

|                                  |  |                                 |
|----------------------------------|--|---------------------------------|
| Glass Type/Application           | Borosilicate glass 3.3 acc. to ISO 3585, chemically highly resistant, highly resistant to thermal shock<br>Special applications in the pharmaceutical industry |                                 |
| Physical Data<br>(approx. value) | Coefficient of mean linear thermal expansion<br>$\alpha(20^{\circ}\text{C}; 300^{\circ}\text{C})$ acc. to ISO 7991 ..... $3.3 \cdot 10^{-6} \text{K}^{-1}$     |                                 |
|                                  | Transformation Temperature $T_g$ ..... $525 \text{ }^{\circ}\text{C}$  |                                 |
|                                  | Glass temperature at viscosity $\eta$ in $\text{dPa} \cdot \text{s}$   |                                 |
|                                  | $10^{13}$ (annealing point).....   | $560 \text{ }^{\circ}\text{C}$  |
|                                  | $10^{7.6}$ (softening point) .....   | $825 \text{ }^{\circ}\text{C}$  |
|                                  | $10^4$ (working point) .....   | $1260 \text{ }^{\circ}\text{C}$ |
|                                  | Density $\rho$ at $25^{\circ}\text{C}$ ..... $2.23 \text{ g} \cdot \text{cm}^{-3}$   |                                 |

|               |                                   |                |
|---------------|-----------------------------------|----------------|
| Chemical Data | Hydrolytic resistance             |                |
|               | acc. to ISO 719 .....             | Class HGB 1    |
|               | acc. to Ph. Eur. ....             | Type I         |
|               | acc. to USP.....                  | Type I         |
|               | acc. to JP.....                   | fulfilled      |
|               | Acid resistance (DIN 12116) ..... | Class S 1      |
|               | Alkali resistance (ISO 695) ..... | Class A 2      |
|               | ASTM E 438 .....                  | Type I Class A |

|   |  |
|---|--|
| Chemical Composition<br>(main components in approx. weight %) | SiO <sub>2</sub> B <sub>2</sub> O <sub>3</sub> Al <sub>2</sub> O <sub>3</sub> Na <sub>2</sub> O K <sub>2</sub> O |
|   | 81 13 2 3.5 0.5  |
|   | The heavy metal content for the elements lead, cadmium, mercury and hexavalent chromium is below 100 ppm.        |

Transmission  
(exemplary spectrum)

