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>> POLYPHENYLENE SULPHIDE (PPS)

TECHTRON[®] HPV PPS

TECHTRON HPV PPS is a reinforced, internally lubricated semi-crystalline polymer developed to close the gap both in performance and price between the standard thermoplastic materials (e.g. PA, POM, PET, ...) and the high end Advanced Engineering Plastic Products (e.g. PBI, PI, PAI, PEEK, ...).

Main characteristics

- **Very high maximum allowable service temperature in air** (220°C continuously going up to 260°C for short periods of time) *see figure 1 on page 5*
- **High mechanical strength, stiffness and hardness, also at elevated temperatures** - *see figure 2 on page 8*
- **Excellent chemical and hydrolysis resistance** - *see table 3 on page 12*
- **Excellent wear & frictional behaviour** - *see figures 4 and 5 on pages 10 and 11*
- **Very Good dimensional stability** - *see figure 3 on page 9*
- **Excellent resistance to high energy radiation (gamma- and X-rays)** *see figure 6 on page 12*
- **Good UV-resistance**
- **Inherent low flammability** - *see table 1 on page 6*
- **Good electrical insulating and dielectric properties** *see figure 7 on page 13*

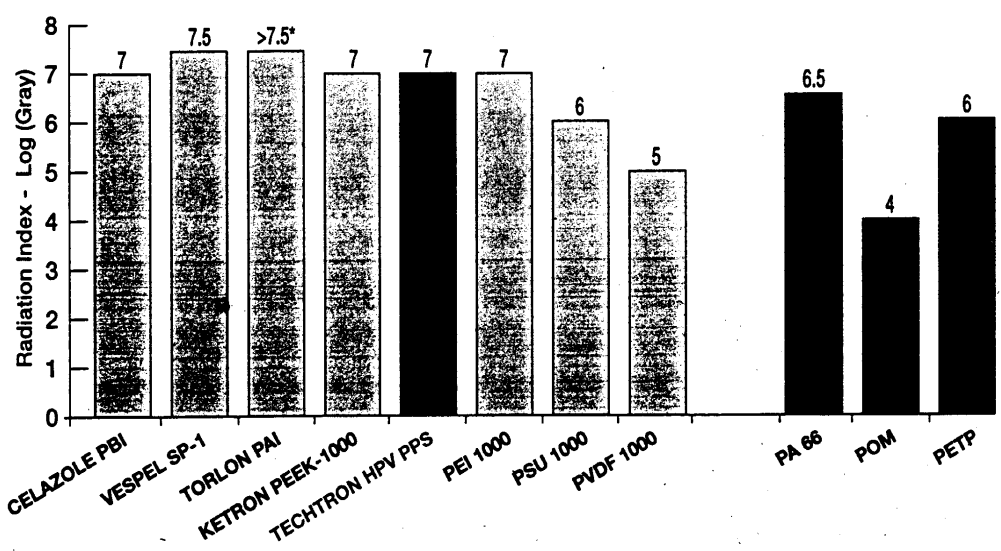
TECHTRON HPV PPS (deep blue)

TECHTRON HPV PPS demonstrates an excellent combination of properties including wear resistance, load-bearing capabilities and dimensional stability when exposed to chemicals and high temperature environments. TECHTRON HPV PPS finds its applications where PA, POM, PET, PEI and PSU fall short or where PI, PEEK and PAI are over-engineered and a more economical solution must be found. Thanks to the uniformly dispersed internal lubricant, TECHTRON HPV PPS exhibits excellent wear resistance and a low coefficient of friction. It overcomes the disadvantages of virgin PPS caused by a high coefficient of friction, and of glass fibre reinforced PPS which causes premature wear of the counterface in moving-part applications. It goes without saying that these features, in combination with its excellent chemical resistance, offer numerous application possibilities for TECHTRON HPV PPS in all kinds of industrial equipment such as industrial drying and food processing ovens, chemical process equipment and electrical insulating systems.

RESISTANCE AGAINST:	TORLON PAI VESPEL SP CELAZOLE PBI	KETRON PEEK PVDF 1000 FLUOROSINT	TECHTRON HPV PPS
Oils	Excellent	Excellent	Excellent
Dilute alkalis and acids	Good	Excellent	Excellent
Strong alkalis and acids	Poor	Excellent	Excellent
Hydro-carbons	Excellent	Excellent	Excellent
Boiling water and steam	Poor	Excellent	Excellent
Overall chemical resistance	Good	Excellent	Excellent

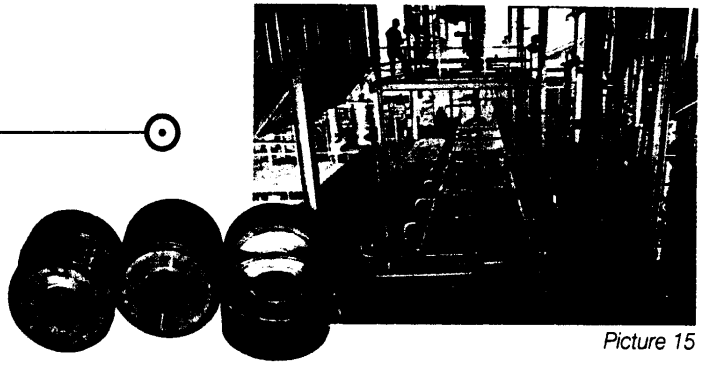
Table 3 : Chemical and hydrolysis resistance.

Fig. 6 - RESISTANCE TO GAMMA RADIATION



The Radiation Index is defined as the logarithm, base 10, of the absorbed dose in grays at which the flexural stress at break or flexural strain at break of the tested material is reduced to 50% of its original value (the most radiation-sensitive of these two properties is chosen as the reference critical property). The irradiation tests were carried out in air at normal room temperature, and at a mean dose rate of about 220 kGy/h. It should be noted that the Radiation Indexes given here can serve as a guideline only since environmental parameters such as temperature, humidity, oxygen content and dose rate influence the radiation behaviour of materials.

* : even at a dose of 30 MGy (log (gray) = 7.5), there is still no significant effect on the flexural properties.



Picture 15

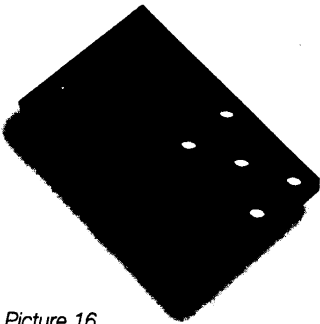
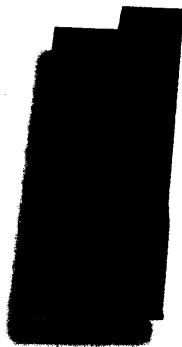
Established applications

→ **Solvent extractor conveyor bushings** - Picture 15

Continuous solvent extractors use aggressive chemicals to extract oil or sugar from the meal. The TECHTRON HPV PPS bushings for the rollers of the screen transporting the meal are continuously submerged in the solvent. Under these "impossible to lubricate" conditions, wear resistant TECHTRON HPV PPS provides a long lasting maintenance free solution.

→ **Insulating printer bearings** - Picture 16

TECHTRON HPV PPS is used as electrically insulating bearings for industrial recto verso printers offering a maintenance free solution.



Picture 16

Important remarks

- Like plenty of reinforced materials, TECHTRON HPV PPS exhibits a moderate toughness and impact strength. Therefore, all corners should be radiused ($R > 1 \text{ mm}$) and edges chamfered to maximise part toughness.
- From 100°C onwards (above the glass transition temperature), the mechanical properties of TECHTRON HPV PPS drop off significantly and the coefficient of linear thermal expansion increases considerably. KETRON® PEEK and TORLON® PAI might be suitable alternatives to overcome these inconveniences.

Fig. 7 - DIELECTRIC STRENGTH (IEC 243 ; 1 mm thick test specimens)

