

SECTION 15250 - PIPE AND EQUIPMENT INSULATION

City of San Diego, CWP Guidelines

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

- A. The WORK of this Section includes providing pipe and equipment insulation for cold and hot piping, exhausts, flues, and equipment, to prevent heat loss or heat gain and injury to personnel upon contact.

1.2 RELATED SECTIONS

- A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.
 - 1. Section 09800 Protective Coating
 - 2. Division [2 and 15, as applicable] Piping

1.3 CODES

- A. The WORK of this Section shall comply with the current editions of the following codes as adopted by the City of San Diego Municipal Code:
 - 1. Uniform Building Code
 - 2. Uniform Mechanical Code
 - 3. Uniform Plumbing Code
 - 4. Uniform Fire Code
 - 5. National Electrical Code

1.4 SPECIFICATIONS AND STANDARDS

- A. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section:

- 1. Federal Standards:

FEDSPEC L-P-535E	Plastic Sheet (Sheeting) "Plastic Strip" Poly (Vinyl Chloride) and Poly (Vinyl Chloride-Vinyl Acetate), Rigid
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FEDSPEC HH-I-558B(3)	Insulation, Blocks, Boards, Blankets, Felt Sleeving (Pipe and Tube Covering), and Pipe Fitting Covering, Thermal (Mineral Fiber, Industrial Type)
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- 2. Commercial Standards:

ASTM B 209	Aluminum and Aluminum-Alloy Sheet and Plate
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ASTM C 533	Calcium Silicate Block and Pipe Thermal Insulation
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ASTM C 547	Specification for Mineral Fiber Preformed Pipe Insulation
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1.5 SHOP DRAWINGS AND SAMPLES

- A. The following shall be submitted in compliance with Section 01300:
 - 1. Shop drawings of all thermal insulation, with manufacturer's data on materials, covering, jackets, and finish.

1.6 QUALIFICATIONS

- A. **Installer:** Authorized installer of manufacturer.

PART 2 -- PRODUCTS

2.1 GENERAL

- A. The CONTRACTOR shall insulate all indicated surfaces.
- B. All components of the insulation, including covering, mastics and adhesives shall have a flame-spread rating of not over 25, and a smoke development rating of not over 50. Ratings shall be as established by tests in accordance with ASTM E 84 and Federal Specification standards. The integrated insulation assemblies shall also conform to the above specifications. Insulation shall be applied in strict accordance with the manufacturer's instructions.

2.2 BASIC MATERIALS

- A. **Standard Insulation:** This type of insulation shall be employed for process, cold-and hot water, steam, and condensate piping and equipment with surface temperatures up to 850 degrees F. Pipe insulation and jacketing shall be applied to piping where indicated, and shall include fittings, flanges and valves. Pipe insulation shall be molded-type pipe covering, made of fibrous glass with a minimum k-factor of 0.23 at 75 degrees F mean temperature. Unless otherwise indicated the insulation thickness shall be as follows:

	Minimum Thickness of Insulation (inches)
1. Pipe Insulation:	
Hot and cold water (domestic) - 6 inches and smaller	1
Hot and chilled water process - 6 inches and smaller 8 inches and large	1-1/2 2
Low pressure steam (50 psi and less) - 8 inches and less	2

Condensate, boiler blowdown, and boiler feed - 8 inches and less	1-1/2
Heated sludge and process piping - 6 inches and smaller	1
8 inches and larger	1-1/2
Heat traced piping - 3 inches and smaller	1
4 inches and larger	1-1/2

2. Equipment and Tanks:

Boilers, heaters and manufactured equipment -	as recommended by manufacturer
Heat exchangers, tanks, and vessels -	3

B. The insulation shall be oversized for installation over electric heating cable. Insulation shall have a factory-applied white fire-retardant vapor-barrier jacket of kraft paper and aluminum foil laminated together and reinforced with fiber glass yarn. Fittings and valves shall be covered with the same material as the pipe, cut in segments to fit snugly without open spaces, held in place with copper wire or cement, and then covered with the same jacketing material as the pipe. Insulated fittings adjacent to vapor-barrier insulation shall be sealed with an acceptable vapor-barrier cement before installation of the finish jacket. Pipe insulation and vapor-barrier shall be continuous through hangers and supports. Insulation shall be coordinated with the pipe hangers and supports and where insulation protection shields are provided the top half section of pipe insulation at support locations shall be of the same specified density, and the bottom half insulation segments provided between the pipe and the insulation protection shields shall have a density of not less than 6 lb/cu ft. All insulation shall be covered with smooth aluminum weatherproof metal or plastic preformed jacketing with a factory-attached moisture barrier. The jacket for the fittings shall consist of precision-formed smooth-sided sections and shall be sized to cover and protect the insulated fitting. Each section shall be manufactured from aluminum or PVC, in accordance with ASTM B 209 and Federal Standard L-P-535E, and all joints shall be sealed with silicon mastic or solvent welding, to provide a continuous air and weathertight joint. Strapping shall be 1/2-inch wide, Type 3003 aluminum or stainless steel.

C. **High Temperature Insulation:** This type of insulation shall be employed for engine exhaust pipes, flues, and similar pipes and equipment with surface temperatures up to 1200 degrees F. The high temperature insulation shall consist of 4-inch thick calcium silicate or similar pre-molded blocks in accordance with ASTM C 533 and Federal Specification HH-I-558B(3) with a minimum k-factor of 0.14, in two layers of 2-inch thickness, each, with staggered joints, all applied over a 3/4-inch high metal rib lath. The inner layer shall be suitable for 1200 degrees F, and the second layer for 1000 degrees F. All bends, voids, joints, fittings and other parts of the piping system shall be filled with insulating cement. Aluminum lagging with preformed aluminum fittings shall be banded to the insulation in a similar fashion as specified for standard insulation. Allowance shall be made for thermal expansion.

2.3 MANUFACTURERS

A. Insulation of the type indicated shall be manufactured by one of the following (or equal):

1. Armstrong World Industries, Inc.
2. Certain-Teed Corporation
3. Manville
4. Owens-Corning Fiberglas Corp.

PART 3 -- EXECUTION

3.1 INSTALLATION

- A. **General:** All insulation shall be installed by a qualified insulation contractor in strict accordance with the manufacturer's recommendations.

**** END OF SECTION ****