Radiation Shielding Glass

Radiation shielding glasses are used where transparent protection against ionizing radiation is necessary. Radiation shielding glass is used in X-ray rooms, operating theatres, radiation therapy rooms, dental clinics, laboratories, and for material testing. Applications include observation windows and intercommunication windows, door glazings, panoramic glazings, mobile protection walls, protective panels for check-up systems.

Protection Level / Measurements / Packing

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Minimum Lead Equivalence (mm) for stated X-ray tube voltage</th>
<th>Weight kg/m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>80 kV 100 kV 110 kV 150 kV 200 kV 250 kV 300 kV</td>
<td></td>
</tr>
<tr>
<td>5,0-6,5</td>
<td>1,7 1,7 1,7 1,5 1,3 1,3 1,3</td>
<td>31,2</td>
</tr>
<tr>
<td>7,0-8,5</td>
<td>2,3 2,3 2,3 2,0 1,8 1,7 1,8</td>
<td>40,8</td>
</tr>
<tr>
<td>8,5-10,0</td>
<td>2,8 2,8 2,8 2,6 2,1 2,1 2,1</td>
<td>48,0</td>
</tr>
<tr>
<td>10,0-12,0</td>
<td>3,3 3,3 3,3 2,9 2,5 2,6 2,6</td>
<td>57,6</td>
</tr>
<tr>
<td>11,0-13,0</td>
<td>N/A 3,5 3,6 3,2 2,7 2,7 2,8</td>
<td>62,4</td>
</tr>
<tr>
<td>14,0-16,0</td>
<td>N/A 4,4 4,7 4,2 3,5 3,6 4,0</td>
<td>76,8</td>
</tr>
<tr>
<td>16,0-18,0</td>
<td>N/A N/A N/A 4,8 4,0 4,1 4,3</td>
<td>86,4</td>
</tr>
<tr>
<td>18,0-20,0</td>
<td>N/A N/A N/A 5,4 4,4 4,5 4,7</td>
<td>96,0</td>
</tr>
</tbody>
</table>

N/A = X-ray transmission below level of detection

Material is supplied as polished plates cut to customer requirements up to 2800 x 1400 mm. Packed in wooden crates (up to 10 plates per crate)

Technical Data

Optical Properties:
- Refractive Index $n_D$: 1,76
- Transmission % @ 550nm through 5mm path: ≥ 85,0

Chemical properties:
- Lead (Pb): 48%
- Barium (Ba): 15%

Mechanical properties:
- Density (g/cm³): 4,8
- Knoop Hardness (kg/mm²): 440
- Young’s Modulus (GPa): 62,7
- Poisson’s Ratio: 0,23
- Coefficient of Thermal Expansion ($x10^{-7/°C}$): 81,8
Radiation Shielding Glass RD 30

RD 30 is used against X-scattered rays at mammography work stations.

Radiation shielding glass RD 30 has a neutral color and meets the requirements of IEC 61331-2 and DIN 6841.

Shock resistance:
RD 30 can be thermally toughened and supplied as safety glass.

Available sizes and lead equivalents in mm Pb for RD 30

<table>
<thead>
<tr>
<th>Tube voltage in kV</th>
<th>56</th>
<th>80</th>
<th>100</th>
<th>120</th>
<th>max. available cut size in mm (length x width)</th>
<th>max. weight per m² in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass thickness in mm/inch</td>
<td>≥0.5 mm Pb</td>
<td>≥0.5 mm Pb</td>
<td>≥0.5 mm Pb</td>
<td>≥0.5 mm Pb</td>
<td>2400 x 1700/94.49 x 66.93</td>
<td>20</td>
</tr>
<tr>
<td>6.0±0.25/0.236±0.010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Technical Data

Optical properties:
- Refractive index n at 20°C/annealed at 40°C: 1.579
- Luminous transmittance (d=6.0 mm): 90.5%

Chemical properties:
- Hydralytic class as per DIN ISO 719: HGB 3
- Lead oxide content (PbO): ≥ 22%
- Heavy metallic oxide content total: ≥ 23%

Mechanical properties:
- Density in g/cm³ (condition as supplied): ≥ 3.13

UV-Resistance:
Excellent. After continuous UV exposure, virtually no transmission loss is measurable.

Basic diagram for installation of radiation shielding glass into window and door frames

- Remove the protection film on radiation shielding glass before installing it. Do not use any sharp objects to remove.
- Please care about the construction regulations (radiation protection rules for X-ray equipment applicable at site—in Germany based on DIN 6812) when assembling the glass.
- Pay attention to a sufficient overlapping of the radiation shielding when assembling.

Eye Protection

- X-ray protective glasses are available in two protection levels
  - type FG 50 protection level front=0.50/side=0.50 mm Pb
  - type FG 75 protection level front=0.75/side=0.50 mm Pb
- Transmit rate of lens not less than 80 per cent
- Frames are available in red, blue and green