Nylon N60M30L, N60M30HL, N60M30HSL

This family of nylon 6 compounds is reinforced 30% by weight with a surface treated mineral. Each formulation is characterized by good rigidity, which is retained even at elevated temperatures, practical toughness and dimensional stability. Each is especially suited for applications where this property profile, in combination with much improved control of warp and sinking in large area or complex shape parts, is required.

For molded parts, which may be exposed to high temperatures for prolonged periods of time, one of the heat stabilized grades should be selected. **N60M30HSL** contains a conventional stabilizer system, which provides excellent protection against thermal aging, but can slightly tint the natural color, normally to a greenish hue. For applications where preservation of natural color is important, especially for precision color matches, the use of **N60M30HL**, which incorporates an effective stabilizer system free from color effects, is recommended.

As with all nylon 6 formulations, these compounds process easily to produce parts with excellent surface appearance.

TYPICAL PROPERTIES
DRY AS MOLDED

	ASTM	ENGLISH		S.I.	
PROPERTY	**TEST METHOD**	**UNITS**	**VALUE**	**UNITS**	**VALUE**
Melting Range	D789	°F	410-428	°C	210-220
Specific Gravity	D792	-	1.39	-	1.39
Water Absorption (24 hrs. immersion)	D570	%	1.2	%	1.2
Heat Deflection Temp. at 264 lbs/in^2(1.82MPa)	D648	°F	221	°C	105
Mold Shrinkage* (Flow Direction)	1/8" section	%	0.9-1.1	%	0.9-1.1
Tensile Strength at Break	D638	lbs/in^2	11,000	MPa	76
Elongation, at Break	D638	%	10-15	%	10-15
Flexural Strength	D790	lbs/in^2	18,000	MPa	124
Flexural Modulus	D790	lbs/in^2	650,000	MPa	4,483
Izod Impact Strength (Notched, 1/8" specimen)	D256	ft. lbs/in of notch	0.8	J/m	43

*** 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.

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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 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

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.**

Tool Surface	Melt Temperatures (°F)			Typical Cylinder Temperatures(°F)		
Temperature (°F)	Max.	Preferred	Min.	Front	Center	Rear
140-180	540	500-520	470	490	500	510

- A "reverse" temperature profile helps ensure a homogeneous melt, improves screw recovery and by accelerating the transition from solid pellets to a melt significantly reduces abrasive wear on screw and barrel surfaces.
- 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 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 pressure - nominal 50 p.s.i. gauge - is normally sufficient to help development of a homogenous melt, and to ensure 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.**