

# **SPECIFICATION SHEET**

for

## **AEROFOAM NBR**

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Status: 01/07/2011

## 1.0. GENERAL

### 1.1. Reference

Supply and install mechanical insulation complete in accordance with the requirement of the Contract Documents. This Section relates to the supply and installation of mechanical insulation for the HVAC Installation.

All pipe work shall be insulated with Aerofoam insulation, a flexible closed-cell elastomeric rubber insulation tube or sheet, with an in-built water vapor barrier. The material shall be Class O according to BS 476 Part 6 and BS 476 Part 7. Materials must be dust and fiber free with a Zero ODP and GWP rating. The insulation should be manufactured in the UAE. No additional vapor barrier is required.

### 1.2. Description of work

Extent of mechanical insulation is specified in this section.

### 1.3. Quality assurance

Insulation material shall comply with the following standards:

- BS 476 Part 7, Surface Spread of Flame and classified Class 1.
- BS 476 Part 6, Surface Spread of Flame and classified Class O.
- ASTM E84-10, Surface Spread of Flame; FSI=20, SD=350
- ISO5659 (2) IMO Resolution MSC 61 (67) 1996: Annex 1, Part 5.

### 1.4. Submittals

#### A. Product Data

Submit manufacturer's technical product data and installation instructions for each type of mechanical insulation. Submit schedule showing manufacturer's product number, k-value, thickness and furnished accessories for each mechanical system requiring insulation.

#### B. Samples

Submit samples for each piping insulation type required.

### C. Certifications

Submit certificates or other data as necessary to show compliance with these specifications and governing regulations. Include proof of compliance for test of products for fire rating, corrosiveness and compressive strength.

#### 1.5. Delivery, storage and handling

- a. Deliver insulation, coverings, adhesives and coating to site in containers with manufacturers stamp or label, affixed showing fire hazard ratings of products.
- b. Protect insulation against dirt, water, chemical and mechanical damage by inside storage and polyethylene wrapping in accordance with the manufacturer's recommendations. Do not install damaged insulation (remove from project site).

#### 1.6. Maintenance data

Submit maintenance data for each type of mechanical insulation. Include this data, product data and certifications in the maintenance manual.

## 2.0. PRODUCTS

### 2.1. General

Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics and adhesives) as mentioned in Regulatory requirements.

All insulating material shall be in close contact with the surface to which it is applied and all joints shall be sealed after ensuring that the edges of sectional material where employed are in close contact with one another over the entire insulated surface. All insulation jacketing and surface finish materials shall be suitable for local weather conditions, space ambient temperature during application or finishing shall be as directed by the manufacturer. Contractor also should calculate and adjust thickness of insulation to ensure design temperatures at equipment.

All adhesive vapor coating, mastics, lagging and bedding compounds shall be compatible with the materials to which they are applied. They shall not soften, corrode or otherwise attack such material in either the wet or dry state and shall only be those recommended by the manufacturer of the insulation as suitable for the application proposed.

Insulation shall be clean and dry when installed and during the application of any finish. Space ambient temperature during application or finishing of insulation shall not be less than 15 °C unless recommended otherwise by insulation manufacturer.

All insulation to unions, thermostatic valves, valves and flange joints shall not be fitted until the particular pipeline has been in operation for at least 2 weeks at the design conditions.

Contractor shall provide the engineer with a manufacturer's certificate of declared thermal conductivity for each type of insulation used.

Galvanized and copper pipe work shall be clean and dry before the application of any thermal insulation.

At bends, tees etc. the sectional insulation shall be formed in neat segments. The sections of insulation shall be carefully butted together to ensure the absence of gaps in the insulation and to obviate voids between the insulation and the pipe work and ductwork.

All applied insulation shall be of uniform thickness and shall not vary from the specified thickness by more than 10%.

To ensure that the correct thickness of insulation has been applied, the contractor shall cut section of the insulation specified where directed by the engineer. The contractor shall allow for the cost of these cuttings and making good in his tender.

Should such cutting outs indicate that the insulation is in any way inadequate further test sections shall be cut out as directed by the engineer. In the event of the insulation being unacceptable the whole of the insulation or such part as the engineer shall direct, shall be stripped and reexecuted at contractor's cost.

The contractor shall be responsible for the protection of all equipment during the application of the insulation.

All exposed pipe work and ductwork on roof shall be insulated as above and then covered with aluminum cladding.

## 2.2. Materials

### A. Pipe insulation

Elastomeric closed cell foam to be used for refrigerant, AC condensate piping.

Thermal Conductivity: 0.035 W/m °C at 20° C, as per ASTM C518 standards.

Density: 45-80 kg/m<sup>3</sup>

Water Vapor Permeability: 0.1 perms-inch max as per ASTM E96 standards.

Water Absorption: 3.5% by volume as per ASTM C209:1998 (after 28 days)

Moisture Resistance Factor  $\mu$ : 7000

Smoke Density and Toxicity: SD=350, FSI=20, in accordance with ISO 5659-2 IMO Resolution MSC 61(67) 1996; Annex 1, Part 2

Working temperature from -50° C to 105° C

Fire-retardant grade, self-fire extinguishing and attaining Class 1 as per BS 476 Part 7 and Class O as per BS 476 Part 6.

Insulation material shall be CFC & HCFC free.

For pipe sizes ½" to 6", use preformed pipe sections with longitudinal slit for ease of installation. Join edges with approved glue.

For higher pipe sizes use sheets cut to the size of the circumference of the pipe.

*For multi-layer installation:* Where pipes +600mm OD or flat surfaces are to be insulated on a multi layer basis the adhesive shall be glued over the entire surface; **do not** apply adhesive in spots or strips of coverage. The butt and longitudinal seams of the second layer must always be offset to the first layer (staggered), you must ensure that the first layer is clean and free of debris before applying the second layer. All seams must be securely closed and fixed with adhesive.

Installation as per recommendation of insulation material manufacturer.

## B. Ductwork insulation

Elastomeric closed cell foam to be used for refrigerant, AC condensate piping.

Thermal Conductivity: 0.035 W/m °C at 20° C, as per ASTM C518 standards.

Density: 45-80 kg/m<sup>3</sup>

Water Vapor Permeability: 0.1 perms-inch max as per ASTM E96 standards.

Water Absorption: 3.5% by volume as per ASTM C209:1998 (after 28 days)

Moisture Resistance Factor  $\mu$ : 7000

Smoke Density and Toxicity: SD=350, FSI=20, in accordance with ISO 5659-2 IMO Resolution MSC 61(67) 1996; Annex 1, Part 2

Working temperature from -50° C to 105° C

Fire-retardant grade, self-fire extinguishing and attaining Class 1 as per BS 476 Part 7 and Class O as per BS 476 Part 6.

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strips of coverage. The butt and longitudinal seams of the second layer must always be offset to the first layer (staggered), you must ensure that the first layer is clean and free of debris before applying the second layer. All seams must be securely closed and fixed with adhesive.

Installation as per recommendation of insulation material manufacturer.

### C. Accessories

Provide self-adhesive tape, glue, protective finishes as paint and similar accessories as recommended by insulation manufacturer for applications indicated.

## 3.0. INSTALLATION OF INSULATION

### 3.1. Piping insulation

- a. Install insulation products in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that insulation serves its intended purpose.
- b. Install insulation on pipe system subsequent to testing and acceptance of tests.
- c. Install insulation materials with smooth and even surfaces, maintain the same thickness and symmetrical appearance. Insulate each continuous run of piping with full-length units of insulation, with single cut piece to complete run. Do not use cut pieces or scraps abutting each other.
- d. Clean and dry pipe surfaces prior to insulating. Butt insulation joints firmly together to ensure complete and tight fit over surfaces to be covered. Each section shall be secured to pipe work by applying an approved adhesive of high quality to the surfaces of both the pipe work and insulation section. The sections shall be fixed in place immediately. Note that the adhesive shall also be applied to the edges of the section. Each joint shall be sealed using aluminum adhesive tape.
- e. Maintain integrity of vapor barrier jackets on pipe insulation, and protect to prevent puncture or other damage.
- f. Extend piping insulation without interruption through walls, floors and similar piping penetrations, except where otherwise indicated.
- g. Install protective metal shields and insulated inserts wherever needed to prevent compression of insulation.

- h. Pipe hanger insulation Inserts: Butt insulation against pipe hanger insulation inserts. For hot pipes, apply wide vapor barrier tape or band over the butt joints. For cold piping apply wet coat of vapor barrier lap cement on butt joints and seal joints with vapor barrier tape or band.

### 3.2. Ductwork insulation

- a. General: Install insulation products in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that insulation serves its intended purpose.
- b. Install insulation materials with smooth and even surfaces. Do not use cut pieces or **scarps** abutting each other.
- c. Clean and dry ductwork prior to insulating. Butt insulation and protect it to prevent puncture and other damage.
- d. Maintain integrity of vapor barrier on ductwork insulation, and protect it to prevent puncture and other damage.
- e. The second coat of vapor seal shall be applied by brush after drying of the first coat.
- f. Extend ductwork insulation without interruption through walls, floors and similar ductwork penetrations, except where otherwise indicated.
- g. Corner Angles: Install corner angles on external corners of insulation on ductwork in exposed finished spaces before covering with jacketing.