Nylon N60MG40HSWL BK206

N60MG40HSWL BK206 is a specialty nylon 6 compound, developed for applications requiring best maintenance of mechanical properties, and surface appearance, even after prolonged outdoor weathering exposure. It is source approved to several Automotive Engineering Standards for use in exterior hardware such as door handles. This performance is achieved through the use of an exceptionally effective U.V. stabilize package, combined with the addition of 2% specially selected carbon black.

This 40% mineral/glass fiber reinforced compound is characterized by high strength and rigidity in addition to good practical toughness. The mineral/glass combination offers much improved control of warp and sinking in large areas or complex shaped parts.

As with all nylon 6 compounds**, N60MG40HSWL BK206** processes easily and even with moderate molding tool temperatures, produces parts of exceptional surface appearance.

TYPICAL PROPERTIES
DRY AS MOLDED

	ASTM	ENGLISH		S.I.	
PROPERTY	**TEST METHOD**	**UNITS**	**VALUE**	**UNITS**	**VALUE**
Melting Range	D789	^{0}F	410 – 437	^{0}C	210 – 225
Specific Gravity	D792	-	1.48	-	1.48
Water Absorption (24 hrs. immersion)	D570	%	0.9	%	0.9
Heat Deflection Temp.	D648	^{0}F	401	^{0}C	205
Mold Shrinkage Guidelines* (Flow Direction)	1/8” section	%	0.1 – 0.4	%	0.1 – 0.4
Tensile Strength at Break	D638	lbs/in^2	16,000	MPa	110
Elongation at Break	D638	%	2 – 4	%	2 – 4
Flexural Modulus	D790	lbs/in^2	25,000	MPa	172
Izod Impact Strength	D790	lbs/in^2	1,050,000	MPa	7241
(Notched, 1/8” specimen)	D256	Ft. lbs/in of notch	0.9 – 1.1	J/m	48 - 59

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

All data generated using test specimens injection molded from black pigmented material. Inclusion of 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; test are conducted at 23^{o}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 the 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.

N60MG40HSWL BK206
Processing Guidelines

Drying
Nylon compounds from MDE are shipped in moisture resistant packaging, dried to less than 0.25% moisture. Most processors will further dry nylon resins and compounds, especially after exposure of virgin resin to ambient air for more than an hour, or when a proportion of reground material is being used.

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 drier, 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 loss of part performance.

Nylon compounds usually demonstrate visual evidence of unacceptably high moisture levels. This includes splay or silver streaking on the molded part surface, or an unstable melt or nozzle drool at the machine. 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. For parts with critical cosmetic requirements, drying to <0.1% may be required.

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 Temperature (°F)	Melt Temperatures (°F)			Typical Cylinder Temperatures (°F)		
	Max.	Preferred	Min.	Front	Center	Rear
160-190	560	510-540	480	505	515	525

- 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 appearance. 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
It is recommended that back pressures of 50 p.s.i gauge to used to help development of a homogeneous melt, and to ensure consistent shot volume. For the reinforced grade, limiting back pressure to about 50 p.si. gauge will minimize the risk of mechanical damage to the glass fivers with consequent loss of part performance. 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.**