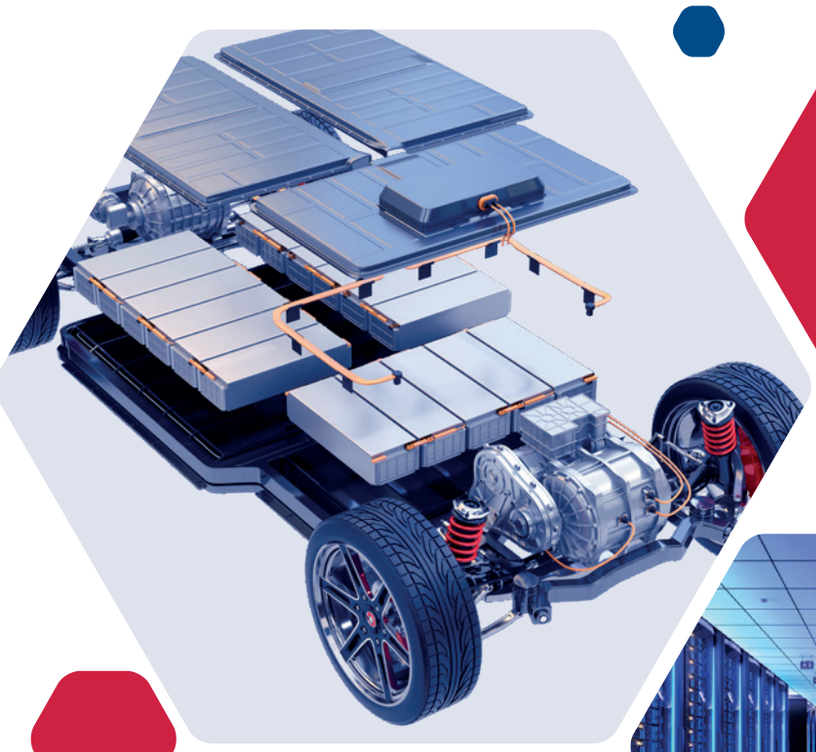
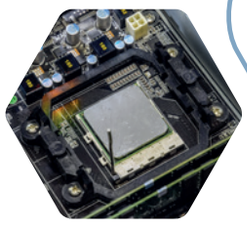
TIMal

THERMAL DISSIPATION SOLUTION





SPECIALTY ALUMINAS FOR

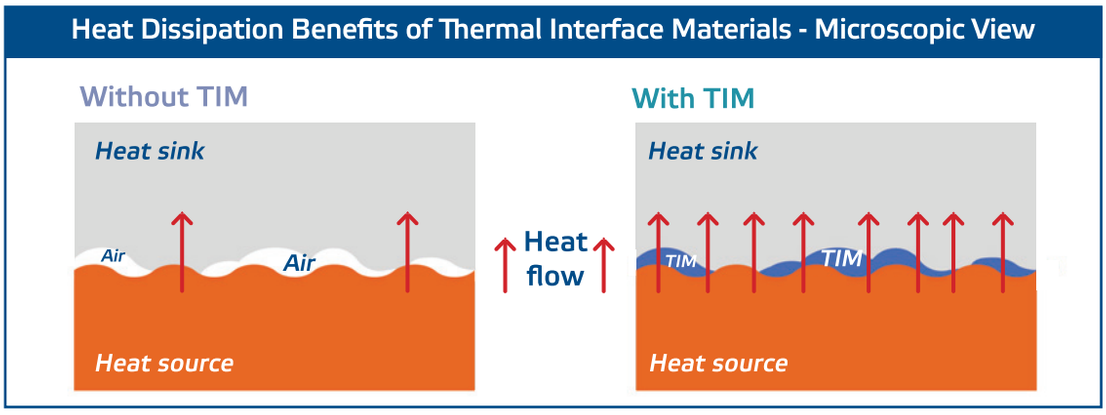
THERMAL MANAGEMENT

2023

alteo
SMART ALUMINA//

ALTEO'S ALUMINAS
TAKING THE HEAT

Rapid and effective **heat dissipation** is an increasingly important requirement for today's ever more powerful **electronic** components. Similarly, the dramatic rise in demand for new energy vehicles has been made possible largely by **Lithium-ion battery** technology. The sheer number of battery cells required to power vehicles again makes it essential that the substantial heat generated can be conducted away quickly from key working components. **Thermal interface materials** play an important role here and their **thermal conductivity** capabilities arise from fillers such as **TIMal**.



The main forms of thermal interface materials are

- **adhesives** – for bonding and sealing in battery packs and modules
- **gap fillers** – to fill in the gaps between two components
- **potting materials** – to encapsulate or fix electronic or electrical parts
- **thermal pads** – flexible material with good compression ratio to used for uneven surfaces and for reducing vibration and for shock dampening
- **greases and gels** – when adhesion and rework capabilities are required

ALUMINA RANGE	Unit	TIMal G4	TIMal G5	TIMal J2	TIMal J5	TIMal 12	TIMal 66	TIMal 16	TIMal 17	TIMal M1
Physical Properties		Monomodal								Bimodal
Particle Size Distribution (Laser)	-									
D10	µm	1.60	2.00	1.90	2.30	1.00	0.80	0.20	0.17	0.40
D50	**µm**	**4.10**	**5.00**	**5.00**	**5.00**	**2.30**	**1.80**	**0.55**	**0.40**	**2.30**
D90	µm	10.00	13.00	12.00	10.00	5.50	4.00	1.30	1.10	4.00
Residue wet screen >45µm	%	0.10	1.50	0.50	0.01	0.20	0.05	0.10	0.10	0.20
Specific Surface Area (BET)	m^2/g	1.00	0.80	1.00	0.75	1.80	2.50	5.50	8.00	2.50
Oil Absorption (oleic acid)	ml/100g	18	21	22	18	15	15	17	17	18
Relative Humidity (20-105ºC)	%	0.10	0.05	0.05	0.10	0.05	0.10	0.20	0.30	0.15
Chemical Properties										
Al_2O_3 - on dry basis	%	99.60	99.60	99.85	99.80	99.80	99.80	99.85	99.85	99.80
Na_2O soluble	ppm	700	700	150	700	150	150	400	400	150
Additional data										
pH	-	9.0	9.0	8.8	9.0	8.8	9.3	9.2	9.7	9.0
Electrical conductivity	µS/cm	80	80	50	90	45	95	140	160	100

These data are typical data and should not be used as guaranteed limits.

The TIMal range provides particularly suitable fillers for **silicone**, **polyurethane, epoxy and acrylics** resins.

It can also add heat dissipation properties to

- CCL (copper-clad laminates)
- ceramic **alumina substrates**

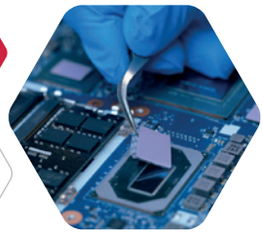
For all these materials TIMal will ensure critical characteristics such as

- **isotropic thermal conductivity** (W/mK)
- **lowest viscosity with maximum filling**
- **electrical insulation**

This is achieved through strictly controlled

- **particle size distribution**
- **chemistry**

which enables Alteo to offer an extensive range of filler options as indicated in the tables below. Our technical team can help you find the ideal products to meet your material needs.



ATH RANGE	Unit	TIMal H	TIMal H4	TIMal H3	TIMal H2	TIMal H1
Physical Properties						
Particle Size Distribution (Laser)	-					
D10	µm	35.0	6.0	4.9	2.5	2.2
D50	**µm**	**95.0**	**21.0**	**13.0**	**11.0**	**8.5**
D90	µm	160.0	60.0	27.0	26.0	22.0
Residue wet screen >45µm	%	-	-	1.00	0.25	0.15
Specific Surface Area (BET)	m^2/g	0.10	0.60	1.10	3.00	4.00
Oil Absorption (oleic acid)	ml/100g	20	20	25	21	23
Relative Humidity (20-105ºC)	%	0.05	0.05	0.15	0.30	0.40
Loss on ignition (20-1000ºC)	%	34.60	34.60	34.60	34.60	34.60
Chemical Properties						
$Al(OH)_3$ - on dry basis	%	99.80	99.80	99.80	99.80	99.80
Al_2O_3 - on dry basis	%	65	65	65	65	65
Na_2O soluble	ppm	100	100	100	100	100
Additional data						
pH	-	9.0	9.3	9.3	9.3	9.3
Electrical conductivity	µS/cm	35	60	60	60	60

These data are typical data and should not be used as guaranteed limits.

ALTEO R&D

For Alteo, innovation and application R&D are major parts of its growth strategy.

Alteo enhances its R&D capabilities through its Innovation and Technical Excellence Center: the installation of state-of-the-art equipment, the recruitment of technical experts and collaborations with key partners and university laboratories.

Alteo has the know-how and equipment to analyze and evaluate raw materials and finished parts, as well as being able to simulate production processes.

Contact our R&D team now at
www.alteo-alumina.com/contact

CUSTOMER CARE COMMITMENT

To meet your highest expectations, our Customer Care team will always strive to ensure a **first class** service. Our commitment is to provide **full support** from your first call to the delivery of our products; with technical assistance, packing solutions and short lead times.

ALTEO AT A GLANCE

- A leading integrated supplier of specialty products with the largest production capacity worldwide for calcined, pure and fine alumina.
- A global sales network with 4 regional hubs, 17 offices and more than 35 local warehouses around the world.
- A leading raw material supplier to the following industrial markets: Advanced Ceramics, Thermal Management EV-Batteries, Flame retardant, Polishing, Performance Refractories, Glass.

Design : Emeline MARTEL - Communication

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