PLAINTIFF'S
EXHIBIT
DUP-1495

219

MATERIALS

PREFORMED BLOCK AND PIPE INSULATION

THERMAL INSULATION
STANDARD ENGINEERING SPECIFICATION

ISSUED OCT 1964
THIS PAGE REVISED JULY 1977
STANDARD REAFFIRMED JULY 1977

SN 100 M

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Grade	16E	16E.1	111
Material Designation	Calcium silicate	Calcium silicate - inhibited	Calcium silicate
Purpose	Insulation for hot pipe and equipment	Insulation for hot pipe and equipment	Insulation for cold or sub-temperature pipe and equipment
Material Description	Asbestos as basic hydrous calcium silicate reinforced with fibers	Asbestos free basic hydrous calcium silicate with inhibitor for chloride stress-corrosion cracking and reinforced with fibers	Calcium silicate fibrous and free from crystalline form
Suitable for Use: On Uninsulated Aluminum	Yes	Yes	Yes
In direct contact with austenitic stainless steel at or above 140°F	Yes	Yes	Yes
Recommended Temperature Range	1,200°F max	1,200°F max	-200° to +100°F (200°F for short terms)
K Factor Btu/(hr)(sq ft)(°F/in.)	0.41 at 200°F mean 0.46 at 400°F mean 0.59 at 600°F mean	0.41 at 200°F mean 0.46 at 400°F mean 0.59 at 600°F mean	0.35 at 50°F mean 0.38 at 75°F mean 0.39 at 100°F mean
Moisture Resistance or Water Vapor Permeability	Poor	Poor	Poor
Density	14 lb per cu ft max	14 lb per cu ft max	7 to 9 lb per cu ft
Compressive Strength Specimen 6 in. x 6 in. x 2 in. Load Rate 0.10 per min	65 lb per sq in min at 5 percent deformation	50 lb per sq in min at 5 percent deformation	50 lb per sq in.
Resistance to Handling Breakage	Poor to fair	Poor	Poor
Dimensions	See SN30	See SN30	See SN30
Flame-Spread Rating			
Specifications, Qualifications, Limitations	All materials listed under Code 16E.1 are approved where Code 16E is specified. Aluminum must be protected per SN1A. Austenitic stainless steel at or above 140°F must be protected per SN1A.	Recommended for use on austenitic stainless steel. Aluminum must be protected per SN1A. For an alternate to pre-stressed reinforced materials, see SN16E.1C. Stressed Type 304 stainless steel U-bend specimens at 150°C, when in contact with this insulating material or the Du Pont wool mat, over 1,000 ppm chlorides as NaCl in the test water, shall show no cracking at the end of 144 hours exposure. Passing the test in MIL-I-24244 specification does not qualify a material under Code 16E.1	Aluminum must be protected per SN1A. Austenitic stainless steel at or above 140°F must be protected per SN1A.
Approved Materials and Vendors	Thermo-12 Johns-Manville Sales Corp	Super Caltemp, Type V-1 Ruberoid Corp	Kaylo-plus Pittsburg Corning Corp
	Asbestos-free Owens-Corning Fiberglas Corp	Pyrogel (Notes 1 and 2) Pyrotek, Inc	
	Super Caltemp, Type V-1 Ruberoid Corp	Silcoflex (Notes 1 and 2) Wallace Co	
	Calsilcap 1200 (Note 1) Cassco Corp		
	Pyrogel (Notes 1 and 2) Pyrotek, Inc		
	Silcoflex (Notes 1 and 2) Wallace Co		

Notes:
1. Various rope-shape filling covers are available or approved, varieties, and sizes types. Advise the fabricator of the origin of aluminum clamp covers to be used to ensure a proper fit.
2. A ceramic-fiber recommended temperature limit 1,100°F

Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions by suppliers are to be made only on approval of the local authority initiating the use of this specification.

SUBCOMMITTEE NO. 20

APPROVED

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SEP 1977

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DU 045935

PREFORMED BLOCK AND PIPE INSULATION

This Page Rev July 1977

Code	112	112.6	114
Material Designation	Glass fiber	Glass fiberboard	Mineral wool - 1,800°F
Purpose	Insulation for moderate temperature pipe and equipment	Block insulation for moderate temperature equipment	Insulation for high-temperature pipe fittings and equipment
Material Description	Glass fiber, thermosetting resin-bonded insulation for pipe and fittings. Pipe sections, one-piece, flanged, plain, without lasset	Glass fiber bonded board, plain without covering	Mineral wool with high-temperature binder
Suitable for Use: On Unprotected Aluminum	No	No	No
In direct contact with austenitic stainless steel at or above 140°F	No	No	No
Recommended Temperature Range	40° to 375°F	40° to 350°F	1,800°F max
K Factor Btu/(hr)(sq ft)(°F/in.)	0.23 at 100°F mean 0.27 at 200°F mean 0.30 at 300°F mean	0.24 at 100°F mean 0.28 at 200°F mean 0.37 at 300°F mean	0.35 at 200°F mean 0.51 at 600°F mean 0.78 at 1,000°F mean
Moisture Resistance or Water Vapor Permeability	Poor	Poor	Poor
Density	4 lb per cu ft, nominal	3 lb per cu ft, nominal	15 to 19 lb per cu ft
Compressive Strength Specimen 6 in. × 6 in. × 2 in. Load Rate 0.10 per min	Nonload bearing. Inserts required where pipe is supported outside insulation	Nonload bearing	Low
Resistance to Handling Breakage	Good	Good	Good
Dimensions	See SN30	Standard block: 24 in. × 48 in. Thickness: 1 in., 1 1/2 in., 2 in.	Standard block: Up to 24 in. × 36 in. Thickness: 1 in. to 4 in.
Flame-Spread Rating			
Specifications, Qualifications, Limitations	Easily damaged in handling. Poor resistance to abuse. Not recommended for preinsulation. Specify whether for pipe or tubing on order. Available with factory-applied finishes and lap adhesives. When specified, contact vendor's catalog and include on order 3 1/4 lb per cu ft density recommended for field fabricated fittings. Molded fittings are generally lower in cost and are preferred over field fabricated fittings. Aluminum must be protected per SN1A. Austenitic stainless steel at or above 140°F must be protected per SN1A.	Available with factory-applied finishes. When specified, contact vendor's catalogs and include on order. Nominal 4 1/4 lb per cu ft density material is available and is recommended for fabrication involving considerable shaping and fitting. Aluminum must be protected per SN1A. Austenitic stainless steel at or above 140°F must be protected per SN1A.	Aluminum must be protected per SN1A. Austenitic stainless steel at or above 140°F must be protected per SN1A.
Approved Materials and Vendors	Sagin-Ho 500 Pipe Covering Certain-Teed Corp	IB 400 Certain-Teed Corp	PV Superheat (Block only) Eagle-Picher Sales Corp
	Micro-Lok 450 Johns-Manville Sales Corp	Spin-Glass No. 814 Johns-Manville Sales Corp	Mono Block (Block only) Keene Corp Industrial Insulation Div
	Pipe Covering + Use Piece Owens-Corning Fiberglass Corp	Fiberboard, Type 703 Owens-Corning Fiberglass Corp	N. For PC (Block only) (Note 2) U. S. Gypsum
	Insul-Sure (Note 1) Birma Products, Insul-Caustic Div		N. T. Block (Block only) Forty-Eight Insulations, Inc

Notes:
1. Molded fitting covers only.
2. Also available as pipe fitting covers. Advise the fabricator of the brand of aluminum elbow covers to be used to ensure a proper fit.

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