

Molecular weight of about 7,000,000 g/mol.

CESTILITE ASTL has been specifically developed for the toughest anti-abrasion applications. The additives used also confer this material static dissipative (anti-static) and UV-stabilised properties. This reduces the risk of explosions when handling certain bulk materials on the one hand and make the material suitable for outdoor use on the other hand.

Physical properties (indicative values*)

PROPERTIES	Test methods ISO/(IEC)	Units	VALUES
Colour	—	—	black
Average molar mass (average molecular weight) (1)	—	10 ⁶ g/mol	7
Density	1183	g/cm ³	0.95
Water absorption at saturation in water of 23°C (2)	—	%	0.05
Thermal Properties (3)			
Melting temperature (DSC, 10°C/min)	11357	°C	130-135
Thermal conductivity at 23°C	—	W/(K·m)	0.40
Average coeff. of linear therm. exp. between 23 and 100°C	—	10 ⁻⁶ m/(m·K)	200
Temperature of deflection under load:			
– method A: 1.8 MPa	75	°C	42
Vicat softening temperature – VST/B50	306	°C	83
Max. allowable service temperature in air:			
– for short periods (4)	—	°C	120
– continuously: for 20,000 h (5)	—	°C	80
Min. service temperature (6)	—	°C	-150
Flammability (7):			
– “Oxygen Index”	4589	%	< 20
– according to UL 94 (1.6 mm thickness)	—	—	HB
Mechanical Properties at 23°C (8)			
Tension test (9):			
– tensile stress at yield (10)	527	MPa	20
– tensile strain at yield (10)	527	%	15
– nominal tensile strain at break (10)	527	%	> 50
– tensile modulus of elasticity (11)	527	MPa	770
Compression test (12):			
– compressive stress at 1/2/5% nominal strain (11)	604	MPa	5/9/15
Charpy impact strength – Unnotched (13)	179/1eU	kJ/m ²	no break
Charpy impact strength – Notched (14)	179/1eA	kJ/m ²	80 P
Charpy impact strength – Notched (double 15° notch) (15)	DIS 11542-2	kJ/m ²	≥ 90
Ball indentation hardness	2039-1	N/mm ²	37
Shore hardness D (3/15 s)	868	—	63/61
Relative weight loss (wear test in “sand/water-slurry”, CESTILENE HD 1000 = 100			
Relative weight loss	internal test	—	85
(wear test on “plastics pin on rotating steel disk”-tribo system); CESTILENE HD 1000 = 100 (16)			
Relative weight loss	internal test	—	80
Electrical Properties at 23°C (3)			
Volume resistivity	(60093)	Ω·cm	< 10 ⁶
Surface resistivity	(60093)	Ω	< 10 ⁶

Note: 1 g/cm³ = 1,000 kg/m³; 1 MPa = 1 N/mm²; 1 kV/mm = 1 MV/m

Availability

Round Rods: Ø 20-240 mm - **Sheets/Plates:** Thicknesses 1-250 mm

All information supplied by or on behalf of Quadrant Engineering Plastic Products in relation to its products, whether in the nature of data, recommendations or otherwise, is supported by research and believed reliable, but Quadrant Engineering Plastic Products assumes no liability whatsoever in respect of application, processing or use made of the aforementioned information or products, or any consequence thereof. The buyer undertakes all liability in respect of the application, processing or use of the aforementioned information or product, whose quality and other properties he shall verify, or any consequence thereof. No liability whatsoever shall attach to Quadrant Engineering Plastic Products for any infringement of the rights owned or controlled by a third party in intellectual, industrial or other property by reason of the application, processing or use of the aforementioned information or products by the buyer.

Legend

- (1) Calculated by means of the Margolies-equation $M = 5.37 \times 10^4 \times [\eta]^{1.49}$, with $[\eta]$ being the Staudinger index derived from a viscosity measurement using decahydronaphthalene as a solvent (concentration of 0.0003 g/cm³ for PE-UHMW).
- (2) Measured on 1 mm thick test plates.
- (3) The figures given for these properties are for the most part derived from raw material supplier data and other literature.
- (4) Only for short time exposure (a few hours) in applications where no or only a very low load is applied to the material.
- (5) Temperature resistance over a period of 20,000 hours. After this period of time, there is a decrease in tensile strength of about 50% as compared with the original value. The temperature value given here is thus based on the thermal-oxidative degradation which takes place and causes a reduction in properties. Note, however, that, as for all thermoplastics, the maximum allowable service temperature depends in many cases essentially on the duration and the magnitude of the mechanical stresses to which the material is subjected.
- (6) Impact strength decreasing with decreasing temperature, the minimum allowable service temperature is practically mainly determined by the extent to which the material is subjected to impact. The value given here is based on unfavourable impact conditions and may consequently not be considered as being the absolute practical limit.
- (7) These estimated ratings, derived from raw material supplier data, are not intended to reflect hazards presented by the materials under actual fire conditions. There is no UL-yellow card available for CESTILITE ASTL stock shapes.
- (8) The figures given for these properties are average values of tests run on test specimens machined out of 20 mm thick plates.
- (9) Test specimens: Type 1 B.
- (10) Test speed: 50 mm/min.
- (11) Test speed: 1 mm/min.
- (12) Test specimens: cylinders Ø 12 x 30 mm.
- (13) Pendulum used: 15 J.
- (14) Pendulum used: 5 J.
- (15) Pendulum used: 25 J.
- (16) Test conditions: pressure: 3 MPa; sliding velocity: 0.33 m/s; surface roughness of the steel disk: Ra = 0.25 - 0.40 µm; total distance run: 28 km; unlubricated operation in normal environment (air, 23°C / 50% RH).

- This table is a valuable help in the choice of a material. The data listed here fall within the normal range of product properties. **However, they are not guaranteed and they should not be used to establish material specification limits nor used alone as the basis of design.**