

DATA SHEET

SCHOTT® Lead Glass RD50

Specification		PCP RD 50®	
Physical and chemical properties			
1. Optical properties			
1.1	Refractive index	n_D	1.79
1.2 Transmittance data			
1.2.1 Spectral transmittance $\tau(\lambda)$			
1.2.1.1	$\tau(\lambda)$ - curve	Plot of spectral transmittance $\tau(\lambda)$ for $d = 5.0$ mm, $d = 10.0$ mm, $d = 20.0$ mm ($\lambda = 340$ nm to 800 nm)	
			see annex
1.2.1.2	$\tau(\lambda)$ - individual values in % ($d = 10$ mm)		
	τ at $\lambda = 550$ nm	τ_{550}	85
1.2.1.3	Edge wavelength ($d = 5.0$ mm)		
	Edge wavelength λ_c ($\tau = 0.46$) in nm		397
1.2.2	Luminous transmittance τ_v as a function of thickness		
		Thickness in mm	τ_{vD65} in % τ_{vA} in %
		5.0	85 85
		10.0	84 84.5
		20.0	82.5 83
2. Thermal properties			
2.1 Viscosities and corresponding temperatures			
	Designation	Viscosity $\lg \eta$ in dPas	Temperature ϑ in °C
	Strain point	14.5	444
	Annealing point	13.0	467
	Softening point	7.6	603
	Forming temperature	6.0	673
	Forming temperature	5.0	729
	Forming temperature	4.0	800
2.2	Transformation temperature T_g in °C		467
2.3 Coefficient of thermal expansion α			
2.3.1	Coefficient of mean linear thermal expansion $\alpha(20\text{ °C}; 300\text{ °C})$ in 10^{-6} K^{-1} (Static measurement)		7.4
2.4	Fuseability		disregarded
2.5	Mean specific heat capacity $c_p(20\text{ °C to } 100\text{ °C})$ in $\text{J}/(\text{g} \cdot \text{K})$		0.39
2.6	Thermal conductivity λ in $\text{W}/(\text{m} \cdot \text{K})$ for 50 °C		0.62

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3. Mechanical properties		
3.1	Density ρ in g/cm ³ (Condition as supplied)	≥ 5.05
3.2	Stress optical coefficient C in $1.02 \cdot 10^{-12}$ m ² /N	0.78
3.3	Breaking strength	disregarded
3.4	Young's modulus E in kN/mm ²	56.6
3.5	Poisson's ratio μ	0.245
3.6	Torsion modulus G in kN/mm ²	22.7
3.7	Knoop hardness HK 0.1/20	360
4. Chemical properties		
4.1	Hydrolytic resistance acc. to DIN ISO 719	
	Hydrolytic class	HGB 1
	Equivalent of alkali (Na ₂ O) per gram of glass grains in µg/g	24
4.2	Acid resistance acc. to DIN 12 116	
	Acid class	◇
	Half surface weight loss after 6 hours in mg/dm ²	◇
4.3	Alkali resistance acc. to DIN ISO 695	
	Class	A 3
	Surface weight loss after 3 hours in mg/dm ²	510
4.4	Hazardous Substances	
	EC-directive 2002/95/EC (RoHS-directive)	on request
5.	Electrical properties	disregarded

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Specification		PCP RD 50®						
Physical and chemical properties								
6. Other properties								
6.1 Lead equivalent in % of glass thickness for different types of radiation								
6.1.1 X - radiation quality								
Minimum thickness in mm	5.0	7.0	8.5	10.0	11.5	16.0	20.0	
Thickness min. to thickness max. in mm	5.0 to 7.0	7.0 to 9.0	8.5 to 10.5	10.0 to 12.0	11.5 to 14.0	16.0 to 19.0	20.0 to 23.0	
Tube voltage in kV								
76*	31.2	31.3	30.9	30.8	30.2	◇	◇	
80	31.2	31.2	31.1	31.2	31.2	◇	◇	
100	30.6	30.8	31.0	31.3	31.5	31.5	31.5	
110	30.0	30.2	30.3	30.5	30.6	30.6	30.6	
150	30.1	30.3	30.5	30.8	30.9	30.9	30.9	
200	29.2	29.2	29.1	29.1	29.1	29.3	29.1	
250	28.7	28.7	28.8	28.9	29.0	29.5	29.5	
300	29.3	29.4	29.6	29.6	29.8	30.2	30.6	
350*	29.8	30.0	30.2	30.3	30.4	30.9	31.3	
400	30.5	30.8	30.9	31.1	31.3	31.7	32.1	
450*	30.9	31.2	31.4	31.6	31.8	32.3	32.7	
500*	31.2	31.6	31.8	32.0	32.2	32.7	33.2	
550*	31.7	32.1	32.3	32.6	32.8	33.3	33.7	
600*	32.0	32.5	32.7	33.0	33.2	33.7	34.2	
650*	32.2	32.8	33.1	33.3	33.6	34.1	34.6	
750*	32.7	33.3	33.7	34.0	34.2	34.8	35.2	
1000*	33.9	34.6	34.9	35.3	35.5	36.1	36.5	
* tube voltage not enclosed in DIN EN 61331-1								
Measuring and Test Procedures								
TÜV NORD EnSys Hannover GmbH & Co. KG (23.06.2009)						on request		

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Specification		PCP RD 50®						
Physical and chemical properties								
6.1.2	Radionuclide							
	Thickness min. to thickness max. in mm	5.0 to 7.0	7.0 to 9.0	8.5 to 10.5	10.0 to 12.0	11.5 to 14.0	16.0 to 19.0	20.0 to 23.0
	Nuclide							
	¹¹ C	37.2	37.2	37.2	37.2	37.2	37.2	37.2
	¹³ N	37.2	37.2	37.2	37.2	37.2	37.2	37.2
	¹⁵ O	37.2	37.2	37.2	37.2	37.2	37.2	37.2
	¹⁸ F	37.2	37.2	37.2	37.2	37.2	37.2	37.2
	²² Na	41.1	41.5	41.5	41.5	41.4	41.0	40.6
	⁵⁸ Co	40.7	40.5	40.4	40.3	40.3	40.1	39.9
	⁵⁹ Fe	44.7	44.6	44.5	44.4	44.3	44.2	44.2
	⁶⁰ Co	44.5	44.5	44.5	44.5	44.5	44.5	44.5
	⁶⁸ Ga	37.5	37.4	37.4	37.3	37.3	37.2	37.1
	⁸² Rb	38.0	37.9	37.8	37.7	37.7	37.5	37.5
	⁹⁹ Mo	44.1	45.9	45.5	44.8	44.2	42.9	42.2
	⁹⁹ Tc ^m	29.2	29.1	29.0	29.0	28.9	28.7	28.6
	¹²³ I	31.2	32.6	34.7	37.7	38.8	39.2	39.8
	¹²⁵ I	--*	--*	--*	--*	--*	--*	--*
	¹³¹ I	34.1	33.9	33.8	33.7	33.5	33.0	32.6
	¹³⁷ Cs	39.8	39.4	39.3	39.2	39.1	38.9	38.8
	¹⁹² Ir	32.1	33.8	34.4	34.7	34.9	34.7	34.3
* For the radionuclide ¹²⁵ I we have not been able to calculate a lead equivalent within the preset calculating time, because the glass shields the radiation too good.								
Measuring and Test Procedures								
TÜV NORD EnSys Hannover GmbH & Co. KG (23.06.2009)							on request	

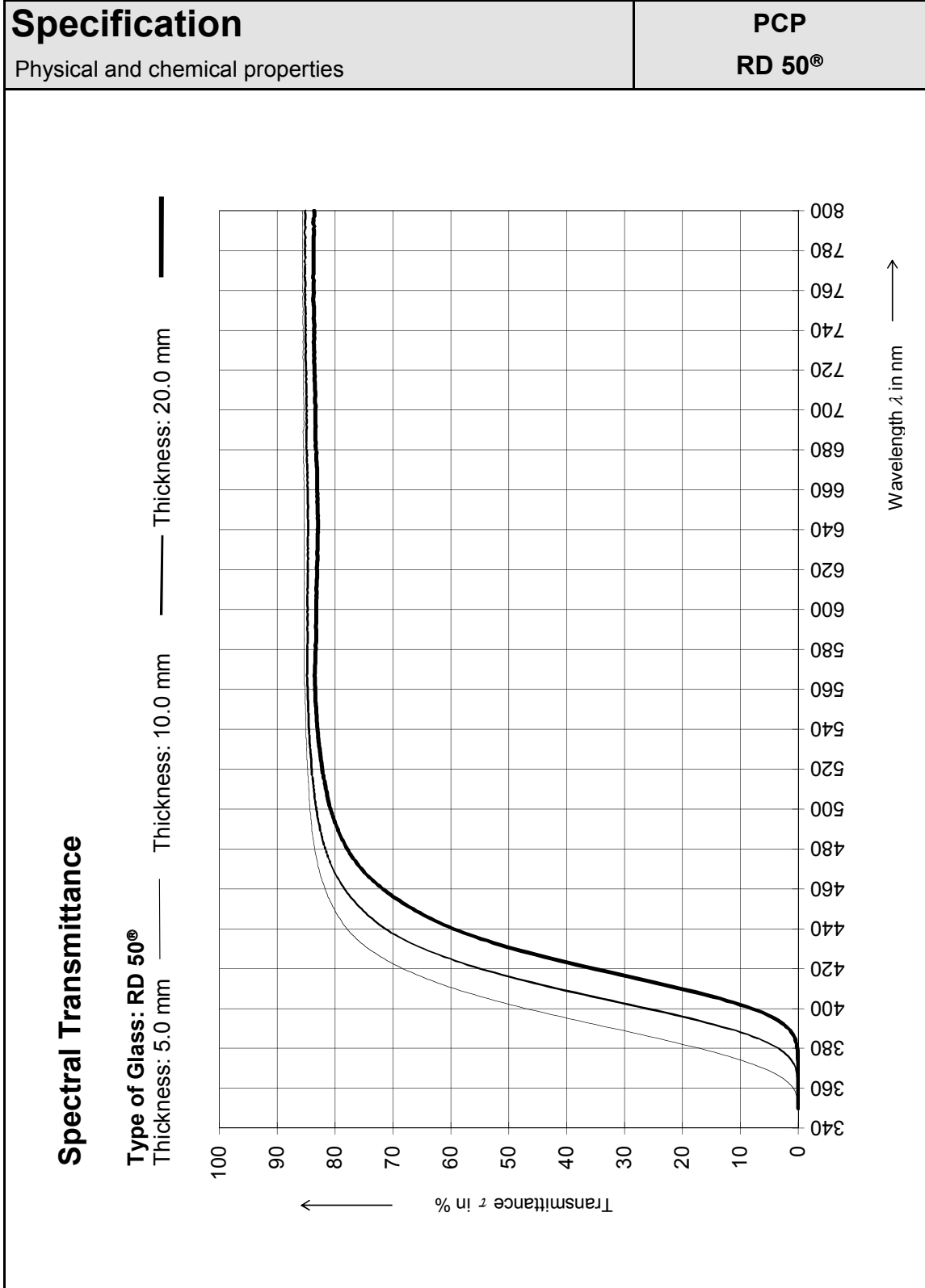
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Specification		PCP RD 50®						
Physical and chemical properties								
6.1.3	Monoenergetic photon radiation							
	Thickness min. to thickness max. in mm	5.0 to 7.0	7.0 to 9.0	8.5 to 10.5	10.0 to 12.0	11.5 to 14.0	16.0 to 19.0	20.0 to 23.0
	Energy in MeV							
	0.5	36.9	37.0	37.0	37.0	37.0	37.0	37.0
	0.75	40.9	40.9	40.9	40.9	40.9	40.9	40.9
	1	43.0	43.0	43.0	43.0	43.0	43.1	43.1
	1.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5
	2.5	43.4	43.4	43.4	43.4	43.4	43.5	43.5
	5	39.3	39.3	39.4	39.4	39.4	39.4	39.5
	7.5	37.4	37.5	37.5	37.6	37.6	37.7	37.8
	9	37.2	37.4	37.4	37.5	37.5	37.7	37.8
	Measuring and Test Procedures							
	TÜV NORD EnSys Hannover GmbH & Co. KG (23.06.2009)						on request	
7.	Annex (diagrams, curves)							

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