

## Specification

Physical and chemical properties

PCP  
NEOTHERM®

### NEOTHERM®

NEOTHERM® is an infrared - protective filter for observation of melting processes. It guarantees always adequate recognition and judgement during melting. Simultaneously optimal eye protection against harmful infrared radiation is given (DIN EN 171).

The subsequent properties are based primarily upon the measuring results of the very latest standards and measuring methods, which are defined in corresponding "Measuring and Test Procedures". We retain the right to change the data in keeping with the latest technical standards. Non-toleranced numerical values are reference values of an average production quality.

Values marked with  $\diamond$  do not apply to the type of glass or no values are available.

Requirements deviating from these specifications must be defined in writing in a **customer agreement**.

<b>Specification</b>		<b>PCP</b>	
Physical and chemical properties		<b>NEOTHERM<sup>®</sup> N = 4 - 6</b>	
<b>1.</b>	<b>Optical properties</b>		
<b>1.1</b>	<b>Refractive index</b>	$n_e$	1.52
<b>1.2</b>	<b>Transmittance data</b>		
<b>1.2.1</b>	<b>Spectral transmittance <math>\tau(\lambda)</math></b>		
<b>1.2.1.1</b>	<b><math>\tau(\lambda)</math> - curve</b>		
	Plot of spectral transmittance $\tau(\lambda)$ ( $\lambda = 300 \text{ nm to } 2000 \text{ nm}$ )		see annex
<b>1.2.2</b>	<b>Luminous transmittance <math>\tau_{VP}</math> in %</b>		1.2 to 0.44
<b>1.2.2.1</b>			disregard
<b>1.2.2.2</b>	<b>Scale number</b>		4 - 6
<b>1.2.3</b>	<b>Special transmittance values in %</b>		
<b>1.2.3.1</b>	<b>UV - transmittance</b>		disregard
<b>1.2.3.2</b>	<b>IR - transmittance</b>		
		$\tau_A$	< 0.2
		$\tau_N$	< 1

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<b>Specification</b>		<b>PCP</b>	
Physical and chemical properties		<b>NEOTHERM® N = 4 - 7</b>	
<b>1.</b>	<b>Optical properties</b>		
<b>1.1</b>	<b>Refractive index</b>	$n_e$	1.52
<b>1.2</b>	<b>Transmittance data</b>		
<b>1.2.1</b>	<b>Spectral transmittance <math>\tau(\lambda)</math></b>		
<b>1.2.1.1</b>	<b><math>\tau(\lambda)</math> - curve</b>		
	Plot of spectral transmittance $\tau(\lambda)$ ( $\lambda = 300 \text{ nm to } 2000 \text{ nm}$ )		see annex
<b>1.2.2</b>	<b>Luminous transmittance <math>\tau_{VP}</math> in %</b>		0.44 to 0.16
<b>1.2.2.1</b>			disregard
<b>1.2.2.2</b>	<b>Scale number</b>		4 - 7
<b>1.2.3</b>	<b>Special transmittance values in %</b>		
<b>1.2.3.1</b>	<b>UV - transmittance</b>		disregard
<b>1.2.3.2</b>	<b>IR - transmittance</b>		
		$\tau_A$	< 0.15
		$\tau_N$	< 0.6

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<b>Specification</b>		<b>PCP NEOTHERM®</b>																					
Physical and chemical properties																							
<b>2.</b>	<b>Thermal properties</b>																						
<b>2.1</b>	<b>Viscosities and corresponding temperatures</b>																						
	<table border="1"> <thead> <tr> <th>Designation</th> <th>Viscosity lg <math>\eta</math> in dPas</th> <th>Temperature <math>\vartheta</math> in °C</th> </tr> </thead> <tbody> <tr> <td>Strain point</td> <td>14.5</td> <td>497</td> </tr> <tr> <td>Annealing point</td> <td>13.0</td> <td>525</td> </tr> <tr> <td>Softening point</td> <td>7.6</td> <td>702</td> </tr> <tr> <td>Forming temperature</td> <td>6.0</td> <td>802</td> </tr> <tr> <td>Forming temperature</td> <td>5.0</td> <td>889</td> </tr> <tr> <td>Forming temperature</td> <td>4.0</td> <td>1007</td> </tr> </tbody> </table>	Designation	Viscosity lg $\eta$ in dPas	Temperature $\vartheta$ in °C	Strain point	14.5	497	Annealing point	13.0	525	Softening point	7.6	702	Forming temperature	6.0	802	Forming temperature	5.0	889	Forming temperature	4.0	1007	
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<b>2.2</b>	<b>Transformation temperature <math>T_g</math> in °C</b>	523																					
<b>2.3</b>	<b>Coefficient of thermal expansion <math>\alpha</math></b>																						
<b>2.3.1</b>	<b>Coefficient of mean linear thermal expansion <math>\alpha(20\text{ °C};300\text{ °C})</math> in <math>10^{-6}\text{ K}^{-1}</math> (Static measurement)</b>	9.1																					
<b>3.</b>	<b>Mechanical properties</b>																						
<b>3.1</b>	<b>Density <math>\rho</math> in g/cm<sup>3</sup></b>	2.51																					
<b>3.2</b>	<b>Stress optical coefficient <math>C</math> in <math>1.02 \cdot 10^{-12}\text{ m}^2/\text{N}</math></b>	2.82																					
<b>3.3</b>	<b>Breaking strength</b>																						
	Admissible value for the bending strength $\sigma_{zul}$ of technically annealed glasses as calculation basis (air) in N/mm <sup>2</sup> .	30																					
	A higher mechanical strength is possibly by thermal toughening.																						
<b>3.3.1</b>		disregard																					
<b>3.3.2</b>	<b>Thermal toughening</b>	special order																					

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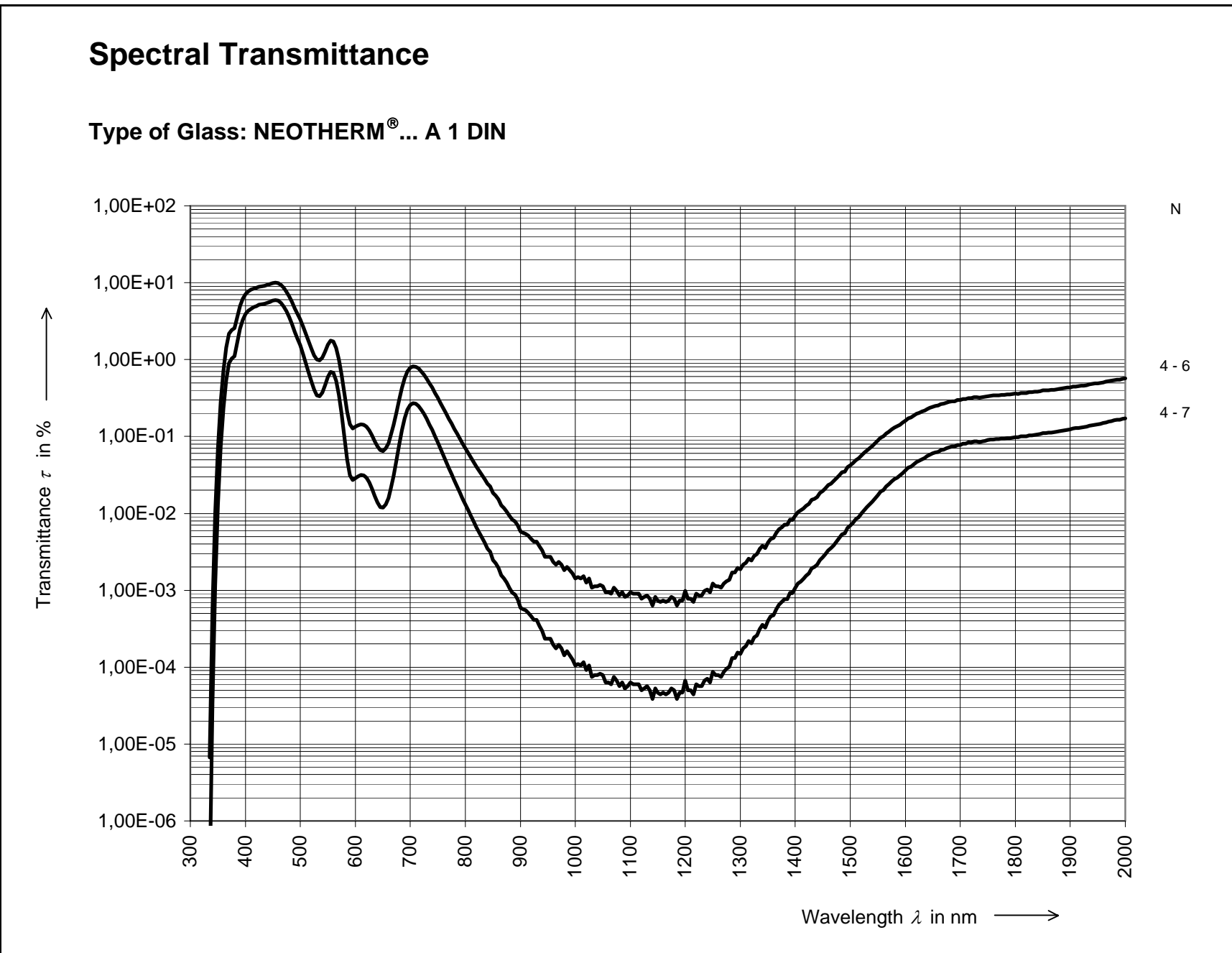
<b>Specification</b>		<b>PCP NEOTHERM®</b>
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<b>4.</b>	<b>Chemical properties</b>	
<b>4.1</b>	<b>Hydrolytic resistance acc. to DIN ISO 719</b>	
	Hydrolytic class	HGB 3
	Equivalent of alkali (Na <sub>2</sub> O) per gram of glass grains in µg/g	209
<b>4.2</b>	<b>Acid resistance acc. to DIN 12 116</b>	
	Acid class	S 2
	Half surface weight loss after 6 hours in mg/dm <sup>2</sup>	1.45
<b>4.3</b>	<b>Alkali resistance acc. to DIN ISO 695</b>	
	Class	A 1
	Surface weight loss after 3 hours in mg/dm <sup>2</sup>	68
<b>4.4</b>	<b>Hazardous Substances</b>	
	EC-directive 2002/95/EC (RoHS-directive)	on request
<b>5.</b>	<b>Electrical properties</b>	disregard
<b>6.</b>	<b>Other properties</b>	
<b>6.1</b>	<b>DIN-Test certificate / EC-type-examination certificate (Survey)</b>	see annex
<b>6.2</b>	<b>Additional requirements acc. to DIN EN 166</b>	
<b>6.2.1</b>	Scattered light in $\frac{cd / m^2}{lx}$	0,05
<b>6.2.2</b>	<b>Resistance to ultraviolet radiation</b>	
	Scattered light in $\frac{cd / m^2}{lx}$	0,05
<b>6.2.3</b>	<b>Stability at elevated temperatures</b>	is guaranteed
<b>6.2.4</b>	<b>Resistance to ignition</b>	is guaranteed
<b>7.</b>	<b>Annex (diagrams, curves)</b>	

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Annex 6.1

<b>Specification</b>						<b>PCP NEOTHERM®</b>	
Physical and chemical properties							
<b>DIN - Test certificate by SCHOTT, status 12/02/08</b>							
<b>PTB - No. PZA - No.</b>	<b>Period of validity</b>	<b>Marking</b>	<b>Thickness (±0.3 mm)</b>	<b>Curvature (±0.5 dpt)</b>	<b>Lot size</b>	<b>Remark</b>	<b>DIN-test Certificate and EC-type examination certificate</b>
<b>Infrared protective filter, flat</b>							
10491-PZA-07	30/04/2012	4-6 A 1 DIN	2.3		500	Neoth.	existing
10492-PZA-07	30/04/2012	4-7 A 1 DIN	2.9		500	Neoth.	existing

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