

Special Specification 6449

Sleeves and Sleeve Seals for Electrical Raceways and Cabling



1. DESCRIPTION

Provide and install sleeves and sleeve seals for electrical raceways and cabling.

2. MATERIALS

2.1. References

Perform the work in accordance with the following:

- Item 618, "Conduit,"
- Special Specification "Fire Rated Cable and Conduit,"
- Special Specification "Electrical Underground Vault,"
- Special Specification "Electrical Service Building," and
- Special Specification "Tunnel Lighting."

2.2. **Round Sleeves.** Use steel wall sleeves that comply with ASTM A53/A53M and are constructed of Type E, Grade B, Schedule 40, zinc coated and have plain ends and integral water stop.

2.3. **Rectangular Sleeves.** Fabricate sleeves from galvanized sheet steel. If the sleeve cross-section rectangle perimeter is less than 50 in. and no side is larger than 16 in., use a galvanized sheet that is 0.052 in. thick. If the sleeve cross-section rectangle perimeter is not less than 50 in. or one or more sides is larger than 16 in., use a galvanized sheet that is 0.138 in. thick.

2.3.1. **Sleeve Seal Systems.** Provide a sleeve seal system that is a modular sealing device, designed for field assembly, to fill annular space between the sleeve and the raceway or cable or between raceway and cable.

Use EPDM rubber interlocking links shaped to fit surface of pipe. Include the type and number required for pipe material and size of pipe. Use stainless steel pressure plates. Use stainless steel connecting bolts and nuts of the length required to secure pressure plates to sealing elements.

2.4. **Grout.** Use nonshrink grout recommended for interior and exterior sealing openings in non-fire-rated walls or floors. Select grout that meets the following requirements:

- ASTM C1107/C1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout,
- 5000-psi (34.5-MPa), 28-day compressive strength, and
- premixed and factory packaged.

2.5. **Pourable Sealants.** Select single-component, neutral-curing elastomeric sealants of the appropriate grade. Use pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.

2.6. **Foam Sealants.** Select multicomponent, liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam. Ensure foam expansion does not damage cables or crack penetrated structure.

3. CONSTRUCTION

- 3.1. **Sleeves for Conduits Penetrating Above-Grade, Non-Fire-Rated, Concrete and Masonry-Unit Floors and Walls.** Comply with NECA 1 when installing sleeves for non-fire-rated electrical penetrations. Seal the space outside of sleeves with mortar or grout. Pack sealing material solidly between the sleeve and the wall or floor, so no voids remain. Tool the exposed surfaces smooth and protect the material while curing. Seal the annular space between the sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint.

Use pipe sleeves unless the penetration arrangement requires rectangular sleeved opening. Size the pipe sleeves to provide 1/4-in. (6.4-mm) annular clear space between the sleeve and the raceway or cable, unless sleeve seal system is to be installed. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.

Install sleeves for floor penetrations. Extend sleeves installed in floors 2 in. (50 mm) above finished floor level. Install sleeves during erection of floors.

- 3.1.1. **Sleeves for Conduits Penetrating Non-Fire-Rated Wall Assemblies.** Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening. Seal space outside of sleeves with approved joint compound for wall assemblies.

- 3.1.2. **Roof-Penetration Sleeves.** Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

- 3.1.3. **Aboveground, Exterior-Wall Penetrations.** Seal penetrations using steel pipe sleeves and mechanical sleeve seal systems. Size sleeves to allow for 1-in. (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

- 3.1.4. **Underground, Exterior-Wall and Floor Penetrations.** Install steel pipe sleeves with integral water stops. Size sleeves to allow for 1-in. (25-mm) annular clear space between raceway or cable and sleeve for installing sleeve seal system. Install sleeve during construction of floor or wall.

- 3.2. **Installation of Rectangular Sleeves and Sleeve Seals.** Install sleeves in existing walls without compromising structural integrity of walls. Do not cut structural elements without reinforcing the wall to maintain the designed weight bearing and wall stiffness.

Install conduits and cable with no crossings within the sleeve. Fill opening around conduits and cables with expanding foam without leaving voids. Provide metal sheet covering at both wall surfaces and finish to match surrounding surfaces. Metal sheet must be same material as sleeve.

- 3.3. **Installation of Sleeve Seal Systems.** Sleeve seal systems in this Article are used in slabs-on-grade and in below-grade exterior concrete walls for a watertight seal around service-piping entries into the building. These systems require installation in a sleeve for proper operation.

Install sleeve seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into the building. Install the type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position the raceway or cable in center of sleeve. Assemble the mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

- 3.4. **Firestopping.** Apply firestopping to electrical penetrations of fire rated wall to restore original fire-resistance rating.

4. SUBMITTALS

Submit manufacturer's standard product data and project-specific shop drawings.

5. MEASUREMENT AND PAYMENT

The work performed, materials, labor, tools, shop drawings, operational testing and incidentals will not be measured or paid for directly but will be subsidiary to pertinent Items.