SECTIONS 15080 AND 15084

PART 1: GENERAL

1. SUMMARY

1.1. Section includes: The work covered by this specification consists of furnishing all labor, equipment, materials, accessories, and performing all operations required for the correct installation of insulation on all tanks & equipment systems operating up to 1200˚F (650˚C).

2. DEFINITIONS

2.1. ASHRAE - American Society of Heating, Refrigeration and Air Conditioning Engineers
2.2. ASTM - American Society of Testing and Materials
2.3. IIG - Industrial Insulation Group, LLC
2.4. MICA - Midwest Insulation Contractors Association
2.5. MIL - Military
2.6. NFPA - National Fire Protection Association
2.7. NRC - Nuclear Regulatory Commission
2.8. OPL - Omega Point Laboratories
2.9. OSHA - Occupational Safety and Health Act
2.10. UL - Underwriters' Laboratories, Inc
2.11. CAN/CGSB-Canadian General Standards Board
2.12. CAN/ULC - Underwriters Laboratories of Canada, Inc.

3. REFERENCES

3.1. ASHRAE - National Voluntary Consensus Standard 90.1 (2004) - "Energy Standards for Buildings Except Low-Rise Residential Buildings"
3.2. ASTM C165 - "Standard Test Method for Measuring Compressive Properties of Thermal Insulations."
3.3. ASTM C356 - "Standard Test Method for Linear Shrinkage of Pre-Formed High Temperature Thermal Insulation Subjected to Soaking Heat."
3.4. ASTM C411 - "Standard Method for Hot-Surface Performance of High-Temperature Thermal Insulation"
3.5. ASTM C612 - "Standard Specification for Mineral Fiber Block and Board Thermal Insulation"
3.6. ASTM C795 - "Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel"
3.7. ASTM C1104 - "Standard Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation"
3.8. ASTM C1335 - "Standard Test Method for Measuring Non-Fibrous Content of Man-Made Rock and Slag Mineral Fiber Insulation"
3.9. ASTM C1338 - "Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings"
3.10. ASTM E84 - "Test Method for Surface Burning Characteristics of Building Materials"
3.11. ASTM E136 - "Test Method for Behavior of Materials in a Vertical Tube Furnace at 750˚C"
3.12.CAN/CGSB-51.10-"Mineral Fibre Thermal Insulation"
3.13. CAN4-S114-M - "Standard Test Method for Determination of Non Combustibility in Building Materials"
3.14. CAN/ULC-S102-M88 - "Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies"
3.15. MICA - "Commercial and Industrial Insulation Standards"
3.16. Mil-I-24244 – "Military Specification for Insulation Material with Special Corrosion, Chloride and Fluoride Requirements."
3.17. NFPA 255 - "Method of Test of Surface Burning Characteristics of Building Materials"
3.18. PIP – "Process Industry Practice"
3.19. UL 723 - "Test for Surface Burning Characteristics of Building Materials"

4. SYSTEM PERFORMANCE

4.1. Insulation material furnished should meet the minimum thickness requirements of the National Voluntary Consensus Standard 90.1 (2004) established by ASHRAE. However if other factors such as condensation control or personal protection are to be considered, the selection of thickness of insulation should satisfy the controlling factor.
4.2. Insulation materials furnished and installed hereunder shall meet the fire hazard requirements of applicable building codes per one of the following nominally equivalent test methods:
4.2.1. ASTM E84
4.2.2. UL 723, CAN/ULC-S102-M88
4.2.3. NFPA 255

5. SUBMITALS

5.1. Product Data
5.1.1. Provide product description, list of materials, thickness schedules for each service location and piece of equipment.

5.2. Shop Drawings

5.2.1. Submit a list of insulation to be used for each service location.

5.3. Samples

5.3.1. Submit samples of each insulation material to be used.

6. QUALITY ASSURANCE

6.1. All work shall conform to accepted industry and trade standards for commercial and industrial insulations and shall conform to manufacturer's recommendations.

6.2. Insulation shall be installed by skilled and experienced applicators who are regularly engaged in commercial or industrial insulation work.

6.3. Damaged, wet or contaminated insulation shall not be installed.

7. DELIEVERY, STORAGE AND HANDLING

7.1. Deliver all materials to the job site in factory containers with manufacturer's label showing manufacturer, product name and fire hazard information.

7.2. Protect the insulation from dirt, water, chemical attack and mechanical damage before, during and after installation.

8. PROJECT AND SITE CONDITIONS

8.1. Maintain job site temperature and conditions before, during and after installation as required by the manufacturer of the insulation, cement, adhesives and coatings, etc.

8.2. Installed Insulation that has not been weatherproofed and is not protected by a roof and walls shall be protected from precipitation by weatherproof sheeting.

PART 2: PRODUCTS

1. MANUFACTUERERS

1.1. Industrial Insulation Group, LLC

1.1.1 Mineral wool board insulation

1.1.1.1. IIG MinWool-1200 Industrial Board

1.1.1.2. Approved alternate

2. MATERIALS

2.1. IIG MinWool-1200 Industrial Board Insulation

2.1.1. Complies with ASTM C612, Type 1A, 1B, II, III, IVA, and IVB

2.1.2. Furnished in standard sizes of 24"x48" (610mm x 1219mm) and 36"x48" (914mm x 2119mm) and in thicknesses from 1" to 5" (25mm to 127mm)

2.1.3. Rated maximum service temperature of 1200˚F (650˚C).

2.1.5. Does not exceed 25 flame spread and 50 smoke developed when tested in accordance with ASTM E84, UL 723, CAN/ULC-S102-M88 or NFPA 255.

2.1.6.Certified to meet the requirements of ASTM C795 for use over stainless steel.

2.1.7. Rated as noncombustible when tested in accordance with ASTM E136

3. FIELD APPLIED JACKETS

3.1. Aluminum Jacketing

3.1.1. Use a 0.016" (0.045mm) type T-3003 H-14 sheet with a smooth or embossed finish and a factory applied protective inner layer.

3.2. Stainless Steel Jacketing

3.2.1. Use 0.010" (0.025mm) type 304 sheet with a smooth finish and with or without a factory applied protective inner layer.

3.3. UV Resistant PVC Jacketing

3.3.1. May be applied in lieu of metal jacketing provided the jacketing manufacturer's limitations with regard to pipe size, surface temperature and thermal expansion and contraction are followed.

4. ACCESSORIES

4.1. Adhesives

4.1.1. Adhesive compatible with mineral fiber insulations

4.1.2. Approved alternate

4.2. Fasteners

4.2.1. Pins with speed washers

4.2.2. Studs with washers and nuts

4.2.3. Approved alternate

4.3. Weatherproofing

4.3.1. Compatible mastic

4.3.2. Approved alternate

4.4. Accessory materials shall be installed in accordance with project drawings and specifications, manufacturer's instructions and in conformance with the current edition of the MICA - "Commercial & Industrial Insulation Standards", Process Industry Practices, or other recognized standard.

PART 3: EXECUTION

1. EXAMINATION

1.1. Verify that all surfaces are clean, dry and free from dirt, scale, moisture, oil and grease.

1.2. Verify that it is physically possible to install the mineral wool insulation in accordance with project drawings, operation performance parameters and the limitations of this specification.

2. INSTALLATION

2.1. The preferred method for installing MinWool-1200 Industrial Board Insulation is described as follows.

2.1.1. Pins or studs shall be welded onto the surface that is to be covered.

2.1.1.1. Pins are to be installed on maximum 16" (4006mm) centers and not more than 4" (102mm) from the edge of the insulation.

2.1..2. The insulation is then impaled over the pins or studs and held in place with speed washers or nuts.

2..2. For temperatures above 600°F (316°C) double layer insulation is recommended for optimum thermal performance.

2.2.3.1. The first layer must be secured by speed washers or nuts before the second layer can be installed.

2.2.3.2. Stagger all joints with a minimum of 6" (152mm) of overlap between the top and bottom layers.

2.2.4 For applications where the MinWool-1200 Industrial Board Insulation is subject to physical abuse or may come in contact with adverse weather conditions or chemicals a rigid jacket is recommended.

2..2.1. Secure the metal jacketing with screws, rivets or boarding. (All joints in the jacketing should be staggered a minimum of 6"(152mm) from the joints in the insulation) Overlaps should be positioned to shed water. Longitudinal and Butt joint overlaps should be wide enough to provide weather-proof seal. Metal bands should be used as butt joints and be evenly spaced between joints for jacket securement.

2.5. Fill joints, cracks and seams with mineral fiber.

2.6. Neatly finish insulation at supports, protrusions and interruptions.

2.7. Do not insulate over nameplates or ASME stamps. Instead form a tight insulation seal around them.

2.8. When equipment with insulation requires periodic opening for maintenance, repair or routine inspection, install the insulation in such a way that it can be easily removed and put back in place without damage.

3. FIELD QUALITY CONTROL

3.1. Upon completion of the installation of the insulation and before start up, visually inspect and verify that the insulation has been installed correctly.

4. INSULATION PROTECTION

4.1. Replace damaged insulation which cannot be satisfactorily repaired, including insulation with damage to the vapor barrier and insulation that has been saturated with moisture.

5. SAFETY PRECAUTIONS

5.1. The insulation installers shall be properly protected during installation of the insulation. Protection when handling and applying insulation materials shall include but not be limited to:

5.1.1. Disposable dust respirators

5.1.2. Gloves

5.1.3. Hard hats

5.1.4. Eye protection

5.2. The insulation contractor shall conduct all job site operations in compliance with applicable provisions given by OSHA as well as with all state and local safety and health codes and regulations that may apply.

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Industrial Insulation Group, LLC is a Calsilite/Johns Manville joint venture. IIG manufactures Thermo-12 Gold® pipe and block insulation as well as a variety of other insulation products including IIG Thermo-12 RainJacket™ Insulation, Sproule WR-1200™ expanded perlite pipe and block insulation, Super Firetemp® fireproofing board, MinWool-1200 pipe and block, high temperature adhesives and insulating finishing cement.