



ALMATIS

PREMIUM ALUMINA

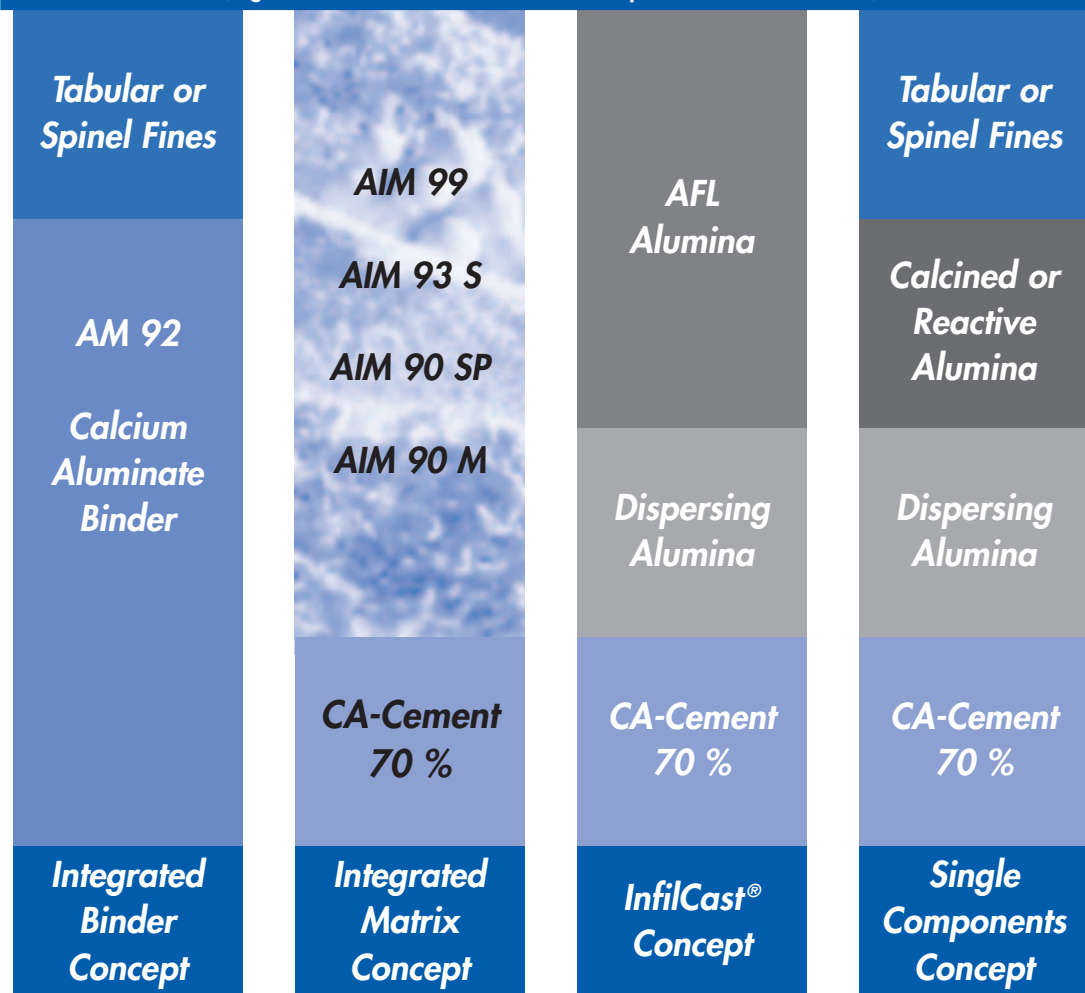


Global Product Data

Refractory Matrix Brochure

Coarse Fractions

(e.g. Tabular Alumina T60 / T64 and Spinel AR 90 and Bonite)



Think alumina, think Almatris.

GP-RCP/012/R06/1207



I. Almatris Premixed Matrix Concept Products

A. Almatris Integrated Matrix (AIM) Concept:

AIM products are an integrated matrix of aggregate fines, Calcined, Reactive and Dispersing Aluminas for use in Tabular Alumina, Spinel or other high alumina aggregate containing refractory castables. Cement (70 % Al₂O₃ cements such as CA-14 W/M/S or CA-270 are recommended) is all that must be added to complete the refractory matrix. AIM offers you the tool for easy formulation of low water demand, self-flowing and vibration castables of medium, low or high cement content.

AIM 99	[99 % Alumina]
AIM 93 S	[93 % Alumina plus Spinel]
AIM 90 SP	[90 % Alumina plus Spinel and Periclase (In situ Spinel)]
AIM 90 M	[90 % Alumina plus Microsilica]

Use of the AIM products for free-flowing casting slips according to German patent DE 4125511 and its correspondent equivalent patents is not allowed without corresponding license of patent proprietor.

B. Almatris InfilCast® Concept:

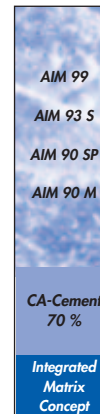
The Infiltration Castable concept is where a mold is filled with dry coarse (5-20 mm) particles e.g. Tabular Alumina "Converter Discharge Sieved" (CDS) balls to form a skeleton. The voids in this skeleton are filled with a self-flowing fine castable (particle size 0-1 mm). The fine fraction consists of cement, Dispersing Aluminas and "Infiltration Aluminas" (AFL).

Almatris offers two different "Infiltration Aluminas" for your applications:

AFL 1	Alumina / Spinel	[87 - 89 % Al ₂ O ₃]
AFL 13	Alumina	[>99 % Al ₂ O ₃]

C. Almatris Integrated Binder Concept (AM 92):

AM 92 is a fully dispersed high alumina (~ 90 % Al₂O₃) and cement containing binder and matrix system for high performance refractory castables. Addition into castable formulations at a 25 % level to 75 % sized fractions (coarse to fine) of aggregates like Tabular Alumina and 4.5 % H₂O is recommended for optimum vibration flow.



II. Almatis Single Components Concept Products

Almatis continues to offer all the single components required for the matrix of high performance refractory castables. These products range from Calcined and Reactive Aluminas to Tabular Alumina and Spinel fine particles. Also offered are Dispersing Aluminas and Calcium Aluminate Cements.

Typical key properties of these products are:

A. Reactive Aluminas:

	D50 Cilas/*Sedigraph	BET
A 1000 SG*	0.4 µm (Mono-modal)	8.4 m ² /g
CT 3000 SG	0.8 µm (Mono-modal)	7.5 m ² /g
RG 4000	0.8 µm (Mono-modal)	7.2 m ² /g
RG 4000*	0.5 µm (Mono-modal)	7.2 m ² /g
A 152 SG*	1.5 µm (Mono-modal)	4.3 m ² /g
CTC 55**	1.9 µm (Multi-modal)	3.8 m ² /g
CTC 50	1.7 µm (Multi-modal)	4.1 m ² /g
CTC 40	1.4 µm (Bi-modal)	4.8 m ² /g
CTC 30	1.8 µm (Multi-modal)	3.8 m ² /g
CL 370	2.6 µm (Bi-modal)	3.0 m ² /g
CL 370*	2.9 µm (Bi-modal)	3.0 m ² /g
A 3000 FL*	3.0 µm (Bi-modal)	2.6 m ² /g
CTC 20	1.9 µm (Mono-modal)	2.0 m ² /g
A 20 SG*	3.6 µm (Mono-modal)	1.3 m ² /g
E-SY 1000	1.9 µm (Bi-modal)	3.3 m ² /g
E-SY 2000**	1.9 µm (Bi-modal)	3.5 m ² /g

B. Calcined Aluminas:

	D50 Cilas/*Sedigraph	BET
CT 9 G	5.0 µm (Mono-modal)	0.7 m ² /g
CT 9 FG	5.0 µm (Mono-modal)	0.8 m ² /g
A 2 - 325 Mesh*	5.9 µm (Mono-modal)	0.6 m ² /g
CT 800 SG	3.4 µm (Mono-modal)	0.9 m ² /g
CT 10 SG	3.0 µm (Mono-modal)	13.0 m ² /g

C. Tabular Alumina fines:

T60 / T64	- 45 micron STD
T60 / T64	- 45 micron Low Iron
T60 / T64	- 20 micron

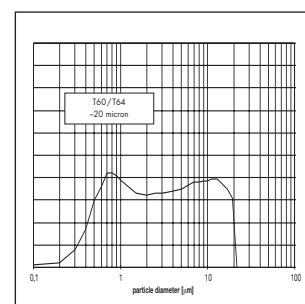
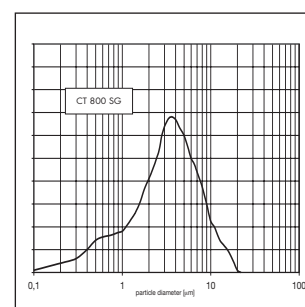
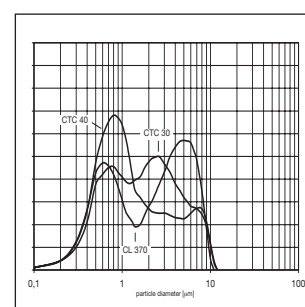
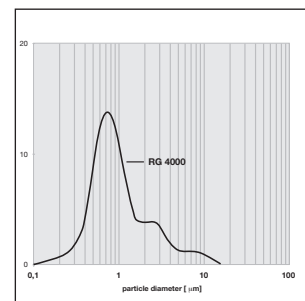
D. Spinel fines:

AR 78	- 90 micron
AR 78	- 45 micron
AR 78	- 20 micron

E. Bonite fines:

Bonite	- 45 micron
Bonite	- 20 micron

(*Designates North American produced products or test methods, others are produced or tested in Europe. All products are available worldwide. **CTC 55 and E-SY 2000 contain Spinel)



Typical particle size distribution by Cilas
Figures represent relative vol.-%



II. Almatix Single Components Concept Products (cont.)

F. Dispersing Aluminas:

Almatix offers five aluminas for dispersion of matrix components and control of setting time of refractory castables. The retarding and accelerating versions are used in combination. Their ratio is varied to achieve the required setting time.

Dispersing Aluminas for **castables without Microsilica:**

ADS 1:	dispersing and retarding	[80 % Al ₂ O ₃]
ADS 3:	dispersing and strong retarding	[76 % Al ₂ O ₃]
ADW 1:	dispersing and accelerating	[80 % Al ₂ O ₃]

Dispersing Aluminas for **castables with Microsilica:**

M-ADS 1:	dispersing and retarding	[91 % Al ₂ O ₃]
M-ADW 1:	dispersing and accelerating	[96 % Al ₂ O ₃]

G. Calcium Aluminate Cements and Alphasbond binder:

Almatix produces 70 % Al₂O₃ and 80 % Al₂O₃ containing Calcium Aluminate Cements for refractory castables with different setting behavior corresponding Vicat Final Setting Time and Exothermic Reaction Time EXO max with NORTAB Test Mixtures:

70 % Al₂O₃ cements:

	Final Setting	EXO max
CA-14 W	190 - 240 min.	310 - 370 min.
CA-14 M	270 - 330 min.	370 - 430 min.
CA-14 S	370 - 450 min.	470 - 550 min.
CA-270	330 - 420 min.	440 - 480 min.

80 % Al₂O₃ cements:

	Final Setting
CA-25 R	50 - 90 min.
CA-25 M	90 - 145 min.
CA-25 C	100 - 180 min.

Alphasbond 300* + Alphasbond 500* (contains additives)

Hydratable 100 % Al₂O₃ binder

(*Designates North American produced products or test methods, others are produced or tested in Europe. All products are available worldwide.)



Almatis Refractory Matrix Products:

Almatis aspires to supply highest quality of alumina based refractory materials. Our strength lies in a complete range of alumina based raw materials for refractory applications we can offer our customers.

In addition to coarse aggregate materials (Tabular Alumina, Magnesium Aluminate Spinel, or Bonite) Almatis is focused on the production of fine sized materials with particle sizes between 0.4 μm and 45 μm . These so called matrix components strongly determine the behavior of a refractory castable (e.g. rheology and/or strength).

Traditionally a wide range of different single components such as Calcined, Reactive and Dispersing Aluminas, Calcium Aluminate Cements, Alphasbond binders and Tabular Alumina or Magnesium Aluminate Spinel fines is considered necessary to produce a refractory castable matrix.

With the introduction of multi-modal Reactive Aluminas e.g. CTC 55 and the InfilCast® technology, which requires the AFL-Alumina family, the first steps towards combined matrix products were made. The next step was the integrated binder AM 92, which is a complete cement containing matrix system.

The AIM product family includes fully combined matrix formulations for Tabular Alumina, Magnesium Aluminate Spinel, Bonite, Bauxite or Aluminosilicate containing refractory castables with the flexibility of using various types and content of 70 % alumina cement.

In this brochure all Almatis premixed matrix products and all single components for refractory matrices are compiled to give you a comprehensive offering of products to be used in our Refractory Matrix Concepts.

For further information please contact your local Almatis representative.



Refractory Matrix Brochure



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