

Developmental Product Information

Nylon NST60P90L, and NST60P90HSL

NST60P90L is a nylon 6 based graft blend formulated with reactive alloy technology and a compatible plasticizer to provide an unique extrusion resin. This product combines very high flexibility, outstanding practical toughness, superior chemical resistance with high melt strength to enable tubing of a wide range of diameters to be extruded easily. For applications that require exposure to elevated temperatures **NST60P90L** containing an effective heat stabilizer system is recommended. For tubing that is required to be manufactured in different colors, **NST60P90HSL** has been formulated with a special non-tinting heat stabilizer system.

Typical Properties DRY AS MOLDED

<u>PROPERTY</u>	<u>ASTM TEST METHOD</u>	<u>ENGLISH</u>		<u>S.I.</u>	
		<u>UNITS</u>	<u>VALUE</u>	<u>UNITS</u>	<u>VALUE</u>
Melting Range	D789	°F	420-428	°C	215-220
Specific Gravity	D792	-	1.06	-	1.06
Water Absorption (24 hours immersion)	D570	%	1.5	%	1.5
Heat Deflection Temperature at 264 lbs/in ² (1.82 MPa)	D648	°F	105	°C	40
Tensile Strength at Yield	D638	lbs/in ²	7,000	MPa	50
Elongation at Break	D638	%	100 min	%	100
Flexural Strength	D790	lbs/in ²	3,000	MPa	21
Flexural Modulus	D790	lbs/in ²	65,000	MPa	45
Izod Impact Strength @ 25 °C (Notched, 1/8" specimen)	D256	ft. lbs/in of notch	15 min	J/m	801 min

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.

*These properties are based on a limited number of developmental/scale-up lots and are therefore listed as preliminary data, and may be adjusted with additional production experience.

Nylon NST60P90L and NST60P90HSL EXTRUSION GUIDELINES

Material Handling

NST60P90HSL is supplied in sealed containers, and drying prior to molding is not required. If drying becomes necessary, a dehumidifying or desiccant dryer operating at 180°F is recommended. Drying time is dependent upon moisture level, and resin should be dried to less than 0.20% moisture. Further information concerning safe handling procedures can be obtained from the Product Material Safety Data Sheet.

Melt Temperature

NST60P90HSL Blend exhibits a crystalline melting point of 420°F, and a melt temperature range of 440-480°F is recommended for most applications. A typical barrel profile is as follows (°F)

Rear:	430-470	Flange:	440-480
Middle:	430-470	Head:	440-480
Front:	440-490	Die:	440-480

Screw Recommendations

Length to Diameter Ratio:	20:1 to 24:1
Compression Ratio:	3.5:1 to 4.0:1
Metering Section:	40% of Screw Flights
Transition Section:	6-7 Flights
Feed Section	Balance of Screw Flights

Tooling

Pin and die sizes will vary dependent upon tube specification and are selected based on draw ratio of 8:1 to 10:1. Suggested tooling based on finished tubing of 3/8" outside diameter or smaller for open tank sizing and quenching is:

Bushing (Die) I.D.	=	2.5 x (Finished O.D.)
Pin (Mandrel) I.D.	=	Bushing I.D.-(2 x annular die opening)
Annular Die Opening	=	(Finished Wall x 2.5) + 0.010 inches

Sizing

Proper sizing of tubing can be accomplished through use of either an open quench tank in conjunction with a low pressure air control system, and sizing plates, or in a differential pressure (vacuum) tank. Above 3/8" O.D. vacuum is preferred.

Quenching

For diameters of 3/8" O.D. and smaller, open tank quenching with normal tap water is suggested. Depending upon line speed, quenching distance can vary from 25 to 40 feet. A short air gap (die to quench water) is recommended for both tubing and cable jacketing for best flexibility.