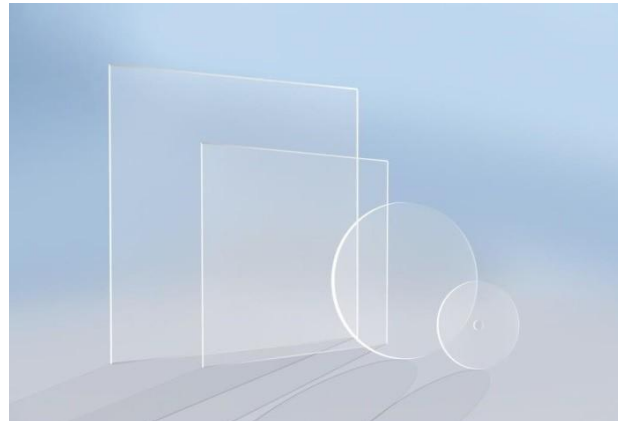




BK 7 / H-K9L / B270

Description

BK7 produced by Schott and its equivalent H-K9L are used for standard optical glass components, or when optical glass is requested for customized items. BK7 and H-K9L are high quality optical glasses that are used whenever the additional benefits of fused silica and fused quartz (like for example for high transmission outputs in the UV-C light section and deep IR-light) are not required.



These materials perform well in all chemical tests and no special handling is required. The materials are also relatively hard materials with an extremely low bubble and inclusion content. Besides they provide an excellent transmittance through-out the visible and near infrared spectra and down to 350 nm in the ultraviolet with low absorption.

Special properties of BK7/H-K9L

- high optical quality
- made of the purest raw materials
- colorless appearance and very clear looking
- nearly free of bubbles
- nearly free to inclusions
-

Typical applications

- protective windows for laser applications
- general optical applications
- optical items like lenses and prisms
- mirror substrates
- substrates for optical coatings



PROPERTIES OF BK7

Chemical Composition

SiO ₂	B ₂ O ₃	BaO	Na ₂ O	K ₂ O	As ₂ O ₃
69.13%	10.75%	3.07%	10.40%	6.29%	0.36%

Thermal Properties

Thermal Coefficient of Expansion	(0/300°C): $70 \times 10^{-7}/^{\circ}\text{C}$
Annealing Point	550°C / 1022 °F
Softening Point	719°C/ 1326 °F
Strain Point	624°C / 1155 °F

Mechanical Properties

Density	2.51 g/cm ³
Young's Modulus	$82 \times 10^3 \text{ N/mm}^2$
Poisson's Ratio	0.206
Knoop hardness	HK _{0,1/20} : 610

Optical Properties

Refractive Index n _d :	1.51680 (587.6nm)
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Chemical Properties

Hydrolytic Resistance	class 2
Acid Resistance	class 1
Alkali Resistance	class 1

Electrical Properties

Dielectric Constant	N/A
Resistivity	N/A
Dielectric Strength	N/A

For more information please visit the material manufacturer's website: www.schott.de



PROPERTIES OF H-K9L

Chemical Properties (grade)

RC(S)	RA(S)	D _w	D _A
1	1	2	1

Thermal Properties

Transition Temperature	Coefficient of Thermal Expansion	Coefficient of Thermal Expansion	Coefficient of Thermal Conductivity	Specific Heat Capacity
T _g	α (-30/70)	α (100/300)	λ	C _p
556	76	93	1.21	0.749

Mechanical Properties

Knoop Hardness		Abrasion Factor	Young's Modulus	Rigidity	Poisson's	Flexural Strength	Spec. Gravity
HK	HKrank	FA	E	G	μ	σ_b	d
595	6	100	79	32.7	0.214	106	2.52

Density: $\rho(\text{g/cm}^3) = 2.49$

Optical Properties

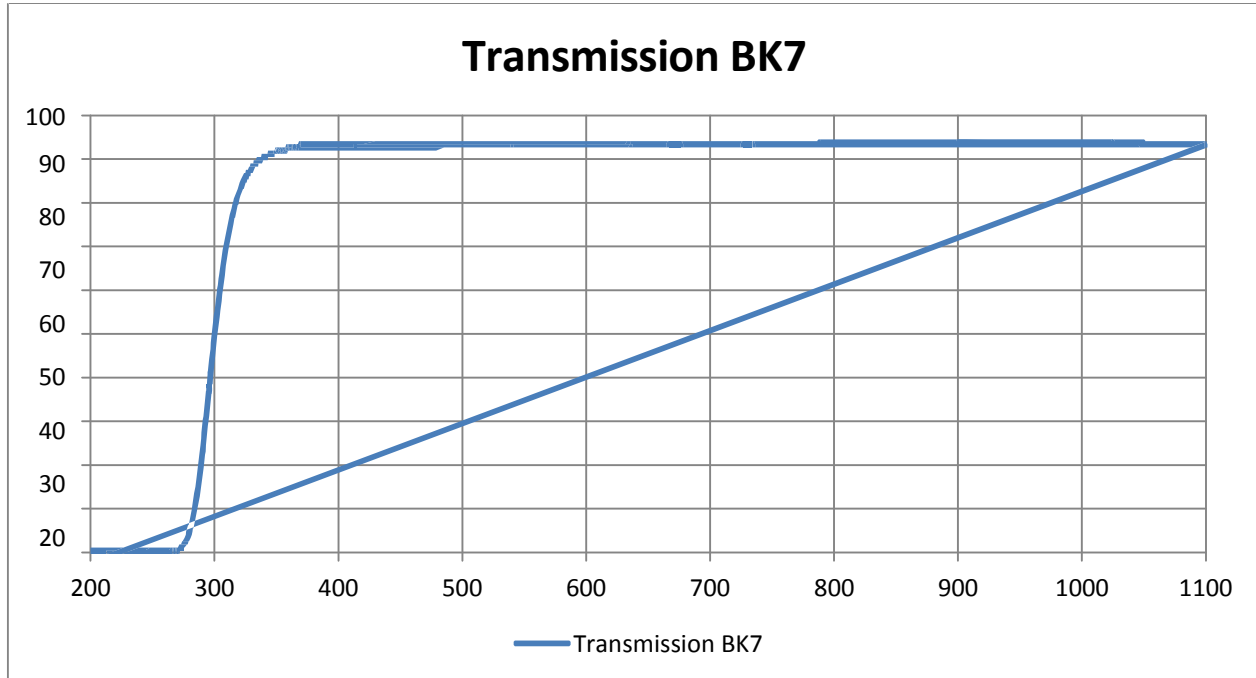
Refractive Index		Abbe-number		Dispersion
nd	ne	vd	ve	n _F -n _C
1.5168	1.51872	64.2	64	0.00805

Color Code (λ_{80}/λ_5) = 33/29

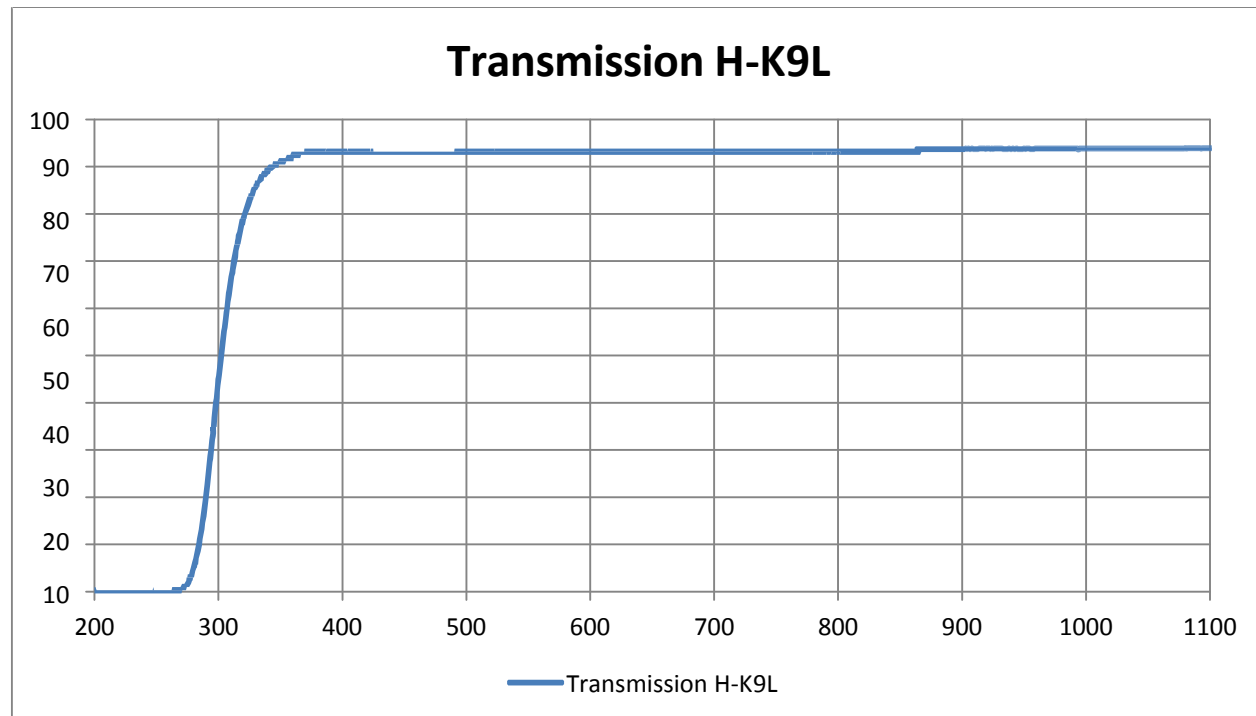


TRANSMISSION CURVES BK7 / H-K9L

Optical Transmission in the VIS of BK7



Optical Transmission in the VIS of H-K9L





PROPERTIES OF B270

Description

B270 also produced by Schott is a Crown Glass with an economical cost effectiveness and high, uniform transmittance in the visual light and near infrared light and has a colorless appearance.

Special properties of B270

made of the purest raw materials
 colorless appearance and very clear looking
 nearly free of bubbles
 very stable in regards to solarization
 excellent processability during treatment

Typical applications

optical protective windows
 general optical applications
 Chip masks
 Image Forming Optics
 for optical items like LCD covers
 substrates for laboratories
 substrates for optical coatings

Thermal Properties	
Thermal Coefficient of Expansion	(20-300°C): $9,4 \times 10^{-7} / ^\circ\text{C}$
Annealing Point	Tg: 533°C
Softening Point	($10^{7,6}$ dPa): 724°C
Strain Points Upper Strain Point Lower Strain Point	(10^{13} dPa): 541°C ($10^{14,5}$ dPa): 511°C
Mechanical Properties	
Density	2.55 g/cm ³
Young's Modulus	71.5×10^3 kN/mm ²
Poisson's Ratio	0.219
Knoop hardness	HK ₁₀₀ : 542
Optical Properties	
Refractive Index n_d :	1.5230 (587,5nm)

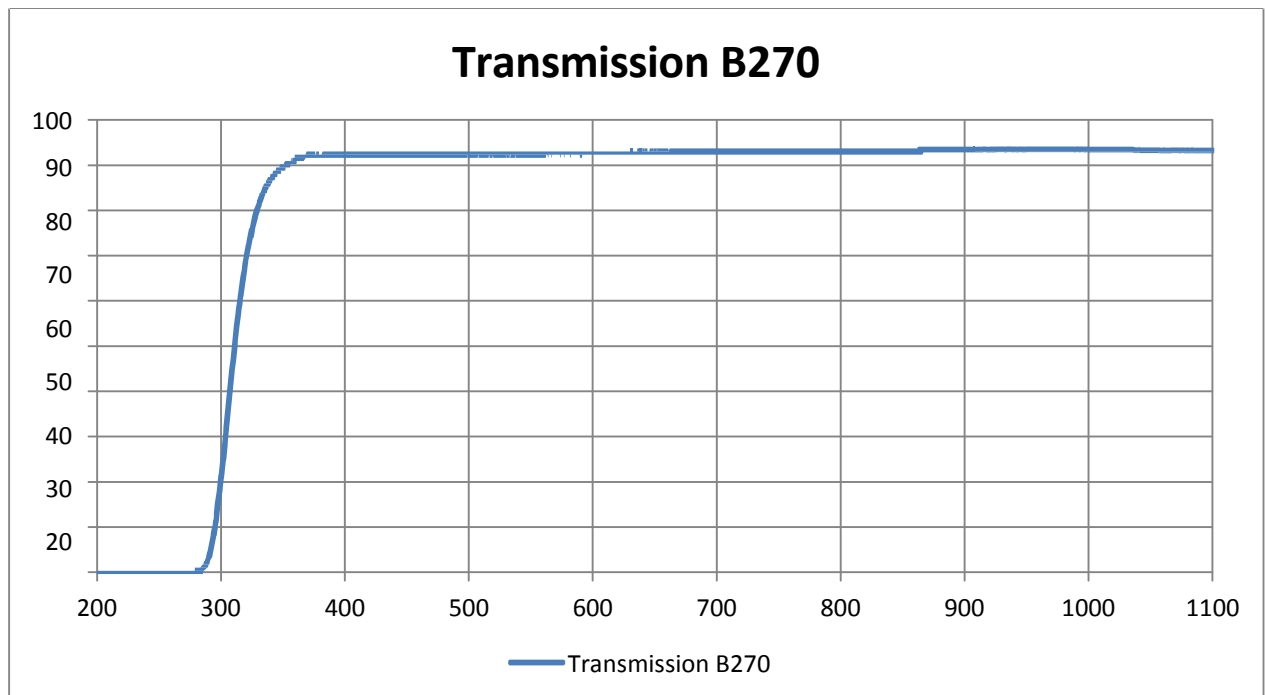


Chemical Properties	
Hydrolytic Resistance DIN ISO 719:	class HGB 3
Acid Resistance DIN 12 116:	class 2
Alkali Resistance DIN ISO 695:	class 2
Electrical Properties	
Dielectric Constant	7.0 (1Mhz)
Resistivity (ρ_D ($\Omega \times \text{cm}$):	109 (250°C) 1,6 x 10 ⁷ (350°C) 2,0 x 10 ⁶ (400°C)
Dielectric Loss tangent ($\tan \delta$):	30 x 10 ⁻⁴ (1 MHz)

For more information please visit the material supplier's website: www.schott.de

TRANSMISSION CURVE B270

Optical Transmission in the VIS of B270





Treatment and cleaning of Optical Glass

A thorough and appropriate cleaning and treatment of optical glass products is essential to maintain the properties. The following recommendations should be noticed:

Our recommendations for cleaning

- Do not clean parts of optical glass with alkali detergents.
- Contaminations with fat can be removed with alcohol.
- Subsequent cleaning in distilled or deionised water.
- After cleaning, touch the glass only with clean gloves.
- If possible, process glass only after cleaning or pack it carefully.

Optical glass should always be touched only with gloves. You should also take care that the rooms, tools and machines meet high cleanness demands.