

# DuPont™ Zytel® FR15 NC010

## NYLON RESIN

Product Information

Zytel® FR15 NC010 is an Unreinforced, Flame Retardant, Non-Halogenated, Polyamide 66

Product information	Value	Unit	Test Standard
Resin Identification	PA66-FR(30)	-	ISO 1043
Part Marking Code	PA66-FR(30)	-	ISO 11469
Rheological properties	dry / cond	Unit	Test Standard
Molding shrinkage, parallel	0.9 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	0.8 / -	%	ISO 294-4, 2577
Mold Shrinkage, Flow, 3.2mm (0.125in)	0.9 / *	%	-
Mechanical properties	dry / cond	Unit	Test Standard
Tensile Modulus	536641 / -	psi	ISO 527-1/-2
Stress at break	12300 / -	psi	ISO 527-1/-2
Strain at break	6 / -	%	ISO 527-1/-2
Flexural Modulus	479000 / -	psi	ISO 178
Flexural Strength	15200 / -	psi	ISO 178
Charpy notched impact strength, 73°F	1.43 / -	ftlb/in <sup>2</sup>	ISO 179/1eA
Hardness, Rockwell, M-scale	80 / -	-	ISO 2039-2 A
Hardness, Rockwell, R-scale	120 / -	-	ISO 2039-2
A: Assessed			
Thermal properties	dry / cond	Unit	Test Standard
Melting temperature, 18°F/min	504 / *	°F	ISO 11357-1/-3
Temp. of deflection under load, 260 psi	185 / *	°F	ISO 75-1/-2
RTI, electrical			UL 746B
30mil	266	°F	
60mil	266	°F	
120mil	266	°F	
RTI, impact			UL 746B
30mil	167	°F	
60mil	167	°F	
120mil	167	°F	
RTI, strength			UL 746B
30mil	185	°F	
60mil	185 / *	°F	
120mil	185	°F	
Flammability	dry / cond	Unit	Test Standard
Glow Wire Flammability Index			IEC 60695-2-12
30mil	1760 / -	°F	
60mil	1760 / -	°F	
120mil	1760 / -	°F	
Glow Wire Ignition Temperature			IEC 60695-2-13
30mil	1340 / -	°F	
60mil	1340 / -	°F	
120mil	1340 / -	°F	
Flammability			IEC 60695-11-10
0.75mm	V-0 / *	-	
1.5mm	V-0 / *	-	
3.0mm	V-0 / *	-	
Fl. 0.75mm, UL Yellow Card			-
Fl. 0.75mm, UL Yellow Card	V-0 / *	-	
Fl. 1.5mm, UL Yellow Card	V-0 / *	-	
Fl. 3.0mm, UL Yellow Card	V-0 / *	-	
Oxygen Index	32 / *	%	ASTM D 2863

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Hot Wire Ignition			UL 746A
30mil	11 / *	s	
60mil	23 / *	s	
120mil	72 / *	s	
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<80	in/min	ISO 3795 (FMVSS 302)
<b>Electrical properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Comparative tracking index	600 / -	-	IEC 60112
Dielectric Strength, Short Time, 500 V/s, in oil, 23°C, 1.6mm (0.062in)	686 / -	kV/in	ASTM D 149
High Amperage Arc Ignition Resistance			UL 746A
30 mil	99 / *	arcs	
60 mil	143 / *	arcs	
120 mil	149 / *	arcs	
<b>Other properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Density	1.17 / -	g/cm <sup>3</sup>	ISO 1183
<b>Injection</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Drying Recommended	yes		-
Drying Temperature	≥176	°F	-
Drying Time, Dehumidified Dryer	2 - 4	h	-
Processing Moisture Content	≤0.2	%	-
Melt Temperature Optimum	518	°F	-
Min. melt temperature	500	°F	-
Max. melt temperature	536	°F	-
Max. screw tangential speed	0.2 / *	m/s	-
Mold Temperature Optimum	158	°F	-
Min. mold temperature	122	°F	-
Max. mold temperature	194	°F	-
Hold pressure range	7250 - 14500	psi	-
Hold pressure time	0.0889	s/mil	-
Back pressure	As low as possible		-
Maximum hold up time	≤15	min	-
<b>Characteristics</b>			
Processing	• Injection Molding		
Delivery form	• Pellets		
Additives	• Lubricants	• Release agent	

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### Chemical Media Resistance

#### Acids

- ✓ Acetic Acid (5% by mass) (23 °C)
- ✓ Citric Acid solution (10% by mass) (23 °C)
- ✓ Lactic Acid (10% by mass) (23 °C)
- ✗ Hydrochloric Acid (36% by mass) (23 °C)
- ✗ Nitric Acid (40% by mass) (23 °C)
- ✗ Sulfuric Acid (38% by mass) (23 °C)
- ✗ Sulfuric Acid (5% by mass) (23 °C)
- ✗ Chromic Acid solution (40% by mass) (23 °C)

#### Bases

- ✗ Sodium Hydroxide solution (35% by mass) (23 °C)
- ✓ Sodium Hydroxide solution (1% by mass) (23 °C)
- ✓ Ammonium Hydroxide solution (10% by mass) (23 °C)

#### Alcohols

- ✓ Isopropyl alcohol (23 °C)
- ✓ Methanol (23 °C)
- ✓ Ethanol (23 °C)

#### Hydrocarbons

- ✓ n-Hexane (23 °C)
- ✓ Toluene (23 °C)
- ✓ iso-Octane (23 °C)

#### Ketones

- ✓ Acetone (23 °C)

#### Ethers

- ✓ Diethyl ether (23 °C)

#### Mineral oils

- ✓ SAE 10W40 multigrade motor oil (23 °C)
- ✗ SAE 10W40 multigrade motor oil (130 °C)
- ✗ SAE 80/90 hypoid-gear oil (130 °C)
- ✓ Insulating Oil (23 °C)

#### Standard Fuels

- ✓ ISO 1817 Liquid 1 - E5 (60 °C)
- ✓ ISO 1817 Liquid 2 - M15E4 (60 °C)
- ✓ ISO 1817 Liquid 3 - M3E7 (60 °C)
- ✓ ISO 1817 Liquid 4 - M15 (60 °C)
- ✓ Standard fuel without alcohol (pref. ISO 1817 Liquid C) (23 °C)
- ✓ Standard fuel with alcohol (pref. ISO 1817 Liquid 4) (23 °C)

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- ✓ Diesel fuel (pref. ISO 1817 Liquid F) (23°C)
- ✓ Diesel fuel (pref. ISO 1817 Liquid F) (90°C)
- ✗ Diesel fuel (pref. ISO 1817 Liquid F) (>90°C)

### Salt solutions

- ✓ Sodium Chloride solution (10% by mass) (23°C)
- ✗ Sodium Hypochlorite solution (10% by mass) (23°C)
- ✓ Sodium Carbonate solution (20% by mass) (23°C)
- ✓ Sodium Carbonate solution (2% by mass) (23°C)
- ✗ Zinc Chloride solution (50% by mass) (23°C)

### Other

- ✓ Ethyl Acetate (23°C)
- ✗ Hydrogen peroxide (23°C)
- ✗ DOT No. 4 Brake fluid (130°C)
- ✗ Ethylene Glycol (50% by mass) in water (108°C)
- ✓ 1% nonylphenoxy-polyethyleneoxy ethanol in water (23°C)
- ✓ 50% Oleic acid + 50% Olive Oil (23°C)
- ✓ Water (23°C)
- ✗ Water (90°C)
- ✗ Phenol solution (5% by mass) (23°C)

#### Symbols used:

✓ possibly resistant

Defined as: Supplier has sufficient indication that contact with chemical can be potentially accepted under the intended use conditions and expected service life. Criteria for assessment have to be indicated (e.g. surface aspect, volume change, property change).

✗ not recommended - see explanation

Defined as: Not recommended for general use. However, short-term exposure under certain restricted conditions could be acceptable (e.g. fast cleaning with thorough rinsing, spills, wiping, vapor exposure).

Contact DuPont for Material Safety Data Sheet, general guides and/or additional information about ventilation, handling, purging, drying, etc. ISO Mechanical properties measured at 160 mil (Hytrel® measured at 80 mil), IEC Electrical properties measured at 80 mil, all ASTM properties measured at 120 mil, and test temperatures are 73°F unless otherwise stated.

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