



HEAT
STABILIZATION
OF
NYLON 66

T E C H N O T E

Heat Stabilization of Nylon 66

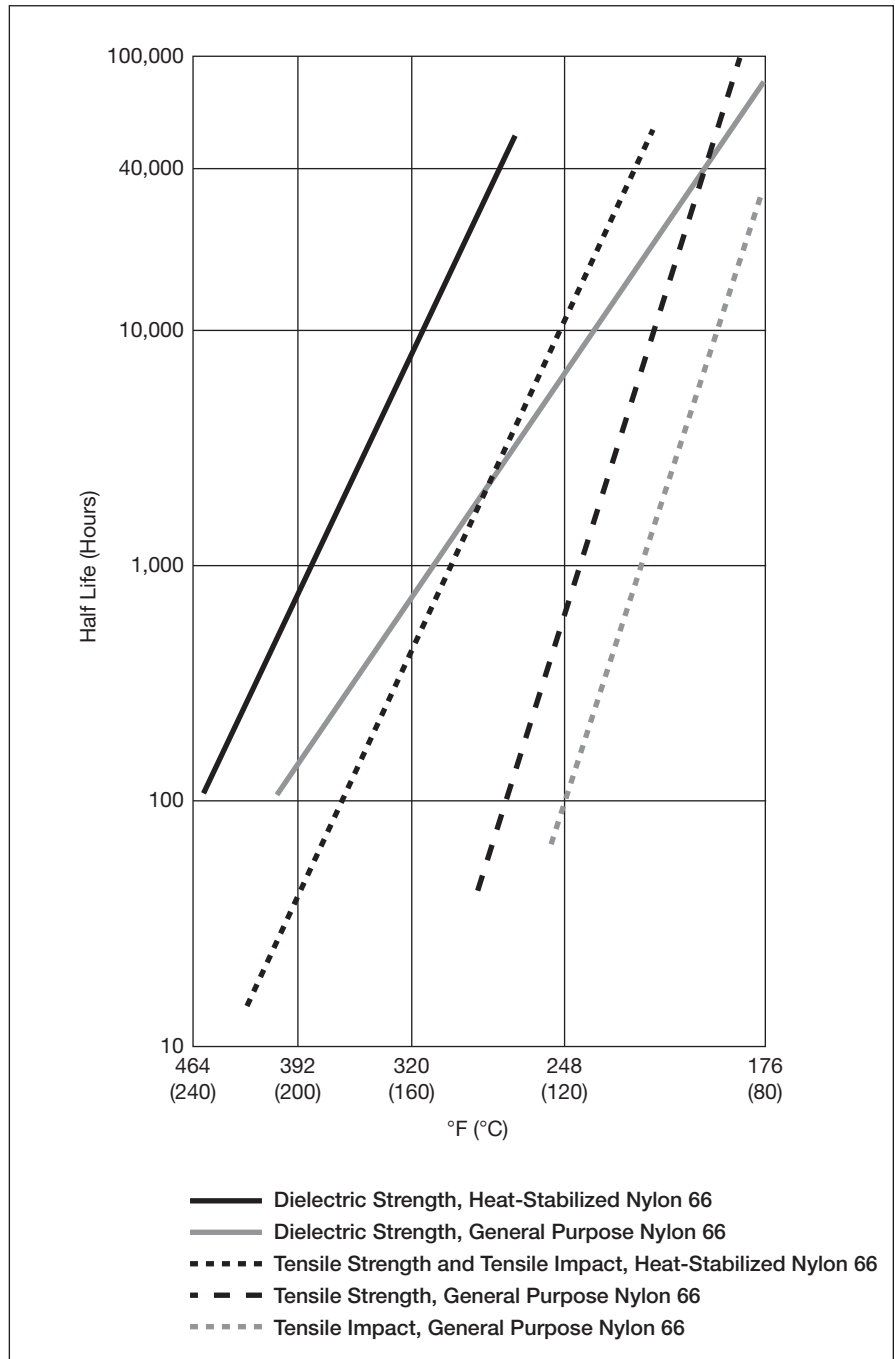
Nylon 66 resins are susceptible to oxidative and thermal degradation when used in applications requiring continuous or extended exposure to high temperatures. Since this exposure will cause a reduction in physical properties, specially formulated heat stabilized resins have been developed to provide additional thermal endurance. The improved retention of physical and electrical properties has enabled the use of VYDYNE® heat-stabilized resins in applications that involve exposure to temperatures above 185°F/85°C.

Thermal endurance curves comparing physical properties of VYDYNE heat-stabilized Nylon 66 and general purpose Nylon 66 are illustrated in Figure 1. Thermal endurance testing measures the ability of a material to withstand long exposures to elevated temperatures. The half life versus temperature curves on Figure 1 may be used to estimate the maximum continuous service temperature of a part made from VYDYNE heat-stabilized Nylon 66, given a required service life.

Companies often develop internal specifications for physical property retention of heat-stabilized Nylon 66 resins. These requirements and the test methods used to define them vary from company to company. Certain VYDYNE resins have been tested under specific customer specifications. Results are shown in Table 1 and Table 2.

Be aware that as with any heat-stabilized nylon, certain pigments can interact with the heat stabilizer additive system causing adverse affects on the resulting color and a loss in heat stabilization.

Figure 1 – Heat-Stabilized Half Life¹ Versus Temperature of Heat-Stabilized VYDYNE Nylon Resins (Nylon 66)



¹Time after which half the original property has been lost at 1/16 in (1.6 mm) thickness.

Table 1 – Typical Values¹ for Property Retention of Heat-Stabilized Nylon 66

Mechanical Properties	Customer Specification	Nylon 66 Heat-Stabilized Values
Tensile Strength (minimum), psi(MPa)		
DAM ²	11,000(76)	12,000(83)
Heat-Aged ³	7,000(48)	9,000(62)
Elongation (minimum), %		
DAM ²	40	60
Heat-Aged ⁴	30 ⁵	50

Table 2 – Typical Values¹ for Tensile Strength Retention of Glass-Reinforced, Heat-Stabilized Nylon 66

Mechanical Properties	Customer Specification	Nylon 66 Heat-Stabilized Values
13% Glass-Reinforced Nylon 66		
DAM ²	14,000(96)	17,000(117)
Heat-Aged ⁴	12,500(86 ⁶)	18,500(128)
33% Glass-Reinforced Nylon 66		
DAM ²	25,000/(170)	27,000(186)
Heat-Aged ⁴	22,000(152 ⁶)	28,000(193)

¹Typical values are intended as guides only and do not reflect the specification range for a particular property.

²Specimens sealed in moisture barrier packages immediately after molding.

³Heat conditioning conducted on an air circulating oven at 400°F (204°C) for 84 hours.

⁴Heat conditioning conducted on an air circulating oven at 350°F (177°C) for 48 hours.

⁵Must not decrease by more than 50% of original test value.

⁶Must not decrease by more than 10% of original test value.

For more information or to place an order in the U.S., please call our Customer Service Center at 1-888-927-2363.

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