

## Product Description

**PLEXIGLAS® GS**  
**PLEXIGLAS® XT**

PLEXIGLAS® – the trademark for the world's first acrylic – was invented by us and first produced in 1933 by the casting process.

Today we manufacture PLEXIGLAS® GS (= cast) and PLEXIGLAS® XT (= extruded) in many different product forms.

# Application Characteristics of PLEXIGLAS®

## PLEXIGLAS® GS

## PLEXIGLAS® XT

### cast

### extruded

	absolutely colorless and clear	
break-resistant to impact-resistant (PLEXIGLAS RESIST® HP)		break-resistant to impact-resistant (PLEXIGLAS RESIST® 45 ... 100)
	unequaled resistance to weathering and aging	
high-quality surface and planarity; high-gloss, textured or satin (PLEXIGLAS SATINICE® DC/SC)		very good surface; high-gloss, textured or satin (PLEXIGLAS® Crystal Ice)
solid sheets, blocks, tubes, round and square rods		solid sheets, tubes, round rods, multi-skin sheets, corrugated sheets, mirror sheets
2 to 160 mm solid sheet/block thickness		1.5 to 25 mm solid sheet thickness, multi-skin sheets 8, 16 and 32 mm thick
standard sizes up to 3050 x 2030 mm		standard size 3050 x 2050 mm, extra lengths and special sizes on request
over 50 standard colors		over 25 standard colors
	good resistance to dilute acids and to alkalis	
	limited resistance to organic solvents	
very easy to work, similar to hardwood		easy to work, similar to hardwood
easy to thermoform over a wide range of conditions		very easy to thermoform under optimal, constant conditions
easily and firmly bonded, e.g. with reaction adhesives (e.g. ACRIFIX® 190, 192)		very easily bonded, also with solvent adhesives (e.g. ACRIFIX® 116, 117)
	burns more or less like hardwood; very little smoke generation; combustion gases are non-toxic and non-corrosive	
max. service temperature approx. 80 °C		max. service temperature approx. 70 °C

# Survey of PLEXIGLAS® Grades and Relevant Product Groups

## PLEXIGLAS® GS

### **PLEXIGLAS® GS 209**

UV-absorbing special grade with increased heat deflection temperature and better chemical resistance

### **PLEXIGLAS® GS 218**

UV-transmitting special grade for exacting demands (e.g. for optical waveguides)

### **PLEXIGLAS® GS 222**

Standard grade for blocks from 30 mm thick, UV-absorbing

### **PLEXIGLAS® GS 231**

UV-absorbing special grade for applications requiring high UV protection, as well as for areas with strong sunlight

### **PLEXIGLAS® GS 232**

Standard grade for tubes, UV-absorbing

### **PLEXIGLAS® GS 233/0F00**

Standard solid sheet grade from 2 to 25 mm thickness, largely UV-absorbing

### **PLEXIGLAS® GS 235**

Clear special grade with increased heat deflection temperature, yet more easy to form (e.g. for sanitary-ware)

### **PLEXIGLAS® GS 241, 245, 249**

Special grades approved for aircraft glazing, UV-absorbing, of high optical quality

### **PLEXIGLAS® EndLighten**

UV-absorbing, „forward-diffusing“ special grade for edge-lit, energy-saving and ultraslim illuminated signs

### **PLEXIGLAS® GS Colors**

Transparent, translucent, opaque or fluorescent standard and special grades

### **PLEXIGLAS RESIST® HP**

Special solid sheet grade with greater impact strength and lower rigidity, with high-gloss or satin surfaces, UV-absorbing, for windshields on two-wheeled vehicles, trade-show booth construction and store fixtures, protective glazing etc.

### **PLEXIGLAS SATINICE® SC and DC**

Clear and colored standard grades with one (SC) and two (DC) satin surfaces for furniture, displays, illuminated signs and light objects

### **PLEXIGLAS SOUNDSTOP® GS**

UV-absorbing special solid sheet grade, complies with ZTV-Lsw 88, EN 1793 and EN 1794 for noise barriers

### **PLEXIGLAS SOUNDSTOP® GS CC**

UV-absorbing special solid sheet grade with integrated PA threads, complies with ZTV-Lsw 88, EN 1793 and EN 1794 for noise barriers

### **PLEXIGLAS SUNACTIVE® GS <sup>1)</sup>**

UV-transmitting, highly UV-resistant clear and transparent-colored special grades for tanning beds

### **PLEXIGLAS® GS SW and PLEXIGLAS FREE FLOW® GS SW**

Clear and colored special grades offering ease/particular ease (FREE FLOW) of forming, with better chemical resistance and higher heat deflection temperature; for sanitary-ware

### **PLEXIGLAS truLED®**

UV-absorbing special grades in specific colors for illuminated signs with LEDs or colored neon tubing

### **PLEXIGLAS® MULTICOLOR**

Special solid sheet grades from 9 mm thickness, consisting of two or three transparent, translucent, opaque or fluorescent colored layers, with high-gloss, satin or textured surfaces; for applications with cutouts or decorative edge effects.

### **Textured PLEXIGLAS® Trend Line**

Standard grades of clear and transparent-colored solid sheets with a textured surface for balcony parapets, decorative glazing and promotional items

### **Our group of cast acrylic products furthermore comprises:**

#### **PLEXICOR®**

Special grades of solid sheets and formed products made from mineral-filled, opaquely colored acrylic material with surface décors; for countertops and items of furniture, tradeshow booths and store fixtures

#### **PARAPAN®**

High-gloss solid acrylic sheets in 18 mm main thickness with special opaque standard and special colors for furniture fronts

1) Europ. patent EP 1 164 633

# PLEXIGLAS® XT

## **PLEXIGLAS® EndLighten**

UV-absorbing, „forward-diffusing“ special grade for edge-lit, energy-saving and ultraslim illuminated signs

## **PLEXIGLAS® XT 20070**

Standard solid sheet grade; largely UV-absorbing

## **PLEXIGLAS® XT 20070 HQ**

High-quality special grade of solid sheets, suitable for mirror coating, largely UV-absorbing

## **PLEXIGLAS® XT 24370**

UV-transmitting and highly UV-resistant clear standard grade of solid sheet (for conservatories, patios, etc).

## **PLEXIGLAS® XT 29070 or 29080**

Standard grades of PLEXIGLAS ALLTOP® SDP 16 double-skin sheets, and of tubes and round rods; UV-transmitting

## **PLEXIGLAS ALLTOP® SP 3)**

Group of multi-skin sheets (The “Noble” Sheet) with a water-dispersing coating on both surfaces and inside the cavities

## **PLEXIGLAS® XT Colors**

Transparent, translucent or opaque standard and special grades

## **PLEXIGLAS Gallery®**

Family of UV-absorbing and UV-protecting standard grades for glazing of pictures and exhibits

## **PLEXIGLAS HEATSTOP® XT / SP / WP 1)**

IR-reflecting standard grades that greatly reduce incident solar radiation of solid sheets, multi-skin sheets (The “Cool” Sheet) with a water-dispersing NO DROP 2) coating on one side, and corrugated sheets (The “Cool” Sheet); for domed and continuous rooflights, patio and conservatory roofs etc.; UV-absorbing

## **PLEXIGLAS RESIST® 4) 45, -65, -75, -100**

Standard grades of solid sheets with higher, graded impact strength and reduced rigidity, UV-absorbing

## **PLEXIGLAS RESIST® SP / WP 5)**

Groups of multi-skin sheets (The “Tough” Sheet) with higher impact strength, with a water-dispersing NO DROP 2) coating on one side, and corrugated sheets (The “Tough” Sheet); UV-absorbing

## **PLEXIGLAS® XT RP**

Satin, gray-transparent colored special grade made of special molding compound, with specific lighting-engineering performance for rear projection (RP)

## **PLEXIGLAS® Crystal Ice**

Clear and colored standard grades with one (AR) and two (DF) satin surfaces for picture glazing, furniture, displays, illuminated signs and light objects

## **PLEXIGLAS SOUNDSTOP® XT 6)**

UV-absorbing special grades of solid sheet, in accordance with ZTV-Lsw 88, EN 1793 and EN 1794 for noise barriers

## **PLEXIGLAS® MIRROR XT**

Various colored sheets of PLEXIGLAS® XT with one mirror surface, back-painted

## **Textured PLEXIGLAS® Classic Line**

Standard grades of clear and transparent-colored solid sheets with a textured surface for balcony parapets, decorative glazing and promotional items

## **PLEXIGLAS SUNACTIVE® XT 24770**

UV-transmitting, highly UV-resistant clear special grade for tanning bed canopies; thickness max. 3 mm

## **PLEXIGLAS SUPERCLEAR®**

Group of UV-absorbing solid sheets of the highest optical quality, for optoelectronic applications

1) Europ. patent EP 548 822

2) Europ. patent EP 149 182

3) Europ. patent EP 530 617

4) Europ. patent EP 776 931

5) Europ. patent EP 733 754

6) Europ. patent EP 600 332

In addition to the mentioned products, we supply for various EUROPLEX® (films and sheets made of PMMA, PC, PSU, PPSU etc.) and ROHACELL® (PMI rigid foam).

# Typical Property Values

(at 23 °C and 50 % relative humidity)

Mechanical properties	PLEXIGLAS® GS	PLEXIGLAS® XT	PLEXIGLAS RESIST®	Unit	Test standard
	233; 222; 209; 0F00	20070; 29070	45; 65; 75; 100		
Density $\rho$	1.19	1.19	1.19	g/cm <sup>3</sup>	ISO 1183
Impact strength $a_{cU}$ (Charpy)	15	15	45; 65; 75;	kJ/m <sup>2</sup>	ISO 179/1fu no break
Notched impact strength $a_{iN}$ (Izod)	1.6	1.6	2.5; 4.5; 6.0; 6.5	kJ/m <sup>2</sup>	ISO 180/1 A
Notched impact strength $a_{cN}$ (Charpy)	–	–	3.5; 6.5; 7.5; 8.0	kJ/m <sup>2</sup>	ISO 179/1eA
Tensile strength $\sigma_M$ a) –40 °C b) 23 °C c) 70 °C	110 80 40	100 72 35	– 60; 50; 45; 40 –	MPa	ISO 527-2/1B/5
Elongation at break $\epsilon_B$	5.5	4.5	–	%	ISO 527-2 1B/5
Nominal elongation at break $\epsilon_{tB}$	–	–	10; 15; 20; 25	%	ISO 527-2/1B/50
Flexural strength $\sigma_{bB}$ , Standard test specimen (80 x 10 x 4 mm <sup>3</sup> )	115	105	95; 85; 77; 69	MPa	ISO 178 (5mm/min)
Compressive yield stress $\sigma_{dF}$	110	103	–	MPa	ISO 604
Max. safety stress $\sigma_{max}$ (up to 40 °C)	5 ... 10	5 ... 10	5 ... 10	MPa	–
Modulus of elasticity $E_t$ (short-term value)	3300	3300	2700; 2200; 2000; 1800	MPa	ISO 527-2/1B/1
Min. cold bending radius	330 x thickness	330 x thickness	270 x thickness; 210 x thickness; 180 x thickness; 150 x thickness	–	–
Dynamic shear modulus G at approx. 10 Hz	1700	1700	–	MPa	ISO 537
Indentation hardness $H_{961/30}$	175	175	145; 130;	MPa	ISO 2039-1 120; 100
Abrasion resistance in Taber abrader test (100 rev.; 5.4 N; CS-10F)	20 ... 30	20 ... 30	20 ... 30 30 ... 40 30 ... 40 30 ... 40	% haze	ISO 9352
Coefficient of friction $\mu$ a) plastic / plastic b) plastic / steel c) steel / plastic	0.8 0.5 0.45	0.8 0.5 0.45	– – –	–	–
Poisson's ratio $\mu_b$ (dilatation speed of 5 % per min; up to 2 % dilatation; at 23 °C)	0.37	0.37	0,41; 0,42; 0,41; 0,43	–	ISO 527-1
Resistance to puck impact from thickness (Test Certificate No. from FMPA Stuttgart)	–	12 mm (46/900 550)	–; 6 <sup>1</sup> ); (6); 6 <sup>2</sup> ) mm ( <sup>1</sup> 46/901 869/Sm/C; <sup>2</sup> 46/901 870/Sm/C)	–	similar to DIN 18032, part 3

<b>Acoustical properties</b>	<b>PLEXIGLAS® GS</b> 233; 222; 209; 0F00	<b>PLEXIGLAS® XT</b> 20070; 29070	<b>PLEXIGLAS RESIST®</b> 45; 65; 75; 100	<b>Unit</b>	<b>Test standard</b>
Sound velocity (at room temperature)	2700...2800	2700...2800	–	m/s	–
Weight sounded reduction index $R_w$ at thickness: 4 mm 6 mm 10 mm	26 30 32	26 30 32	– – –	dB	–
<b>Optical properties</b> (of clear grades, at 3 mm thickness)	<b>PLEXIGLAS® GS</b> 233; 222; 209; 0F00	<b>PLEXIGLAS® XT</b> 20070; 29070	<b>PLEXIGLAS RESIST®</b> 45; 65; 75; 100	<b>Unit</b>	<b>Test standard</b>
Transmittance $\tau_{D65}$	~ 92	~ 92	~ 91	%	DIN 5036, Part 3
UV transmission	no; no; no	no; yes	no; no; no; no	–	–
Reflecion loss the visible range (for each surface)	4	4	4	%	–
Total energy transmittance g	85	85	85	%	DIN EN 410
Adsorption in the visible range	< 0.05	< 0.05	< 0.05	%	–
Refractive index $n_D^{20}$	1.491	1.491	1.491	–	ISO 489
<b>Electrical properties</b>	<b>PLEXIGLAS® GS</b> 233; 222; 209; 0F00	<b>PLEXIGLAS® XT</b> 20070; 29070	<b>PLEXIGLAS RESIST®</b> 45; 65; 75; 100	<b>Unit</b>	<b>Test standard</b>
Volume resistivity $\rho_D$	> $10^{15}$	> $10^{15}$	> $10^{14}$	ohm · cm	DIN VDE 0303, Part 3
Surface resistivity $R_{OA}$	$5 \cdot 10^{13}$	$5 \cdot 10^{13}$	> $10^{14}$	ohm	
Dielectric strength $E_d$ (1 mm specimen thickness)	~ 30	~ 30	–	kV/mm	DIN VDE 0303, Part 2
Dielectric constant $\epsilon$ at 50 Hz at 0.1 MHz	3.6 2.7	3.7 2.8	– –	– –	DIN VDE 0303, Part 4
Dissipation factor $\tan \delta$ at 50 Hz at 0.1 MHz	0.06 0.02	0.06 0.03	– –	– –	DIN VDE 0303, Part 4
Tracking, CTI-Value	600	600	–	–	DIN VDE 0303, Part 1

<b>Thermal properties</b>	<b>PLEXIGLAS® GS</b> 233; 222; 209; 0F00	<b>PLEXIGLAS® XT</b> 20070; 29070	<b>PLEXIGLAS RESIST®</b> 45; 65; 75; 100	<b>Unit</b>	<b>Test standard</b>
Coefficient of linear thermal expansion $\alpha$ for 0...50 °C	$7 \cdot 10^{-5}$ (0.07)	$7 \cdot 10^{-5}$ (0.07)	$7 \cdot 10^{-5}$ ; $8 \cdot 10^{-5}$ ; $9 \cdot 10^{-5}$ ; $11 \cdot 10^{-5}$ (0.07; 0.08; 0.09; 0.11)	1/K (mm/ m °C)	DIN 53752-A
Possible expansion due to heat and moisture	5	5	5; 6; 6; 8	mm/m	–
Thermal conductivity $\lambda$	0.19	0.19	–	W/mK	DIN 52612
U-value, for thickness: 1 mm 3 mm 5 mm 10 mm	5.8 5.6 5.3 4.4	5.8 5.6 5.3 4.4	5.8 5.6 5.3 4.4	W/m²K	DIN 4701
Specific heat c	1.47	1.47	1.47	J/gK	–
Forming temperature	160...175	150...160	150...160 140...150 140...150 140...150	°C	–
Max. surface temperature (IR radiator)	200	180	–	°C	–
Max. permanent service temperature	80	70	70; 70; 70; 65	°C	–
Reverse forming temperature	> 80; > 80; > 90	> 80; > 80	> 80; > 80; > 75; > 70	°C	–
Ignition temperature	425	430	–	°C	DIN 51794
Smoke gas volume	very little	very little	very little	–	DIN 4102
Smoke gas toxicity	non	non	non	–	DIN 53436
Smoke gas corrosiveness	non	non	non	–	–
Fire rating class	B 2, normally flammable	B 2 normally flammable	B 2, normally flammable	–	DIN 4102
	Class 3	Class 3	–	–	BS 476, Part 7 + 6
	TP(b)	TP(b)	–	–	BS 2782, Method 508A
	M 4	M 4	–	–	NF P 92 501 + 92 505
Vicat softening temperature	115	103	102; 100; 100; 97	°C	ISO 306, Method B 50
Heat deflection temperature under load (HDT) a) deflection 1.8 MPa b) deflection 0.45 MPa	105; 105; 107 113; 113; 115	95 100	94; 93; 92; 90; 99; 98; 96; 93	°C	ISO 75

Behavior towards water	PLEXIGLAS® GS 233; 222; 209; 0F00	PLEXIGLAS® XT 20070; 29070	PLEXIGLAS RESIST® 45; 65; 75; 100	Unit	Test standard
Water absorption (24 hrs, 23 °C) from dry state; specimen 60 x 60 x 2 mm <sup>3</sup>	41	38	41; 45; 46; 49	mg	ISO 62, Method 1
Max. weight gain during immersion	2.1	2.1	2.1	%	ISO 62, Method 1
Permeability to water vapour	2.3 · 10 <sup>-10</sup>	2.3 · 10 <sup>-10</sup>	–	g cm — cm <sup>2</sup> h Pa	–
N <sub>2</sub>	4.5 · 10 <sup>-15</sup>	4.5 · 10 <sup>-15</sup>	–		
O <sub>2</sub>	2.0 · 10 <sup>-14</sup>	2.0 · 10 <sup>-14</sup>	–		
CO <sub>2</sub>	1.1 · 10 <sup>-13</sup>	1.1 · 10 <sup>-13</sup>	–		
air	8.3 · 10 <sup>-15</sup>	8.3 · 10 <sup>-15</sup>	–		

### Global Availability

We sell our PLEXIGLAS® products both directly to fabricators and via a closely meshed network of distributors. The extensive and efficient distribution system ensures that products are rapidly available throughout Europe, Asia, Australia and Africa. In the Americas, the business unit has its own production facilities and distribution system. Our range is sold in that part of the world under the ACRYLITE® trademark.

### Important notice

This is an international English-language information prepared for several markets.

It is essential that the selection of particular materials and their

methods of use conform with the requirements of national and local Building Regulations.

The availability of any particular product should be checked with your supplier.

Advice and delivery by:

### Degussa Methacrylates

#### Röhm GmbH

Certified to DIN EN ISO 9001 (quality)  
and DIN EN ISO 14001 (environment)

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**PLEXIGLAS,  
PLEXIGLAS ALLTOP,  
PLEXIGLAS HEATSTOP,  
PLEXIGLAS RESIST,  
PLEXIGLAS SATINICE,  
PLEXIGLAS SOUNDSTOP,  
PLEXIGLAS SUNACTIVE,  
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