

# CURRENT INDUSTRIAL REPORTS SERIES

2008

## MA327C — REFRACTORIES

### DEFINITIONS AND SPECIAL INSTRUCTIONS

#### 1. Scope of survey

This survey covers manufacturers of refractories.

#### 2. Figures to be reported

Companies with more than one establishment manufacturing the products covered by this survey are requested to complete a separate report form for each location. If you have not received a separate form for each of your establishments, please call the contact listed on the back of the report form or write to the U.S. Census Bureau for additional forms.

Quantity of shipments — Report products shipped to customers or transferred to other manufacturing plants of your company during the year. Report shipments of products made in the reporting plant only. Do not include shipments of products manufactured in other plants of your company or products made by other manufacturers which were purchased by you for resale in the same condition.

Report all items in metric tons. Report brick and shapes in both metric tons and thousand 9-inch equivalents. (A 9-inch equivalent is a solid volume of 101.25 cubic inches; a metric ton equals 1.102 short tons.)

Value of Shipments — Report the net selling value of the total quantity shipped of each product. The reported figures should represent the net-selling price, f.o.b. plant, after discounts, allowances, and returns. Exclude freight charges and excise taxes. If freight charges are prepaid by you, deduct these charges from the values reported. Report value in thousands of dollars.

#### 3. Definitions

##### SHIPMENTS OF REFRACTORIES AND REFRACTORY MATERIALS, BY TYPE

###### CLAY REFRACTORIES

Item code 3210 — High alumina brick and shapes and pouring pit refractories, fireclay and high alumina containing 50% alumina and over, including glass-house pots, tank blocks, feeder parts, and upper structure shapes, made predominantly of calcined bauxite, kyanite, andalusite and similar raw materials. "Calcined" as applied to bauxite implies heat treatment short of fusion for volume stability prior to use in a refractory product. In the process, volatile materials are driven off and chemical changes take place.

Exclude mullite and extra high alumina refractories and molten cast. Report these products as nonclay refractories in item code 4130.

— Fireclay and bloating fireclay ladle brick. Include alumina ladle brick which contain less than 50%  $\text{Al}_2\text{O}_3$ .

— Insulating fire brick and shapes. The subdivision of this code should be made in accordance with the ASTM Classification C-I 55, the respective groups being 16, 20, 23, 26, 28, and higher.

Item code 3220 — Refractory bonding mortars, wet and dry types. Include both airsetting and heatsetting bonding mortars which contain  $\text{Al}_2\text{O}_3$ , dry basis, by analysis.

— Plastic refractories and ramming mixes. Include products referred to as plastic fire brick and the less plastic materials intended for ramming into place after the addition of water (when shipped in dry form). Exclude plastic refractories and ramming mixes of mullite or extra high alumina. Report products made of these materials in code 4140.

— Clay castable refractories (hydraulic setting), made from calcined fireclay, diaspore or bauxite base, and portland or calcium aluminate cements.

— High alumina castable refractories (hydraulic setting) 50% and over  $\text{Al}_2\text{O}_3$ , made predominantly of bauxite, kyanite, andalusite, and similar raw materials.

— Fireclay gunning mixes, including less than 50%  $\text{Al}_2\text{O}_3$ . Include aluminosilicate compositions less than 50%  $\text{Al}_2\text{O}_3$  specifically engineered for gunning applications; may include hydraulic setting or other chemical bonding agents. Insulating gunning mixes (hydraulic setting). Density up to 105 pounds per cubic foot, less than 50%  $\text{Al}_2\text{O}_3$ .

###### NONCLAY REFRACTORIES

Note: Molten cast refractories are made by fusing refractory oxides, as in an electric furnace, and pouring the molten material into molds to form finished shapes.

Item code 4110 — Extra-high alumina brick and shapes made predominantly of fused bauxite, fused or dense-sintered alumina. Exclude molten cast extra high

# CURRENT INDUSTRIAL REPORTS SERIES

MA327C

## DEFINITIONS AND SPECIAL INSTRUCTIONS — Continued

### 3. Definitions — Continued

alumina brick and shapes. Fused as applied to bauxite and alumina, means complete melting, as in an electric furnace. After cooling, the product is crushed and graded for use in the refractory. Dense-centered alumina refers to heat treatment (short of melting) to render it relatively volume-stable for use in a refractory.

— Extra-high alumina pouring pit refractories including sleeves, nozzles, runners, tuyeres, and ladle gate parts, made predominantly of fused and synthetic aluminas.

— Extra-high alumina mortars, made predominantly of fused or synthetic aluminas and mullites.

— Extra-high alumina castables (hydraulic setting), made predominantly of fused or synthetic aluminas and mullite.

— Other nonclay refractory castables (hydraulic setting). Include hydraulic-setting castables made from nonclay refractory materials and portland or calcium cements. Report clay castables in code 3220.

— Basic nonclay gunning mixes. Include chrome, chrome-magnesia, magnesia-chrome, magnesia, and dolomite gunning mixes. Extra high alumina castables which can be gunned should be reported in code 4140.

Item code 4191 — All nonclay refractory material sold in lump or ground form and used directly by consumer as a finished refractory, and exported material. Includes calcined clay, ground brick and siliceous and other gunning mixes.

Item code 4195 — All other domestic shipments of nonclay refractory materials sold in ground or lump form as a refractory raw material and for reprocessing in the manufacture of brick and other refractories. Do not include magnesite or dolomite.

### 4. Comparability

Data reported in this survey should correspond to data reported in the Annual Survey of Manufactures form. The sum of values for item codes shown in column (a) should correspond to dollar values reported under product class codes indicated in column (b) below.

Current Industrial Reports (Form MA327C)	Annual Survey of Manufactures
Item codes (a)	Product class codes (b)
3210-3290	3271240
4110-4195	3271250

# CURRENT INDUSTRIAL REPORTS SERIES

## REFERENCE LIST

FORM MA327C		
REFRACTORIES		
Product code	Item code	Item description
		CLAY REFRACTORIES
		Brick and shapes
3271240125	3210	Fireclay, high alumina, and insulating brick and shapes
		Unshaped clay refractories
3271240135	3220	Refractory bonding mortars, castable refractories, and gunning mixes
		Other refractory raw materials and refractory materials sold in lump or ground form, either for direct use by customer as a finished refractory product or as exported material
3271240451	3280	Clay and high alumina refractory raw materials
3271240461	3290	Clay and high alumina refractory materials
3271240100	3200	TOTAL VALUE OF CLAY REFRACTORIES (Sum of items 3210–3290)
		NONCLAY REFRACTORIES
		Brick and shapes
3271250125	4110	Magnesite and magnesite-chrome brick and shapes and chrome brick
3271250135	4130	All other brick and shapes
		Unshaped nonclay refractories
3271250145	4140	Mortars, plastic refractories and ramming mixes, gunning mixes, and ceramic refractory fibers
		Other nonclay refractory materials sold in lump or ground form, including ground silica.
3271250256	4191	Domestic shipments for direct use by customers as a finished refractory and all exported material
3271250261	4195	All other domestic shipments of nonclay refractory materials sold in lump or ground form as refractory raw materials (Do not include magnesite.)
3271250100	4100	TOTAL VALUE OF NONCLAY REFRACTORIES (Sum of items 4110 – 4195)

3/4/09