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Ultrason® S 2010 NAT

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Unreinforced, medium viscosity standard injection moulding grade.
Abbreviated designation according to ISO 1043-1: PSU

Processing/Physical Characteristics	Value	Unit	Test Standard
ASTM Data			
Mold Shrinkage, MD	0.006	mm/mm	ASTM D 955
Density, 73°F	1240	kg/m³	ASTM D 792

Rheological properties	dry / cond	Unit	Test Standard
ISO Data			
Melt volume-flow rate, MVR	95 / *	cm³/10min	ISO 1133
Temperature	360 / *	°C	-
Load	10 / *	kg	-
Molding shrinkage, parallel	0.7 / *	%	ISO 294-4, 2577
Molding shrinkage, normal	0.7 / *	%	ISO 294-4, 2577

Mechanical Properties	dry / cond	Unit	Test Standard
ISO Data			
Tensile Modulus	- / 2550	MPa	ISO 527
Yield stress	- / 75	MPa	ISO 527
Yield strain	- / 5.5	%	ISO 527
Nominal strain at break	- / >50	%	ISO 527
Tensile Creep Modulus, 1h	* / 2500	MPa	ISO 899-1
Impact Strength (Charpy), +23°C	- / no break	kJ/m²	ISO 179/1eU
Impact Strength (Charpy), -30°C	- / no break	kJ/m²	ISO 179/1eU
Notched Impact Strength (Charpy), +23°C	- / 5.5	kJ/m²	ISO 179/1eA
Notched Impact Strength (Charpy), -30°C	- / 6	kJ/m²	ISO 179/1eA
ASTM Data			
Tensile Strength at Yield	80 / -	MPa	ASTM D 638
Elongation at Yield	5.7 / -	%	ASTM D 638
Flexural Modulus	2599 / -	MPa	ASTM D 790
Notched Impact Strength (Izod), 1/8 in	10 / -	J/m	ASTM D 256

Thermal Properties	dry / cond	Unit	Test Standard
ISO Data			
Glass Transition Temperature (10°C/min)	187 / *	°C	ISO 11357-1/-2
Temp. of deflection under load (1.80 MPa)	175 / *	°C	ISO 75-1/-2
Temp. of deflection under load (0.45 MPa)	181 / *	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	180 / *	°C	ISO 306
Coeff. of Linear Therm. Expansion, parallel	53 / *	E-6/K	ISO 11359-1/-2
Burning Behav. at 1.5 mm Nom. Thickn.	HB / *	class	UL 94
Thickness tested	1.6 / *	mm	-
UL recognition	yes / *	-	-
Burning Behav. at thickness h	V-2 / *	class	UL 94
Thickness tested	3.2 / *	mm	-
UL recognition	yes / *	-	-
Oxygen index	32 / *	%	ISO 4589-1/-2
ASTM Data			
DTUL @ 66 psi	179	°C	ASTM D 648
DTUL @ 264 psi	167	°C	ASTM D 648

Electrical Properties	dry / cond	Unit	Test Standard
ISO Data			
Relative permittivity, 100Hz	- / 3.1	-	IEC 62631-2-1
Relative permittivity, 1MHz	- / 3.1	-	IEC 62631-2-1
Dissipation Factor, 100Hz	- / 8	E-4	IEC 62631-2-1
Dissipation Factor, 1MHz	- / 64	E-4	IEC 62631-2-1
Volume Resistivity	- / >1E13	Ohm*m	IEC 62631-3-1
Surface Resistivity	* / >1E15	Ohm	IEC 62631-3-2
Electric Strength	- / 40	kV/mm	IEC 60243-1
Comparative tracking index	- / 125	-	IEC 60112

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Other Properties	dry / cond	Unit	Test Standard
ISO Data			
Water Absorption	0.8 / *	%	Sim. to ISO 62
Humidity absorption	0.3 / *	%	Sim. to ISO 62
Density	1230 / -	kg/m³	ISO 1183

Material Specific Properties	dry / cond	Unit	Test Standard
ISO Data			
Viscosity number	63 / *	cm³/g	ISO 307, 1157, 1628

Rheological calculation properties	Value	Unit	Test Standard
ISO Data			
Density of melt	1090	kg/m³	-
Thermal Conductivity of Melt	0.15	W/(m K)	-
Spec. heat capacity of melt	2170	J/(kg K)	-
Eff. thermal diffusivity	6.34E-8	m²/s	-
Ejection temperature	165	°C	-

Test specimen production	Value	Unit	Test Standard
ISO Data			
Injection Molding, melt temperature	350	°C	ISO 294
Injection Molding, mold temperature	140	°C	ISO 294
Injection Molding, injection velocity	200	mm/s	ISO 294
Injection Molding, pressure at hold	60	MPa	ISO 294

Processing Recommendation Injection Molding	Value	Unit	Test Standard
Pre-drying - Temperature	140	°C	-
Pre-drying - Time	4	h	-
Processing humidity	≤0.02	%	-
Melt temperature	330 - 390	°C	-
Mold temperature	120 - 160	°C	-

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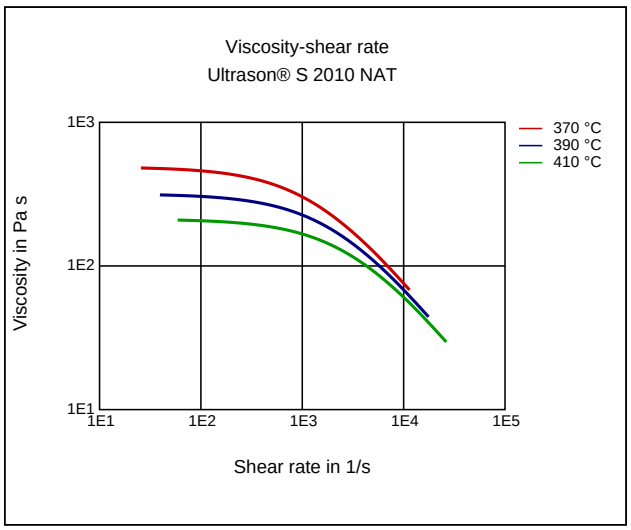
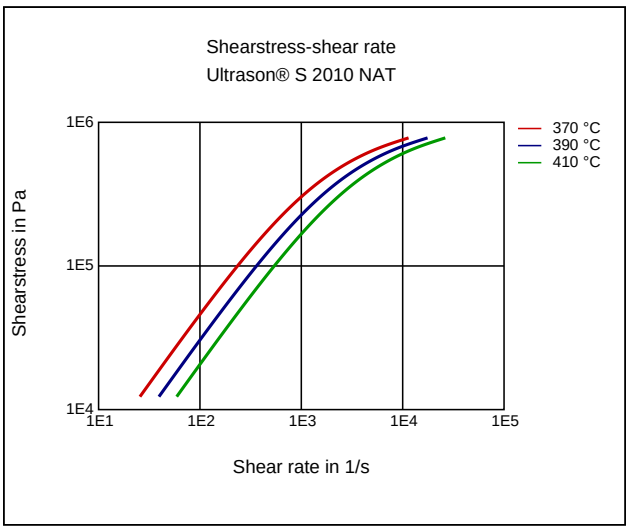
Diagrams

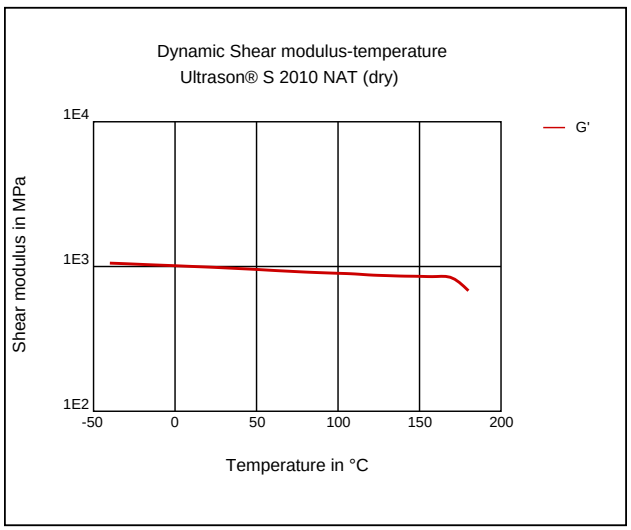
Viscosity-shear rate



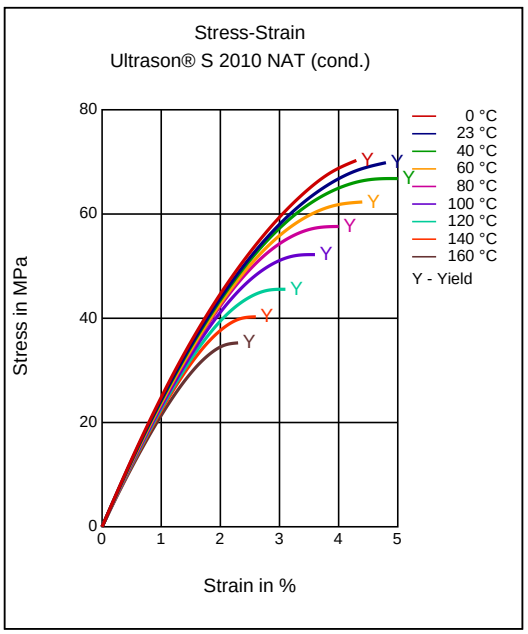
Shearstress-shear rate



Dynamic Shear modulus-temperature



Stress-strain



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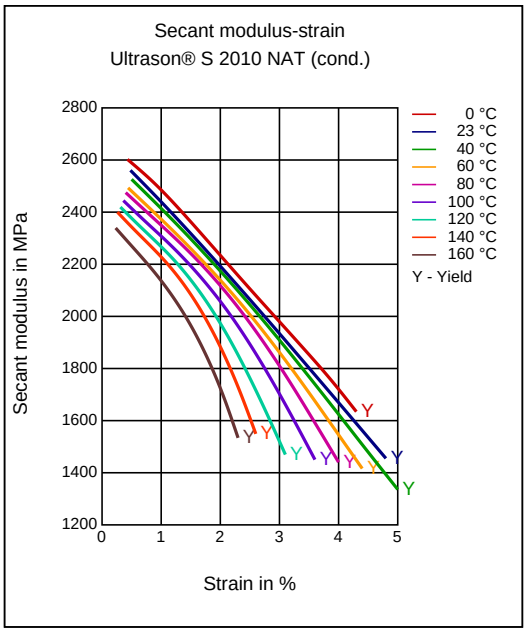
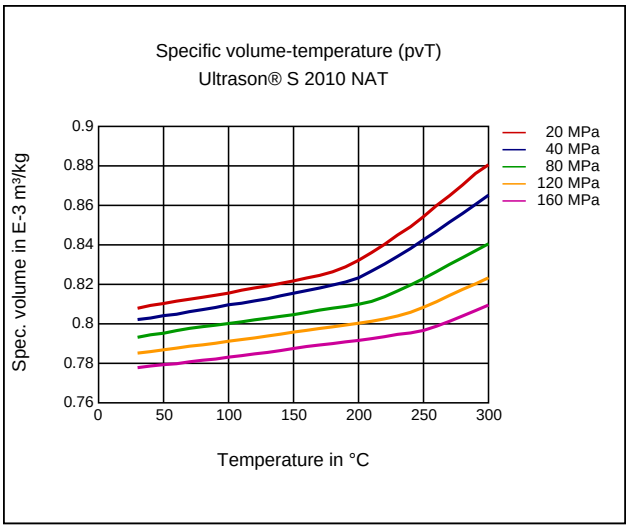
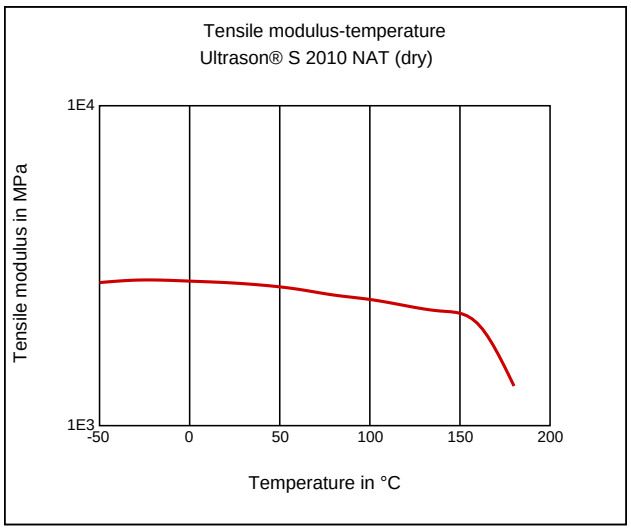
Secant modulus-strain



Specific volume-temperature (pvT)



Tensile Modulus-Temperature



Characteristics

Processing

Injection Molding, Film Extrusion, Profile Extrusion, Sheet Extrusion, Blow Molding, Thermoforming

Delivery form

Pellets, Natural Color

Injection Molding

PREPROCESSING
Pre/Post-processing, max. allowed water content: .02 %
Pre/Post-processing, Pre-drying, Temperature: 140 °C
Pre/Post-processing, Pre-drying, Time: 4 h

PROCESSING
injection molding, Melt temperature, range: 330 - 390 °C
injection molding, Melt temperature, recommended: 350 °C

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injection molding, Mold temperature, range: 120 - 160 °C
injection molding, Mold temperature, recommended: 140 °C
injection molding, Dwell time, thermoplastics: 10 min

Pretreatment
Drying temperature: 130 - 150°C
Drying time: minimum 4h
recommended dryer: vaccum or dry air dryer
maximum moisture: 0,02 - 0,05%

Ultrason® can be injection molded by any type of machinery on the market, provided that the plasticizing unit and the mold temperature control system have been configured appropriately. The machinery manufacturer must be consulted if any doubts exist on the ability of various parts to withstand the high temperatures required (e.g. barrel, barrel head, bolted connections, etc.)

Long residence time in combination with high temperatures should be avoided e.g. by pump out material at regular intervals.
During extended interruptions, the barrel temperature should be lowered to about 250-280°C.

It has been found out that heating to the requested processing temperature and shutting down or lowering the temperature is best carried out in two steps.
First, the barrel temperatures are set at the lower processing temperature range for the particular thermoplastic (340 - 350 °C). As soon as these temperatures have reached a steady state, the material in the barrel is pumped out. Second, the barrel temperature can be set to the required processing temperature or the heaters can be shut down.

Chemical Media Resistance

Acids

✔ Acetic Acid (5% by mass) (23°C)