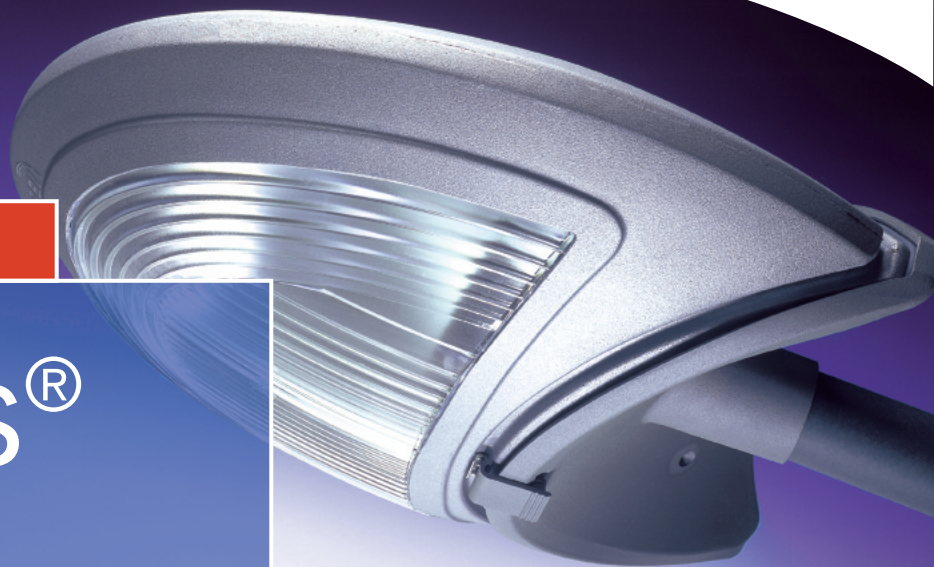


ALTUGLAS[®]
BY ARKEMA

Acrylic Resin

Altuglas[®]
HT 121

HOT TECHNOLOGY
FOR
LUMINOUS DESIGNS



ALTUGLAS
INTERNATIONAL
ARKEMA GROUP

**Arkema, Altuglas International,
Altuglas®**

Arkema, is a worldwide chemical player with sales of 5 billion euros and a workforce of 18 600 employees.

Altuglas International, one of Arkema's business units is the world's leading producer of PMMA (polymethylmethacrylate) supplying approximately 20% of the world's demand.

Altuglas® is the registered trade name for Altuglas International PMMA products in the form of resins for injection and extrusion, and sheet.

Clear vision of your business needs

In a global world, Altuglas International fits to all market situations.

High grade se



- > Continuous operative resistance up to 95 °C
- > Outstanding scratch resistance
- > Light transmission
- > Weather resistance

Whether your needs are local, regional or global, Altuglas International offers a leading range of sophisticated acrylic products and innovative services.

As a world leader, Altuglas International offers the widest choice of acrylics.

Partner to the major automotive and lighting manufacturers, in the Americas, Europe and Asia, Altuglas International has over the years built an extensive knowledge base.

Customers thus benefit from a global vision of the most advanced applications in their business.



Tail lamps for cars, Head lamps for bikes

Altuglas® HT 121 is an acrylic resin that is highly attractive to car and motorcycles designers.

All designers face the twin challenge of increased power for lamps with ever greater demand for compactness. Together, these two requirements result in elevated temperatures within a confined space. Hence the importance of choosing a material with high thermal resistance. Altuglas® HT 121 is the answer to all these constraints, and in addition provides undeniable advantages in terms of light output and appearance.

Lamps for the street

It can resist many years at temperatures above the 90 °C current in street lights, traffic signs and outdoor advertising. Altuglas® HT 121 illuminates our nights, whatever the weather.



Service



Logos for the stars

Altuglas® HT 121 is the quality brand for quality logos. Great looking, resistant to weather and UV, these signs and badges accept all forms of metallisation.

Lamps for the road

Excellent light transmittance, high resistance to UVs, knocks and scratches.

Altuglas® HT 121 offers optimal optics for safety on the road.

Screens for the nomads

Transparency and the high resistance to scratching, facilitate visibility on small screens.

Altuglas® HT 121 allows the most daring designs for the new generation of mobile phones.



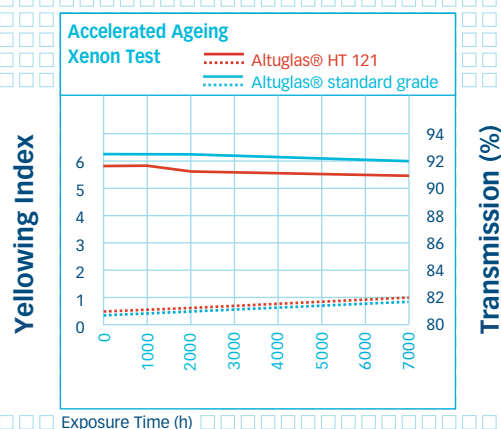
Altuglas® HT 121 is a special grade of polymethylmethacrylate resin developed by Altuglas International for excellent resistance to high temperature and to surface scratching with superior optical properties and easy processing.

↑ Resistant to all attacks



UV and weather resistant

Excellent weatherability and UV resistance equivalent to standard Altuglas® grades. Meets 3-year outdoor weathering test of SAE J576. Altuglas® HT 121 is available in a large selection of colours with proven stability.



Impervious to knocks and scratches

Altuglas® HT 121 has a breakage resistance up to 10 times stronger than glass of same thickness: a big advantage for front and rear lights. It has also a higher surface hardness and scratch resistance, markedly superior to standard Altuglas® grades.

Guiding the light for optimal comfort and safety

Altuglas® HT 121 is the ultimate guide for light. For light transmission and low haze, it is clearly the best polymer.

Altuglas® HT 121 fuels the automotive industry with creative lighting solutions: back lit control panels, high performance front and rear lights.

Optical compatibility and easily blended with Altuglas® standard or impact-modified grades.

Optical compatibility

	Refractive Index B	Light Transmittance	Haze
	ISO R-489	DIN 5036	DIN 5036
Altuglas® HT 121	1.49	92%	0.5%
Altuglas® Standard grade	1.49	92%	0.5%

2 Closer to your design needs

In wonderful shape regardless of the heat

Its high thermal stability makes Altuglas® HT 121 the ideal polymer for high intensity lamps.

In fact its name was inspired by the excellent Vicat softening temperature of 121 °C.

Altuglas® HT 121 allows dimensional stability at continuous operating temperature up to 95 °C.

Thermal properties

	VICAT Softening Temperature (50N)	HDT 1.82 MPa
	ISO 306	ISO 75-2
Altuglas® HT 121	121 °C	110 °C
Altuglas® Standard grade	Max. 108 °C	Max. 100 °C

Time saver on the factory floor

Add nothing, waste no time. Because it resists to UV, Altuglas® HT 121 does not need any post moulding protective varnish. This advantage, compared to polycarbonates, is particularly sought after for vehicle lights. The industrial process is easier, faster and more economical with Altuglas® HT 121.

Pre-drying Conditions. In order to avoid surface defects caused by excessive moisture, it is recommended to pre-dry the granules before processing at: 90-100 °C for 4-6 hours with a traditional thermoplastic dryer, 100 °C for 4 hours with a de-humidifier with a dew point at -40 °C. Humidity content of the granules for critical parts should not exceed the following values: 0,05% for injection, 0,03% for extrusion without venting.

3 Processing and decoration



Altuglas® HT 121 can be processed with general equipment used for thermoplastics.

The melt temperature should not exceed 250 °C. Avoid a long residence time in the plastification cylinder.

Altuglas® HT 121 can be processed with general equipment used for thermoplastics.

Injection conditions

	°C
Rear	210 - 230
Center	220 - 235
Front	230 - 245
Nozzle	225 - 240
Material temperature	240 - 250
Mould temperature	80 - 90

Extrusion conditions

	°C
Rear feed	200 - 220
Transition section	215 - 235
Metering	220 - 240
Adaptater	220 - 240
Melt blender	220 - 240
Die	220 - 230
Melt temperature	225 - 240
Calibrator	65 - 70

Post moulding operation

Easy post-moulding operations on Altuglas® HT 121 such as: Decoration, Vacuum metallisation, Hot stamping, Painting, Silk-screening, Welding (best results are obtained with ABS, ABS/PC, PC).

Mechanical Properties

	Method	Mesure Unit	Altuglas® HT 121	Altuglas® Standard grade
Tensile Strength	ISO 527-2	MPa	70	70
Elongation at break	ISO 527-2	%	5	5-6
Flexural Strength	ISO 178	MPa	103	103
Flexural Modulus	ISO 178	GPa	3.5	3.3
Compressive Strength	ISO 604	MPa	117	117
Scratch Resistance	Pencil test		5 H	Max 3H
Rockwell Hardness	ASTM D 785		M-102	Max M-97
Impact Resistance (Charpy, Unnotched)	ISO 179-2D	kJ/m²	11	11
Impact Resistance (Charpy, Notched)	ISO 179-2C	kJ/m²	2	2
Impact Resistance (Izod, Notched)	ISO 180-1A	kJ/m²	1.8	1.8



Optical Properties

	Method	Mesure Unit	Altuglas® HT 121	Altuglas® Standard grade
Refractive Index B	ISO R-489		1.49	1.49
Light Transmittance	ASTM D 1003	%	92	92
Haze	ASTM D 1003	%	0.5	0.5

Thermal Properties

	Method	Mesure Unit	Altuglas® HT 121	Altuglas® Standard grade
VICAT Softening Temperature (50 N)	ISO 306	°C	121	Max 108
HDT: 1.82 MPa	ISO 75-2	°C	110	Max 100
Glass Transition	ASTM D 3418	°C	128	Max 115
Melt Flow Index (230 °C / 3,8 kg)	ISO 1133	g/10mn	2	2,8
Fire Resistance	ASTM UL/94	Class	HB	HB

NB: The values quoted are the average of results obtained under laboratory conditions and are given only as indication to enable customers to make best use of our products.

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