

# Rynite® FR533NH NC010 (PRELIMINARY)

## THERMOPLASTIC POLYESTER RESIN

Common features of Rynite® thermoplastic polyester include mechanical and physical properties such as excellent balance of strength and stiffness, dimensional stability, creep resistance, heat resistance, high surface gloss and good inherent electrical properties at elevated temperature. It can be processed over a broad temperature range and has excellent flow properties.

Rynite® thermoplastic polyester resins are typically used in demanding applications in the automotive, electrical and electronics, appliances where they successfully replace metals and thermosets, as well as other thermoplastic polymers.

Rynite® FR533NH NC010 is a 33% glass reinforced, modified polyethylene terephthalate resin using a non-halogenated flame retardant.

### Product information

Resin Identification	PET- GF33FR(40)	ISO 1043
Part Marking Code	>PET-GF33FR(40)<	ISO 11469

### Rheological properties

Moulding shrinkage, parallel	0.3 %	ISO 294-4, 2577
Moulding shrinkage, normal	0.7 %	ISO 294-4, 2577

### Typical mechanical properties

Tensile modulus	13100 MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	85 MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	0.9 %	ISO 527-1/-2
Flexural modulus	13000 MPa	ISO 178
Flexural strength	140 MPa	ISO 178
Charpy notched impact strength, 23°C	11 kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -40°C	11 kJ/m <sup>2</sup>	ISO 179/1eA
Poisson's ratio	0.33	

### Thermal properties

Melting temperature, 10°C/min	249 °C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	90 °C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	240 °C	ISO 75-1/-2
Ball pressure test	230 °C	IEC 60695-10-2
Coeff. of linear therm. expansion, parallel, -40-23°C	18 E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), parallel	18 E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel, 55-160°C	11 E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, -40-23°C	51 E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	72 E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, 55-160°C	81 E-6/K	ISO 11359-1/-2
RTI, electrical, 0.4mm	155 °C	UL 746B
RTI, electrical, 0.75mm	155 °C	UL 746B
RTI, electrical, 1.5mm	155 °C	UL 746B
RTI, electrical, 3.0mm	155 °C	UL 746B
RTI, impact, 0.75mm	160 °C	UL 746B

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RTI, impact, 1.5mm	170 °C	UL 746B
RTI, impact, 3.0mm	170 °C	UL 746B
RTI, strength, 0.75mm	160 °C	UL 746B
RTI, strength, 1.5mm	170 °C	UL 746B
RTI, strength, 3.0mm	170 °C	UL 746B

### Flammability

Burning Behav. at 1.5mm nom. thickn.	V-0 class	IEC 60695-11-10
Thickness tested	1.5 mm	IEC 60695-11-10
UL recognition	yes	UL 94
Burning Behav. at thickness h	V-0 class	IEC 60695-11-10
Thickness tested	0.4 mm	IEC 60695-11-10
UL recognition	yes	UL 94
Glow Wire Flammability Index, 0.75mm	960 °C	IEC 60695-2-12
Glow Wire Flammability Index, 1.5mm	960 °C	IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	960 °C	IEC 60695-2-12
Glow Wire Ignition Temperature, 0.75mm	825 °C	IEC 60695-2-13
Glow Wire Ignition Temperature, 1.5mm	775 °C	IEC 60695-2-13
Glow Wire Ignition Temperature, 3.0mm	850 °C	IEC 60695-2-13
Railway classification	R22	EN 45545-2
Railway classification rating	HL1	EN 45545-2

### Electrical properties

Volume resistivity	1E13 Ohm.m	IEC 62631-3-1
Electric strength	34 kV/mm	IEC 60243-1
Comparative tracking index	350	IEC 60112
Comparative tracking index, 3.0mm	2 PLC	UL 746A

### Physical/Other properties

Density	1610 kg/m <sup>3</sup>	ISO 1183
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### Injection

Drying Recommended	yes
Drying Temperature	120 °C
Drying Time, Dehumidified Dryer	4 - 6 h
Processing Moisture Content	≤0.01 <sup>[1]</sup> %
Melt Temperature Optimum	275 °C
Min. melt temperature	270 °C
Max. melt temperature	280 °C
Mold Temperature Optimum	130 °C
Min. mould temperature	120 °C
Max. mould temperature	140 <sup>[2]</sup> °C
Ejection temperature	192 °C

[1]: At levels above 0.02%, strength and toughness will decrease, even though parts may not exhibit surface defects.

[2]: (6mm - 1mm thickness)

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### Characteristics

Processing	Injection Moulding
Delivery form	Pellets
Additives	Flame retardant, Non-halogenated/Red phosphorous free flame retardant
Special characteristics	Flame retardant, Heat stabilised or stable to heat

The above data are preliminary and are subject to change as additional data are developed on subsequent lots.

NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colourants or other additives may cause significant variations in data values. Properties of moulded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Other than those products expressly identified as medical grade (including by MT® product designation or otherwise), Celanese's products are not intended for use in medical or dental implants. Regardless of any such product designation, any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use. 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. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication. 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. We recommend that persons intending to rely on any 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. We strongly recommend that users seek and adhere to the manufacturer's current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed for additional technical information. Call Customer Services for the appropriate Materials Safety Data Sheets (MSDS) before attempting to process our products.

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