



Process Extrusion Guide PEXIDAN[®] SX Unfilled

This guide applies to the following grades:

SX408, SX409, SX490, SX522A, SX505, SX510, SX523, SX554, SX-0410, SX-0470 PEXIDAN[®] U/T, PEXIDAN[®] R/T

Equipment

Extruder	Ideally 20 to 24 L/D ratio.
Extruder head	Ideally with as small a volume as possible and with deep flow channels. A head assembly with a diverter valve is beneficial.
Screw	Low compression ideally 2:1 (up to 3:1 for SX522A)
Extension piece	If there is an extension piece connecting the end of the extruder and head then this needs to be heated to 190°C by heater bands or similar.
Tooling Pressure	Short land length; no longer than 3mm. The flow path should be as gentle as possible with the adequate separation of the core and ring die without losing concentricity.
Tubing	Double taper designs are preferred. Draw down ratios of no greater than 1.5:1 is recommended.

Processing conditions

Drying	The graft should not be dried. The catalyst can be dried in a dehumidifying drier.
Temperature profile	Ranging from 130 to 190°C from the feed to the end of the extruder with 190°C on the head and 210°C on the die.
Extrusion speed	The aim is always to keep the residence time in the extruder to a minimum. On initial start up screw speed should be at a minimum of 5 rpm and during production at a minimum of 20 to 30 rpm. When changing tooling or during other stoppages every attempt should be made to keep material moving through the extruder.



Trial procedure

It is suggested that when conducting a first trial, the graft is run first without catalyst and a satisfactory extrusion is achieved.

Initially catalyst should be used at 3% and if it runs well then it can be increase to 5%.

A rough finish may be experienced at extruder speeds below 10 rpm but this should disappear above screw speeds of 20 rpm.

Colour masterbatches Those from PW Hall are recommended.

Troubleshooting Guides

Problem	Cause	Solution
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Poor surface finish	Temperature low	Increase barrel and head temperatures
		Use higher shear screw
	Melt fracture	Increase barrel and head temperatures
		Use lower draw-down ratio
		Reduce extrusion rate
	Extrusion O/D too low	Reduce haul off speed
	Change to smaller die (run with slight die swell)	



Problem	Cause	Solution
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Material reactive on start up	Compound shelf life expired	Replace material
	Compound wet	Vacuum dry at ambient temperature
	Catalyst masterbatch too strong or overdosed	Vacuum dry at high temperature
		Reduce amount used
Replace with weaker catalyst masterbatch		

Material reactive during production	Stagnation in extruder or head	Use process aid
		Check screw and head design
	Melt temperature too high	Check extruder heating and cooling for faults
		Reduce temperature profile
	Catalyst overdosed	Check dosing unit calibration

Die drool	Low molecular weight material exuding during extrusion	Use highly polished die/point
		Add 1-2% process aid



Problem	Cause	Solution
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High motor amps	Is motor rating sufficient?	Upgrade motor
	Incorrect screw design	Use lower shear/compression design
	Material crosslinking	See reactive material on prior page
	Gauze pack too harsh	Remove some/all gauzes
	Head design restrictive	Change head design
	Material too stiff	Increase temperature profile
		Check heater bands/thermocouples
Use higher MFI material		

Gels in extrudate	Stagnation	Use process aid
		Use highly polished die and point
		Check screw and head design
	Gels in extrudate	See reactive section on the prior page

Fails hot set test	Shear breaks (locked-in stresses too high)	Reduce draw down ratio
		Reduce vacuum
		Adjust die separation
	High elongation (low cure level)	Increase cure time
		Check calibration dosing unit
		Use stronger or more catalyst