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MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED OCT 1954	SN 100 A Page 1 of 13
		REVISED JAN 1965	
Code	102 ¹	102.1 ¹	
Material	Calcium silicate	Calcium silicate-inhibited	
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers	
Temperature Range	1200°F max	1200°F max	
K Factor	500°F - 0.60 max	500°F - 0.60 max	
Density	14 lb per cu ft max	14 lb per cu ft max	
Compressive Strength	60 lb per sq in. min at 5% deformation	60 lb per sq in. min at 5% deformation	
Manufacturing Process	Pen molded, precision molded, or filter press molded	Precision molded	
Resistance to Breakage in Handling	Block must average 2" or greater in drop test per ASTM C 487.		
Dimensions	See SN30	See SN30	
Other Qualifications		Stressed Type 304 stainless steel U-bond specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 the product meets the above specifications.			
* Bands are supplied as extra cost. Order must state "without bands" if not required. For 11" IPS and larger there is an additional charge for 2-in. curved cover. Material should be specified "without 2-in. curved" to avoid extra charge. † Codes 104 and 106 are acceptable alternatives unless noted on the Product Specifications. ‡ Expanded Particle insulation with fittings available in screwed, welded, and street types.	Calulite The Ruberoid Co Kevlo Owens-Corning Corp Thermobestos John-Manville Sales Corp Callomp Fiberboard Paper Products Corp Caroytemp Philo Carey Mfg Co Thermalit Baldwin-Ehren-Hill, Inc	Thermalit Baldwin-Ehren-Hill, Inc	
** Thermalit is a gray material with longitudinal extrusion marks on block and pipe covering. The ends and no more than one edge of block and the ends and ends of pipe covering will show cutting marks. This material is acceptable in Baldwin-Ehren-Hill printed catalogs, not in catalogs ever labeled with a Baldwin-Ehren-Hill sticker. Armstrong "L-K" catalogs with a "B" in the lower left-hand corner of the label will contain acceptable material.			
Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this specification.			

DUP 0990069

028894

Code	104	106	
Material	Inorganic silicates	Asbestos fiber and sodium silicate	
Material Description	Inorganic silica and asbestos fibers	Compressed fluffy amosite asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory coating.	
Temperature Range	100°F to 1800°F	1200°F max	
K Factor	Block - 500°F - 0.58 max	400°F - 0.54 max 600°F - 0.65 max	
Density	Block - 14 lb per cu ft	20 lb per cu ft max	
Compressive Strength	65 lb per sq in. min at 5% deformation	27 lb per sq in. at 10% deformation - dry	
Manufacturing Process	Formed and cased on mandrel. Pipe mach cut on die		
Resistance to Breakage in Handling	Block must average 3" or greater in drop test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.		
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F	Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Minimum thickness available 1 1/2", also available in pipe covering on special order † Pipe covering only	Kayle 20° Owens-Corning Corp	Calbestos Pittsburgh Corning Corp	

DUP 0990070



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MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED OCT 1954	.SN 100 M Page 1 of 13
		REVISED OCT 1965	
Code	102° ±	102.1°	
Material	Calcium silicate	Calcium silicate-inhibited	
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers	
Temperature Range	1200°F max	1200°F max	
K Factor	500°F - 0.60 max	500°F - 0.60 max	
Density	14 lb per cu ft max	14 lb per cu ft max	
Compressive Strength	60 lb per sq in. min at 5% deformation	60 lb per sq in. min at 5% deformation	
Manufacturing Process	Pen molded, precision molded, or filter press molded	Precision molded	
Resistance to Breakage in Handling	Block must average 2" or greater in drop test per ASTM C 487.		
Dimensions	See SN30	See SN30	
Other Qualifications		Stressed Type 304 stainless steel U-bond specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Bands are supplied or extra cost. Order must state "without bands" if not required. For 11" 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. † Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications. ‡ Expanded Perlite insulation. Molded rebar-type fitting covers are available in serrated, welded, and smooth types.	Calclite The Ruberoid Co	Thermalit™ Baldwin-Ehren-Hill, Inc	
	Rayle Owens-Corning Corp		
	Thermobestos Johns-Manville Sales Corp		
	Caltemp Fiberboard Paper Products Corp		
	Carotemp † Philip Carey Mfg Co		
	Thermalit™ Baldwin-Ehren-Hill, Inc		DUP 0990071
™ Thermalit is a gray material with longitudinal corrosion marks on block and pipe covering. The ends and no more than one edge of block and the edges and ends of pipe covering will show cutting marks. This material is acceptable in Baldwin-Ehren-Hill printed catalogs, not in catalogs over labeled with a Baldwin-Ehren-Hill sticker. Armstrong "L-K" catalogs with a "3" in the lower left-hand corner of the label will contain acceptable material.			
Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this specification.			

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MATERIAL SPECIFICATION - SERIES 100

UN. LOCK 1704

Rev Jan 1965

Code	104	106	
Material	Inorganic silicates	Asbestos fiber and sodium silicate	
Material Description	Inorganic silica and asbestos fibers	Compressed fluffy anisotropic asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory coating	
Temperature Range	100°F to 1800°F	1200°F max	
K Factor	Block - 500°F - 0.58 max	400°F - 0.54 max 600°F - 0.65 max	
Density	Block - 14 lb per cu ft	20 lb per cu ft max	
Compressive Strength	65 lb per sq in. min at 5% deformation	27 lb per sq in. at 10% deformation - dry	
Manufacturing Process		Formed and cased on mandrel. Pipe mach cut on die	
Resistance to Breakage in Handling	Block must average 3" or greater in drop test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.		
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F	Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications:			
* Minimum thickness available 1 1/2", also available in pipe covering on special order † Pipe covering only	Kevlar 30° Owens-Corning Corp	Unibestos Pittsburgh Corning Corp	

DUP 0990072



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113

MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED OCT 1954	SN 100 M Page 1 of 13
		REVISED OCT 1965	
Code	102°	102.1°	
Material	Calcium silicate	Calcium silicate-inhibited	
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers	
Temperature Range	1200°F max	1200°F max	
K Factor	500°F - 0.60 max	500°F - 0.60 max	
Density	14 lb per cu ft max	14 lb per cu ft max	
Compressive Strength	60 lb per sq in. min at 5% deformation	60 lb per sq in. min at 5% deformation	
Manufacturing Process	Pan molded, precision molded, or filter press molded	Precision molded	
Resistance to Breakage in Handling	Block must average 2" or greater in drop test per ASTM C 487.		
Dimensions	See SN3D	See SN3D	
Other Qualifications		Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Bands are supplied at extra cost. Order must state "without bands" if not required. For 11" 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. Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications. † Expanded Perlite insulation. Molded two-piece fitting covers are available in screwed, welded, and sweat types.	Calisilite The Rubensoid Co	Thermasil™ Baldwin-Ehrst-Hill, Inc	
	Keylo Owens-Corning Corp		
	Thermabestos Johns-Manville Sales Corp		
	Caltemp Fiberboard Paper Products Corp		
	Cerystemp † Philip Carey Mfg Co		
	Thermasil™ Baldwin-Ehrst-Hill, Inc		
™ Thermasil is a gray material with longitudinal extrusion marks on block and pipe covering. The ends and no more than one edge of block and the edges and ends of pipe covering will show cutting marks. This material is acceptable in Baldwin-Ehrst-Hill printed cartons, not in cartons over labeled with a Baldwin-Ehrst-Hill printer. Armstrong "L-K" cartons with a "2" in the lower left-hand corner of the label will contain acceptable material.			
Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this specification.			
TUBESHEET™ 22 NO. 33		DUP 0990142	

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NOTE



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SM 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1964
Page 2				Rev Jan 1963
Code	104		106	
Material	Inorganic silicates		Asbestos fiber and sodium silicate	
Material Description	Inorganic silicas and asbestos fibers		Compressed fluffy amosite asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory coating	
Temperature Range	100°F to 1800°F		1200°F max	
K Factor	Block - 500°F - 0.58 max		400°F - 0.54 max 600°F - 0.65 max	
Density	Block - 14 lb per cu ft		20 lb per cu ft max	
Compressive Strength	65 lb per sq in. min at 5% deformation		27 lb per sq in. at 10% deformation - dry	
Manufacturing Process			Formed and comp on mandrel. Pipe mach cut on die	
Resistance to Breakage in Handling	Block must average 3" or greater in drop test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.			
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F		Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.				
* Minimum thickness available 1 1/2", also available in pipe covering on special order † Pipe covering only	Karlo 30° Owens-Corning Corp		Unibestos Pittsburgh Corning Corp	

DUP 0990143





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NOTE — THIS SPECIFICATION IS THE PROPERTY OF THE INSULATING MANUFACTURERS AND COMPANY THE TECHNICAL INFORMATION HEREIN IS TO BE USED BY THE USER UNDER THE PERMISSION OF THE PIONEER

MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION - SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED	OCT 1954
		REVISED	JAN 1963
		SN 100 M Page 1 of 13	
Code	102° ±	102.1°	
Material	Calcium silicate	Calcium silicate-inhibited	
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers	
Temperature Range	1200°F max	1200°F max	
K Factor	500°F = 0.60 max	500°F = 0.60 max	
Density	14 lb per cu ft max	14 lb per cu ft max	
Compressive Strength	60 lb per sq in. min at 5% deformation	60 lb per sq in. min at 5% deformation	
Manufacturing Process	Pan molded, precision molded, or filter press molded	Precision molded	
Resistance to Breakage in Handling	Block must average 2" or greater in drop test per ASTM C 487.		
Dimensions	See SN3D	See SN3D	
Other Qualifications		Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 the product meets the above specifications.			
* Bands are supplied at extra cost. Order must state "without bands" if not required. For 11 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. † Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications. ‡ Expanded Perlite insulation with linings available in sawed, welded, and sheet types.	Calulite The Ruberoid Co	Thermasil** Baldwin-Ehren-Hill, Inc	
	Kevla Owens-Corning Corp		
	Thermobestos Johns-Manville Sales Corp		
	Caltemp Fiberboard Paper Products Corp		
	Carystemp † Philip Carey Mfg Co		
	Thermasil** Baldwin-Ehren-Hill, Inc		
** Thermasil is a gray material with longitudinal extrusion marks on block and pipe covering. The ends are no more than one edge of block and the edges and ends of pipe covering will show extrusion marks. This material is acceptable in Baldwin-Ehren-Hill printed cartons, not in cartons over labeled with a Baldwin-Ehren-Hill sticker. Armstrong "L-X" cartons with a "B" in the lower left-hand corner of the label will contain acceptable material.			
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SUBSTITUTE NO. 35			

SM 100 M		OCTOBER 1954	
Page 2		Rev Jan 1965	
MATERIAL SPECIFICATION - SERIES 100			
Code	104	106	
Material	Inorganic silicates	Asbestos fiber and sodium silicate	
Material Description	Inorganic silica and asbestos fibers	Compressed fluffy amosite asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory coating	
Temperature Range	100°F to 1800°F	1200°F max	
K Factor	Block - 500°F - 0.58 max	400°F - 0.54 max 600°F - 0.65 max	
Density	Block - 14 lb per cu ft	20 lb per cu ft max	
Compressive Strength	65 lb per sq in. min at 5% deformation	27 lb per sq in. at 10% deformation - dry	
Manufacturing Process	Formed and comp on mandrel. Pipe mach cut on die		
Resistance to Breakage in Handling	Block must average 3" or greater in drop test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.		
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F	Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. Stressed Type 304 stainless steel U-bend specimens at 100°C. when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Minimum thickness available 1 1/2"; also available in pipe covering on special order	Kanto 20° Owens-Corning Corp	Unibestos Pittsburgh Corning Corp	
† Pipe covering only			



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MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED	OCT 1954
		REVISED	OCT 1965
		SN 100 M Page 1 of 13	
Code	102° ±	102.1°	
Material	Calcium silicate	Calcium silicate-inhibited	
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers	
Temperature Range	1200°F max	1200°F max	
K Factor	500°F - 0.60 max	500°F - 0.60 max	
Density	14 lb per cu ft max	14 lb per cu ft max	
Compressive Strength	60 lb per sq in. min at 5% deformation	60 lb per sq in. min at 5% deformation	
Manufacturing Process	Pen molded, precision molded, or filter press molded	Precision molded	
Resistance to Breakage in Handling	Block must average 2" or greater in drop test per ASTM C 487.		
Dimensions	See SN3D	See SN3D	
Other Qualifications		Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Bands are supplied at extra cost. Order must state "without bands" if not required. For 11" 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. † Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications. ‡ Expanded Perlite insulation. Molded two-piece fitting covers are available in serrated, welded, and smooth types.	Calulite The Ruberoid Co	Thermasil™ Baldwin-Ehren-Hill, Inc	
	Kayle Owens-Corning Corp		
	Thermax Johns-Manville Sales Corp		
	Celltemp Fiberboard Paper Products Corp		
	Carystemp ? Phillips Carey Mfg Co		
	Thermasil™ Baldwin-Ehren-Hill, Inc		
** Thermasil is a gray material with longitudinal corrosion marks on block and pipe covering. The ends and no more than one edge of block and the edges and ends of pipe covering will show cutting marks. This material is acceptable in Baldwin-Ehren-Hill printed covers, not in covers over labeled with a Baldwin-Ehren-Hill sticker. Arranging "L-K" covers with a "3" in the lower left-hand corner of the label will contain acceptable material.			
Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this specification.			
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DUP 0990255

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040280

MATERIAL SPECIFICATION - SERIES 100

OCTOBER 1954

Page 2

Rev Jan 1965

Code	104	106	
Material	Inorganic silicates	Asbestos fiber and sodium silicate	
Material Description	Inorganic silicates and asbestos fibers	Compressed fluffy amosite asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory coating	
Temperature Range	100°F to 1800°F	1200°F max	
K Factor	Block - 500°F - 0.58 max	400°F - 0.54 max 600°F - 0.65 max	
Density	Block - 14 lb per cu ft	20 lb per cu ft max	
Compressive Strength	65 lb per sq in. min at 5% deformation	27 lb per sq in. at 10% deformation - dry	
Manufacturing Process		Formed and comp on mandrel. Pipe mach cut on die	
Resistance to Breakage in Handling	Block must average 3" or greater in drop test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.		
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F	Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. 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 product meets the above specifications.			
* Minimum thickness available 1 1/2", also available in pipe covering on special order † Pipe covering only	Kevlar 30*	Laibestos	
	Owens-Corning Corp	Pittsburgh Corning Corp	



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MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED OCT 1954	SN 100 M
		REVISED JAN 1965	Page 1 of 13
Code	102°	102.1°	
Material	Calcium silicate	Calcium silicate-inhibited	
Material Description	Reconstituted hydrous calcium silicate reinforced with mineral fibers	Reconstituted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers	
Temperature Range	1200°F max	1200°F max	
K Factor	500°F - 0.60 max	500°F - 0.60 max	
Density	14 lb per cu ft max	14 lb per cu ft max	
Compressive Strength	60 lb per sq in. min at 5% deformation	60 lb per sq in. min at 5% deformation	
Manufacturing Process	Pen molded, precision molded, or filter press molded	Precision molded	
Resistance to Breakage in Handling	Block must average 2" or greater in drop test per ASTM C 487.		
Dimensions	See SN30	See SN30	
Other Qualifications		Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 the product meets the above specifications.			
* Bands are supplied on extra cast. Order must state "without bands" if not required. For 11" 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. † Codes 104 and 106 are acceptable alternatives unless noted on the Product Specifications. ‡ Expanded Perlite insulation with fittings available in screwed, welded, and flange types.	Calmar The Ruberoid Co	Thermalit™ Baldwin-Ehren-Hill, Inc	
	Kyle Owens-Corning Corp		
	Thermalbestos Johns-Manville Sales Corp		
	Caltemp Fiberglass Paper Products Corp		
	Coretemp Philip Carey Mfg Co		
	Thermalit™ Baldwin-Ehren-Hill, Inc		
** Thermalit is a grey material with longitudinal extrusion marks on block and pipe covering. The ends and no more than one edge of block and the ends and ends of pipe covering will show extrusion marks. This material is acceptable in Baldwin-Ehren-Hill printed catalogs, not in catalogs ever labeled with a Baldwin-Ehren-Hill stylized Armstrong "L-2" covers with a "B" in the lower left-hand corner of the label will contain acceptable material.			
Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this specification.			
SUBCOMMITTEE NO. 25			

DUP 0990257

848282

Code	104	106	
Material	Inorganic silicates	Asbestos fiber and sodium silicate	
Material Description	Inorganic silices and asbestos fibers	Compressed fluffy amosite asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory coating	
Temperature Range	100°F to 1800°F	1200°F max	
K Factor	Block - 500°F - 0.58 max	400°F - 0.54 max 600°F - 0.65 max	
Density	Block - 14 lb per cu ft	20 lb per cu ft max	
Compressive Strength	65 lb per sq in. min at 5% deformation	27 lb per sq in. at 10% deformation - dry	
Manufacturing Process		Formed and comp on mandrel. Pipe mach cut on die	
Resistance to Breakage in Handling	Block must average 3" or greater in drop test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.		
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F	Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications:			
* Minimum thickness available 1 1/2", also available in pipe covering on special order † Pipe covering only	Kevlar 30*	Calbestos	
	Owens-Corning Corp	Pittsburgh Corning Corp	



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113

MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED OCT 1954	SN 100 M
		REVISED OCT 1963	Page 1 of 13
Code	102° ±	102.1°	
Material	Calcium silicate	Calcium silicate-inhibited	
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers	
Temperature Range	1200°F max	1200°F max	
K Factor	500°F - 0.60 max	500°F - 0.60 max	
Density	14 lb per cu ft max	14 lb per cu ft max	
Compressive Strength	60 lb per sq in. min or 5% deformation	60 lb per sq in. min or 5% deformation	
Manufacturing Process	Pen molded, precision molded, or filter press molded	Precision molded	
Resistance to Breakage in Handling	Block must average 2" or greater in drop test per ASTM C 487.		
Dimensions	See SN30	See SN30	
Other Qualifications		Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Bands are supplied at extra cost. Order must state "without bands" if not required. For 11" 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. † Codes 184 and 186 are acceptable alternatives unless noted on the Product Specifications. ‡ Expanded Perlite insulation. Molded two-piece fitting covers are available in serrated, welded, and smooth types.	Calisil The Ruberoid Co Keyle Owens-Corning Corp Thermobestos Johns-Manville Sales Corp Calisil Fiberboard Paper Products Corp Caroytemp Philip Carey Mfg Co Thermasil Baldwin-Ehren-Hill, Inc	Thermasil Baldwin-Ehren-Hill, Inc	
Thermasil is a grey material with longitudinal expansion marks on block and pipe covering. The ends and no more than one edge of block and the edges and ends of pipe covering will show curving marks. This material is acceptable in Baldwin-Ehren-Hill printed catalogs, not in catalogs over labeled with a Baldwin-Ehren-Hill sticker. Armstrong "L-K" catalog with a "2" in the lower left-hand corner of the label will contain acceptable material. Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this specification.			

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NOTE

R-209

DUP 0990344

Code	104	106	
Material	Inorganic silicates	Asbestos fiber and sodium silicate	
Material Description	Inorganic silices and asbestos fibers	Compressed fluffy amosite asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory coating	
Temperature Range	100°F to 1800°F	1200°F max	
K Factor	Block - 500°F - 0.58 max	400°F - 0.54 max 600°F - 0.65 max	
Density	Block - 14 lb per cu ft	20 lb per cu ft max	
Compressive Strength	65 lb per sq in. min at 5% deformation	27 lb per sq in. at 10% deformation - dry	
Manufacturing Process		Formed and came on mandrel. Pipe mach cut on die	
Resistance to Breakage in Handling	Block must average 3" or greater in drop test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.		
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F	Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Minimum thickness available 1 1/2", also available in pipe covering on special order † Pipe covering only	Kevlar 30*	Unibestos	
	Owens-Corning Corp	Pittsburgh Corning Corp	

DUP 0990345



248578

218

REV. BY SUP. BY

NOTE - THIS SPECIFICATION IS THE PROPERTY OF D. DU PONT DE NEMOURS AND COMPANY. THE TECHNICAL INFORMATION CONTAINED HEREIN IS TO BE USED ONLY IN CONNECTION WITH THE PURCHASE OF INSULATING MATERIALS FROM D. DU PONT DE NEMOURS AND COMPANY.

MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED	OCT 1954
		REVISED	JAN 1963
		SN 100 M Page 1 of 13	
Code	102° ±	102.1°	
Material	Calcium silicate	Calcium silicate-inhibited	
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers	
Temperature Range	1200°F max	1200°F max	
K Factor	500°F - 0.60 max	500°F - 0.60 max	
Density	14 lb per cu ft max	14 lb per cu ft max	
Compressive Strength	60 lb per sq in. min at 5% deformation	60 lb per sq in. min at 5% deformation	
Manufacturing Process	Non-molded, precision molded, or filter press molded	Precision molded	
Resistance to Breakage in Handling	Block must average 2" or greater in drop test per ASTM C 487.		
Dimensions	See SN10	See SN10	
Other Qualifications		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 the product meets the above specifications.			
* Bonds are supplied at extra cost. Order must state "without bonds" if not required. For 11" 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.	Calclite The Ruberoid Co	Thermalit™ Baldwin-Ehren-Mill, Inc	
† Codes 184 and 106 are acceptable alternatives unless noted on the Product Specifications.	Kevle Owens-Corning Corp		
‡ Expanded Perlite insulation with fittings available in covered, welded, and sweat types.	Thermobestos Johns-Manville Sales Corp		
	Caltemp Fiberglass Paper Products Corp		
	Carystemp ? Philip Carey Mfg Co		
	Thermalit™ Baldwin-Ehren-Mill, Inc		
** Thermalit is a gray material with longitudinal corrosion marks on block and pipe covering. The ends and no more than one edge of block and the ends and ends of pipe covering will show curing marks. This material is acceptable in Baldwin-Ehren-Mill printed cartons, not in cartons over labeled with a Baldwin-Ehren-Mill slogan. Armstrong "L-X" cartons with a "B" in the lower left-hand corner of the label will contain acceptable material.			
Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this specification.			
DUP 0990346			

A-210

DUP 0990346

Code	104	106	
Material	Inorganic silicates	Asbestos fiber and sodium silicate	
Material Description	Inorganic silica and asbestos fibers	Compressed fluffy amosite asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory coating	
Temperature Range	100°F to 1800°F	1200°F max	
K Factor	Block - 500°F - 0.58 max	400°F - 0.54 max 600°F - 0.63 max	
Density	Block - 14 lb per cu ft	20 lb per cu ft max	
Compressive Strength	65 lb per sq in. min at 5% deformation	27 lb per sq in. at 10% deformation - dry	
Manufacturing Process	Formed and comp on mandrel. Pipe mach cut on die		
Resistance to Breakage in Handling	Block must average 3" or greater in drop test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.		
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F	Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Minimum thickness available 1 1/2", also available in pipe covering on special order † Pipe covering only	Ketle 20° Owens-Corning Corp	Asbestos Pittsburgh Corning Corp	

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DUP 0990347



048372

173

MATERIALS

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

**THERMAL INSULATION
STANDARD ENGINEERING SPECIFICATION**

ISSUED OCT 1954

REVISED OCT 1965

SM 100 M

Page 1 of 13

Code	102° ±	102.1°
Material	Calcium silicate	Calcium silicate-inhibited
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers
Temperature Range	1200°F max	1200°F max
K Factor	500°F - 0.60 max	500°F - 0.60 max
Density	14 lb per cu ft max	14 lb per cu ft max
Compressive Strength	60 lb per sq in. min at 5% deformation	60 lb per sq in. min at 5% deformation
Manufacturing Process	Pen molded, precision molded, or filter press molded	Precision molded
Resistance to Breakage in Handling	Block must average 2" or greater in drop test per ASTM C 487.	
Dimensions	See SN3D	See SN3D
Other Qualifications		Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.

* Bonds are supplied at extra cost. Order must state "without bonds" if not required. For 11" 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.	Calisil The Ruberoid Co	Thermasil** Baldwin-Ehren-Mill, Inc
† Comes 104 and 106 are acceptable alternatives unless noted on the Project Specifications.	Kevlo Quans-Corning Corp	
‡ Expanded Perlite insulation. Molded two-piece fitting covers are available in sawed, beveled, and sweat types.	Thermabestos Johns-Manville Sales Corp	
	Caltemp Fiberboard Paper Products Corp	
	Carystemp † Philis Carey Mfg Co	
	Thermasil** Baldwin-Ehren-Mill, Inc	

** Thermasil is a grey material with longitudinal corrosion marks on block end pipe covering. The ends and no more than one edge of block and the edges and ends of pipe covering will show cutting marks. This material is acceptable in Baldwin-Ehren-Mill printed cartons, not in cartons over labeled with a Baldwin-Ehren-Mill sticker. Armstrong "L-K" cartons with a "3" in the lower left-hand corner of the label will contain acceptable material.

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

TUBCORP-100-100

DUPONT

R-257

DUP 0990428

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MATERIAL SPECIFICATION - SERIES 100

OCTOBER 1954

Page 2

Rev Jan 1963

Code	104	106
Material	Inorganic silicates	Asbestos fiber and sodium silicate
Material Description	Inorganic silicates and asbestos fibers	Compressed fluffy amosite asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory coating
Temperature Range	100°F to 1800°F	1200°F max
K Factor	Block - 500°F - 0.58 max	400°F - 0.54 max 600°F - 0.65 max
Density	Block - 14 lb per cu ft	20 lb per cu ft max
Compressive Strength	65 lb per sq in. min at 5% deformation	27 lb per sq in. at 10% deformation - dry
Manufacturing Process		Formed and comp on mandrel. Pipe mach cut on die
Resistance to Breakage in Handling	Block must average 3" or greater in drop test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.	
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F	Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.		
* Minimum thickness available 1 1/2", also available in pipe covering on special order † Pipe covering only	Kevlar 30*	Unibestos
	Owens-Corning Corp	Pittsburgh Corning Corp

DUP 0990429



048454

REV. 02/1965 SUP. BY

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MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED	OCT 1954
		REVISED	JAN 1965
		SN 100 M Page 1 of 13	
Code -	102° ±	102.1°	
Material	Calcium silicate	Calcium silicate-inhibited	
Material Description	Reactive hydrous calcium silicate reinforced with mineral fibers	Reactive hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers	
Temperature Range	1200°F max	1200°F max	
K Factor	500°F = 0.60 max	500°F = 0.60 max	
Density	14 lb per cu ft max	14 lb per cu ft max	
Compressive Strength	60 lb per sq in. min at 5% deformation	60 lb per sq in. min at 5% deformation	
Manufacturing Process	Pen molded, precision molded, or filter press molded	Precision molded	
Resistance to Breakage in Handling	Block must average 2" or greater in drop test per ASTM C 487.		
Dimensions	See SN3D	See SN3D	
Other Qualifications		Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 the product meets the above specifications.			
* Bonds are supplied at extra cost. Order must state "without bonds" if not required. For 11" 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. † Cases 104 and 106 are acceptable alternatives unless noted on the Product Specifications. ‡ Expanded Perlite insulation with linings available in covered, voided, and sweet types.	Calatite The Ruberoid Co	Thermasil™ Baldwin-Ehrst-Hill, Inc	
	Kevlar Owens-Corning Corp		
	Thermobestos Johns-Manville Sales Corp		
	Caltemp Fiberboard Paper Products Corp		
	Carystemp † Phillips Caray Mfg Co		
	Thermasil™ Baldwin-Ehrst-Hill, Inc		
** Thermasil is a gray material with longitudinal extrusion marks on block and pipe covering. The ends are no more than one edge of block and the edges and ends of pipe covering will show extrusion marks. This material is acceptable in Baldwin-Ehrst-Hill printed cartons, not in cartons over labeled with a Baldwin-Ehrst-Hill sticker. Armstrong "L-K" cartons with a "B" in the lower left-hand corner of the label will contain acceptable material.			
Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this specification.			
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R-258

048455

DUP 0990430

SM 100 -		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954
Page 2				Rev Jan 1965
Code	104	106		
Material	Inorganic silicates	Asbestos fiber and sodium silicate		
Material Description	Inorganic silices and asbestos fibers	Compressed fluffy amosite asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory coating		
Temperature Range	100°F to 1800°F	1200°F max		
K Factor	Block - 500°F - 0.58 max	400°F - 0.54 max 600°F - 0.65 max		
Density	Block - 14 lb per cu ft	20 lb per cu ft max		
Compressive Strength	65 lb per sq in. min at 5% deformation	27 lb per sq in. at 10% deformation - dry		
Manufacturing Process		Formed and cased on mandrel. Pipe mach cut on die		
Resistance to Breakage in Handling	Block must average 3" or greater in drop test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.			
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F	Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.				
* Minimum thickness available 1 1/2", also available in pipe covering on special order † Pipe covering only	Kevlar 20*	Unibestos		
	Quens-Corning Corp	Pittsburgh Corning Corp		

DUP 0990431



040456

713

MATERIAL SPECIFICATION		THERMAL INSULATION	
SERIES 100		STANDARD ENGINEERING SPECIFICATION	
PREFORMED BLOCK AND PIPE		ISSUED	SN 100 M
		REVISED	Page 1 of 13
		OCT 1954	
		OCT 1963	

Code	102° ±	102.1°
Material	Calcium silicate	Calcium silicate-inhibited
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers
Temperature Range	1200°F max	1200°F max
K Factor	500°F - 0.60 max	500°F - 0.60 max
Density	14 lb per cu ft max	14 lb per cu ft max
Compressive Strength	60 lb per sq in. min at 5% deformation	60 lb per sq in. min at 5% deformation
Manufacturing Process	Pan molded, precision molded, or filter press molded	Precision molded
Resistance to Breakage in Handling	Block must average 2" or greater in drop test per ASTM C 487.	
Dimensions	See SN30	See SN30
Other Qualifications		Stressed Type 304 stainless steel U-bond specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.

* Bands are supplied at extra cost. Order must state "without bands" if not required.	Calisil The Ruberoid Co	Thermalit [™] Baldwin-Ehren-Hill, Inc
For 11" 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.	Kayle Owens-Corning Corp	
† Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications.	Thermabestos Johns-Manville Sales Corp	
‡ Expanded Perlite insulation. Molded two-piece fitting covers are available in serrated, welded, and smooth types.	Calcomp Fiberboard Paper Products Corp	
	Careystamp † Philip Carey Mfg Co	
	Thermalit [™] Baldwin-Ehren-Hill, Inc	

[™] Thermalit is a gray material with longitudinal extrusion marks on block and pipe covering. The ends and no more than one edge of block and the edges and ends of pipe covering will show cutting marks. This material is acceptable in Baldwin-Ehren-Hill printed catalogs, not in catalogs ever labeled with a Baldwin-Ehren-Hill station. Arranging "L-X" catalogs with a "3" in the lower left-hand corner of the label will contain acceptable material.

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

SUBCOMMITTEE NO. 15

R-305

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DUP 0990513

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NOTE

MATERIAL SPECIFICATION - SERIES 100

OCTOBER 1954

Rev Jan 1963

Code	104	106	
Material	Inorganic silicates	Asbestos fiber and sodium silicate	
Material Description	Inorganic silicates and asbestos fibers	Compressed fluffy amosite asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory coating	
Temperature Range	100°F to 1800°F	1200°F max	
K Factor	Block - 500°F - 0.58 max	400°F - 0.54 max 600°F - 0.65 max	
Density	Block - 14 lb per cu ft	20 lb per cu ft max	
Compressive Strength	65 lb per sq in. min at 5% deformation	27 lb per sq in. at 10% deformation - dry	
Manufacturing Process		Formed and comp on mandrel. Pipe mach cut on die	
Resistance to Breakage in Handling	Block must average 3" or greater in drop test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.		
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F	Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Minimum thickness available 1 1/2", also available in size covering on special order	Kevlar 20° Owens-Corning Corp	Unibestos Pittsburgh Corning Corp	
† Pipe covering only			



DUP 0990514

048541

REV. 021 405 SUP. BY

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MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED OCT 1954	SN 100 M Page 1 of 13
		REVISED JAN 1965	
Code	102° F	102.1°	
Material	Calcium silicate	Calcium silicate-inhibited	
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers	
Temperature Range	1200°F max	1200°F max	
K Factor	500°F - 0.60 max	500°F - 0.60 max	
Density	14 lb per cu ft max	14 lb per cu ft max	
Compressive Strength	60 lb per sq in. min at 5% deformation	60 lb per sq in. min at 5% deformation	
Manufacturing Process	Pen molded, precision molded, or filter press molded	Precision molded	
Resistance to Breakage in Handling	Block must average 2° or greater in drop test per ASTM C 487.		
Dimensions	See SN30	See SN30	
Other Qualifications		Stressed Type 304 stainless steel U-bond specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 the product meets the above specifications.			
* Bands are supplied at extra cost. Order must state "without bands" if not required. † For 11" 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. ‡ Codes 184 and 186 are acceptable alternatives unless noted on the Product Specifications. § Expanded Perlite insulation with fittings available in screwed, welded, and flange types.	Calatite The Rubenoid Co	Thermasil™ Baldwin-Ehren-Hill, Inc	
	Kevlar Owens-Corning Corp		
	Thermobestos Johns-Manville Sales Corp		
	Caltemp Fiberboard Paper Products Corp		
	Carotemp Philip Carey Mfg Co		
	Thermasil™ Baldwin-Ehren-Hill, Inc		
** Thermasil is a gray material with longitudinal corrosion marks on block and pipe covering. The ends and no more than one edge of block and the edges and ends of pipe covering will show curing marks. This material is acceptable in Baldwin-Ehren-Hill printed catalogs, not in catalogs ever labeled with a Baldwin-Ehren-Hill sticker. Arrowing "L-K" catalogs with a "B" in the lower left-hand corner of the label will contain acceptable material.			
Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this specification.			
SUBCOMMITTEE NO. 18			

R-306

048542

DUP 0990515

SM 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954
Page 2				Rev Jan 1963
Code	104	106		
Material	Inorganic silicates	Asbestos fiber and sodium silicate		
Material Description	Inorganic silices and asbestos fibers	Compressed fluffy amosite asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory coating		
Temperature Range	100°F to 1800°F	1200°F max		
K Factor	Block - 500°F - 0.58 max	400°F - 0.54 max 600°F - 0.63 max		
Density	Block - 14 lb per cu ft	20 lb per cu ft max		
Compressive Strength	65 lb per sq in. min at 5% deformation	27 lb per sq in. at 10% deformation - dry		
Manufacturing Process		Formed and comp on mandrel. Pipe mach cut on die		
Resistance to Breakage in Handling	Block must average 3" or greater in-draw test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.			
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F	Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.				
* Minimum thickness available 1 1/2", also available in pipe covering on special order † Pipe covering only	Kevlar 20° Owens-Corning Corp	Unibestos Pittsburgh Corning Corp		

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DUP 0990516

048543

REV. 621 4965 SUP. BY

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MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED OCT 1954	SN 100 M
		REVISED JAN 1965	Page 1 of 13
Code	102* 6	102.1*	
Material	Calcium silicate	Calcium silicate-inhibited	
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers	
Temperature Range	1200°F max	1200°F max	
K Factor	500°F - 0.60 max	500°F - 0.60 max	
Density	14 lb per cu ft max	14 lb per cu ft max	
Compressive Strength	60 lb per sq in. min at 5% deformation	60 lb per sq in. min at 5% deformation	
Manufacturing Process	Pen molded, precision molded, or filter press molded	Precision molded	
Resistance to Breakage in Handling	Block must average 2" or greater in drop test per ASTM C 487.		
Dimensions	See SN3D	See SN3D	
Other Qualifications		Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Bands are supplied at extra cost. Order must state "without bands" if not required. For 11" 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. † Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications. ‡ Expanded Perlite insulation with fittings available in screwed, welded, and sweat types.	Calssilite The Ruberoid Co	Thermalit** Baldwin-Ehrst-Hill, Inc	
	Keylo Owens-Corning Corp		
	Thermobestos Johns-Manville Sales Corp		
	Caltemp Fiberboard Paper Products Corp		
	Careytemp † Philip Carey Mfg Co		
	Thermalit** Baldwin-Ehrst-Hill, Inc		
** Thermalit is a gray material with longitudinal extrusion marks on block and pipe covering. The ends and no more than one edge of block and the ends and ends of pipe covering will show cutting marks. This material is acceptable in Baldwin-Ehrst-Hill printed cartons, not in cartons over labeled with a Baldwin-Ehrst-Hill sticker. Armstrong "L-K" cartons with a "B" in the lower left-hand corner of the label will contain acceptable material.			

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DUP 0991184

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SN 100 M		OCTOBER 1954	
Page 2		MATERIAL SPECIFICATION - SERIES 100	
		Rev Jan 1965	
Code	104	106	
Material	Inorganic silicates	Asbestos fiber and sodium silicate	
Material Description	Inorganic silicas and asbestos fibers	Compressed fluffy amosite asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory coating	
Temperature Range	100°F to 1800°F	1200°F max	
K Factor	Block - 500°F - 0.58 max	400°F - 0.54 max 600°F - 0.55 max	
Density	Block - 14 lb per cu ft	20 lb per cu ft max	
Compressive Strength	65 lb per sq in. min at 5% deformation	27 lb per sq in. at 10% deformation - dry	
Manufacturing Process		Formed and comp on mandrel. Pipe mech cut on die	
Resistance to Breakage in Handling	Block must average 3" or greater in drop test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.		
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F	Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Minimum thickness available 1 1/2", also available in pipe covering on special order † Pipe covering only	Keylo 20° Owens-Corning Corp	Unibestos Pittsburgh Corning Corp	

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MATERIAL SPECIFICATION - SERIES 100

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REV. MAR 1964

OCTOBER 1954			
MATERIAL SPECIFICATION - SERIES 100			
Rev. Feb 1964			
SN 100 M			
Page 5			
Code	112.01	112.02	
Material	Glass fiber	See Code 112.01	
Material Description	Textile-type fine glass fiber pipe and fitting insulation, plain, with medium-temperature binder		
Filler			
Binder	Phenol-formaldehyde or Di-Cy		
Temperature Range	80°F to 350°F		
K Factor	100°F - 0.25		
Density	3" and 6" lb per cu ft		
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.		
Resistance to Breakage in Handling	Very good		
Other Qualifications	Specify whether for iron pipe or copper tubing		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
* Fittings, only as follows: For 125-lb cast iron screwed ends and tees Size Thickness 1/2 thru 4 1/2, 1, 1 1/2 For butt-welding long-radius 90° and 45° elbows Size Thickness 2 thru 6 1/2, 1 2 thru 12 1 1/2, 2 Available factory finished with Code 731 "Hypalon" mastic on request	* Ultrafine Snap-on Gustin-Bacon Mfg Co		
	* Mono-Kover Baldwin-Ehrst-Hill, Inc		
	* Thermoglas Phillips Carey Mfg Co		
	** Fiberglas Owens-Corning Corp		
	** Armoglas PF Pipe Insul Armstrong C&S Corp		
	* Micro-Lok Johns-Manville Sales Corp		
	* FIT-rise Fibrous Glass Products, Inc, Michaville, NY Crestwood Ind Park, Mountain Top, Pa.		
	* Insul-Sure Insul-Counties Corp Massport 78, NY		
	* PPG Glass Fiber Pima Plate Glass Co		
	* Superfloc The Ruberoid Co		

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SN 100 M		OCTOBER 1954	
Page 6		Rev April 1963	
MATERIAL SPECIFICATION - SERIES 100			
Code	112.11	112.12	
Material	Glass fiber	See 112.11	
Material Description	Textile type fine glass fiber banded pipe insulation with 45-lb factory-applied roofing felt finish. Code 701 asbestos felt must be used.		
Filler			
Binder	Phenol-formaldehyde or Di-Cy		
Temperature Range	80°F to 350°F		
K Factor	100°F - 0.25		
Density	3" and 6" lb per cu ft		
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.		
Resistance to Breakage in Handling	Very good		
Dimensions			
Other Qualifications	Specify whether for iron pipe or copper tubing.		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
* Order must specify finish noted under Material Description.	* Ultrafine Snap-on Gustin-Bacon Mfg Co		
	* Mono-Kover Baldwin-Ehret-Hill, Inc		
	* Thermoglas Philip Carey Mfg Co		
	* Fiberglas Owens-Corning Corp		
	* Armaglas PF Pipe Insu Armstrong C&S Corp		
	* Micro-Lok Johns-Manville Sales Corp		
	* PPC Glass Fiber Pitts Plate Glass Co		
	* Superfine The Ruberoid Co		

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OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100

SM 100 M

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Code	112.16	112.17	
Material	Glass fiber	Glass fiber	
Material Description	Textile type fine glass fiber bonded pipe insulation with 4-oz factory-applied canvas finish.	Textile type fine glass fiber bonded pipe insulation with 8-oz factory-applied canvas finish.	
Filler			
Binder	Phenol-formaldehyde or Di-Cy	Phenol-formaldehyde or Di-Cy	
Temperature Range	80°F to 300°F	80°F to 300°F	
K Factor	100°F - 0.25	100°F - 0.25	
Density	3" and 6" lb per cu ft	3" and 6" lb per cu ft	
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.	
Resistance to Breakage in Handling	Very good	Very good	
Dimensions			
Other Qualifications	Specify whether for iron pipe or copper tubing	Specify whether for iron pipe or copper tubing	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
	*Ultrafine Snap-on Gustin-Bacon Mfg Co	*Ultrafine Snap-on Gustin-Bacon Mfg Co	
	*Vene-Kover Baldwin-Ehret-Hill, Inc	*Vene-Kover Baldwin-Ehret-Hill, Inc	
	*Thermoglas Philip Carey Mfg Co	*Thermoglas Philip Carey Mfg Co	
	**Fiberglas Owens-Corning Corp	**Fiberglas Owens-Corning Corp	
	**Armoglas PF Pipe Insu Armstrong C&S Corp	**Armoglas PF Pipe Insu Armstrong C&S Corp	
	*Micro-Lok Johns-Manville Sales Corp	*Micro-Lok Johns-Manville Sales Corp	
	*PPG Glass Fiber Pima Plate Glass Co	*PPG Glass Fiber Pima Plate Glass Co	
	*Superfine The Ruberoid Co	*Superfine The Ruberoid Co	



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SN 100 M		OCTOBER 1954
Page 8		Rev April 1963
MATERIAL SPECIFICATION - SERIES 100		
Code	112.22	
Material	Glass fiber	
Material Description	Preformed pipe covering composed of glass fibers banded together by inert thermosetting resin with factory-applied 35-lb minimum per 1000 sq ft white bleached kraft paper, laminated to 0.0007" aluminum foil by firewater-rent adhesive (moisture vapor transmission rate shall not exceed 0.315 perms - wet cup test) and reinforced by glass threads in both directions, maximum spacing 1/4". Finish includes lap 2", ± 1/4", long and butt strips 4", ± 1/4", wide. Paper to be creased or embossed sufficiently to conceal wrinkles without requiring excessive use of adhesive to make a tight seal. Type A - one-piece Type B - two-piece	
Filler		
Binder	Phenol-formaldehyde or Di-Cy	
Temperature Range	40°F to 250°F	
K Factor	100°F - 0.23, 250°F - 0.33	
Density	Type A - 3 lb per cu ft min Type B - 6 lb per cu ft min	
Compressive Strength*	Compressive strength and resilience are very low. Inserts are required where pipe is supported by insulation. Type B has more resistance to abuse than Type A.	
Resistance to Breakage in Handling	Very good	
Dimensions	3-ft sections Type A - 1/2", 3/4", 1", 1 1/2", 2", 2 1/2", and 3" thick Type B - 1/2", 1", 1 1/2", 2", and 2 1/2" thick	
Other Qualifications	Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.		
	Ultrafine Snap-on (Type A) Gustin-Bacon Mfg Co	
	Nono-Kover (Type A) Baldwin-Ehren-Mill, Inc	
	Fiberglass (Type A and Type B) Owens-Corning Corp	
	Armoglas PF Pipe Insulation (Type A and Type B) Armstrong C&S Corp	
	Micro-Lok (Type A) Johns-Manville Sales Corp	
	PPG Glass Fiber (Type A) Pittsburgh Plate Glass Co	
	Superfine (Type A) The Ruberoid Co	
	Thermoglas (Type A) Philip Carey Mfg Co	

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MATERIAL SPECIFICATION - SERIES 100

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Code	112.61		
Material	Glass fiber		
Material Description	Plain semi-rigid board, formed from fibrous glass or mineral fibers.		
Filler			
Binder	Phenol-formaldehyde		
Temperature Range	40°F to 350°F		
K Factor	100°F - 0.25 to 0.30		
Density	6 and 9 lb per cu ft		
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.		
Resistance to Breakage in Handling	Very good		
Dimensions	Std 24" x 48" Thickness PF615 (6-lb density) 1/2" through 3". PF617 (9-lb density), 1/2" through 2 1/4".		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
	Fiberglas PF615 or 617 Insulation Owens-Corning Corp		
	Armoglas PF Insulation Armstrong C&S Corp		
	Spinox No. 414 or 415 Johns-Manville Sales Corp		
	E-Z Ply Duct Insulation Baldwin-Ehret-Hill, Inc		

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SN 100 M		OCTOBER 1954	
MATERIAL SPECIFICATION - SERIES 100		Rev April 1963	
Code	112.71		112.81
Material	Glass fiber		Glass fiber
Material Description	Bonded board insulation formed from fibrous glass or mineral fibers, with asphalt and kraft paper vapor-barrier finish.		Bonded acoustical board formed from fibrous glass or mineral fibers with a thin neoprene compound on one surface.
Filler			
Binder	Phenol-formaldehyde		Phenol-formaldehyde
Temperature Range	40°F to 150°F		40°F to 150°F
K Factor	100°F - 0.26		100°F - 0.26
Density	3 and 6 lb per cu ft		6 lb per cu ft
Compressive Strength			
Manufacturing Process	Machine molded		Machine molded
Resistance to Breakage in Handling	Very good		Very good
Dimensions	24" x 48" boards 3/4" to 2" thickness		24" x 48" boards 5/8" to 2" thickness
Other Qualifications	Higher density material is more resistant to abuse		Neoprene coating on side of board exposed to air flow
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
* 3-lb density. High-density outer layers.	Fiberglas Vapor Seal Duct Insu Owens-Corning Corp		Fiberglas Coated Duct Insu Owens-Corning Corp
	Armoglas Vapor Seal Duct Insu Armstrong C&S Corp		Armoglas Coated Duct Insu Armstrong C&S Corp
	Spintex No. 414VS Johns-Manville Sales Corp		Coated Duct Insulation Baldwin-Ehrst-Hill, Inc
	E-Z Ply Duct Insu Baldwin-Ehrst-Hill, Inc		
	Fiberglass Board* Gustin-Bacon Mfg Co		

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OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SM 100 M
Rev Aug 1964				Page 11
Code		114		
Material		Mineral wool (Block only)		
Material Description		Mineral slag wool		
Filler				
Binder		High temp binder		
Temperature Range		500°F to 1700°F		
K Factor		500°F - 0.45 max		
Density		19.2 lb per cu ft		
Compressive Strength		12 lb per sq in.		
Manufacturing Process		Machine molded		
Resistance to Breakage in Handling		Good		
Dimensions				
Other Qualifications				
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.				
		PV Supertamp Eagle-Picher		
		Mono-Block Baldwin-Ehret-Hill, Inc		
		Armatamp Armstrong C&S Corp		
		M F Block M. H. Derrick Co		

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SN 100 M		OCTOBER 1954	
Page 12		MATERIAL SPECIFICATION - SERIES 100	
		Rev Aug 1964	
Code	118		
Material	Urethane Foam, Rigid		
Material Description	Preformed rigid urethane foam block, pipe, and fitting insulation manufactured with polyester or polyether resins with fluorocarbon blowing agent		
Temperature Range	-270°F to +150°F		
K Factor	0.17 max at 75°F		
Density	1.7 to 2.5 lb per cu ft		
Compressive Strength	Min 30 psi at 6.6% deformation, measured parallel to the direction in which the foam rose during manufacture or min 24 psi at 6.6% deformation in all directions		
Manufacturing Process	Molded or cut from molded billet		
Resistance to Breakage in Handling	Excellent		
Dimensional Tolerances	Inside Diameter (In.)		
	Pipe Size of Insulation ID (In.)	Minimum Diameter (In.)	Maximum Diameter (In.)
	1/2 - 6	IPS OD	IPS OD + 1/16
	7 - 12	IPS OD	IPS OD + 1/8
	14 and up	IPS OD + 1/16	IPS OD + 3/16
	Outside Diameter (In.)		
	Pipe Size of Insulation OD (In.)	Minimum Diameter (In.)	Maximum Diameter (In.)
	1/2 - 6	IPS OD - 1/8	IPS OD - 1/16
	7 - 12	IPS OD - 1/8	IPS OD
	14 and up	IPS OD - 1/16	IPS OD + 1/16
All other dimensions to be $\pm 1/16$ " including straightness and squareness			
Other Qualifications	Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding 1/4". 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 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 60 when coated with PVA mastic 3/32" dry thickness reinforced by 10 x 10 mesh glass cloth, 10 lb per 100 sq yd. Water absorption max 2% by volume into a 2" x 2" x 1" skin-free piece immersed in water just under the surface for 5 days		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
	U-200 Unarco Industries		
	Zerocel NB200 National Gypsum		

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OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100

SN 100 M

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Code	120		
Material	Polystyrene		
Material Description	Preformed rigid cellular polystyrene block, pipe, and fitting insulation.		
Filler			
Binder			
Temperature Range	-100°F to +160°F		
K Factor	0.29 max at 75°F		
Density	1.7 to 2.3		
Compressive Strength	Min 20 lb per sq in. at 10% deformation		
Manufacturing Process	Cut from molded logs		
Resistance to Breakage in Handling	Excellent		
Dimensions	+ 1/16" - 0" on insulation ID, all other dimensions to be ± 1/16" including straightness and squareness		
Other Qualifications	Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding 1/8". No distortion or volume change, or loss of compressive strength after exposure at 160°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.		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
	Styrofoam 33 MMM Co, Houston, Texas		
	Styrofoam 33 Tufflite Plastics, Inc		

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MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED OCT 1954	SN 100 M Page 1 of 13
		REVISED JAN 1965	
Code	102" ø	102.1"	
Material	Calcium silicate	Calcium silicate-inhibited	
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers	
Temperature Range	1200°F max	1200°F max	
K Factor	500°F - 0.60 max	500°F - 0.60 max	
Density	14 lb per cu ft max	14 lb per cu ft max	
Compressive Strength	60 lb per sq in. min at 5% deformation	60 lb per sq in. min at 5% deformation	
Manufacturing Process	Pan molded, precision molded, or filter press molded	Precision molded	
Resistance to Breakage in Handling	Block must average 2" or greater in drop test per ASTM C 487.		
Dimensions	See SN3D	See SN3D	
Other Qualifications		Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Bands are supplied as extra cost. Order must state "without bands" if not required. For 11" IPS and larger there is an additional charge for 2-as canvas cover. Material should be specified "without 2-as canvas" to avoid extra charge. † Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications. ‡ Expanded Perlite insulation with fittings available in screwed, welded, and sweat types.	Calasilite The Ruberoid Co	Thermasil** Baldwin-Ehret-Hill, Inc	
	Kaylo Owens-Corning Corp		
	Thermobestos Johns-Manville Sales Corp		
	Caltemp Fiberboard Paper Products Corp		
	Careytemp † Philip Carey Mfg Co		
	Thermasil** Baldwin-Ehret-Hill, Inc		
** Thermasil is a gray material with longitudinal extrusion marks on block and pipe covering. The ends and no more than one edge of block and the edges and ends of pipe covering will show cutting marks. This material is acceptable in Baldwin-Ehret-Hill printed cartons, not in cartons over labeled with a Baldwin-Ehret-Hill sticker. Armstrong "L-K" cartons with a "B" in the lower left-hand corner of the label will contain acceptable material.			

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

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SN 100 M		OCTOBER 1954	
Page 2		MATERIAL SPECIFICATION - SERIES 100	
		Rev Jan 1965	
Code	104	106	
Material	Inorganic silicates	Asbestos fiber and sodium silicate	
Material Description	Inorganic silicas and asbestos fibers	Compressed fluffy amosite asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory coating	
Temperature Range	100°F to 1800°F	1200°F max	
K Factor	Block - 500°F - 0.58 max	400°F - 0.54 max 600°F - 0.65 max	
Density	Block - 14 lb per cu ft	20 lb per cu ft max	
Compressive Strength	65 lb per sq in. min at 5% deformation	27 lb per sq in. at 10% deformation - dry	
Manufacturing Process		Formed and comp on mandrel. Pipe mach cut on die	
Resistance to Breakage in Handling	Block must average 3" or greater in drop test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.		
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F	Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Minimum thickness available 1 1/2", also available in pipe covering on special order	Keyle 20° Owens-Corning Corp	Unibestos Pittsburgh Corning Corp	
† Pipe covering only			

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OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SN 100 M
Rev Feb 1964				Page 3
Code	110	111	111.1	
Material	Vegetable cork	Cellular glass	Cellular glass	
Material Description	Vegetable cork, granulated and compressed into cork-board or molded forms, from material of vegetable origin for low and medium temperature insulation.	Cellular glass foamed and fused into unicellular form.	Cellular glass foamed and fused into unicellular form. Factory-applied jacket having white kraft paper outer jacket (60 lb per 3000 sq ft) backed by 0.00035" aluminum foil with fire-resistant adhesive.	
Filler				
Binder	Natural resin in cork			
Temperature Range	-200°F to 100°F	-200°F to 100°F (+300°F for dual temp)	+35°F to +300°F	
K Factor	100°F - 0.29 max	100°F - 0.43 max	100°F - 0.43 max	
Density	9 - 11 lb per cu ft	10 - 11 lb per cu ft	9 lb per cu ft	
Compressive Strength	15 lb per sq in. min	30 lb per sq in. min at 5 percent deformation	30 lb per sq in. min at 5 percent deformation	
Manufacturing Process	Machine comp. or molded. Baked at moderate temp			
Resistance to Breakage in Handling	Good			
Dimensions				
Other Qualifications	Pipe covering shall be coated on the outside with heavy mastic			
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.				
	Cork Armstrong C&S Corp	Foamglas Pittsburgh Corning Corp	Foamglas Stay-Dry Pittsburgh Corning Corp	DUP 0991199
	Cork Munder Cork Co			
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Code	111.2	111.3	112
Material	Cellular glass	Cellular glass	Glass fiber
Material Description	Cellular glass foamed and fused into unicellular form. Factory applied jacket having 0.00035" aluminum foil outer jacket backed by kraft paper (60 lb per 3000 sq ft)	Cellular glass foamed and fused into unicellular form. Plain - without jacket.	See Codes 112.01 through 112.81.
Filler			
Binder			
Temperature Range	+35°F to +300°F	+35°F to +300°F	
K Factor			
Density	9 lb per cu ft	9 lb per cu ft	
Compressive Strength	30 lb per sq in. min at 5 percent deformation	30 lb per sq in. min at 5 percent deformation	
Manufacturing Process			
Resistance to Breakage in Handling			
Dimensions			
Other Qualifications			

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.

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OCTOBER 1954				SN 100 M
MATERIAL SPECIFICATION - SERIES 100				Page 5
Code	112.01	112.02		
Material	Glass fiber	See Code 112.01		
Material Description	Textile-type fine glass fiber pipe and fitting insulation, plain, with medium-temperature binder			
Filler				
Binder	Phenol-formaldehyde or Di-Cy			
Temperature Range	80°F to 350°F			
K Factor	100°F - 0.25			
Density	3" and 6" lb per cu ft			
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.			
Resistance to Breakage in Handling	Very good			
Other Qualifications	Specify whether for iron pipe or copper tubing			
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.				
* Fittings only as follows: For 125-lb cast iron screwed ends and tees Size Thickness 1/2 thru 4 1/2, 1, 1 1/2 For butt-welding long-radius 90° and 45° elbows Size Thickness 2 thru 6 1/2, 1 2 thru 12 1 1/2, 2 Available factory finished with Code 731 "Hypalon" mastic on request	* Ultrafine Snap-on Gustin-Bacon Mfg Co			
	* Mono-Kover Baldwin-Ehret-Hill, Inc			
	* Thermaglas Philip Carey Mfg Co			
	** Fiberglass Owens-Corning Corp			
	** Armaglas PF Pipe Insu Armstrong C&S Corp			
	* Micro-Lok Johns-Manville Sales Corp			
	* FIT-nite Fibrous Glass Products, Inc, Hicksville, NY Crestwood Ind Park, Mountain Top, Pa.			
	* Insul-Sure Insul-Couette Corp Masspath 78, NY			
	* PPG Glass Fiber Pipe Plate Glass Co			
	* Superfine The Ruberoid Co			

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SN 100 M		OCTOBER 1954	
MATERIAL SPECIFICATION - SERIES 100			
Page 6		Rev April 1963	
Code	112.11	112.12	
Material	Glass fiber	See 112.11	
Material Description	Textile type fine glass fiber bonded pipe insulation with 45-lb factory-applied roofing felt finish. Code 701 asbestos felt must be used.		
Filler			
Binder	Phenol-formaldehyde or Di-Cy		
Temperature Range	80°F to 350°F		
K Factor	100°F - 0.25		
Density	3" and 6" lb per cu ft		
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.		
Resistance to Breakage in Handling	Very good		
Dimensions			
Other Qualifications	Specify whether for iron pipe or copper tubing.		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
* Order must specify finish noted under Material Description.	* Ultrafine Snap-on Gustin-Bacon Mfg Co		
	* Mono-Kover Baldwin-Ehret-Hill, Inc		
	* Thermoglas Philip Carey Mfg Co		
	** Fiberglas Owens-Corning Corp		
	** Armaglas PF Pipe Insu Armstrong C&S Corp		
	* Micro-Lot Johns-Manville Sales Corp		
	* PPG Glass Fiber Pitts Plate Glass Co		
	* Superfine The Ruberoid Co		

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MATERIAL SPECIFICATION - SERIES 100

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Code	112.16	112.17	
Material	Glass fiber	Glass fiber	
Material Description	Textile type fine glass fiber banded pipe insulation with 4-oz factory-applied canvas finish.	Textile type fine glass fiber banded pipe insulation with 8-oz factory-applied canvas finish.	
Filler			
Binder	Phenol-formaldehyde or Di-Cy	Phenol-formaldehyde or Di-Cy	
Temperature Range	80°F to 300°F	80°F to 300°F	
K Factor	100°F - 0.25	100°F - 0.25	
Density	3" and 6" lb per cu ft	3" and 6" lb per cu ft	
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.	
Resistance to Breakage in Handling	Very good	Very good	
Dimensions			
Other Qualifications	Specify whether for iron pipe or copper tubing	Specify whether for iron pipe or copper tubing	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
	*Ultrafine Snap-on Gustin-Bacon Mfg Co	*Ultrafine Snap-on Gustin-Bacon Mfg Co	
	*Vona-Kover Baldwin-Ehrst-Hill, Inc	*Vona-Kover Baldwin-Ehrst-Hill, Inc	
	*Thermoglas Philip Carey Mfg Co	*Thermoglas Philip Carey Mfg Co	
	**Fiberglas Owens-Corning Corp	**Fiberglas Owens-Corning Corp	
	**Armoglas PF Pipe Insu Armstrong C&S Corp	**Armoglas PF Pipe Insu Armstrong C&S Corp	
	*Micro-Lok Johns-Manville Sales Corp	*Micro-Lok Johns-Manville Sales Corp	
	*PPG Glass Fiber Pitts Plate Glass Co	*PPG Glass Fiber Pitts Plate Glass Co	
	*Superfine The Ruberoid Co	*Superfine The Ruberoid Co	
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111 00 P F Q R S S T T U U

SN 100 M		OCTOBER 1954
Page 8		Rev. April 1962
MATERIAL SPECIFICATION - SERIES 100		
Code	112.22	
Material	Glass fiber	
Material Description	Preformed pipe covering composed of glass fibers bonded together by inert thermosetting resin with factory-applied 35-lb minimum per 3000 sq ft white bleached kraft paper, laminated to 0.0007" aluminum foil by fire-retardant adhesive (moisture vapor transmission rate shall not exceed 0.015 perms - wet cup test) and reinforced by glass threads in both directions, maximum spacing 1/4". Finish includes lap 2", ± 1/4", long and butt strips 4", ± 1/4", wide. Paper to be creased or embossed sufficiently to conceal wrinkles without requiring excessive lap adhesive to make a tight seal. Type A - one-piece Type B - two-piece	
Filler		
Binder	Phenol-formaldehyde or Di-Cy	
Temperature Range	40°F to 250°F	
K Factor	100°F - 0.25, 250°F - 0.33	
Density	Type A - 3 lb per cu ft min Type B - 4 lb per cu ft min	
Compressive Strength*	Compressive strength and resilience are very low. Inserts are required where pipe is supported by insulation. Type B has more resistance to abuse than Type A.	
Resistance to Breakage in Handling	Very good	
Dimensions	2-ft sections Type A - 1/2", 3/4", 1", 1 1/2", 2", 2 1/2", and 3" thick Type B - 1/2", 1", 1 1/2", 2", and 2 1/2" thick	
Other Qualifications	Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.		
	Ultrafine Snap-on (Type A) Gustin-Bacon Mfg Co	
	Mono-Kover (Type A) Baldwin-Ehren-Mill, Inc	
	Fiberglas (Type A and Type B) Owens-Corning Corp	
	Armoglas PF Pipe Insulation (Type A and Type B) Armstrong C&S Corp	
	Micro-Lok (Type A) John-Manville Sales Corp	
	PPG Glass Fiber (Type A) Pittsburgh Plate Glass Co	
	Superfine (Type A) The Ruberoid Co	
	Thermoglas (Type A) Philip Carey Mfg Co	

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DUP 0991204

OCTOBER 1954

Rev Feb 1964

MATERIAL SPECIFICATION - SERIES 100

SM 100 M

Page 9

Code	112.61		
Material	Glass fiber		
Material Description	Plain semi-rigid board, formed from fibrous glass or mineral fibers.		
Filler			
Binder	Phenol-formaldehyde		
Temperature Range	40°F to 350°F		
K Factor	100°F - 0.25 to 0.30		
Density	6 and 9 lb per cu ft		
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.		
Resistance to Breakage in Handling	Very good		
Dimensions	Std 24" x 48" Thickness PF615 (6-lb density) 1/2" through 3". PF617 (9-lb density), 1/2" through 2 1/4".		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
	Fiberglas PF615 or 617 Insulation Owens-Corning Corp		
	Armaglas PF Insulation Armstrong C&S Corp		
	Spintex No. 414 or 415 Johns-Manville Sales Corp		
	E-Z Ply Duct Insulation Baldwin-Ehret-Hill, Inc		

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SN 100 M		OCTOBER 1954	
(10		MATERIAL SPECIFICATION - SERIES 100	
		Rev April 1963	
Code	112.71		112.81
Material	Glass fiber		Glass fiber
Material Description	Bonded board insulation formed from fibrous glass or mineral fibers, with asphalt and kraft paper vapor-barrier finish.		Bonded acoustical board formed from fibrous glass or mineral fibers with a thin neoprene compound on one surface.
Filler			
Binder	Phenol-formaldehyde		Phenol-formaldehyde
Temperature Range	40°F to 150°F		40°F to 150°F
K Factor	100°F - 0.26		100°F - 0.26
Density	3 and 6 lb per cu ft		6 lb per cu ft
Compressive Strength			
Manufacturing Process	Machine molded		Machine molded
Resistance to Breakage in Handling	Very good		Very good
Dimensions	24" x 48" boards 3/4" to 2" thickness		24" x 48" boards 5/8" to 2" thickness
Other Qualifications	Higher density material is more resistant to abuse		Neoprene coating on side of board exposed to air flow
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
* 3-lb density. High-density outer layers.	Fiberglas Vapor Seal Duct Insu Owens-Corning Corp		Fiberglas Coated Duct Insu Owens-Corning Corp
	Armaglas Vapor Seal Duct Insu Armstrong C&S Corp		Armaglas Coated Duct Insu Armstrong C&S Corp
	Spinas No. 414VS Johns-Manville Sales Corp		Coated Duct Insulation Baldwin-Ehret-Hill, Inc
	E-Z Ply Duct Insu Baldwin-Ehret-Hill, Inc		
	Fiberglass Board™ Gustin-Bacon Mfg Co		

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SN 100 M

OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100

page 12

Rev Feb 1965

Code	118		
Material	Urethane Foam, Rigid		
Material Description	Preformed rigid urethane foam block, pipe, and fitting insulation manufactured with polyester or polyether resins with fluorocarbon blowing agent		
Temperature Range	-270°F to +150°F		
K Factor	0.17 max at 75°F		
Density	1.7 to 2.5 lb per cu ft		
Compressive Strength	Min 30 psi at 6.6% deformation, measured parallel to the direction in which the foam rose during manufacture or min 24 psi at 6.6% deformation in all directions		
Manufacturing Process	Molded or cut from molded billet		
Resistance to Breakage in Handling	Excellent		
Dimensional Tolerances	Inside Diameter (In.)		
	Pipe Size of Insulation ID (In.)	Minimum Diameter (In.)	Maximum Diameter (In.)
	1/2 - 6	IPS OD	IPS OD + 1/16
	7 - 12	IPS OD	IPS OD + 1/8
	14 and up	IPS OD + 1/16	IPS OD + 3/16
	Outside Diameter (In.)		
	Pipe Size of Insulation OD (In.)	Minimum Diameter (In.)	Maximum Diameter (In.)
	1/2 - 6	IPS OD - 1/8	IPS OD - 1/16
	7 - 12	IPS OD - 1/8	IPS OD
	14 and up	IPS OD - 1/16	IPS OD + 1/16
All other dimensions to be $\pm 1/16$ " including straightness and squareness			
Other Qualifications	Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding 1/4". 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 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 60 when coated with PYA mastic 3/32" dry thickness reinforced by 10 x 10 mesh glass cloth, 10 lb per 100 sq yd. Water absorption max 2% by volume into a 2" x 2" x 1" skin-free piece immersed in water just under the surface for 5 days		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
	U-200 Unarco Industries		
	Zerocal NB200 National Gypsum		
	Zerofoam Johns-Manville Sales Corp		
	Thurane FR Dow Chemical Co		

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OCTOBER 1954

Rev June 1963

MATERIAL SPECIFICATION - SERIES 100

SN 100 M

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Code	120		
Material	Polystyrene		
Material Description	Preformed rigid cellular polystyrene block, pipe, and fitting insulation.		
Filler			
Binder			
Temperature Range	-100°F to +160°F		
K Factor	0.29 max at 75°F		
Density	1.7 to 2.3		
Compressive Strength	Min 20 lb per sq in. at 10% deformation		
Manufacturing Process	Cut from molded logs		
Resistance to Breakage in Handling	Excellent		
Dimensions	+ 1/16" - 0" on insulation ID, all other dimensions to be ± 1/16" including straightness and squariness		
Other Qualifications	Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding 1/4". No distortion or volume change, or loss of compressive strength after exposure at 160°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.		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
	Styrofoam 33 MMM Co, Houston, Texas		
	Styrofoam 33 Tufflite Plastics, Inc		

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MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED OCT 1954	SN 100 M Page 1 of 13
		REVISED JAN 1965	
Code	102* &	102.1*	
Material	Calcium silicate	Calcium silicate-inhibited	
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers	
Temperature Range	1200°F max	1200°F max	
K Factor	500°F - 0.60 max	500°F - 0.60 max	
Density	14 lb per cu ft max	14 lb per cu ft max	
Compressive Strength	60 lb per sq in. min at 5% deformation	60 lb per sq in. min at 5% deformation	
Manufacturing Process	Pan molded, precision molded, or filter press molded	Precision molded	
Resistance to Breakage in Handling	Block must average 2" or greater in drop test per ASTM C 487.		
Dimensions	See SN3D	See SN3D	
Other Qualifications		Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Bands are supplied at extra cost. Order must state "without bands" if not required. For 11" 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. † Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications. ‡ Expanded Perlite insulation with fittings available in serrated, welded, and sweat types.	Cal-silite The Ruberoid Co	Thermasil** Baldwin-Ehren-Hill, Inc	
	Kaylo Owens-Corning Corp		
	Thermobestos Johns-Manville Sales Corp		
	Caltemp Fiberboard Paper Products Corp		
	Careytemp † Philip Carey Mfg Co		
	Thermasil** Baldwin-Ehren-Hill, Inc		
** Thermasil is a gray material with longitudinal extrusion marks on block and pipe covering. The ends and no more than one edge of block and the edges and ends of pipe covering will show cutting marks. This material is acceptable in Baldwin-Ehren-Hill printed cartons, not in cartons over labeled with a Baldwin-Ehren-Hill sticker. Armstrong "L-K" cartons with a "B" in the lower left-hand corner of the label will contain acceptable material.			
Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this specification.			

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SN 100 M		OCTOBER 1954	
Page 2		MATERIAL SPECIFICATION - SERIES 100	
		Rev Jan 1965	
Code	104	106	
Material	Inorganic silicates	Asbestos fiber and sodium silicate	
Material Description	Inorganic silicas and asbestos fibers	Compressed fluffy amosite asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory coating	
Temperature Range	100°F to 1800°F	1200°F max	
K Factor	Block - 500°F - 0.58 max	400°F - 0.54 max 600°F - 0.65 max	
Density	Block - 14 lb per cu ft	20 lb per cu ft max	
Compressive Strength	65 lb per sq in. min at 5% deformation	27 lb per sq in. at 10% deformation - dry	
Manufacturing Process		Formed and comp on mandrel. Pipe mach cut on die	
Resistance to Breakage in Handling	Block must average 3" or greater in drop test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.		
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F	Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Minimum thickness available 1 1/2", also available in pipe covering on special order † Pipe covering only	Kevis 20°	Unibestos	
	Owens-Corning Corp	Pittsburgh Corning Corp	

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SN 100 M		OCTOBER 1954	
Page 4		Rev. Feb 1964	
MATERIAL SPECIFICATION - SERIES 100			
Code	111.2	111.3	112
Material	Cellular glass	Cellular glass	Glass fiber
Material Description	Cellular glass foamed and fused into unicellular form. Factory applied jacket having 0.00035" aluminum foil outer jacket backed by kraft paper (60 lb per 3000 sq ft)	Cellular glass foamed and fused into unicellular form. Plain - without jacket.	See Codes 112.01 through 112.81.
Filler			
Binder			
Temperature Range	+35°F to +300°F	+35°F to +300°F	
K Factor			
Density	9 lb per cu ft	9 lb per cu ft	
Compressive Strength	30 lb per sq in. min at 5 percent deformation	30 lb per sq in. min at 5 percent deformation	
Manufacturing Process			
Resistance to Breakage in Handling			
Dimensions			
Other Qualifications			
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
	Foamglas Stay-Dry Pittsburgh Corning Corp	Foamglas Stay-Dry Pittsburgh Corning Corp	
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OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100

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Code	112.01	112.02	
Material	Glass fiber	See Code 112.01	
Material Description	Textile-type fine glass fiber pipe and fitting insulation, plain, with medium-temperature binder		
Filler			
Binder	Phenol-formaldehyde or Di-Cy		
Temperature Range	80°F to 350°F		
K Factor	100°F - 0.25		
Density	3" and 6" lb per cu ft		
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.		
Resistance to Breakage in Handling	Very good		
Other Qualifications	Specify whether for iron pipe or copper tubing		

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.

* Fittings only as follows:

For 125-lb cast iron screwed ends and tees

Size	Thickness
1/2 thru 6	1/2, 1, 1 1/2
8	1 only

For butt-welding long-radius 90° and 45° elbows

Size	Thickness
2 thru 6	1/2, 1
2 thru 12	1 1/2, 2

Available factory finished with Code 731 "Hypalon" mastic on request

* Ultrafine Snap-on
Gustin-Bacon Mfg Co

* Mono-Kover
Daldwin-Ehrer-Hill, Inc

* Thermaglas
Philip Carey Mfg Co

* Fiberglas
Owens-Corning Corp

* Armaglas PF Pipe Insul
Armstrong C&S Corp

* Micro-Lok
Johns-Manville Sales Corp

* Insul-Sure
Insul-Coastic Corp
Massena 78, NY

* PPG Glass Fiber
Pitts Plate Glass Co

* Superfine
The Ruberoid Co

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SN 100 M		OCTOBER 1954	
Page 6		MATERIAL SPECIFICATION - SERIES 100	
		Rev April 1963	
Code	112.11	112.12	
Material	Glass fiber	See 112.11	
Material Description	Textile type fine glass fiber bonded pipe insulation with 45-lb factory-applied roofing felt finish. Code 701 asbestos felt must be used.		
Filler			
Binder	Phenol-formaldehyde or Di-Cy		
Temperature Range	80°F to 350°F		
K Factor	100°F - 0.25		
Density	3" and 6" lb per cu ft		
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.		
Resistance to Breakage in Handling	Very good		
Dimensions			
Other Qualifications	Specify whether for iron, pipe or copper tubing.		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
* Order must specify finish noted under Material Description.	* Ultrafine Snap-on Gustin-Bacon Mfg Co		
	* Vene-Kover Baldwin-Ehrst-Mill, Inc		
	* Thermoglas Philip Corey Mfg Co		
	** Fiberglas Owens-Corning Corp		
	** Armaglas PF Pipe Insu Armstrong C&S Corp		
	* Micro-Lol* Johns-Manville Sales Corp		
	* PPG Glass Fiber Pitts Plate Glass Co		
	* Superfine The Ruberoid Co		

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OCTOBER 1954			
MATERIAL SPECIFICATION - SERIES 100			
Rev. March 1962			
Page 7			
Code	112.16	112.17	
Material	Glass fiber	Glass fiber	
Material Description	Textile type fine glass fiber banded pipe insulation with 4-oz factory-applied canvas finish.	Textile type fine glass fiber banded pipe insulation with 8-oz factory-applied canvas finish.	
Filler			
Binder	Phenol-formaldehyde or Di-Cy	Phenol-formaldehyde or Di-Cy	
Temperature Range	80°F to 300°F	80°F to 300°F	
K Factor	100°F - 0.25	100°F - 0.25	
Density	3" and 6" lb per cu ft	3" and 6" lb per cu ft	
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.	
Resistance to Breakage in Handling	Very good	Very good	
Dimensions			
Other Qualifications	Specify whether for iron pipe or copper tubing	Specify whether for iron pipe or copper tubing	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
	*Ultrafine Snap-on Gustin-Bacon Mfg Co	*Ultrafine Snap-on Gustin-Bacon Mfg Co	
	*Mono-Kover Baldwin-Ehrst-Hill, Inc	*Mono-Kover Baldwin-Ehrst-Hill, Inc	
	*Thermoglas Philip Carey Mfg Co	*Thermoglas Philip Carey Mfg Co	
	**Fiberglas Owens-Corning Corp	**Fiberglas Owens-Corning Corp	
	**Armoglas PF Pipe Insu Armstrong C&S Corp	**Armoglas PF Pipe Insu Armstrong C&S Corp	
	*Micro-Lok Johns-Manville Sales Corp	*Micro-Lok Johns-Manville Sales Corp	
	*PPG Glass Fiber Pitts Plate Glass Co	*PPG Glass Fiber Pitts Plate Glass Co	
	*Superfine The Ruberoid Co	*Superfine The Ruberoid Co	

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SN 100 M		OCTOBER 1954
Page 8		Rev April 1963
MATERIAL SPECIFICATION - SERIES 100		
Code	112.22	
Material	Glass fiber	
Material Description	Preformed pipe covering composed of glass fibers bonded together by inert thermosetting resin with factory-applied 35-lb minimum per 3000 sq ft white bleached kraft paper, laminated to 0.0007" aluminum foil by firewater-resistant adhesive (moisture vapor transmission rate shall not exceed 0.015 perms - wet cup test) and reinforced by glass threads in both directions, maximum spacing 1/8". Finish includes lap 2", 2 1/4", long and butt strips 4", 2 1/4", wide. Paper to be creased or embossed sufficiently to conceal wrinkles without requiring excessive lap adhesive to make a tight seal. Type A - one-piece Type B - two-piece	
Filler		
Binder	Phenol-formaldehyde or Di-Cy	
Temperature Range	40°F to 250°F	
K Factor	100°F - 0.25, 250°F - 0.33	
Density	Type A - 3 lb per sq ft min Type B - 6 lb per sq ft min	
Compressive Strength*	Compressive strength and resilience are very low. Inserts are required where pipe is supported by insulation. Type B has more resistance to abuse than Type A.	
Resistance to Breakage in Handling	Very good	
Dimensions	3-ft sections Type A - 1/2", 3/4", 1", 1 1/2", 2", 2 1/2", and 3" thick Type B - 1/2", 1", 1 1/2", 2", and 2 1/2" thick	
Other Qualifications	Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.		
	Ultrafine Snap-on (Type A) Gustin-Bacon Mfg Co	
	Mono-Kover (Type A) Baldwin-Ehren-Mill, Inc	
	Fiberglas (Type A and Type B) Owens-Corning Corp	
	Armoglas PF Pipe Insulation (Type A and Type B) Armstrong C&S Corp	
	Micro-Lok (Type A) John-Manville Sales Corp	
	PPG Glass Fiber (Type A) Pittsburgh Plate Glass Co	
	Superfine (Type A) The Ruberoid Co	
	Thermoglas (Type A) Philip Carey Mfg Co	

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OCTOBER 1954			
MATERIAL SPECIFICATION - SERIES 100			
Rev Feb 1964			
SN 100 M			
Page 9			
Code	112.61		
Material	Glass fiber		
Material Description	Plain semi-rigid board, formed from fibrous glass or mineral fibers.		
Filler			
Binder	Phenol-formaldehyde		
Temperature Range	40°F to 350°F		
K Factor	100°F - 0.25 to 0.30		
Density	6 and 9 lb per cu ft		
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.		
Resistance to Breakage in Handling	Very good		
Dimensions	Std 24" x 48" Thickness PF615 (6-lb density) 1/2" through 3". PF617 (9-lb density), 1/2" through 2 1/4".		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
	Fiberglas PF615 or 617 Insulation Owens-Corning Corp		
	Armaglas PF Insulation Armstrong C&S Corp		
	Spinex No. 414 or 415 Johns-Manville Sales Corp		
	E-Z Ply Duct Insulation Baldwin-Ehret-Mill, Inc		

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SN 100 M		OCTOBER 1954	
MATERIAL SPECIFICATION - SERIES 100		Rev April 1963	
Code	112.71		112.81
Material	Glass fiber		Glass fiber
Material Description	Bonded board insulation formed from fibrous glass or mineral fibers, with asphalt and kraft paper vapor-barrier finish.		Bonded acoustical board formed from fibrous glass or mineral fibers with a thin neoprene compound on one surface.
Filler			
Binder	Phenol-formaldehyde		Phenol-formaldehyde
Temperature Range	40°F to 150°F		40°F to 150°F
K Factor	100°F - 0.26		100°F - 0.26
Density	3 and 6 lb per cu ft		6 lb per cu ft
Compressive Strength			
Manufacturing Process	Machine molded		Machine molded
Resistance to Breakage in Handling	Very good		Very good
Dimensions	24" x 48" boards 3/4" to 2" thickness		24" x 48" boards 5/8" to 2" thickness
Other Qualifications	Higher density material is more resistant to abuse		Neoprene coating on side of board exposed to air flow
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
* 3-lb density. High-density outer layers.	Fiberglas Vapor Seal Duct Insu Owens-Corning Corp		Fiberglas Coated Duct Insu Owens-Corning Corp
	Armaglas Vapor Seal Duct Insu Armstrong C&S Corp		Armaglas Coated Duct Insu Armstrong C&S Corp
	Spinses No. 414VS Johns-Manville Sales Corp		Coated Duct Insulation Baldwin-Ehret-Hill, Inc
	E-2 Ply Duct Insu Baldwin-Ehret-Hill, Inc		
	Fiberglass Board* Gustin-Bacon Mfg Co		

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OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SN 100 M
Rev Aug 1964				Page 11
Cats		114		
Material		Mineral wool (Black only)		
Material Description		Mineral slag wool		
Filler				
Binder		High temp binder		
Temperature Range		500°F to 1700°F		
K Factor		500°F - 0.45 max		
Density		19.2 lb per cu ft		
Compressive Strength		12 lb per sq in.		
Manufacturing Process		Machine molded		
Resistance to Breakage in Handling		Good		
Dimensions				
Other Qualifications				
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.				
		PV Supertemp Eagle-Picher		
		Mono-Block Baldwin-Ehrer-Hill, Inc		
		Armastemp Armstrong C&S Corp		
		M V Block M. H. Detrick Co		

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SN 100 M		OCTOBER 1954	
Page 12		Rev Feb 1965	
Code		118	
Material		Urethane Foam, Rigid	
Material Description		Preformed rigid urethane foam block, pipe, and fitting insulation manufactured with polyester or polyether resins with fluorocarbon blowing agent	
Temperature Range		-270°F to +150°F	
K Factor		0.17 max at 75°F	
Density		1.7 to 2.5 lb per cu ft	
Compressive Strength		Min 30 psi at 6.6% deformation, measured parallel to the direction in which the foam rose during manufacture or min 24 psi at 6.6% deformation in all directions	
Manufacturing Process		Molded or cut from molded billet	
Resistance to Breakage in Handling		Excellent	
Dimensional Tolerances	Inside Diameter (In.)		
	Pipe Size of Insulation ID (In.)	Minimum Diameter (In.)	Maximum Diameter (In.)
	1/2 - 6	IPS OD	IPS OD + 1/16
	7 - 12	IPS OD	IPS OD + 1/8
	14 and up	IPS OD + 1/16	IPS OD + 3/16
	Outside Diameter (In.)		
	Pipe Size of Insulation OD (In.)	Minimum Diameter (In.)	Maximum Diameter (In.)
	1/2 - 6	IPS OD - 1/8	IPS OD - 1/16
	7 - 12	IPS OD - 1/8	IPS OD
	14 and up	IPS OD - 1/16	IPS OD + 1/16
All other dimensions to be ± 1/16" including straightness and squareness			
Other Qualifications		Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding 1/4". 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 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 60 when coated with PVA mastic 3/32" dry thickness reinforced by 10 x 10 mesh glass cloth, 10 lb per 100 sq yd. Water absorption max 2% by volume into a 2" x 2" x 1" skin-free piece immersed in water just under the surface for 5 days	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
		U-200 Unarco Industries	
		Zerocel NB200 National Gypsum	
		Zerofoam Johns-Manville Sales Corp	
		Thurane FR Dow Chemical Co	

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OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100

SN 100 M

Rev June 1963

Page 13

Code	120		
Material	Polystyrene		
Material Description	Preformed rigid cellular polystyrene block, pipe, and fitting insulation.		
Filler			
Binder			
Temperature Range	-100°F to +160°F		
K Factor	0.29 max at 75°F		
Density	1.7 to 2.3		
Compressive Strength	Min 20 lb per sq in. at 10% deformation		
Manufacturing Process	Cut from molded logs		
Resistance to Breakage in Handling	Excellent		
Dimensions	+ 1/16" - 0" on insulation ID, all other dimensions to be ± 1/16" including straightness and squareness		
Other Qualifications	Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding 1/8". No distortion or volume change, or loss of compressive strength after exposure at 160°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.		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
	Styrofoam 33		
	MMM Co, Houston, Texas		
	Styrofoam 33		
	Tufflite Plastics, Inc		

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MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED OCT 1954	SN 100 M
		REVISED OCT 1965	Page 1 of 13
Code	102* 0	102.1*	
Material	Calcium silicate	Calcium silicate-inhibited	
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers	
Temperature Range	1200°F max	1200°F max	
K Factor	500°F - 0.60 max	500°F - 0.60 max	
Density	14 lb per cu ft max	14 lb per cu ft max	
Compressive Strength	60 lb per sq in. min at 5% deformation	60 lb per sq in. min at 5% deformation	
Manufacturing Process	Pan molded, precision molded, or filter press molded	Precision molded	
Resistance to Breakage in Handling	Block must average 2" or greater in drop test per ASTM C 487.		
Dimensions	See SN3D	See SN3D	
Other Qualifications		Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Bands are supplied at extra cost. Order must state "without bands" if not required. For 11" 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. † Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications. ‡ Expanded Perlite insulation. Molded two-piece fitting covers are available in screwed, welded, and sweat types.	Calasilite	Thermasil**	
	The Ruberoid Co	Baldwin-Ehret-Hill, Inc	
	Keylo		
	Owens-Corning Corp		
	Thermobestos		
	Johns-Manville Sales Corp		
† Expanded Perlite insulation. Molded two-piece fitting covers are available in screwed, welded, and sweat types.	Caltemp		
	Fiberboard Paper Products Corp		
	Caretemp †		
	Philip Carey Mfg Co		
	Thermasil**		
	Baldwin-Ehret-Hill, Inc		
** Thermasil is a gray material with longitudinal extrusion marks on block and pipe covering. The ends and no more than one edge of block and the edges and ends of pipe covering will show cutting marks. This material is acceptable in Baldwin-Ehret-Hill printed cartons, not in cartons ever labeled with a Baldwin-Ehret-Hill sticker. Armstrong "L-K" cartons with a "B" in the lower left-hand corner of the label will contain acceptable material.			

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

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SN 100 M		OCTOBER 1954	
Page 2		MATERIAL SPECIFICATION - SERIES 100	
		Rev Jan 1965	
Code	104	106	
Material	Inorganic silicates	Asbestos fiber and sodium silicate	
Material Description	Inorganic silicas and asbestos fibers	Compressed fluffy amosite asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory casting	
Temperature Range	100°F to 1800°F	1200°F max	
K Factor	Block - 500°F - 0.58 max	400°F - 0.54 max 600°F - 0.65 max	
Density	Block - 14 lb per cu ft	20 lb per cu ft max	
Compressive Strength	65 lb per sq in. min at 5% deformation	27 lb per sq in. at 10% deformation - dry	
Manufacturing Process		Formed and cased on mandrel. Pipe mach cut on die	
Resistance to Breakage in Handling	Block must average 3" or greater in drop test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.		
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F	Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Minimum thickness available 1 1/2", also available in pipe covering on special order † Pipe covering only	Kavlo 20*	Unibestos	
	Owens-Corning Corp	Pittsburgh Corning Corp	

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OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SM 100 M
Rev Feb 1964				Page 3
Code	110	111	111.1	
Material	Vegetable cork	Cellular glass	Cellular glass	
Material Description	Vegetable cork, granulated and compressed into cork-board or molded forms, from material of vegetable origin for low and medium temperature insulation.	Cellular glass foamed and fused into unicellular form.	Cellular glass foamed and fused into unicellular form. Factory-applied jacket having white kraft paper outer jacket '60 lb per 3000 sq ft) backed by 0.00035" aluminum foil with fire-resistant adhesive.	
Filler				
Binder	Natural resin in cork			
Temperature Range	-200°F to 100°F	-200°F to 100°F (+300°F for dual temp)	+35°F to +300°F	
K Factor	100°F - 0.29 max	100°F - 0.43 max	100°F - 0.43 max	
Density	9 - 11 lb per cu ft	10 - 11 lb per cu ft	9 lb per cu ft	
Compressive Strength	15 lb per sq in. min	30 lb per sq in. min at 5 percent deformation	30 lb per sq in. min at 5 percent deformation	
Manufacturing Process	Machine comp. or molded. Baked at moderate temp.			
Resistance to Breakage in Handling	Good			
Dimensions				
Other Qualifications	Pipe covering shall be coated on the outside with heavy mastic			
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers met their product meets the above specifications.				
	Cork Armstrong C&S Corp	Foamglas Pittsburgh Corning Corp	Foamglas Star-Dry Pittsburgh Corning Corp	
	Cork Munder Cork Co			
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SN 100 M
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MATERIAL SPECIFICATION - SERIES 100

OCTOBER 1954
 Rev. Feb. 1964

Code	111.2	111.3	112
Material	Cellular glass	Cellular glass	Glass fiber
Material Description	Cellular glass foamed and fused into unicellular form. Factory applied jacket having 0.00035" aluminum foil outer jacket backed by kraft paper (60 lb per 3000 sq ft)	Cellular glass foamed and fused into unicellular form. Plain - without jacket.	See Codes 112.01 through 112.81.
Filler			
Binder			
Temperature Range	+35°F to +300°F	+35°F to +300°F	
K Factor			
Density	9 lb per cu ft	9 lb per cu ft	
Compressive Strength	30 lb per sq in. min at 5 percent deformation	30 lb per sq in. min at 5 percent deformation	
Manufacturing Process			
Resistance to Breakage in Handling			
Dimensions			
Other Qualifications			
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
	Foamglas Stay-Dry Pittsburgh Corning Corp	Foamglas Stay-Dry Pittsburgh Corning Corp	

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OCTOBER 1954

SM 100 M

Rev March 1965

MATERIAL SPECIFICATION - SERIES 100

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Code	112.01	112.02	
Material	Glass fiber	See Code 112.01	
Material Description	Textile-type fine glass fiber pipe and fitting insulation, plain, with medium-temperature binder		
Filler			
Binder	Phenol-formaldehyde or Di-Cy		
Temperature Range	80°F to 350°F		
K Factor	100°F - 0.25		
Density	3" and 6" lb per cu ft		
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.		
Resistance to Breakage in Handling	Very good		
Other Qualifications	Specify whether for iron pipe or copper tubing		

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.

* Fittings only as follows:

For 125-lb cast iron screwed ends and tees

Size Thickness
1/2 thru 6 1/2, 1, 1 1/2
8 1 only

For butt-welding long-radius 90° and 45° elbows

Size Thickness
2 thru 6 1/2, 1
2 thru 12 1 1/2, 2

Available factory finished with Code 731 "Hypalon" mastic on request

* Ultrafine Snap-on
Gustin-Bacan Mfg Co

* Mono-Kover
Baldwin-Ehrert-Hill, Inc

* Thermoglas
Philip Carey Mfg Co

* Fiberglas
Owens-Corning Corp

* Armaglas PF Pipe Insul
Armstrong C&S Corp

* Micro-Lok
Johns-Manville Sales Corp

* Insul-Dure
Insul-Caustic Corp
Maspoth 78, NY

* PPG Glass Fiber
Pitts Plate Glass Co

* Superfine
The Ruberoid Co

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SN 100 M		OCTOBER 1954	
Page 6		MATERIAL SPECIFICATION - SERIES 100	
		Rev April 1963	
Code	112.11	112.12	
Material	Glass fiber	See 112.11	
Material Description	Textile type fine glass fiber bonded pipe insulation with 45-lb factory-applied roofing felt finish. Code 701 asbestos felt must be used.		
Filler			
Binder	Phenol-formaldehyde or Di-Cy		
Temperature Range	80°F to 350°F		
K Factor	100°F = 0.25		
Density	3" and 6" lb per cu ft		
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.		
Resistance to Breakage in Handling	Very good		
Dimensions			
Other Qualifications	Specify whether for iron pipe or copper tubing.		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
* Order must specify finish noted under Material Description.	* Ultrafine Snap-on Gustin-Bacon Mfg Co		
	* Mono-Kover Baldwin-Ehret-Mill, Inc		
	* Thermoglas Philip Carey Mfg Co		
	** Fiberglas Owens-Corning Corp		
	** Armaglas PF Pipe Insu Armstrong C&S Corp		
	* Micro-Lot Johns-Manville Sales Corp		
	* PPG Glass Fiber Pints Plate Glass Co		
	* Superfine The Ruberoid Co		



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OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100

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Code	112.16	112.17	
Material	Glass fiber	Glass fiber	
Material Description	Textile type fine glass fiber bonded pipe insulation with 4-oz factory-applied canvas finish.	Textile type fine glass fiber bonded pipe insulation with 8-oz factory-applied canvas finish.	
Filler			
Binder	Phenol-formaldehyde or Di-Cy	Phenol-formaldehyde or Di-Cy	
Temperature Range	80°F to 300°F	80°F to 300°F	
K Factor	100°F - 0.25	100°F - 0.25	
Density	3" and 6" lb per cu ft	3" and 6" lb per cu ft	
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.	
Resistance to Breakage in Handling	Very good	Very good	
Dimensions			
Other Qualifications	Specify whether for iron pipe or copper tubing	Specify whether for iron pipe or copper tubing	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
	*Ultrafine Snap-on Gustin-Bacon Mfg Co	*Ultrafine Snap-on Gustin-Bacon Mfg Co	
	*Mono-Kover Baldwin-Ehrer-Hill, Inc	*Mono-Kover Baldwin-Ehrer-Hill, Inc	
	*Thermoglas Philip Carey Mfg Co	*Thermoglas Philip Carey Mfg Co	
	**Fiberglas Owens-Corning Corp	**Fiberglas Owens-Corning Corp	
	**Armoglas PF Pipe Insu Armstrong C&S Corp	**Armoglas PF Pipe Insu Armstrong C&S Corp	
	*Micro-Lok Johns-Manville Sales Corp	*Micro-Lok Johns-Manville Sales Corp	
	*PPG Glass Fiber Pitts Plate Glass Co	*PPG Glass Fiber Pitts Plate Glass Co	
	*Superfine The Ruberoid Co	*Superfine The Ruberoid Co	



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SM 100 M		OCTOBER 1954
MATERIAL SPECIFICATION - SERIES 100		
Page 8		Rev April 1963
Code	112.22	
Material	Glass fiber	
Material Description	Preformed pipe covering composed of glass fibers bonded together by inert thermosetting resin with factory-applied 35-lb minimum per 3000 sq ft white bleached kraft paper, laminated to 0.0007" aluminum foil by firewater-resistant adhesive (moisture vapor transmission rate shall not exceed 0.215 perms - wet cup test) and reinforced by glass threads in both directions, maximum spacing 1/4". Finish includes lap 2", 3/4", long and butt strips 4", 3/4", wide. Paper to be craped or embossed sufficiently to conceal wrinkles without requiring excessive lap adhesive to make a tight seal. Type A - one-piece Type B - two-piece	
Filler		
Binder	Phenol-formaldehyde or Di-Cy	
Temperature Range	40°F to 250°F	
K Factor	100°F - 0.25, 250°F - 0.33	
Density	Type A - 3 lb per cu ft min Type B - 6 lb per cu ft min	
Compressive Strength*	Compressive strength and resilience are very low. Inserts are required where pipe is supported by insulation. Type B has more resistance to abuse than Type A.	
Resistance to Breakage in Handling	Very good	
Dimensions	3-ft sections Type A - 1/2", 3/4", 1", 1 1/2", 2", 2 1/2", and 3" thick Type B - 1/2", 1", 1 1/2", 2", and 2 1/2" thick	
Other Qualifications	Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.		
	Ultrafine Snap-on (Type A) Gustin-Beacon Mfg Co	
	Mono-Kover (Type A) Baldwin-Ehrst-Mill, Inc	
	Fiberglas (Type A and Type B) Owens-Corning Corp	
	Armoglas PP Pipe Insulation (Type A and Type B) Armstrong C&S Corp	
	Micro-Lok (Type A) Johns-Manville Sales Corp	
	PPG Glass Fiber (Type A) Pittsburgh Plate Glass Co	
	Superfine (Type A) The Rubenoid Co	
	Thermoglas (Type A) Philip Carey Mfg Co	

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MATERIAL SPECIFICATION - SERIES 100

SM 100 M

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Code	112.61		
Material	Glass fiber		
Material Description	Plain semi-rigid board, formed from fibrous glass or mineral fibers.		
Filler			
Binder	Phenol-formaldehyde		
Temperature Range	40°F to 350°F		
K Factor	100°F - 0.25 to 0.30		
Density	6 and 9 lb per cu ft		
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.		
Resistance to Breakage in Handling	Very good		
Dimensions	Std. 24" x 48" Thickness PF615 (6-lb density) 1/2" through 3". PF617 (9-lb density), 1/2" through 2 1/4".		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
	Fiberglas PF615 or 617 Insulation Owens-Corning Corp		
	Armaglas PF Insulation Armstrong C&S Corp		
	Spinex No. 414 or 415 Johns-Manville Sales Corp		
	E-Z Ply Duct Insulation Baldwin-Ehret-Hill, Inc		

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SN 100 M		OCTOBER 1954	
(10		Rev April 1963	
MATERIAL SPECIFICATION - SERIES 100			
Code	112.71		112.81
Material	Glass fiber		Glass fiber
Material Description	Bonded board insulation formed from fibrous glass or mineral fibers, with asphalt and kraft paper vapor-barrier finish.		Bonded acoustical board formed from fibrous glass or mineral fibers with a thin neoprene compound on one surface.
Filler			
Binder	Phenol-formaldehyde		Phenol-formaldehyde
Temperature Range	40°F to 150°F		40°F to 150°F
K Factor	100°F - 0.26		100°F - 0.26
Density	3 and 6 lb per cu ft		6 lb per cu ft
Compressive Strength			
Manufacturing Process	Machine molded		Machine molded
Resistance to Breakage in Handling	Very good		Very good
Dimensions	24" x 48" boards 3/4" to 2" thickness		24" x 48" boards 5/8" to 2" thickness
Other Qualifications	Higher density material is more resistant to abuse		Neoprene coating on side of board exposed to air flow
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
* 3-lb density. High-density outer layers.	Fiberglas Vapor Seal Duct Insu Owens-Corning Corp		Fiberglas Coated Duct Insu Owens-Corning Corp
	Armoglas Vapor Seal Duct Insu Armstrong C&S Corp		Armoglas Coated Duct Insu Armstrong C&S Corp
	Spintex No. 614VS Johns-Manville Sales Corp		Coated Duct Insulation Baldwin-Ehret-Hill, Inc
	E-Z Ply Duct Insu Baldwin-Ehret-Hill, Inc		
	Fiberglass Board" Gustin-Bacon Mfg Co		

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OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SN 100 M
Rev Aug 1964				Page 11
Code		114		
Material		Mineral wool (Black only)		
Material Description		Mineral slag wool		
Filler				
Binder		High temp binder		
Temperature Range		500°F to 1700°F		
K Factor		500°F - 0.45 max		
Density		19.2 lb per cu ft		
Compressive Strength		12 lb per sq in.		
Manufacturing Process		Machine molded		
Resistance to Breakage in Handling		Good		
Dimensions				
Other Qualifications				
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.				
		PV Superemp Eagle-Picher		
		Mono-Block Baldwin-Ehret-Mill, Inc		
		Armasep Armstrong C&S Corp		
		M V Block M. H. Detrick Co		
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SN 100 M		OCTOBER 1954	
Page 12		MATERIAL SPECIFICATION - SERIES 100	
		Rev Oct 1963	
Code	118		
Material	Urethane Foam, Rigid		
Material Description	Preformed rigid urethane foam block, pipe, and fitting insulation manufactured with polyester or polyether resins with fluorocarbon blowing agent		
Temperature Range	-270°F to +150°F		
K Factor	0.17 max at 75°F		
Density	1.7 to 2.5 lb per cu ft		
Compressive Strength	Min 30 psi at 6.6% deformation, measured parallel to the direction in which the foam rose during manufacture or min 24 psi at 6.6% deformation in all directions		
Manufacturing Process	Molded or cut from molded billet		
Resistance to Breakage in Handling	Excellent		
Dimensional Tolerances	Inside Diameter (In.)		
	Pipe Size of Insulation ID (In.)	Minimum Diameter (In.)	Maximum Diameter (In.)
	1/2 - 6	IPS OD	IPS OD + 1/16
	7 - 12	IPS OD	IPS OD + 1/8
	14 and up	IPS OD + 1/16	IPS OD + 3/16
	Outside Diameter (In.)		
	Pipe Size of Insulation OD (In.)	Minimum Diameter (In.)	Maximum Diameter (In.)
	1/2 - 6	IPS OD - 1/8	IPS OD - 1/16
	7 - 12	IPS OD - 1/8	IPS OD
	14 and up	IPS OD - 1/16	IPS OD + 1/16
All other dimensions to be $\pm 1/16$ " including straightness and squareness			
Other Qualifications	Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding 1/4". 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 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 60 when coated with PVA mastic 3/32" 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 5 days and then wiped with a wet cloth and weighed, with no delay between steps.		
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 only as two-piece sectional fittings for 90-degree elbows and tees.	U-200		
	Unarco Industries		
	Zerocel NB 200		
	National Gypsum		
	Thurane FR		
	Dow Chemical Co		
	Foamthane FR		
	Pittsburgh-Corning		
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OCTOBER 1954

Rev Oct 1945

MATERIAL SPECIFICATION - SERIES 100

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Code	120		
Material	Polystyrene		
Material Description	Preformed rigid cellular polystyrene block, pipe, and fitting insulation		
Filler			
Binder			
Temperature Range	- 100°F to + 160°F		
K Factor	0.29 max at 75°F		
Density	1.7 to 2.3		
Compressive Strength	Min 20 lb per sq in. at 10% deformation		
Manufacturing Process	Cut from molded logs		
Resistance to Breakage in Handling	Excellent		
Dimensions	+ 1/16" - 0" on insulation ID, all other dimensions to be ± 1/16" including straightness and squareness		
Other Qualifications	Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding 1/4". No distortion or volume change, or loss of compressive strength after exposure at 160°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		
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 as two-piece sectional fittings for 90-degree elbows and tees	Styrofoam Blue® MMM Co, Houston Texas		
	Styrofoam Blue® Unicell Products, Inc		
	Styrofoam Blue® Styro Fabricators, Inc		
		797	

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MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED	SN 100 M Page 1 of 13
		OCT 1954	
		REVISED	
		OCT 1965	
Code	102* †	102.1*	
Material	Calcium silicate	Calcium silicate-inhibited.	
Material Description	Reacted hydrous calcium silicate reinforced with mineral fibers	Reacted hydrous calcium silicate with inhibitor for chloride stress corrosion cracking and reinforced with mineral fibers	
Temperature Range	1200°F max	1200°F max	
K Factor	500°F - 0.60 max	500°F - 0.60 max	
Density	14 lb per cu ft max	14 lb per cu ft max	
Compressive Strength	60 lb per sq in. min at 5% deformation	60 lb per sq in. min at 5% deformation	
Manufacturing Process	Pan molded, precision molded, or filter press molded	Precision molded	
Resistance to Breakage in Handling	Block must average 2" or greater in drop test per ASTM C 487.		
Dimensions	See SN3D	See SN3D	
Other Qualifications		Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Bands are supplied at extra cost. Order must state "without bands" if not required. For 11" 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. † Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications. * Expanded Perlite insulation. Molded two-piece fitting covers are available in screwed, welded, and sweat types.	Calisite The Ruberoid Co	Thermasil** Baldwin-Ehrst-Hill, Inc	
	Kaylo Owens-Corning Corp		
	Thermobestos Johns-Manville Sales Corp		
	Caltemp Fiberboard Paper Products Corp		
	Careytemp † Philip Carey Mfg Co		
	Thermasil** Baldwin-Ehrst-Hill, Inc		
** Thermasil is a gray material with longitudinal extrusion marks on block and pipe covering. The ends and no more than one edge of block and the edges and ends of pipe covering will show cutting marks. This material is acceptable in Baldwin-Ehrst-Hill printed cartons, not in cartons over labeled with a Baldwin-Ehrst-Hill sticker. Armstrong "L-K" cartons with a "B" in the lower left-hand corner of the label will contain acceptable material.			
Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this specification.			

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SN 100 M		OCTOBER 1954	
Page 2		MATERIAL SPECIFICATION - SERIES 100	
		Rev Jan 1965	
Code	104	106	
Material	Inorganic silicates	Asbestos fiber and sodium silicate	
Material Description	Inorganic silicas and asbestos fibers	Compressed fluffy amosite asbestos fiber sprayed with sodium silicate to form a mat containing a minimum of 20% sodium silicate by weight. Asbestos mat is then sprinkled with diatomaceous earth to provide an integral refractory coating	
Temperature Range	100°F to 1800°F	1200°F max	
K Factor	Block - 500°F - 0.58 max	400°F - 0.54 max 600°F - 0.65 max	
Density	Block - 14 lb per cu ft	20 lb per cu ft max	
Compressive Strength	65 lb per sq in. min at 5% deformation	27 lb per sq in. at 10% deformation - dry	
Manufacturing Process		Formed and came on mandrel. Pipe mach cut on die	
Resistance to Breakage in Handling	Block must average 3" or greater in drop test per ASTM C 487, tentative method of test for resistance to dropping of preformed block thermal insulation.		
Other Qualifications	Good mechanical strength. Shrinkage less than 2% at 1600°F	Formed on a mandrel to a predetermined weight. Pressed to obtain the desired density, and baked. Stressed Type 304 stainless steel U-bend specimens at 100°C, when in contact with this insulating material in the Du Pont wick 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 product meets the above specifications.			
* Minimum thickness available 1 1/2", also available in pipe covering on special order † Pipe covering only	Kevlar 30*	Unibestos	
	Owens-Corning Corp	Pittsburgh Corning Corp	

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OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SN 100 M
Rev June 1966				Page 1
Code	110	111	111.1	
Material	See Codes 111, 118, or 120	Cellular glass	See Code 111	
Material Description		Cellular glass foamed and fused into unicellular form		
Filler				
Binder				
Temperature Range		-200 F to 100 F (+300 F for dual temp)		
K Factor		100 F -0.43 max		
Density		10 - 11 lb per cu ft		
Compressive Strength		30 lb per sq in. min at 5 percent deformation		
Manufacturing Process				
Resistance to Breakage in Handling				
Dimensions				
Other Qualifications				
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.				
		Foamglas Pittsburgh Corning Corp		
		800		

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SN 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954
Page 4				Rev June 1966
Code	111.2	111.3	112	
Material	See Code 111	See Code 111	Glass fiber	
Material Description			See Codes 112.01 through 112.81	
Filler				
Binder				
Temperature Range				
K Factor				
Density				
Compressive Strength				
Manufacturing Process				
Resistance to Breakage in Handling				
Dimensions				
Other Qualifications				
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.				

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MATERIAL SPECIFICATION - SERIES 100

Page 5

Code	112.01	112.02	
Material	Glass fiber	See Code 112.01	
Material Description	Textile-type fine glass fiber pipe and fitting insulation, plain, with medium-temperature binder		
Filler			
Binder	Phenol-formaldehyde or Di-Cy		
Temperature Range	80°F to 350°F		
K Factor	100°F - 0.25		
Density	3" and 6" 1b per cu ft		
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.		
Resistance to Breakage in Handling	Very good		
Other Qualifications	Specify whether for iron pipe or copper tubing		

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.

* Fittings only as follows:

For 125-lb cast iron
screwed ends and tees

Size	Thickness
1/2 thru 6	1/2, 1, 1 1/2
8	1 only

For butt-welding long-
radius 90° and 45° elbows

Size	Thickness
2 thru 6	1/2, 1
2 thru 12	1 1/2, 2

Available factory finished
with Code 731 "Hypalon"
mastic on request

* Ultrafine Snap-on
Gustin-Bacon Mfg Co

* Mono-Kover
Baldwin-Ehrer-Hill, Inc

* Thermoglas
Philip Carey Mfg Co

* Fiberglas
Owens-Corning Corp

* Armaglas PF Pipe Insu
Armstrong C&S Corp

* Micro-Lok
Johns-Manville Sales Corp

* Insul-Sure
Insul-Coustic Corp
Massena, NY

* PPG Glass Fiber
Pitts Plate Glass Co

* Superfine
The Rubenoid Co

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SN 100 M		OCTOBER 1954	
MATERIAL SPECIFICATION - SERIES 100			
Page 6		Rev April 1963	
Code	112.11	112.12	
Material	Glass fiber	See 112.11	
Material Description	Textile type fine glass fiber bonded pipe insulation with 45-lb factory-applied roofing felt finish. Code 701 asbestos felt must be used.		
Filler			
Binder	Phenol-formaldehyde or Di-Cy		
Temperature Range	80°F to 350°F		
K Factor	100°F - 0.25		
Density	3" and 6" lb per cu ft		
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.		
Resistance to Breakage in Handling	Very good		
Dimensions			
Other Qualifications	Specify whether for iron pipe or copper tubing.		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
* Order must specify finish noted under material description.	* Ultrafine Snap-on Gustin-Bacon Mfg Co		
	* Mono-Kover Baldwin-Ehret-Hill, Inc		
	* Thermoglas Philip Carey Mfg Co		
	** Fiberglas Owens-Corning Corp		
	** Armaglas PF Pipe Insu Armstrong C&S Corp		
	* Micro-Lnl. Johns-Manville Sales Corp		
	* PPG Glass Fiber Pitts Plate Glass Co		
	* Superfine The Ruberoid Co		

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OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SH 100 M
Rev March 1962				Page 7
Code	112.16	112.17		
Material	Glass fiber	Glass fiber		
Material Description	Textile type fine glass fiber bonded pipe insulation with 4-oz factory-applied canvas finish.	Textile type fine glass fiber bonded pipe insulation with 8-oz factory-applied canvas finish.		
Filler				
Binder	Phenol-formaldehyde or Di-Cy	Phenol-formaldehyde or Di-Cy		
Temperature Range	80°F to 300°F	80°F to 300°F		
K Factor	100°F - 0.25	100°F - 0.25		
Density	3" and 6" lb per cu ft	3" and 6" lb per cu ft		
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.		
Resistance to Breakage in Handling	Very good	Very good		
Dimensions				
Other Qualifications	Specify whether for iron pipe or copper tubing	Specify whether for iron pipe or copper tubing		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.				
	*Ultrafine Snap-on Gustin-Bacon Mfg Co	*Ultrafine Snap-on Gustin-Bacon Mfg Co		
	*Mono-Kover Baldwin-Ehrst-Hill, Inc	*Mono-Kover Baldwin-Ehrst-Hill, Inc		
	*Thermoglas Philip Carey Mfg Co	*Thermoglas Philip Carey Mfg Co		
	*Fiberglas Owens-Corning Corp	*Fiberglas Owens-Corning Corp		
	*Armoglas PF Pipe Insu Armstrong C&S Corp	*Armoglas PF Pipe Insu Armstrong C&S Corp		
	*Micro-Lok Johns-Manville Sales Corp	*Micro-Lok Johns-Manville Sales Corp		
	*PPG Glass Fiber Pitts Plate Glass Co	*PPG Glass Fiber Pitts Plate Glass Co		
	*Superfine The Ruberoid Co	*Superfine The Ruberoid Co		

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REV. 3-62
REV. 10-63

SM 100 M		OCTOBER 1954	
Page 8		Rev April 1963	
MATERIAL SPECIFICATION - SERIES 100			
Code	112.22		
Material	Glass fiber		
Material Description	Preformed pipe covering composed of glass fibers banded together by inert thermosetting resin with factory-applied 35-lb minimum per 3000 sq ft white bleached kraft paper, laminated to 0.0007" aluminum foil by fire-retardant adhesive (moisture vapor transmission rate shall not exceed 0.015 perms - wet cup test) and reinforced by glass threads in both directions, maximum spacing 1/4". Finish includes lap 2", ± 1/4", long and butt splice 4", ± 1/4", wide. Paper to be creased or embossed sufficiently to conceal wrinkles without requiring excessive lap adhesive to make a tight seal. Type A - one-piece Type B - two-piece		
Filler			
Binder	Phenol-formaldehyde or DI-Cy		
Temperature Range	40°F to 250°F		
K Factor	100°F - 0.25, 250°F - 0.33		
Density	Type A - 3 lb per cu ft min Type B - 6 lb per cu ft min		
Compressive Strength*	Compressive strength and resilience are very low. Inserts are required where pipe is supported by insulation. Type B has more resistance to abuse than Type A.		
Resistance to Breakage in Handling	Very good		
Dimensions	3-ft sections Type A - 1/2", 3/4", 1", 1 1/2", 2", 2 1/2", and 3" thick Type B - 1/2", 1", 1 1/2", 2", and 2 1/2" thick		
Other Qualifications	Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.		
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
	Ultrafine Snap-on (Type A) Gustaf-Bacon Mfg Co		
	Mesa-Kover (Type A) Baldwin-Ehren-Mill, Inc		
	Fiberglas (Type A and Type B) Owens-Corning Corp		
	Armoglas PF Pipe Insulation (Type A and Type B) Armstrong C&S Corp		
	Micro-Lok (Type A) Johns-Manville Sales Corp		
	PPG Glass Fiber (Type A) Pittsburgh Plate Glass Co		
	Superfine (Type A) The Ruberoid Co		
	Thermoglas (Type A) Philip Carey Mfg Co		

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OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SM 100 M
Rev. Feb. 1964				Page 9
Code	112.61			
Material	Glass fiber			
Material Description	Plain semi-rigid board, formed from fibrous glass or mineral fibers.			
Filler				
Binder	Phenol-formaldehyde			
Temperature Range	40°F to 350°F			
K Factor	100°F - 0.25 to 0.30			
Density	6 and 9 lb per cu ft			
Compressive Strength	Compressive strength and resilience are very low. Inserts are required where pipe is supported by the insulation. Has poor resistance to abuse.			
Resistance to Breakage in Handling	Very good			
Dimensions	Std 24" x 48" Thickness PF615 (6-lb density) 1/2" through 3". PF617 (9-lb density), 1/2" through 2 1/4".			
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.				
	Fiberglas PF615 or 617 Insulation Owens-Corning Corp			
	Armoglas PF Insulation Armstrong C&S Corp			
	Spinox No. 414 or 415 Johns-Manville Sales Corp			
	E-Z Ply Duct Insulation Baldwin-Ehret-Hill, Inc			

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SN 100 M		OCTOBER 1954	
MATERIAL SPECIFICATION - SERIES 100			
- 10		Rev April 1963	
Code	112.71		112.81
Material	Glass fiber		Glass fiber
Material Description	Bonded board insulation formed from fibrous glass or mineral fibers, with asphalt and kraft paper vapor-barrier finish.		Bonded acoustical board formed from fibrous glass or mineral fibers with a thin neoprene compound on one surface.
Filler			
Binder	Phenol-formaldehyde		Phenol-formaldehyde
Temperature Range	40°F to 150°F		40°F to 150°F
K Factor	100°F - 0.26		100°F - 0.26
Density	3 and 6 lb per cu ft		6 lb per cu ft
Compressive Strength			
Manufacturing Process	Machine molded		Machine molded
Resistance to Breakage in Handling	Very good		Very good
Dimensions	24" x 48" boards 3/4" to 2" thickness		24" x 48" boards 5/8" to 2" thickness
Other Qualifications	Higher density material is more resistant to abuse		Neoprene coating on side of board exposed to air flow
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
* 3-lb density. High-density outer layers.	Fiberglas Vapor Seal Duct Insu Owens-Corning Corp		Fiberglas Coated Duct Insu Owens-Corning Corp
	Armaglas Vapor Seal Duct Insu Armstrong C&S Corp		Armaglas Coated Duct Insu Armstrong C&S Corp
	Spintex No. 414VS Johns-Manville Sales Corp		Coated Duct Insulation Baldwin-Ehret-Hill, Inc
	E-Z Ply Duct Insu Baldwin-Ehret-Hill, Inc		
	Fiberglass Board® Gustin-Bacon Mfg Co		
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OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SM 100 M
Rev Aug 1964				Page 11
Code		114		
Material		Mineral wool (Block only)		
Material Description		Mineral slag wool		
Filler				
Binder		High temp binder		
Temperature Range		500°F to 1700°F		
K Factor		500°F - 0.45 max		
Density		19.2 lb per cu ft		
Compressive Strength		12 lb per sq in.		
Manufacturing Process		Machine molded		
Resistance to Breakage in Handling		Good		
Dimensions				
Other Qualifications				
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.				
		PV Supertemp Eagle-Picher		
		Mono-Block Baldwin-Ehret-Hill, Inc		
		Armasemp Armstrong C&S Corp		
		M V Block M. H. Derrick Co		

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SN 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954	
Page 12				Rev Oct 1965	
Code		118			
Material		Urethane Foam, Rigid			
Material Description		Preformed rigid urethane foam block, pipe, and fitting insulation manufactured with polyester or polyether resins with fluorocarbon blowing agent			
Temperature Range		-270°F to +150°F			
K Factor		0.17 max at 75°F			
Density		1.7 to 2.5 lb per cu ft			
Compressive Strength		Min 30 psi at 6.6% deformation, measured parallel to the direction in which the foam rose during manufacture or min 24 psi at 6.6% deformation in all directions			
Manufacturing Process		Molded or cut from molded billet.			
Resistance to Breakage in Handling		Excellent			
Dimensional Tolerances		Inside Diameter (In.)			
		Pipe Size of Insulation ID (In.)	Minimum Diameter (In.)	Maximum Diameter (In.)	
		1/2 - 6	IPS OD	IPS OD + 1/16	
		7 - 12	IPS OD	IPS OD + 1/8	
		14 and up	IPS OD + 1/16	IPS OD + 3/16	
		Outside Diameter (In.)			
		Pipe Size of Insulation OD (In.)	Minimum Diameter (In.)	Maximum Diameter (In.)	
		1/2 - 6	IPS OD - 1/8	IPS OD - 1/16	
7 - 12	IPS OD - 1/8	IPS OD			
14 and up	IPS OD - 1/16	IPS OD + 1/16			
		All other dimensions to be ± 1/16" including straightness and squareness			
Other Qualifications		Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding 1/4". 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 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 60 when coated with PVA mastic 3/32" dry thickness reinforced by 10x10 mesh glass cloth, 10lb 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 5 days and then wiped with a wet cloth and weighed, with no delay between steps.			
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 only as two-piece sectional fittings for 90-degree elbows and tees.		U-200 Urethane Industries			
		Zerocel NB 200 National Gypsum			
		Thurane FR Dow Chemical Co			
		Foamthane FR Pittsburgh-Corning			

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MATERIAL SPECIFICATION - SERIES 100

SN 100 M

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Code	120		
Material	Polystyrene		
Material Description	Preformed rigid cellular polystyrene block, pipe, and fitting insulation		
Filler			
Binder			
Temperature Range	- 100°F to + 160°F		
K Factor	0.29 max at 75°F		
Density	1.7 to 2.3		
Compressive Strength	Min 20 lb per sq in. at 10% deformation		
Manufacturing Process	Cut from molded logs		
Resistance to Breakage in Handling	Excellent		
Dimensions	+ 1/16" - 0" on insulation ID, all other dimensions to be ± 1/16" including straightness and squareness		
Other Qualifications	Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding 1/4". No distortion or volume change, or loss of compressive strength after exposure at 160°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		
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 as two-piece sectional fittings for 90-degree elbows and tees	Styrofoam Blue * MMM Co, Houston Texas		
	Styrofoam Blue * Unicell Products, Inc		
	Styrofoam Blue * Styro Fabricators, Inc		

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MATERIAL SPECIFICATION - SERIES 100

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Page 12

This Page Rev Aug 1966

Code	118		
Material	Urethane Foam, Rigid		
Material Description	Preformed rigid urethane foam block, pipe, and fitting insulation manufactured with polyester or polyether resins with fluorocarbon blowing agent		
Temperature Range	-270 F to +150 F		
K Factor	0.17 max at 75 F		
Density	1.7 to 2.5 lb per cu ft		
Compressive Strength	Min 30 psi at 6.6% deformation, measured parallel to the direction in which the foam rose during manufacture or min 24 psi at 6.6% deformation in all directions		
Manufacturing Process	Molded or cut from molded billet		
Resistance to Breakage in Handling	Excellent		
Dimensional Tolerances	Inside Diameter (In.)		
	Pipe Size of Insulation ID (In.)	Minimum Diameter (In.)	Maximum Diameter (In.)
	1/2 - 6	IPS OD	IPS OD + 1/16
	7 - 12	IPS OD	IPS OD + 1/8
	14 and up	IPS OD + 1/16	IPS OD + 3/16
	Outside Diameter (In.)		
	Pipe Size of Insulation OD (In.)	Minimum Diameter (In.)	Maximum Diameter (In.)
	1/2 - 6	IPS OD - 1/8	IPS OD - 1/16
	7 - 12	IPS OD - 1/8	IPS OD
	14 and up	IPS OD - 1/16	IPS OD + 1/16
All other dimensions to be $\pm 1/16$ " including straightness and squareness			
Other Qualifications	Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding 1/4". 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 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 60 when coated with PYA mastic 3/32" 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 5 days and then wiped with a wet cloth and weighed, with no delay between steps.		
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 only as two-piece sectional fittings for 90-degree elbows and tees ** Available only as molded fitting covers. (Do not use water-base adhesives or finish with these covers)	U-200 Unarco Industries		
	Zerocel NB 200 National Gypsum		
	Thurane FR Dow Chemical Co		
	Foamthane FR+ Pittsburgh-Corning		
	Yellow Jack ** Toyed Corp		

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MATERIAL SPECIFICATION - SERIES 100

SM 100 M

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Code	120		
Material	Polystyrene		
Material Description	Preformed rigid cellular polystyrene block, pipe, and fitting insulation		
Filler			
Binder			
Temperature Range	-100°F to +160°F		
K Factor	0.29 max at 75°F		
Density	1.7 to 2.3		
Compressive Strength	Min 20 lb per sq in. at 10% deformation		
Manufacturing Process	Cut from molded logs		
Resistance to Breakage in Handling	Excellent		
Dimensions	+ 1/16" - 0" on insulation ID, all other dimensions to be ± 1/16" including straightness and squareness		
Other Qualifications	Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding 1/4". No distortion or volume change, or loss of compressive strength after exposure at 160°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		
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 as two-piece sectional fittings for 90-degree elbows and tees	Styrofoam Blue [®] MMM Co, Houston Texas		
	Styrofoam Blue [®] Unicell Products, Inc		
	Styrofoam Blue [®] Styro Fabricators, Inc		
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