TPE PROCESSING : PROBLEM SOLVING

HEXPOL TPE

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GENERAL INTRODUCTION

Since the production process consists of a large number of complex operations, sometimes problems may arise. TPE is a “living” material, which ages and is affected by its environment. Your TPE compound can follow all guidelines for a long period of time, but disturbances may then suddenly occur without any obvious reason.

Not even the most competent or reliable TPE manufacturer can explain this. But there are certain points that can be checked to help eliminate problems that may occur in the processing of TPE, we have included these in this eGuide. If you are having difficulties processing your TPE, please contact us for further information.

INJECTION MOULDING

PROBLEM	POSSIBLE REASON	POSSIBLE SOLUTION
BURN MARKS	Melt and/or mould too hot	1. Lower the nozzle and cylinder temperatures 2. Lower the mould temperature 3. Lower the injection rate
	Material sticks in the cylinder	1. Clean the cylinder
	Heater output stuck	1. Check the thermocouple and temperature control equipment
	Mould design	1. Increase the gate 2. Check that the vent is not clogged 3. Apply vacuum for venting 4. Review the vent location

PROBLEM	POSSIBLE REASON	POSSIBLE SOLUTION
INCOMPLETE FILLING OF THE MOULD	Melt and/or mould too cold	1. Increase the nozzle and cylinder temperatures 2. Increase the mould temperature 3. Increase the injection rate 4. Increase the screw speed
	Heater not working	1. Check the thermocouple
	Shot weight too low	1. Increase the shot weight 2. Increase the mix cushion
	Mould design	1. Check that the gate is not clogged 2. Extend the gate 3. Increase the runner 4. Check that the vent is not clogged 5. Increase the venting 6. Check location of the vent 7. Apply vacuum for venting

PROBLEM	POSSIBLE REASON	POSSIBLE SOLUTION
STICKS IN THE MOULD	Too hot	1. Lower the nozzle and cylinder temperatures 2. Lower the mould temperature 3. Increase the cooling time
	Insufficient cooling	1. Increase the cooling time 2. Lower the cylinder temperature
	Mould design	1. Clean the mould 2. Shot blast or EDM* the surface 3. Increase the draft 4. Use release agent

*Electrical Discharge Machined

PROBLEM	POSSIBLE REASON	POSSIBLE SOLUTION
SINK MARKS	Holding pressure too low	1. Increase the holding pressure
	Melt and/or mould too hot	1. Lower the nozzle and cylinder temperatures 2. Lower the mould temperature 3. Lower the screw speed
	Part too hot when ejected	1. Increase the cooling time 2. Decrease mould temperature
ODOUR OR YELLOWING	Melt and/or mould too hot	1. Lower the nozzle and cylinder temperatures 2. Lower the mould temperature 3. Lower the injection rate 4. Lower the screw speed and back-pressure 5. Check temperature in hot runner (if used) 6. Add nitrogen to the hopper

PROBLEM	POSSIBLE REASON	POSSIBLE SOLUTION
PATCHINESS	Injection pressure too high	1. Lower the injection pressure 2. Increase the clamping pressure 3. Lower the injection rate
	Melt and/or mould too hot	1. Lower the nozzle and cylinder temperatures 2. Lower the mould temperature 3. Lower the screw speed 4. Check the thermocouple and temperature control
LOCAL DEFECTS	High orientation	1. Increase the mould and melt temperatures 2. Lower the injection rate
	Overfilling	1. Increase the clamping pressure 2. Adjust the injection time and the mould filling time
	Uneven mould filling	1. Change the gate location 2. Check that the mould temperature is uniform 3. Increase the screw speed and back pressure

PROBLEM	POSSIBLE REASON	POSSIBLE SOLUTION
BLACK SPOTS OR UNDISPERSED PARTICLES	Contamination	1. Clean with viscous PP or LDPE 2. Check that the colour MB is based on PS (SBS) and PP or PE (SEBS) – not PVC
SURFACE DEFECTS AROUND THE INJECTION AREA	Moisture	1. Dry the granules 2. Check that the valve is not clogged if a ventilated screw is used 3. Apply vacuum for venting
	Melt and/or mould too cold	1. Increase the nozzle and cylinder temperatures
FLOW LINES	Melt and/or mould too cold	1. Increase the nozzle and cylinder temperatures 2. Increase the mould temperature 3. Increase the injection rate 4. Increase the screw speed and backpressure
	Mould design	1. Change the gate location 2. Extend the gate 3. Extend the runners 4. Cooling of the runners

PROBLEM	POSSIBLE REASON	POSSIBLE SOLUTION
POROSITY	Melt fixed too quickly	1. Increase the mould temperature 2. Increase the screw speed and backpressure
	Moisture	1. Dry the granules 2. Check that the valve is not clogged if a ventilated screw is used 3. Apply vacuum for venting
	Backpressure too low	1. Increase the back-pressure
POOR STRENGTH	Mould design	1. Increase the gate 2. Avoid wide differences in cross-sectional areas in the material flow path
	Material stressed by turbulent mix	1. Adjust the injection pressure and the injection rate 2. Increase the cooling time 3. Increase the mould temperature 4. Increase the cylinder temperature

EXTRUSION

PROBLEM	POSSIBLE REASON	POSSIBLE SOLUTION
ROUGH EXTRUDATE SURFACE	Melt too cold	1. Increase the extruder temperature 2. Increase the die temperature
	Heater not working	1. Check the thermocouples
	Melt not mixed	1. Use a screw with a higher compression ratio or kneading zones
	Poor die design	1. Lower the parallel length of die
UNEVEN CROSS SECTIONAL AREA	Pulsing	1. Lower the extrusion speed 2. Use a screw with a longer feed zone or dosing zone 3. Lower the die temperature 4. Use more strainers to increase the backpressure

PROBLEM	POSSIBLE REASON	POSSIBLE SOLUTION
BLACK SPOTS OR UNDISPERED PARTICLES	Contamination	1. Clean with viscous PP or LDPE 2. Check that the colour MB is based on PS (SBS) and PP or PE (SEBS) – not PVC
ODOUR OR YELLOWING	Melt too hot	1. Lower the extruder cylinder temperature 2. Lower the die temperature 3. Lower the screw speed 4. Use fewer strainers to lower the backpressure 5. Use a screw with a lower compression ratio 6. Add nitrogen to the hopper
	Heater output stuck	1. Check the thermocouples temperature control equipment
POROSITY	Moisture	1. Dry the granules 2. Check that the valve is not clogged if a ventilated screw is used 3. Apply vacuum for venting

PROBLEM	POSSIBLE REASON	POSSIBLE SOLUTION
HIGH EXTRUDER PRESSURE / LOW THROUGHPUT	Melt too cold	1. Increase the extruder temperature 2. Increase the die temperature
	Strainers clogged	1. Clean
	Heater not working	1. Check thermocouples
PULSATION	Viscous material	1. Increase the extruder speed 2. Increase the cylinder temperature

ABOUT HEXPOL TPE

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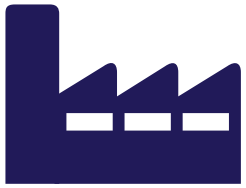
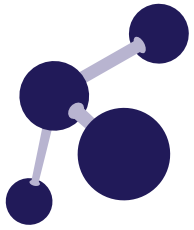
300+ EMPLOYEES WORLDWIDE

PRODUCTION PLANTS
Sweden, UK, Germany, China, USA



GLOBAL CAPACITY
> 80,000 tonnes p.a.

HEXPOL GROUP HEADQUARTERS
Malmö, Sweden



34,796+ PROPRIETARY FORMULATIONS

KEY MARKETS
Consumer, automotive, medical, construction, industrial

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