SECTION 230529
THERMAL INSULATED PIPE INSULATION INSERTS AND SHIELDS
FOR
HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

*[NOTE: This version of specification is recommended for requirement of **MSS SP-58** thermal insulated pipe inserts that do **not** necessarily meet 25/50 Flame Spread/Smoke Developed Index normally required in air plenums only. [Check your local codes.]*

Choose insulation insert material/vapor retarder and shield.

For technical assistance confirming correct configurations based on project requirements, contact Extol of Ohio at 419-668-2072 or info@extolohio.com

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PART 1 GENERAL

1.01 SECTION INCLUDES

A. Thermal Insulated Pipe Insert.

B. Thermal Insulated Pipe Support Shields.

1.02 RELATED REQUIREMENTS

A. 22 07 19 - Plumbing Piping Insulation

B. 23 05 29 - Hangers and Supports for HVAC Piping and Equipment

C. 23 07 19 - HVAC Piping Insulation

D. 23 21 14 - Hydronic Piping Specialties

1.03 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2025.

B. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; **2025**.

C. International Mechanical Code
   1. IMC Section 602.2.1 – Materials within Plenums

2. IMC Section 604.1 – General

D. International Building Code (IBC)
   1. Chapter 7; Section 719.7 Insulation and covering on piping and tubing

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
   2. Coordinate the work with other trades to provide additional framing and materials required for installation.
   3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
   4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
   5. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 UBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for thermal insulated pipe supports.

C. Shop Drawings: Include details for fabricated hangers and supports where materials or methods other than those indicated are proposed for substitution.
   1. Application of protective inserts, saddles, and shields at pipe hangers for each type of insulation and hanger.

D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.06 QUALITY ASSURANCE

A. Comply with applicable building code.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

A. **Thermal Insulated Pipe Inserts/Shields:**
   1. Manufacturer:
      a. **Basis of Design: Extol of Ohio, LLC** www.extolohio.com

   2. General Requirements:
      a. All components shall be sourced and manufactured in the United States.
      b. Source Recommendations: It is recommended to furnish shields and thermal insulated pipe inserts from a single manufacturer.

c. Surface Burning Characteristics for Non-Plenum Applications: Maximum flame spread index/smoke developed index of 25/450 when tested in accordance with ASTM E84.
d. Insulation inserts shall consist of either rigid polyisocyanurate, phenolic or cellular glass insulation surrounded by a 180º; or 360º (which is 220º on top, 180º on bottom) shield; and vapor retarder film.
e. Vapor retarder film shall be 0.02 perms or less (ASTM E96).
f. Shield material consists of galvanized G-90 steel or T304 -2B stainless steel.
g. Insulation insert shall extend 1.5" beyond the metal shield on both sides to allow the adjacent mechanical insulation to be sealed with ASJ tape on the circumferential joints.

NOTE: DUAL DENSITY INSULATION INSERTS AVAILABLE WHEN HEAVIER DENSITY ON BOTTOM HALF IS REQUIRED TO WITHSTAND WEIGHT OF PIPE, INSULATION AND ITS CONTENTS. FOR EXAMPLE, 7.5 LB/FT^3 PHENOLIC ON BOTTOM HALF (LOAD SIDE); 2.5 LB/FT^3 PHENOLIC ON TOP HALF.

EXTOL OF OHIO CAN ASSIST WITH CALCULATIONS TO DETERMINE CORRECT DENSITIES. SEE BOTTOM OF THIS DOCUMENT FOR INFORMATION REQUIRED FOR CALCULATIONS (E.G., PIPE SIZE, INSULATION TYPE/THICKNESS, HANGER SPACING, PIPE CONTENTS, ETC)

1. Performance Requirements:
   a. MSS SP-58
   b. **Non-plenums and outdoors**: Maximum **25 flame spread / 450 smoke developed** per ASTM E84. International Building Code (IBC) Chapter 7; Section 719.7 Insulation and covering on piping and tubing (Check local codes)

      NOTE: **Air plenums:** Maximum **25 flame spread / 50 smoke developed index** per ASTM E84. International Mechanical Code (IMC) Section 602.2.1 – Materials within Plenums (Check local codes) ***Extol's LCS 25/50*** inserts would need to be specified.

B. **Thermal Insulated Pipe Inserts:**

1. **Basis of Design: Extol; LCS MSS SP-58 Load Core Support;** www.extolohio.com

   a. **INSULATION INSERT and VAPOR RETARDER FILM MATERIAL**
      1) **Polyisocyanurate insert material thickness):**
         (a) ASTM C591, Grade 2, Type IV
         (b) Available densities and compressive strengths:
            (1) 2 lb: 24 psi
            (2) 4 lb: 95 psi
            (3) 6.0 lb: 140 psi

(c) Tan

NOTE: To reduce cost, dual density insulation inserts available when heavier density on bottom half is not required on top half of insulation insert. For example, 2.0 lb/ft^3 polyiso on top half; 6.0 lb/ft^3 polyiso on bottom half (load).

2) **Phenolic insert material**:
   (a) ASTM C1126
   (b) Available densities and compressive strengths:
      (1) 2.5 lb: 24 psi
      (2) 5.0 lb: 70 psi
      (3) 7.5 lb: 1510 psi
   (c) Green

NOTE: To reduce cost, dual density insulation inserts available when heavier density on bottom half is not required on top half of insulation insert. For example, 2.5 lb/ft^3 phenolic on top half; 5.0 lb/ft^3 phenolic on bottom half.

3) **Cellular Glass insert material:**
   (a) ASTM C552
   (b) Compressive Strength: Minimum 90 psi
   (c) Black

NOTE: For technical assistance confirming correct configurations based on project requirements, contact Extol of Ohio at 419-668-2072 or info@extolohio.com

4) **Vapor Retarder Options:**
   (a) ASJ vapor retarder meeting ASTM C1136 with SSL closure. (e.g., Lamtec® ASJ jacketing)
   (b) PVDC vapor retarder with SSL closure. (e.g., Saranex® CX Vapor Retarder Film)
   (c) Three-ply composite vapor retarder consisting of polyester film, aluminum foil, and polyester film with SSL closure (e.g., Polyguard Zero Perm Vapor Barrier Membrane)

SCHEDULE for Pipe Supports

<u>Thermal Insulated Pipe Supports</u>: (insert insulation material and vapor retarder from above for each (or all) insulated piping types

1. **CHW Piping: _____**
2. **Dual Temperature Water: _____**
3. **Glycol Systems: _____**
4. **Steam: _____**
5. **Domestic Cold: _____**

6. **Domestic Hot: _____**
7. **Storm Drain: _____**
8. **Process Water: _____**
9. **Other plenum-installed piping_____**

Insulation Insert Service Limits:

Material	Min Temp	Max Temp
Polyiso	-297°F	300°F
Phenolic	-290°F	250°F
Cellular Glass	-450°F	900°F

C. **Pipe Shields (or Saddles) for Insulated Piping:**

1. Manufacturers:
   a. **Basis of Design: Extol of Ohio LLC, LCS Shields.** www.extolohio.com

      1) All components shall be sourced and manufactured in the United States.
      2) Source Recommendations: It is recommended to furnish shields and thermal insulated pipe inserts from a single manufacturer.
      3) Insulation insert shall extend 1.5" beyond the metal shield on both sides to allow the adjacent mechanical insulation to be sealed with ASJ tape on the circumferential joints.

2. Product Requirement:
   a. Shield material consists of either galvanized G-90 steel or T304 -2B stainless steel.
   b. Diameters – ASTM C585
   c. MSS SP-58 Compliant
3. Configuration:
   a. 180º; or 360º available (which is 220º on top, 180º on bottom)
4. Design Requirements:
   a. Conform to MSS SP-58:
   b. Gauge and length based on
      1) Pipe size (NPS)
      2) Support Spacing.
      3) Insulation Compressive Strength
5. Typical shields
      1) Gauge: 22g to 12g
      2) Length: 6 inch to 18 inch

      NOTE: MSS SP 58 Table A3 listing pipe sizes, shield gauge, shield length and hanger spacing based on only 15 psi compressive insulation material insert. Higher compressive strength insulation inserts like polyisocyanurate, phenolic, and cellular could offer thinner gauge and shorter lengths. For technical assistance confirming correct configurations based on project requirements, contact Extol of Ohio at 419-668-2072 or info@extolohio.com

SHIELD SCHEDULE

(insert shield gauge and shield length for each insulated piping types based on 10 ft hanger spacing)

Size (IPS)	Shield Thickness (gauge)	Shield Length (in)
½” to 3”		
3 ½”		
4”		
5”		
6”		
8”		
10”		
12”		
14”		
16”		
18”		
20”		
24”		

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Copper Tube (CPS)	Shield Thickness (gauge)	Shield Length (in)
5/8”, 7/8”, 1 1/8”, 1 3/8”, 1 5/8”, 2 1/8”, 2 5/8”, 3 1/8”, 3 5/8”, to 4 1/8”		
5 1/8”		
6 1/8”		

PART 3 EXECUTION

2.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that mounting surfaces are ready to receive support and attachment components.

C. Verify that conditions are satisfactory for installation prior to starting work.

2.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Adhere to industry standards: MICA for commercial/light industrial. IIAR for industrial refrigeration.

C. When installing dual density inserts/shields, apply the heavier density insulation material on load side

D. Provide thermal insulated pipe supports and shields complete with hangers and accessories. Install thermal insulated pipe supports during the installation of the piping system.

END OF SECTION

NOTE: For technical assistance to confirm appropriate shields and/or polyisocyanurate, phenolic, or cellular glass density under load, contact Extol of Ohio at 419-668-2072 or info@extolohio.com.
The following information will be required.

1) Pipe Size
2) Pipe Type
3) Support Span (distance between supports per pipe size)
4) Content of Pipe (specific gravity)
5) Reason for Insulating Pipe (condensation control, personnel protection, heat loss, etc)
6) Insulation Type on Non-Support Portion of Pipe
7) Pipe Support Insulation
8) Insulation Thickness
9) Length of Shield
10) Gauge of Shield
11) 180°; or 360° Shield (220º on top, 180º on bottom)
12) Required Safety Factor (3x or 5x) (how much stronger an insulation density is than it needs to be for its specified maximum load)
13) Vapor Retarder Jacket specified

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