

PLAINTIFF'S
EXHIBIT
K-1572

Sil-O-Cel Insulating Brick

Johns-Manville manufactures three types of Sil-O-Cel® Insulating Brick: Sil-O-Cel Super Brick and Sil-O-Cel C-22 Brick for use behind refractory linings only, and Sil-O-Cel 16L Brick for both back-up and direct exposure. All are particularly useful where high load-bearing characteristics are required. The new Sil-O-Cel 16L is an improved replacement for the former Sil-O-Cel Natural Brick. All are used in boilers, stills, heat-treating furnaces, kilns, lehrs, flues, retorts, stacks and other types of high temperature equipment. Their maximum service temperatures and types of bonding mortars are given below. Complete properties are shown in a following table.

Type of Brick	Max Service Temp, F	Mortar used and approx. lb per 1000 Brick			
		Back-up	lb	Exposed	lb
Sil-O-Cel Super	2500	Super Brick	80	—	—
Sil-O-Cel C-22	2000	Sil-O-Cel	80	—	—
Sil-O-Cel 16L	1600	Sil-O-Cel	80	J-M 1626 Cement	200-400

The mortars used for laying the Sil-O-Cel brick possess high insulating properties to assure a wall of practically the same insulating value throughout.

All types of Sil-O-Cel brick are furnished in the standard 9" shapes of the 2½" and 3" series, as well as special shapes.

Sil-O-Cel 16L Brick

For temperatures to 1600 F

Sil-O-Cel 16L Brick are made from diatomaceous silica, molded and calcined. They serve for temperatures to 1600 F, back-up or exposed. This type of Sil-O-Cel brick is one of the most efficient insulating brick obtainable and is used in preference to other types of Sil-O-Cel Brick except where severe temperatures are encountered.

Sil-O-Cel 16L Brick have a cold crushing strength of approximately 350 psi, and so are amply strong for structural purposes. Owing to the extremely low reversible thermal expansion, less than 0.1 at 1600 F, Sil-O-Cel 16L Brick are particularly advantageous in building long-lasting refractory masonry. Because of this valuable property, 16L brick can also be bonded for direct exposure.

Sil-O-Cel 16L Brick are furnished so that accurate, smooth surfaces are assured. This enables the brick to

* Reg. U. S. Pat. Off.



"Core wall" of Sil-O-Cel Brick in down-draft brick kiln for firing refractories

be laid up with thin joints and permits bonding with the fire brick where required.

Sil-O-Cel C-22 Brick

For temperatures to 2000 F

Sil-O-Cel Brick are an efficient, diatomaceous silica brick, molded and calcined for use as a back-up insulation behind fire brick or behind insulating fire brick where the temperature on the insulation will not exceed 2000 F.

In preventing transmitted heat loss, C-22 Brick are three to four times as effective as fire brick in retarding heat flow through furnace walls. In other characteristics, they combine, to a remarkable degree, all those qualities desirable in an ideal, general-purpose insulating brick.

Sil-O-Cel C-22 Brick have a cold crushing strength of about 700 psi, equivalent to over 50 tons per sq ft. They are therefore especially recommended for locations where high load-bearing properties are essential. While this strength is ample for structural purposes, C-22 Brick should not be used as headers in bonding walls except where they are used as a veneer.

SIL-O-CEL INSULATING BRICK

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PRODUCED
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DEFENDANT'S
EXHIBIT

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Outside wall of Cross Cracking Unit being insulated with $4\frac{1}{2}$ " of Sil-O-Cel C-22 Brick in "core wall" construction

Sil-O-Cel C-22 Brick are furnished true to size within the limits prescribed for No. 1 fire brick. This makes possible correct bonding with the fire brick.

In addition to its other uses Sil-O-Cel C-22 Brick are often used as the outside course in the combustion zone and first pass of water-tube boilers. They

are also used as a combination insulating and face brick course on the outside of bake ovens and similar equipment where an exterior wall of pleasing appearance and wear-resisting properties is desired.

Sil-O-Cel Super Brick

For temperatures to 2500 F

Sil-O-Cel Super Brick are a calcined type of Sil-O-Cel brick designed for exceptionally severe insulating service where subjected to temperatures behind the refractory in excess of 2000 F. The Super Brick can be used where they will come in contact with temperatures up to 2500 F.

These brick have a cold crushing strength of approximately 300 psi, equivalent to over 21 tons per sq ft. While this is ample for structural purposes, they should not be used as headers in bonding walls, except where they are used in veneer wall construction.

In many cases it is possible to cut down on the thickness of first-quality fire brick when Sil-O-Cel Super Brick are used. For instance, in equipment where Sil-O-Cel 16L Brick would be used behind $13\frac{1}{2}$ " of fire brick, Sil-O-Cel Super Brick could be safely used back of 9", or in some cases as low as $4\frac{1}{2}$ " of refractory, introducing a considerable saving.

Properties of Sil-O-Cel Insulating Brick

	16L*	C-22	Super
Density, lb per cu ft.....	33-35	38	40
Transverse Strength, psi	60	115	90
Cold Crushing Strength, psi	350	700	300
Linear Shrinkage, percent	0.7 at 1600 F	0.8 at 2000 F	2.0 at 2500 F
Reversible Thermal Expansion, percent..	Less than 0.1 at 1600 F	0.7 at 2000 F	1.3 at 2000 F
Conductivity (Btu in. per sq ft per F per hour at indicated mean temperatures)	0.95 at 600 F 1.01 at 800 F 1.07 at 1000 F 1.13 at 1200 F	1.67 at 500 F 1.88 at 1000 F 2.08 at 1500 F	1.70 at 500 F 1.95 at 1000 F 2.19 at 1500 F 2.45 at 2000 F
Recommended Service			
Back-up	1600 F	2000 F	2500 F
Exposed	1600 F	—	—

* Properties given for this brick are approximate.