HYLAC® ABS

TYPICAL PROCESSING CONDITIONS†

DRYING

Hylac® ABS should be dried prior to melt processing. Hylac® ABS resins exhibit equilibrium moisture content of 0.3% to 0.4% at 73°F and 50% relative humidity. This moisture content increases between 0.6% and 0.8% at 90% relative humidity. Although the proper amount of drying depends on the relative humidity, the ratio of regrind to virgin resin and the storage period of the resin, it is recommended that Hylac® ABS resins be dried at 175-185°F (80-85°C) for 3 hours. A moisture level of ≤ 0.1% should be reached before injection molding the resin.

INJECTION MOLDING

The following molding conditions are recommended starting points for Hylac® ABS resins. Some modifications may be required depending on the specific molding equipment and part configuration.

PARAMETER	GP55, GP74, GP48, GP28, HF143, HF224, HF96	PL75*	FR134, FR103	FR104	FR74	FR134G10	GP74G10, GP74G20, GP74G30
Rear Temp (°F)	355-390	375-410	330-350	350-365	320-355	335-355	375-390
Center Temp (°F)	390-430	410-430	335-355	355-375	340-375	340-365	400-430
Center Temp (°F)	390-430	430-445	345-365	365-385	355-390	350-375	410-430
Front Temp (°F)	420-455	430-480	355-375	375-390	365-400	360-380	410-435
Nozzle Temp (°F)	410-445	430-470	345-365	365-385	350-380	350-370	410-445
Melt Temp Max (°F)	465	495	395	430	445	395	465
Mold Temp (°F)	120-140	140-175	105-160	105-160	105-160	120-160	120-140
Filling Speed	Slow-Med	Very Slow	Slow-Med	Slow-Med	Slow-Med	Slow-Med	Slow-Med
Filling Pressure (psi)**	850-1000	700-1000	710-850	710-850	710-1000	1050-1250	1050-1200
Holding Pressure (psi)**	710-850	550-850	570-710	570-710	570-850	900-1100	900-1000
Back Pressure (psi)**	70-140	70-140	70-140	70-140	70-140	70-140	70-120
Screw Speed (RPM)	50-90	50-90	50-90	50-90	50-90	50-90	50-70
Shot to Cylinder Size (%)	40-80	40-80	40-80	40-80	40-80	40-80	40-80

**Pressures given are in the hydraulic circuit..

*Molding conditions for PL75, electroplating grade ABS are as listed above. Regrind levels should not exceed 15% with this grade. To obtain high quality parts, a low residual stress process is necessary. Moisture content of the resin should be less than 0.02% prior to molding. Avoid using mold release agents. If necessary, water soluble agents are recommended.

EXTRUSION MOLDING

Hylac® ABS extrusion grade resins should be dried to a moisture content of 0.02% or less prior to processing. Control of the outer stock temperature is important in successfully finishing the product. Typical temperatures of outer stock range from 160°F to 175°F after passing through a water bath. The bath temperature profile will greatly affect the dimensional stability and appearance of the part, and if not set up properly could be detrimental to the ultimate mechanical strength of the product. Extruders with one-stage or two-stage force venting are recommended for the extrusion of sheets or profiles. Compression ratios should be between 2.5/1 and 3.0/1 for a single stage screw and between 1.5/1 and 2.0/1 for a two-stage screw. L/D ratios of 20/1 and 36/1 are typical.

PROCESS PARAMETER	SETTING	PROCESS PARAMETER	SETTING
Drying Temperature (°F)	185	Outer Die Zone (°F)	435-475
Drying Time (hrs)	3	Mid Die Zone (°F)	430-465
Zone 1 (°F)	375-410	Center Die Zone (°F)	420-465
Zone 2 (°F)	375-410	Mid Die Zone (°F)	430-465
Zone 3 (°F)	390-430	Outer Die Zone (°F)	435-475
Zone 4 (°F)	390-430	Die Lip Thickness (mm)	3.2-4.0
Zone 5 (°F)	390-430	Nip Roll Top (°F)	185-195
Zone 6 (°F)	430-465	Nip Roll Middle (°F)	175-185
Zone 7 (°F)	430-465	Nip Roll Bottom (°F)	165-175
Adapter (°F)	430-465	Screen Pack Mesh (2 layers)	#60-80

Extrusion parameters were found by extruding 3.2mm thick sheets at a haul off speed of 1368 mm/min and an output rate of 210Kg/hr. A polishing roll in a up stack wrap arrangement was used as well as a single screw with a 100mm diameter screw, a L/D ratio of 35/1, and a compression ratio of 3/1.

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