Level Gage Glass Program

MAXOS® safety sight and level gauge glasses have proved themselves universally where visual process control is essential. This includes pressure vessels subjected to thermal and chemical stresses and liquid level gauge application.

A high safety level is secured through the use of special borosilicate glass of high chemical durability, exceptional purity and homogeneity. The low thermal expansion of our SUPRAX® 8488 borosilicate glass, combined with thermal prestressing (tempering) creates a high resistance to sudden temperature changes.

The material properties values and small dimensional tolerances are guaranteed by production and quality controls. With these exceptional safety characteristics, MAXOS safety sight and level gauge glasses can be used under extreme operational conditions. It is therefore mainly these safety aspects which influence responsible technicians again and again to choose MAXOS.

MAXOS® product range

Special tempered reflex and transparent level gauge glasses and disc sight glasses can be supplied in accordance to:
- DIN 7080/7081
- BS 3463
- JIS B 8211
- MIL – G – 16356 D
- Auer USA specification
- Customer specification
- Aluminosilicate glass on request
**Glass type SUPRAXR 8488**

- **Coefficient of expansion @ 20°C/300°C**: $4.1 \times 10^{-6}$/K
- **Transformation temperature**: 540°C
- **Glass temperature for the viscosities**: 1013.0°C, 560°C
- **dPas (Poise)**:
  - 10$^{3.0}$ at 800°C
  - 10$^{4.0}$ at 1200°C
- **Density at 25°C**: 2.3 g/cm$^3$
- **Modulus of elasticity**: 67 x 10$^4$ N/mm$^2$
- **Poisson’s ratio μ**: 0.20
- **Thermal conductivity λ at 90°C**: 1.2 W/mK
- **Refractive index nd (λ=587.6 nm)**: 1.484
- **Photoelastic parameter K**: $3.2 \times 10^{-6}$ mm$^2$/N

### Chemical characteristics

<table>
<thead>
<tr>
<th>Chemical characteristics</th>
<th>Hydrolytic resistance</th>
<th>Acid resistance</th>
<th>Alkali resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test acc. to DIN ISO 719</td>
<td>DIN ISO 1776</td>
<td>DIN ISO 695</td>
<td></td>
</tr>
<tr>
<td>max. abrasion acc. to DIN ISO</td>
<td>0.1</td>
<td>&lt;100 μg Na$_2$O each 100 cm$^2$</td>
<td>&gt;75–175 mg each 100 cm$^2$</td>
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<tr>
<td>MAXOS® max. abrasion</td>
<td>0.050</td>
<td>&lt;60 μg Na$_2$O each 100 cm$^2$</td>
<td>&lt;100 mg each 100 cm$^2$</td>
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<tr>
<td>MAXOS®</td>
<td>HgB 1</td>
<td>–</td>
<td>class A2</td>
</tr>
</tbody>
</table>

### Long form reflex and transparent

Bending strength is determined by the surface compressive stress and the inherent resistance of the glass. The inherent resistance is heavily dependent upon the surface quality.

For safety reasons, the stress to the glasses caused by internal forces, thermal stress and vessel pressure have to be totally absorbed by the surface compressive stress so that a tensile stress of the glass surface is prevented.

### Surface compressive stress

- **Parallelism**
  - Standard level gauge glasses: ≤ 0.08 mm 0.003 inches
  - High pressure level gauge glasses: ≤ 0.05 mm 0.002 inches

### Bending strength (typical values)

#### Standard level gauge glasses

- **≥ 150 N/mm$^2$**: 21,000 psi
- **Average**: 170 N/mm$^2$, 25,000 psi

#### High pressure level gauge glasses

- **≥ 180 N/mm$^2$**: 26,000 psi
- **Average**: 200 N/mm$^2$, 29,000 psi

### Temperature

- **Thermal shock resistance Δ T 265 K**
- **Max. permissible temperature 300°C (572°F)**
- **Protected with mica 320°C (608°F)**

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**MAXOS® – a registered trademark of Auer Lighting GmbH**

**SUPRAX® – a registered trademark of SCHOTT AG**

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