



## **Component Shrinkage - Injection Moulding**

### **Shrinkage**

The shrinkage of a moulded part can be affected by many factors such as the injection speed and pressure, the viscosity and melt of the polymer, wall thickness and tool temperature. The sprue, runner and gate design of the mould are also major factors, which determine shrinkage. Many grades contain fillers such as chalk, talc and glass which all affect the degree of shrinkage.

### **Processing**

Any one or combination of the following measures should reduce shrinkage.

- 1 Increase injection pressure.
- 2 Increase injection speed.
- 3 Increase screw forward holding time.
- 4 Increase cooling time.
- 5 Reduce mould temperature, in line with melt temp: differential.
- 6 Increase nozzle size.
- 7 Increase gate size or gate land.
- 8 Install multiple gates.
- 9 Increase cavity venting.

To increase shrinkage employ the opposite procedure to those listed above.



<u>Material</u>	<u>Type</u>	<u>Approximate Linear shrinkage</u>
ABS	Medium impact	0.4 - 0.5 %
	High impact	0.5 - 0.6 %
Acetal	Standard	2.0%
	Glass Bead	1.6%
	Glass Fibre	0.6%
Acrylic	Standard	0.2% - 0.7%
Cellulose Acetate	Standard	0.2% - 0.7%
EVA	VA 5 -28%	0.7 - 2.0%
HDPE	Standard	2.0% - 3.0%
LDPE	Standard	2.0% - 3.0%
LLDPE	Standard	2.0% - 3.0%
Polypropylene Homo polymer	Standard	1.5% - 2.5%
	Talc 20%	1.0% - 1.2%
	FR Glass Filled	1.0% - 1.4% 0.3% - 0.7%
PC/ABS Blend	Standard	0.4% - 0.7%
Polycarbonate	Standard	0.5% - 0.5%
	Lubricated	0.3% - 0.5%
	Glass Filled	0.1% - 0.3%
Polystyrene HIPS	Standard	0.2% - 0.8%
Polystyrene GPPS	Standard	0.3% - 0.6%
PBT	Standard	1.7% - 2.3%
	Glass Filled	0.3% - 1.0%
PET	Standard	0.2% - 1.2%
	Glass Filled	0.2% - 0.8%
NYLON 6	Standard	1.2% - 1.6%
	Imp-Mod	1.5% - 1.25%
	High Viscosity	0.9% - 1.3%
	Glass 18%	0.4% - 0.5%
	Glass 30%	0.3% - 0.4%
	Glass 40%	0.2% - 0.3%
	Glass 50%	0.1% - 0.2%
NYLON 66	Standard	1.9%
	Imp-Mod	2.2%
	Glass 20%	0.6% - 0.9%
	Glass 30%	0.5% - 0.8%
	Glass 40%	0.2% - 0.6%
	Glass Bead	1.8%



<u>Material</u>	<u>Type</u>	<u>Approximate Linear shrinkage</u>
<b>PVC Compound</b>		
PVC/U	Moulding	0.4% - 0.6%
Flexible	BSS 1	0.5% - 1.0%
PVC/P	BSS 20	0.7% - 1.2%
	BSS 30	0.8% - 1.3%
	BSS 40	0.9% - 1.4%
	BSS 50	1.1% - 1.6%
	BSS 60	1.2% - 1.7%
	BSS 70	1.4% - 1.9%
	BSS 80	1.5% - 2.0%
	BSS 90	1.7% - 2.2%
	BSS 100	2.3% - 2.8%

The shrinkage of Plasticised PVC is determined by many factors. The harder highly filled grades with an S.G of between 1.40 - 1.50 will shrink less.

For moulds with larger gate sizes, long flow paths and fast cycle times the shrinkage can increase, as with increased temperatures and lower processing pressures.

**The information contained in the document is a guide only. Customers must therefore complete their own tests to ensure that finished products are suitable for their intended purpose.**