



## Alumina Castable Type ZIRALCAST-95

### General Information

ZIRCAR Ceramics' Alumina Castable Type ZIRALCAST-95 is a high-purity, lightweight alumina refractory castable composed primarily of hollow, fused alumina bubbles incorporated into a high-quality hydraulically setting cement. With its high alumina bubble aggregate, ZIRALCAST-95 exhibits low thermal conductivity, excellent chemical stability and very good strength. ZIRALCAST-95 provides good utility in applications with temperatures as high as 1800°C (3292°F)

ZIRALCAST-95 is a conventional castable refractory designed to be installed using typical concrete placement techniques. ZIRALCAST-95 Mixing and Casting Guidelines are provided below.



### Characteristics & Properties

Composition, wt%	
Al <sub>2</sub> O <sub>3</sub>	95.3
CaO	3.7
SiO <sub>2</sub>	0.4
Fe <sub>2</sub> O <sub>3</sub>	0.1
Water of Hydration, wt %	11-17
Hydraulic Set Time, hr	
Initial	1-4
Final	7-10
Grain Size, mesh (mm)	4 (5) and finer
Density, g/cc (pcf)	
As Cast	1.52 (95)
After firing to:	
980°C (1800°F)	1.38 (86)
1315°C (2400°F)	1.44 (90)
1480°C (2700°F)	1.41 (88)
Modulus of Rupture**, MPa (psi)	
After firing to:	
760°C (1400°F)	3.1 (445)
980°C (1800°F)	3.8 (545)
1315°C (2400°F)	3.9 (565)
1480°C (2700°F)	5.8 (835)

### ZIRCAR Ceramics, Inc.

PO Box 519  
100 N. Main St., Florida, NY 10921-0519  
Telephone: (845) 651-6600  
E-mail: sales@zircarceramics.com

Technical Data Bulletin  
Alumina Castable Type ZIRALCAST-95  
[www.zircarceramics.com](http://www.zircarceramics.com)  
Page 1 of 3

# Alumina Castable Type ZIRALCAST-95

## Characteristics & Properties Continued

Firing Shrinkage, %	
After firing to:	
760°C (1400°F)	0.3
980°C (1800°F)	0.1
1315°C (2400°F)	0
1480°C (2700°F)	-0.3
Thermal Conductivity**, W/m <sup>2</sup> K (BTU/hr ft <sup>2</sup> °F/in)	
1038°C (1900°F)	0.71 (4.89)
1249°C (2280°F)	0.72 (5.02)
1460°C (2660°F)	0.79 (5.46)
1671°C (3040°F)	0.93 (6.47)
Shelf Life	Not to exceed 24 months

The data presented herein is intended to help the user to determine the appropriateness of this material for their application. This data is a nominal representation of this product's properties and characteristics and therefore should not be used in preparing specifications. \*\* Properties expressed parallel to thickness.

## Suggested Applications

Insulating refractory in furnaces operating to temperatures as high as 1800°C (3272°F).  
 Manufacture of low-density cast refractory shapes including covers, crowns and doors.  
 Crucible support in laboratory glass melting furnaces.  
 Liner for crucible pre-heaters.

## Availability of Standard Castable

ITEM #	DESCRIPTION
D6100	ZIRALCAST-95, 55 LB.

## To Order

**Standard ZIRALCAST-95:** order online or specify quantity, item # and description.

Standard items are available for immediate shipment from stock. Standard item packaged in 25kg (55 lb.) multi-wall paper bags, 48 bags (1200kg or 2645 lb.) per 42" x 42" pallet. Bulk-bag packaging is available upon request.

**Custom precast shapes** are available on request. Please provide requirements for consideration.



## ZIRCAR Ceramics, Inc.

PO Box 519

100 N. Main St., Florida, NY 10921-0519

Telephone: (845) 651-6600

E-mail: [sales@zircarceramics.com](mailto:sales@zircarceramics.com)

[www.zircarceramics.com](http://www.zircarceramics.com)

# Alumina Castable Type ZIRALCAST-95

## ZIRALCAST-95 Mixing and Casting Guidelines

Type	Water Content, wt. %
Vibration Casting	12
Pouring	16-17

ZIRCAR Alumina Castable Type ZIRALCAST-95 mixes are handled and placed in the same manner as concrete. The best mixer is a paddle-type concrete mixer. Mortar boxes, wheelbarrows and other stationary containers can also be used. Be sure the mixer used is clean of all foreign products. For best casting results, dry-blend entire contents of bag, as some segregation of bubble from cement can occur during transport and handling.

Steel, acrylic and other plastic forms are best for casting shapes, but plaster, wood and cardboard forms can be used if coated with a product to make them impervious to moisture. Aluminum forms should not be used, due to reaction with the castable. Clean all forms and coat them with a release to prevent sticking. Suggested release agents are oil, oil and graphite, silicone oils or paraffin.

Vibration casting and pouring are the preferred installation methods. Mechanical vibrators allow for the use of a mix with lower water content, which can give the best results. However, care should be taken to avoid excessive vibration which brings the water, fine particles and bond to the surface, and forms films which can cause layering, spalling and low strength. Vibration casting requires a closer control of the water content to ensure removal of air pockets and proper placement. When pouring shapes, be sure not to use an excessive amount of water to get the desired consistency. Higher water content will reduce the strength and increase shrinkage of the cast product.

When mixing, weigh both the castable and the water to be sure the exact water content is obtained. Clean water in a temperature range of 18-270°C (65-800°F) should be used. Colder water retards the set times, and warmer water accelerates them. Add part of the water to the concrete mixer before adding dry mix, then add the balance of the water while mixing. When mixing in stationary mixers, add water slowly to the dry castable while mixing with a hoe or paddle by hand. Keep the concrete mixer turning while placing the mix, or keep turning the mix over by hand with a hoe or paddle to keep it in the same consistency for placement.

After casting, all exposed surfaces should be covered with damp cloths or plastic to keep them moist. Initial set will take place in one-half to four hours, depending on the water content, method of placement and temperature. Final set will occur in three to six hours. Forms may be removed any time after final set has taken place, but all exposed surfaces should be kept moist for 24 hours after casting to allow for maximum strength development.

Air-drying at room temperature is recommended for as long as practical after uncovering the cast refractory, with a minimum of 24 hours before application of heat. Attaching thermocouples to the refractory surface is an excellent way to monitor its temperature. Bring the temperature on the cast refractory up to 1210°C (2500°F) at the rate of 140°C/hour (250°F). Hold at 1210°C (2500°F) for 24 hours per inch of refractory thickness. The casting should then be heated at a rate of 140°C (250°F) per hour, to a minimum of 1093°C (2000°F). If there are any indications of forced steam evolving from it, then a slower rate should be used. After holding at this temperature, the cast refractory is ready for service.



### ZIRCAR Ceramics, Inc.

PO Box 519

100 N. Main St., Florida, NY 10921-0519

Telephone: (845) 651-6600

E-mail: [sales@zircarceramics.com](mailto:sales@zircarceramics.com)

[www.zircarceramics.com](http://www.zircarceramics.com)

Revision Date Sept. 16, 2016