PROFESSIONAL PLASTICS, INC.

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SuperTest® ZD Properties

The technical information “Properties of SUPERTEST ZD®” compiles thermal, mechanical, electrical and optical properties also those not displayed in detail in the SUPERTEST ZD® catalog. All data presented in this technical information are typical values for SUPERTEST ZD®. Measurement results of single batches can vary slightly from these data.

Thermal Properties

Thermal conductivity λ at 20℃ [W/(m · K)]	**1.46**
Thermal diffusivity index a at 20℃ [10^{-6} m^2/s]	**0.72**
Specific heat capacity cp at 20℃ [J/(g·K)]	**0.80**

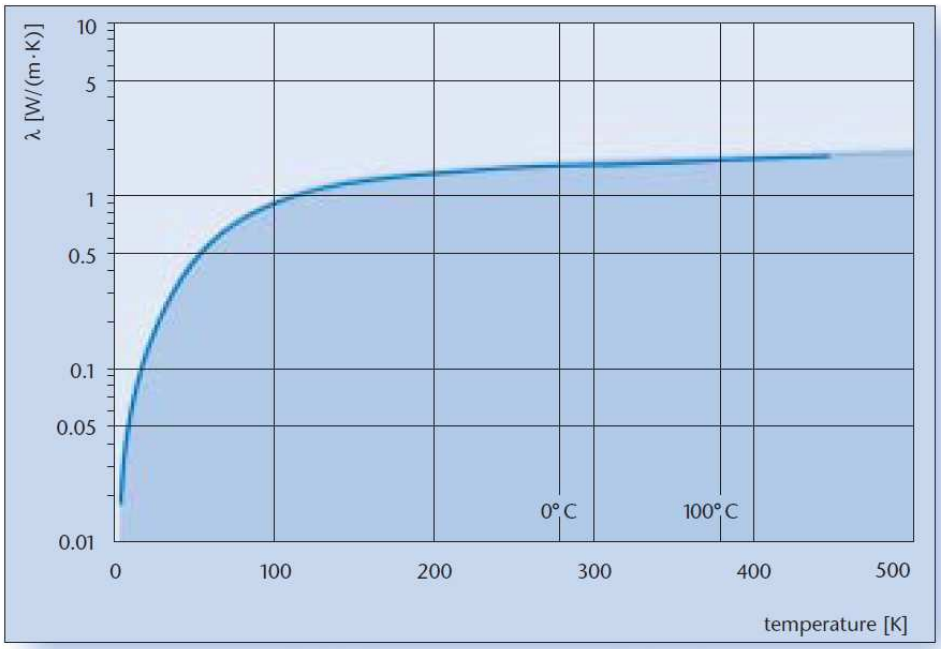

Figure 1: Thermal conductivity of SUPERTEST ZD® as a function of temperature.

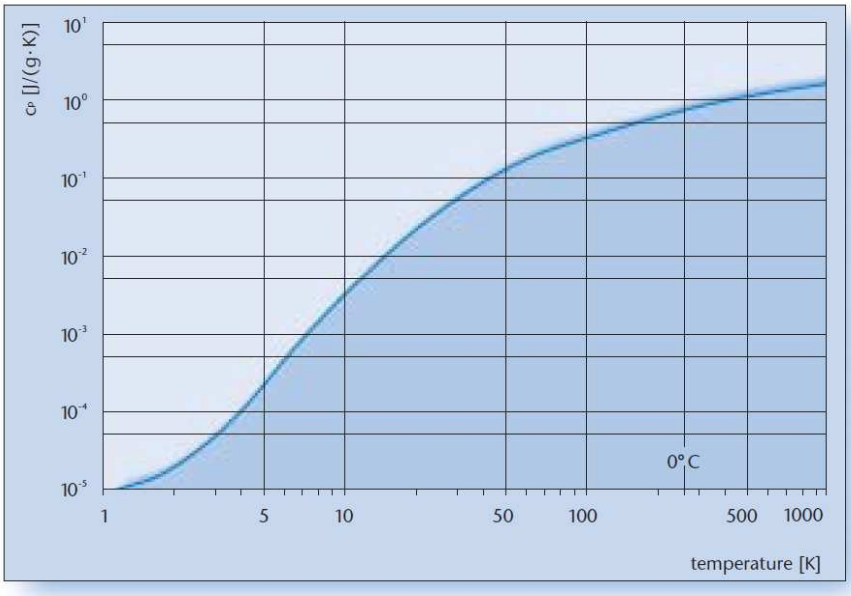

Figure 2: Specific heat capacity of SUPERTEST ZD® as a function of temperature.

2. Mechanical Properties

Young's modulus E at 20℃ [GPa]-mean value	**90.3**
Poisson number μ	**0.24**
Density・・・ g/cm3]	**2.53**
Knoop hardness HK 0.1/20 according ISO 9385	**620**

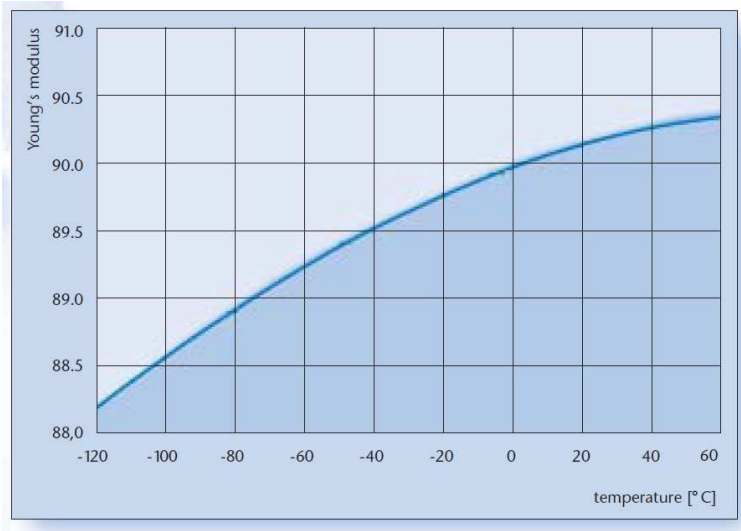

Figure 3: Young's modulus of SUPERTEST ZD® as a function of temperature.

3. Electrical Properties

Temperature [℃]	Specific Resistivity ρ [Ω cm]
20	$2.6 \cdot 10^{13}$
100	$1.3 \cdot 10^{10}$
200	$3.5 \cdot 10^{7}$
300	$7.4 \cdot 10^{5}$
400	$4.9 \cdot 10^{4}$
500	$6.6 \cdot 10^{3}$
600	$1.4 \cdot 10^{3}$

Table 1: The specific electrical resistivity of SUPERTEST ZD® as a function of temperature.

t_{K100} [℃], temperature for $\rho = 10^8$ Ωcm 178

	At 1 kHz	At 1 MHz
Dielectric constant ε	**8.0**	**7.4**
Loss factor tan δ	$29 \cdot 10^{-3}$	$15 \cdot 10^{-3}$

Table 2: Dielectric properties of SUPERTEST ZD®

Bubbles and Inclusions

For general SUPERTEST ZD® applications only bubbles and inclusions of diameters >0.3 mm are taken into account. The bubbles and inclusion specification of optical glass is in general much tighter. The evaluation starts at bubble and inclusions diameters of >0.03 mm [1]. For smaller and thinner parts with a maximum thickness of up to ~100 mm optical grade inclusion quality for SUPERTEST ZD® can be achieved by precise selection. For large and thick SUPERTEST ZD®
blanks (>800 mm in diameter and >100 mm in thickness) such a selection process is not applicable due to the low visibility of very small inclusions inside such a SUPERTEST ZD® blank. In this case the actual inclusion specification has to be fixed in close cooperation with the customer. In general for the selection of SUPERTEST ZD® based on optical quality bubbles and inclusion grades, it is mandatory to polish the inspection surfaces of the material, therefore optical grade bubbles and inclusions specifications are treated on special request only

SuperTest ZD is a tradename of Professional Plastics, Inc.