

dryflex[®]

mediprene[®]



PROBLEM SOLVING



General

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 Dryflex® and Mediprene® 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 elementary search paths for eliminating problems that may occur in the processing of TPE, below are those mentioned.

Injection Moulding

Problem	Possible Reason	Possible Solution
Burn marks	Melt and/or mould too hot	<ol style="list-style-type: none"> 1. Lower the nozzle and cylinder temperatures. 2. Lower the mould temperature. 3. Lower the injection rate.
	Material sticks in the cylinder	<ol style="list-style-type: none"> 1. Clean the cylinder.
	Heater output stuck	<ol style="list-style-type: none"> 1. Check the thermocouple and temperature control equipment.
	Mould design	<ol style="list-style-type: none"> 1. Increase the gate. 2. Check that the vent is not clogged. 3. Apply vacuum for venting. 4. Check the vent location.
Incomplete filling of the mould	Melt and/or mould too cold	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Check the thermocouple.
	Shot weight	<ol style="list-style-type: none"> 1. Increase the shot weight. 2. Increase the mix cushion.
	Mould design	<ol style="list-style-type: none"> 1. Check that the gate is not clogged. 2. Increase 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	<ol style="list-style-type: none"> 1. Lower the nozzle and cylinder temperatures. 2. Lower the mould temperature. 3. Increase the cooling time.
	Insufficient cooling	<ol style="list-style-type: none"> 1. Increase the cooling time. 2. Lower the cylinder temperature.
	Mould design	<ol style="list-style-type: none"> 1. Clean the mould. 2. Shot blast or EDM* the surface. 3. Increase the draft. 4. Use release agent.
Sink marks	Back pressure too low	<ol style="list-style-type: none"> 1. Increase the back-pressure.
	Melt and/or mould too hot	<ol style="list-style-type: none"> 1. Lower the nozzle and cylinder temperatures. 2. Lower the mould temperature. 3. Lower the screw speed.
	Part too hot when ejected	<ol style="list-style-type: none"> 1. Increase the cooling time. 2. Cool the part.
Smell or yellowing	Melt and/or mould too hot	<ol style="list-style-type: none"> 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.
Patchiness	Injection pressure too high	<ol style="list-style-type: none"> 1. Lower the injection pressure. 2. Increase the clamping pressure. 3. Lower the injection rate.
	Melt and/or mould too hot	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Increase the mould and melt temperatures. 2. Lower the injection rate.
	Overfilling	<ol style="list-style-type: none"> 1. Lower the clamping pressure. 2. Adjust the injection time and the mould filling time.
	Uneven mould filling	<ol style="list-style-type: none"> 1. Change the gate location. 2. Check that the mould temperature is uniform. 3. Increase the screw speed and back pressure.

*Electrical Discharge Machined



Problem	Possible Reason	Possible Solution
Black spots or undispersed particles	Contamination	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Increase the nozzle and cylinder temperatures.
Flow lines	Melt and/or mould too cold	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Change the gate location. 2. Increase the gate. 3. Increase the runners. 4. Cooling of the runners.
Porosity	Melt fixed too quickly	<ol style="list-style-type: none"> 1. Increase the mould temperature 2. Increase the screw speed and backpressure.
	Moisture	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Increase the back-pressure.
Poor strength	Mould design	<ol style="list-style-type: none"> 1. Increase the gate. 2. Avoid wide differences in cross-sectional areas in the material flow path.
	Material stressed by turbulent mix	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Increase the extruder temperature. 2. Increase the die temperature.
	Heater not working	<ol style="list-style-type: none"> 1. Check the thermocouples.
	Melt not mixed	<ol style="list-style-type: none"> 1. Use a screw with a higher compression ratio or screw with kneading zones.
	Poor die design	<ol style="list-style-type: none"> 1. Lower the parallel length of die.
Uneven cross sectional area	Pulsing	<ol style="list-style-type: none"> 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.
Black spots or undispersed particles	Contamination	<ol style="list-style-type: none"> 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.
Smell or yellowing	Melt too hot	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Check the thermocouples temperature control equipment.
Porosity	Moisture	<ol style="list-style-type: none"> 1. Dry the granules. 2. Check that the valve is not clogged if a ventilated screw is used. 3. Apply vacuum for venting.
High extruder pressure/ low throughput	Melt too cold	<ol style="list-style-type: none"> 1. Increase the extruder temperature. 2. Increase the die temperature.
	Strainers clogged Heater not working	<ol style="list-style-type: none"> 1. Clean. 1. Check thermocouples.
Pulsation	Viscous material	<ol style="list-style-type: none"> 1. Increase the extruder speed. 2. Increase the cylinder temperature.

We provide all the written and illustrated information and advice in good faith. This should only be regarded as being advisory. We retain the right to make changes without prior notice. For further information, please contact us.

Vita Thermoplastic Polymers (VTP) and VTC Elastoteknik AB are members of the VTC TPE Group

Vita Thermoplastic Polymers (VTP)

United Kingdom

t : 44 (0)161 654 6616

f : 44 (0)161 654 2333

sales@vtctpe.com

VTC Elastoteknik AB

Sweden

t : 46 (0) 532 60 75 00

f : 46 (0) 532 60 75 99

info@elastoteknik.se

Paris Office

France

t : 33 (0) 160 43 17 17

f : 33 (0) 160 43 11 13

pgruyer@aol.com

For further information about our distributors or to download this and other publications please visit

www.vtctpe.com



www.vtctpe.com