



## Safety Information for VITROVEX® glass material

### Product details

Trade name: DURAN®  
Material name: Borosilicate glass 3.3 (special glass)  
Laboratory, industrial and special industrial glassware

### Possible hazards

Hazard description: Products made from DURAN material are, on the basis of data available to us, not a dangerous substance in the sense of chemical legislation or hazardous substances ordinance in its currently applicable version.

Particular risks  
applying to people  
and the environment: None

### Composition / Details of Constituents

Composition:	SiO <sub>2</sub>	81%
	B <sub>2</sub> O <sub>3</sub>	13%
	Al <sub>2</sub> O <sub>3</sub>	2.4%
	Na <sub>2</sub> O	3.0%
	K <sub>2</sub> O	0.6%

Dangerous constituents: None

### First-aid measures

General instructions: No special measures required.  
Upon skin contact: No special measures required.  
Upon eye contact: No special measures required.  
If swallowed: No material-specific measures required.

### Fire fighting measures

No special measures required.

### Measures to be taken in case of an unintended release

No special measures required.

### Handling and Storage

Handling: If strongly heated (above T<sub>g</sub>), the material softens, if heated above T<sub>s</sub>, a transition to the liquid phase occurs.  
Storage: Drying under normal conditions: no special measures required.



### Exposure limits and personal protective equipment

Workplace exposure limits and / or biological limit values:	Not applicable.
Occupational exposure limit value, (OEL) Germany:	Not applicable.
Workplace guideline limit values in the European Union:	Not applicable.
Limiting and monitoring of exposure:	Not applicable.
Personal Protective Equipment (PPE):	Not required
Respiratory protection:	Not required
Hand protection:	Not required
Eye protection:	Not required
Body protection:	Not required
Work hygiene statements:	Not required
Environmental protection measures:	see <b>Handling and Storage</b> No measures additional to these are required.

### Physical and chemical properties

Thermal conductivity $\lambda$ at 100 °C	[W/(m.K)]		0.2
Mean specific heat capacity CP (20°C; 100°C)	[J / (g.K)]		0.8
Young's modulus	[Gpa]		64
Poisson's ratio $\mu$			0.20
Stress-optical coefficient:	[mm <sup>2</sup> / N]		4.0.10 <sup>-6</sup>
Refractive index $n_d$ :			1.473
Dielectric constant $\epsilon$		at 1 MHz and	4.6
Loss factor $\tan \delta$	[10 <sup>-4</sup> ]	25 °C	37
T <sub>k</sub> 100 (DIN 52326)	[°C]		250
Thermal expansion $\alpha$ (20 °C; 300°C)	[10 <sup>-6</sup> /K]		3.3
Transformation temperature T <sub>g</sub>	[°C]		525
Density $\rho$	[g/cm <sup>3</sup> ]		2.23
Temperatures at the viscosities	[°C]	10 <sup>13</sup> dPa s 10 <sup>7.6</sup> dPa s 10 <sup>4</sup> dPa s	560 820 1260
Chemical resistance	Water Acid Base	(DIN ISO 719) (DIN 12 116) (DIN 180 695)	Class 1 Class 1 Class 2

### Stability and reactivity

Do not heat above T<sub>g</sub> for standard applications.

### Toxicology Statement

If handled correctly and used for the intended purpose, the material has no health-threatening effects. The material is physiologically harmless.



### **Environmental Statement**

DURAN® is environmentally neutral and biologically inert. It is non-biodegradable and non-soluble in water.

### **Notes on disposal**

Waste code according to AVW (German waste regulations): AWV- No. 10 11 12

### **Transport statement**

Is not designated as a dangerous material as defined by transport regulations.

### **Regulations**

Based on the data known to us, the product is not a dangerous substance in the sense of chemical legislation or hazardous substances ordinance.

### **Other information**

The statements are based on our current state of knowledge; it does not however represent any confirmation of material properties and does not form the basis for any contractual legal position.

The purpose of the information is solely to describe aspects of the material relating to health, safety and the environment. It remains the responsibility of the user, to check and test our material, in order that they are sure of the suitability of the material for the specific application. The user is also responsible for employing a reasonable, safe and legal method of use of our material as well as for its processing and handling. In the case of disagreement, only the German version of this specification is valid.