

Resistance to water, fuels and chemicals

A polymeric thermoplastic material is chemically resistant to certain ambient conditions if the surrounding medium does not cause any degradation, that is to say, a reduction of the molecular weight or a shortening of the polymer molecules. The chemical resistance depends on the concentration, on the duration of exposure and on the temperature of the medium. The swelling (reversible absorption and release of a substance, for example, a solvent) and the stress crack formation (disentanglement of convoluted polymer molecules without chemical degradation) have to be distinguished from the chemical resistance.

Ultraform® displays good to very good long-term chemical resistance against the following media: water, washing liquors, aqueous solutions of salts and most of the commonly employed organic solvents (such as alcohols, esters, ketones, aliphatic and aromatic hydrocarbons), fuels (also those containing ethanol and methanol, for example, M15, CM15, CM15A, CM15_AP, E85, FAM-B, biodiesel) as well as against fats and oils, braking fluids and coolants, even at elevated temperatures.

Some solvents and fuel components, particularly short-chain alcohols like ethanol and methanol, cause a slight (reversible) swelling.

There are only a few solvents that are known to dissolve Ultraform®, and this usually only takes place at elevated temperatures.

Stress cracking formation due to solvents or other chemicals is not known to occur in Ultraform®.

Figures 15 to 18 show the often superior resistance of Ultraform® in comparison to similar homopolymeric or copolymeric competitive products when exposed to hot water and fuels. This advantage makes Ultraform® suitable for many applications, for example, in the plumbing sector, in espresso and coffee-making machines, in dishwashers as well as in vehicle fuel systems.

Ultraform® is attacked by oxidizing agents and organic and inorganic acids (pH < 4).

Contact with strong acids (e.g. hydrochloric acid, sulfuric acid) should be avoided at all costs. On the other hand alkalis have no effect, even at elevated temperatures.

Detailed information may be found in the brochure "Resistance of Ultramid®, Ultraform® and Ultradur® to chemicals" and can also be obtained at the Ultra-Infopoint.



Shower head insert

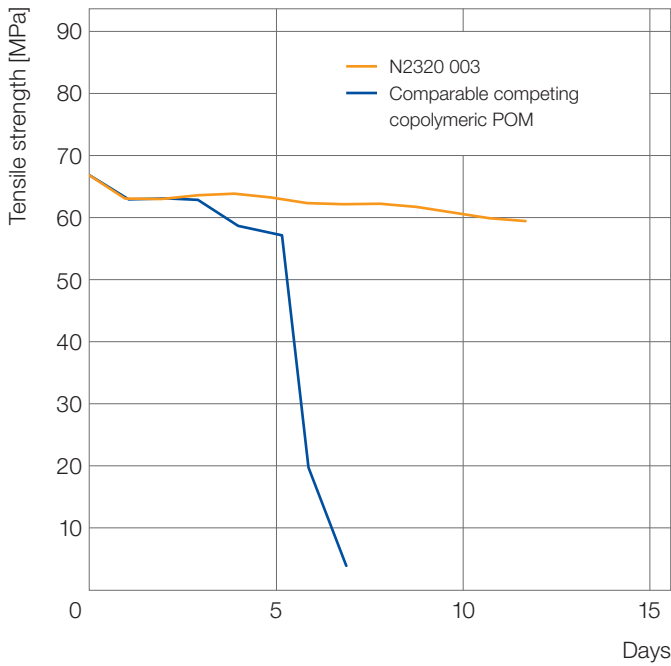


Fig. 15: Hot water storage of tensile bars at 130°C in an autoclave

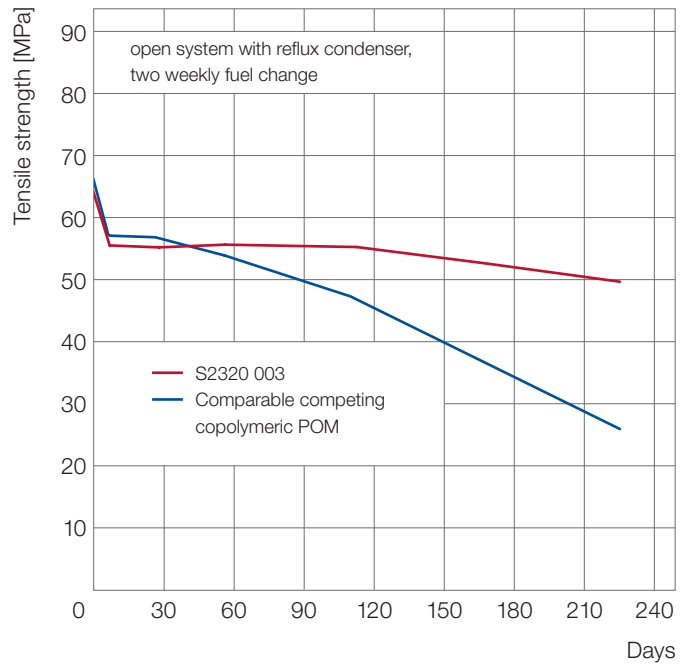


Fig. 17: Storage of Ultraform® S2320 003 in fuel CM15_AP (peroxide number 50) at +60°C

