

## Thermal properties

The standard Ultraform® grades have a narrow melting range of approx. 164 °C to 168 °C. Up to the neighborhood of this melting range Ultraform® moldings can be briefly subjected to thermal stresses without the material being damaged.

Figures 11 and 12 show the influence exerted by temperature on the strength-related properties of this material. At a temperature of 80 °C, for instance, Ultraform® N2320 003 still displays the strength of high-density polyethylene at room temperature. The advantage of fiberglass-reinforced products such as Ultraform® N2200 G53 in terms of stiffness and strength is retained, even at an elevated temperature.

The long-term thermal stability of Ultraform® in air is also exceptionally high, as 12-month storage tests at 100 °C and 120 °C have shown (Fig. 13). From these a maximum long-term service temperature of approximately 100 °C can be derived.

Parts made from glass-fiber reinforced Ultraform® can withstand prolonged exposure to temperatures of up to 120 °C without deterioration in material properties due to heat aging (Fig. 14).

It has to be expected that sustained exposures to temperatures above 110 °C will eventually cause discoloration. Ultraform® also exhibits good long-term thermal stability in the presence of water, neutral oils, greases, fuels and many solvents.

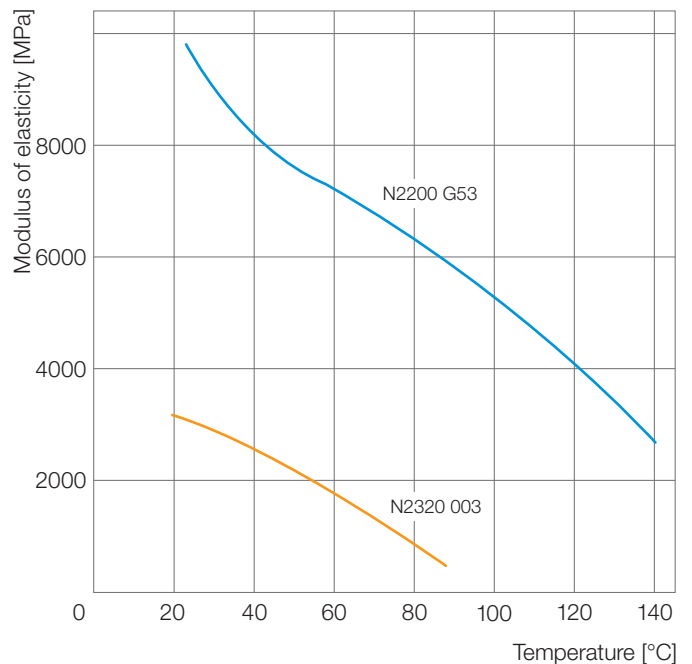


Fig. 11: Modulus of elasticity of unreinforced and reinforced Ultraform® measured in accordance with ISO 527 as a function of temperature

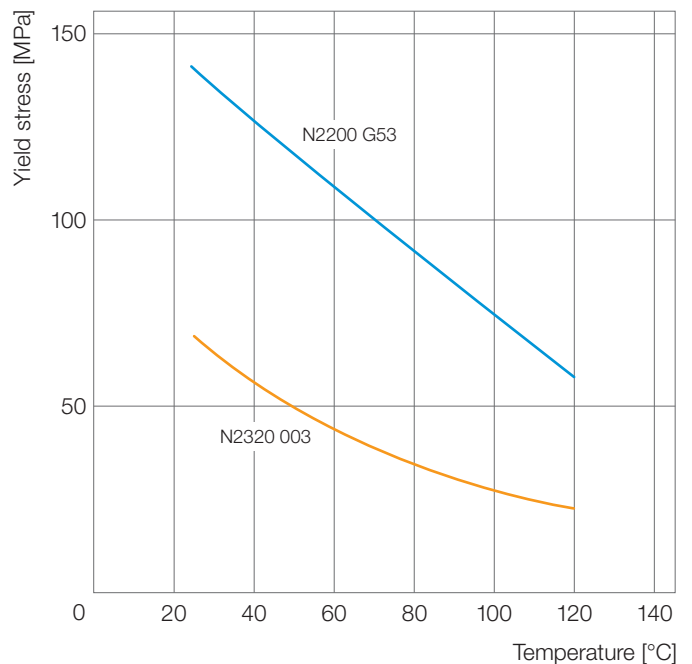


Fig. 12: Yield stress or tensile strength of unreinforced and reinforced Ultraform® measured in accordance with ISO 527 as a function of temperature