VALUE ENGINEERED PRODUCTS, INC.
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Phone: 303-715-9990 ~ 1-800-921-1177 ~ Fax: 303-715-9991

Introduction

Writing The Book

Since the introduction of the first manufactured thermal hanger shields the industry has seen a proliferation of 'me too' products. Value Engineered Products, Inc. broke this pattern by introducing a line which was easy to specify and install while fully meeting existing industry standards. For the past two decades, V.E.P. has written the book on insulated pipe supports by continually updating our products, engineering new designs and employing new manufacturing techniques to set the highest measure of quality and consistency. While others claim knowledge, V.E.P. documents facts. While others struggle to balance industry requirements, V.E.P. delivers proven designs. While others simply copy existing designs, Value Engineered Products leads the industry with innovation and performance. In short, writing the book for thermal hanger shields.

Setting The Standard

All insulated pipe systems require protection at each point of support to maintain the integrity of the insulation system. Descriptions for this type of product vary widely throughout the industry. The most commonly referenced standards are those published by The Manufacturers Standardization Society of the Pipe, Valve and Fitting Industry (MSS)*. The MSS document SP-58, Section 9 "Protection Saddles and Shields" provides the parameters for Type 40 thermal hanger shields. V.E.P. has taken these standards, which generically call for 'high-density inserts,' to a new level by re-defining 'high-density' in terms of compressive strength and offering insulation materials with documented compressive strengths up to 900 PSI. Additionally, V.E.P. has addressed the real-world field concerns of point loading, moisture resistance, unit weight and ease of installation. Value Engineered Products' Pro-Shield, Pro-Shield N.T. and MaxSpan R.H. meet the design criteria of both The Manufacturers Standardization Society and the American Institute of Architects 'MasterSpec' provisions.

Simplicity Of Design

V.E.P.'s line of insulated pipe supports is easy to specify, order and install. Each design works in concert with standard pipe hanger systems to provide the level of protection needed, while eliminating the 'guess-work' of choosing among a medley of 'up-graded' products.

Components

Value Engineered Products, Inc. machines the insulation material to precisely fit pipe of various diameters and match the outside diameters of the adjoining insulation. Every unit, regardless of insert material or design, has an integral layer of Compac Corporation's MPC 400 vapor barrier jacketing.

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Components (Continued)

This material exceeds industry standards for vapor permeance, puncture resistance, and because it is non-reactive and chemical-resistant, is the only jacket appropriate for wide ranging applications. Finally, our shields are fabricated using only US-made, G-90 galvanized steel.

While many claims are made as to what insulation material may be best suited for use in high-density inserts, V.E.P. has millions of successful applications using various forms and densities of American-made calcium silicate.

Perlite, promoted as being 'water-resistant', still absorbs 50% of its own weight in moisture when tested to ASTM C-240 standards. Manufactured by a 'dry process,' perlite will crumble if subjected to moderate loads or, more importantly, pipe vibration.

Urethane, polyurethane, and polyisocyanurate insulation dense enough to provide adequate support does not meet most municipal fire and safety codes. Typically these materials have a significantly limited upper temperature range.

Foam glass (a.k.a. cellular glass) is not dependable under load, is naturally abrasive and can be detrimental to the life of the pipe itself.

The use of phenolic foam as pipe support material is also questionable due to its friability and the residual acids in this type of material which may promote corrosion. Because the cells are typically riddled with 'pin holes,' phenolic foam insulation can actually absorb and hold water!

Certain severe applications (i.e. cryogenic lines) dictate the use of urethane foam as the only appropriate insulation and pipe support material. For this reason, V.E.P. offers a distinct line of insulated pipe supports fabricated solely from Dow Chemical's heavier density polyisocyanurate material. Dow Chemical, a worldwide leader in urethane technology, provides material of superior consistency, documented compressive strength and insulation value as well as compliance to many of the fire and safety codes in use today.

Conclusion

When considering a system of thermal hanger shields and insulated pipe alignment hardware on your next project, rely on those who have direct access to the best materials, access to state-of-the-art testing facilities and established fabrication techniques. Value Engineered Products' time-proven designs and experience with custom, project-specific models, separates us from those who merely imitate the ones who have 'set the standard' for insulated pipe supports.

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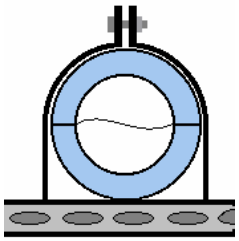
Product Introduction

Value Engineered Products, Inc. manufactures a wide array of insulated pipe supports to meet the needs of various piping systems and specifications. Units may be ordered to precisely fit copper tube, steel, cast or ductile iron pipe at no additional cost. Standard units are available in 1/2-inch wall thickness through 4-inch pipe and 1-inch wall thickness through 24-inch pipe diameters. Ultra-high compressive strength structural inserts are standard on 10-inch pipe with 1-inch wall thickness and all units for 12-inch pipe size and larger.

All products feature a true vapor barrier making the units appropriate for either high or low temperature applications. The vapor barrier and insulation extend beyond the steel shields to provide a positive, neat seal with the adjoining insulation. Custom units can be manufactured to meet any engineering requirements.



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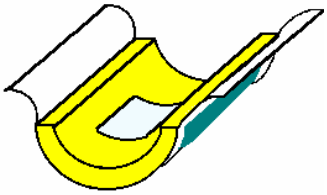
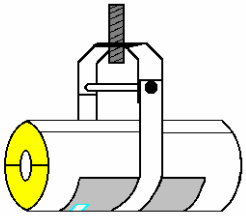
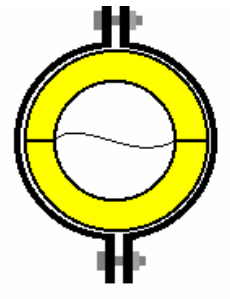


Quik-Shield
(Shown With Structural Insert)

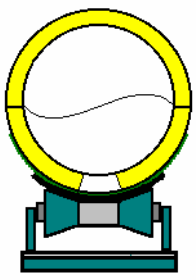


Pro -Shield N.T.

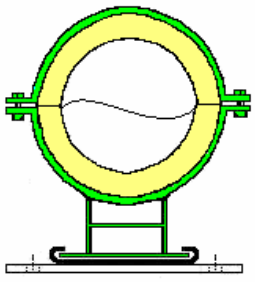
SUPPORT SYSTEMS DESIGNED FOR HANGER SPANS PER TABLE 5 OF MSS SP-69



MaxSpan



MaxSpan R.H.



P.G. Series Pipe Guide

SUPPORT SYSTEMS DESIGNED FOR HANGER SPANS PER TABLE 3 OF MSS SP-69

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Product Comparison Guide

Value Engineered Products, Inc.	Fronek Pipe Shields, Inc.	Rilco Manufacturing	Bergen / Carpenter & Paterson, Inc.
PIPE SUPPORTS			
Pro-Shield	A-1000, A-2000, A-3000, A-4000	HC-1000 to HC-4000 HH-1000 to HH-4000	BP-8100, BP-8200 BP-8300, BP-8400
Pro-Shield N.T.	No Equal	No Equal	No Equal
Quik-Shield	No Equal	No Equal	465 CVB
Max Span	A-9000	HC-9000	BP-8490
MaxSpan R.H.	A-5000 to A-8400	HF-1000 to HF-7400 HR-3000 to HR-8400	BP-8150 to BP-8184
Chill-Shield	No Equal	CC-1000, CF-1000	265 CVB, 365 CVB
Chill-Shield E.R.	No Equal	No Equal	No Equal
PIPE SLIDES			
PS-Series (Axial +/- 2")	B-1000 to B-1200	HS-1000 to HS-1200	BP-8210 to BP-8212
PS-Plus Series (Axial +/- 4.5")	B-2000 to B-2200	HS-2000 to HS-2200	BP-8220 to BP-8222
PIPE GUIDES			
PG-Series (Axial +/- 2")	B-3000 to B-3200	HG-3000 to HG-3200	BP-8230 to BP-8232
PG-Plus Series Axial (+/- 4.5")	B-4000 to B-4200	HG-4000 to HG-4200	BP-8240 to BP-8242
PIPE ANCHORS			
PA-2 (Light Duty)	No Equal	No Equal	No Equal
PA-3 (Heavy Duty)	No Equal	No Equal	No Equal
UPGRADES AVAILABLE			
WeatherShield Protection	Not Available	Not Available	Not Available
Powder Coated Hardware	Not Available	Not Available	Not Available
Stainless Steel Shields	Yes	Yes	Unknown

NOTE: Product designs listed are for quick reference only. Actual load-bearing characteristics, allowable spans between hangers, travel allowed (pipe slides and guides) and hanger applications vary significantly between manufacturers. Individual product specification and application sheets must be referenced for complete information.

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Suggested Specification Guidelines: Insulated Pipe Supports

Division 15:
Section: Hangers and Supports

1) Thermal hanger shields shall be used on all horizontal insulated pipe systems at each point of support. Manufactured units shall comply with MSS SP-58 standards and be tested per MSS SP-89 guidelines. Each assembly shall fit the various pipe diameters and match the outside diameter of the adjoining pipe insulation.

2) Thermal hanger inserts shall be calcium silicate with a minimum compressive strength of 100 PSI. The insert shall be jacketed with industry standard, non-reactive, all service jacket as a vapor barrier. 'Water-resistant coatings', which do not provide a vapor barrier, shall not be allowed. A vapor barrier mastic of a contrasting color may be used (i.e. Childers CP-30 or MEI 55-10 or equal), providing the longitudinal seam is field-sealed during installation.

3) A rolled shield of G-90 galvanized steel shall be an integral part of the unit and shall be of a gauge and length appropriate for the compressive strength of the insert material and type of hanger.

4) Insulation and vapor barrier jacket shall extend beyond the galvanized steel shield to provide a complete, neat and vapor-tight seal with the adjoining insulation.

5) Hanger type and span between hangers shall govern the type of thermal hanger shield used and shall be as follows:

   Band-type hangers to 10 foot maximums (clevis, teardrop) – Value Engineered Products' (V.E.P.) Pro-Shield, Pro-Shield N.T., Quik-Shield or equal.

   Roller-type hangers, ***regardless of hanger spans*** - V.E.P.'s MaxSpan R.H. or equal.

   Band-type hangers with spans greater than 10 feet* - V.E.P.'s MaxSpan units or equal.

   Trapeze style and other clamping-type supports to 10-foot maximums - V.E.P.'s Pro-Shield or equal.

   Trapeze style and other clamping-type supports exceeding 10 feet* - V.E.P.'s MaxSpan units or equal.

6) Individual components shall not exceed a Flame Spread and Smoke Developed rating of 25/50.

7) Safety Ratio shall be a minimum of 3:1 - (support capabilities to anticipated pipe load).

8) Independent test results documenting the compliance of 'or equal' products shall be available upon request of the Architect, Engineer or Owner.

*PER MSS-SP-69, TABLE 5.

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Suggested Specification Guidelines: Insulated Pipe Guides, Slides and Anchors

Mechanical Section 15
Anchors & Supports: 15040/15140

1.1 General

Factory made pre-insulated pipe guides, slides, anchors and supports shall be used on all insulated piping systems to protect and maintain the integrity of the insulated pipe system.

Pre-insulated pipe guides designed to support and control pipe expansion, contraction and lateral movement shall be used to protect expansion joints and vital equipment from shearing and lateral offset forces. Pre-insulated pipe guides shall be installed where indicated by the design engineer. The use of pre-insulated guides with expansion joints shall be controlled by the recommendation of the expansion joint manufacturer. At a minimum, three (3) guides on each side of the expansion joint shall be required.

Pre-insulated pipe supports, slides and anchors shall be used as required by the design engineer for all other pipe support points.

Pipe guide and slide plates must have one powder coated or stainless steel surface opposing a heat-bonded PTFE pad to provide a low coefficient of friction over a broad range of temperatures. All components shall be manufactured in compliance with the Manufacturers Standardization Society (MSS) SP-58 and SP-89.

Pre-insulated pipe supports, guides, slides and anchors shall be as manufactured by **Value Engineered Products, Inc.** or equal.

1.2 Pre-Insulated Pipe Guides

A. - Shall allow a ***minimum*** axial movement of +/- 2 inches.

B. - Shall allow a ***maximum*** vertical and lateral movement of +/- 1/8 inch.

C. - Shall have a 360° insulation insert of Xonotlite calcium silicate having a minimum 450 PSI compressive strength, factory jacketed with a vapor barrier meeting ASTM E96-A, and having a perm rating no greater than 0.02. Inserts shall be encased in a G-90 galvanized or stainless steel protection shield.

D. - Insulation inserts and integral vapor barrier jacket shall extend a minimum of 1" beyond each end of the protection shield for all systems designed to operate below ambient air temperature.

E. - Select proper model from table or chart and submit showing load ratings for pipe, type of service, and spacing for each application or system.

F. - Insulated pipe guides may be selected for use in lieu of pipe rollers and Type 39 saddles.

(Continued)

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Suggested Specification Guidelines:
Insulated Pipe Guides, Slides and Anchors (Continued)

1.3 Pre-Insulated Pipe Slides

A. - Shall allow a ***minimum*** axial movement of +/- 2 inches.

B. - Shall allow a system design ***maximum*** lateral movement of +/- 2 inches.

C. - Shall have a 360° insulation insert of Xonotlite calcium silicate with a minimum 450 PSI compressive strength, factory jacketed with a vapor barrier meeting ASTM E96-A and having a perm rating of 0.02, encased in a G-90 galvanized steel protection shield.

D. - Insulation insert and integral vapor barrier jacket shall extend a minimum of 1" beyond each end of the protection shield for all systems designed to operate below ambient air temperature.

E. - Select appropriate model from table or chart and submit specification/data sheet showing load ratings for pipe, type of service, and spacing for each application.

1.4 Pre-Insulated Pipe Anchors

A. - Shall be provided ready to be bolted or welded to a structural building component.

B. - Shall prevent vertical, lateral and axial movement of the pipe.

C. - Shall have 360° insulation inserts of Xonotlite calcium silicate having a minimum 900 PSI compressive strength for all pipe sizes. Anchors shall be of a length recommended by the manufacturer to meet the required design loads.

D. - Select proper model and submit table or chart showing load ratings for pipe, type of service, and spacing for each application or system.

E. - Insulated pipe anchors shall be used for vertical as well as horizontal pipe and on all piping systems where expansion, contraction and/or pipe movement is anticipated.

F. - All anchors must have anchor lugs field welded to the pipe. 'Friction anchors' are not permitted.

G. - All anchors must be installed in conjunction with manufactured expansion joints, bellows or loops and meet or exceed the expansion units' design loads.

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Manufacturers Standardization Society (MSS) Statement

MSS SP-58 And SP-69 Requirements

MSS SP-58 and SP-69 are widely referenced throughout the industry for insulation protection shields. Both the SP-58 and SP-69 documents reference Type 40 shields. Each document has its own 'Table 5' which may be referenced in individual specifications. Table 3 from SP-69 may also be included in any given specification and may warrant consideration. To correctly apply this information it is essential that the user be aware of the scope of each publication and its purpose.

***MSS SP-69** - Table 3 - Specifies the maximum pipe span allowed when hangers are directly attached to the pipe.*

***MSS SP-69** - Table 5 - Specifies maximum allowable pipe spans as well as protection shield lengths and gauges for insulated systems installed **without** the use of manufactured thermal hanger shields.*

***MSS SP-58** - Table 5 and Paragraph 9.2 provides information for insulated pipe systems utilizing protection shields either **with** or **without** high-density inserts.*

In general, the MSS SP-69 acts as a guide for installing the components of a mechanical system. It directs the reader (paragraph 5.1 Pipe Hangers and Supports - Selection and Application) to refer to the MSS SP-58 for information related to pipe supports:

> "*The materials of all pipe hanging and supporting elements shall be in accordance with the MSS SP-58."*

The MSS SP-58 is a reference for 'material, design and manufacture' of the individual components of the mechanical system. SP-58 paragraph 9.2 specifically addresses the use of Type 40 shields both *with* and *without* the use of high-density insulation materials. Paragraph 9.2.2 supersedes the shield lengths and gauges shown in *this* document's Table 5:

> *"When pipe covering protection shields are used with high compressive strength inserts, the shield length and thickness shall be appropriate for the compressive strength of the insert material. The insert shall be at least as long as the shield and where a vapor barrier is required; the vapor barrier shall extend two inches beyond the shield and overlap the outside circumference by two inches."*

All Value Engineered Products, Inc. units are made with high-density insulation with compressive strengths from 80 PSI up to 900 PSI. Additionally, every model includes the vapor barrier required to meet MSS-based specifications. Therefore all 360° Value Engineered Products exceed the requirements of a Type 40 shield. The V.E.P. Quik-Shield provides the basic components necessary for field fabrication of a Type 40 shield and may meet MSS-based specifications.

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Corps Of Engineers Statement

The US Army Corps of Engineers writes the specifications for most military and many government buildings across the country. Value Engineered Products, Inc. has developed manufacturing processes to meet the most stringent Corps specifications for all insulation thicknesses and pipe sizes. Please contact us for submittal sheets and pricing for these custom units.

The Corps of Engineers Guideline Specification (CEGS) requirements are set forth in the following table of insulation lengths and gauges:

Pipe Size	1/2" to 3-1/2"	4"	5" to 6"	8" to 14"	16" to 24"
Insulation Length	16"	16"	22"	28"	28"
Shield Length	12"	12"	18"	24"	24"
Metal Gauge	18 ga.	16 ga.	16 ga.	14 ga.	12 ga.

NOTE: These dimensions are substantially greater than accepted industry standards and must be considered when estimating a project.

Other shield dimensions may be acceptable on certain projects or in certain areas. Each region is autonomous and has the authority to alter specifications to meet the needs of the region or project. For this reason, Value Engineered Products, Inc. strongly recommends that you submit data sheets on every Corps of Engineers project.

Other important points when bidding to a Corps of Engineers Specification are:

- Galvanized steel shields *only*, twelve inches long, of 18-gauge material *may be* allowed on pipe 2 inches and smaller.
- The Corps of Engineers typically addresses only the lower 180 degrees (load bearing portion) of the unit on horizontal pipe.
- The Corps of Engineers does require a 360^{o} vapor barrier jacket to be continuous through the pipe hanger.
- Insulation inserts typically must extend a minimum of two inches *at each end* beyond the steel shield.
- Value Engineered Products' ultra-high compressive strength structural inserts or weight distribution plates are not included on Corps of Engineers units.
- Sample boards are usually required on Corps of Engineers projects to protect both the contractor and the Corps.

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Application Information

Allowable Loads and Hanger Spans for Calcium Silicate Based Supports

Pro-Shield / Pro-Shield N.T. / Quik-Shield

Spans Are Based On MSS SP-69 Table 5, Type 40 Shields

Nominal Pipe Size	Span Feet	Span Meters	Anticipated Load* (Pounds)	Maximum Allowable Loads Clevis	Trapeze	Roller
2	10	3.0	51	160	80	70
4	10	3.0	163	380	170	165
6	10	3.0	315	605	330	N/R
8	10	3.0	502	800	510	N/R
10	10	3.0	747	1160	830	N/R
12	10	3.0	1021	1400	1200	N/R
14	10	3.0	1222	1800	1250	N/R
16	10	3.0	1595	2600	N/R	N/R
18	10	3.0	2018	3300	N/R	N/R
20	10	3.0	2438	4000	N/R	N/R

Maximum allowable loads include a minimum 3:1 safety factor.
Spans may be increased *only* when installed in band-type hangers.

MaxSpan / MaxSpan R.H.

Spans Are Based On MSS SP-69 Table 3, Water Service

Nominal Pipe Size	Span Feet	Span Meters	Anticipated Load* (Pounds)	Maximum Allowable Loads Clevis	Trapeze	Roller
4	14	4.3	228	390	400	400
6	17	5.2	535	830	1000	1000
8	19	5.8	955	1400	1600	1500
10	22	6.1	1644	2100	2500	2400
12	23	7.2	2349	2600	3500	3400
14	25	7.6	3050	3600	4800	4600
16	27	8.3	4307	6000	8000	8000
18	28	8.5	5651	7200	9600	9000
20	30	9.1	7315	9000	10600	9500

'MaxSpan' units may be used to MSS Table 3 maximum hanger spans *only* when installed in band- or clamping-type (i.e. 'two-bolt') hangers. All flat surface and roller ratings are for MaxSpan R.H. units.

*Anticipated load is the weight (in pounds) of a water filled Schedule 40 pipe for the indicated span. When using the 'Maximum Allowable Loads' to determine hanger spacing, the actual load must include pipe weight, weight of transported media, valves or fittings or other items which may affect the total weight of that span of pipe.

N/R = Not Recommended

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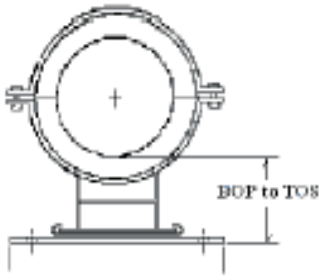
Insulated Guide and Slide Selection Chart

- Shaded Areas Indicate Recommended Applications.
- 'Bottom of Pipe' to 'Top of Steel' (BOP-TOS).
- PG and PS Units Allow +/- 2" of Axial Travel.
- PG Units Limit Lateral Travel to 1/8".
- Specify *'PLUS'* for +/- 4-1/2" of Axial Travel.



PG-1 and PS-1 BOP to TOS

Insulation Thickness	PIPE SIZE 1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3
1"	4.40	4.30	4.40	4.30	4.40	4.40	4.40	4.40
1-1/2"	4.90	4.90	4.60	5.00	4.90	4.90		
2"	5.40	5.30	5.40	5.30				
2-1/2"								
3"								
3-1/2"								
4"								
ALLOWABLE LOAD (Vertical & Lateral)	115	145	185	235	265	355	405	495

PG-2 and PS-2 BOP to TOS

Insulation Thickness	PIPE SIZE 2	2-1/2	3	4	5	6	8
1"				4.30	4.30	4.30	4.40
1-1/2"		5.00	4.80	4.80	4.80	4.80	4.90
2"	5.30	5.60	5.30	5.30	5.80	5.40	
2-1/2"	5.90	6.10	5.80	5.80	5.90	5.90	
3"	6.40	6.60	6.30	6.40	6.40		
3-1/2"	6.90	7.20	7.00	7.00			
4"	7.50	7.80	7.50				
ALLOWABLE LOAD (Vertical & Lateral)	670	810	990	1270	1570	1870	2430

PG-3 and PS-3 BOP to TOS

Insulation Thickness	PIPE SIZE 4	5	6	8	10	12	14	16
1"					5.80	6.00	5.90	6.10
1-1/2"					6.50	6.50	6.60	6.60
2"				6.80	7.00	7.20	7.10	7.10
2-1/2"				7.50	7.50	7.80	7.60	
3"			7.80	8.10	8.10	8.20	8.10	
3-1/2"		8.40	8.50	8.60	8.80	8.80		
4"	8.90	9.00	9.00	9.20	9.20			
ALLOWABLE LOAD (Vertical & Lateral)	1690	2100	2500	3250	4050	4800	5300	6100

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Pipe Dimensions / MSS Allowable Spans

Manufacturers Standardization Society (MSS) Recommended Spans

Schedule 40 Steel Pipe

Nominal Pipe Size	Actual O.D.	Weight Per Ft. Empty (lb.)	Weight Per Ft. Fully Flooded	Spans Per MSS SP-69 Table 3	Spans Per MSS SP-69 Table 5
1/2	.840	.85	.98	7	7
3/4	1.050	1.13	1.36	7	7
1	1.315	1.68	2.05	7	7
1-1/4	1.660	2.27	2.92	7	7
1-1/2	1.900	2.72	3.60	9	9
2	2.650	3.65	5.11	10	10
2-1/2	2.875	5.79	7.87	11	10
3	3.500	7.58	10.8	12	10
4	4.500	10.8	16.3	14	10
5	5.563	14.6	23.3	16	10
6	6.625	18.9	31.5	17	10
8	8.625	28.6	50.3	19	10
10	10.75	40.5	74.7	22	10
12	12.75	53.5	102.2	23	10
14	14.00	63.4	122.2	25	10
16	16.00	82.8	159.5	27	10
18	18.00	104.7	201.8	28	10
20	20.00	123.1	243.9	30	10
24	24.00	171.3	345.9	32	10

Copper Tube (Type-K)

Nominal Tube Size	Actual O.D.	Weight Per Ft. Empty (lb.)	Weight Per Ft. Fully Flooded	Spans Per MSS SP-69 Table 3	Spans Per MSS SP-69 Table 5
1/2	.625	.34	.44	5	5
3/4	.875	.64	.87	5	5
1	1.125	.84	1.22	6	6
1-1/4	1.375	1.04	1.61	7	7
1-1/2	1.625	1.36	2.16	8	8
2	2.125	2.06	3.44	8	8
2-1/2	2.625	2.93	5.06	9	9
3	3.125	4.00	7.03	10	10
4	4.125	6.51	11.8	12	10

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Hanger Sizing Guide

Minimum Hanger Inside Hanger Diameters (In Inches) To Fit Standard Insulated Pipe Supports

	Insulation Thickness			
Iron Pipe	**X 1/2"**	**X 1"**	**X 1-1/2"**	**X 2"**
1/2	2.000	**3.000**	**4.125**	**5.125**
3/4	2.250	**3.000**	**4.125**	**5.125**
1	2.500	**3.625**	4.625	**5.625**
1-1/4	3.000	**3.625**	**5.125**	**5.625**
1-1/2	3.125	4.125	**5.125**	**6.750**
2	3.625	4.625	5.625	**6.750**
2-1/2	4.125	5.125	**6.750**	**7.750**
3	4.625	5.625	**6.750**	**7.750**
4	5.625	6.750	7.750	8.750
5	6.750	7.750	8.750	9.750
6	7.750	8.750	9.750	10.875
8	9.875	10.875	11.875	12.875
10	12.000	12.875	14.250	15.250
12	14.000	15.250	16.250	17.250
14	15.125	16.375	17.375	18.375

	Insulation Thickness			
Copper Tube	**X 1/2"**	**X 1"**	**X 1-1/2"**	**X 2"**
5/8	**2.000**	**3.000**	3.500	4.625
7/8	**2.000**	**3.000**	**4.125**	**5.125**
1-1/8	2.250	**3.000**	**4.125**	**5.125**
1-3/8	2.500	**3.500**	4.500	**5.625**
1-5/8	3.000	**3.500**	**5.125**	**5.625**
2-1/8	3.625	4.125	**5.125**	6.750
2-5/8	4.125	4.625	5.625	6.750
3-1/8	4.625	5.125	6.750	7.750
4-1/8	5.625	6.625	7.750	8.750
6-1/8	7.750	8.750	9.750	10.875

NOTE: Hanger inside diameters must be large enough to accommodate the insulation wall thickness and the steel protection shield thickness. **Bold Type** indicates insulation sizes where outside diameters **do not change** as the pipe size changes.

Units comply with ASTM C-585 dimensional standards, subject to normal manufacturing tolerances.

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Protection Shield Ordering Guide

Sizing Guide To Select '180° Metal Only' Insulation Protection Shields
(For Use *Without* High Density Inserts)

	Insulation Thickness			
Iron Pipe	**X 1/2"**	**X 1"**	**X 1-1/2"**	**X 2"**
1/2	2.0	3.0	4.0	5.0
3/4	2.5	3.0	4.0	5.0
1	2.5	3.5	4.5	5.5
1-1/4	3.0	3.5	5.0	5.5
1-1/2	3.0	4.0	5.0	6.5
2	3.5	4.5	5.5	6.5
2-1/2	4.0	5.0	6.5	7.5
3	4.5	5.5	6.5	7.5
4	5.5	6.5	7.5	8.5
5	6.5	7.5	8.5	9.5
6	7.5	8.5	9.5	11.0
8	--	11.0	12.0	13.0
10	--	13.0	14.0	15.0
12	--	15.0	16.0	17.0
14	--	16.0	17.0	18.0

	Insulation Thickness			
Copper Tube	**X 1/2"**	**X 1"**	**X 1-1/2"**	**X 2"**
5/8	2.0	3.0	3.5	4.5
7/8	2.0	3.0	4.0	5.0
1-1/8	2.5	3.0	4.0	5.0
1-3/8	2.5	3.5	4.5	5.5
1-5/8	3.0	3.5	5.0	5.5
2-1/8	3.5	4.0	5.0	6.5
2-5/8	4.0	4.5	5.5	6.5
3-1/8	4.5	5.0	6.5	7.5
4-1/8	5.5	6.5	7.5	8.5
6-1/8	7.5	8.5	9.5	11.0

NOTE: To Order: Determine Insulation Outside Diameter X Length X Gauge - i.e. 4.5" (Insulation OD, From Chart Above) **X 12**" (Specified Overall Length**) X 18 Gauge** (Specified Metal Thickness).

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Standard Packaging and Box Weights

Pro-Shields and Quik-Shields

Pro-Shields

Pipe Size		Insulation Thickness X 1/2"	X 1"	X 1-1/2"	2"
--	5/8	96 / 34 lb.	40 / 32 lb.	24 / 24 lb.	14 / 18 lb.
1/2	7/8	96 / 33 lb.	40 / 30 lb.	20 / 26 lb.	12 / 22 lb.
3/4	1-1/8	70 / 26 lb.	40 / 30 lb.	20 / 26 lb.	12 / 22 lb.
1	1-3/8	60 / 26 lb.	24 / 24 lb.	14 / 21 lb.	10 / 22 lb.
1-1/4	1-5/8	40 / 22 lb.	24 / 23 lb.	12 / 21 lb.	10 / 22 lb.
1-1/2	--	24 / 21 lb.	20 / 23 lb.	12 / 21 lb.	6 / 17 lb.
2	--	24 / 19 lb.	14 / 20 lb.	10 / 21 lb.	6 / 18 lb.
--	2-1/8	24 / 21 lb.	20 / 22 lb.	12 / 20 lb.	6 / 17 lb.
2-1/2	--	20 / 20 lb.	12 / 23 lb.	6 / 17 lb.	6 / 22 lb.
--	2-5/8	20 / 20 lb.	14 / 17 lb.	10 / 19 lb.	6 / 18 lb.
3	--	14 / 15 lb.	10 / 18 lb.	6 / 16 lb.	6 / 21 lb.
--	3-1/8	14 / 15 lb.	12 / 17 lb.	6 / 16 lb.	6 / 24 lb.
4	4-1/8	N/A	6 / 14 lb.	6 / 19 lb.	5 / 20 lb.

Quik-Shields

Pipe Size		Insulation Thickness X 1/2"	X 1"	X 1-1/2"
--	5/8	200 / 34 lb	90 / 30 lb.	60 / 27 lb
1/2	7/8	200 / 34 lb.	90 / 33 lb.	40 / 26 lb.
3/4	1-1/8	175 / 33 lb.	90 / 33 lb.	40 / 25 lb.
1	1-3/8	150 / 32 lb.	60 / 29 lb.	36 / 27 lb.
1-1/4	1-5/8	120 / 28 lb.	70 / 33 lb.	30 / 26 lb.
1-1/2	--	75 / 30 lb.	50 / 28 lb.	30 / 26 lb.
2	--	55 / 26 lb.	48 / 34 lb.	28 / 29 lb.
--	2-1/8	75 / 30 lb.	50 / 27 lb.	30 / 25 lb.
2-1/2	--	50 / 26 lb.	34 / 27 lb.	18 / 24 lb.
--	2-5/8	55 / 26 lb.	48 / 33 lb.	28 / 29 lb.
3	--	48 / 24 lb.	30 / 33 lb.	20 / 25 lb.
--	3-1/8	50 / 26 lb.	34 / 27 lb.	18 / 24 lb.
4	4-1/8	N/A	20 / 22 lb.	15 / 23 lb.

NOTE: Standard box size for units listed is 16" X 12" X 12". Weights are approximate only. Actual shipping weights may vary due to packaging, design variations and other manufacturing tolerances.

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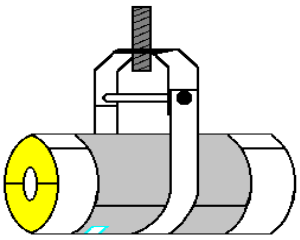
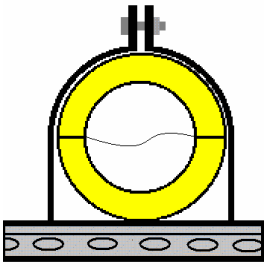
Pro-Shield





Description / Features

Pro-Shields are 360° thermal hanger shields designed to meet the broadest range of pipe support applications. They provide a continuous section of insulation and vapor barrier through a wide variety of pipe hangers for pipe systems operating between +20° F. and +1200° F. The insulation and vapor barrier extend beyond the galvanized steel shield for a neat, vapor-tight joint with the adjoining insulation. Pro-Shields are suitable for use in any type of clamp as well as in band-type hangers and on flat surfaces. To assure proper support in all situations, high density 450 PSI inserts are installed in units for 10" pipe with 1" insulation thickness and in all units for 12" pipe and larger. **Pro-Shields meet the MSS standard for a Type 40 shield per MSS SP-58, Paragraph 9.2.2.**

Applications

- For indoor use on clamping support systems, flat surfaces, clevis or other band-type hangers (see WeatherShield Upgrade submittal for outdoor use).
- Pipe sizes 16 inch and larger *in clevis or two bolt hangers only.*
- Chilled to steam piping and dual temperature lines.
- Hanger spans per MSS SP-69 Table 5.
- Available for pipe 1/2 inch through 30 inches, insulation thickness 1/2 inch through 4 inches.

Materials / Construction

- 135 PSI Calcium silicate meeting ASTM C-533, C-585, C-795, E-84, Flame Spread -0-, Smoke Developed -0-, Thermal Conductivity ('k') .40 @ 75° F. mean.
- Adhesive complying with NFPA 90-A, ASTM E-84, Flame Spread -10-, Smoke Developed -0-.
- G-90 Galvanized steel shield, small check per ASTM A-527.
- Vapor Barrier of all service jacket meeting ASTM D-774, D-828 and E-84, Flame Spread -5-, Smoke Developed -5-.
- Structural insert (12" pipe and larger) minimum 450 PSI calcium silicate meeting ASTM C-533, C-795 and E-84, Flame Spread -0-, Smoke Developed -0-.
- All units and components are asbestos free and 100% made and assembled in the U.S.A.

DIMENSIONS

PIPE SIZE	1/2" to 1-1/2"	2" to 5"	6" to 8"	10" to 12"	14" to 24"
Insulation Length	6"	6"	9"	9"`	12"
	150 mm	150 mm	230 mm	230 mm	300 mm
Shield Length	4"	4"	6"	6"	9"
	100 mm	100 mm	150 mm	150 mm	230 mm
Shield Gauge	22 ga.	20 ga.	16 ga.	14 ga.	12 ga.
	.9 mm	1.0 mm	1.6 mm	2.0 mm	2.75 mm

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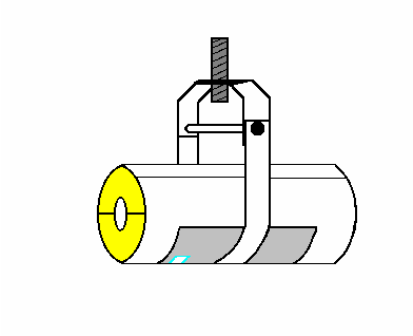
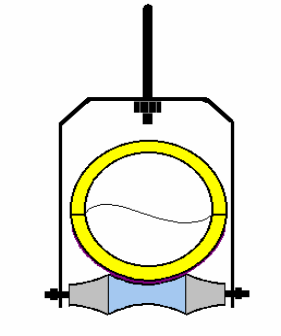
Pro-Shield N.T.





Description / Features

Pro-Shield N.T. units provide a continuous section of insulation and vapor barrier through a wide variety of pipe hangers for piping systems operating between +20° F and +1200° F. The Pro-Shield N.T. is designed for use in band-type hangers and on flat surfaces. The insulation and vapor barrier extend beyond the galvanized steel shield for a neat, vapor-tight joint with the adjoining insulation. **Pro-Shield N.T. meets the MSS standard for Type 40 Shields per MSS SP-58, Paragraph 9.2.2.** To assure proper support, high density 450 PSI inserts are included on units for 10" pipe with 1" wall thickness and on all units for 12" pipe and larger.

Applications

- For indoor use on flat surfaces or clevis & other band-type hangers (see WeatherShield Upgrade data page for outdoor applications).
- Pipe sizes 16 inch and larger *in clevis hangers only.*
- Chilled to steam piping and dual temperature lines.
- Hanger spans per MSS SP-69 Table 5.
- Available for pipe 1/2 inch through 30 inches, insulation thickness 1/2 inch through 4 inches.

Materials / Construction

- 135 PSI Calcium silicate meeting ASTM C-533, C-585, C-795, E-84, Flame Spread -0-, Smoke Developed -0-, Thermal Conductivity ('k') .40 @ 75° F. mean.
- Adhesive complying with NFPA 90-A, ASTM E-84, Flame Spread -10-, Smoke Developed -0-.
- G-90 Galvanized steel shield, small check per ASTM A-527.
- Vapor Barrier of all service jacket meeting ASTM D-774, D-828 and E-84, Flame Spread -5-, Smoke Developed -5-.
- Structural insert (12" pipe and larger) minimum 450 PSI calcium silicate meeting ASTM C-533, C-795 and E-84, Flame Spread -0-, Smoke Developed -0-.
- All units and components are asbestos free and 100% made and assembled in the U.S.A.

DIMENSIONS

PIPE SIZE	1/2" to 1-1/2"	2" to 5"	6" to 8"	10" to 12"	14" to 24"
Insulation Length	6"	6"	9"	9"`	12"
	150 mm	150 mm	230 mm	230 mm	300 mm
Shield Length	4"	4"	6"	6"	9"
	100 mm	100 mm	150 mm	150 mm	230 mm
Shield Gauge	22 ga.	20 ga.	16 ga.	14 ga.	12 ga.
	.9 mm	1.0 mm	1.6 mm	2.0 mm	2.75 mm

R.9-07/07

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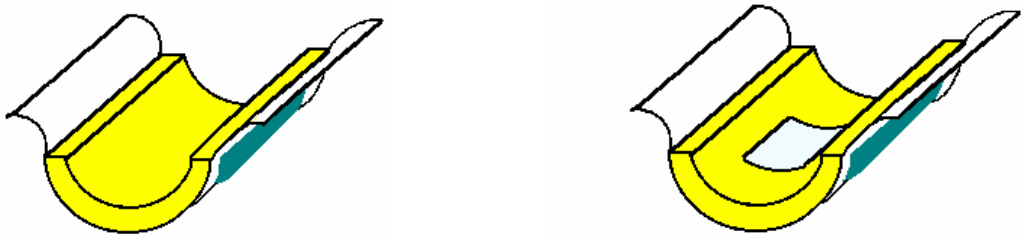
Quik-Shield



(With 450 PSI Structural Insert)

Description / Features

Quik-Shields ™ are economically priced 180° thermal hanger shields providing a continuous section of insulation and vapor barrier through a variety of pipe hangers. The vapor barrier jacket extends beyond the galvanized steel shield and beyond the insulation insert for a neat, vapor-tight fit with both the adjoining and the field-applied top insulation. To assure proper support in all situations, high density 450 PSI structural inserts are installed on units for 10" pipe with 1" wall thickness and on all units for 12" pipe and larger.

Applications

- For indoor use on flat surfaces, clevis or other band-type hangers.
- Pipe sizes 16 inch and larger in *clevis hangers only.*
- Chilled to steam piping and dual temperature lines.
- Hanger spans per MSS SP-69 Table 5.
- Available for pipe 1/2 inch through 30 inches.
- Insulation thickness 1/2 inch through 4 inches.

Materials / Construction

- 135 PSI Calcium silicate meeting ASTM C-533, C-585, C-795, E-84, Flame Spread -0-, Smoke Developed -0-, Thermal Conductivity ('k') .40 @ 75° F. mean.
- Adhesive complying with NFPA 90-A, ASTM E-84, Flame Spread -10-, Smoke Developed -0-.
- G-90 Galvanized steel shield, small check per ASTM A-527.
- Vapor Barrier of all service jacket meeting ASTM D-774, D-828 and E-84, Flame Spread -5-, Smoke Developed -5-.
- Structural insert (12" pipe and larger) minimum 450 PSI calcium silicate meeting ASTM C-533, C-795 and E-84, Flame Spread -0-, Smoke Developed -0-.
- All units and components are asbestos free and 100% made and assembled in the U.S.A.

DIMENSIONS

PIPE SIZE	1/2" to 1-1/2"	2" to 5"	6" to 8"	10" to 12"	14" to 24"
Insulation Length	6"	6"	9"	9"`	12"
	150 mm	150 mm	230 mm	230 mm	300 mm
Shield Length	4"	4"	6"	6"	9"
	100 mm	100 mm	150 mm	150 mm	230 mm
Shield Gauge	22 ga.	20 ga.	16 ga.	14 ga.	12 ga.
	.9 mm	1.0 mm	1.6 mm	2.0 mm	2.75 mm

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MaxSpan

Description / Features

MaxSpan thermal hanger shields are designed to provide a superior safety margin when supporting pipe with hanger spans up to the maximum allowed in Table 3 of the MSS SP-69. Like the Pro-Shield™ and Pro-Shield N.T.™ these 360° thermal hanger shields provide a continuous section of insulation and vapor barrier through a wide variety of pipe hangers and can be used on piping systems operating between +20° F. and +1200° F. The insulation and vapor barrier extend beyond the galvanized steel shield for a neat, vapor-tight joint with the adjoining insulation. To achieve the protection required by long hanger spans, the MaxSpan™ thermal hanger shields utilize heavier gauge shields, and 900 PSI structural inserts (10" pipe and larger).

Applications

- For indoor use on all band and clamping hanger systems (see WeatherShield Upgrade data sheet for outdoor applications).
- Chilled to steam piping and dual temperature lines.
- Hanger spans per MSS SP-69 Table 3.
- Available for pipe 4 inch through 30 inches.
- Insulation thickness 1/2 inch through 4 inches.

Materials / Construction

- 135 PSI Calcium silicate meeting ASTM C-533, C-585, C-795, E-84, Flame Spread -0-, Smoke Developed -0-, Thermal Conductivity ('k') .40 @ 75° F mean.
- Adhesive complying to NFPA 90-A and ASTM E-84, Flame Spread -10-, Smoke Developed -0-.
- G-90 Galvanized steel shield, small check per ASTM A-527.
- Vapor barrier of all service jacket meeting ASTM D-774, D-828 and E-84, Flame Spread -5-, Smoke Developed -5-.
- Structural insert minimum 900 PSI calcium silicate meeting ASTM C-533, C-795 and E-84, Flame Spread -0-
, Smoke Developed -0-.
- All units and components are asbestos free and 100% made and assembled in the U.S.A.

DIMENSIONS

PIPE SIZE	1/2" to 3"	4" to 5"	6" to 8"	10" to 12"	14" to 24"
Insulation Length	6"	9"	12"	12"`	14"
	150 mm	230 mm	300 mm	300 mm	350 mm
Shield Length	4"	6"	6"	9"	12"
	100 mm	150 mm	150 mm	230 mm	300 mm
Shield Gauge	18 ga.	16 ga.	16 ga.	14 ga.	12 ga.
	1.3 mm	1.6 mm	1.6 mm	2.0 mm	2.75 mm

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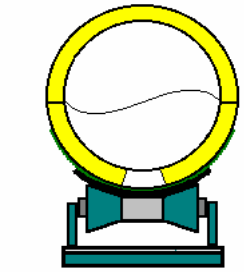
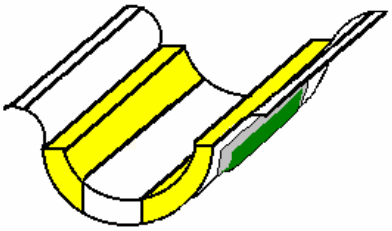
MaxSpan R.H.





Shown With 900 PSI Structural Insert

Description / Features

The MaxSpan R.H. thermal hanger shield is specifically designed to provide a superior safety margin for pipe mounted on pipe rollers, flat surfaces or with supports where point loading may be a concern. These rugged units allow hanger spans up to the maximum allowed in Table 3 of the MSS SP-69. They are appropriate for either hot or cold pipe systems. The insulation and vapor barrier extend beyond the galvanized steel shield for a neat, vapor-tight joint with the adjoining insulation. Units for pipe 4" and larger include a wear/weight distribution plate of carbon steel (primer painted). Additionally, a segment of ultra high density, 900 PSI calcium silicate is fabricated into units for 10" pipe size and larger. The **MaxSpan R.H. meets or exceeds the MSS standard for Type 40 Shields per MSS SP-58, Paragraph 9.2.2.**

Applications

- For indoor use on all roller hanger systems and flat surfaces (see WeatherShield Upgrade data page for outdoor applications).
- Chilled to steam piping and dual temperature lines.
- Hanger spans per MSS SP-69 Table 3.
- Available for pipes 1/2 inch through 30 inches.
- Insulation thickness 1/2 inch through 4 inches.

Materials / Construction

- 135 PSI Calcium silicate meeting ASTM C-533, C-585, C-795, E-84, Flame Spread, Smoke Developed -0-.
- Adhesive complying with NFPA 90-A and ASTM E-84, Flame Spread -10-, Smoke Developed -0-.
- G-90 Galvanized steel shield, small check per ASTM A-527.
- Wear/Weight Distribution Plate - carbon steel meeting ASTM A-36.
- Vapor Barrier of all service jacket meeting ASTM D-774, D-828 and E-84.
- Structural insert (10" pipe and larger) minimum 900 PSI calcium silicate.
- All units and components are asbestos free and 100% made and assembled in the U.S.A.

DIMENSIONS

PIPE SIZE	1/2" to 1-1/2"	2" to 3"	4" to 8"	10" to 12"	14" to 24"
Insulation Length	9" 230 mm	9" 230 mm	9" 230 mm	12"` 300 mm	14" 350 mm
Shield Length	6" 150 mm	6" 150 mm	6" 150 mm	9" 230 mm	12" 300 mm
Shield Gauge	18 ga. 1.3 mm	16 ga. 1.6 mm	14 ga. 2.0 mm	14 ga. 2.0 mm	14 ga. 2.75 mm
Plate Dimensions	N/A	N/A	1/8" X 6"	1/4" X 6"	1/4" X 10"
Travel Allowed	+/- 2"	+/- 2"	+/- 2"	+/- 2"	+/- 3"

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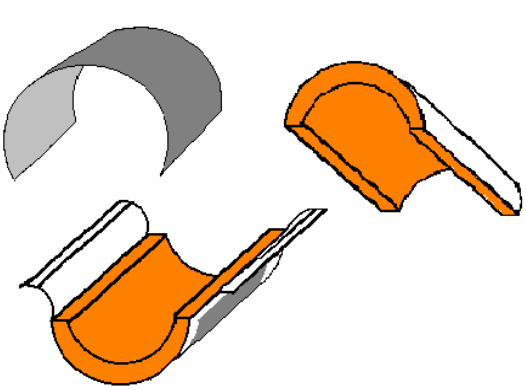
Chill-Shield



Description / Features

Chill-Shields are 360° thermal hanger shields designed to meet a broad range of pipe support applications on low temperature lines. They provide a continuous section of insulation and vapor barrier, and are designed for pipe systems operating between -250° F. and +225° F. The insulation and vapor barrier extend beyond the galvanized steel shield for a neat, vapor-tight joint with the adjoining insulation. Chill-Shields are suitable for use in any type of clamp as well as in band-type hangers. High-compressive strength polyurethane inserts and extra long, heavy gauge steel shields ensure proper pipe support. These cost effective designs meet the requirements of either pipe or tube systems.

Applications

- For indoor use on clamping support systems, clevis or other band-type hangers.
- Chilled piping to domestic hot water.
- Hanger spans per MSS SP-69 Table 5 (not suitable for extended hanger spans).
- Available for pipe 1/2 inch through 24 inches.
- Insulation thickness 1/2 inch through 4 inches.

Materials / Construction

- 360° Polyurethane
  80 PSI - Flame Spread -15-, Smoke Developed -360-, Thermal Conductivity ('k') .19 @ 75° F. mean.
  140 PSI - Flame Spread -15-, Smoke Developed -550-, Thermal Conductivity ('k') .20 @ 75° F. mean.
- Meeting ASTM D-1621, D-1622, D-1623, C-203, C-518, E-96 and E-84.
- 360° Non-reactive vapor barrier jacket meeting ASTM D-774, D-828 and E-84.
- Adhesive complying with NFPA 90-A and ASTM E-84, Flame Spread -10-, Smoke Developed -0-.
- 360° G-90 Galvanized steel shield, small check per ASTM A-527.
- All units are asbestos free and 100% made and assembled in the U.S.A.

DIMENSIONS

PIPE SIZE	1/2" to 1-1/2"	2" to 3"	4" to 6"	8" to 12"	14" to 24"
Insulation Length	6"	9"	12"	12"`	14"
	150 mm	230 mm	300 mm	300 mm	350 mm
Compressive Strength	80 PSI	80 PSI	80 PSI	140 PSI	Per Design
	552 Kpa	552 Kpa	552 Kpa	965 Kpa	Requirements
Shield Length	4"	6"	6"	9"	12"
	100 mm	150 mm	150 mm	230 mm	300 mm
Shield Gauge	20 ga.	18 ga.	16 ga.	14 ga.	12 ga.
	1.0 mm	1.3 mm	1.6 mm	2.0 mm	2.75 mm

R.9-07/07

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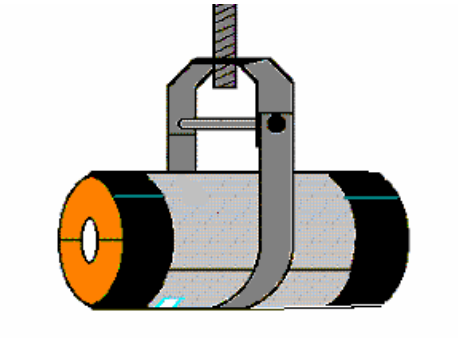
Chill-Shield E.R.



Description/Features

The Chill-Shield E.R. thermal hanger shield is similar to the Chill-Shield. Both are 360 degree units designed for low temperature systems. The Chill-Shield E.R. incorporates an elastomeric vapor barrier jacket and matches lines insulated with elastomeric rubber ('Armaflex') or polyethylene-type insulation materials. Both the Chill-Shield and Chill-Shield E.R. use high density/high compressive strength polyurethane inserts and have an exterior jacket designed to match the adjoining insulation. The Chill-Shield E.R. units are suitable for use in any type of clamp as well as in all band-type hangers.

Applications

- For indoor use on clamping support systems, clevis or band-type hangers.
- Low temperature tubing systems to minus 250° F.
- Hanger spans per MSS SP-69 Table 5.
- Available for pipe sizes 1/2 inch through 24 inches.
- Insulation thickness 3/4, 1, 1-1/2 and 2 inch.

Materials/Construction

- 360° Polyurethane foam:
  80 PSI - Flame Spread -15-, Smoke Developed -360-, Thermal Conductivity ('k') .19 @ 75° F mean.
  140 PSI - Flame Spread -15-, Smoke Developed -550-, Thermal Conductivity ('k') .20 @ 75° F. mean.
- Meets ASTM D-1621, D-1622, D-1623, C-203, C-518, E-96 and E-84.
- 360° Elastomeric jacket meeting ASTM D-1056, C-534 and E-84, Flame Spread -25-, Smoke Developed -50-.
- Adhesive complying with NFPA 90-A & ASTM E-84, Flame Spread -10-, Smoke Developed -0-.
- 360° G-90 Galvanized steel shield, small check per ASTM A-527.
- All units are asbestos free and 100% made and assembled in the U.S.A.

DIMENSIONS

PIPE SIZE	1/2" to 1-1/2"	2" to 3"	4" to 6"	8" to 12"	14" to 24"
Insulation Length	6"	9"	12"	12"`	14"
	150 mm	230 mm	300 mm	300 mm	350 mm
Compressive Strength	80 PSI	80 PSI	80 PSI	140 PSI	Per Design
	552 Kpa	552 Kpa	552 Kpa	965 Kpa	Requirements
Shield Length	4"	6"	6"	9"	12"
	100 mm	150 mm	150 mm	230 mm	300 mm
Shield Gauge	20 ga.	18 ga.	16 ga.	14 ga.	12 ga.
	1.0 mm	1.3 mm	1.6 mm	2.0 mm	2.75 mm

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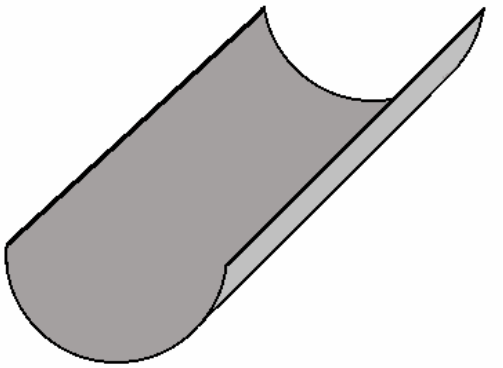
Insulation Protection Shields

(Without High Compressive Strength Inserts)



Description / Features

All insulation systems require steel shields either with or without high-density inserts to be installed at each point pipes are to be supported. Shield lengths and gauges may vary widely between specifications. For this reason, Value Engineered Products, Inc. provides a variety of shield lengths and gauges to meet the industry's varying requirements. All shields are precision stamped or rolled to meet ASTM C-585 dimensional standards and match the pipe insulations' outside diameters.

Applications

Galvanized or stainless steel shields without high density inserts may be allowed on small-bore pipe, two inches in diameter or smaller. Steel shields alone may be permitted on larger diameter pipe, providing the length of the shield is long enough to prevent the insulation from showing signs of compression from the weight of the pipe plus the weight of the media being transported and any valves or fittings which add to the pipe load.

Materials / Construction

- 100% American made steel.
- G-90 galvanized per ASTM A-527.
- Precision pressed or rolled to ASTM C-585 dimensional standards.
- Available from 2.0" ID and larger.
- Available from 24 gauge galvanized to 3/8" thick mild steel plate.
- Available to MSS SP-58 and SP-69, Table 5 dimensions.

Manufacturers Standardization Society (MSS)
Type 40 Shields Without High Compressive Strength Inserts

The MSS SP-58 and SP-69 list the following shield lengths and steel gauges for use with insulation having a compressive strength of 15 PSI and when used in clevis hangers and pipe spans with a maximum of 10 feet.

PIPE SIZE	1/2" to 3"	4"	5" & 6"	8" to 14"	16" to 24"
Shield Length	12"	12"	18"	24"	24"
Steel Gauge	18 ga.	16 ga	16 ga.	14 ga.	12 ga.

All Mss references and quotes in this catalogue are extracted from MSS SP-58 (2002) and MSS SP-69 (2003) with permission of the publisher. The Manufacturers Standardization Society.

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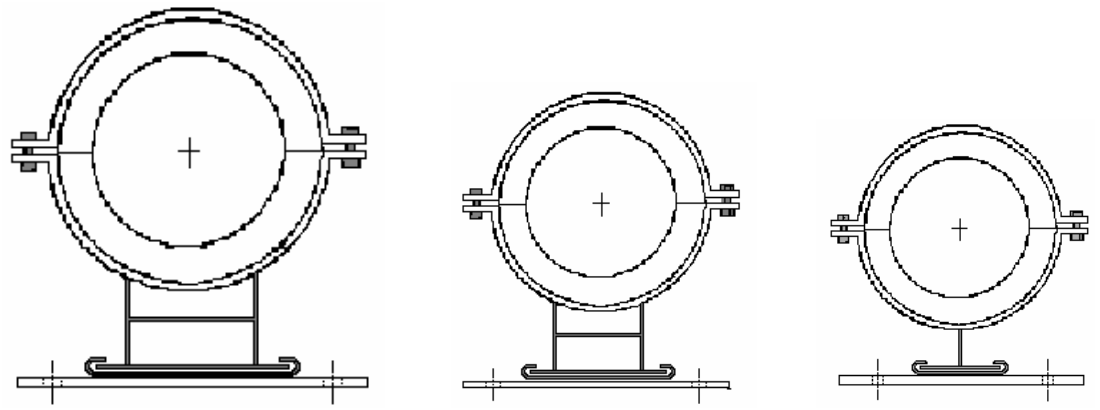
PG Series Insulated Pipe Guides



Description / Features

The Value Engineered Products line of insulated pipe guides is engineered to provide a superior method for pipe alignment and controlled travel. Insulation efficiency is achieved from the use of a unique and rugged Xonotlite insulation insert. This insert eliminates areas of heat loss or gain, impossible to control with direct attachment systems. The rugged nature and high compressive strength of this insert material allows the elimination of intermediary pipe supports resulting in fewer mechanical components to purchase and install. The 'PG' series of pipe guides incorporates a logical system of hardware design where pipe size and insulation thickness dictate the construction of the unit. PG Series insulated pipe guides are far superior to pipe rollers and may be seismic rated. The use of 'PS Series' pipe slides along with the 'PG Series' pipe guides assures that the critical 'bottom of pipe' (BOP) to 'top of steel' (TOS) dimension stays constant throughout the system.

PG-Plus Series insulated pipe guides allow additional axial travel up to nine inches. Units for severe loads and/or greater travel are available by design.

Applications

- All systems operating from + 20° to +1700° F.
- Pipe sizes 2 inch to 20 inch - custom sizes by design.
- Hanger spans to MSS SP-69, Table 3 maximums.
- Insulation thickness 1" to 4" (see application charts).
- Total axial pipe travel of 4" (PG Series) - 9" travel for PG-*Plus* Series.
- Lateral travel (all models) +/- 1/8".
- Eliminates pipe rollers and other direct attachment methods.

Materials / Construction

- Powder coated finish meeting ASTM B-117 (1000 hour salt spray) ASTM D-3359, ASTM D-3363.
- Heat bonded PTFE low friction slide pad.
- 1700 Degree F. temperature limit Xonotlite calcium silicate, meeting ASTM C-656 Type II, E-84 Flame Spread -0-, Smoke Developed -0-.
- Vapor barrier meeting ASTM E-96, D-774, D-828 and E-84, Flame Spread -5-, Smoke Developed -5-.
- Insulation 'k'-Factor of .54 @ 200 degrees F.
- 100% American-made materials and construction.

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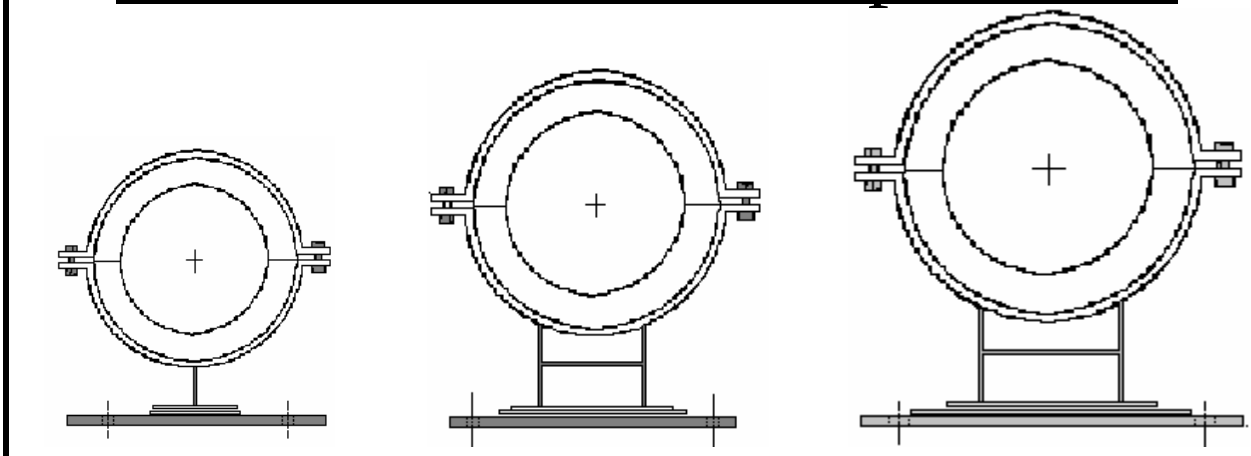
PS Series Insulated Pipe Slides



Description / Features

Value Engineered Products' line of insulated pipe slides provides a superior method of supporting pipes while allowing unrestricted axial and lateral pipe movement. Use of a 360° insulation insert of Xonotlite calcium silicate eliminates areas of heat loss or gain allowed by direct attachment systems. The rugged nature and high compressive strength of this insert material supports pipes to their maximum allowable spans, eliminating the need for intermediary supports. The 'PS Series' of insulated pipe slides incorporates a logical system of hardware design and when used in conjunction with the 'PG Series' of insulated pipe guides, the critical 'bottom of pipe (BOP) to 'top of steel' (TOS) dimension stays constant throughout the system. This practical design facilitates fast installation saving valuable field labor. The 'virgin' PTFE slide pad provides an extremely low coefficient of friction and is available in a variety of sizes which can allow up to seven inches of lateral travel.

Specify ***PS-Plus Series*** pipe slides for systems requiring greater axial and/or lateral pipe movement.

Applications

- All piping systems operating between +20° F. to +1700° F.
- Pipe sizes 1/2" to 20", larger pipe sizes by design.
- Hanger spans to MSS SP-69, Table 3 maximums.
- Insulation thickness 1" to 4" (see application charts).
- Total axial pipe travel of 4" (PS-Series), 9" travel for *PS-Plus* Series.
- Up to 7" of total lateral travel (PS-*Plus* Series).
- Base plates may be bolted or welded in place.

Material Construction

- Powder coated finish meeting ASTM B-117, ASTM D-3359, and ASTM D-3363.
- Heat bonded PTFE low friction slide pad.
- 1700° F. Xonotlite insulation with compressive strengths of either 450 or 900 PSI meeting ASTM C-656 Type II, E-84, Flame Spread -0-, Smoke Developed -0-.
- Vapor barrier jacket meeting ASTM D-774, D-828 and E-84, Flame Spread -5-, Smoke Developed -5-.
- Insulation 'k'-Factor of .54 @ 200 degrees F.
- 100% American-made materials and construction.

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PA Series Insulated Pipe Anchors

Value Engineered Products recognizes the need to provide insulated pipe anchors to complete their line of insulated pipe hangers, slides and guides.

Many competitors promote anchors in their catalogues and provide tables which state allowable vertical and axial loads. These two ratings, however, only apply to a system where the anchor would be 'bracketed' by expansion joints, - i.e. expansion joint - anchor - expansion joint.

In all other 'real world' applications, there are ***at least six forces*** at play whose ***combined*** stresses must be taken into account. The net, cumulative effect of these combined forces typically far exceeds published 'allowable loads' for insulated anchors. Additional 'moments of force' caused by a variety of system operating factors can easily exceed the highest published load ratings. The type of expansion joints, loops, or bellows used in a system also vary widely in design and load characteristics.

Some mechanical specifications call for 'friction anchors'. This type of anchor should truly be called a '*fiction* anchor' as there is no possible way to calculate the ability of this type of unit to operate as an anchor. Each anchor will have a different amount of resistance to movement based on how well the section of insulation matches the pipe and the amount of force applied to the pipe by the clamp. The smallest amount of variation or wear to the insulation insert or deviation in clamping force will change the anticipated (or required) resistance to pipe movement.

For these reasons, Value Engineered Products requires specific temperature ranges, pipe spans, and system applications before making an anchor recommendation. Our 'Light Duty' PA (Pre-Insulated Anchor) is appropriate where 'friction anchors' are called for. Our Heavy Duty PA is an engineered unit and can only be quoted once the required system parameters are provided.

In all cases V.E.P. Pre-Insulated Pipe Anchors require field welding to the pipe. For this reason, true pipe anchors for copper tube cannot be provided.

DATA

Insulation Inserts:

- Xonotlite calcium silicate - full length**.**
- Compressive strength - 900 PSI or 1600 PSI (depending on system design).
- Temperature limit to 1800° F.
- Flexural strength - 550 PSI or 800 PSI (depending on system design).
- Meets ASTM C-656 Type II, E-84, Flame Spread -0-, Smoke Developed -0-.

Anchor Hardware:

- Steel meeting ASTM A-36.
- Powder coated per ASTM B-117 (1000 hour salt spray), ASTM D-3363 (pencil hardness 'H'), and ASTM D-3359 (adhesion '5B').
- Fasteners are plated - Grade 2, Industrial.

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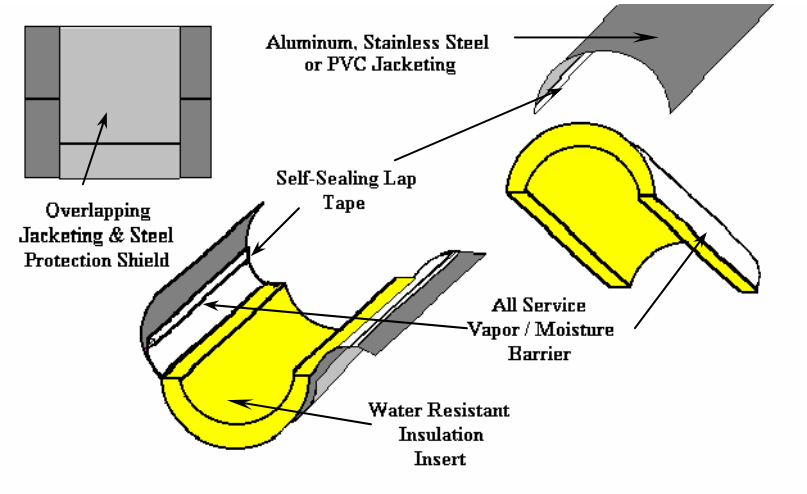
WeatherShield Upgrade

Protection System For Outdoor Applications



Description / Features

WeatherShield modifications are appropriate wherever aluminum, stainless steel or PVC jacketed insulation systems may be specified. The calcium silicate insulation is treated with a water-resistant compound to provide additional protection from moisture. The WeatherShield is constructed with the specified jacketing material laminated between the steel protection shield and the insulation material. WeatherShield modifications may be specified for Pro-Shield, Pro-Shield N.T., MaxSpan or MaxSpan R.H. designs. WeatherShields *must be installed as 360^{o} units* to maintain their integrity and weather resistance.

Construction / Installation Procedure

The bottom shield's weather barrier covers approximately 240^{o} of the unit's circumference. The top weather barrier is provided as a separate piece from the top half of insulation. Once the top insulation piece is installed, this top weather barrier overlaps the bottom weather barrier to act as a watershed, and is then attached with two strips of self-sealing tape, sealing it to the lower half of the unit. If a top metal shield is required, it can be slid into place completing the unit. Insulation and jacketing extend beyond the steel protection shield for a neat, weather-tight connection with the adjoining insulation.

Available Weather Barriers

- **PVC Jacketing** - .020 or .030 thickness. Colors to match adjoining system requirements.
- **Aluminum Jacketing** - .016 or .020 thickness. Smooth or stucco embossed.
- **Stainless Steel Jacketing** - .010 or .015 thickness. Smooth or stucco embossed.

Pricing Policy

All WeatherShield Upgrades will be quoted on a per job basis to a list of materials**.**

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Test Procedures and Information

Value Engineered Products, Inc. has designed a line of thermal hanger shields to provide both superior support and insulation capabilities to accommodate a vast array of hanger types and pipe spans encountered in the field. To insure that our products meet 'real world' mechanical system requirements, Value Engineered Products has conducted extensive destructive testing on our products.

All tests performed by Value Engineered Products are 'Design Proof Tests' as defined by the Manufacturer's Standardization Society of the Pipe, Valve and Fitting Industry (MSS) as detailed in the MSS SP-89 document.

Tests on multiple samples follow the physical test method detailed in Paragraph 7.3.3a. of the SP-89 document and to the American Standard Testing Method (ASTM) C-165A standard. Results from the physical tests are the basis of analytical methods and formulae used to determine a safe load rating for various component sizes, as per paragraph 7.3.2.3a. of the same SP-89 document.

In these tests, compression of the calcium silicate is measured in hundredths of an inch as pressure is applied to the sample positioned on the test bed. This compression is then expressed as a percentage in relation to the original thickness of the insulation material.

While 10% compression is a recognized allowable standard, Value Engineered Products' samples must show no more than 5% compression at three times the anticipated load to be considered acceptable. Testing continues beyond this point until visible changes, such as cracks in the insulation material or dimpling of the steel protection shield are observed.

Testing is an ongoing event and is conducted on a variety of devices. Results are compared to insure uniformity and consistency in our final products.

Test machines include:

- Enerpac Corporation hydraulic press with a calibrated ram and No-Shok glycerin filled gauge, 8000 pound capacity - Value Engineered Products, Inc., Denver CO.
- Instron Series IX Testing Device, 20,000 pound capacity - Johns Manville Laboratories, Littleton, CO.
- Southwark/Emery Press with calibrated digital readout, 100,000 pound capacity - IIG-LLC, Fruita, CO.

Test results are compiled and analyzed. These results are incorporated into the charts shown on Page 8 of the V.E.P. catalogue. Additionally, each submittal sheet has a table showing 'Allowable Loads - Recommended Spans' for quick, convenient reference.

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Terms and Conditions Of Sale, Warranty

Value Engineered Products, Inc. guarantees that its products are free from manufacturing defects or damage when released from our plant. Value Engineered Products, Inc. further warrants our workmanship and guarantees compliance with published ASTM dimensional standards. Should a claim for defective materials arise, it must be brought to our attention, in writing, within 30 days after purchase. Upon inspection by Value Engineered Products, Inc., new product shall be furnished for replacement of defective units. Value Engineered Products, Inc. shall not be liable for incorrect selection or improper installation of our products. All dimensions, ratings and designs have been carefully determined, however, they are not guaranteed.

Claims for shortages in shipments must be made within 10 days from shipment. Deductions on invoice amounts are not allowed without prior written approval.

Returns are subject to a minimum 25% restock charge and are subject to inspection at the plant. Value Engineered Products, Inc. will not pay return freight. Special orders and noted sizes or project specific designs are not returnable. Special orders are defined as any product not complying with our standard published data sheet and listed on our price pages. Materials returned to our plant must be in original condition to receive credit. Value Engineered Products, Inc. reserves the right to refuse credit on any returns. *Credits for returned goods shall be applied to future sales*.

Value Engineered Products, Inc. has designed a line of thermal hanger shields requiring a minimum of models and styles in order to make ordering and installation easy. It is the responsibility of the customer to order correct sizes and quantities, to know whether the pipe is steel, cast iron, ductile iron, stainless steel tube or copper and to determine the correct insulation thickness. Request for returns of incorrectly ordered material may be refused.

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Material Safety Data Sheet (M.S.D.S.)

Value Engineered Products, Inc. insulated pipe supports comply (per OSHA CFR 1910.1200) with the definition of an "Article" as follows:

"Article" means a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees.

Therefore, Value Engineered Products, Inc. does not publish its own Material Safety Data Sheets (MSDS). For your convenience, we have on file copies of MSDS sheets for the following component materials for our products and can provide them at your request.

Calcium Silicate - Hydrous
Calcium Silicate - Xonotlite
Elastomeric Rubber Sheet
Polyisocyanurate Foam
Urethane Foam
Adhesive - Fabrication
Adhesive - Laminating
Galvanized Steel
Stainless Steel
Steel Plate
Aluminum Jacket
PVC Jacket
All Service Jacket

Any further information on Value Engineered Products can be obtained by contacting:

Mark C. Reardon
Vice President - Sales

Aaron I. Gold
Manufacturers Service Coordinator

(800) 921-1177 or via e-mail at valueng@aol.com