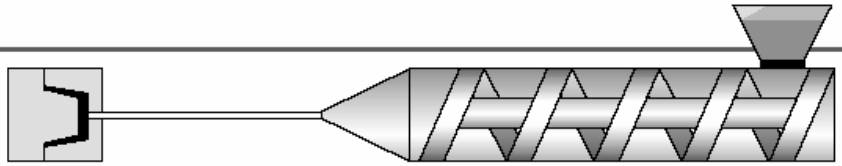
Stanyl® PA46

Recommendations for Injection Molding

Machinery: Stanyl® (PA46) can be processed on standard plastic processing equipment. Typically, general-purpose screw designs with compression ratios of approximately 2.5 : 1 with sliding check rings work best. For unreinforced Stanyl® grades, reversed taper nozzles work well, while reinforced grades typically do better with general purpose, free flowing nozzles.

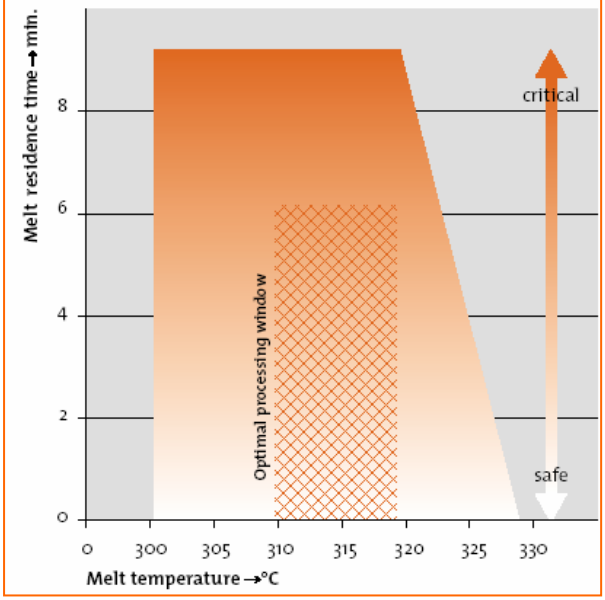
Barrel Temperatures: Due to the high melting point and high crystallinity of Stanyl®, barrel temperatures need to be set high enough to provide a homogeneous melt without getting too near to the degradation point of Stanyl® at 330 °C. The recommendations are given in the sheet below.

TEMPERATURE SETTINGS



Stanyl	Mould	Melt	Nozzle	Front	Center	Rear	
Standard grades	80-120	305-320	280-300 [2)]	300-320	300-320	280-320	°C
High Flow grades	60-120	315-330	280-300 [2)]	315-330	310-325	280-310	°C

PROCESSING WINDOW



Screw rotation speeds: Stanyl® has excellent flow properties due to its relatively low melt viscosity. The effect of screw rotation speed on the amount of shear which is transmitted to the melt is relatively low and high screw speeds can generally be used without harm to the polymer. The maximum screw rotation speed must be lower than 6500/D rpm where D = screw diameter in mm.

Back Pressure: An effective back pressures of between 20 and 100 bar is recommended for processing Stanyl®, to homogenize the melt and prevent gas entrapment.

Injection speeds/pressures: Due to the fast solidification of Stanyl®, high injection speeds are required in order to obtain good packing and surface finish. Generous mold venting is therefore necessary to avoid burning at the end of the flow path. Do not exceed vents of 0.02mm otherwise flash will occur.

Holding pressure/holding time: In general, the holding time of Stanyl® is very short compared to other engineering plastics due to its fast solidification. Sink marks and voids caused by volumetric shrinkage can be reduced by adequate holding time and pressure, however the holding pressure should not be so high that stresses are induced. One method of determining the correct level is by increasing the holding pressure until no sink marks are visible, and keep decreasing the holding time until just before the weight starts to decrease.

Mold temperature / cooling time: Because of the fast solidification of Stanyl®, the cooling time is very short. For this reason screw recovery time is the determining step for the cycle time.

Mold temperatures above 80 °C are recommended for good dimensional stability and flow properties. A mold temperature of up to 120°C may be necessary for reducing post-mold shrinkage, increase flow performance, increase weld line strength, increase toughness and improve surface appearance.

Wall thickness	1 mm	2 mm	3 mm
Cooling time	5 sec	7 sec	9 sec

Valid for unreinforced Stanyl.

Ejection of molded parts: Stanyl® does not stick to mold surfaces and has good ejection properties. The high crystallization rate and the very high stiffness at high temperatures permits the ejection of Stanyl® at relatively high temperatures, such as >200 °C, resulting in short cycle times.

Recommendations for Stanyl® 46HF (High Flow grades):

Due to their improved flow, these grades exhibit less shear heating and LCP settings may be applied.

- Melt temperature should be 315-325ºC
- Increased settings in the compression/metering zone
- Lower temperatures in the feed zone but at least 280ºC
- Mold temperatures of 120ºC for optimal dimensional stability
- High screw rotation speeds
- Low back pressure, ± 10 bar effective
- High injection speed
- Control part fill with screw position or start with low or moderate pressure to avoid overpacking.
- Use low or moderate holding pressures in case of cushion variations
- Use reverse tapered nozzles. Adjust nozzle temperature (but do not set too low) to avoid drooling.

Material Handling and regrind

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