SECTION 230517 - SLEEVES AND SLEEVE SEALS FOR HVAC PIPING

Revise this Section by deleting and inserting text to meet Project-specific requirements.

1. GENERAL
   * + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

* + - * 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
      1. SUMMARY
         1. Section Includes:

Sleeves.

Stack-sleeve fittings.

Sleeve-seal systems.

Sleeve-seal fittings.

Grout.

Silicone sealants.

* + - 1. SUBMITTALS
         1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
         4. Product Data: For each type of product.

USE PARAGRAPH BELOW WITH EPD REQUIREMENT WHEN PROJECT ESTIMATE IS $1M OR MORE.

* + - * 1. Submit an Environmental Product Declaration (EPD) from the manufacturer for steel pipe sleeves within this specification section, if available. A statement of the contractor’s good faith effort to obtain the EPD shall be provided if not available.

Manufacturer-provided EPDs must be Product Specific Type III (Third-Party Reviewed), in adherence with ISO 14025 *Environmental labels and declarations*, ISO 14044 *Environmental management – Life cycle assessment*, and *ISO 21930 Core rules for environmental product declarations of construction products and services*.

Retain "Field quality-control reports" paragraph below if Contractor is responsible for field quality-control testing and inspecting.

* + - * 1. Field quality-control reports.

1. PRODUCTS

Manufacturers and products listed in SpecAgent and Masterworks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications. For definitions of terms and requirements for Contractor's product selection, see Section 016000 "Product Requirements."

* + - 1. SLEEVES

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=12978) Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

[Advance Products & Systems, Inc](http://www.specagent.com/Lookup?uid=123457075940).

[CALPICO, Inc](http://www.specagent.com/Lookup?uid=123457075939).

[GPT; an EnPro Industries company](http://www.specagent.com/Lookup?uid=123457075941).

Approved equivalent.

* + - * 1. Cast-Iron Pipe Sleeves: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop collar.
        2. Steel Pipe Sleeves: ASTM A53/A53M, Type E, Grade B, Schedule 40, [**anti-corrosion coated**] [**or**] [**zinc coated**], with plain ends and integral welded waterstop collar.
        3. Galvanized-Steel Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

PVC sleeves in "PVC Pipe Sleeves" and "Molded-PVC Sleeves" paragraphs below may be prohibited by authorities having jurisdiction.

* + - * 1. PVC Pipe Sleeves: ASTM D1785, Schedule 40.
        2. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.
        3. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.
      1. STACK-SLEEVE FITTINGS

Stack-sleeve fittings are used as a watertight sleeve for piping passing through concrete floors and roofs. Grout is used to seal the annular space between fitting and slab opening. Silicone sealant is used to seal annular space between the pipe and top hub of fitting.

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=3029) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Jay R. Smith Mfg Co; a division of Morris Group International](http://www.specagent.com/Lookup?uid=123457073342).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457073343).

Approved equivalent.

Natural cast iron is subject to surface discoloration caused by oxidation. If this is a concern, consider retaining one of the options in the "Description" pParagraph below.

* + - * 1. Description: Manufactured, [**Dura-coated or Duco-coated**] [**galvanized**] cast-iron sleeve with integral cast flashing flange for use in waterproof floors and roofs. Include clamping ring, bolts, and nuts for membrane flashing.

Retain "Underdeck Clamp" sSubparagraph below if required for securing fitting to slab.

Underdeck Clamp: Clamping ring with setscrews.

* + - 1. SLEEVE-SEAL SYSTEMS

Sleeve-seal systems in this article are used for piping penetrations in slabs-on-grade and below grade in exterior walls.

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=3030) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Advance Products & Systems, Inc](http://www.specagent.com/Lookup?uid=123457073338).

[CALPICO, Inc](http://www.specagent.com/Lookup?uid=123457073339).

[GPT; an EnPro Industries company](http://www.specagent.com/Lookup?uid=123457074353).

Approved equivalent.

* + - * 1. Description:

Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.

Designed to form a hydrostatic seal of 20-psig.

In "Sealing Elements" sSubparagraph below, retain first option for standard applications with temperature ranges from minus 40 deg F (minus 40 deg C) to 250 deg F (121 deg C). Retain second option for wide- and high-temperature-range applications fromminus 67 deg F (minus 55 deg C) to )400 deg F (204 deg C). Retain third option if hydrocarbons are present in the soil. Coordinate with application recommendations of retained manufacturers.

Sealing Elements: [**EPDM-rubber**] [**High-temperature-silicone**] [**Nitrile (Buna N)**] interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size.

In "Pressure Plates" sSubparagraph below, retain first or second option for standard applications. Retain third or fourth option when hydrocarbons are present in soil. Coordinate with application recommendations of retained manufacturers.

Pressure Plates: [**Carbon steel**] [**Composite plastic**] [**Stainless steel**] [**Stainless steel, Type 316**].

In "Connecting Bolts and Nuts" sSubparagraph below, retain first option for standard applications. Retain second or third option when hydrocarbons are present in soil or for wide- and high-temperature-range applications of minus 67 deg F (minus 55 deg C) to 400 deg F (204 deg C). Coordinate with application recommendations of retained manufacturers.

Connecting Bolts and Nuts: [**Carbon steel, with corrosion-resistant coating, ASTM B633**] [**Stainless steel**] [**Stainless steel, Type 316,**] of length required to secure pressure plates to sealing elements.

* + - 1. SLEEVE-SEAL FITTINGS

Sleeve-seal fittings in this article are used for piping penetrations in slabs-on-grade and in exterior walls. These fittings are made to match piping OD, so they must be selected to match penetrating piping size.

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=3032) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Advance Products & Systems, Inc](http://www.specagent.com/Lookup?uid=123457074338).

[CALPICO, Inc](http://www.specagent.com/Lookup?uid=123457074339).

[GPT; an EnPro Industries company](http://www.specagent.com/Lookup?uid=123457074341).

Approved equivalent.

* + - * 1. Description:

Manufactured plastic, sleeve-type, waterstop assembly, made for imbedding in concrete slab or wall.

Plastic or rubber waterstop collar with center opening to match piping OD.

* + - 1. GROUT
         1. Description: Nonshrink, recommended for interior and exterior sealing openings in nonfire-rated walls or floors.
         2. Standard: ASTM C1107/C1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
         3. Design Mix: 5000-psi, 28-day compressive strength.
         4. Packaging: Premixed and factory packaged.

Retain "Silicone Sealants" Article when use of silicone sealants and silicone foams is permitted as an alternative to grout, for sealing of annular space between sleeve and wall or floor. Also, retain "Silicone Sealants" Article when retaining "Stack-Sleeve Fittings" Article, for sealing of annular space between pipe and top hub of fitting.

* + - 1. SILICONE SEALANTS
         1. Silicone, S, NS, 25, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 25, use NT.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9402) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Polymeric Systems, Inc](http://www.specagent.com/Lookup?uid=123457076024).

[Sherwin-Williams Company (The)](http://www.specagent.com/Lookup?uid=123457076026).

[The Dow Chemical Company](http://www.specagent.com/Lookup?uid=123457076022).

Approved equivalent.

* + - * 1. Silicone, S, P, 25, T, NT: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade P, Class 25, Uses T and NT. Grade P Pourable (self-leveling) formulation is for opening in floors and other horizontal surfaces that are not fire rated.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9408) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[May National Associates, Inc.; a subsidiary of Sika Corporation](http://www.specagent.com/Lookup?uid=123457076028).

W.R. Meadows, Inc.

Tremco CPG Inc.

Approved equivalent.

* + - * 1. Silicone Foam: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=12979) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Smooth-On](http://www.specagent.com/Lookup?uid=123457076029).

Stockwell Elastomerics

Approved equivalent.

1. EXECUTION

See "Writing Guide" Article in the Evaluations for a discussion of how this Section is organized and the most efficient way to revise this Section.

* + - 1. SLEEVE INSTALLATION
         1. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
         2. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide [**1-inch**] <**Insert dimension**> annular clear space between piping and concrete slabs and walls.

Retain subparagraph below if applicable.

Sleeves are not required for core-drilled holes.

* + - * 1. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.

Permanent sleeves are not required for holes in slabs formed by molded-PE or -PP sleeves.

Cut sleeves to length for mounting flush with both surfaces.

Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas [**2 inches**] <**Insert dimension**> above finished floor level.

Using [**grout**] [**or**] [**silicone sealant**], seal space outside of sleeves in slabs and walls without sleeve-seal system.

* + - * 1. Install sleeves for pipes passing through interior partitions.

Cut sleeves to length for mounting flush with both surfaces.

Revise subparagraph below as required for seismic design conditions. Coordinate sleeve requirements with Section 230719 "HVAC Piping Insulation."

Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.

Seal annular space between sleeve and piping or piping insulation; use sealants appropriate for size, depth, and location of joint.

Revise "Fire-Resistance-Rated Penetrations, Horizontal Assembly Penetrations, and Smoke-Barrier Penetrations" pParagraph below to suit Project.

* + - * 1. Fire-Resistance-Rated Penetrations, Horizontal Assembly Penetrations, and Smoke-Barrier Penetrations: Maintain indicated fire or smoke rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with fire- and smoke-stop materials. Comply with requirements for firestopping and fill materials specified in Section 078413 "Penetration Firestopping."
      1. STACK-SLEEVE-FITTING INSTALLATION
         1. Install stack-sleeve fittings in new slabs as slabs are constructed.

Revise first subparagraph below as required for seismic design conditions. Coordinate stack-sleeve-fitting requirements with Section 230719 "HVAC Piping Insulation."

Install fittings that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.

Secure flashing between clamping flanges for pipes penetrating floors with membrane waterproofing. Comply with requirements for flashing specified in Section 076200 "Sheet Metal Flashing and Trim."

Install section of cast-iron soil pipe to extend sleeve to 3 inches above finished floor level.

Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.

Using waterproof silicone sealant, seal space between top hub of stack-sleeve fitting and pipe.

Revise "Fire-Resistance-Rated, Horizontal Assembly, and Smoke Barrier Penetrations" pParagraph below to suit Project.

* + - * 1. Fire-Resistance-Rated, Horizontal Assembly, and Smoke Barrier Penetrations: Maintain indicated fire or smoke rating of floors at pipe penetrations. Seal pipe penetrations with fire- and smoke-stop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."
      1. SLEEVE-SEAL-SYSTEM INSTALLATION

Sleeve-seal systems in this article are used in slabs-on-grade and below grade in exterior concrete walls, for a watertight seal around service piping entries into building. These systems typically require installation in a sleeve for proper operation.

* + - * 1. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.
        2. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal-system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.
      1. SLEEVE-SEAL-FITTING INSTALLATION

Sleeve-seal fittings in this article are used above and below grade in concrete slabs and in concrete walls, for a watertight seal around piping. These fittings do not require a sleeve.

* + - * 1. Install sleeve-seal fittings as new walls and slabs are constructed.
        2. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
        3. Secure nailing flanges to concrete forms.
        4. Using [**grout**] [**or**] [**silicone sealant**], seal space around outside of sleeve-seal fittings.
      1. FIELD QUALITY CONTROL

Retain "Perform the following tests and inspections" pParagraph below to require Contractor to perform tests and inspections.

* + - * 1. Perform the following tests and inspections:

Leak Test: After allowing for a full cure, test sleeves and sleeve seals for leaks. Repair leaks and retest until no leaks exist.

See Section 014000 "Quality Requirements" for retesting and reinspecting requirements and Section 017300 "Execution" for requirements for correcting the Work.

* + - * 1. Sleeves and sleeve seals will be considered defective if they do not pass tests and inspections.
      1. SLEEVE AND SLEEVE-SEAL SCHEDULE
         1. Use sleeves and sleeve seals for the following piping-penetration applications:

Exterior Concrete Walls Above Grade:

Piping Smaller Than [**NPS 6**] <**Insert pipe size**>: [**Cast-iron sleeves**] [**Steel pipe sleeves**] [**Sleeve-seal fittings**] <**Insert material**>.

Piping [**NPS 6**] <**Insert pipe size**> and Larger: [**Cast-iron pipe sleeves**] [**Steel pipe sleeves**] [**Sleeve-seal fittings**] <**Insert material**>.

Exterior Concrete Walls Below Grade:

Piping Smaller Than [**NPS 6**] <**Insert pipe size**>: [**Cast-iron pipe sleeves with sleeve-seal system**] [**Steel pipe sleeves with sleeve-seal system**] [**Sleeve-seal fittings**] <**Insert material**>.

Retain first subparagraph below if using sleeve-seal systems; delete if using sleeve-seal fittings.

Select sleeve size to allow for 1-inch <**Insert dimension**> annular clear space between piping and sleeve for installing sleeve-seal system.

Piping [**NPS 6**] <**Insert pipe size**> and Larger: [**Cast-iron pipe sleeves with sleeve-seal system**] [**Steel pipe sleeves with sleeve-seal system**] [**Sleeve-seal fittings**] <**Insert material**>.

Retain first subparagraph below if using sleeve-seal systems; delete if using sleeve-seal fittings.

Select sleeve size to allow for 1-inch <**Insert dimension**> annular clear space between piping and sleeve for installing sleeve-seal system.

Concrete Slabs-on-Grade:

Piping Smaller Than [**NPS 6**] <**Insert pipe size**>: [**Cast-iron pipe sleeves with sleeve-seal system**] [**Steel pipe sleeves with sleeve-seal system**] [**Sleeve-seal fittings**] <**Insert material**>.

Retain first subparagraph below if using sleeve-seal systems; delete if using sleeve-seal fittings.

Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.

Piping [**NPS 6**] <**Insert pipe size**> and Larger: [**Cast-iron pipe sleeves with sleeve-seal system**] [**Steel pipe sleeves with sleeve-seal system**] [**Sleeve-seal fittings**] <**Insert material**>.

Retain first subparagraph below if using sleeve-seal systems; delete if using only galvanized-steel pipe sleeves.

Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.

Concrete Slabs Above Grade:

Piping Smaller Than [**NPS 6**] <**Insert pipe size**>: [**Steel pipe sleeves**] [**PVC-pipe sleeves**] [**Stack-sleeve fittings**] [**Sleeve-seal fittings**] [**Molded-PE or -PP sleeves**] [**Molded-PVC sleeves**] <**Insert material**>.

Piping [**NPS 6**] <**Insert pipe size**> and Larger: [**Steel pipe sleeves**] [**PVC-pipe sleeves**] [**Stack-sleeve fittings**] <**Insert material**>.

Interior Partitions:

Verify, with fire authorities having jurisdiction, that PVC materials are allowed for sleeves.

Piping Smaller Than [**NPS 6**] <**Insert pipe size**>: [**Steel pipe sleeves**] [**PVC-pipe sleeves**] <**Insert material**>.

Piping [**NPS 6**] <**Insert pipe size**> and Larger: [**Galvanized-steel sheet sleeves**] <**Insert material**>.

END OF SECTION 230517