

# FORTRON<sup>®</sup> FLEXIBLE PPS

## VERSATILE, HIGH TEMPERATURE POLYMER

### DURABILITY WITHOUT RIGIDITY

**Celanese has extensive experience producing quality engineered materials. After identifying the demand for high temperature, flexible materials between PA 11/12 and PEEK, our experts have developed a new portfolio of products to fill the performance gap.**

Our Fortron<sup>®</sup> flexible polyphenylene sulphide (PPS) expands upon our broad portfolio of engineered materials, and brings new capabilities to polyphenylene sulphide. This new solution offers a unique combination of flexibility at higher temperatures while maintaining strength, durability, and chemical resistance.

#### **SUPERIOR SOLUTIONS FOR AUTOMOTIVE AND INDUSTRIAL APPLICATIONS**

Fortron<sup>®</sup> flexible polymer grades ensure exceptional performance in automotive and industrial applications - specifically in under-the-hood automotive applications (e.g., clips, fasteners, tubing) in fluid handling, and cable insulation.

- ▶ - 40°C to 200°C continuous use temperature, dependent upon the application parameters
- ▶ Higher flexibility - 60% lower modulus vs. unfilled PPS
- ▶ 15x increase in elongation - up to 90% vs. unfilled PPS
- ▶ 35x improved impact strength vs. unfilled PPS
- ▶ 30%-45% lower density versus fluoropolymers
- ▶ Superior permeation resistance at elevated temperature
- ▶ Same level of chemical resistance as standard grades of PPS

#### **SUPERIOR PROCESSABILITY ACROSS MOLDING METHODS**

##### **INJECTION MOLDING (FX32T4 & FX72T6)**

- ▶ Higher viscosity than most filled PPS grades
- ▶ Long flow fill lengths for cable ties
- ▶ Relatively low typical mold temperature: 60°C to 80°C

##### **EXTRUSION (FX55T1 & FX75T1)**

- ▶ Good melt strength facilitates tube and pipe extrusion
- ▶ High viscosity requires good temperature control and extruder power
- ▶ Ideal for both single and multilayer applications

##### **BLOW MOLDING (FX55T1 & FX75T1)**

- ▶ A variety of tubes and ducts demonstrate capability on 2D and 3D machines
- ▶ Excellent melt strength provides good parson hang time
- ▶ Can achieve fast cycle time



## NEW CAPABILITIES FOR AUTOMOTIVE AND INDUSTRIAL APPLICATIONS

### FORTRON® FLEXIBLE POLYMERS

- ▶ Provide the ideal solution for applications that are often subject to high temperatures.
- ▶ Perform in high pressure, high temperature, and highly corrosive environments (e.g., acids, bases, organic solvents, automotive fluids, hydrocarbons and sour gases).
- ▶ Deliver negligible moisture absorption, improving the performance of applications and the processing productivity of parts.

### LOWER COSTS AND IMPROVE PRODUCTION

- ▶ Eliminate the moisture conditioning step required in molding polyamide parts to improve cycle time and reduce operating costs.
- ▶ Extend service life of molded parts with low swell and low chemical degradation
- ▶ Enable greater optimization of part design and processing to reduce weight and improve ergonomics and installation needs.

### UNIQUE PERFORMANCE PROPERTIES

Property	Test Standard	Unit	Extrusion			Injection Molding	
			FX4382T1	FX55T1	FX75T1	FX72T6	FX32T4
MV	310°C/1200s-1	[Poise]	2500	4000	6500	950	1240
Melting Temp	ISO 11357	°C	280	280	280	280	280
Density	ISO 1183	g/cm <sup>3</sup>	1.25	1.25	1.20	1.18	1.25
Tensile Modulus	ISO 527	MPa	2300	2300	1650	1680	2300
Tensile Strength at break	ISO 527	MPa	50	50	42	40	50
Elongation at break	ISO 527	%	25	40	80	20	20
Charpy notched impact (RT)	ISO 179/1eA	KJ/m <sup>2</sup>	30	60	70	10	12
Charpy notched impact (-30°C)	ISO 179/1eA	KJ/m <sup>2</sup>	9	35	46	7	9
HDT at 1.8 MPa	ISO 75	°C	100	100	95	100	100
<b>Processing</b>							
	Injection Molding		+			+	+
	Blow Molding			+	+		
	Extrusion small tubes		+	+	+		
	Extrusion large pipes			+	+		
	Cable Coating			+			

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