Standard Specifications for

85 PER CENT MAGNESIA BLOCK-TYPE THERMAL INSULATION[1]

ASTM Designation: C 319 – 55

ADOPTED, 1955.[2]

This Standard of the American Society for Testing Materials is issued under the fixed designation C 319; the final number indicates the year of original adoption as standard or, in the case of revision, the year of last revision.

Scope

1. These specifications cover the composition, sizes, dimensions, and chemical and physical properties of 85 per cent magnesia block-type thermal insulation intended for use on surfaces operating at temperatures up to approximately 600 F. For specific applications, the actual temperature limit shall be agreed upon between the manufacturer and the purchaser.

Definitions

2. The Standard Definitions of Terms Relating to Thermal Insulating Materials (ASTM Designation: C 168)[3] shall be considered as applying to the terms used in these specifications.

Chemical Requirements

3. Eighty-five per cent magnesia block-type thermal insulation shall contain not less than 85 per cent by weight of hydrated basic magnesium carbonate, reinforced with mineral fiber.

Physical Requirements

4. The insulation shall conform to the following physical requirements:

Density (average), max, lb per cu ft	14.0
Thermal conductivity (average), max, Btu in. per hr sq ft deg Fahr:	
At mean temperature of 200 F	0.46
At mean temperature of 300 F	0.50
At mean temperature of 400 F	0.53
Compressive strength (average), at 10 per cent deformation, min, psi	50.0
Flexural strength (average), min, psi	[a]
Linear shrinkage (average), after heat soaking, max, per cent	2.0

[a] The average flexural strength in pounds per square inch shall be numerically equal to three times the density in pounds per cubic foot.

Standard Shapes, Sizes, and Dimensions

5. (*a*) Eighty-five per cent magnesia block-type thermal insulation may be supplied either flat or curved.

(*b*) Standard sizes of the insulation shall be as follows:

(*1*) *Flat Block.*—Flat block shall be furnished in a length of 36 in., a width of 6 in., and in thicknesses of from 1 to 3 in.

[1] Under the standardization procedure of the Society these specifications are under the jurisdiction of the ASTM Committee C-16 on Thermal Insulating Materials.

[2] Prior to adoption as standard, this method was published as tentative from 1953 to 1955.

[3] Appears in this publication, see Contents in Numeric Sequence of ASTM Designations at front of book.

(2) *Curved Block.*—Curved block shall be furnished in a length of 36 in., a width of approximately 6 in., and curved to inside radii of over $16\frac{1}{2}$ in. Individual dimensions shall conform to those specified by the manufacturer.

Dimensional Tolerances

6. The average measured length, width, and thickness of any individual block shall not differ from the manufacturer's standard dimensions by more than $\pm\frac{1}{8}$ in.

Workmanship

7. Since several requirements for this material are not easily defined by a numerical value but affect the workmanship of a finished job, the insulation shall not have visual defects that will adversely affect the service quality. For example, air holes, cracks, warpage, and bad ends, when excessive, shall be avoided.

Sampling

8. (*a*) From each shipment of the insulation, samples shall be selected by the purchaser or his authorized representative. The samples shall consist of full-size block selected at random so as to be representative of the whole lot of block from which they are selected. Not more than one block shall be taken from any one carton or container.

(*b*) Except for lots of 8000 block or less, the number of block to be selected shall be equivalent to the multiple of five that is next higher than one half the cube root of the total number of block included in the lot. The following table shows the number of block to be selected from shipments of various sizes:

Number of Block in Shipment	Number of Block to be Selected
0 to 100	0
101 to 500	1
501 to 1 000	2
1 001 to 8 000	10
8 001 to 27 000	15
27 001 to 64 000	20

Additional block may be selected at the discretion of the inspector, at the purchaser's expense. When a lot contains material of more than one size, a representative choice of sizes and thicknesses shall be included among the block selected.

(*c*) *Sampling Small Lots.*—Testing of small lots is at the discretion of the purchaser; however, one half the number of block selected on larger lots will be sufficient to test for other requirements.

(*d*) *Identification.*—Each block selected shall be marked so that it can be identified at any time.

Methods of Test

9. The properties enumerated in these specifications shall be determined in accordance with the following methods:

(*a*) *Conditioning.*—Preceding a test, the test specimens shall be conditioned by drying to constant weight in an oven at a temperature of 215 to 250 F.

(*b*) *Chemical Analysis.*—The hydrated basic magnesium carbonate content and mineral fiber content of the insulation shall be determined in accordance with the method described in the Appendix.

(*c*) *Density.*—Tentative Method of Test for Density of Preformed Block-Type Thermal Insulation (ASTM Designation: C 303).[3]

(*d*) *Thermal Conductivity.*—Standard Method of Test for Thermal Conductivity of Materials by Means of the Guarded Hot Plate (ASTM Designation: C 177).[3]

(*e*) *Compressive Strength.*—Standard Method of Test for Compressive Strength of Preformed Block-Type Thermal Insulation (ASTM Designation: C 165).[3]

(*f*) *Flexural Strength.*—Tentative Method of Test for Flexural Strength of Preformed Block-Type Thermal Insulation (ASTM Designation: C 203).[3]

(*g*) *Linear Shrinkage After Heat Soaking.*—Determine linear shrinkage after