

PLASTIC INJECTION MOLDING MATERIAL SHRINK RATE CHART

Plastic material shrinkage occurs in the contraction of a molded part as it cools after injection. All materials have different shrink rates depending on resin family (amorphous vs. crystalline materials), mold design, and processing conditions. Materials may also shrink differently depending on direction of flow. As a general rule of thumb, a 10% change in mold temperature can result in a 5% change in original shrinkage. In addition, injection pressure has a direct effect on shrinkage rates. The higher the injection pressure, the lower the shrinkage rate.

Shrinkage starts at the molecular level when plastics melt and cool. For the most part, these dynamics depend on the type of material and whether any filler or fiber reinforcement is present. There are also processing and [part design factors](#) to consider.

The chart below outlines typical mold shrink rates, as well as tonnage recommendations and vent depth values, for some common-to-moderately used materials and high heat resins:

Material	Recommended Tonnage (per in ²)	Shrink Values	Vent Depth (in.)
Acrylonitrile Butadiene Styrene (ABS)	2.5 – 3.5	.004 - .008	.0010 - .0020
ABS/Polycarbonate Blend (PC/ABS)	3.0 – 4.0	.004 - .007	.0015 - .0030
Acetal (POM)	3.0 – 4.0	.020 - .035	.0005 - .0015
Acrylic (PMMA)	3.0 – 4.0	.002 - .010	.0015 - .0020
Ethylene Vinyl Acetate (EVA)	2.0 – 3.0	.010 - .030	.0005 - .0007
Ionomer	2.5 – 3.5	.003 - .020	.0005 - .0007
High Density Polyethylene (HDPE)	2.5 – 3.5	.015 - .030	.0008 - .0010
Low Density Polyethylene (LDPE)	2.0 – 3.0	.015 - .035	.0005 - .0007
Polyamide - Nylon (PA) Filled	4.0 – 5.0	.005 - .010	.0003 - .0010
Polyamide - Nylon (PA) Unfilled	3.0 – 4.0	.007 - .025	.0005 - .0020
Polybutylene Terephthalate (PBT)	3.0 – 4.0	.008 - .010	.0005 - .0015
Polycarbonate (PC)	4.0 – 5.0	.005 - .007	.0010 - .0030
Polyester	2.5 – 3.5	.006 - .022	.0005 - .0010
Polyetheretherketone (PEEK)	4.0 – 5.0	.010 - .020	.0005 - .0007
Polyetherimide (PEI)	3.0 – 4.0	.005 - .007	.0010 - .0015
Polyethylene (PE)	2.5 – 3.5	.015 - .035	.0005 - .0020
Polyethersulfone (PES)	3.0 – 4.0	.002 - .007	.0005 - .0007
Polyphenylene Oxide (PPO)	3.0 – 4.0	.005 - .007	.0010 - .0020
Polyphenylene Sulfide (PPS)	3.5 – 4.5	.002 - .005	.0005 - .0010
Polyphthalamide (PPA)	3.5 – 4.5	.005 - .007	.0005 - .0020
Polypropylene (PP)	2.5 – 3.5	.010 - .030	.0005 - .0020
Polystyrene (PS)	2.0 – 2.5	.002 - .008	.0015 - .0020
Polysulphone (PSU)	4.0 – 5.0	.006 - .008	.0010 - .0015
Polyurethane (PUR)	2.5 – 3.5	.010 - .020	.0004 - .0010
Polyvinyl Chloride (PVC)	2.5 – 3.5	.002 - .030	.0005 - .0020
Thermoplastic Elastomer (TPE)	2.5 – 3.5	.005 - .020	.0008 - .0010

Are you interested in learning more about material selection, shrinkage rate,
and how to best optimize your custom part?

☞ [Contact an Engineer at Plastic Components, Inc.](#) ☞