Nylon NST60P50L and NST60P50HSL

Suitable for processing by injection molding or extrusion, **NST60P50L** is a nylon 6 compound, both impact modified by reactive alloying and plasticized with caprolactam monomer. Where extended exposure to high temperatures is required, the use of **NST60P50HSL**, the heat stabilized grade is recommended.

These formulations offer the unusual combination of excellent tensile strength, with high flexibility and exceptional toughness even at low temperatures.

NST60P50L and **NST60P50HSL** retain the excellent dynamic fatigue strength, and outstanding wear and abrasion performance, and resistance to the effects of a wide range of chemicals, oils and solvents that is typical of nylon 6, and can thus be considered for use in a wide range of applications and environments.

TYPICAL PROPERTIES
DRY AS MOLDED

PROPERTY	ASTM TEST METHOD	ENGLISH UNITS	ENGLISH VALUE	S.I. UNITS	S.I. VALUE
Melting Range	D789	°F	415-422	°C	212-217
Specific Gravity	D792	-	1.06	-	1.06
Water Absorption (24 hrs. immersion)	D570	%	2.9	%	2.9
Heat Deflection Temp. at 264 lbs/in^2	D648	°F	140	°C	60
Mold Shrinkage* (Flow Direction)	1/8" section	%	1.6	%	1.6
Tensile Strength at Yield	D638	lbs/in^2	7,500	MPa	52
Elongation at Break	D638	%	>275	%	>275
Flexural Strength	D790	lbs/in^2	3,200	MPa	22
Flexural Modulus	D790	lbs/in^2	70,000	MPa	483
Izod Impact Strength (Notched, 1/8" specimen)	D256	ft. lbs/in of notch	18-20	J/m	960-1070

*** Please review shrinkage 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 23°C 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.

NST60P50L and NST60P50HSL
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 0°F and preferably lower; the drying air temperature should normally be no more than 175°F - higher temperatures risk discoloration of natural color material, degradation and loss of properties, especially toughness.

Only if residence times are short (maximum 2 hours) should temperatures to 200°F be considered.

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 - Injection Molding

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 is recommended to improve flow and help realize best molded part performance.

Tool Surface Temperature(°F)	Melt Temperatures(°F) Max.	Melt Temperatures(°F) Preferred Min.	Typical Cylinder Temperatures(°F) Front	Center	Rear
140-180	530		490-500	480	500
500	510				

- A "reverse" temperature profile helps ensure a homogeneous melt, and improves screw recovery.
- 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, minimizes molded in stress, and also contributes to achievement of best surface gloss. Good venting of cavities is essential to allow fast fill without burning.

Screw Forward Time

Adequate screw forward time under follow-up pressure is 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 can generate molded-in stresses.

Screw Recovery

Low back pressures - nominal 50 p.s.i. gauge - are normally sufficient 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 the conditions recommended above for this formulation. **Actual shrinkage of molded parts will depend on several variables including part configuration and gate location, both of which influence material flow direction, wall section thickness, and processing conditions.**