

# Radiation Shielding Glasses

## Product Information

SCHOTT offers a selection of specifically developed Radiation Shielding Glasses in the density range from 2.5 to 5.2 g/cm<sup>3</sup> for applications in nuclear energy production and nuclear waste treatment. Two of these five glass types are doped with CeO<sub>2</sub> in order to avoid radiation-induced discoloration ("browning").

The glasses are optimized in terms of high initial transmission, radiation, discharge resistance and different shielding behaviour. Customized radiation shielding windows for all kinds of nuclear installations can be designed covering a wide range of requirements.

SCHOTT employs the same production equipment and processes as used for the production of optical glasses assuring outstanding high quality standards.

## Applications

Glass blocks and plates for radiation shielding windows to be used in:

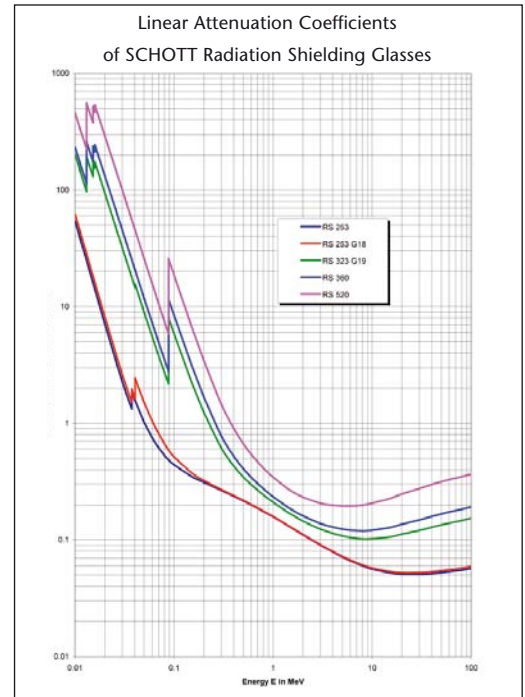
- Nuclear power plants
- Reprocessing plants
- Waste treatment facilities
- Nuclear research institutes
- Isotope production facilities
- Glove boxes

## Supply Forms

Radiation Shielding Glasses are supplied as finished blocks and plates (window faces visual grade polished, lateral faces ground) ready for installation into shielding window frames.

## Advantages

- Superior internal transmission
- Outstanding internal quality (bubbles/inclusions/striae)
- Different shielding behavior allows custom window design
- Enabling designs with very long service lifetime without failure due to discoloration or electrostatic discharge
- Improved neutron attenuation in case of shielding windows for concrete walls



## Characteristics of SCHOTT Radiation Shielding Glasses

General characteristics	RS 253	RS 253 G18	RS 323 G19	RS 360	RS 520
Minimum density $\rho$ [g/cm <sup>3</sup> ]	2.50	2.52	3.26	3.60	5.18
PbO – content [weight-%], synthesis	0	0	33	45	71
CeO <sub>2</sub> – content [weight-%], synthesis	0	1.8	1.8	0	0
Linear attenuation coefficients [cm <sup>-1</sup> ]					
E = 0.2 MeV	0.32	0.33	1.25	1.72	3.54
E = 0.662 MeV ( <sup>137</sup> Cs)	0.19	0.19	0.28	0.32	0.50
E = 1.25 MeV ( <sup>60</sup> Co)	0.14	0.14	0.18	0.21	0.30
Pb – equivalents					
E = 0.2 MeV	0.03	0.03	0.11	0.16	0.32
E = 0.662 MeV ( <sup>137</sup> Cs)	0.16	0.16	0.24	0.27	0.42
E = 1.25 MeV ( <sup>60</sup> Co)	0.22	0.22	0.29	0.32	0.46
<b>Application limits</b>					
with respect to discoloration; total dose [Gy]	1 × 10 <sup>3</sup>	1 × 10 <sup>8</sup>	> 1 × 10 <sup>8</sup>	1 × 10 <sup>3</sup>	1 × 10 <sup>3</sup>
with respect to discharge; discharge threshold (induced discharge), total dose [Gy]	–	> 1 × 10 <sup>8</sup>	> 1 × 10 <sup>8</sup>	–	–
<b>Optical characteristics</b>					
Refractive index $n_d$	1.52	1.52	1.59	1.62	1.81
Dispersion $v_d$	64.2	63.5	39.9	36.4	25.4
Residual reflection loss per surface [%]	4.25	4.25	5.1	5.6	8.3
Internal transmission $\tau_i$ (100 mm)					
for $\lambda = 546.1$ nm	0.987	0.895	0.880	0.992	0.984
for $\lambda = 589.3$ nm	0.985	0.925	0.925	0.993	0.985
for $\lambda = 632.8$ nm	0.981	0.941	0.940	0.990	0.981
<b>Dimensions</b>					
Max. glass size	1600 × 1100 mm <sup>2</sup> or 1360 × 1360 mm <sup>2</sup>				
Maximum weight [kg/slab]	1300	1300	1650	2000	2000
	larger dimensions and weights upon request				

For more information please contact:

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