Nylon NST6650WL and NST6650HWL/HSWL

NST6650WL is a nylon 6.6 formulation, impact modified by reactive alloying to provide exceptional toughness, even when dry as molded, and at low temperatures, and containing a U.V. stabilized additive package to provide outstanding resistance to weathering. Although strength and rigidity are reduced compared with general purpose molding grades (such as N6650L), **NST6650WL** fully retains the resistance to the effects of a wide range of chemicals, oils, greases and solvents typical of nylon materials, and thus can be successfully used for demanding applications in harsh or aggressive environments. Where extended exposure to high temperatures is required, the use of **NST6650HWL** or **HSWL**, heat-stabilized grades, is recommended.

TYPICAL PROPERTIES
DRY AS MOLDED

	ASTM	ENGLISH		S.I.	
PROPERTY	**TEST METHOD**	**UNITS**	**VALUE**	**UNITS**	**VALUE**
Melting Range	D789	ºF	495	ºC	257
Specific Gravity	D792	-	1.08	-	1.08
Water Absorption (24 hours immersion)	D570	%	1.2	%	1.2
Heat Deflection Temperature at 264 lbs/in^2 (1.82 MPa)	D648	ºF	158	ºC	70
Mold Shrinkage Guideline* (Flow Direction)	1/8" section	%	1.6	%	1.6
Tensile Strength at Yield	D638	lbs/in^2	7,000	MPa	48
Elongation at Break	D638	%	40-60	%	40-60
Flexural Strength	D790	lbs/in^2	8,000	MPa	61
Flexural Modulus	D790	lbs/in^2	250,000	MPa	1,724
Izod Impact Strength	D256	ft. lbs/in of notch		J/m	
(Notched, 1/8" specimen)					
+23°C			13-15		694-801
-40º			2.1-2.7		133-160
Rockwell Hardness	D785	R scale	110	-	-

***Please review shrinkages projections for specific applications with an MDE Technical Representative.**

All data generated using test specimens injection molded from natural color material. Inclusion of color pigments or other additives may change some or all of these test results. Test specimens are stored in a moisture proof container immediately after molding and contain less than 0.2% moisture; tests are conducted at 23ºC and 50% relative humidity unless otherwise stated.

These mechanical property test data have been developed using injection molded specimens tested under standardized conditions; furthermore, many of the mechanical properties of thermoplastic materials can be influenced by changes in processing conditions, environmental factors such as temperature and humidity, and rate of application of stress. Therefore, these test results, which characterize typical production material, should not be used either to establish specification limits or alone as the basis for engineering design.
6:63v2smw

NST6650WL and NST6650HWL/HSWL Processing Guidelines

Drying

Nylon compounds from MDE are shipped in moisture-resistant packaging, dried and ready to be processed.

If drying is required after, for example, exposure of virgin resin to humid air for more than one hour, or for reground material, the use of dehumidifying dryers is strongly preferred.

The dew point of the drying air stream should be no more than -20°F, and preferably lower. The drying air temperature must be high enough to achieve a pellet temperature of 175-180°F. If using a hopper dryer, depending on air hose length and insulation of hoses and hopper, the drying air temperature may need to reach 200-220°F to achieve the required material temperature.

If the pellet temperature reaches 180°F, a residence time of 4 hours is generally adequate to ensure that the material is ready to be processed. Only if residence times are limited to 2 hours should a pellet temperature of 200°F be considered; at 200°F, there is a risk of material oxidation, with associated yellowing and loss of part performance.

Nylon compounds usually demonstrate visual evidence of unacceptably high moisture levels, such as uncontrollable nozzle drool, or splay or silver streaks on the molded part. Additional drying time is indicated if these characteristics are observed.

If moisture analysis equipment is available, an acceptable moisture content range for processing is 0.1% to 0.25% maximum.

Temperature Guidelines

The following temperature guidelines are suggested for general use if a machine can be selected where shot size is 40-70% of nominal machine capacity. The viscosity of these "super-tough" modified grades is higher than that of general purpose nylons. However, melt stability is excellent, and the use of higher melt temperatures within the limits shown are suggested where part or tool design requires higher flow.

Tool Surface	Melt Temperatures (°F)			Typical Cylinder Temperatures (°F)		
Temperature (°F)	Max.	Preferred	Min.	Front	Center	Rear
150-180	575	540-560	530	530	540	550

- A "reverse" temperature profile helps ensure a homogeneous melt, improves screw recovery and helps to optimize cycle times.
- A mold surface temperature in the suggested range improves surface appearance, helps consistency of mold fill and therefore consistency of dimensions, minimizes the effect of weld lines and also helps realize best molded part performance.
- A medium to fast injection speed maximizes weld line strength and minimizes molded-in stress. Good venting of cavities is essential to allow fast fill without burning.

Screw Forward Time

Adequate screw forward time under follow-up pressure is very important to ensure proper packing before gate freeze, during which time it is essential to maintain a "cushion" of 1/8-1/4". Optimum screw forward time can be judged by a part weight vs. forward time plot. Avoid overpacking, which generates molded-in stresses.

Screw Recovery

It is recommended that low back pressures of 50 p.s.i. gauge be used to help development of an homogeneous melt, and ensure a consistent shot volume. Screw rotation should also be as slow as possible consistent with cycle time goals, usually 40-80 r.p.m.

Mold Shrinkage

Standard ASTM test specimens are used to develop shrinkage guidelines. Test specimens are end-gated, 1/8 inch thickness, and molded at conditions recommended for this formulation**. Actual shrinkage in molded parts will depend on several variables including processing conditions, part configuration and gate location, both of which influence material flow direction, and wall section thickness.**