EUROPLEX®

An outstanding material – virtually indestructible

EUROPLEX® PPSU

A sheet material distinguished by its unique combination of properties:

- EUROPLEX® PPSU has a high heat distortion temperature of up to 190 °C in permanent service.
- Excellent mechanical properties over a wide temperature range – even at low temperatures.
- Extraordinary chemical resistance for an amorphous material.
- Parts made from EUROPLEX® PPSU can be sterilized by all conventional methods, particularly by superheated steam at 1000 cycles or more, and also in combination with morpholine. Shows particularly good resistance to hydrolysis.
- Inherently flame-retardant (self-extinguishing without added flame retardant). Its rating of UL94:V0 at 0.8 mm thickness stands for very good fire behavior.
- EUROPLEX® PPSU is physiologically inoffensive, and easily meets FDA, USP Class VI and ISO 10993 requirements for food contact and medical applications.

Engineered plastic sheets are the better alternative for manufacturing sterilizable trays and containers.

EUROPLEX® sheets based on the engineered polymer polyphenyl sulphone (PPSU) are employed more and more frequently to manufacture trays or containers for medical instruments or implants.

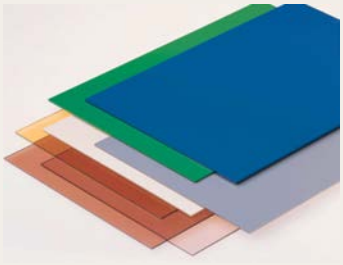
Sheet material as a basis for such containers offers more rapid and flexible design and manufacturing options than injection molding. Because of the relatively low cost for forming equipment, the use of sheet material is a very economical solution, particularly for smaller series volumes.

The EUROPLEX® PPSU sheets used for boxes and trays for surgical instruments, implants and endoscopes, as well as disinfection baths and sterilizable equipment covers, have a proven history of withstanding the tough conditions of everyday use in hospitals with excellent results. Their low weight, functional design and the ability to recognize contents through transparent lids are major advantages over conventional metal containers.

Components fabricated from EUROPLEX® PPSU show high impact strength and are practically unbreakable. Their excellent resistance to hydrolysis and chemicals permits frequent contact with aggressive disinfectants and repeated sterilization by means of superheated steam or other methods.

Sterile medical instruments stored clearly and safely!

Evonik, the plastics specialist and manufacturer of EUROPLEX® PPSU sheets, will be glad to advise you. Together with the manufacturers of sterilizable containers, we can support you from product design through selection of materials and right up to serial manufacturing.



EUROPLEX® PPSU sheets are available in transparent and opaque colors in thicknesses of 0.5 to 6.0 mm.

Characteristics of EUROPLEX® PPSU

Product properties	EUROPLEX® PPSU	Unit	Standard
Density	1.29	g/cm³	ISO 1183
Vicat softening temperature	222	°C	ISO 306/B50
Max. permanent service temperature	190	°C	
Modulus of elasticity	2350	MPa	ISO 527
Tensile strength	70 – 80	MPa	ISO 527
Izod notched impact strength (3.0 mm)	60 – 70	kJ/m²	ISO 180/1A

Processing instructions for thermoforming:

Before thermoforming, EUROPLEX® PPSU sheets must be dried in an air-circulation oven. The sheets are to be positioned in such a way that air can circulate freely between and around them. They should not be stacked, so as not to prolong drying unnecessarily. The temperature of the oven must be controlled. The following drying time and temperature is recommended: five hours per 1mm sheet thickness at 175°C (+/-5°C). This recommendation was established based on storage under normal conditions (23°C, 50% rel. humidity). If the sheets are stored in particularly damp rooms, drying periods may have to be extended by up to 50%. To permit problems - free thermoforming, machines must be equipped as follows: heating from above and below; the output of the individual upper radiators should be adjustable. It should be possible to support the heated sheets automatically by means of air. Area output approx. 43-54 kW/m² (heating potential for sheets up to approx. 300°C), at minimum 22 kW/m². Metal molds must be heatable (175°C). The forming temperature range of EUROPLEX® PPSU sheets lies between 270 and 285°C, with the optimum forming temperature being approx. 275°C. This provides good mold reproduction, preservation of the surface texture and minimal sagging. Due to the narrow range of the forming temperature, it must be possible to control the sheet temperature throughout the heating phase. Suitable for this are radiation pyrometers, which in some thermoforming machines are firmly installed in the center of the upper heaters.

In general, the edges of the sheets should be heated to a higher temperature than the central areas, especially if these are flat. The thermoformed parts shrink when cooling down to room temperature. Shrinkage of EUROPLEX® PPSU is uniform, predictable and must be taken into account when designing molds so that a finished part has the required dimensions. Since various mold materials have different coefficients of linear thermal expansion, shrinkage values of EUROPLEX® PPSU have been determined as the difference between the dimensions of the mold at operating temperature and the dimensions of the part after cooling for at least 24 hours and conditioning under standard conditions. Shrinkage of EUROPLEX® PPSU moldings, measured according to this method, is about 0.8 - 1 %. Additional processing instructions are available upon request.

Evonik Industries AG
Kirschenallee, 64293 Darmstadt, Germany
phone +49 6151 18-3698, albert.drexler@evonik.com

www.evonik.com/europlex-sheets