Sterilization

Properly and flawlessly manufactured parts made of Ultraform® can be sterilized in hot steam at 121°C and, with some limitations, even at 134°C, over the course of many cycles, whereby the high-molecular grades perform best. Plasma sterilization is also a good option.

Repeated sterilization in ethylene oxide can be carried out at room temperature without problems employing familiar methods, but this hardly plays a role any more because of the absorption and subsequent release of toxic ethylene oxide.

Great caution is advisable in case of sterilization using ionizing radiation. Chemical disinfection is not recommended.

Behavior on exposure to high-energy radiation

Polyacetals are only moderately resistant to electron and gamma rays. Ultraform® behaves fundamentally in the same way with respect to these two types of radiation. Depending on the total radiation dose, a more or less pronounced degradation occurs, along with brittleness. A total dose of 25 kGy (2.5 Mrad) can already affect the mechanical properties and the color of the parts.

Fire behavior

Polyoxymethylenes ignite on exposure to flame and continue to burn after the ignition source has been removed. A flame-retardant treatment is not offered.

Ultraform® has a UL 94 flammability rating of “HB”.

The combustion rate required by FMVSS 302 of <100 mm/min is met by Ultraform® test specimens having a thickness of 1.0 mm and over.

Electrical properties

Ultraform® has good electrical insulation properties and high dielectric strength. The very low moisture absorption of the material does not impair this property, making parts made from Ultraform® highly suitable for use in consumer electronics and telecommunications.

In the field of electric power engineering, Ultraform® is widely used for functional and drive parts which are not used directly as supports for current-carrying parts.

Electrically conductive special grades such as, for example, Ultraform® N2520 L, are available for applications that call for low electric surface resistance.

Product line

The Ultraform® product line encompasses grades for processing by means of extrusion and injection molding. The following product groups exist:

Grades with a high melt strength and high molecular weight
for the extrusion of thin-walled as well as thick-walled tubes and panels, hollow profiles and semi-finished products having wall thicknesses of up to 50 mm and more. These are made into gear wheels, bearings and other machine elements by means of non-cutting procedures.

H2320 004	for thin-walled semi-finished parts
H4320	for thick-walled semi-finished parts

The grades are likewise suitable for blow molding (E3320) and for the injection molding of thick-walled molded parts with few voids.

Standard injection-molding grades
in various viscosity classes. As a rule, they can be processed rapidly, without deposits and are also easy to demold.

H2320 006	for thick-walled parts
N2320 003/0035	standard grades
S2320 003/0035	easy flowing
W2320 003/0035	very easy flowing
Z2320 003/0035	extremely easy flowing

Impact-modified injection-molding grades
for applications that make particularly high demands in terms of the toughness. There are TPU-modified grades (N2650 Z2/Z4/Z6) as well as grades containing rubber (N2640 E2/E4), each with differing contents of impact modifiers. The products containing rubber exhibit a number of advantages for processing technology such as, for instance, high weld line strength.

Mineral-filled injection-molding grades
with differing mineral contents for low-warpage and dimensionally stable molded parts that display increased stiffness, hardness and heat distortion resistance.

Glass fiber-reinforced injection-molding grades
with differing glass fiber contents for applications entailing very high demands in terms of strength, stiffness, hardness, creep resistance and dimensional stability under heat.

Grades with special treatment for purposes of

- improving light resistance, UV resistance and weathering resistance
  (N2320 U035, W2320 U035 LEV)
- optimizing sliding and abrasion characteristics
  (e. g. N2310 P, N2770 K)
- achieving a certain electrical surface conductivity or volume conductivity, for instance, to reliably and permanently prevent static charging (N2520 L, N2320 C)
- enhancing the fatigue strength against diesel fuel at high temperatures (S1320 0021)
- increasing the contrast for printing by means of an Nd:YAG laser
  (W2320 003 BK11020)
- producing especially low-odor parts, e. g. for the interior of vehicles
  (e. g. N2320 0035 LEV, N2650 Z2/Z4/Z6 LEV)

A detailed overview of the product line can be requested from the Ultra-Infopoint.

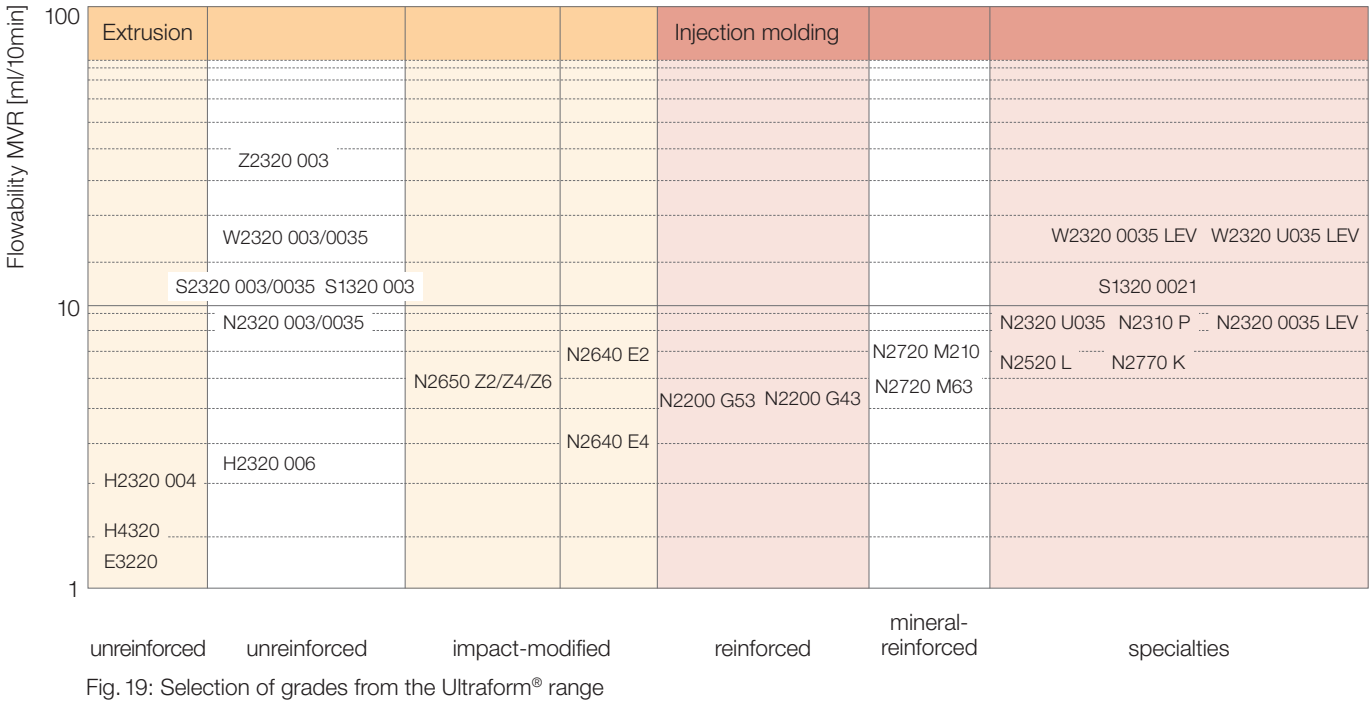

Fig. 19: Selection of grades from the Ultraform® range