-3/4"	
 Maul Bell Pattern Spike	10 lbs	15"	2	1"x3/8"	36"		1-1/4"	1-5/8"	
 Punch Track Round	5-1/2 lbs	13"	3	3/4"x1-3/8"	24"				
 Adze Full Head	6 lbs	12"	11	1-3/4"x2"	34"	4"x9"			

Conveyor Rigid Structure Components

Inline Troughing Idler Assembly

- Available upon request for 20 degree and 45 degree
- Equal Troughing Length Idlers
- Available upon request for different can size and constructions



Inline Troughing Idler Assembly

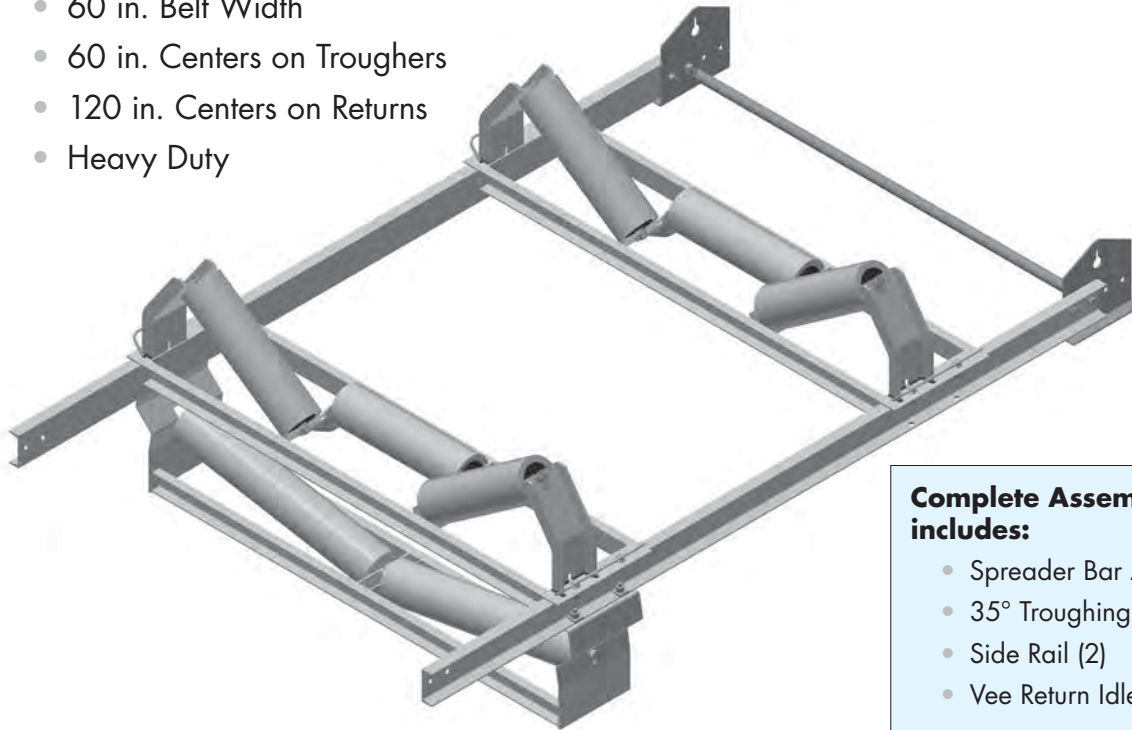
Belt Width	Part Number	A	B	C	D
24	3IT2435I005725	33"	35.5"	8.75"	9"
30	3IT3035I005725	39"	41.5"	8.75"	11"
36	3IT3635I005725	45"	47.5"	8.75"	13"
42	3IT4235I006730	51"	53.5"	9.25"	15"
48	3IT4835I006730	57"	59.5"	9.25"	17"
54	3IT5435I006730	63"	65.5"	9.5"	19"
60	3IT6035I006730	69"	71.5"	9.5"	21"
72	3IT7235I006730	81"	83.5"	9.75"	25"

*Available in 5 inch, 6 inch, or 7 inch upon request.

**Part Numbers are shown in 5 inch.

Roof-Hung Complete Assembly

- 60 in. Belt Width
- 60 in. Centers on Troughers
- 120 in. Centers on Returns
- Heavy Duty



Complete Assembly includes:

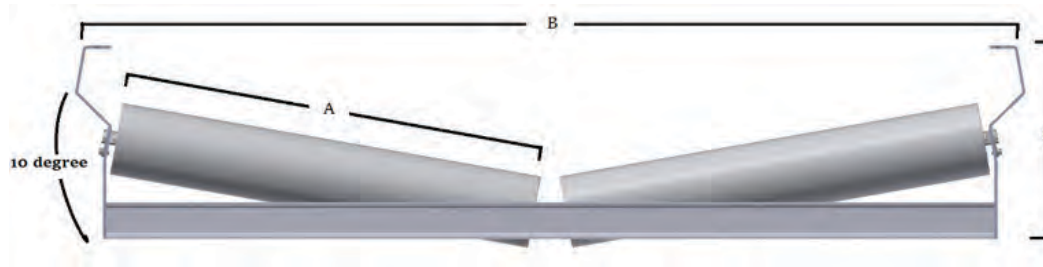
- Spreader Bar Assembly
- 35° Troughing Idler (2)
- Side Rail (2)
- Vee Return Idler Assembly

Sample of JENNMAR's Bolt on Rigid Rail System with Heavy Duty Top Trougher and "Vee" Return Idler System



Sample of JENNMAR's Quick Lock Rigid Rail System with Standard Duty Top Trougher, Offset Return Brackets, and Flat Return Idler.

Conveyor Return "Vee" Idler Assembly



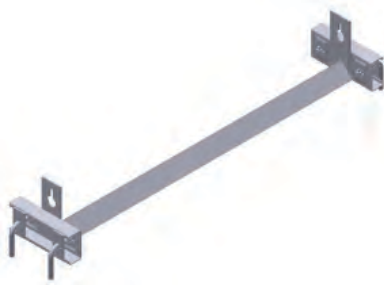
10 Degree Return "Vee" Idler Assembly

Belt Width	Part Number	A	B	C
60	3IRVASSY60	34 3/4"	73 1/2"	13"
72	3IRVASSY72	40 3/4"	85 1/2"	14"
84	3IRVASSY84	46 3/4"	97 1/2"	15"

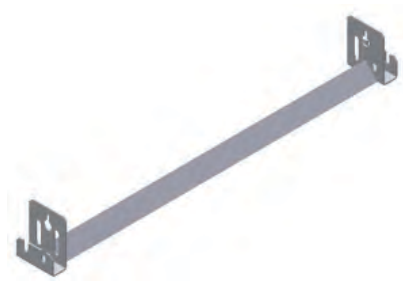
Hanging Spreader Bars



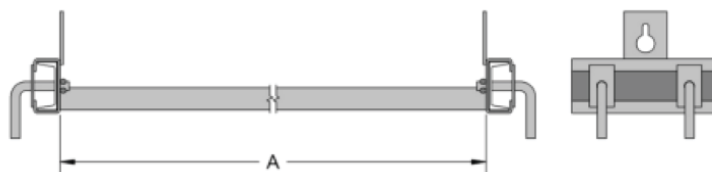
Bolt on



Quick Lock



Pin Lock

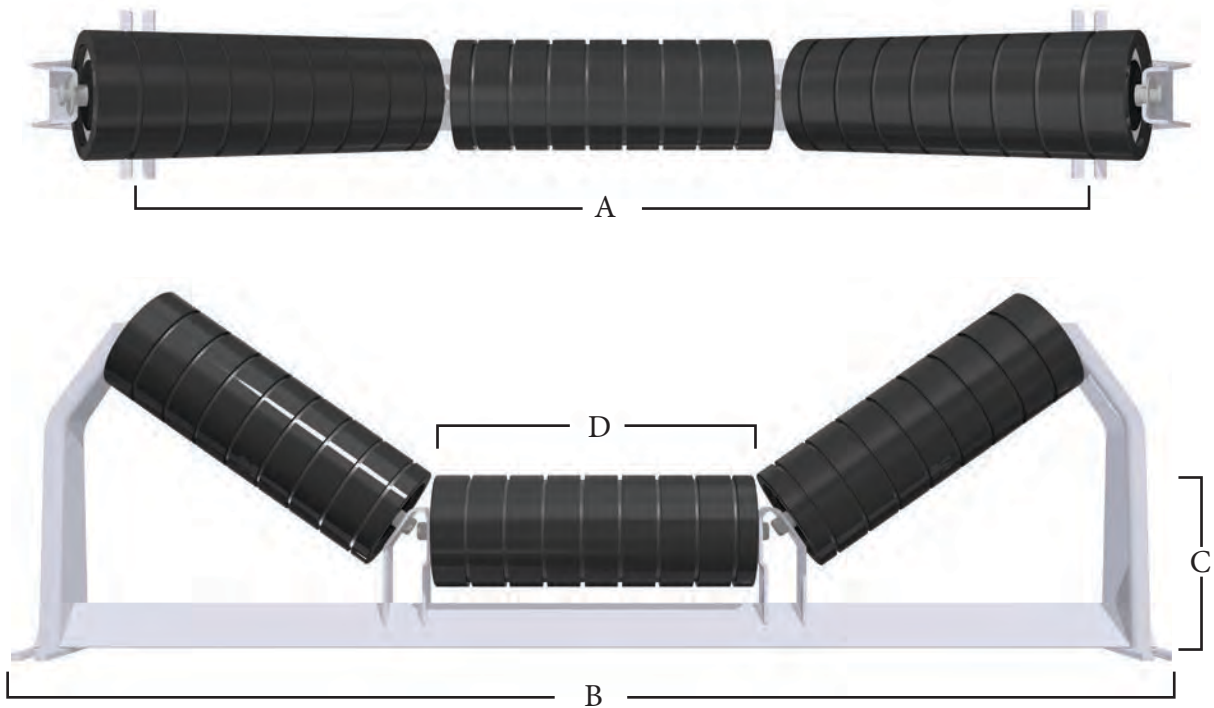


Supply us with your needed belt width or the needed frame width(A) and we can design the correct spreader to meet your Conveyor needs.

Conveyor Rigid Structure Components

Inline Impact Troughing Assembly

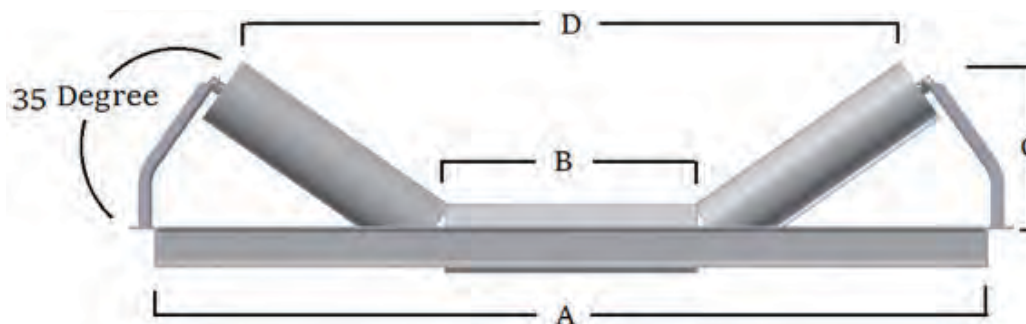
- All Impacts are available in either 6in or 7in cans
- Great for high impact areas just as transfers and scales
- Equal Troughing Length Idlers
- Available in any degree angle from 10 degree to 45 degree



Inline Impact Troughing Assembly

Belt Width	Part Number	A	B	C	D
24	4ITI24D	33"	35.5"	8.75"	9"
30	4ITI30D	39"	41.5"	8.75"	11"
36	4ITI36D	45"	47.5"	8.75"	13"
42	4ITI42D	51"	53.5"	9.25"	15"
48	4ITI48D	57"	59.5"	9.25"	17"
54	4ITI54D	63"	65.5"	9.5"	19"
60	4ITI60D	69"	71.5"	9.5"	21"
72	4ITI72D	81"	83.5"	9.75"	25"

Conveyor Top Troughing Assemblies



Heavy Duty



Standard Duty



35 Degree Offset Trougher Assembly Heavy Duty

Belt Width	Part Number	A	B	C	D
48	3IT48350BX57	55 1/2"	18"	13"	45 1/4"
54	3IT54350BX57	67 1/2"	20.5"	13 1/2"	51 1/4"
60	3IT60350BS625	73 1/2"	22.5"	14"	57 1/4"
72	3IT72350BX625	85 1/2"	26.5"	14 1/2"	69 1/4"
84	3IT84350BX625	97 1/2"	30.5"	15"	81 1/4"

35 Degree Offset Trougher Assembly Standard Duty

Belt Width	Part Number	A	B	C	D
30	3IT3035057	41 1/4"	12"	10 3/4"	29"
36	3IT3635057	47 1/4"	14"	11"	35"
42	3IT4235057	53 1/4"	16"	11 1/4"	41"
48	3IT4835057	59 1/4"	18"	12"	47"
54	3IT5435057	65 1/4"	20"	12 1/4"	55"

Floor Mounted Spreader Bars

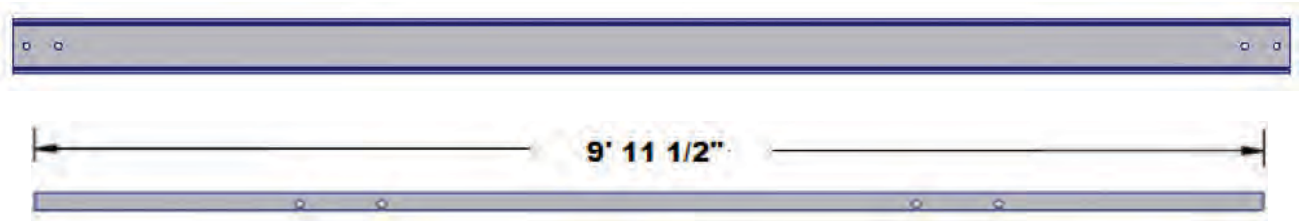


Connection Systems

- We are able to attach any Connection System (Bolt On, Quick Lock, or Pin Lock) onto the desired height needed and the desired belt width as needed. Let us know and we can design it for your special need.
- This gives our customers the option of still using it as a roof hung product or having the flexibility to use the Floor Mounted system.
- Each design incorporates our fully powder coated legs for better life expectancy and added value.

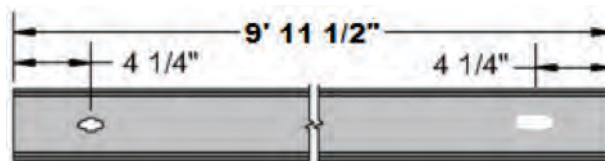
Rigid Bed Rails

Bolt On Rail



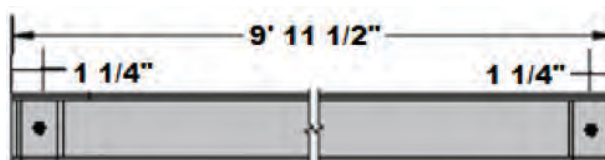
- Available in any length and Rail height needed. We just need the desired Length, Height, and Function!
- Our standard design is a 10ft rail with 5ft centers for the top troughing idlers and 10ft spacing on the return idler system. System length above as shown.

Quick Lock Rail

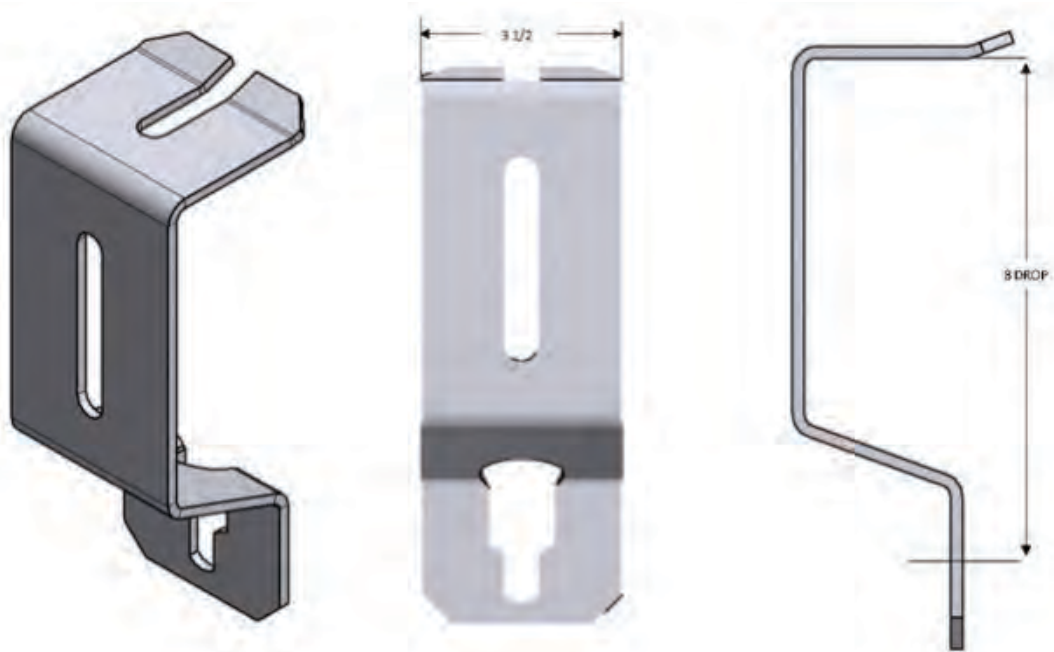


- Available in the tradition slotted design (Shown right) or the "Mickey Mouse" Style (Shown Left).
- Our standard style incorporates both styles. This leaves the ability for flexibility in the design and still securing the troughing assemblies properly and safely.
- Available in any length and rail height needed. We just need the desired length, height, and connection requests into our quick lock system.

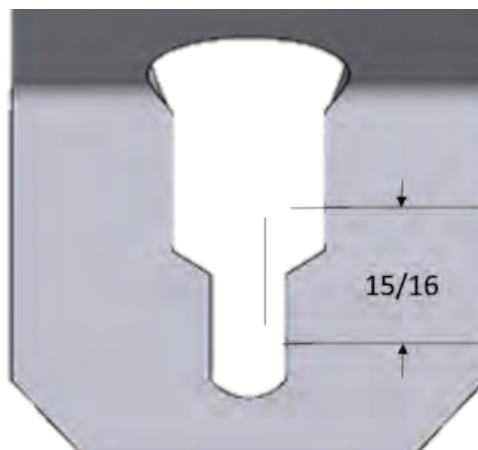
Pin Lock Rail



Drop Brackets

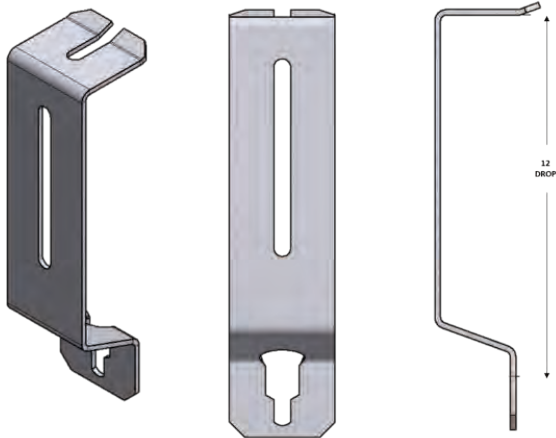


3" x 8"	3DB058
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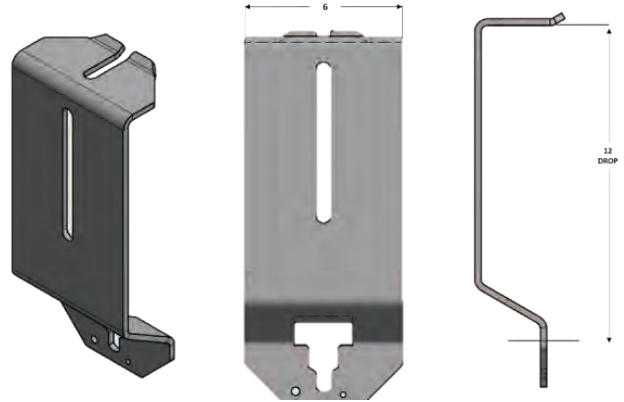
Each of our Drop Brackets are designed to carry either the Small Hex head design or the Slotted Design for the Idler ends which gives more flexibility in our design!

Drop Brackets



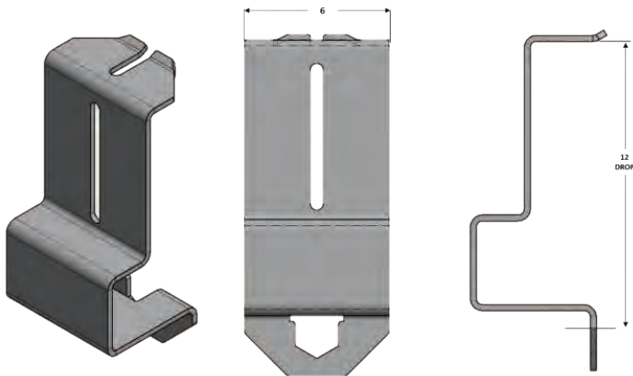
3" x 12"

3DB0512



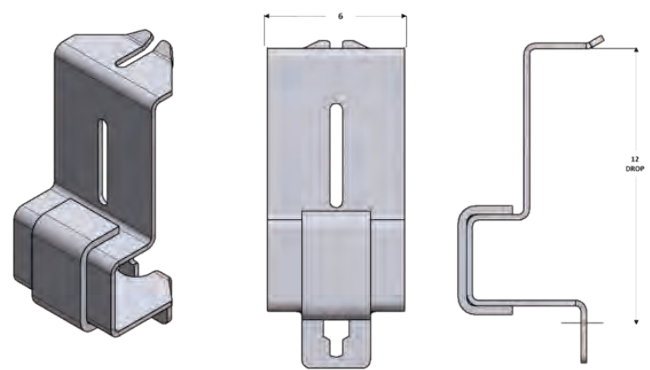
6" x 12"

3DB0612



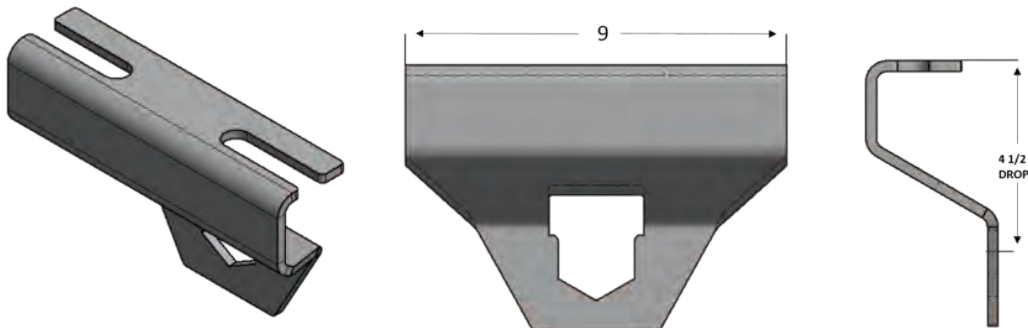
6" x 12" Offset

3DB06120



6" x 12" Offset Reinforced

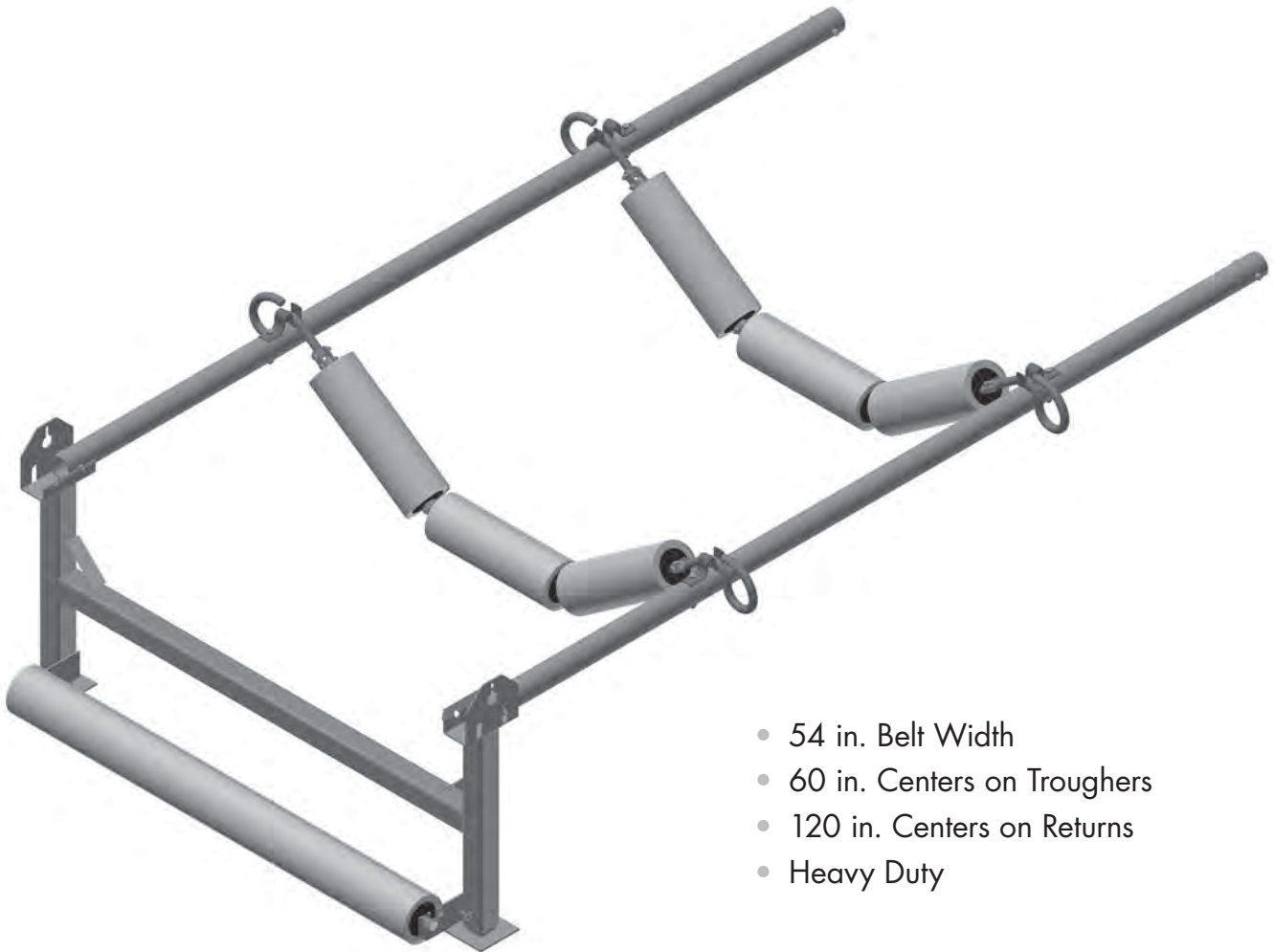
3DB06120R



9" x 4"

3DB0694

Floor-Mounted (Catenary) Complete Assembly

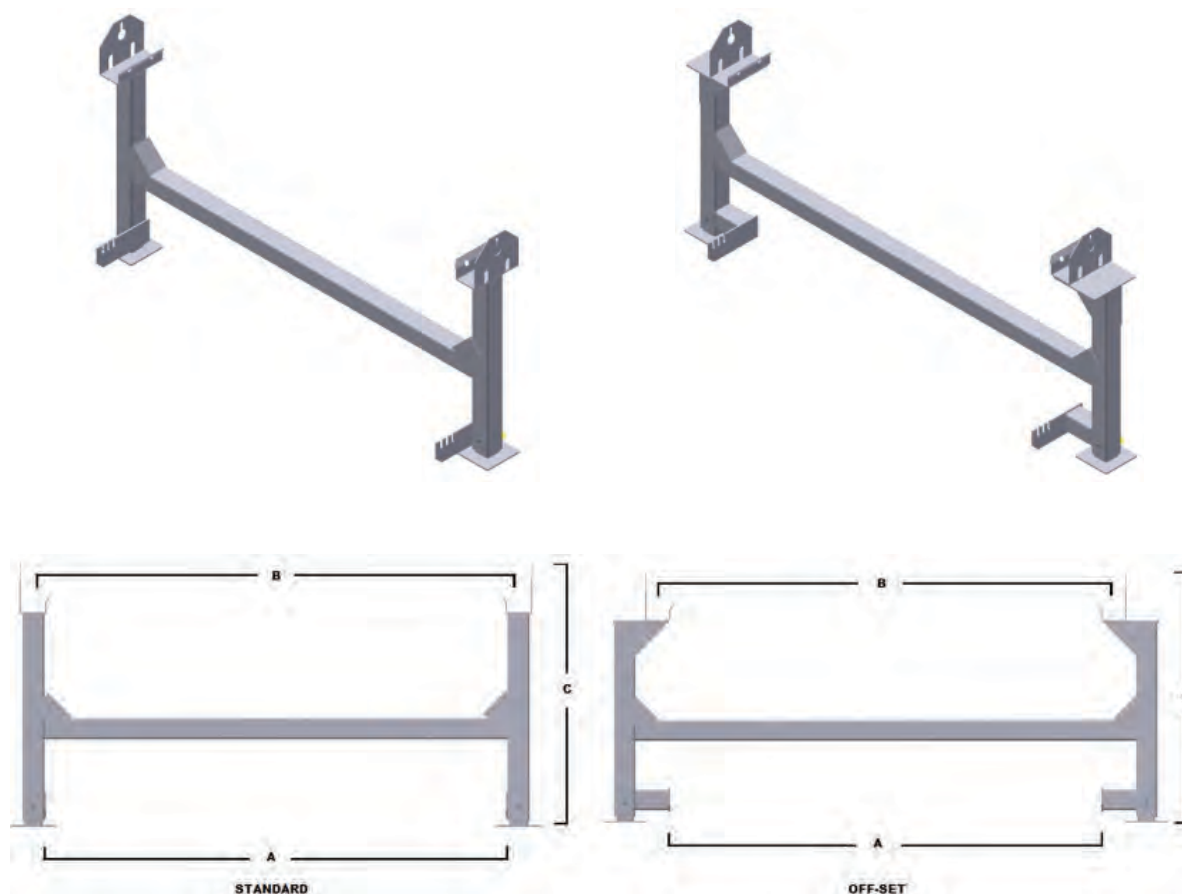


- 54 in. Belt Width
- 60 in. Centers on Troughers
- 120 in. Centers on Returns
- Heavy Duty

Complete Assembly includes:

- Top Troughing Idler (2)
- Side Rail (2)
- Floor Stand
- Return Roller

Catenary Spreader Bars



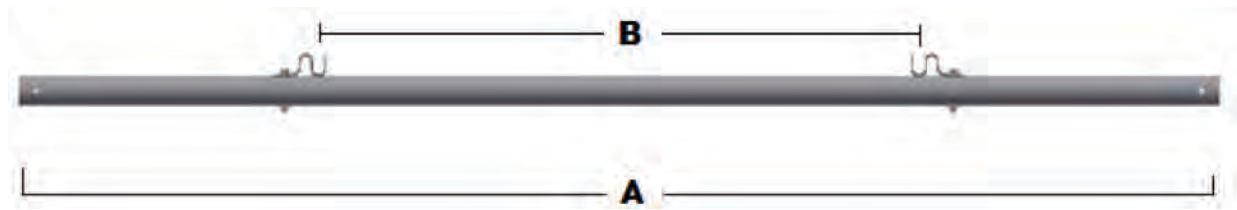
Standard Catenary Spreader

Belt Width	Part Number	A	B	C
48	3SB3TASSYCAT48	62 1/2"	65 1/2"	34"
54	3SB3TASSYCAT54	68 1/2"	71 1/2"	34"

Off-Set Catenary Spreader

Belt Width	Part Number	A	B	C
48	3SB3TASSYCAT48OS	62 1/2"	65 1/2"	34"
54	3SB3TASSYCAT54OS	68 1/2"	71 1/2"	34"

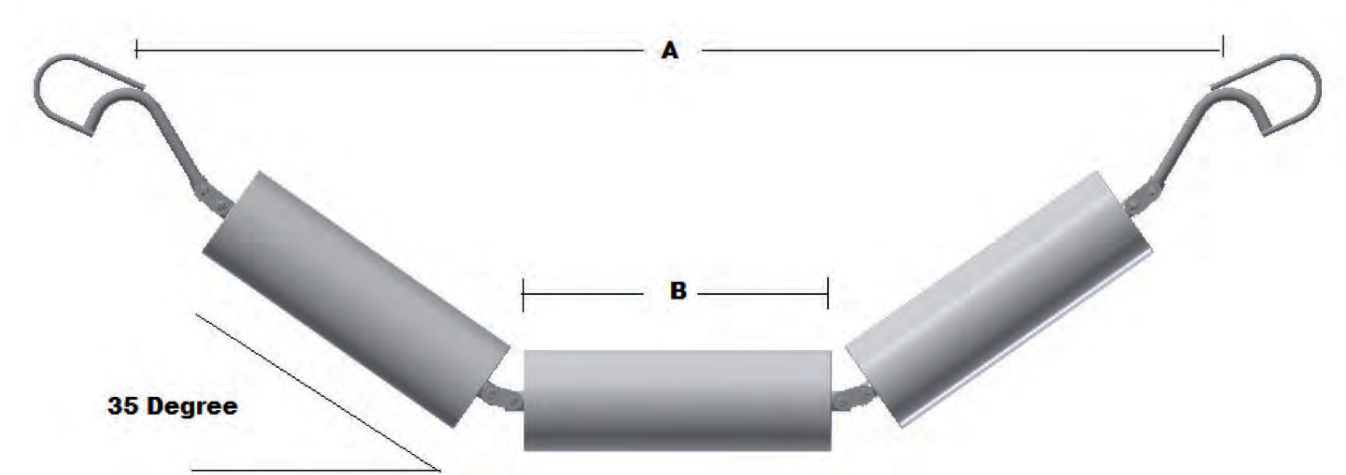
Catenary Bed Rails



Part Number	A	B
3SR3TCAT120	120"	60"

- * with 3" SCH 40 pipe Standard
- * Available in 3" SCH 80 with HD upgrade

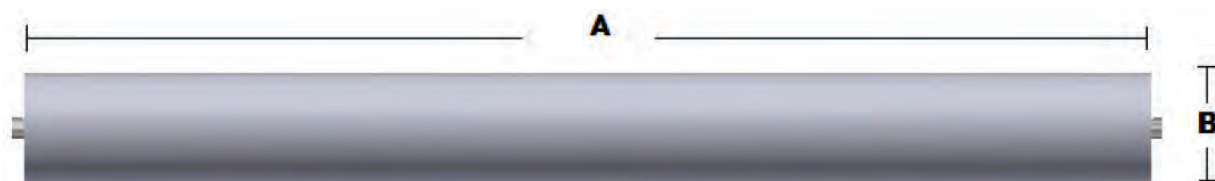
Catenary Top Idler Assembly



Catenary Top Idler Assembly

Belt Width	Part Number	A	B
48	3IT4835CATI57	62 1/2"	20 1/2"
54	3IT5435CATI57	71 1/2"	22 1/2"

Catenary Return Idlers



Available with or without handles and in different sizes to meet your Conveyor needs.

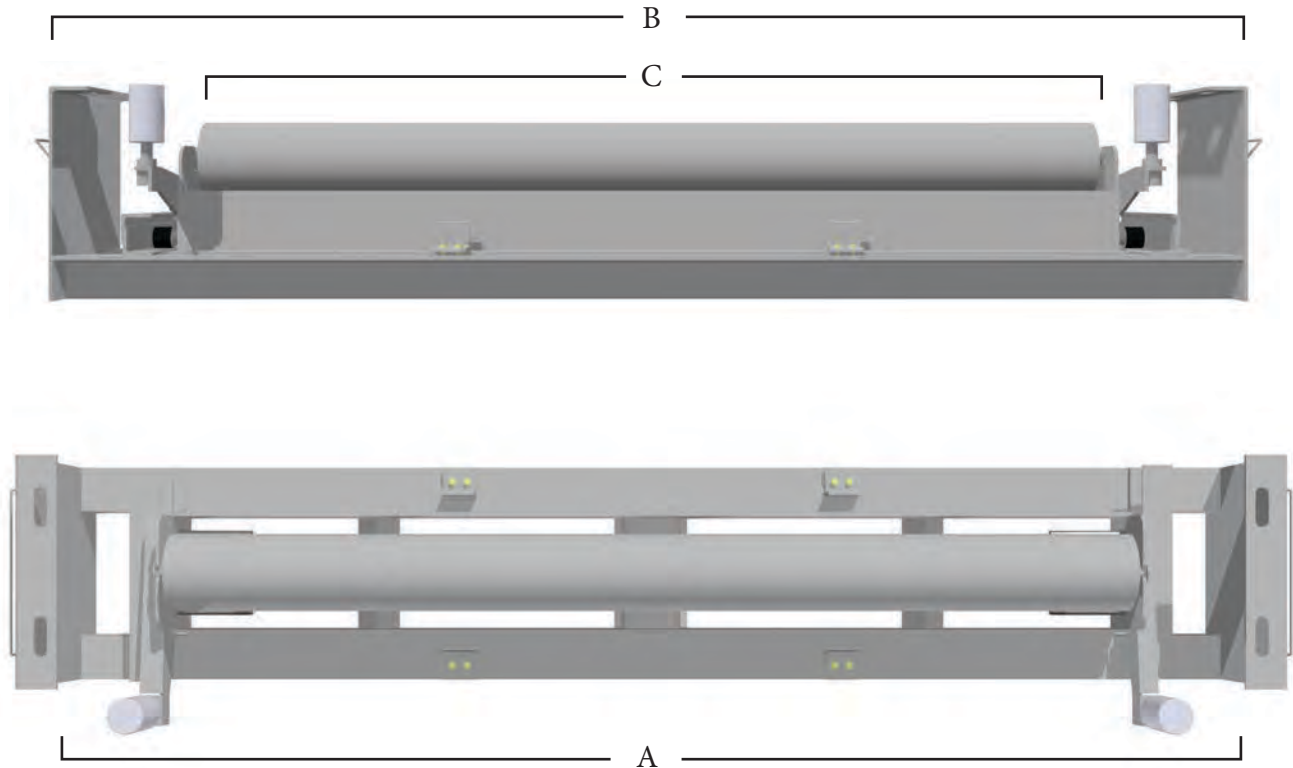
Catenary Return Idlers

Belt Width	Part Number	A	B
48	3IT4835CATI57	54 1/2"	5"
54	3RR5435CATI625	60 1/2"	6"



Return Training Assembly

- Available upon request for different can size and constructions



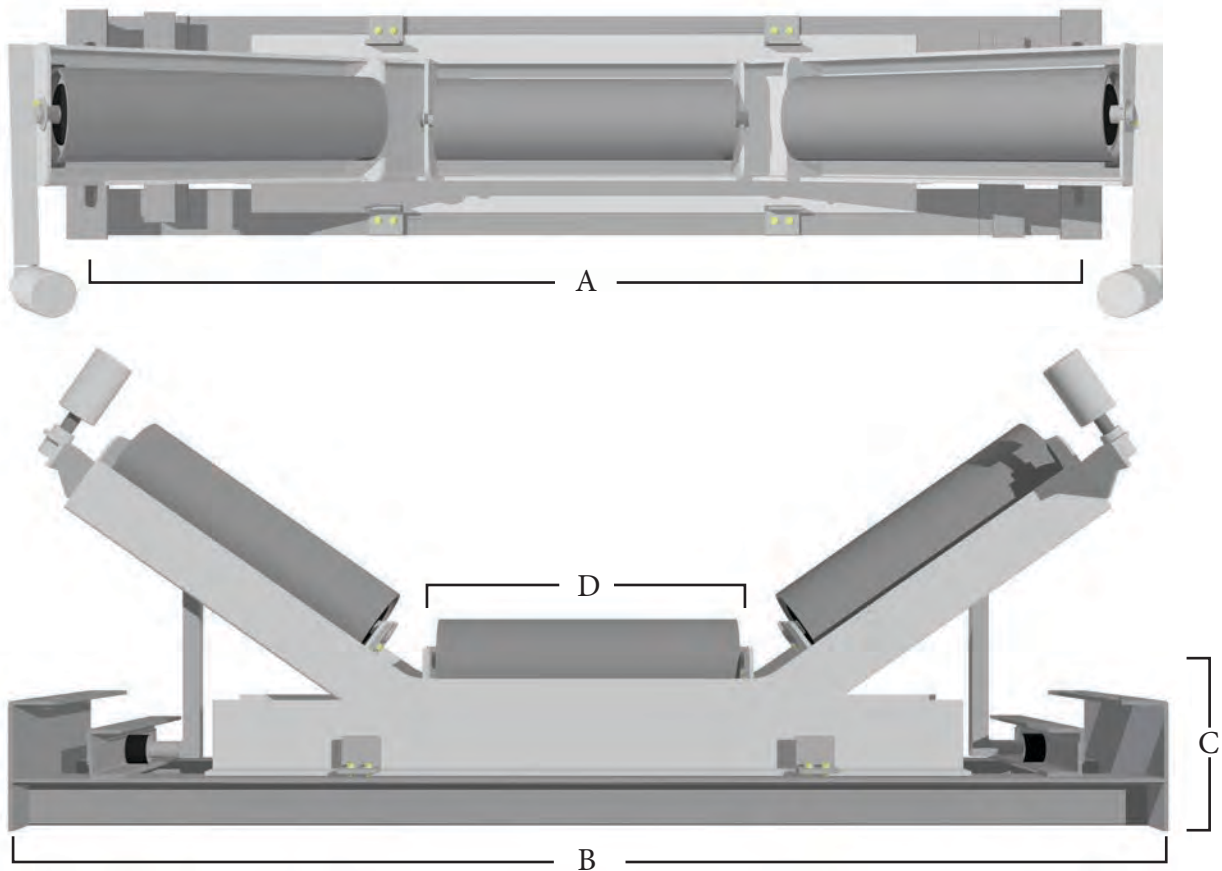
Return Training Assembly

Belt Width	Part Number	A	B	C
24	4FR24D	33"	35.5"	27"
30	4FR30D	39"	41.5"	33"
36	4FR36D	45"	47.5"	39"
42	4FR42D	51"	53.5"	45"
48	4FR48D	57"	59.5"	51"
54	4FR54D	63"	65.5"	57"
60	4FR60D	69"	71.5"	63"
72	4FR72D	81"	83.5"	75"

* When ordering please specify your idler circumference, wall thickness and bearing sizes

Top Training Assembly

- Available upon request for 20 degree and 45 degree
- Equal Troughing Length Idlers
- Available upon request for different can size and constructions



Top Training Assembly

Belt Width	Part Number	A	B	C	D
24	4IT24D	33"	35.5"	9"	9"
30	4IT30D	39"	41.5"	9"	11"
36	4IT36D	45"	47.5"	9"	13"
42	4IT42D	51"	53.5"	9.5"	15"
48	4IT48D	57"	59.5"	9.5"	17"
54	4IT54D	63"	65.5"	9.5"	19"
60	4IT60D	69"	71.5"	9.5"	21"
72	4IT72D	81"	83.5"	9.75"	25"

* When ordering please specify your idler circumference, wall thickness and bearing sizes

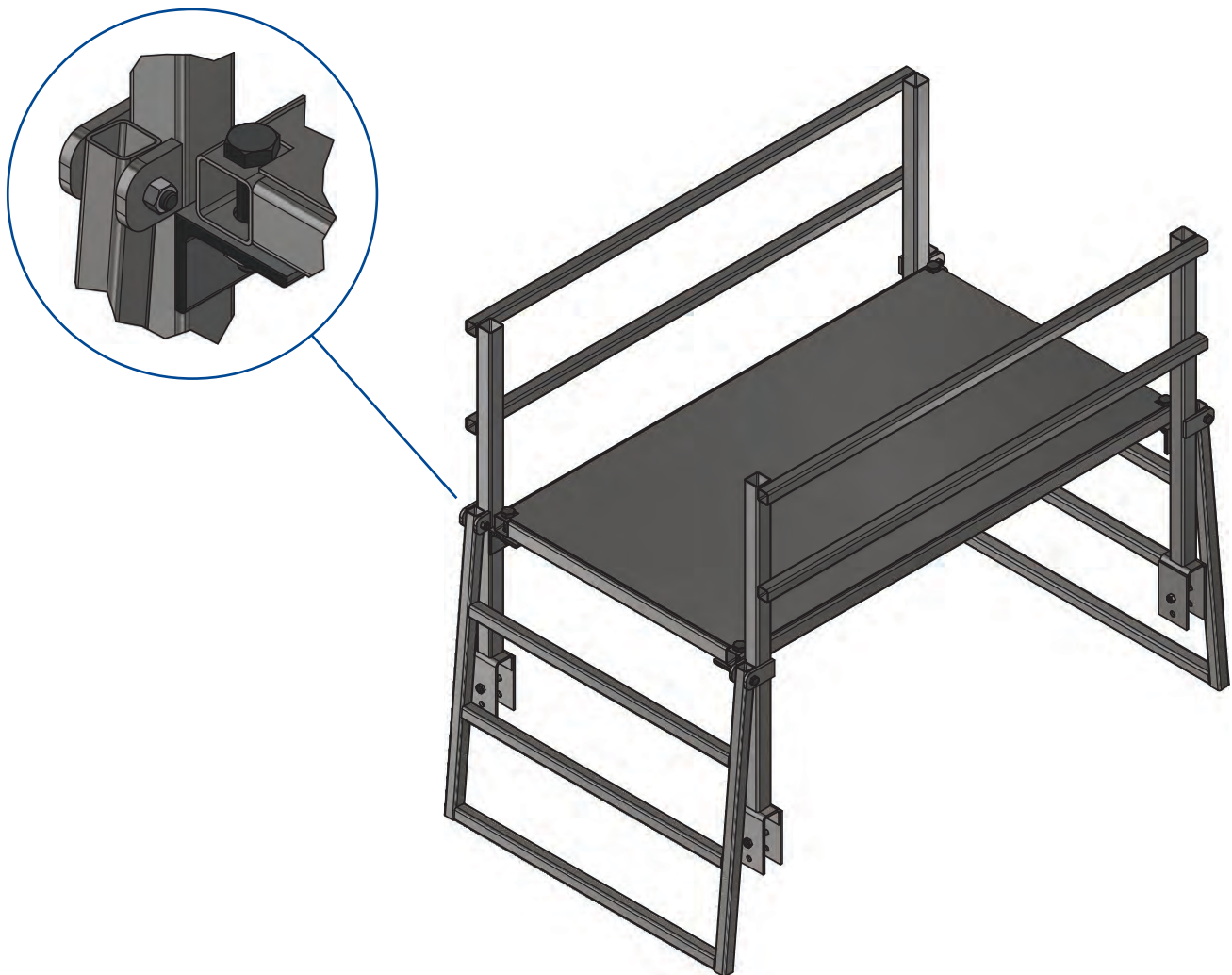
J-Walk Crossover System



JENNMAR also manufactures these J-Walk crossover systems. These reusable crossover structures are designed and built with ladders and handrails for extra safety when traveling over conveyor belts.

The advantages to our J-Walk system:

- Quick and easy to install
- Extremely strong and rugged
- An efficient and safe addition to any conveyor system
- Offered in unpainted, painted or powder coated for extra durability versions



Available to meet the needs and design of any mine, one of our specialized sales members will need to personally measure to ensure the proper fit, connection, and placement to ensure ease of crossing capabilities.

TURNSTONE INDUSTRIAL SOLUTIONS, LLC.

A joint venture between ABC Technology Group USA and Calandra Group, LLC, Turnstone Industrial Solutions manufactures non-metal structural support systems, flexible ducting and semi-rigid polymer tubing products for mine and tunnel ventilation, industrial flexible ducting for temperature and environmental control, and rapidly-deployable air-stop seals and barriers. ABC Technology Group's vertically-integrated manufacturing experience of high-quality ventilation products, along with the support of Jennmar's and Jennchem's leading sales and service network, offers a comprehensive ventilation product line and application solutions throughout the USA.

Some of the products manufactured and sold by Turnstone Industrial Solutions:

PILLAR BAGS: A range of rapidly deployable cement containment bags used to provide load bearing roof support. Brand: J-CRIB®.

FLEXLINE PERFORMANCE DUCTING®: A range of flexible ducting and accessories for supply, return and exhaust air applications using Hi-Strength fabric material and construction, low-leakage couplings and safe installation solutions. Brands: MineVent®, TwinDuct™, MineDuct®.

HARDLINE PERFORMANCE DUCTING®: A range of low-leakage, low-resistance semi-rigid polymer tubing and accessories for supply, return and exhaust air applications. Brands: HardLine-MAX™, HardLine-COAL™, HardLine-Oval™.

INFLATABLE AIRSTOP: Inflatable and rapidly deployable underground ventilation control, air-stopping and sealing systems and overhead safety solutions. Brands: AirStop™, AirStop-EPASS™, AirStop-OPS™.



THREE CATEGORIES OF PERFORMANCE VENTILATION SOLUTIONS:



Flexible ducting manufactured for mine and tunnel ventilation



Semi-rigid polymer ducting manufactured for mine and tunnel ventilation



Underground ventilation control, stopping systems and safety solutions



ROCBOLT Resins

A joint venture between DSI Underground, A Sandvik Company and JENNMAR, supplies a large proportion of the Australian mining & tunneling markets with J-LOK Resin and Fasloc resin capsules.

ROCBOLT Resins manufactures a vast portfolio of resin capsules and is extremely flexible in meeting customer requirements in lead time and diversity of product range; ROCBOLT manufacture 6 different speeds, 7 diameters, lengths varying from 300 mm up to 3400 mm in total, with multiple packaging options.

Australia is one of the safest mining industries in the world in both Hardrock and Coal. They continue to contribute to this statistic by providing the very best products and system solutions that enhance safety in mines.

Through this joint venture, we have combined the resources and products of two of the world's leading suppliers of quality mining, tunneling and geotechnical solutions.





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