PLAINTIFF'S
EXHIBIT
DUP-1491

219

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

Class	102	102.1	111
Material Designation	Calcium silicate	Calcium silicate - hydrous	Cellular glass
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 fiber, reacted hydrous calcium silicate reinforced with fibers	Asbestos fiber, reacted hydrous calcium silicate with inhibitor for stainless steel stress-corrosion cracking and reinforced with fibers	Cellular glass, inorganic and water and vaporproof form
Suitable for Use: On Unprotected Aluminum	No	No	No
In direct contact with austenitic stainless steel at or above 140°F	No	Yes	No
Recommended Temperature Range	1,200°F max	1,200°F max	-297° to +100°F (300°F for short term)
K Factor Btu/(hr)(sq ft)(°F/in.)	0.41 @ 200°F mean 0.46 @ 400°F mean 0.56 @ 600°F mean	0.41 @ 200°F mean 0.46 @ 400°F mean 0.56 @ 600°F mean	0.29 @ 25°F mean 0.35 @ 75°F mean 0.39 @ 100°F mean
Moisture Resistance or Water Vapor Permeability	Poor	Poor.	Fair
Density	14 lb per cu ft max	14 lb per cu ft max	7 to 9 lb per cu ft
Compressive Strength Deflection 6 in. x 6 in. x 2 in. Load Rate 0.10 per min	50 lb per sq in. min @ 5 percent deformation	50 lb per sq in. min @ 5 percent deformation	50 lb per sq in.
Resistance to Handling Breakage	Poor to fair	Poor	Fair
Dimensions	See SN 400	See SN 400	See SN 400
Flame-Spread Rating			
Specifications, Qualifications, Limitations	All materials listed under Code 102.1 are approved where Code 102 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-shipped inhibitor material, see SN102.10. Stressed Type 304 stainless steel U-bend specimens at 150°C, when in contact with this insulating material in the Ca Pad test and with 1,000 ppm chlorine as NaCl in the test water, shall show no cracking at the end of 168 hours exposure. Passing the test in MIL-I-24244 specification does not qualify a material under Code 102.1.	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 Pittsburgh Corning Corp	Foamglas Pittsburgh Corning Corp
	Kaylo-10/F Owens-Corning Fiberglass Corp	Pittsburgh Corning Corp	
	Super Caltemp, Type V-1 Pittsburgh Corning Corp	Foamglas (Notes 1 and 2) Pittsburgh Co	
	Caltemp (Note 1) Calsil Corp		
	Pittsburgh Corning Corp		
	Foamglas (Notes 1 and 2) Pittsburgh Co		

REMARKS
1. Molded fiberglass fitting covers are available in segments, mitres, and molded fittings. Always use (regardless of the brand of aluminum jacket covers to be used) to ensure a proper fit.
2. A glass-cloth, [illegible] temperature limit 1,100°F

Vendors and merchandise designations are given to describe materials and are not intended to be comprehensive. Substitutions by suppliers are to be made only on approval of the local authority governing the use of this specification.

SUPERSEDES SPEC. NO. 30

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SEP 1977

DU 045925

Grade	112	112-A	114
Material Designation	24-ply yarn	24-ply yarn	Mineral wool - to 800°F
Purpose	Insulation for moderate temperature pipe and equipment	Glass 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, hinged, plain, without jacket	Glass fiber canvas sheet, 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	1,200°F max
K Factor Btu/(hr)(sq ft)(°F/in.)	0.23 @ 100°F mean 0.27 @ 200°F mean 0.31 @ 300°F mean	0.24 @ 100°F mean 0.28 @ 200°F mean 0.32 @ 300°F mean	0.39 @ 200°F mean 0.51 @ 600°F mean 0.76 @ 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	10 to 12 lb per cu ft
Compressive Strength Specimen 6 in. × 6 in. × 2 in. Load Rate 0.10 per min	Nominal bearing where required where pipe is supported without insulation	Nominal bearing	Low
Resistance to Handling Breakage	Good	Good	Good
Dimensions	See SNIO	Standard sheets: 24 in. × 48 in. Thickness: 1 in., 1½ in., 2 in.	Standard sheets: 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 protrusion. Specify whether for pipe or tubing on order. Available with factory-applied finishes and lap adhesive. When specified, special vapor-sealing end mastic on order. 7½ lb per cu ft density recommended for heat tolerances through. Molded fittings are generally used on cold and are preferred over field fabricated fittings. Aluminum must be protected per SNIA. Austenitic stainless steel at or above 140°F must be protected per SNIA.	As above with factory-applied finishes. When specified, special vapor-sealing end mastic on order. Nominal 4½ lb per cu ft density required to maintain size and is recommended for temperatures exceeding contemporary piping and tubing. Aluminum must be protected per SNIA. Austenitic stainless steel at or above 140°F must be protected per SNIA.	Aluminum must be protected per SNIA. Austenitic stainless steel at or above 140°F must be protected per SNIA.
Approved Materials and Vendors	Insulation Pipe Covering Certain-Teed Corp	18 oz Certain-Teed Corp	PF Insulation (Glass only) Eagle-Picher Sales Corp
	Vimasil 439 Johns-Manville Sales Corp	Type Glass No. 814 Johns-Manville Sales Corp	Vetro Fiber (Glass only) Keene Corp Insulation Division Div
	Pipe Covering - Uni-Flex Owens-Corning Fiberglas Corp	Fiberglass, Type 702 Owens-Corning Fiberglas Corp	A-Flex PF (Glass only) Grade 2 U. S. Gypsum
	Insulation (Glass 1) Glass Products, West-Coulee Div		H. T. Fiber (Glass only) Perry-Glass Industries, Inc

Notes:
1. Mineral fiber (glass only).
2. Also available as glass fiber (glass). Advise the fabricator of the brand of aluminum alloy sheet to be used to ensure a proper fit.

DUP 0990107

DU 045926