

**MATERIAL SPECIFICATION
SERIES 100
PREFORMED BLOCK AND PIPE**

**THERMAL INSULATION
STANDARD ENGINEERING SPECIFICATION**

ISSUED OCT 1954
THIS PAGE REVISED MAY 1973
STANDARD REAPPROVED MAY 1973

SN 100 M

Page 1 of 6

Code	102	102.1
Material	Calcium silicate	Calcium silicate - inhibited*
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers. All vendor's materials listed below are asbestos free.
Recommended Temperature Range	1200 F max	
K Factor, Max Btu/(hr) (sq ft)(°F/in.)	0.33 at 200 F, 0.46 at 400 F, and 0.57 at 600 F	
Density	14 lb per cu ft max	
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	60 lb per sq in. min or 5% deformation	50 lb per sq in. min or 5% deformation
Dimensions	See SN3D	
Qualifications and Limitations	Not recommended for use on austenitic stainless steel or above 140 F, see SN102D. Where used on aluminum, coat the latter with Code 709, fibroed asphalt cutback (300 F temp limit). All materials listed under Code 102.1 are approved where Code 102 is specified.	Recommended for use on austenitic stainless steel. For an alternate to purchased inhibited calcium silicate, see SN102.1D. Where used on aluminum, coat the latter with Code 709, fibroed asphalt cutback (300 F temp limit). Stressed Type 304 stainless steel U-bend specimens at 100 C, when in contact with this insulating material in the De Form test with 1500 ppm chloride as NaCl in the test water, shall show no cracking at the end of 144 hours exposure.
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.		
For 12" IPS and larger, there is an additional charge for 2-lbs canvas cover. Material should be specified "without 2-lbs canvas" to avoid extra charge. * Passing the test in MIL-1-24244 specification does not qualify a material under Code 102.1 ** Molded replacement fitting covers are available in serrated, welded, and smooth types	Thermal - Asbestos Free Insul Div, Keene Corp	Thermal - Asbestos Free Insul Div, Keene Corp
	Thermal-12** Johns-Manville Sales Corp	
	Kayle - 10AP Owens - Corning	Super Calcamp, Type NA Fibreboard Corp
	Super Calcamp, Type NA** Fibreboard Corp	
	Carvyming 1500** Celanese Corp	

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.



Document 102-25-0.25

DUP 0990089

048114

NOTE - THIS DOCUMENT IS THE PROPERTY OF S. C. PONT DE MEMBERS AND COMPANY THE TECHNICAL INFORMATION HEREON MAY NOT BE USED OR REPRODUCED WITHOUT THE PERMISSION OF S. C. PONT

**PLAINTIFF'S
EXHIBIT**

DUP-104P

PREFORMED BLOCK AND PIPE

This Page Rev May 1973

128

Code	111	112	112.6
Material	Cellular glass or ceramic	Glass fiber	Glass fiberboard
Material Description	Cellular glass or ceramic formed and fused into unicellular form.	Glass fiber, bonded insulation for pipe and fittings. Pipe sections, and pieces, hinged. Plain, without inserts.	Glass fiber bonded board, plain, without covering.
Binder		Thermosetting resin	
Recommended Temperature Range	-200 F to +100 F (+300 F for dual cures)	40 F to 375 F	40 F to 375 F
K Factor, Max Btu/(hr) (sq ft) (°F/in.)	0.25 at 50 F 0.37 at 75 F 0.39 at 100 F	0.23 at 100 F 0.37 at 200 F 0.33 at 300 F	0.24 at 100 F 0.30 at 200 F 0.37 at 300 F
Density	7 to 9 lb per cu ft	Nominal 4 lb per cu ft	Nominal 3 lb per cu ft
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	30 lb per sq in. min at 5% deformation	Nonload bearing. Inserts required where pipe is supported by insulation.	Nonload bearing
Dimensions	See SN30		Standard is 24" x 48" in thicknesses 1", 1 1/2", 2"
Qualifications and Limitations		Not recommended for pre-insulation because it is easily damaged in handling. Has poor resistance to abuse. Specify whether for pipe or tubing on order. Available with factory-applied Raushan and leg adhesives. When specified, consult vendors' catalogs and include on order. Available as molded fittings as noted below. For field fabrication of fittings, it is recommended that glass fiber insulation with nominal 7 1/2 lb per cu ft density be used. Molded fittings will be lower cost in most cases and are preferred. Do not use on austenitic stainless steel or above 140 F or unprotected aluminum.	Available with factory-applied finishes. When specified, consult vendor's catalogs and include on order. Nominal 4 1/2 lb per cu ft density material is available and is recommended for fabrication involving considerable shaping and fitting. Not recommended for use on austenitic stainless steel or above 140 F or unprotected aluminum.

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.

? Molded fitting covers only	Pyroglas Pittsburgh Corning Corp	Snappers Pipe Covering Carnahanwood St. Gobain Insulation Corp	X-230-J Carnahanwood St. Gobain Insulation Corp
	Ceramic Foam Dow Chemical Co	Micro-Lab Johnstonville Sales Corp	No. 814 Spun-Glas Johnstonville Sales Corp
		1-Piece Pipe Covering Owens-Corning Corp	Type 703 Owens-Corning Corp
		PPG Pipe Insulation Pittsburgh Plate Glass Co	Type 3 Rigid Board Pittsburgh Plate Glass Co
		? 0 Insul-Flex Insul-Coatings Div, Birming Prod	



DUP 0990090

REV 111

040115

MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE

THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION

ISSUED OCT 1954
THIS PAGE
REVISED NOV 1973
STANDARD
REAPPROVED MAY 1973

SN 100 M
Page 1 of 6

Code	102	102.1	
Material	Calcium silicate	Calcium silicate - inhibited *	
Material Description	Reconstituted hydrous calcium silicate reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	Reconstituted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	
Recommended Temperature Range	1200 F max		
K Factor, Max Btu/(hr) (sq ft)(°F/in.)	0.28 at 200 F, 0.44 at 400 F, and 0.57 at 600 F		
Density	14 lb per cu ft max		
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	60 lb per sq in. min or 3% deformation	50 lb per sq in. min or 3% deformation	
Dimensions	See SN30		
Qualifications and Limitations	Not recommended for use on austenitic stainless steel or at above 140 F, see SN102D. Where used on aluminum, use the latter with Code 709, fibrous asphalt surfact (300 F temp limit). All materials listed under Code 102.1 are approved where Code 102 is specified.	Recommended for use on austenitic stainless steel. For an alternative to purchased inhibited calcium silicate, see SN102.1D. Where used on aluminum, use the latter with Code 709, fibrous asphalt surfact (300 F temp limit). Stressed Type 304 stainless steel U-bolts specimens at 100 C, when in contact with this insulating material in the De Pass test with 1500 ppm chloride as NaCl in the test water, shall show no cracking at the end of 144 hours exposure.	

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.

For 12" IPS and larger, there is an additional charge for 2-as convex cover. Material should be specified "without 2-as convex" to avoid extra charge. * Passing the test in MIL-1-24244 specification does not qualify a material under Code 102.1 ** Molded one-piece fitting covers are available in serrated, welded, and smooth types	Thermal - Asbestos Free Insul Dite, Keene Corp	Thermal - Asbestos Free Insul Dite, Keene Corp	
	Thermal-12 ** Johnstonville Sales Corp		
	Kayle - 10AF Gruen - Corning	Super Calcium, Type NA *** Fibreboard Corp	
	Super Calcium, Type NA *** Fibreboard Corp	Pemelle Pearce, Inc	
	Carving 1300 ** Celcor Corp		
	Pemelle Pearce, Inc		

* This product is pink in color
* A perlite-silicate

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 instituting the use of this specification.

24244-1-73



DUP 0990091

24244-1-73

REV. JUN 1974

NOTE - THIS DOCUMENT IS THE PROPERTY OF S O S PONT DE MENDRE AND COMPANY. THE TECHNICAL INFORMATION HEREIN MAY NOT BE USED FOR REPRODUCTION WITHOUT THE PERMISSION OF S O S PONT DE MENDRE AND COMPANY.

Code	111	112	112A
Material	Cellular glass or ceramic	Glass fiber	Glass fiberboard
Material Description	Cellular glass or ceramic foamed and fused into unicellular form.	Glass fiber, banded insulation for pipe and fittings. Pipe sections, one piece, hinges. Plain, without jacket.	Glass fiber banded board, plain, without covering.
Binder		Thermosetting resin	
Recommended Temperature Range	-200 F to +100 F (+300 F for dual cures)	40 F to 375 F	40 F to 375 F
K Factor, Max Btu/(hr) (sq ft) (°F/in.)	0.25 at 50 F 0.37 at 75 F 0.39 at 100 F	0.23 at 100 F 0.27 at 200 F 0.33 at 300 F	0.24 at 100 F 0.30 at 200 F 0.37 at 300 F
Density	7 to 9 lb per cu ft	Nominal 4 lb per cu ft	Nominal 3 lb per cu ft
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	30 lb per sq in. min or 5% deformation	Nonload bearing. Inserts required where pipe is supported by insulation.	Nonload bearing
Dimensions	See SNGD		Standard is 24" x 48", in thicknesses 1", 1 1/2", 2"
Qualifications and Limitations		Not recommended for pre-insulation because it is easily damaged in handling. Has poor resistance to abuse. Specify whether for pipe or tubing on order. Available with factory-applied finishes and lap adhesives. When specified, consult vendors' catalogs and include on order. Available as molded fittings as noted below 6. For field fabrication of fittings, it is recommended that glass fiber insulation with nominal 7 1/4 lb per cu ft density be used. Molded fittings will be lower cost in most cases and are preferred. Do not use on austenitic stainless steel or above 140 F or unprotected aluminum.	Available with factory-applied finishes. When specified, consult 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. Not recommended for use on austenitic stainless steel or above 140 F or unprotected aluminum.
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.			
† Molded fitting covers only	Foamglas Pittsburgh Corning Corp	Seamless Pipe Covering Corvairwood St. Gobain Insulation Corp	K-230-3 Corvairwood St. Gobain Insulation Corp
	Ceramic Foam Dow Chemical Co	Micro-Lab John-Manville Sales Corp	No. 814 Span-Glas John-Manville Sales Corp
		1-Piece Pipe Covering Owens-Corning Corp	Type 703 Owens-Corning Corp
		PPG Pipe Insulation Pittsburgh Plate Glass Co	Type 3 Rigid Board Pittsburgh Plate Glass Co
		† 4 Insul-Sure Insul-Concrete Div., Birmar Prod	

DUP 0990092

R-49

040817

SN 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954
Page 4		PREFORMED BLOCK AND PIPE		This Page Rev Sept 1949
Code	120			130
Material	Polystyrene foam:			Asbestos board
Material Description	Preformed polystyrene foam: Type A - block, pipe and fitting insulation cut from extruded polystyrene foam. Pipe insulation available with a variety of different joint designs. Type B - pipe and fitting insulation molded to final shape from expanded polystyrene beads with tongue and groove side wall joints and ship lap butt joints.			Asbestos fibers, diatomaceous silica, and inorganic binder. Flame-spread rating 0. Weather-resistant
Filler				Asbestos fiber
Binder				Inorganic
Temperature Range	-100 F to +140 F			1200 F max
K Factor Btu/(hr) (sq ft) (°F/in.)	0.26 max at 75 F mean			0.38 max at 500 F mean
Density	1.3 lb per cu ft minimum			24 lb per cu ft
Compressive Strength	Min 25 lb per sq in. at 3% deformation			Compressive, ultimate - 14,000 psi Tensile - 420 psi Shear normal to face - 700 psi Shear parallel - 320 psi
Resistance to Breakage in Handling	Excellent			Good
Dimensions	See SN30			
Dimensional Tolerances	±1/16" - 0" on insulation ID, all other dimensions to be ±1/16" including straightness and squareness			Thickness, in. = 1/2, 3/4, 7/8, 1, 1 1/4, 1 1/2, 2 and 4 Sheet size, ft = 3, 3 1/2 or 4 x 8 and 4 x 10
Other Qualifications	Uniform cell structure with max 10% open cells for Type A. No voids having any dimensions exceeding 1/8". No distortion or volume change, or loss of compressive strength after exposure at 140 F and 80% relative humidity for 15 days. Water absorption max 0.03% by volume after being subjected to 90 F, 90% relative humidity for 15 days and max 4% by volume into a 2" x 2" x 1" shrink-free piece immersed in water just under the surface for 5 days, then wiped with a wet cloth and weighed, with no delay between steps. Not resistant to solvents other than alcohol			Sanded both sides, may be used unpainted for interior use. When painted, use water base or epoxy coating
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.				
* Available in the form of pipe and fitting insulation from fabricators.	Type A: Styrofoam PR® Dow Chemical Co			Marmulux 36 (Type A) John-Manville Sales Corp
	Type B: Vapor - Lock MMM Div, Insular Products Co			Unares Board 36 Chambers Div Unares Industries, Inc
REV. JUL 1970		SHIP BY		DUP 0990093

REV. JUL

1970

SHIP BY

DUP 0990093

040F18

87

OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100
PREFORMED BLOCK AND PIPE

SN 100

This Page Rev Feb. 1972

Page

Code	120	130
Material	Polystyrene foam	Asbestos beads
Material Description	Preformed polystyrene foam block, pipe, and fitting insulation cut from extruded polystyrene foam (pipe insulation available with a variety of different joint designs), or pipe and fitting insulation molded to final shape from expanded polystyrene beads with tongue-and-groove side longitudinal joints and ship lap butt joints.	Asbestos fibers, diatomaceous silica, and inorganic binder. Flame-spread rating 0. Weather-resistant.
Recommended Temperature Range	-100 F to +140 F	1200 max
K Factor, Max Btu·(hr) (sq ft) (°F/in.)	0.24 at 50 F 0.26 at 75 F 0.28 at 100 F	0.77 at 200 F 0.79 at 400 F 0.81 at 600 F
Density	1.5 lb per cu ft minimum	36 lb per cu ft
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	Min 25 lb per sq in. at 5% deformation	Compressive, ultimate - 14,000 psi Tensile parallel to face - 420 psi Shear normal to face - 700 psi Shear parallel - 320 psi
Dimensions	SN10. All dimensions to be $\pm 1/16"$ including straightness and squareness	Thickness, in. = 1/2, 3/4, 1, 1 1/4, 1 1/2, 2 and 4 Sheet size, ft = 3, 3 1/2 or 4 x 8 and 4 x 10
Qualifications and Limitations	Uniform cell structure with max 10% open cells. No distortion or volume change, or loss of compressive strength after exposure at 140 F and 80% relative humidity for 15 days. Water absorption max 0.03% by volume after being subjected to 90 F, 90% relative humidity for 15 days and max 4% by volume into a 2" x 2" x 1" skin-free piece immersed in water just under the surface for 3 days, then wiped with a wet cloth and weighed, with no delay between steps. Not resistant to solvents other than alcohol.	Sanded both sides, may be used unpainted for interior use. When painted, use water base or epoxy coating.

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon confirmation as to their identity.

* Available in the form of pipe and fitting insulation from fabricators.

Styrofoam PR 4
Dow Chemical Co

Veratite 36 (Type 4)
Johns-Manville Sales Corp

Fyroc
Owens-Corning Corp

DUP 0990094

-848339

97

OCTOBER 1954

This Page Rev Aug 1972

MATERIAL SPECIFICATION - SERIES 100
PREFORMED BLOCK AND PIPE

SN 100

Page

Code	120	130
Material	Polystyrene foam	Asbestos board
Material Description	Preformed polystyrene foam block, pipe, and fitting insulation cut from extruded polystyrene foam (pipe insulation available with a variety of different joint designs), or pipe and fitting insulation molded to final shape from expanded polystyrene beads with tongue-and-groove side longitudinal joints and ship lap butt joints.	Asbestos fibers, diatomaceous silica, and inorganic binders. Flame-spread rating 0. Weather-resistant.
Recommended Temperature Range	-100 F to +140 F	1200 max
K Factor, Max Btu/(hr) (sq ft) (°F/in.)	0.24 at 50 F 0.26 at 75 F 0.28 at 100 F	0.77 at 200 F 0.79 at 400 F 0.81 at 600 F
Density	1.5 lb per cu ft minimum	36 lb per cu ft
Compressive Strength Specimen size 6" x 6" x 2", load rate 0.10" per min	Min 25 lb per sq in. at 5% deformation	Compressive, ultimate = 14,000 psi Tensile parallel to face = 420 psi Shear normal to face = 700 Shear parallel = 320
Dimensions	SN30. All dimensions to be $\pm 1/16$ " including straightness and squareness	Thickness, in. = 1/2, 3/4, 1, 1 1/8, 1 1/2, 2 and 4 Sheet size, ft = 3, 3 1/2 or 4 x 8 and 4 x 10
Qualifications and Limitations	Uniform cell structure with max 10% open cells. No distortion or volume change, or loss of compressive strength after exposure at 140 F and 80% relative humidity for 15 days. Water absorption max 0.52% by volume after being subjected to 90 F, 90% relative humidity for 15 days and max 4% by volume into a 2" x 2" x 1" specimen piece immersed in water just under the surface for 5 days, then wiped with a wet cloth and weighed, with no delay between steps. Not resistant to solvents other than alcohol.	Sanded both sides, may be used unpainted for interior use. When painted, use water base or epoxy coating.
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.		
Available in the form of fitting covers (see Code 114.1) from fabricators	Stryfoam FR 6 Dow Chemical Co	Varulite 36 (Type 4) Johns-Manville Sales Corp
		Pyrex Corning-Glass Corp

DUP 0990095

R-52

1 - - - -

040120

275

MAY 1973
REV.

OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SM 100
This Page Rev Oct 1972		PREFORMED BLOCK AND PIPE		Page
Code	120		130	
Material	Polystyrene foam		Asbestos board	
Material Description	Preformed polystyrene foam block, pipe, and fitting insulation cut from extruded polystyrene foam (pipe insulation available with a variety of different joint designs), or pipe and fitting insulation molded to final shape from expanded polystyrene beads with tongue-and-groove side longitudinal joints and shiplap butt joints.		Asbestos fibers, diatomaceous silica, and inorganic binders. Flame-spread rating 0. Weather-resistant.	
Recommended Temperature Range	- 100 F to + 140 F		1200 max	
R Factor, Max Btu/(hr) (sq ft) (°F/in.)	0.24 at 50 F 0.26 at 75 F 0.28 at 100 F		0.77 at 200 F 0.79 at 400 F 0.81 at 600 F	
Density	1.5 lb per cu ft minimum		36 lb per cu ft	
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	Min 25 lb per sq in. at 5% deformation		Compressive, ultimate - 14,000 psi; Tensile parallel to face - 420 psi; Shear normal to face - 700 psi; Shear parallel - 320 psi	
Dimensions	SM30. All dimensions to be ± 1/16" including straightness and squareness		Thickness, in. = 1/3, 2/3, 1, 1 1/4, 1 1/2, 2 and 4 Sheet size, ft = 3, 3 1/2 or 4 x 8 and 4 x 10	
Qualifications and Limitations	Uniform cell structure with max 10% open cells. No distortion or volume change, or loss of compressive strength after exposure at 140 F and 80% relative humidity for 15 days. Water absorption max 0.03% by volume after being subjected to 90 F, 90% relative humidity for 15 days and max 4% by volume into a 2" x 2" x 1" shrink-free piece immersed in water just under the surface for 5 days, then wiped with a wet cloth and weighed, with no delay between steps. Not resistant to solvents other than alcohol.		Sanded both sides, may be used unpainted for interior use. When painted, use water base or epoxy coating.	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.				
† Available in the form of fitting covers (see Code 114.1) from fabricators	Synfoam FR † Olin Chemical Co		Marlite 36 (Type A) John-Manville Sales Corp	
DUP 0990096				
R-53				

OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100
PREFORMED BLOCK AND PIPE

SM 100

This Page Rev May 1973

Page

Code	120	130
Material	Polystyrene foam	Asbestos board
Material Description	Preformed polystyrene foam block, pipe, and fitting insulation cut from extruded polystyrene foam (pipe insulation available with a variety of different joint designs), or pipe and fitting insulation molded to final shape from expanded polystyrene beads with tongue-and-groove side longitudinal joints and ship lap butt joints.	Asbestos fibers, diatomaceous silica, and inorganic binder. Flame-spread rating 0. Weather-resistant.
Recommended Temperature Range	-100 F to +140 F	1200 max
K Factor, Max Btu/(hr) (sq ft) (°F/in.)	0.24 at 50 F 0.26 at 75 F 0.28 at 100 F	0.77 at 200 F 0.79 at 400 F 0.81 at 600 F
Density	1.5 lb per cu ft minimum	36 lb per cu ft
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	Min 25 lb per sq in. at 5% deformation	Compressive, ultimate - 14,000 psi Tensile parallel to face - 420 psi Shear normal to face - 700 ps Shear parallel - 320 ps
Dimensions	SM20. All dimensions to be 2 1/16" including straightness and squareness	Thickness, in. - 1/2, 3/4, 7/8, 1, 1 1/4, 1 1/2, 2 and 4 Sheet size, ft - 3, 3 1/2 or 4 x 8 and 4 x 10
Qualifications and Limitations	Uniform cell structure with max 10% open cells. No distortion or volume change, or loss of compressive strength after exposure at 140 F and 80% relative humidity for 15 days. Water absorption max 0.03% by volume after being subjected to 90 F, 90% relative humidity for 15 days and max 4% by volume into a 2" x 2" x 1" shrink-free piece immersed in water just under the surface for 5 days, then wiped with a wet cloth and weighed, with no delay between steps. Not resistant to solvents other than alcohol.	Sanded both sides, may be used unpainted for interior use. When painted, use water base or epoxy coating.
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.		
Available in the form of fitting covers (see Code 1T4.1) from fabricators	Styrofoam FR Dow Chemical Co	Marmite 36 (Type A) Johns-Manville Sales Corp
	Vapen-Less Inco-lyne Corp	

REV. JUN 1974

DUP 0990097

A-54

1 0 2 0 1

040122

REV. JUN 1975

OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SM 100
This Page Rev May 1973		PREFORMED BLOCK AND PIPE		Page
Code	120	130		
Material	Polystyrene foam	Asbestos board		
Material Description	Preformed polystyrene foam block, pipe, and fitting insulation cut from extruded polystyrene foam (pipe insulation available with a variety of different joint designs), or pipe and fitting insulation molded to final shape from expanded polystyrene beads with tongue-and-groove side longitudinal joints and ship lap butt joints.	Asbestos fibers, diatomaceous silica, and inorganic binder. Flame-spread rating 0. Weather-resistant.		
Recommended Temperature Range	- 100 F to + 140 F	1200 max		
R Factor, Max Btu/(hr) (sq ft) (°F/in.)	0.24 at 50 F 0.24 at 75 F 0.28 at 100 F	0.77 at 200 F 0.79 at 400 F 0.81 at 600 F		
Density	1.5 lb per cu ft minimum	36 lb per cu ft		
Compressive Strength Specimen size 4" x 6" x 2"; load rate 0.10" per min	Min 25 lb per sq in. at 5% deformation	Compressive, ultimate = 14,000 psi Tensile parallel to face = 420 psi Shear normal to face = 700 psi Shear parallel = 320 psi		
Dimensions	SM30. All dimensions to be $\pm 1/16"$ including straightness and squareness	Thickness, in. = 1/2, 3/4, 1, 1 1/4, 1 1/2, 2 and 4 Sheet size, ft = 3, 3 1/2 or 4 x 8 and 4 x 10		
Qualifications and Limitations	Uniform cell structure with max 10% open cells. No distortion or volume change, or loss of compressive strength after exposure at 140 F and 80% relative humidity for 15 days. Water absorption max 0.02% by volume after being subjected to 90 F, 90% relative humidity for 15 days and max 6% by volume into a 2" x 2" x 1" skin-free piece immersed in water just under the surface for 5 days, then wiped with a wet cloth and weighed, with no delay between steps. Not resistant to solvents other than alcohol.	Sanded both sides, may be used unpainted for interior use. When painted, use water base or epoxy coating.		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.				
Available in the form of fitting covers (see Code 174.1) from fabricators	Synfoam FR 6 Dow Chemical Co	Monaste 36 (Type A) Johns-Manville Sales Corp		
	Vapo-Lock Insuldyne Corp			

DUP 0990098

R-55

J-A-21A

040123

OCTOBER 1954

PREFORMED BLOCK AND
PIPE INSULATION

SM 100 -

This Page Rev. July 1973

Page 5

Code	120	130
Material	Polystyrene foam	Asbestos board
Material Description	Preformed polystyrene foam block, pipe, and fitting insulation cut from extruded polystyrene foam (pipe insulation available with a variety of different joint designs), or pipe and fitting insulation molded in final shape from expanded polystyrene beads with tongue-and-groove side longitudinal joints and shiplap butt joints.	Asbestos fibers, diatomaceous silica, and inorganic binder. Flame-spread rating 0. Weather-resistant.
Recommended Temperature Range	-100 F to +140 F	1200 max
K Factor, Max Btu/(hr) (sq ft) (°F/in.)	0.24 at 50 F 0.26 at 75 F 0.28 at 100 F	0.77 at 200 F 0.79 at 400 F 0.81 at 600 F
Density	1.5 lb per cu ft minimum	26 lb per cu ft
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	Min 25 lb per sq in. at 5% deformation	Compressive, ultimate - 14,000 psi Tensile parallel to face - 420 psi Shear normal to face - 700 psi Shear parallel - 320 psi
Dimensions	SM20. All dimensions to be $\pm 1/16"$ including straightness and squareness	Thickness, in. - 1/2, 3/4, 7/8, 1, 1 1/4, 1 1/2, 2 and 4 Sheet size, ft - 3, 3 1/2 or 4 x 8 and 4 x 10
Qualifications and Limitations	Uniform cell structure with max 10% open cells. No distortion or volume change, or loss of compressive strength after exposure at 140 F and 80% relative humidity for 15 days. Water absorption max 0.03% by volume after being subjected to 90 F, 90% relative humidity for 15 days and max 4% by volume into a 2" x 2" x 1" shrink-free piece immersed in water just under the surface for 5 days, then wiped with a wet cloth and weighed, with no delay between steps. See SM20 for flame-spread rating limitations. Not resistant to solvents other than alcohol.	Sanded both sides, may be used uncoated for interior use. When painted, use water base or epoxy coating.
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.		
Available in the form of fitting covers (see Code 114.1) from fabricators	Soyfoam FR ¹ Dow Chemical Co	Marmulite 36 (Type A) Johns-Manville Sales Corp
	Vapen-Lock Insulfron Corp	
	Expanded Polystyrene Insulation Min Density 1.5 lb/ft ³ Dyplast of Florida Inc	

DUP 0990099

R-56

L-B-38A

040124

REV. NOV 1978

OCTOBER 1964

PREFORMED BLOCK AND PIPE INSULATION

SN '00 W

This Page Rev July 1977

Page 5

Code	126	127
Material Description	Asbestos board	High-density calcium silicate board
Purpose	Use where high structural strength insulation is required	Use where high structural strength insulation is required
Material Description	Weather-resistant board consisting of asbestos fibers, glass fibers, mica, and other organic binder bonded on both sides	Asbestos-free (inorganic) high-density structural insulation board consisting of calcium silicate, inert fibers, and non-leaching agents. Bonded on both sides
Exposure to Use: On Unprotected Aluminum	No	No
In direct contact with corrosive materials such as or above 140°F	No	No
Recommended Temperature Range	-200°F max	1200°F max
K Factor Btu/(R)(sq ft)(°F)	0.77 at 200°F max 0.79 at 400°F max 0.81 at 600°F max	0.81 at 350°F max 0.82 at 400°F max 0.87 at 600°F max
Moisture Resistance or Water Vapor Permeability	Low	Low. Must be painted for outdoor use
Density	25 lb per cu ft	45 lb per cu ft
Compressive Strength Specimen 6 in. x 6 in. x 2 in. Load Rate 0.16 per min	Compressive: minimum 14,000 psi Tensile parallel to face 400 psi Shear parallel to face 700 psi Shear parallel to face 320 psi	1,000 psi at 5 percent compression modulus of rupture 500 psi
Resistance to Handling Breakage	Very good	Very good
Dimensions	Sheet size, ft: 2, 3 1/2, or 4 x 8 and 4 x 10 Thickness, in.: 1/2, 3/4, 1, 1 1/4, 1 1/2, 2, and 4	Sheet size, ft: 4 x 8 standard Thickness, in.: 1/2, 3/4, 1, 1 1/4, 1 1/2, and 2
Flame-Spread Rating	Flame-spread rating is 0	Flame-spread rating is 0
Specifications, Qualifications, Limitations	May be used uncoated for interior use. When painted, use water base or epoxy coating. Aluminum must be protected per SITA. Asbestos exposure level is or above 140°F must be protected per SITA.	Self-cleaning screw fastening strength is 1/2 in. diameter, not 1/2 in. girth. May be used uncoated for interior use when painted on the exterior side for hot surfaces, use breathing-type water base paint only. Aluminum must be protected per SITA. Asbestos exposure level is or above 140°F must be protected per SITA.
Approved Materials and Vendors	Vendor in (Type A) Jenningsville Sales Corp	Vendor V. Jenningsville Sales Corp

L. BURKHART-22
SEPT 20 1981

JUN 25 1981

JOSEPH I. HECHT

R-57
MTHSV

DUP 0990100

048123

SN 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954	
Page 4		PREFORMED BLOCK AND PIPE		This Page Rev July 1970	
Code		120		130	
Material		Polystyrene foam:		Asbestos board	
Material Description		Preformed polystyrene foam: Type A - block, pipe and fitting insulation cut from extruded polystyrene foam. Pipe insulation available with a variety of different joint designs. Type B - pipe and fitting insulation molded to final shape from expanded polystyrene beads with tongue and groove side wall joints and ship lap butt joints.		Asbestos fibers, diatomaceous silice, and inorganic binder. Flameproof rating 0. Weather-resistant	
Filler				Asbestos fiber	
Binder				Inorganic	
Temperature Range		-100 F to +140 F		1200 F max	
K Factor Btu/(hr) (sq ft) (°F/in.)		0.26 max at 73 F mean		0.80 max at 500 F mean	
Density		1.8 lb per cu ft minimum		36 lb per cu ft	
Compressive Strength		Min 25 lb per sq in. at 5% deformation		Compressive, ultimate - 14,000 psi Tensile - 420 psi Shear normal to face - 700 psi Shear parallel - 320 psi	
Resistance to Breakage in Handling		Excellent		Good	
Dimensions		See SN3D			
Dimensional Tolerances		±1/16" - 0" on insulation ID, all other dimensions to be ±1/16" including straightness and squareness		Thickness, in. = 1/2, 3/4, 7/8, 1, 1 1/4, 1 1/2, 2 and 4 Sheet size, ft = 3, 3 1/2 or 4 x 8 and 4 x 10	
Other Qualifications		Uniform cell structure with max 10% open cells for Type A. No voids having any dimensions exceeding 1/4". No distortion or volume change, or loss of compressive strength, after exposure at 140 F and 80% relative humidity for 15 days. Water absorption max 0.02% by volume after being subjected to 98 F, 90% relative humidity for 15 days and max 4% by volume into a 2" x 2" x 1" skin-free piece immersed in water just under the surface for 3 days, then wiped with a wet cloth and weighed, with no delay between steps. Not resistant to solvents other than alcohol		Sanded both sides, may be used unsanded for interior use. When painted, use water base or epoxy coating	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.					
* Available in the form of pipe and fitting insulation from manufacturers.		Type A: Styrofoam PR [®] Dow Chemical Co		Marinite 36 (Type 4) Johnstonville Sales Corp	
		Type B: Vapor - Lock MMM Div, Insular Products Co		Unarco Board 36 Chamber Div Unarco Industries, Inc	

R-58

DUP 0990101

048126

MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION		
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED	OCT 1954	SN 100 M Page 1 of 6
		THIS PAGE REVISED	NOV 1973	
		STANDARD REAFFIRMED	MAY 1973	
Code	102	102.1		
Material Material Description	Calcium silicate Reconstituted hydrous calcium silicate reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	Calcium silicate - inhibited * Reconstituted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers. All vendor's materials listed below are asbestos free.		
Recommended Temperature Range	1200 F max			
K Factor, Max Btu/(hr) (sq ft)(°F/in.)	0.35 at 200 F, 0.46 at 400 F, and 0.57 at 600 F			
Density	14 lb per cu ft max			
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	60 lb per sq in. min at 5% deformation	50 lb per sq in. min at 5% deformation		
Dimensions	See SN30			
Qualifications and Limitations	Not recommended for use on austenitic stainless steel at or above 140 F, see SN1020. Where used on aluminum, coat the latter with Code 709, fibroed asphalt curbuck (300 F temp limit). All materials listed under Code 102.1 are approved where Code 102 is specified.	Recommended for use on austenitic stainless steel. For on aluminum to purchased inhibited calcium silicate, see SN102.10. Where used on aluminum, coat the latter with Code 709, fibroed asphalt curbuck (300 F temp limit). Stressed Type 304 stainless steel U-bend specimens at 100 C, when in contact with this insulating material in the Du Pont wet test with 1500 ppm chloride as NaCl in the test water, shall show no cracking at the end of 144 hours exposure.		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.				
For 12" IPS and larger, there is an additional charge for 2-in. convex cover. Material should be specified "without 2-in. convex" to avoid extra charge. * Passing the test in MIL-1-24244 specification does not qualify a material under Code 102.1 ** Molded neoprene flashing covers are available in covered, welded, and cover types	Therma-1 - Asbestos Free Insul Div, Keene Corp	Therma-1 - Asbestos Free Insul Div, Keene Corp		
	Therma-12 ** Johns-Manville Sales Corp			
	Keylo - 10AF Owens - Corning	Super Galsamp, Type NA *** Fibreboard Corp		
	Super Galsamp, Type NA *** Fibreboard Corp	Pensile Pensile, Inc		
	Careysing 1500 ** Celotex Corp			
	Pensile Pensile, Inc			
A This product is pink in color B perlite-silicate 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 instituting the use of this specification.				

DUP 0990122

SUBCSM11-72 40.25



SUBCMM-11-73-40.23



DUP 0990122

040147

JUN 1974

NOTE - THIS DOCUMENT IS THE PROPERTY OF E. I. DU PONT DE NEMOURS AND COMPANY THE TECHNICAL INFORMATION HEREIN MAY NOT BE USED OR REPRODUCED WITHOUT THE PERMISSION OF E. I. DU PONT DE NEMOURS AND COMPANY

SM 100 M

MATERIAL SPECIFICATION - SERIES 100
PREFORMED BLOCK AND PIPE

OCTOBER 1954

Page 2

This Page Rev Nov 1973

Code	111	112	112A
Material	Cellular glass or ceramic	Glass fiber	Glass fiberboard
Material Description	Cellular glass or ceramic foamed and fused into unicellular form.	Glass fiber, banded insulation for pipe and fittings. Pipe sections, one piece, hinged. Plain, without jacket.	Glass fiber banded board, plain, without covering.
Binder		Thermosetting resin	
Recommended Temperature Range	-200 F to +100 F (+300 F for dual cures)	40 F to 375 F	40 F to 375 F
K Factor, Max Btu/(hr) (sq ft) (°F/in.)	0.25 at 50 F 0.37 at 75 F 0.39 at 100 F	0.23 at 100 F 0.27 at 200 F 0.33 at 300 F	0.24 at 100 F 0.30 at 200 F 0.37 at 300 F
Density	7 to 9 lb per cu ft	Nominal 4 lb per cu ft	Nominal 3 lb per cu ft
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	30 lb per sq in. min at 5% deformation	Nonload bearing. Inserts required where pipe is supported by insulation.	Nonload bearing
Dimensions	See SM30		Standard is 24" x 48", in thicknesses 1", 1½", 2"
Qualifications and Limitations		Not recommended for pre-insulation because it is easily damaged in handling. Has poor resistance to abuse. Specify whether for pipe or fitting on order. Available with factory-applied finishes and lap adhesives. When specified, consult vendors' catalogs and include on order. Available as molded fittings as noted below. For field fabrication of fittings, it is recommended that glass fiber insulation with nominal 7¼ lb per cu ft density be used. Molded fittings will be lower cost in most cases and are preferred. Do not use on austenitic stainless steel or above 140 F or unprotected aluminum.	Available with factory-applied finishes. When specified, consult vendor's catalogs and include on order. Nominal 4½ lb per cu ft density material is available and is recommended for fabrication involving considerable shaping and fitting. Not recommended for use on austenitic stainless steel or above 140 F or unprotected aluminum.

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.

† Molded fitting covers only	Pyroglas Pittsburgh Corning Corp	Seapac Pipe Covering Containwood St. Gobain Insulation Corp	K-230-J Containwood St. Gobain Insulation Corp
	Ceramic Foam Dow Chemical Co	Micro-Lok Johns-Manville Sales Corp	No. 814 Spin-Glas Johns-Manville Sales Corp
		In-Piece Pipe Covering Owens-Corning Corp	Type 703 Owens-Corning Corp
		PPG Pipe Insulation Pittsburgh Plate Glass Co	Type 5 Rigid Board Pittsburgh Plate Glass Co
		† Insul-Sure Insul-Concrete Div., Sima Prod	

DUP 0990123



DUP 0990123



040148

MATERIALS

**MATERIAL SPECIFICATION
SERIES 100
PREFORMED BLOCK AND PIPE**

**THERMAL INSULATION
STANDARD ENGINEERING SPECIFICATION**

ISSUED OCT 1954
THIS PAGE REVISED MAY 1973
STANDARD REAPPROVED MAY 1973

SN 100 M

Page 1 of 6

Code	102	102.1	
Material	Calcium silicate	Calcium silicate - inhibited *	
Material Description	Reconstituted hydrous calcium silicate reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	Reconstituted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	
Recommended Temperature Range	1200 F max		
K Factor, Max Btu/(hr) (sq ft)(°F/in.)	0.33 at 200 F, 0.44 at 400 F, and 0.57 at 600 F		
Density	14 lb per cu ft max		
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	60 lb per sq in. min at 5% deformation	50 lb per sq in. min at 5% deformation	
Dimensions	See SN30		
Qualifications and Limitations	Not recommended for use on austenitic stainless steel at or above 140 F, see SN102D. Where used on aluminum, coat the latter with Code 789, fibreglass asphalt enamel (300 F temp limit). All materials listed under Code 102.1 are approved where Code 102 is specified.	Recommended for use on austenitic stainless steel. For an alternative to purchased inhibited calcium silicate, see SN102.1D. Where used on aluminum, coat the latter with Code 789, fibreglass asphalt enamel (300 F temp limit). Stressed Type 304 stainless steel U-bend specimens at 100 C, when in contact with this insulating material in the Du Pont wet test with 1500 ppm chloride as NaCl in the test water, shall show no cracking at the end of 144 hours exposure.	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.			
For 12" IPS and larger, there is an additional charge for 2-in canvas cover. Material should be specified "without 2-in canvas" to avoid extra charge.	Thermal - Asbestos Free Insul Div, Keene Corp	Thermal - Asbestos Free Insul Div, Keene Corp	
	Thermal-12 ** John-Manville Sales Corp		
	Kaylo - 10AF Owens - Corning	Super Calump, Type NA Fibreboard Corp	
	Super Calump, Type NA ** Fibreboard Corp		
	Corrymbe 1500 ** Calover Corp		
* Passing the test in MIL-12434A specification does not qualify a material under Code 102.1			
** Molded nonpressure fitting covers are available in screwed, welded, and sweat types			

DUP 0990124

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.



SM 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954
Page 2		PREFORMED BLOCK AND PIPE		This Page Rev. Mar. 1973
Code	111	112	112.6	
Material	Cellular glass or ceramic	Glass fiber	Glass fiberboard	
Material Description	Cellular glass or ceramic foamed and fused into uncellular form.	Glass fiber, bonded insulation for pipe and fittings. Pipe sections, one piece, hinged. Plain, without jacket.	Glass fiber bonded board, plain, without covering.	
Binder		Thermosetting resin		
Recommended Temperature Range	-200 F to +100 F (+300 F for dual cements)	40 F to 375 F	40 F to 375 F	
K Factor, Max Br/In. (sq ft) (°F/in.)	0.35 at 50 F 0.37 at 75 F 0.39 at 100 F	0.23 at 100 F 0.27 at 200 F 0.33 at 300 F	0.24 at 100 F 0.30 at 200 F 0.37 at 300 F	
Density	7 to 9 lb per cu ft	Nominal 4 lb per cu ft	Nominal 3 lb per cu ft	
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	50 lb per sq in. min at 5% deformation	Nonload bearing. Inserts required where pipe is supported by insulation.	Nonload bearing	
Dimensions	See SM30		Standard is 24" x 48", in thicknesses 1", 1 1/2", 2"	
Qualifications and Limitations		Not recommended for pre-insulation because it is easily damaged in handling. Has poor resistance to abuse. Specify whether for pipe or tubing on order. Available with factory-applied finishes and lac adhesives. When specified, consult vendors' catalogs and include on order. Available as molded fittings as noted below. For field fabrication of fittings, it is recommended that glass fiber insulation with nominal 7 1/4 lb per cu ft density be used. Molded fittings will be lower cost in most cases and are preferred. Do not use on austenitic stainless steel at or above 140 F or unprotected aluminum.	Available with factory-applied finishes. When specified, consult 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. Not recommended for use on austenitic stainless steel at or above 140 F or unprotected aluminum.	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.				
* Molded fitting covers only	Pyroglas Pittsburgh Corning Corp	Snap-on Pipe Covering Cincinnati St. Gobain Insulation Corp	K-230-1 Cincinnati St. Gobain Insulation Corp	
	Ceramic Foam Owens Corning Co	Micro-Lok Johns-Manville Sales Corp	No. 814 Spin-Glas Johns-Manville Sales Corp	
		1-Piece Pipe Covering Owens-Corning Corp	Type 703 Owens-Corning Corp	
		PPG Pipe Insulation Pittsburgh Plate Glass Co	Type S Rigid Board Pittsburgh Plate Glass Co	
		T & Insul-Sure Insul-Concrete Div., Birmo Prod		
DUP 0990125 				

REV 11

048158

**MATERIAL SPECIFICATION
SERIES 100
PREFORMED BLOCK AND PIPE**

**THERMAL INSULATION
STANDARD ENGINEERING SPECIFICATION**

ISSUED OCT 1954
THIS PAGE NOV 1973
STANDARD REAPPROVED MAY 1973

SN 100 M

Page 1 of 6

Code	102	102.1
Material Description -	Calcium silicate Reacted hydrous calcium silicate reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	Calcium silicate - inhibited * Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers. All vendor's materials listed below are asbestos free.
Recommended Temperature Range	1200 F max	
K Factor, Max Btu/(hr) (sq ft)(°F/in.)	0.32 at 200 F, 0.44 at 400 F, and 0.57 at 600 F	
Density	14 lb per cu ft max	
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	60 lb per sq in. min or 3% deformation	30 lb per sq in. min or 3% deformation
Dimensions	See SN30	
Qualifications and Limitations	Not recommended for use on austenitic stainless steel or on above 140 F, see SN102.10. Where used on aluminum, coat the latter with Code 709, fibrous asphalt curbish (200 F temp limit). All materials listed under Code 102.1 are approved where Code 102 is specified.	Recommended for use on carbonistic stainless steel. For an alternative to purchased inhibited calcium silicate, see SN102.10. Where used on aluminum, coat the latter with Code 709, fibrous asphalt curbish (200 F temp limit). Stressed Type 304 stainless steel Unbond specimens at 100 C, when in contact with this insulating material in the Du Pont test with 1300 ppm chloride or NaCl in the test water, shall show no cracking at the end of 144 hours exposure.
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.		
For 12" IPS and larger, there is an additional charge for 2-in canvas cover. Material should be specified "without 2-in canvas" to avoid extra charge. * Passing the test in MIL-12434A specification does not qualify a material under Code 102.1 ** Molded non-piece fitting covers are available in serrated, welded, and smooth types	Thermal - Asbestos Free Insul Div, Keene Corp	Thermal - Asbestos Free Insul Div, Keene Corp
	Thermal-12 ** John-Manville Sales Corp	
	Kayle - 10AF Quincy - Corning	Super Calcamp, Type NA *** Fiberglass Corp
	Super Calcamp, Type NA *** Fiberglass Corp	Pamelle Pamelle, Inc
	Carving 1500 ** Celcor Corp	
	Pamelle Pamelle, Inc	

* This product is pink in color
† A perlite-silicate

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.



RECOMMENDED 10-25

A-150

040260

PREFORMED BLOCK AND PIPE

This Page Rev June 1974

Code	111	112	112.6
Material	Cellular glass	Glass fiber	Glass fiberboard
Material Description	Cellular glass, foamed and fused into unicellular form.	Glass fiber, bonded insulation for pipe and fittings. Pipe sections, one piece, hinged. Plain, without jacket.	Glass fiber bonded board, plain, without covering.
Binder		Thermosetting resin	
Recommended Temperature Range	-200 F to +100 F (+300 F for dual temp)	40 F to 375 F	40 F to 375 F
K Factor, Max Btu/(hr) (sq ft) (°F/in.)	0.23 at 50 F 0.37 at 75 F 0.39 at 100 F	0.23 at 100 F 0.37 at 200 F 0.33 at 300 F	0.24 at 100 F 0.30 at 200 F 0.37 at 300 F
Density	7 to 9 lb per cu ft	Nominal 4 lb per cu ft	Nominal 3 lb per cu ft
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	30 lb per sq in.	Monolod bearing. Inserts required where pipe is 380° ported by insulation.	Monolod bearing
Dimensions	See SN3D		Standard is 24" x 48", in thicknesses 1", 1 1/2", 2"
Qualifications and Limitations		Not recommended for pre-insulation because it is easily damaged in handling. Has poor resistance to abuse. Specify whether for pipe or tubing on order. Available with factory-applied finishes and lag adhesives. When specified, consult vendors' catalogs and include on order. Available as molded fittings as noted below. For field fabrication of fittings, it is recommended that glass fiber insulation with nominal 7 1/4 lb per cu ft density be used. Molded fittings will be lower cost in most cases and are preferred. Do not use on austenitic stainless steel or on above 140 F or unprotected aluminum.	Available with factory-applied finishes. When specified, consult 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. Not recommended for use on austenitic stainless steel or on above 140 F or unprotected aluminum.
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.			
† Molded fitting covers only	Formglas Pittsburgh Corning Corp	Snap-on Pipe Covering Corrainwood St. Gobain Insulation Corp	K-230-J Corrainwood St. Gobain Insulation Corp
		Micro-Lok Johns-Manville Sales Corp	No. 814 Span-Glas Johns-Manville Sales Corp
		1-Piece Pipe Covering Owens-Corning Corp	Type 703 Owens-Corning Corp
			Type 3 Rigid Board Pittsburgh Plate Glass Co
		† Insul-Sure Insul-Coramic Div, Birm Prod	



DUP 0990236

045261

127

THIS DOCUMENT IS THE PROPERTY OF E. I. DU PONT DE NEMOURS AND COMPANY. THE TECHNICAL INFORMATION HEREIN MAY NOT BE USED OR REPRODUCED WITHOUT THE PERMISSION OF DU PONT.

NOTE

MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION		
		ISSUED OCT 1954	SN 100 M Page 1 of 6	
		THIS PAGE REVISED MAY 1973		
		STANDARD REAPPROVED MAY 1973		
Code	102	102.1		
Material Description	Calcium silicate Reconstituted hydrous calcium silicate reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	Calcium silicate - inhibited * Reconstituted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers. All vendor's materials listed below are asbestos free.		
Recommended Temperature Range	1200 F max			
K Factor, Max Btu/(hr) (sq ft)(F/in.)	0.38 at 200 F, 0.44 at 400 F, and 0.57 at 600 F			
Density	14 lb per cu ft max			
Compressive Strength Specimen size 4" x 6" x 2"; load rate 0.10" per min	40 lb per sq in. min or 5% deformation	30 lb per sq in. min or 5% deformation		
Dimensions	See SM3D			
Qualifications and Limitations	Not recommended for use on austenitic stainless steel or at above 140 F, see SM102D. Where used on aluminum, coat the latter with Code 709, fibrous asphalt carbide (300 F temp limit). All materials listed under Code 102.1 are approved where Code 102 is specified.	Recommended for use on austenitic stainless steel. For an alternative to purchased inhibited calcium silicate, see SM102.1D. Where used on aluminum, coat the latter with Code 709, fibrous asphalt carbide (300 F temp limit). Inressed Type 304 stainless steel U-bend specimens at 100 C, when in contact with this insulating material in the Du Pont wet test with 1500 ppm chloride as NaCl in the test water, shall show no cracking at the end of 144 hours exposure.		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.				
For 12" IPS and larger, there is an additional charge for 2-as covers cover. Material should be specified "without 2-as covers" to avoid extra charge. * Passing the test in MIL-STD-24244 specification does not qualify a material under Code 102.1 ** Molded seamless fitting covers are available in covered, welded, and stress types	Thermal - Asbestos Free Insul Div, Keene Corp	Thermal - Asbestos Free Insul Div, Keene Corp		
	Thermal-12 ** John-Manville Sales Corp			
	Kyle - 10AF Owens - Corning	Super Calamp, Type NA Fibreboard Corp		
	Super Calamp, Type NA ** Fibreboard Corp			
	Coroying 1300 ** Celcor Corp			
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.				



R-151

DUP 0990237

848262

PREFORMED BLOCK AND PIPE

This Page Rev. May 1972

Code	111	112	112A
Material	Cellular glass or ceramic	Glass fiber	Glass fiberboard
Material Description	Cellular glass or ceramic formed and fused into unicellular form.	Glass fiber, bonded insulation for pipe and fittings. Pipe sections, one piece, banded. Pipe, without jacket.	Glass fiber bonded board, plain, without covering.
Binder		Thermosetting resin	
Recommended Temperature Range	-200 F to +100 F (+300 F for dual temp)	40 F to 375 F	40 F to 375 F
K Factor, Max Btu/(hr) (sq ft) (°F/in.)	0.35 at 50 F 0.37 at 75 F 0.39 at 100 F	0.23 at 100 F 0.27 at 200 F 0.33 at 300 F	0.24 at 100 F 0.30 at 200 F 0.37 at 300 F
Density	7 to 9 lb per cu ft	Nominal 4 lb per cu ft	Nominal 3 lb per cu ft
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	50 lb per sq in. min at 5% deformation	Nonload bearing. Inserts re- quired where pipe is sup- ported by insulation.	Nonload bearing
Dimensions	See SM3D		Standard is 24" x 48", in thicknesses 1", 1 1/2", 2"
Qualifications and Limitations		Not recommended for pre- insulation because it is easily damaged in handling. Has poor resistance to abuse. Specify whether for pipe or rushing on order. Available with factory-applied finishes and low adhesives. When specified, consult vendors' catalogs and include an order. Available as molded fittings as noted below. For field fabrication of fit- tings, it is recommended that glass fiber insulation with nominal 7 1/4 lb per cu ft density be used. Molded fit- tings will be lower cost in most cases and are preferred. Do not use on austenitic stainless steel or above 140 F or unprotected aluminum.	Available with factory- applied finishes. When specified, consult vendor's catalogs and include an order. Nominal 4 1/4 lb per cu ft density material is available and is recommended for fabrication involving con- siderable shaping and fitting. Not recommended for use on austenitic stainless steel or above 140 F or unprotected aluminum.
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.			
† Molded fitting covers only	Pyroglas Pittsburgh Corning Corp	Seep-on Pipe Covering Corvair-road St. Gobain Insulation Corp	K-230-J Corvair-road St. Gobain Insulation Corp
	Ceramic Foam Owens Corning Co	Micro-Lab Johns-Manville Sales Corp	No. 816 Span-Glas Johns-Manville Sales Corp
		Lo-Pipe Pipe Covering Owens-Corning Corp	Type 703 Owens-Corning Corp
		PPG Pipe Insulation Pittsburgh Plate Glass Co	Type S Rigid Board Pittsburgh Plate Glass Co
		T & Insul-Sure Insul-Ceramic Div, Birming Prod	



048263

DUP 0990238

MATERIALS

**MATERIAL SPECIFICATION
SERIES 100
PREFORMED BLOCK AND PIPE**

**THERMAL INSULATION
STANDARD ENGINEERING SPECIFICATION**

ISSUED OCT 1964

THIS PAGE REVISED NOV 1973

STANDARD REAPPROVED MAY 1973

SN 100 M

Page 1 of 6

Code	102	102.1
Material Material Description	Calcium silicate Reconstituted calcium silicate reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	Calcium silicate - inhibited * Reconstituted calcium silicate with inhibitor for chlorine stress corrosion cracking and reinforced with mineral fibers. All vendor's materials listed below are asbestos free.
Recommended Temperature Range	1200 F max	
K Factor, max 8m/hr) (sq ftK°F/in.)	0.25 at 200 F, 0.46 at 400 F, and 0.57 at 600 F	
Density	14 lb per cu ft max	
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	60 lb per sq in. min or 3% deformation	30 lb per sq in. min or 3% deformation
Dimensions	See SH3D	
Qualifications and Limitations	Not recommended for use on austenitic stainless steel or at above 140 F, see SH102D. Where used on aluminum, cover the latter with Code 709, fibrous asphalt mastic (200 F temp limit). All materials listed under Code 102.1 are approved where Code 102 is approved.	Recommended for use on austenitic stainless steel. For an alternative to purchased inhibited calcium silicate, see SH102.1D. Where used on aluminum, cover the latter with Code 709, fibrous asphalt mastic (200 F temp limit). Stressed Type 304 stainless steel U-bolts specimens at 100 C, when in contact with this insulating material in the Du Pont test with 1500 ppm chloride as NaCl in the test water, shall show no cracking at the end of 144 hours exposure.

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.

For 12" IPS and larger, there is an additional charge for 2-in. covers cover. Material should be specified "without 2-in. covers" to avoid extra charge. * Passing the test in MIL-12424d specification does not qualify a material under Code 102.1 ** Molded rectangular fitting covers are available in serrated, welded, and smooth types	Thermal - Asbestos Free Ind Insul Div, Kewanee Corp	Thermal - Asbestos Free Ind Insul Div, Kewanee Corp
	Thermal-13 ** Johnstonville Sales Corp	
	Kaylo - 184F Owens - Corning	Super Calcium, Type NA ** Fiberglass Corp
	Super Calcium, Type NA ** Fiberglass Corp	Panellit Panellit, Inc
	Caroying 1300 ** Celcor Corp	
	Panellit Panellit, Inc	

* This product is pink in color
* A perlite-silicate

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 authorizing the use of this specification.

RECEIVED 11-22-73



R-199

DUP 0990324

PREFORMED BLOCK AND PIPE

This Page Rev. Nov. 1973

Code	111	112	112.6
Material	Cellular glass or ceramic	Glass fiber	Glass fiberboard
Material Description	Cellular glass or ceramic formed and fused into unit cellular form.	Glass fiber, banded insulation for pipe and fittings. Pipe sections, one piece, banded. Plain, without jacket.	Glass fiber banded board, plain, without covering.
Binder	-	Thermosetting resin	-
Recommended Temperature Range	-200 F to +100 F (+300 F for dual temp)	40 F to 375 F	40 F to 375 F
K Factor, Max Btu/(hr) (sq ft) (°F/in.)	0.25 at 50 F 0.27 at 75 F 0.29 at 100 F	0.23 at 100 F 0.27 at 200 F 0.33 at 300 F	0.24 at 100 F 0.30 at 200 F 0.37 at 300 F
Density	7 to 9 lb per cu ft	Nominal 4 lb per cu ft	Nominal 3 lb per cu ft
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	50 lb per sq in. min at 5% deformation	Monolod bearing. Inserts required where pipe is supported by insulation.	Monolod bearing
Dimensions	See SM3D		Standard is 24" x 48", in thicknesses 1", 1 1/2", 2"
Qualifications and Limitations		Not recommended for pre-insulation because it is easily damaged in handling. Has poor resistance to abuse. Specify whether for pipe or tubing on order. Available with factory-applied finishes and ice adhesives. When specified, consult vendors' catalogs and include on order. Available as molded fittings as noted below. For field fabrication of fittings, it is recommended that glass fiber insulation with nominal 7 1/2 lb per cu ft density be used. Molded fittings will be lower cost in most cases and are preferred. Do not use on austenitic stainless steel or above 140 F or unprotected aluminum.	Available with factory-applied finishes. When specified, consult vendor's catalogs and include on order. Nominal 4 1/2 lb per cu ft density material is available and is recommended for fabrication involving considerable shaping and fitting. Not recommended for use on austenitic stainless steel or above 140 F or unprotected aluminum.
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.			
* Molded fitting covers only	Pyroglass Pittsburgh Corning Corp	Snap-on Pipe Covering Corrainwood St. Gobain Insulation Corp	K-230-J Corrainwood St. Gobain Insulation Corp
	Cermax Foam Dow Chemical Co	Micro-Lok John-Manville Sales Corp	No. 816 Span-Glas John-Manville Sales Corp
		I-Plex Pipe Covering Owens-Corning Corp	Type 703 Owens-Corning Corp
		PPG Pipe Insulation Pittsburgh Plate Glass Co	Type 3 Rigid Board Pittsburgh Plate Glass Co
		T 0 Insul-Sure Insul-Coverie Div, Bimac Prod	



DUP 0990325

137

1-E-37F

MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION		
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED	OCT 1954	
		THIS PAGE REVISED	MAY 1973	
		STANDARD REAPPROVED	MAY 1973	
		SN 100 M		
		Page 1 of 6		
Code	102	102.1		
Material Material Description	Calcium silicate Reconstituted hydrous calcium silicate reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	Calcium silicate - inhibited* Reconstituted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers. All vendor's materials listed below are asbestos free.		
Recommended Temperature Range	1200 F max			
K Factor, max Btu/(hr) (sq ft)(°F/in.)	0.23 at 200 F, 0.44 at 400 F, and 0.37 at 600 F			
Density	14 lb per cu ft max			
Compressive Strength Specimen max 4" x 4" x 2"; load rate 0.10" per min	60 lb per sq in. min or 5% deformation	30 lb per sq in. min or 6% deformation		
Dimensions	See SN30			
Qualifications and Limitations	Not recommended for use on austenitic stainless steel or on above 140 F, see SN1020. Where used on aluminum, coat the latter with Code 709, fibrous asphalt cutback (200 F max limit). All materials listed under Code 102.1 are approved where Code 102 is specified. Recommended for use on austenitic stainless steel. For an alternative to purchased inhibited calcium silicate, see SN102.10. Where used on aluminum, coat the latter with Code 709, fibrous asphalt cutback (200 F max limit). Stressed Type 304 stainless steel U-bend specimens at 100 C, when in contact with this insulating material in the Du Pont test with 1500 ppm chloride or NaCl in the test water, shall show no cracking at the end of 144 hours exposure.			
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.				
For 12" IPS and larger, there is an additional charge for 2-in. curves cover. Material should be specified "without 2-in. curves" to avoid extra charge. * Passing the test in MIL-2434d specification does not qualify a material under Code 102.1 ** Molded replacement fitting covers are available in screwed, welded, and flange types	Thermoseal - Asbestos Free Insul Insul Div., Kewanee Corp Thermoseal-12** John-Manville Sales Corp	Thermoseal - Asbestos Free Insul Insul Div., Kewanee Corp Super Calcium, Type NA Fibreboard Corp		
	Raylo - 18AF Owens - Corning Super Calcium, Type NA** Fibreboard Corp			
	Covering 1500** Calcium Corp			
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.				

NOTE - THIS DOCUMENT IS THE PROPERTY OF S. I. DUPONT DE MEMPHIS AND COMPANY. THE TECHNICAL INFORMATION HEREON MAY NOT BE USED OR REPRODUCED WITHOUT THE PERMISSION OF DUPONT

UOP 0990326

R-200

**MATERIAL SPECIFICATION - SERIES 100
PREFORMED BLOCK AND PIPE**

OCTOBER 1954

Page 2

This Page Rev May 1973

Code	111	112	112.6
Material	Cellular glass or ceramic	Glass fiber	Glass fiberboard
Material Description	Cellular glass or ceramic foamed and fused into unit cellular form.	Glass fiber, bonded insulation for pipe and fittings. Pipe sections, one piece, hinged. Plain, without jacket.	Glass fiber bonded board, plain, without covering.
Binder		Thermosetting resin	
Recommended Temperature Range	-200 F to +100 F (+300 F for dual range)	40 F to 375 F	40 F to 375 F
K Factor, Max Btu/(hr) (sq ft) (°F/in.)	0.25 or 50 F 0.37 or 75 F 0.39 or 100 F	0.23 or 100 F 0.27 or 200 F 0.33 or 300 F	0.24 or 100 F 0.30 or 200 F 0.37 or 300 F
Density	7 to 9 lb per cu ft	Nominal 4 lb per cu ft	Nominal 3 lb per cu ft
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	50 lb per sq in. min at 5% deformation	Nonload bearing. Inserts re- quired where pipe is sup- ported by insulation.	Nonload bearing
Dimensions	See SH3D		Standard is 24" x 48", in thicknesses 1", 1 1/2", 2"
Qualifications and Limitations		Not recommended for pre- insulation because it is easily damaged in handling. Max pipe resistance to abuse. Specify whether for pipe or r tubing on order. Available with factory-applied flanges and lag adhesives. When specified, consult vendors' catalogs and include on order. Available as molded fittings as noted below. For field fabrication of fit- tings, it is recommended that glass fiber insulation with nominal 7 1/2 lb per cu ft density be used. Molded fit- tings will be lower cost in most cases and are preferred. Do not use on austenitic stainless steel or on above 140 F or unprotected aluminum.	Available with factory- applied finishes. When specified, consult vendor's catalogs and include on order. Nominal 4 1/2 lb per cu ft density material is available and is recommended for fabrication involving con- siderable shaping and fitting. Not recommended for use on austenitic stainless steel or on above 140 F or unprotected aluminum.
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.			
* Molded fitting covers only	Pyroglas Pittsburgh Corning Corp	Seamless Pipe Covering Corvairwood St. Gobain Insulation Corp	K-230-J Corvairwood St. Gobain Insulation Corp
	Cermax Foam Dow Chemical Co	Micro-Lab Johns-Manville Sales Corp	No. 816 Spin-Glas Johns-Manville Sales Corp
		1-Piece Pipe Covering Owens-Corning Corp	Type 703 Owens-Corning Corp
		PPG Pipe Insulation Pittsburgh Plate Glass Co	Type S Rigid Board Pittsburgh Plate Glass Co
		T & Insul-Juro Insul-Consolid Div, Birmo Prod	



DUP 0990327

**MATERIAL SPECIFICATION
SERIES 100
PREFORMED BLOCK AND PIPE**

**THERMAL INSULATION
STANDARD ENGINEERING SPECIFICATION**

ISSUED OCT 1954

THIS CASE REVISED NOV 1973

STANDARD REAPPROVED MAY 1973

SN 100 M

Page 1 of 5

Code	102	102.1
Material	Calcium silicate	Calcium silicate - inhibited *
Material Description	Reconstituted hydrous calcium silicate reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	Reconstituted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers. All vendor's materials listed below are asbestos free.
Recommended Temperature Range	1200 F max	
K Factor, Max Btu/ft-hr (sq ft)(°F/in.)	0.33 at 200 F, 0.44 at 400 F, and 0.57 at 600 F	
Density	14 lb per cu ft max	
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	60 lb per sq in. min at 5% deformation	30 lb per sq in. min at 5% deformation
Dimensions	See SM30	
Qualifications and Limitations	Not recommended for use on austenitic stainless steel or at above 140 F, see SM102D. Where used on aluminum, coat the latter with Code 709, fibrous asphalt cutback (300 F temp limit). All materials listed under Code 102.1 are approved where Code 102 is specified.	Recommended for use on austenitic stainless steel. For an alternate to purchased inhibited calcium silicate, see SM102.1D. Where used on aluminum, coat the latter with Code 709, fibrous asphalt cutback (300 F temp limit). Stressed Type 304 stainless steel Unbond specimens at 100 C, when in contact with this insulating material in the Du Pont web test with 1500 ppm chloride as NaCl in the test water, shall show no cracking at the end of 144 hours exposure.

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.

For 12" IPS and larger, there is an additional charge for 2-x canvas cover. Material should be specified "without 2-x canvas" to avoid extra charge. * Passing the test in MIL-1-2424d specification does not qualify a material under Code 102.1 ** Molded seamless fitting covers are available in screwed, welded, and sweet types	Thermal - Asbestos Free Insul Div, Keene Corp	Thermal - Asbestos Free Insul Div, Keene Corp
	Thermal-12 ** Johns-Manville Sales Corp	
	Keyle - 10AF Owens - Corning	Super Calcamp, Type NA *** Fibreboard Corp
	Super Calcamp, Type NA *** Fibreboard Corp	Pamelle Pabrad, Inc
	Caroyang 1500 ** Celanese Corp	
	Pamelle Pabrad, Inc	

* This product is given in color
* A partitioned area

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 retaining the use of this specification.

WCCOMMITTEE NO. 28



R-247

648433

DUP 0990408

15/4 JUN 1974

NOTE - THIS SPECIFICATION IS THE PROPERTY OF THE ENGINEERING AND COMPANY THE TECHNICAL INFORMATION CONTAINED HEREIN IS TO BE USED ONLY IN CONNECTION WITH THE COMMISSION OF THE FINE

Case	111	112	112.6
Material	Cellular glass	Glass fiber	Glass fiberboard
Material Description	Cellular glass, formed and fused into unicellular form.	Glass fiber, bonded insulation for pipe and fittings. Pipe sections, one piece, hinged. Plain, without jacket.	Glass fiber bonded boards, plain, without covering.
Binder		Thermosetting resin	
Recommended Temperature Range	-200 F to +100 F (+300 F for dual temp)	40 F to 375 F	40 F to 375 F
K Factor, Max Btu (hr) (sq ft) (°F in.)	0.25 at 50 F 0.27 at 75 F 0.29 at 100 F	0.23 at 100 F 0.27 at 200 F 0.33 at 300 F	0.24 at 100 F 0.30 at 200 F 0.37 at 300 F
Density	7 to 9 lb per cu ft	Nominal 4 lb per cu ft	Nominal 3 lb per cu ft
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	50 lb per sq in.	Nonload bearing. Inserts required where pipe is supported by insulation.	Nonload bearing
Dimensions	See SN3D		Standard is 24" x 48", in thicknesses 1", 1 1/2", 2"
Qualifications and Limitations		Not recommended for pre-insulation because it is easily damaged in handling. Has poor resistance to abuse. Specify whether for pipe or tubing on order. Available with factory-applied finishes and lag adhesives. When specified, consult vendors' catalogs and include on order. Available as molded fittings as noted below 6. For field fabrication of fittings, it is recommended that glass fiber insulation with nominal 7 1/2 lb per cu ft density be used. Molded fittings will be lower cost in most cases and are preferred. Do not use on austenitic stainless steel at or above 140 F or unprotected aluminum.	Available with factory-applied finishes. When specified, consult vendor's catalogs and include on order. Nominal 4 1/2 lb per cu ft density material is available and is recommended for fabrication involving considerable shaping and fitting. Not recommended for use on austenitic stainless steel at or above 140 F or unprotected aluminum.
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.			
* Molded fitting covers only	Feen-Glas Pittsburgh Corning Corp	Snap-on Pipe Covering Corairedwood St. Gobain Insulation Corp	K-230-3 Corairedwood St. Gobain Insulation Corp
		Micro-Lok Johns-Manville Sales Corp	No. 816 Spin-Glas Johns-Manville Sales Corp
		1-Piece Pipe Covering Owens-Corning Corp	Type 703 Owens-Corning Corp
			Type S Rigid Board Pittsburgh Plate Glass Co
		P 6 Insul-Sure Insul-Courier Div, Birmo Prod	



MATERIALS

**MATERIAL SPECIFICATION
SERIES 100
PREFORMED BLOCK AND PIPE**

**THERMAL INSULATION
STANDARD ENGINEERING SPECIFICATION**

ISSUED OCT 1954
THIS PAGE
REVISED MAY 1973
STANDARD
REAPPROVED MAY 1973

SN 100 M

Page 1 of 6

Code	102	102.1
Material Description	Calcium silicate Reacted hydrous calcium silicate reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	Calcium silicate - inhibited * Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers. All vendor's materials listed below are asbestos free.
Recommended Temperature Range	1200 F max	
K Factor, max Btu/ft-hr (sq ft)(°F/in.)	0.25 at 200 F, 0.46 at 400 F, and 0.57 at 600 F	
Density	14 lb per cu ft max	
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	60 lb per sq in. min at 5% deformation	50 lb per sq in. min at 5% deformation
Dimensions	See SM3D	
Qualifications and Limitations	Not recommended for use on austenitic stainless steel or on above 140 F, see SM102D. Where used on aluminum, coat the latter with Code 709, fibrocoat asphalt curbcoat (300 F temp limit). All materials listed under Code 102.1 are approved where Code 102 is specified.	Recommended for use on austenitic stainless steel. For an alternative to purchased inhibited calcium silicate, see SM102.1D. Where used on aluminum, coat the latter with Code 709, fibrocoat asphalt curbcoat (300 F temp limit). Stressed Type 304 stainless steel U-bend specimens at 100 C, when in contact with this insulating material in the Du Pont wet test with 1500 ppm chloride as NaCl in the test water, shall show no cracking at the end of 144 hours exposure.
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.		
For 12" IPS and larger, there is an additional charge for 2nd covers cover. Material should be specified "without 2nd covers" to avoid extra charge.	Thermal - Asbestos Free Ins Insul Div, Keene Corp	Thermal - Asbestos Free Ins Insul Div, Keene Corp
	Thermal-12 ** John-Manville Sales Corp	
	Keylo - 104F Quana - Corning.	Super Calcomp, Type NA Fibreboard Corp
	Super Calcomp, Type NA ** Fibreboard Corp	
	Corcomp 1300 ** Caloria Corp	
* Passing the test in MIL-12424d specification does not qualify a material under Code 102.1		
** Molded nonplastic lining covers are available in ceramic, vitreous, and sheet types		

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.

SUCCESSOR TEE NO. 25



R-248

048435

DUP 0990410

THIS DOCUMENT IS THE PROPERTY OF S. I. DUPONT DE NEMOURS AND COMPANY. THE DESIGN AND COMPANY HAVE BEEN REGISTERED AND THE DESIGN IS THE PROPERTY OF S. I. DUPONT DE NEMOURS AND COMPANY. THE DESIGN IS THE PROPERTY OF S. I. DUPONT DE NEMOURS AND COMPANY. THE DESIGN IS THE PROPERTY OF S. I. DUPONT DE NEMOURS AND COMPANY.

PIPE INSULATION SPECIFICATION - SERIES 00
PREFORMED BLOCK AND PIPE

0070829 451

Page 2

This Page Rev. Nov. 1972

123

Code	111	112	112A
Material	Cellular glass or ceramic	Glass fiber	Glass fiberboard
Material Description	Cellular glass or ceramic foamed and fused into unicellular form.	Glass fiber, bonded insulation for pipe and fittings. Pipe sections, one piece, hinges. Plain, without jacket.	Glass fiber bonded beads, plain, without covering.
Binder		Thermosetting resin	
Recommended Temperature Range	-200 F to +100 F (+300 F for dual tone)	40 F to 375 F	40 F to 375 F
K Factor, Max Stru/(hr) (sq ft) (°F/in.)	0.25 at 50 F 0.37 at 75 F 0.29 at 100 F	0.23 at 100 F 0.27 at 200 F 0.22 at 300 F	0.24 at 100 F 0.30 at 200 F 0.37 at 300 F
Density	7 to 9 lb per cu ft	Nominal 4 lb per cu ft	Nominal 3 lb per cu ft
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	30 lb per sq in. min at 5% deformation	Nonload bearing. Inserts re- quired where pipe is sup- ported by insulation.	Nonload bearing
Dimensions	See SM30		Standard is 24" x 48", in thicknesses 1", 1 1/2", 2"
Qualifications and Limitations		Not recommended for pipe insulation because it is easily damaged in handling. Has poor resistance to abuse. Specify whether for pipe or ruting on order. Available with factory-applied finishes and lap adhesives. When specified, consult vendors' catalogs and include on order. Available as molded fittings as noted below 6. For field fabrication of fit- tings, it is recommended that glass fiber insulation with nominal 7 1/4 lb per cu ft density be used. Molded fit- tings will be lower cost in most cases and are preferred. Do not use on austenitic stainless steel at or above 140 F or unprotected aluminum.	Available with factory- applied finishes. When specified, consult 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 con- siderable shaping and fitting. Not recommended for use on austenitic stainless steel at or above 140 F or unprotected aluminum.

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.

* Molded fitting covers only	Pyroglas Pittsburgh Corning Corp	Seapex Pipe Covering Cameron-road St. Gobain Insulation Corp	K-230-J Cameron-road St. Gobain Insulation Corp
	Ceramic Foam Dow Chemical Co	Micro-Lab Johnstonville Sales Corp	No. 814 Spun-Glas Johnstonville Sales Corp
		1-Piece Pipe Covering Owens-Corning Corp	Type 703 Owens-Corning Corp
		PPG Pipe Insulation Pittsburgh Plate Glass Co	Type S Rigid Board Pittsburgh Plate Glass Co
		T-6 Insul-Sure Insel-Castle Div, Birmo Prod	



DUP 0990411

848438

**MATERIAL SPECIFICATION
SERIES 100
PREFORMED BLOCK AND PIPE**

**THERMAL INSULATION
STANDARD ENGINEERING SPECIFICATION**

ISSUED OCT 1954
THIS PAGE REVISED NOV 1973
STANDARD REAPPROVED MAY 1973

SN 100 M

Page 1 of 6

Code	102	102.1
Material	Calcium silicate	Calcium silicate - inhibited *
Material Description	Reconstituted hygroscopic calcium silicate reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	Reconstituted hygroscopic calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers. All vendor's materials listed below are asbestos free.
Recommended Temperature Range	1200 F max	
R Factor, max Btu/(hr) (sq ft)(°F/in.)	0.23 at 200 F, 0.46 at 400 F, and 0.57 at 600 F	
Density	14 lb per cu ft max	
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	60 lb per sq in. min or 3% deformation	50 lb per sq in. min or 3% deformation
Dimensions	See SM30	
Qualifications and Limitations	Not recommended for use on austenitic stainless steel or on above 140 F, see SM102.1D. Where used on aluminum, coat the latter with Code 709, fibrous asphalt cutback (300 F temp limit). All materials listed under Code 102.1 are approved where Code 102 is specified.	Recommended for use on austenitic stainless steel. For an alternate to purchased inhibited calcium silicate, see SM102.1D. Where used on aluminum, coat the latter with Code 709, fibrous asphalt cutback (300 F temp limit). Stressed Type 304 stainless steel U-bend specimens at 100 C, when in contact with this insulating material in the Du Pont test cell with 1300 ppm chloride or NaCl in the test water, shall show no cracking at the end of 144 hours exposure.

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.

For 12" IPS and larger, there is an additional charge for 2-in. curves cover. Material should be specified "without 2-in. curves" to avoid extra charge. * Pressing the test in MIL-12434d specification does not qualify a material under Code 102.1 ** Molded nonplastic fitting covers are available in covered, voided, and sweet types	Thermal - Asbestos Free Insul Dtg, Keene Corp	Thermal - Asbestos Free Insul Dtg, Keene Corp
	Thermal-12 ** John-Manville Sales Corp	
	Rayco - 104F Quincy - Corning	Super Calcamp, Type NA *** Fibreboard Corp
	Super Calcamp, Type NA *** Fibreboard Corp	Pamelle Pamelle, Inc
	Carving 1300 ** Calorex Corp	
	Pamelle Pamelle, Inc	

* This product is pink in color
* A portion of silicate

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 governing the use of this specification.

SUSCRIPTION NO. 25



R-295

DUP 0990493

49528

NOTE - THIS DOCUMENT IS THE PROPERTY OF A SHARP & COMPANY THE TECHNICAL INFORMATION HEREIN MAY NOT BE USED OR REPRODUCED WITHOUT THE PERMISSION OF SHARP & COMPANY

JUN 1974

Code	111	112	112.6
Material	Cellular glass or ceramic	Glass fiber	Glass fiberboard
Material Description	Cellular glass or ceramic foamed and fused into unicellular form.	Glass fiber, bonded insulation for pipe and fittings. Pipe sections, one piece, hinges. Plain, without jacket.	Glass fiber bonded board, plain, without covering.
Binder		Thermosetting resin	
Recommended Temperature Range	-200 F to +100 F (+300 F for dual cures)	40 F to 375 F	40 F to 375 F
K Factor, max Btu/(hr) (sq ft) (°F/in.)	0.35 at 50 F 0.37 at 75 F 0.39 at 100 F	0.33 at 100 F 0.27 at 200 F 0.33 at 300 F	0.24 at 100 F 0.30 at 200 F 0.37 at 300 F
Density	7 to 9 lb per cu ft	Nominal 4 lb per cu ft	Nominal 3 lb per cu ft
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	50 lb per sq in. min at 5% deformation	Nonload bearing. Inserts required where pipe is supported by insulation.	Nonload bearing
Dimensions	See SM3D		Standard is 24" x 48", in thicknesses 1", 1 1/2", 2"
Qualifications and Limitations		Not recommended for pre-insulation because it is easily damaged in handling. Has poor resistance to abuse. Specify whether for pipe or fitting on order. Available with factory-applied finishes and lap adhesives. When specified, consult vendors' catalogs and include on order. Available as molded fittings as noted below 6. For field fabrication of fittings, it is recommended that glass fiber insulation with nominal 7 1/4 lb per cu ft density be used. Molded fittings will be lower cost in most cases and are preferred. Do not use on austenitic stainless steel or on above 140 F or unprotected aluminum.	Available with factory-applied finishes. When specified, consult 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. Not recommended for use on austenitic stainless steel or on above 140 F or unprotected aluminum.
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.			
† Molded fitting covers only	Pencglas Pittsburgh Corning Corp	Snap-on Pipe Covering Coramwood St. Gobain Insulation Corp	K-230-J Coramwood St. Gobain Insulation Corp
	Ceramic Foam Dow Chemical Co	Micro-Lok Johnstonville Sales Corp	No. 814 Spin-Glas Johnstonville Sales Corp
		1-Piece Pipe Covering Owens-Corning Corp	Type 703 Owens-Corning Corp
		PPG Pipe Insulation Pittsburgh Plate Glass Co	Type S Rigid Board Pittsburgh Plate Glass Co
		T & Insul-Sure Insul-Guarding Div, Birmo Prod	



DUP 0990494

040521

107

10/1

10/1

THIS DOCUMENT IS THE PROPERTY OF S O D PONT US MEMBERS AND COMPANY THE TECHNICAL INFORMATION HEREON MAY NOT BE USED NOR REPRODUCED WITHOUT THE PERMISSION OF S O D PONT

NOT

4-E-37F

MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED	OCT 1954
		THIS PAGE REVISED	MAY 1973
		STANDARD REAPPROVED	MAY 1973
		SN 100 M	
		Page 1 of 6	
Code	102	102.1	
Material Material Description	Calcium silicate Reconstituted hydrous calcium silicate reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	Calcium silicate - inhibited* Reconstituted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	
Recommended Temperature Range	1200 F max		
K Factor, Max Btu/ft ² (sq ft)(°F/in.)	0.22 at 200 F, 0.46 at 400 F, and 0.57 at 600 F		
Density	14 lb per cu ft max		
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	60 lb per sq in. min or 5% deformation	50 lb per sq in. min or 5% deformation	
Dimensions	See SN100		
Qualifications and Limitations	Not recommended for use on austenitic stainless steel or above 1400 F, see SN102D. Where used on aluminum, coat the latter with Code 709, fibrous asphalt curbside (300 F temp limit). All materials listed under Code 102.1 are approved where Code 102 is specified.	Recommended for use on austenitic stainless steel. For an alternate to purchased inhibited calcium silicate, see SN102.1D. Where used on aluminum, coat the latter with Code 709, fibrous asphalt curbside (300 F temp limit). Stressed Type 304 stainless steel U-bend specimens at 100 C, when in contact with this insulating material in the Du Pont wet test with 1500 ppm chloride as NaCl in the test water, shall show no cracking at the end of 144 hours exposure.	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.			
For 12" IPS and larger, there is an additional charge for 2-in. curved cover. Material should be specified "without 2-in. curves" to avoid extra charge. * Passing the test in MIL-12424 specification does not qualify a material under Code 102.1 ** Molded rebarless fitting covers are available in serrated, welded, and smooth types	Thermal - Asbestos Free Insul Div, Keene Corp	Thermal - Asbestos Free Insul Div, Keene Corp	
	Thermal-12** Johnstonville Sales Corp		
	Keyle - 184F Quana - Corning	Super Calcium, Type NA Fibreboard Corp	
	Super Calcium, Type NA** Fibreboard Corp		
	Corning 1500** Corning Corp		
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.			

DUP 0950495

SUCCESSORS NO. 13

R-2916

848522

**MATERIAL SPECIFICATION - SERIES 100
PREFORMED BLOCK AND PIPE**

OCTOBER 1954

Page 2

This Page Rev. Mar. 1973

138

Code	111	112	112.4
Material	Cellular glass or ceramic	Glass fiber	Glass fiberboard
Material Description	Cellular glass or ceramic formed and fused into unicellular form.	Glass fiber, bonded insulation for pipe and fittings. Pipe sections, end pieces, hinged. Plain, without leader.	Glass fiber bonded board, plain, without covering.
Binder		Thermosetting resin	
Recommended Temperature Range	-200 F to +100 F (+300 F for dual cures)	40 F to 375 F	40 F to 375 F
K Factor, Max Btu/(hr) (sq ft) (°F/in.)	0.25 or 50 F 0.37 or 75 F 0.39 or 100 F	0.23 or 100 F 0.27 or 200 F 0.33 or 300 F	0.24 or 100 F 0.30 or 200 F 0.37 or 300 F
Density	7 to 9 lb per cu ft	Nominal 4 lb per cu ft	Nominal 3 lb per cu ft
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	50 lb per sq in. min at 5% deformation	Nonload bearing. Inserts required where pipe is supported by insulation.	Nonload bearing
Dimensions	See SN30		Standard is 24" x 48", in thicknesses 1", 1½", 2"
Qualifications and Limitations		Not recommended for pre-insulation because it is easily damaged in handling. Has poor resistance to abuse. Specify whether for pipe or tubing on order. Available with factory-applied finishes and lap adhesives. When specified, consult vendors' catalogs and include on order. Available as molded fittings as noted below. For field fabrication of fittings, it is recommended that glass fiber insulation with nominal 7½ lb per cu ft density be used. Molded fittings will be lower cost in most cases and are preferred. Do not use on austenitic stainless steel at or above 140 F or unprotected aluminum.	Available with factory-applied finishes. When specified, consult vendor's catalogs and include on order. Nominal 4½ lb per cu ft density material is available and is recommended for fabrication involving considerable shaping and fitting. Not recommended for use on austenitic stainless steel at or above 140 F or unprotected aluminum.

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.

* Molded fitting covers only	Pyroglas Pittsburgh Corning Corp	Seal-on Pipe Covering Corrainwood St. Gobain Insulation Corp	K-230-3 Corrainwood St. Gobain Insulation Corp
	Ceramic Foam Dow Chemical Co	Micro-Lok Johns-Manville Sales Corp	No. 816 Spin-Glas Johns-Manville Sales Corp
		1-Piece Pipe Covering Owens-Corning Corp	Type 703 Owens-Corning Corp
		PPG Pipe Insulation Pittsburgh Plate Glass Co	Type S Rigid Board Pittsburgh Plate Glass Co
		T & Insul-Sure Insul-Coastal Div, Birm Prod	



A-1

DUP 0990496

048523

MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION		
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED	OCT 1954	SN 100 M Page 1 of 6
		THIS PAGE REVISED	MAY 1973	
		STANDARD REAPPROVED	MAY 1973	
Code	102	102.1		
Material	Calcium silicate	Calcium silicate - inhibited *		
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers. All vendor's materials listed below are asbestos free.		
Recommended Temperature Range	1200 F max			
K Factor, Max Btu/(hr) (sq ft)(°F/in.)	0.38 at 200 F, 0.46 at 400 F, and 0.57 at 600 F			
Density	14 lb per cu ft max			
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	60 lb per sq in. min at 5% deformation	50 lb per sq in. min at 5% deformation		
Dimensions	See SN3D			
Qualifications and Limitations	Not recommended for use on austenitic stainless steel at or above 140 F, see SN102D. Where used on aluminum, cast the letter with Code 709, fibrored asphalt curbuck (300 F temp limit). All materials listed under Code 102.1 are approved where Code 102 is specified.	Recommended for use on austenitic stainless steel. For an alternate to purchased inhibited calcium silicate, see SN102.1D. Where used on aluminum, cast the letter with Code 709, fibrored asphalt curbuck (300 F temp limit). Stressed Type 304 stainless steel U-bend specimens at 100 C, when in contact with this insulating material in the Du Pont web test with 1500 ppm chloride as NaCl in the test water, shall show no cracking at the end of 144 hours exposure.		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.				
For 12" IPS and larger, there is an additional charge for 2-oz canvas cover. Material should be specified "without 2-oz canvas" to avoid extra charge * Passing the test in MIL-I-24244 specification does not qualify a material under Code 102.1 ** Molded rampiece fitting covers are available in serrated, welded, and sweat types	Thermal - "Asbestos Free Insul Div, Keene Corp	Thermal - "Asbestos Free Insul Div, Keene Corp		
	Thermal-12 ** John-Manville Sales Corp			
	Kayle - 10AF Quana - Canning	Super Caltemp, Type NA Fibreboard Corp		
	Super Caltemp, Type NA ** Fibreboard Corp			
	Caltemp 1500 ** Calores Corp			
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.				

DUP 0991318

890

890

NOTE - THIS DOCUMENT IS THE PROPERTY OF E. I. DU PONT DE NEMOURS AND COMPANY. THE TECHNICAL INFORMATION HEREON MAY NOT BE USED NOR REPRODUCED WITHOUT THE PERMISSION OF E. I. DU PONT

DUP 0991318

880

090904



SM 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954	
Page 2		PREFORMED BLOCK AND PIPE		This Page Rev May 1973	
Code	111	112	112.6		
Material	Cellular glass or ceramic	Glass fiber	Glass fiberboard		
Material Description	Cellular glass or ceramic foamed and fused into unicellular form.	Glass fiber, banded insulation for pipe and fittings. Pipe sections, one piece, banded. Plain, without jacket.	Glass fiber banded board, plain, without covering.		
Binder		Thermosetting resin			
Recommended Temperature Range	-200 F to +100 F (+300 F for dual temp)	40 F to 375 F	40 F to 375 F		
K Factor, Max Std./hr (sq ft) (°F/in.)	0.35 at 50 F 0.37 at 75 F 0.39 at 100 F	0.23 at 100 F 0.27 at 200 F 0.33 at 300 F	0.24 at 100 F 0.30 at 200 F 0.37 at 300 F		
Density	7 to 9 lb per cu ft	Nominal 4 lb per cu ft	Nominal 3 lb per cu ft		
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	50 lb per sq in. min or 5% deformation	Nonload bearing. Inserts required where pipe is supported by insulation.	Nonload bearing		
Dimensions	See SM30		Standard is 24" x 48", in thicknesses 1", 1½", 2"		
Qualifications and Limitations		Not recommended for pre-insulation because it is easily damaged in handling. Has poor resistance to abuse. Specify whether for pipe or tubing on order. Available with factory-applied finishes and lap adhesives. When specified, consult vendors' catalogs and include on order. Available as molded fittings as noted below. For field fabrication of fittings, it is recommended that glass fiber insulation with nominal 7½ lb per cu ft density be used. Molded fittings will be lower cost in most cases and are preferred. Do not use on austenitic stainless steel at or above 140 F or unprotected aluminum.	Available with factory-applied finishes. When specified, consult vendor's catalogs and include on order. Nominal 4½ lb per cu ft density material is available and is recommended for fabrication involving considerable shaping and fitting. Not recommended for use on austenitic stainless steel at or above 140 F or unprotected aluminum.		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.					
† Molded fitting covers only	Foamglas Pittsburgh Corning Corp	Snap-on Pipe Covering Certainwood St. Gobain Insulation Corp	K-230-3 Certainwood St. Gobain Insulation Corp		
	Ceramic Foam Dow Chemical Co	Micro-Lok Johns-Manville Sales Corp	No. 814 Spin-Glas Johns-Manville Sales Corp		
		I-Piece Pipe Covering Owens-Corning Corp	Type 703 Owens-Corning Corp		
		PPG Pipe Insulation Pittsburgh Plate Glass Co	Type 5 Rigid Board Pittsburgh Plate Glass Co		
		† Insul-Sure Insul-Acoustic Div, Birmo Prod			

581

OUTPOST

138

REV. 3 11 1971

DUP 0991319

581



090905

OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100
PREFORMED BLOCK AND PIPE

SM 100 M

This Page Rev May 1973

Page 3

Code	114	114.1	116
Material	Mineral wool	Mineral wool - inhibited	
Material Description	Mineral slag wool, with high-temperature binder. Block and pipe section insulation.	Mineral slag wool, with high-temperature binder. Block and pipe section insulation. Dipped, brushed, or sprayed with sodium silicate, Code 802.1, to the equivalent of 100 sq ft per gallon.	Preformed, resilient, closed cell elastomer foam sheet and pipe (to 4-inch) insulation.
Recommended Temperature Range	1800 F max	900 F max - limited by sodium silicate	-40 to 180 F
K Factor, Max Btu, in./hr, sq ft, °F	0.36 at 200 F mean 0.51 at 600 F mean 0.76 at 1000 F mean	0.36 at 200 F mean 0.51 at 600 F mean 0.76 at 1000 F mean	0.28 at 75 F 0.39 at 90 F
Density	15 to 19 lb per cu ft	11 to 19 lb per cu ft	6.0 lb per cu ft max
Water Vapor Permeability (Wet Cup)			0.15 perm-inches
Compressive Strength 6" x 6" x 2" Specimen load rate 0.10"/min	10 lb per sq in. min at 10% deformation	5 lb per sq in. min at 10% deformation	
Dimensions	Standard block sizes up to 24" x 36", 1" to 4" thickness. Standard pipe sizes, see vendor's literature.	Standard block sizes up to 24" x 36", 1" to 4" thickness. Standard pipe sizes, see vendor's literature.	Sheet size is 36" x 48" in thicknesses 1/8", 1/4", 3/8", 1/2", 5/8", 3/4", and 1". Pipe and tubing to 3" ID and 6' long in thicknesses 1/8", 1/4", 3/8", 1/2", 5/8", 3/4", and 1".
Qualifications and Limitations	Not recommended for use on unprotected austenitic stainless steel or on above 140 F, or unprotected aluminum. Where used on aluminum, coat the latter with Code 709, Fiberglass Asphalt Cutback (300 F temperature limit).	Satisfactory for use on austenitic stainless steel to 900 F. Where used on aluminum, coat the latter with Code 709, Fiberglass Asphalt Cutback (300 F temperature limit).	Flame spread rating per ASTM E162 shall not exceed 75 unexposed. A protective coating is recommended for outdoor use only. Uniform cell structure with no voids having any dimension exceeding 1/8-inch. Not recommended for use on austenitic stainless steel or on above 140 F.
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.			
† Also available as pipe fitting covers	"PV" Supertemp (black only) Eagle-Picher Industries		FR/Armaflex Armstrong Cork Company (11)
‡ Contact Purchasing for vendors names		N-1200 Black 00 MF Pipe Insulation Ferry-Eight Insulations	
00 Pipe insulation in 2 ft lengths only	Mono-Block (black only) Keene Corp		
(11) FR/Armaflex pipe covering is identified with inked blue lines. FR/Armaflex sheet material is identified with inked white lines	K-Fac † ‡ (block and pipe sections) U. S. Gypsum	K-Fac, Inhibited † ‡ (block and pipe sections) U. S. Gypsum	

DUP 0991320

882



090906

REV. JUN 19/4

SN 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954	
Page 4		PREFORMED BLOCK AND PIPE		This Page Rev May 1973	
Code		118			
Material		Polyurethane foam, rigid			
Material Description		Preformed rigid urethane foam block, pipe, and fitting insulation manufactured with polyester or polyether resins with fluorocarbon blowing agent			
Recommended Temperature Range		- 100 to + 180 F			
K Factor, Max. Btu/(hr) (sq ft) (°F/in.)		0.15 at 50 F 0.15 at 75 F 0.16 at 100 F			
Density		1.8 to 2.5 lb per cu ft			
Compressive Strength Specimen size 6" x 6" x 2", load rate 0.10" per min		Min 25 psi at 5% deformation, measured parallel to the direction in which the foam rose during manufacture or min 20 psi at 5% deformation in all directions.			
Dimensions		See SN30. All dimensions to be ± 1/16" including straightness and squareness.			
Qualifications and Limitations		Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding 1/4". Meet aging test: Block 1" square by 7" long, cut from near outer surface, on rests 6" apart with 70 gm weight having 1" square base in middle of span shall not distort block more than 1/16" in 1 hour at 225 F. Flame-spread rating per ASTM E 162 shall not exceed 75 when coated with Hypalon S mastic V32" dry thickness reinforced by 10 x 10 mesh glass cloth, 10 lb per 100 sq yd. Water absorption max 4% by volume into a 2" x 2" x 1" skid-free piece, immersed in water just under the surface for 5 days and then wiped with a wet cloth and weighed, with no delay between steps. Not to be used in contact with unprotected austenitic stainless steel at or above 140 F.			
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.					
		Type 24 Urethane Owens-Corning Corp			
		Zer-O-Cel Gress National Gypsum			
		Thurane Dow Chemical Co			
		U-Thane 200 The Urethane Co			
† Pipe insulation sections only; 4 ft standard length with factory-applied vapor barrier jacket. For physical properties, see manufacturer's technical data sheet		Armada† Armstrong Cork Co			

DUP 0991321

883



140

JUN 1974

DUP 0991321

883

DUPOND

090907

REV. JUL 1975

OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SM 100 M
This Page Rev May 1973		PREFORMED BLOCK AND PIPE		Page 5
Code	120		130	
Material	Polystyrene foam		Asbestos board	
Material Description	Preformed polystyrene foam block, pipe, and fitting insulation cut from extruded polystyrene foam (pipe insulation available with a variety of different joint designs), or pipe and fitting insulation molded to final shape from expanded polystyrene beads with tongue-and-groove side longitudinal joints and ship lap butt joints.		Asbestos fibers, diatomaceous silica, and inorganic binder. Flame-spread rating 0. Weather-resistant.	
Recommended Temperature Range	- 100 F to + 140 F		1200 max	
K Factor, Max Btu/(hr) (sq ft) (°F/in.)	0.24 at 50 F 0.26 at 75 F 0.28 at 100 F		0.77 at 200 F 0.79 at 400 F 0.81 at 600 F	
Density	1.5 lb per cu ft minimum		36 lb per cu ft	
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	Min 25 lb per sq in. at 5% deformation		Compressive, ultimate - 14,000 psi; Tensile parallel to face - 420 psi; Shear normal to face - 700 psi; Shear parallel - 320 psi.	
Dimensions	SNJD. All dimensions to be $\pm 1/16"$ including straightness and squareness		Thickness, in. = $1/2, 3/4, 7/8, 1, 1 1/4, 1 1/2, 2$ and 4 Sheet size, ft = $3, 3 1/2$ or 4×8 and 4×10	
Qualifications and Limitations	Uniform cell structure with max 10% open cells. No distortion or volume change, or loss of compressive strength after exposure at 140 F and 80% relative humidity for 15 days. Water absorption max 0.03% by volume after being subjected to 90 F, 90% relative humidity for 15 days and max 4% by volume into a 2" x 2" x 1" skin-free piece immersed in water just under the surface for 5 days, then wiped with a wet cloth and weighed, with no delay between steps. Not resistant to solvents other than alcohol.		Sanded both sides, may be used unpainted for interior use. When painted, use water base or epoxy coating.	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.				
Available in the form of fitting covers (see Code 1T4.1) from fabricators	Styrofoam FR 6 Dow Chemical Co		Marinite 36 (Type A) Johns-Manville Sales Corp	
	Vapo-Lock Insuldyne Corp			

DUP 0991322

884



DUP 0991322

884



090908

SN 100 M

MATERIAL SPECIFICATION - SERIES 100
PREFORMED BLOCK AND PIPE

OCTOBER 1954

Page 6

This Page Rev Oct 1972

OBSOLETE CODES

Code	Material	Date Cancelled	Superseded by Code
101	85% Magnesia	Feb 1964	102, 102.1
103	Diatomaceous earth	Feb 1964	102, 102.1
104	Inorganic silicates	Oct 1972	
105	Asbestos matted	Dec 1956	106
106	Asbestos fiber and sodium silicate	Feb 1972	
107	Asbestos sponge	Feb 1964	
109	Corrugated asbestos preshrunk	Feb 1964	
110	Vegetable cork	Jun 1966	111, 118, 120
111.1	Cellular glass	Jun 1966	111
111.2	Cellular glass	Jun 1966	111
111.3	Cellular glass	Jun 1966	111
112	Glass fiber	Apr 1956	Reinstated Sept 1969
112.01	Glass fiber	Sept 1969	112
112.02	Glass fiber	Oct 1956	112.01
112.11	Glass fiber	Sept 1969	112
112.12	Glass fiber	Mar 1959	112.11
112.16	Glass fiber	Sept 1969	112
112.17	Glass fiber	Sept 1969	112
112.21	Glass fiber	Jan 1961	
112.22	Glass fiber	Sept 1969	112
112.23	Glass fiber	Apr 1963	
112.61	Glass fiberboard	Sept 1969	112.6
112.66	Glass fiberboard	Feb 1964	
112.71	Glass fiberboard	Sept 1969	112.6
112.81	Glass fiberboard	Sept 1969	112.6
113	Glass fiber - neoprene coated	Apr 1956	
115	Mineral wool - asphalt impregnated	Apr 1956	
116	Flexible foamed plastic	Jun 1962	
117	Urethane foam resilient	Jun 1963	
117.1	Urethane foam resilient	Dec 1960	
117.2	Urethane foam resilient	Feb 1960	
117.3	Urethane foam resilient	June 1963	
117.4	Urethane foam resilient	Feb 1960	
117.5	Urethane foam resilient	Apr 1960	
117.6	Urethane foam resilient	July 1963	

DUP 0991323

555

GUPON

DUP 0991323

555

REV. JUN 11/4

090909

MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED	OCT 1954
		THIS PAGE REVISED	NOV 1973
		STANDARD REAPPROVED	MAY 1973
		SN 100 M	
		Page 1 of 6	
Code	102	102.1	
Material Material Description	Calcium silicate Reacted hydrous calcium silicate reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	Calcium silicate - inhibited * Reacted hydrous calcium sili- cate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers. All vendor's materials listed below are asbestos free.	
Recommended Temperature Range	1200 F max		
K Factor, Max Btu/(hr) (sq ft)(K°F/in.)	0.38 at 200 F, 0.46 at 400 F, and 0.57 at 600 F		
Density	14 lb per cu ft max		
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	60 lb per sq in. min at 5% deformation	50 lb per sq in. min at 5% deformation	
Dimensions	See SM3D		
Qualifications and Limitations	Not recommended for use on austenitic stainless steel at or above 140 F, see SM102D. Where used on aluminum, coat the latter with Code 709, fibred asphalt cutback (300 F temp limit). All materials listed under Code 102.1 are approved where Code 102 is speci- fied.	Recommended for use on aus- tenitic stainless steel. For an alternate to purchased in- hibited calcium silicate, see SM102.1D. Where used on aluminum, coat the latter with Code 709, fibred asphalt cutback (300 F temp limit). Stressed Type 304 stainless steel U-bond specimens at 100 C, when in contact with this insulating material in the Du Pont wet test with 1500 ppm chloride as NaCl in the test water, shall show no cracking at the end of 144 hours exposure.	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.			
For 12" IPS and larger, there is an additional charge for 2-oz canvas cover. Material should be specified "without 2-oz canvas" to avoid extra charge. * Passing the test in MIL-I-24244 specifi- cation does not qualify a material under Code 102.1 ** Molded two-piece fitting covers are available in screwed, welded, and sweet types	Thermal - Asbestos Free Insul Div, Keene Corp	Thermal - Asbestos Free Insul Div, Keene Corp	
	Thermal-12 ** John-Manville Sales Corp		
	Kayle - 10AP Owens - Corning	Super Caltemp, Type NA *** Fibreboard Corp	
	Super Caltemp, Type NA *** Fibreboard Corp	Pamatic Pamred, Inc	
	Carvtemp 1500 ** Celcor Corp		
	Pamatic Pamred, Inc		
△ This product is pink in color △ A perlite-silicate 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. 25



DUP 0991324

556

099910

NOTE — THIS DOCUMENT IS THE PROPERTY OF DU PONT DE NEMOURS AND COMPANY THE TECHNICAL INFORMATION HEREON MAY NOT BE USED NOR REPRODUCED WITHOUT THE PERMISSION OF DU PONT

RLV JUN 19/4

SN 100 M

MATERIAL SPECIFICATION - SERIES 100
PREFORMED BLOCK AND PIPE

OCTOBER 1954

Page 2

This Page Rev May 1973

138

Code	111	112	112.6
Material	Cellular glass or ceramic	Glass fiber	Glass fiberboard
Material Description	Cellular glass or ceramic foamed and fused into unicellular form.	Glass fiber, bonded insulation for pipe and fittings. Pipe sections, one piece, hinged. Plain, without jacket.	Glass fiber bonded board, plain, without covering.
Binder		Thermosetting resin	
Recommended Temperature Range	-200 F to +100 F (+300 F for dual temp)	40 F to 375 F	40 F to 375 F
K Factor, Max Btu/(hr) (sq ft) (°F/in.)	0.35 at 50 F 0.37 at 75 F 0.39 at 100 F	0.23 at 100 F 0.27 at 200 F 0.33 at 300 F	0.24 at 100 F 0.30 at 200 F 0.37 at 300 F
Density	7 to 9 lb per cu ft	Nominal 4 lb per cu ft	Nominal 3 lb per cu ft
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	50 lb per sq in. min at 5% deformation	Nonload bearing. Inserts required where pipe is supported by insulation.	Nonload bearing
Dimensions	See SN3D		Standard is 24" x 48", in thicknesses 1", 1 1/2", 2"
Qualifications and Limitations		Not recommended for pre-insulation because it is easily damaged in handling. Has poor resistance to abuse. Specify whether for pipe or tubing on order. Available with factory-applied finishes and lap adhesives. When specified, consult vendors' catalogs and include on order. Available as molded fittings as noted below. For field fabrication of fittings, it is recommended that glass fiber insulation with nominal 7 1/2 lb per cu ft density be used. Molded fittings will be lower cost in most cases and are preferred. Do not use on austenitic stainless steel or above 140 F or unprotected aluminum.	Available with factory-applied finishes. When specified, consult vendor's catalogs and include on order. Nominal 4 1/2 lb per cu ft density material is available and is recommended for fabrication involving considerable shaping and fitting. Not recommended for use on austenitic stainless steel or above 140 F or unprotected aluminum.

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.

† Molded fitting covers only	Foamglas Pittsburgh Corning Corp	Snap-on Pipe Covering Certain-teed St. Gobain Insulation Corp	K-230-3 Certain-teed St. Gobain Insulation Corp
	Ceramic Foam Dow Chemical Co	Micro-Lok Johns-Manville Sales Corp	No. 814 Spin-Glas Johns-Manville Sales Corp
		1-Piece Pipe Covering Owens-Corning Corp	Type 703 Owens-Corning Corp
		PPG Pipe Insulation Pittsburgh Plate Glass Co	Type S Rigid Board Pittsburgh Plate Glass Co
		† Insul-Sure Insul-Coastal Div, Birmo Prod	

REV. 3-11-72

DUP 0991325

557



000011

OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100
PREFORMED BLOCK AND PIPE

SN 100 M

This Page Rev May 1973

Page 3

Code	114	114.1	116
Material	Mineral wool	Mineral wool - inhibited	
Material Description	Mineral slag wool, with high-temperature binder. Block and pipe section insulation.	Mineral slag wool, with high-temperature binder. Block and pipe section insulation. Dipped, brushed, or sprayed with sodium silicate, Code 802.1, to the equivalent of 100 sq ft per gallon.	Preformed, resilient, closed cell elastomer foam sheet and pipe (to 4-inch) insulation.
Recommended Temperature Range	1800 F max	900 F max - limited by sodium silicate	-40 to 180 F
K Factor, Max Btu, in./hr, sq ft, °F	0.36 at 200 F mean 0.51 at 600 F mean 0.76 at 1000 F mean	0.36 at 200 F mean 0.51 at 600 F mean 0.76 at 1000 F mean	0.28 at 75 F 0.29 at 90 F
Density	15 to 19 lb per cu ft	11 to 19 lb per cu ft	6.0 lb per cu ft max
Water Vapor Permeability (Wet Cup)			0.15 perm-inches
Compressive Strength 6" x 6" x 2" Specimen load rate 0.10"/min	10 lb per sq in. min at 10% deformation	5 lb per sq in. min at 10% deformation	
Dimensions	Standard block sizes up to 24" x 36", 1" to 4" thickness. Standard pipe sizes, see vendor's literature.	Standard block sizes up to 24" x 36", 1" to 4" thickness. Standard pipe sizes, see vendor's literature.	Sheet size is 36" x 48" in thicknesses 5/8" to 1". Pipe and tubing to 3" ID and 6' long in thicknesses 3/8", 1/2" and 3/4".
Qualifications and Limitations	Not recommended for use on unprotected austenitic stainless steel or on above 140 F, or unprotected aluminum. Where used on aluminum, coat the latter with Code 709, Fiberglass Asphalt Cutback (300 F temperature limit).	Satisfactory for use on austenitic stainless steel to 900 F. Where used on aluminum, coat the latter with Code 709, Fiberglass Asphalt Cutback (300 F temperature limit).	Flame spread rating per ASTM E162 shall not exceed 75 uncoated. A protective coating is recommended for outdoor use only. Uniform cell structure with no voids having any dimension exceeding 5/16-inch. Not recommended for use on austenitic stainless steel or on above 140 F.
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.			
† Also available as pipe fitting covers	"PR" Supertemp (Block only) Eagle-Picher Industries		FR/Armaflex Armstrong Cork Company ⁽¹⁾
♦ Contact Purchasing for vendors names		N-1200 Block ♦♦ MF Pipe Insulation Ferry-Eight Insulations	
♦♦ Pipe insulation in 2 ft lengths only	Mono-Block (Block only) Keene Corp		
⁽¹⁾ FR/Armaflex pipe covering is identified with inked blue lines. FR/Armaflex sheet material is identified with inked white lines	K-Fac † ♦ (Block and pipe sections) U. S. Gypsum	K-Fac, Inhibited † ♦ (Block and pipe sections) U. S. Gypsum	

DUP 0991326

SSS



090912

REV. JUN 1974

SN 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954	
Page 4		PREFORMED BLOCK AND PIPE		This Page Rev May 1973	
Code		118			
Material		Polyurethane foam, rigid			
Material Description		Preformed rigid urethane foam block, pipe, and fitting insulation manufactured with polyester or polyether resins with fluorocarbon blowing agent			
Recommended Temperature Range		- 100 to + 180 F			
K Factor, Max Btu/(hr) (sq ft) (°F/in.)		0.15 at 50 F 0.15 at 75 F 0.16 at 100 F			
Density		1.8 to 2.5 lb per cu ft			
Compressive Strength Specimen size 6" x 6" x 2", load rate 0.10" per min		Min 25 psi at 5% deformation, measured parallel to the direction in which the foam rose during manufacture or min 20 psi at 5% deformation in all directions.			
Dimensions		See SN3D. All dimensions to be $\pm 1/16$ " including straightness and squareness.			
Qualifications and Limitations		Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding V_8 ". Heat aging test: Block 1" square by 7" long, cut from near outer surface, on rests 6" apart with 70 gm weight having 1" square base in middle of open shell not distort block more than V_{16} " in 1 hour at 225 F. Flame-spread rating per ASTM E 162 shall not exceed 75 when coated with Hypalon 5 mastic V_{32} " dry thickness reinforced by 10 x 10 mesh glass cloth, 10 lb per 100 sq yd. Water absorption max 4% by volume into a 2" x 2" x 1" skin-free piece, immersed in water just under the surface for 3 days and then wiped with a wet cloth and weighed, with no delay between steps. Not to be used in contact with unprotected austenitic stainless steel at or above 140 F.			
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.					
		Type 24 Urethane Owens-Corning Corp			
		Zen-O-Gel Gress National Gypsum			
		Thurane Dow Chemical Co			
		U-Thane 200 The Upjohn Co			
♦ Pipe insulation sections only; 4 ft standard length with factory-applied vapor barrier jacket. For physical properties, see manufacturer's technical data sheet		Armalak ♦ Armstrong Cork Co			

DUP 0991327

559



140

JUN 19/4

DUP 0991327

559



090913

REV. JUL 1975

OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SM 100 M
This Page Rev May 1973		PREFORMED BLOCK AND PIPE		Page 5
Code	120		130	
Material	Polystyrene foam		Asbestos board	
Material Description	Preformed polystyrene foam block, pipe, and fitting insulation cut from extruded polystyrene foam (pipe insulation available with a variety of different joint designs), or pipe and fitting insulation molded to final shape from expanded polystyrene beads with tongue-and-groove side longitudinal joints and ship lap butt joints.		Asbestos fibers, diatomaceous silica, and inorganic binder. Flame-spread rating 0. Weather-resistant.	
Recommended Temperature Range	- 100 F to + 140 F		1200 max	
K Factor, Max Btu/(hr) (sq ft) (°F/in.)	0.24 at 50 F 0.26 at 75 F 0.28 at 100 F		0.77 at 200 F 0.79 at 400 F 0.81 at 600 F	
Density	1.5 lb per cu ft minimum		36 lb per cu ft	
Compressive Strength Specimen size 6" x 6" x 2"; load rate 0.10" per min	Min 25 lb per sq in. at 5% deformation		Compressive, ultimate - 14,000 psi; Tensile parallel to face - 420 psi; Shear normal to face - 700 psi; Shear parallel - 320 psi.	
Dimensions	SN3D. All dimensions to be $\pm 1/16"$ including straightness and squareness		Thickness, in. - 1/2, 3/4, 7/8, 1, 1 1/4, 1 1/2, 2 and 4 Sheet size, ft - 3, 3 1/2 or 4 x 8 and 4 x 10	
Qualifications and Limitations	Uniform cell structure with max 10% open cells. No distortion or volume change, or loss of compressive strength after exposure at 140 F and 80% relative humidity for 15 days. Water absorption max 0.03% by volume after being subjected to 90 F, 90% relative humidity for 15 days and max 4% by volume into a 2" x 2" x 1" skin-free piece immersed in water just under the surface for 5 days, then wiped with a wet cloth and weighed, with no delay between steps. Not resistant to solvents other than alcohol.		Sanded both sides, may be used unpainted for interior use. When painted, use water base or epoxy coating.	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their products meet the above specifications. These manufacturers' materials also are acceptable under other vendor's labels upon certification as to their identity.				
† Available in the form of fitting covers (see Code 1T4.1) from fabricators	Styrofoam FR † Dow Chemical Co		Marmite 36 (Type A) Johns-Manville Sales Corp	
	Vapo-Lock Insuldyne Corp			

DUP 0991328

890



DUP 0991328

890



090914

OBSOLETE CODES

Code	Material	Date Cancelled	Superseded by Code
101	85% Magnesia	Feb 1964	102, 102.1
103	Diatomaceous earth	Feb 1964	102, 102.1
104	Inorganic silicates	Oct 1972	
105	Asbestos molded	Dec 1956	106
106	Asbestos fiber and sodium silicate	Feb 1972	
107	Asbestos sponge	Feb 1964	
109	Corrugated asbestos prestrunk	Feb 1964	
110	Vegetable cork	Jun 1966	111, 118, 120
111.1	Cellular glass	Jun 1966	111
111.2	Cellular glass	Jun 1966	111
111.3	Cellular glass	Jun 1966	111
112	Glass fiber	Apr 1956	Reinstated Sept 1969
112.01	Glass fiber	Sept 1969	112
112.02	Glass fiber	Oct 1956	112.01
112.11	Glass fiber	Sept 1969	112
112.12	Glass fiber	Mar 1959	112.11
112.16	Glass fiber	Sept 1969	112
112.17	Glass fiber	Sept 1969	112
112.21	Glass fiber	Jan 1961	
112.22	Glass fiber	Sept 1969	112
112.23	Glass fiber	Apr 1963	
112.61	Glass fiberboard	Sept 1969	112.6
112.66	Glass fiberboard	Feb 1964	
112.71	Glass fiberboard	Sept 1969	112.6
112.81	Glass fiberboard	Sept 1969	112.6
113	Glass fiber - neoprene coated	Apr 1956	
115	Mineral wool - asphalt impregnated	Apr 1956	
116	Flexible foamed plastic	Jun 1962	
117	Urethane foam resilient	Jun 1963	
117.1	Urethane foam resilient	Dec 1960	
117.2	Urethane foam resilient	Feb 1960	
117.3	Urethane foam resilient	June 1963	
117.4	Urethane foam resilient	Feb 1960	
117.5	Urethane foam resilient	Apr 1960	
117.6	Urethane foam resilient	July 1963	

891



REV. JUN 19/4

DUP 0991329

090915