Trouble Shooting

Introduction: TempRite® CPVC materials run more consistently and produce parts with better properties and appearance when they are processed with melt temperatures toward the upper end of their recommended range. The typical molding problems encountered are too low a melt temperature, and a downward trend of melt temperature with time. If the correct screw design is being used (Page 2) experience has repetitively shown that a few critical process parameters tend to force melt temperature down.

1. ***Condition of the chrome plate:*** *As chrome wears, contact with the base metal exposes the CPVC melt to the element iron (Fe), which catalyzes the decomposition of the CPVC. The tendency for the machine operator, who may be unaware of the condition, is to reduce melt temperature setting to prevent the burning of the material. This will cause poor fusion at the weld lines and weak, poor appearance parts are the result. Under these conditions, high quality parts cannot be produced.*
2. ***Small molds in large presses:*** *Small molds in large presses cause low utilization of barrel capacity (Page 2). This means the CPVC melt resides in the barrel at processing temperatures long enough to initiate decomposition. Again, the typical response is to lower melt temperature settings to allow the material to process without burning. The result is again, weak knit lines and flow lines.*

   Run to run repeatability is often blamed on batch to batch variability of TempRite® CPVC. However, operating procedures should be examined first.
3. ***Melt Temperatures:*** *Melt temperature in the lower end of the recommended range will cause the entire molding process to be more sensitive to variations of any kind.*
4. ***Screw RPM:*** *Variations in screw RPM will drastically alter melt temperature. Once an RPM has been established that yields the correct melt temperature for a given press/mold combination, it should be standardized. It is not reasonable to expect operators to maintain constant RPM settings* ***without a working tachometer on the machine.***
5. ***Injection Rate:*** *Injection speed profoundly affects the temperature of the melt. It should be standardized and optimized for each mold/machine combination. If burning occurs in the sprue, runners or gates, the injection rate must be reduced, or the flow passages enlarged.*

Problem Solving Guide

	Possible Causes		
Problem	***Barrel/Screw/Nozzle***	***Sprue/Mold***	***Feed Stock***
Short Shots	*Injection Pressure Low* *Injection Time Short* *Stroke Short* *Injection Rate Low* *Melt Temperature Low*	*Mold Temperature Low* *Vents Not Working* *Gates Too Small* *Sprue, Runners Small* *Unbalanced Filling*	*Hopper Empty* *Hopper Bridging* *Compound Undried*
Burn Streaks in Parts	*Injection Speed Too High* *Melt Temperature Low*	*Mold Too Cold* *Gates Too Small* *Vents Not Working* *Unbalanced Filling*	*Compound Undried*
	Check For Burning in Runners & Sprue		
Burn Streaks in Runners	*Nozzle Too Hot* *Nozzle Too Small* *Chrome Bad*	*Sprue Too Small* *Runners Too Small* *Runners Rough* *Poor Radii at Branches*	
	Check for Burning in Barrel (Air Shots)		
Burning in Barrel	*Controller Malfunctioning* *Screw RPM Too High* *Screw Too Severe* *Chrome Plating Bad* *Back Pressure Too High* *Shot Size Too Small*		*Over-Used Regrind* *Contaminated Regrind*
Weak Weld Lines	*Melt Temperature Low* *Injection Pressure Low* *Packing Pressure Low* *Cushion Inadequate* *Injection Speed Low*	*Vents Not Working* *Mold Too Cold* *Mold Release Excessive* *Gates Too Small* *Poor Gate Location*	*Compound Undried*
Splay, Silver Streaks Blisters	*Melt Temperature High* *Injection Speed High* *Incipient Burning*	*Mold Too Cold* *Vents Not Working* *Gates Too Small*	*Compound Undried* *Compound Contaminated* *Over-Used Regrind*
Sink Marks	*Packing Pressure Low* *Packing Time Short* *Injection Speed Slow* *Cushion Excessive* *Cushion Inadequate* *Nozzle Too Hot* *Nozzle Too Small*	*Unbalanced Filling* *Mold Too Hot* *Cool Time Inadequate* *Gates Too Small* *Sprues, Runners Small* *Consider Water Quench*	
Flow Lines, Delamination	*Melt Temperature Low* *Injection Speed Slow*	*Mold Too Cold* *Gates Too Small* *Gates Rough*	*Compound Undried*
Warping	*Packing Pressure Low* *Melt Temperature Low*	*Mold Too Hot* *Cool Time Inadequate* *Mold Cooling Uneven* *Consider Cooling Fixture*	
Excessive Shrinkage	*Melt Temperature Low* *Packing Pressure Low* *Injection Speed Low*	*Mold Too Cold* *Cooling Time Inadequate* *Unbalanced Filling*	