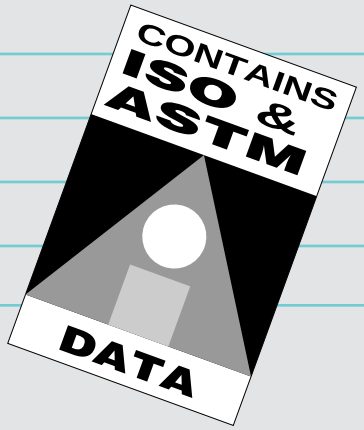
Ticona

Impet®

Thermoplastic Polyester

Short Term Properties (IP-4)



Impet® Thermoplastic Polyester

Introduction

Impet PET resins are injection moldable thermoplastic polyester compounds. The "R" grades are made with up to 100% post-consumer recycled polyethylene terephthalate (PET). The grades described are reinforced with glass fibers or with combinations of mineral fillers and glass fibers. These products offer outstanding mechanical properties, plus superior thermal and chemical resistance.

Impet PET thermoplastic polyesters are ideal for high-performance applications that require toughness, rigidity, exceptional dimensional stability, and excellent electrical properties.

All Impet PET grades mold easily but must be thoroughly dried before processing, preferably in a dehumidifying hopper dryer to achieve optimum properties.

Impet Grade Characteristics

Grade	Properties
320R	15% glass reinforced. General purpose, good mechanical properties.
330R	30% glass reinforced. Good thermal stability. Good mechanical properties.
340R	45% glass reinforced. Good thermal stability. High impact resistance.
HI430	15% Glass reinforced. High impact.
610R	13% glass/mineral reinforced. Good balance of properties.
630R	35% glass/mineral reinforced. Low warpage grade for structural applications.
740	45% glass/mineral reinforced for electrical applications where UL94HB flammability resistance is acceptable.
830R	35% glass/mineral reinforced for structural automotive components.
840R	45% glass/mineral reinforced. Improved high temperature capability over 830R. Excellent combination of strength, stiffness and warp resistance.

Injection Molding Conditions†

Drying Conditions: 3 hours @ 135°C (275°F)
A dehumidifying hopper dryer should be used

Mold Temperature: 110° - 121°C (230° - 250°F)

Screw Speed: 50 - 75 rpm

Back Pressure: Zero - low pressure

Injection Pressure: 8,000 - 12,000 psi

Typical Barrel Settings °C (°F):

Feed Zone: 260 - 270 (500 - 520)
Center Zone: 270 - 280 (520 - 530)
Front Zone: 280 - 285 (530 - 540)
Nozzle: 280 - 290 (530 - 550)

† Typical conditions suggested for guidance only.

Typical Application Areas

Automotive:

Electrical / Electronics:

- Distributor housings
- Coil housings
- Rotors
- High-voltage ignition components
- Electrical system components

Interior / Exterior Components:

- Grille opening retainers
- Exterior rear-view mirror housings
- Windshield wiper components
- Headlamp bezels
- HVAC vent doors
- Cowl vents
- Other structural body components

Consumer Electronics/ Appliances:

- Motor housings and internal components
- Corn poppers
- Coffee makers
- Hair curlers
- Hair dryers

Furniture:

- Arm rests
- Seat shells
- Bases

CONTAINS ISO & ASTM DATA

NOTICE! ISO DATA INCLUDED
Ticona has expanded its plastics testing and reporting of data to include ISO (International Organization for Standardization) protocols. This change will mean more reproducible and consistent test data for Ticona products. This brochure contains both ISO and ASTM data.

For more information on these applications or products, contact your local Ticona Sales Office, or Product Information Services at 1-800-833-4882.

Typical Properties of Impet® Thermoplastic Polyester

Properties	Test Method	Units	320R	330R	340R	HI430	610R	630R	740	830R	840R
Physical											
Specific Gravity	ISO 1183	—	1.43	1.58	1.70	1.33	1.40	1.60	1.72	1.60	1.72
Shrinkage @ 1/8" (flow direction)	Internal	mils/in.	1-4	1-3	1-2	2-5	5-8	3-5	1-3	1-3	1-3
Water Absorption	ISO 62	%	0.10	0.09	0.04	0.12	0.09	0.09	0.06	0.08	0.06
Rockwell Hardness	ISO 2039	M-scale	84	100	87	—	81	72	—	76	—
Mechanical											
Tensile Strength	ISO 527	MPa	115	170	190	73	97	85	140	118	140
Flexural Strength	ISO 178	MPa	165	270	290	115	140	130	215	190	215
Flexural Modulus	ISO 178	MPa	5,200	11,000	16,500	4,200	5,200	8,200	15,650	11,300	15,650
Notched Izod Impact	ISO 180	kJ/m^2	5.5	10	11	18	3.8	4.8	7.0	6.2	7.0
Thermal											
Melting Point by DSC	ISO 3146	°C	248	252	252	250	249	252	248	252	250
DTUL @ 0.45 MPa	ISO 75	°C	235	240	243	236	223	230	245	235	244
DTUL @ 1.8 MPa	ISO 75	°C	203	224	229	141	190	175	228	216	228
CLTE @ -22 to 122°F (flow)	ASTM E831	$in/in/°F x10^{-5}$	1.9	1.8	3.8	1.7	2.1	1.7	1.7	1.7	1.7
CLTE @ 122 to 176°F (flow)	ASTM E831	$in/in/°F x10^{-5}$	1.5	1.5	0.57	—	2.1	1.6	—	1.1	—
CLTE @ 176 to 320°F (flow)	ASTM E831	$in/in/°F x10^{-5}$	0.84	1.2	0.58	—	1.3	0.72	—	0.79	—
CLTE @ -22 to 122°F (trans)	ASTM E831	$in/in/°F x10^{-5}$	4.2	4.3	3.6	6.7	3.3	2.8	5.7	4.0	5.7
CLTE @ 122 to 176°F (trans)	ASTM E831	$in/in/°F x10^{-5}$	4.2	0.56	4.7	—	4.7	3.5	—	6.1	—
CLTE @ 176 to 320°F (trans)	ASTM E831	$in/in/°F x10^{-5}$	2.6	4.6	5.8	—	4.7	3.7	—	5.8	—
Flammability											
UL94 @ 1/32" (as tested by Ticona)*	UL94	—	(HB)	(HB)	(HB)	(HB)	(HB)	(HB)	(HB)	(HB)	(HB)
Electrical											
Dielectric Strength @ 1/8" thickness	ASTM D149	kV/mm	540	565	540	490	530	500	440	450	440
Dielectric Constant, 100 kHz	ASTM D150	—	3.1	3.1	3.4	3.4	3.2	3.6	3.9	3.7	3.9
Dissipation Factor, 100 kHz	ASTM D150	—	0.010	0.016	0.012	0.010	0.010	0.020	0.010	0.016	0.010
Arc Resistance	ASTM D495	sec	119	125	129	120	101	125	126	125	126
Comparative Tracking Index	ASTM D3638	volts	—	175	250	400	—	250	200	175	200
ASTM Tests at 72°F (23°C)											
Tensile Strength	ASTM D638	psi	15,190	24,000	28,500	9,800	14,240	14,000	19,800	15,000	19,800
Tensile Elongation	ASTM D638	%	3.0	2.0	2.0	3.4	3.2	2.2	1.4	2.1	1.4
Flexural Strength	ASTM D790	psi	22,100	35,500	45,000	16,000	21,700	21,500	28,600	22,000	28,600
Flexural Modulus	ASTM D790	kpsi	710	1,400	2,100	530	710	1,400	2,100	1,400	2,100
Notched Izod Impact	ASTM D256	ft lb/in	1.1	1.5	2.0	3.4	0.9	1.1	1.2	1.1	1.2
HDT @ 264 psi	ASTM D648	°F	392	435	445	230	380	395	429	420	429

Values shown are based on limited laboratory testing. These provisional values are not intended for use in establishing maximum, minimum or range values for specification purposes.

* UL Flame Class Rating was determined by Ticona laboratory testing except 740 tested by UL.

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NOTICE TO USERS: To the best of our knowledge, the information contained in this publication is accurate, however we do not assume any liability whatsoever for the accuracy and completeness of such information. Further, the analysis techniques included in this publication are often simplifications and, therefore, approximate in nature. More vigorous analysis techniques and/or prototype testing are strongly recommended to verify satisfactory part performance. Anyone intending to rely on such recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards.

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Material data and values included in this publication are either based on testing of laboratory test specimens and represent data that fall within the normal range of properties for natural material or were extracted from various published sources. All are believed to be representative. Colorants or other additives may cause significant variations in data values. These values are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes.

We strongly recommend that users seek and adhere to the manufacturer's or supplier's current instructions for handling each material they use. Please call 1-800-833-4882 for additional technical information. Call Customer Services at the number listed below for the appropriate Material Safety Data Sheets (MSDS) before attempting to process these products. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist.

Impet® thermoplastic polyester is not intended for use in medical or dental implants.

Products Offered by Ticona

Celcon® and **Hostaform**® acetal copolymer (POM)
Celanese® Nylon 6/6
Celanex® thermoplastic polyester
Impet® thermoplastic polyester
Vandar® thermoplastic polyester alloys
Riteflex® thermoplastic polyester elastomer
Celstran®**, Fiberod**®**,** and **Compel**® long fiber reinforced thermoplastics
Encore® recycled thermoplastic molding resins
Fortron® polyphenylene sulfide (PPS)
GUR® ultra-high molecular weight polyethylene (UHMWPE)
GHR® specialty high density polyethylene (HDPE)
Topas® cyclic olefin copolymer (COC)
Vectra® liquid crystal polymer (LCP)
Duracon™ acetal copolymer (POM) and **Duranex**™ thermoplastic polyester are offered by Polyplastics Co., Ltd.

Fortron® is a registered trademark of Fortron Industries.

Technical Information: 1-800-833-4882

Customer Services: 1-800-526-4960

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Printed in U.S.A. 99-328/5M/1199