

Dosage of Liquids: Series N Six-Pack Removable Needles

Manufactured by ILS



- Plunger: Stainless steel
 Glass Barrel: Borosilicate 3.3
 Precision: $< \pm 1\%$ of the volume
 Main Uses:
 - Sample dosage for gas chromatography
 - HPLC-valves
 - Autosamplers

Physical and Chemical Properties of Glass

Coefficient of mean linear thermal expansion α (20°C; 300°C) acc. to ISO 7991		$3.3 \cdot 10^{-6} \text{ K}^{-1}$
Transformation temperature T_g		525°C
Glass temperature at viscosity η in dPa · s:	10^{13} (annealing point) $10^{7.6}$ (softening point) 10^4 (working point)	560°C 852°C 1260°C
Maximum short-time working temperature		500°C
Density ρ at 25°C		$2.23 \text{ g} \cdot \text{cm}^{-3}$
Modulus of elasticity E (Young's modulus)		$64 \cdot 10^3 \text{ N} \cdot \text{mm}^{-2}$
Poisson's ratio μ		0.20
Thermal conductivity λ_w at 90°C		$1.2 \text{ W} \cdot \text{m}^{-1} \cdot \text{K}^{-1}$
Temperature for the specific electrical resistance of $10^8 \Omega \cdot \text{cm}$ (DIN 52326) t_{k100}		250°C
Logarithm of the electric volume resistivity ($\Omega \cdot \text{cm}$)	at 250°C at 350°C	8 6.5
Dielectric properties (1 MHz, 25°C)		
Dielectric constant (permittivity) ϵ		4.6
Dielectric loss factor (dissipation factor) $\tan \delta$		$37 \cdot 10^{-4}$
Refractive index ($\lambda = 587.6 \text{ nm}$) n_d		1.473
Stress-optical coefficient (DIN 52314) k		$4.0 \cdot 10^{-6} \text{ mm}^2 \cdot \text{N}^{-1}$

Reference: Schott Duran®