

## 3.3 Technical Data

### 3.3.1 Physical and mechanical properties

Table 18 Shows the typical physical and mechanical properties of Perspex® cell cast acrylic sheet.

Property	Test Method	Units	Values
<b>General Properties</b>			
Density	ISO 1183	g cm <sup>-3</sup>	1.19
Rockwell Hardness	ISO 2039-2	M scale	102
Water Absorption	ISO 62	%	0.2
Flammability	ISO 11925-2	-	E
<b>Optical Properties</b>			
Light Transmission	ASTM D1003	% (3 mm)	> 92
Refractive Index	ISO 489 A		1.49
<b>Thermal Properties</b>			
Vicat Softening Point	ISO 306 A	°C	> 110
Coefficient of Thermal Expansion - Linear	ASTM D696	x 10 <sup>-5</sup> . K <sup>-1</sup>	7.7
Maximum Working Temperature		°C	80 - 85
Specific Heat	ASTM C351	cal/g °C	0.35
Thermal Conductivity Coefficient (K Value)		W m m <sup>-2</sup> °C	0.189
Heat Transfer Coefficient (U Value)		W m <sup>-2</sup> °C	
- 3 mm single pane			5.2
- 5 mm single pane			4.9
<b>Mechanical Properties</b>			
Tensile strength (5mm/min)	ISO 527	MPa	75
Elongation at Break (5mm/min)	ISO 527	%	4
Flexural Strength (2mm/min)	ISO 178	MPa	116
Flexural Modulus (2mm/min)	ISO 178	MPa	3210
Impact Strength – Charpy (unnotched)	ISO 179	kJ m <sup>-2</sup>	12
Poisson's Ratio			0.38

### 3.3.2 Reaction to Fire

Perspex® is a combustible material and if ignited will continue to burn. Perspex® cast acrylic sheet has a combustion rate similar to hard woods but unlike many other plastic materials, in the event of a fire, Perspex® produces no hydrogen cyanide or halogen-based toxic gases and very little smoke.

Perspex® extruded sheet has a rate of combustion similar to cast sheet but will eventually produce molten droplets which will continue to burn. For full details of the behaviour of Perspex® grades to many international fire tests.

Table 19 Fire test performance of Perspex® to the more important international fire tests

Country	Product Type	Test	Result/Class
Europe	Cast & Extruded	ISO 11925-2	E
France	Cast	NFP 92-307	M4
	Extruded	NFP 92-307	M4
Germany	Cast	DIN 4102	B2
	Extruded	DIN 4102	B2
Holland	Cast	NEN 6005	Class 3 surface spread of flame
	Extruded	NEN 6006	Class 4 contribution to flashover
United Kingdom	Cast	BS 476:Pt 7	Class 4 under 3 mm
	Cast	BS 476:Pt 7	Class 3 for 3 mm and above
	Extruded	BS 476:Pt7	Class 4 all thicknesses
United States	Cast	UL 94	HB
	Extruded	UL 94	HB

Perspex® cast acrylic sheet burns at a rate similar to that of hard woods but with low smoke evolution. Encapsulating the edges of all Perspex® sheets into metal glazing profiles greatly reduces the ease of ignition.