

INVISTA's Novadyn™ DT/DI polyamide is made from monomers DYTEK® A amine, purified terephthalic (PTA) and purified isophthalic acid (PIA).

Mechanical properties			
	TEST METHOD	NOVADYN™ DT/DI	
		DAM ¹	COND ²
Tensile strength (MPa)	ISO 527 (50 mm/min)	105	110
Tensile modulus (GPa)	ISO 527 (1 mm/min)	3.3	3.5
Elongation @ yield (%)	ISO 527 (50 mm/min)	7.5	6
Elongation @ break (%)	ISO 527 (50 mm/min)	10.6	6
Flexural strength (MPa)	ISO 178 (2 mm/min)	123	130
Flexural modulus (GPa)	ISO 178 (2 mm/min)	2.7	3.1
Notched Izod impact strength (kJ/m ²) 23°C	ISO 180	7.6	5
Notched Izod impact strength (kJ/m ²) -40°C	ISO 180	2.1	-
Unnotched Izod impact strength (kJ/m ²) 23°C	ISO 180	170	202
Unnotched Izod impact strength (kJ/m ²) -30°C	ISO 180	136	-
Unnotched Izod impact strength (kJ/m ²) -40°C	ISO 180	107	-
Notched Charpy impact strength (kJ/m ²) 23°C	ISO 179	5.8	5.5
Notched Charpy impact strength (kJ/m ²) -40°C	ISO 179	2.2	-
Unnotched Charpy impact strength (kJ/m ²) 23°C	ISO 179	100	127
Unnotched Charpy impact strength (kJ/m ²) -30°C	ISO 179	125	-
Unnotched Charpy impact strength (kJ/m ²) -40°C	ISO 179	105	-
Thermal properties			
Glass transition temperature (°C)	DSC (20°C/min)	145	-
HDT @ 1.8 MPa (°C)	ISO 75	122	-
HDT @ 0.45 MPa (°C)	ISO 75	134	-
Vicat softening temperature (°C) – A50	ISO 306	143	-
Vicat softening temperature (°C) – A120	ISO 306	139	-
Vicat softening temperature (°C) – B50	ISO 306	136	-
Vicat softening temperature (°C) – B120	ISO 306	141	-

Physical properties			
	TEST METHOD	NOVADYN™ DT/DI	
		DAM ¹	COND ²
Melt flow index – 270°C	ISO 1133	16.9	-
Melt flow index – 280°C	ISO 1133	25.2	-
Melt flow index – 300°C	ISO 1133	59.3	-
Density (g/cm ³)	ISO 1183	1.18	1.19
Hardness (Shore D)	ISO 868	84	-
Mold shrinkage (%)	ISO 294-4 (transverse)	0.53	-
	ISO 294-4 (longitudinal)	0.54	-
Water absorption (%)	ISO 62 (full immersion @ 23°C for 24 hours)	0.97	-
Moisture absorption after conditioning (%)	ISO 1110	-	4.2
L*a*b* color ¹	-	71.21*-1.73*9.63	-
Yellowness index	ASTM E313	36	-
Refractive index	ISO 489, Method B	1.58-1.59	-
Total luminous transmittance (%)	ASTM D1003	91.6	-
Haze (%)	ASTM D1003	2.8	-
Gloss – 20°	ISO 2813	115	-
Gloss – 60°	ISO 2813	128	-
Gloss – 85°	ISO 2813	107	-
Volumetric swelling after conditioning (%)	-	-	5.2



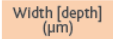
Chemical resistance	
RESULTS	MATERIAL
Tensile strength > 75 MPa Tensile modulus > 3.0 GPa No observed changes in clarity	Mineral oil Engine oil Transmission fluid Toluene Acetone Diesel
Tensile strength > 60 MPa Tensile modulus > 2.8 GPa No observed change in clarity	Methyl ethyl ketone Gasoline (10% ethanol) Dichloromethane 10% NaCl 10% NaOH 10% CaCl ₂
Tensile strength > 45 MPa Tensile modulus > 2.8 GPa No observed changes in clarity	Brake Fluid Glycol/water (50/50) 10% sulfuric acid

Test method: Tensile bars fully immersed in chemicals at 23°C for 39 days and tested per ISO 527. Novadyn™ DT/DI is not suitable for low molecular weight alcohols (e.g., methanol, ethanol) or strong acids (e.g., concentrated sulfuric acid). Novadyn™ DT/DI loses transparency over time in water at temperatures above 40°C.

¹ Slightly yellow appearance

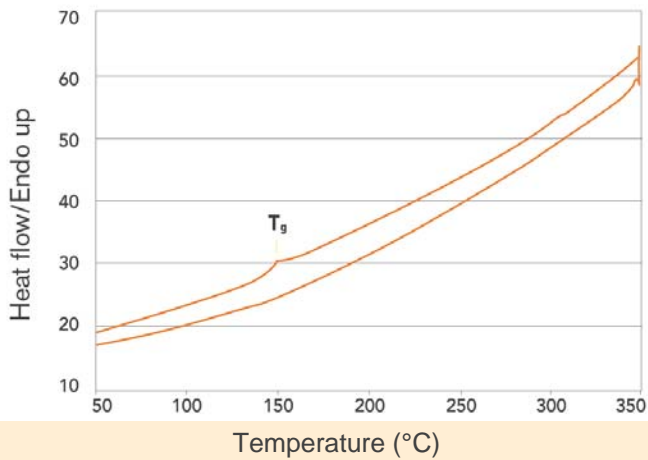
Scratch resistance

Scratch load					
	2 N	3 N	7 N	10 N	15 N
Novadyn™ DT/DI					150 [*]
Nylon 6I/6T				153 [*]	161 [0.51]
Polycarbonate			188 [0.68]	262 [2.42]	250 [5.57]

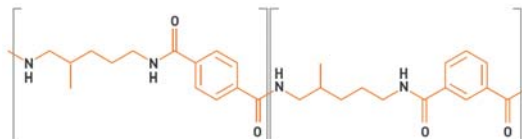
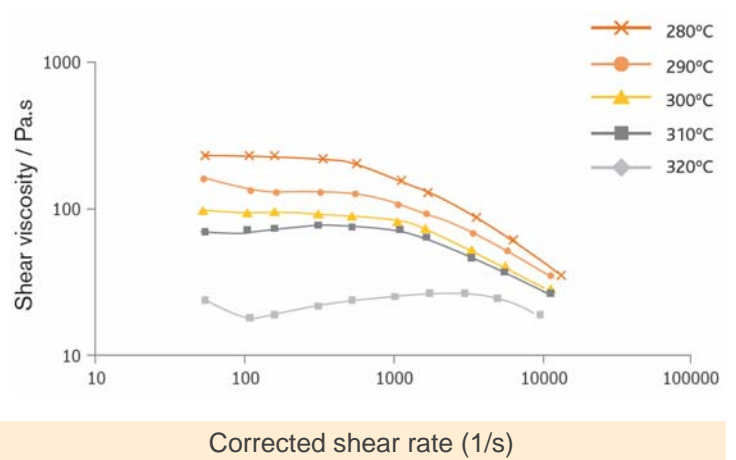
	No visible scratch.
	Visible scratch. Deformation visible at some angles, no more than 30% of the evaluated lines at all angles show deformation.
	Visible scratch. Deformation present at all angles.

* These scratches disrupt the surface, different from a typical ductile scratch. The depth could not be measured.

DSC plot of amorphous as-produced Novadyn™ DT/DI
Heating and cooling rate of 20°C/min.



Melt viscosity versus shear rate for Novadyn™ DT



Nylon 6,6 and nylon 6 blends

Property data is available in nylon 6,6 white papers for 35% glass fiber (GF) reinforced compound with resin ratio of 75% nylon 6,6 with 25% Novadyn™ DT/DI. Property data is available in nylon 6 white papers for 35% GF reinforced compound with resin ratio of 75% nylon 6 with 25% Novadyn™ DT/DI. Both white papers are on Novadyn.INVISTA.com. These formulations were designed to illustrate general properties and are not optimized for any particular end-use application. We encourage customers to experiment with different resin ratios, reinforcement types, additives and additive concentrations.

Processing conditions

Processing conditions used for base resin Novadyn™ DT/DI as well as 35% GF reinforced nylon 6,6 and nylon 6 blends are shown in the table below.

		NOVADYN™ DT/DI	NOVADYN™ DT/DI + NYLON 6 BLEND	NOVADYN™ DT/DI + NYLON 6,6 BLEND
DRYING	Vacuum or desiccant dryer, not recirculating air	4-12 hours at 90-100°C	4-12 hours at 80°C	4-12 hours at 80°C
COMPOUNDING	Extruder	–	Twin screw fitted with kneading elements for GF dispersion	Twin screw fitted with kneading elements for GF dispersion
	Extruder temperature – feed (°C)	–	200	200
	Extruder temperature – all other zones (°C)	–	270	280
	Barrel temperature (°C) – rear	260	260	280
	Barrel temperature (°C) – middle	275	265	285
	Barrel temperature (°C) – front	280	276	290
	Barrel temperature (°C) – nozzle	285	282	300
MOLDING	Mold temperature (°C)	80-90	90-100°C was required to ensure the material crystallized fully	90
	Back pressure (bar)	15	15	15
	Screwback speed (rpm)	100	100	100
	Injection speed	Slow	Medium	Medium
	Holding pressure (bar)	120	100	100
			93	

General Information:

Delivery form: Pellets in 25 kg bags (dried to a moisture level of <0.1% and packaged in moisture-proof bags).

FOR SAMPLES AND FURTHER INFORMATION

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