

Mold Surface Classifications

Surface finish significantly affects the look, feel and overall quality of molded parts. Keep these guidelines handy to quickly find a mold finish that will produce the right results for your material.

SPI Finish	Guide	Typical Application	Roughness Average (µm)	Root Mean Square (µm)	VDI 3400 (CH)
A-1	Grade #3 Diamond	Lens/Mirror*	0.012 to 0.025	0.013 to 0.027	-
A-2	Grade #6 Diamond	High Polish	0.025 to 0.05	0.027 to 0.055	-
A-3	Grade #15 Diamond	High Polish	0.05 to 0.10	0.055 to 0.11	0 to 5
B-1	600 Grit Paper	Medium Polish	0.05 to 0.10	0.055 to 0.11	6
B-2	400 Grit Paper	Medium Polish	0.10 to 0.15	0.11 to 0.18	7 to 8
B-3	320 Grit Paper	Medium to Low Polish	0.25	0.27	9 to 10
C-1	600 Stone	Low Polish	0.3	0.33	11 to 12
C-2	400 Stone	Low Polish	-	-	13 to 15
C-3	320 Stone	Low Polish	-	-	16 to 17
D-1	Dry Blast Glass Bead	Satin Finish	-	-	18 to 19
D-2	Dry Blast #240 Oxide	Dull Finish	-	-	20 to 29
D-3	Dry Blast #24 Oxide	Dull Finish	-	-	30 to 45

*Requires 420 SS material

	A-1	A-2	A-3	B-1	B-2	B-3	C-1	C-2	C-3	D-1	D-2	D-3
ABS	3	3	2	2	2	1	1	1	1	1	1	2
Acetyl	3	3	2	1	1	1	1	1	1	1	1	4
Acrylic	1	1	1	2	2	2	2	2	2	3	3	3
Nylon	3	3	2	2	1	1	1	1	1	1	1	2
Polycarbonate	3	2	1	2	2	3	3	4	4	1	4	4
Polyester	3	3	2	1	2	2	1	2	4	1	1	4
Polyethylene	4	3	3	2	2	1	1	1	1	1	1	1
Polystyrene	3	3	2	1	1	1	1	1	1	1	1	2
Crystal Polystyrene	2	1	1	2	2	3	3	4	4	1	4	4
Polypropylene	4	3	3	2	2	1	1	1	1	1	1	1
Polyurethane	4	4	4	4	3	3	2	2	2	1	1	2
PVC	4	4	4	4	3	3	2	2	2	1	1	2

MATERIAL RECOMMENDATIONS

Not every finish works for every material. This chart can help you find a range of mold finishes to consider.

Scale

1: Good 2: Average 3: Not recommended 4: Not acceptable

ADDITIONAL CONSIDERATIONS

Processing. To achieve high-gloss finishes, mold surfaces must reach or exceed the glass transition temperature of the polymer.

Ejection. Highly polished molds paired with structurally stiff resins can create a vacuum effect that prevents release without a poppet or other vacuum-breaking method. To prevent slow ejection, highly textured parts require additional draft.

Fillers. Resins with fillers (such as glass fiber) will exhibit a rougher texture due to the filler showing through at the surface of the part. This can be alleviated by increasing mold temperature to create a resin-thick surface layer.