FIRSTMOLD

FIRST YOUR NEED • MOLD YOUR PART

# INJECTION MOLD

## SURFACE FINISH GUIDE

# Contents


**1. Introduction** ........ **1**

**2. Surface Finish References** ........ **1**

2.1 SPI Surface Finish ........ 2

2.2 VDI 3400 Texture ........ 7

**3. Mold Surface Finishing Methods** ........ **9**

3.1 Polishing ........ 9

3.2 EDM Texture ........ 10

3.3 Sandblasting ........ 11

3.4 Mold Surface Coating and Plating ........ 12

**4. Selection Guide** ........ **13**

4.1 Define the Surface Goal ........ 13

4.2 Match the Right Reference System ........ 14

4.3 Check Material and Geometry Risks ........ 15

4.4 Balance Appearance, Cost, and Production Volume ........ 16

4.5 Validate Before Tooling and Trial Molding ........ 16

**5. Conclusion** ........ **17**

# 1. Introduction

In injection mold projects, surface finish is often understood as a visual requirement. However, in real production, the mold surface does more than make molded parts look better. It can also affect demolding stability, production efficiency, part quality, and the long-term performance of the mold.

For this reason, surface finish should be clearly defined during product design, material selection, mold design, and pre-tooling review. Different surface grades and texture requirements often correspond to different finishing methods, processing difficulties, and production risks.

Based on First Mold's engineering experience in mold manufacturing and injection molding projects, this guide focuses on common surface finish references such as SPI and VDI 3400, as well as mold surface finishing processes such as polishing, EDM, blasting, chemical etching, and laser texturing. It is designed to help you define surface finish requirements more clearly before tooling begins and choose a surface solution that better fits your project.

# 2.Surface Finish References

For mold projects, if surface finish is confirmed only with broad descriptions such as "high-gloss," "matte," "frosted," or "textured," different customers and suppliers may not understand the same term in exactly the same way. For this reason, surface requirements are usually communicated through more specific surface finish reference systems.

Common surface finish references include SPI, VDI 3400, Mold-Tech, YS texture standards, Ra / Rz roughness values, gloss requirements, and approved texture samples. Among them, SPI and VDI are two of the most commonly used reference systems for injection mold surface requirements.

In actual projects, these surface finish reference systems are not mutually exclusive, and it is not always necessary to choose only one of them. Different areas of the same part can use different surface finish requirements based on their function and appearance needs. For example, highly visible cosmetic surfaces can use SPI grades, while side walls, back surfaces, grip areas, or low-reflection areas can use VDI textures. If leather grain, sand texture, or special decorative effects are required, Mold-Tech, YS texture codes, or physical samples can also be used for confirmation.

## 2.1 SPI Surface Finish

SPI surface finish is a widely used mold surface finish reference originally developed by the Society of the Plastics Industry (SPI). Although SPI was later renamed the Plastics Industry Association, the term “SPI surface finish” is still widely used in the injection molding industry.

In injection molds, SPI is mainly used to define the polished surface effect of the mold cavity or core. It is divided into four major classes, A, B, C, and D, with 12 grades ranging from glossy to dull.

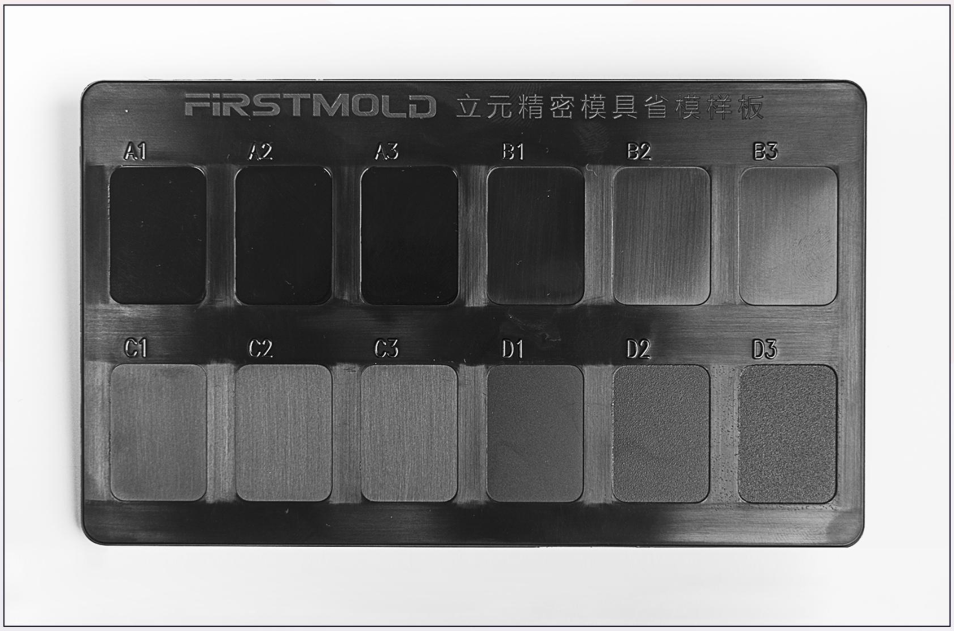


*Figure 1. First Mold Injection Molding Finishes Card*

### 2.1.1 Glossy Class A

SPI Class A is typically used for high-gloss, mirror-like, or near-mirror mold surfaces. Compared with other grades, Class A requires the highest level of mold steel quality, machining accuracy, and polishing quality. It is usually achieved through diamond polishing to produce a very smooth and highly reflective cavity or core surface.

Although the visual effect is outstanding, a Class A finish can also make surface defects on molded parts more visible. Flow marks, weld lines, sink marks, gas marks, scratches, and polishing marks are easier to observe on high-gloss surfaces.

In general:

- A1 is more suitable for mirror or optical surfaces with extremely high requirements.
- A2 is suitable for high-gloss transparent parts or premium cosmetic surfaces.
- A3 is suitable for standard high-gloss cosmetic parts.

In actual projects, a higher SPI Class A grade usually means longer polishing time, higher mold cost, and stricter mold trial validation requirements.

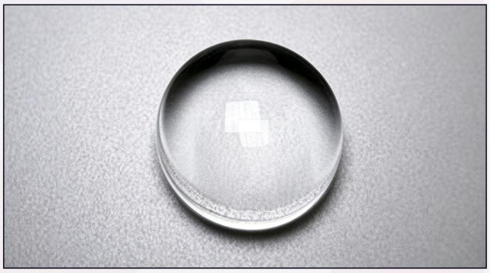

*Figure 2. Transparent optical component.*

### 2.1.2 Semi-glossy Class B

SPI Class B is typically used for semi-gloss or medium-gloss mold surfaces. It is achieved by sanding with abrasive paper of various grit levels, producing a surface texture finer than Class C and Class D, though it does not reach the mirror-like effect of Class A.

On injection molded parts, this finish creates a clean, uniform, and moderately reflective appearance. It is commonly used for consumer electronics housings, home appliance housings, visible plastic covers, and standard cosmetic parts that require a good appearance without mirror-like reflection.

- B1: Features a finer surface, suitable for high-quality cosmetic parts.
- B2: Provides a standard medium semi-gloss effect.
- B3: Lower gloss, suitable for standard visible surfaces or non-critical cosmetic areas.

When selecting Class B, confirm that the cosmetic grade, polishing direction, mold parting line, ejector pin locations, and gate vestige will not negatively affect the final visual result.

*Figure 3. Semi-gloss ABS plastic enclosure.*

### 2.1.3 Matte Class C

SPI Class C is typically used for low-gloss, matte, or softer mold surfaces. It is generally achieved through stone finishing. The surface does not reflect light as noticeably as Class A or Class B. Its advantage is that the surface effect is relatively stable, while the machining difficulty and cost are usually lower than those of high-gloss polished surfaces. For product areas that do not require a mirror-like effect but still need a uniform and controlled surface, Class C is a practical choice.

In terms of specific grades:

- C1 is a finer matte finish, suitable for general visible surfaces or finer low-gloss surfaces.
- C2 is a medium matte finish, commonly used for standard structural parts or functional parts.
- C3 has a rougher surface and may show more obvious machining direction marks. It is usually suitable for internal areas or areas with lower appearance requirements.

When selecting Class C, attention should be paid to the direction of machining marks, surface consistency, and whether the finish will affect the appearance evaluation of the molded part.

*Figure 4. Matte plastic functional housing.*

### 2.1.4 Textured Class D

SPI Class D is typically used for low-gloss, rough matte, or blasted mold surfaces. It is usually produced by applying dry blasting with glass beads or aluminum oxide after the mold surface has received basic preparation, forming a relatively uniform matte surface without obvious directional marks.

On injection molded parts, this finish usually creates a satin, sand-like, or slightly rough visual and tactile effect. It can reduce surface reflection, give the product a more stable appearance, and to some extent reduce the visibility of fine scratches, slight flow marks, or other surface imperfections. It is commonly used for industrial housings, automotive interior parts, tool handles, consumer product housings, and plastic parts that require anti-glare or anti-slip tactile performance.

It should be noted that the rougher the Class D surface is, the greater the friction resistance during demolding will usually be. Therefore, when selecting D1, D2, or D3, it is necessary to check the draft angle, demolding direction, sidewall depth, and ejection method in advance to avoid drag marks, surface scratches, or demolding difficulties.

*Figure 5. Textured automotive trim panel.*

The following table summarizes the typical SPI finish grades, finishing methods, approximate Ra values, common applications, and VDI 3400 reference ranges for practical comparison.

*Table 1. SPI Finish Grades and Surface Finish References*

| SPI Finish Class | SPI Grade | Typical Finishes | Finishing Method | Approx. Ra (μm) | Typical Applications | VDI 3400 |
|---|---|---|---|---|---|---|
| Glossy Class A | A1 | Lens / Mirror | Grade #3, 6000-Grit Diamond | 0.012 - 0.025 | Optical parts, transparent parts, premium mirror surfaces | Not Available |
| | A2 | High Polish | Grade #6, 3000-Grit Diamond | 0.025 - 0.05 | Transparent housings, high-gloss covers, medical plastic enclosures | Not Available |
| | A3 | High Polish | Grade #15, 1200-Grit Diamond | 0.05 - 0.10 | High-gloss cosmetic parts, consumer electronics housings | VDI #0 ~ #5 |

| SPI Finish Class | SPI Grade | Typical Finishes | Finishing Method | Approx. Ra (μm) | Typical Applications | VDI 3400 |
|---|---|---|---|---|---|---|
| Semi-gloss Class B | B1 | Medium Polish | 600-Grit Paper | 0.05 - 0.10 | High-quality cosmetic surfaces, appliance covers, visible housings | VDI #6 |
| | B2 | Medium Polish | 400-Grit Paper | 0.10 - 0.15 | General cosmetic parts, structural housings, visible functional parts | VDI #7 ~ #8 |
| | B3 | Medium- Low Polish | 320-Grit Paper | 0.28 - 0.32 | Secondary cosmetic surfaces, internal visible areas | VDI #9 ~ #10 |
| Matte Class C | C1 | Low Polish | 600-Grit Stone | 0.35 - 0.40 | Low-gloss surfaces, general functional parts | VDI #11 ~ #12 |
| | C2 | Low Polish | 400-Grit Stone | 0.45 - 0.55 | Industrial parts, general structural parts | VDI #13 ~ #15 |
| | C3 | Low Polish | 320-Grit Stone | 0.63 - 0.70 | Internal surfaces, low-cosmetic-requirement areas | VDI #16 ~ #17 |
| Textured Class D | D1 | Satin Finish | Dry Blast Glass Bead #11 | 0.80 - 1.00 | Satin matte surfaces, anti-glare areas, light texture surfaces | VDI #18 ~ #19 |
| | D2 | Dull Finish | Dry Blast #240 Aluminum Oxide | 1.00 - 2.80 | Industrial housings, tool handles, low-reflection surfaces | VDI #20 ~ #29 |
| | D3 | Dull Finish | Dry Blast #24 Aluminum Oxide | 3.20 - 18.0 | Rough matte surfaces, anti-glare or grip areas | VDI #30 ~ #45 |

## 2.2 VDI 3400 Texture

VDI 3400 is a widely used surface texture and roughness reference standard developed by the Association of German Engineers, VDI, which stands for Verein Deutscher Ingenieure. In the injection mold industry, VDI 3400 is commonly used to describe the surface condition formed on mold cavities or cores after EDM machining. Although these standards were developed by the German engineering association, they are widely used by mold manufacturers worldwide, including in North America, Europe, and Asia.

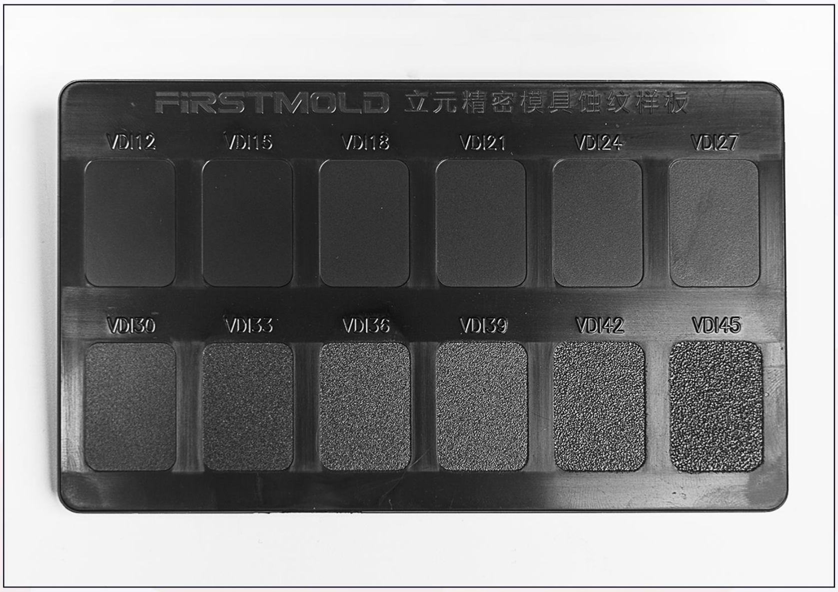


*Figure 6. First Mold Injection Molding Finishes Card*

Unlike SPI, which is mainly used to define polishing grades, VDI 3400 is more commonly used to define EDM textures, matte surfaces, and surface roughness. The standard usually represents surface texture changes through VDI grades from fine to coarse. The lower the number, the finer the surface. The higher the number, the rougher the surface, and the more noticeable the matte appearance, texture, and low-reflection effect on the molded part.

In practice, not every VDI grade is frequently used. In industry reference tables, VDI 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, and 45 are more commonly used as representative grades. These grades help engineers and moldmakers communicate requirements for fine matte surfaces, medium EDM textures, and coarse textured surfaces more efficiently. The reference relationship between VDI 3400 and common roughness parameters is shown in Table 2.

*Table 2. VDI 3400 Surface Roughness Reference Values*

| VDI 3400 | Ra (μm) | Ra (μin) | N3-N10 | Rt (μm) | RMS |
|---|---|---|---|---|---|
| 0 | 0.1 | 4 | N3 | | 4.9 |
| 1 | 0.11 | 4.48 | | | 5.5 |
| 2 | 0.13 | 5.04 | | | 5.9 |
| 3 | 0.14 | 5.6 | | | 6.9 |
| 4 | 0.16 | 6.4 | | | 7.9 |
| 5 | 0.18 | 7.2 | N4 | | 8.9 |
| 6 | 0.2 | 8 | | | 9.9 |
| 7 | 0.22 | 8.8 | | | 10.8 |
| 8 | 0.25 | 10 | | | 12.3 |
| 9 | 0.29 | 11.2 | | | 13.8 |
| 10 | 0.32 | 12.8 | | | 15.8 |
| 11 | 0.35 | 14 | N5 | | 17.2 |
| 12 | 0.4 | 16 | | 1.6 | 19.5 |
| 13 | 0.45 | 18 | | | 22 |
| 14 | 0.5 | 20 | | | 24.5 |
| 15 | 0.56 | 22.4 | | 3.2 | 27 |
| 16 | 0.63 | 25.2 | | | 31.3 |
| 17 | 0.7 | 28 | | | 35.2 |
| 18 | 0.8 | 32 | N6 | 5 | 39 |
| 19 | 0.9 | 36 | | | 44.4 |
| 20 | 1.0 | 40 | | | 49.3 |
| 21 | 1.12 | 44.8 | | | 54.6 |
| 22 | 1.26 | 50.4 | | | 62.4 |
| 23 | 1.4 | 56 | | | 70.3 |
| 24 | 1.6 | 64 | | 12 | 78 |
| 25 | 1.8 | 72 | N7 | | 88.2 |
| 26 | 2.0 | 80 | | | 98.9 |
| 27 | 2.24 | 88 | | 16 | 109.2 |
| 28 | 2.5 | 100 | | | 123.9 |
| 29 | 2.8 | 112 | | | 138.5 |
| 30 | 3.15 | 128 | N8 | 20 | 153.7 |
| 31 | 3.5 | 140 | | | 175.5 |
| 32 | 4.0 | 160 | | | 197.5 |
| 33 | 4.5 | 180 | | 25 | 218.8 |
| 34 | 5 | 200 | | | 248.6 |
| 35 | 5.6 | 224 | | | 277.9 |
| 36 | 6.3 | 252 | N9 | 37 | 306.2 |
| 37 | 7.0 | 280 | | | |
| 38 | 8.0 | 320 | | | |
| 39 | 9.0 | 360 | | 46 | |
| 40 | 10.0 | 400 | | | |
| 41 | 11.2 | 448 | | | |
| 42 | 12.5 | 504 | N10 | 60 | |
| 43 | 14.0 | 560 | | | |
| 44 | 16.0 | 640 | | | |
| 45 | 18.0 | 720 | | 85 | |

# 3.Mold Surface Finishing Methods

SPI and VDI 3400 provide the reference grades for mold surface finish and roughness, but they do not describe how the surface is produced. In practice, these results are achieved through different finishing methods, including polishing for SPI Class A, B, and C surfaces, EDM texturing for VDI related roughness, sandblasting for low-gloss Class D type surfaces, and coating or plating for functional mold surface protection.

## 3.1 Polishing

Polishing is a surface-finishing process that uses fine abrasives and friction to smooth materials, remove microscopic imperfections, and create a highly reflective, mirror-like shine.

According to the finishing method, mold polishing can generally be divided into mechanical polishing and chemical polishing. Mechanical polishing is the most common method used in injection molds. It mainly relies on tools and materials such as stones, abrasive paper, polishing compounds, and diamond paste to gradually refine the mold surface. Chemical polishing is more often used for specific materials, complex structures, or special surface requirements. It improves local surface roughness through chemical or electrochemical action.

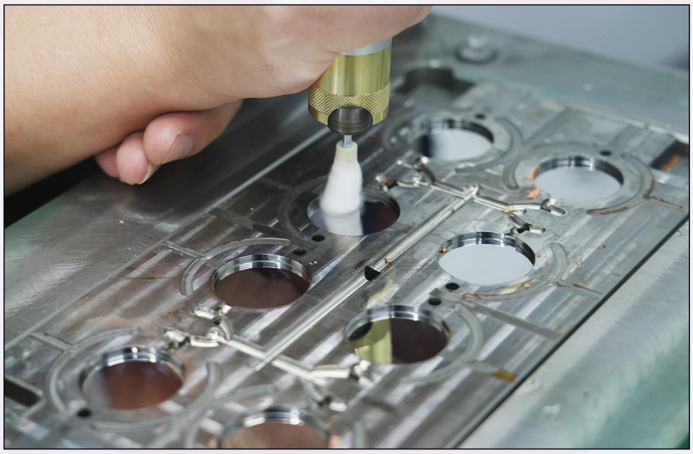

*Figure 7. Mechanical polishing*

Not all mold areas are suitable for high-grade polishing. Deep ribs, narrow slots, sharp corners, complex curved surfaces, and hard to reach areas are more difficult to polish. These areas are also more likely to show surface inconsistency, corner rounding, or local dimensional changes.

Polishing quality is not determined by the polishing operation alone. In practice, the final result is affected by the polishing method, tool selection, mold material, heat treatment condition, initial surface roughness, and the geometric complexity of the molded area.

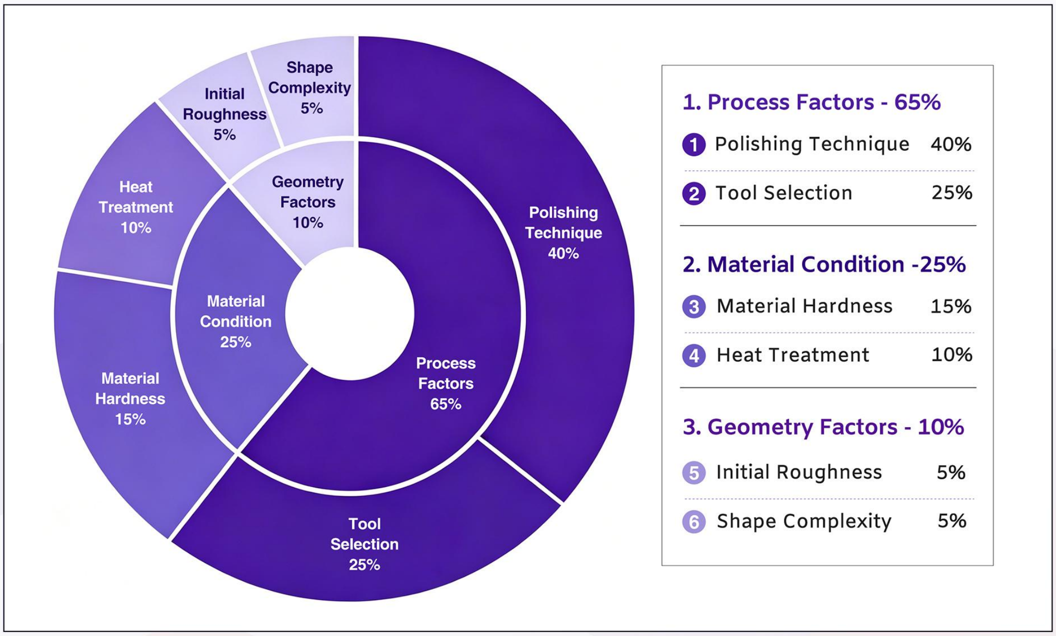


*Figure 8. Key reference factors affecting mold polishing results.*

## 3.2 EDM Texture

EDM texture refers to a distinctive, uniform matte or frosted surface finish produced on mold steel, mold cavities, cores, or metal workpieces through Electrical Discharge Machining. It is created by microscopic, overlapping craters left by electrical sparks, often measured according to the VDI 3400 standard.

EDM texturing is ideal for complex geometries and matte surfaces. It is commonly used for industrial housings, automotive interiors, and functional components where a non-cosmetic, low-gloss finish is required.

The main limitation of EDM texture is demolding resistance. A rougher EDM surface can increase friction during part release, especially on sidewalls, deep ribs, slide areas, or features with strong shrink grip. Therefore, draft angle, demolding direction, sidewall depth, and ejection layout should be checked before retaining EDM texture as the final molding surface.

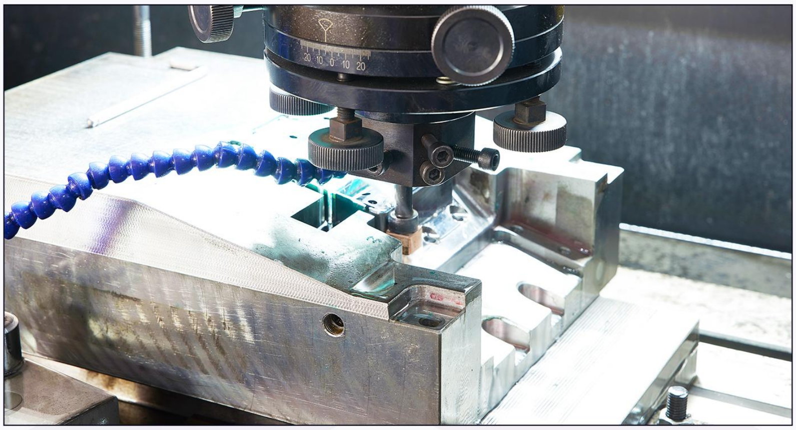

*Figure 9. EDM machining process.*

## 3.3 Sandblasting

Sandblasting, also referred to as abrasive blasting, is a surface finishing method that uses high speed abrasive media to impact the mold surface. Common media include glass beads and aluminum oxide. Depending on the blasting media, particle size, pressure, distance, and processing time, the mold surface can achieve different levels of matte, satin, low-gloss, or slightly rough effects.

Compared with EDM texture, sandblasting is more commonly used as a secondary surface finishing process after machining, polishing, or basic mold preparation. It helps reduce surface reflection, unify the visual appearance of larger surface areas, and weaken obvious directional marks left by manual sanding or machining. Therefore, it is often used for industrial housings, automotive interior trim, tool handles, consumer product shells, and plastic surfaces that require a uniform low-gloss appearance.

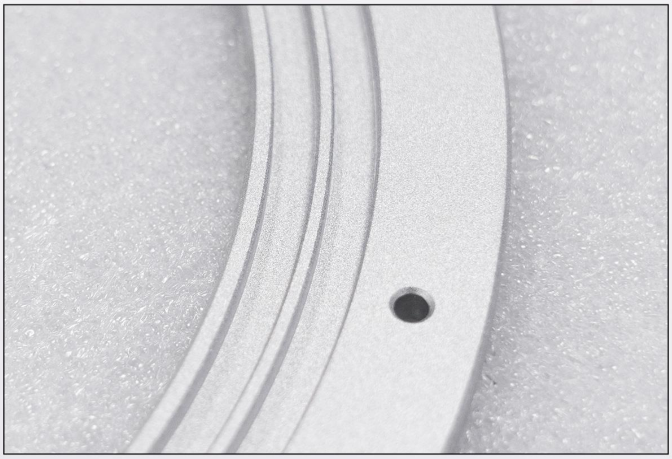

*Figure 10. Sandblasting.*

## 3.4 Mold Surface Coating and Plating

Mold surface coating and plating refer to processes that add a functional surface layer to mold cavities, cores, inserts, slides, ejector pins, or local molding surfaces. Unlike polishing, EDM texturing, or sandblasting, these processes are mainly used to improve wear resistance, corrosion resistance, release performance, or resistance to material sticking. Common methods include hard chrome plating, electroless nickel plating, PVD coating, DLC coating, and certain surface hardening treatments.

These processes are typically applied in projects requiring extended mold life, surface stability, or high-performance demolding. Applications include automotive parts, electronic connectors, industrial structural components, home appliances, and long-term production molds.

It should also be noted that coating or plating can change the mold surface dimensions and surface condition. For precision fitting surfaces, sealing surfaces, sliding surfaces, high-gloss surfaces, or areas that have already been textured, the coating thickness, coverage area, edge buildup, adhesion, future repair method, and potential effect on the final molded part surface should be confirmed in advance. For critical areas, masking requirements or local treatment should usually be defined during the mold design and surface treatment planning stage to avoid rework later.

*Figure 11. Plastic handle before and after electroplating.*

# 4. Selection Guide

Once the common surface finish standards and processing methods are understood, the next step is to determine which finish requirement best fits the project. This decision should take into account part function, user experience, material behavior, mold structure, manufacturing cost, and mass production requirements.
The following steps provide a practical framework for defining suitable surface finish requirements before mold manufacturing begins.


*Figure 12. Surface Finish Selection Flow Before Tooling*

## 4.1 Define the Surface Goal

The first step in selecting a surface finish is to define the final surface effect required for the product. Different products have different surface requirements. Some may require a mirror-like gloss, while others may require a semi-gloss appearance, a matte surface, glare reduction, slip resistance, improved tactile feel, or decorative texture.

For example, transparent parts and high-gloss housings usually place greater emphasis on surface smoothness and reflectivity. Industrial enclosures and automotive interior parts are more often evaluated based on low-gloss appearance, visual durability, and tactile quality. Handle type products may place more importance on slip resistance and grip comfort.

If requirements are described only with vague terms such as “nice surface,” “matte finish,” or “texture finish,” the customer, design engineer, and mold manufacturer may interpret the final surface differently. Therefore, the intended purpose of the surface should be clarified during drawing review, DFM review, or tooling review.

## 4.2 Match the Right Reference System

The next step is to select an appropriate reference system to define the requirement. Surface finish requirements should not rely only on written descriptions. They should be confirmed through standards, finish grades, roughness values, gloss levels, or physical samples whenever possible.

For high-gloss, semi-gloss, or general polished surfaces, SPI finish grades are commonly used as a reference. For EDM textures or matte rough surfaces, VDI 3400 may be used. For leather grain, sand texture, decorative texture, or specified texture effects, Mold-Tech, YS texture codes, or customer approved samples may be required.

For critical cosmetic parts, a standard code alone may not be sufficient. Ra/Rz values, gloss level, physical samples, or first article samples can be used as additional confirmation references. This helps reduce the risk of discovering during mold trials that the actual surface effect does not match the original expectation.

*Table 3. Surface Finish Selection Reference*

| Surface Goal | Common Reference | Typical Process | Key Check |
|---|---|---|---|
| Mirror / High-Gloss | SPI A | Polishing / Diamond Buffing | Check flow marks, sink marks, weld lines, polishability |
| Semi-gloss | SPI B | Sanding / Polishing | Check cosmetic area and polishing direction |
| Matte / Low-Gloss | SPI C / VDI | Stone polishing / EDM / Blasting | Check surface consistency and gloss variation |
| EDM Texture | VDI 3400 | EDM Texture | Check draft angle and demolding risk |
| Blasted / Satin Texture | SPI D / Sample | Blasting / Sandblasting | Check drag marks and part release |
| Leather / Grain Texture | Mold-Tech / YS / Sample | Chemical Etching | Check steel suitability, texture depth, draft angle |
| Custom Fine Texture | Sample / CAD Texture / Ra / Rz | Laser Texturing | Check texture continuity and cost |

## 4.3 Check Material and Geometry Risks

The feasibility of a surface finish should be evaluated together with the selected material and product geometry. The same mold surface may produce different results when applied to ABS, PC, PP, PA, POM, TPE, or glass-fiber-reinforced materials, as each material behaves differently in terms of surface replication, shrinkage, gloss, flow marks, mold sticking, and demolding performance.

Product geometry also affects surface consistency and demolding stability. Deep cavities, sidewalls, ribs, sharp corners, slider areas, gate-adjacent areas, and ejector locations can all increase the risk of cosmetic defects or demolding issues.

Before finalizing the surface finish, it is therefore necessary to assess whether the material is prone to sticking, whether the design provides sufficient draft angles, whether the texture direction is appropriate, and whether the gate and ejector locations will affect visible surfaces. High-risk areas should be addressed during the DFM stage, rather than being corrected after trial molding through polishing or mold modification.

To support a more practical assessment of texture depth, material selection, and demolding risk, Table 4 lists reference Ra/Rz roughness values for common VDI grades and provides recommended draft angle ranges for materials such as PBT, PC, and ABS. In general, a higher VDI value indicates a coarser surface texture, which typically requires greater draft angles and more careful consideration of demolding stability.

*Table 4. VDI 3400 Ra/Rz and Draft Reference*

| VDI 3400 Grade | Ra (μm) | Rz (μm) | Recommended Draft Angle (°) | | |
|---|---|---|---|---|---|
| | | | PBT | PC | ABS |
| 12 | 0.4 | 1.5 | 0.5 | 1 | 0.5 |
| 15 | 0.56 | 2.4 | 0.5 | 1 | 0.5 |
| 18 | 0.8 | 3.3 | 0.5 | 1 | 0.5 |
| 21 | 1.12 | 4.7 | 0.5 | 1 | 0.5 |
| 24 | 1.6 | 6.5 | 0.5 | 1.5 | 1 |
| 27 | 2.24 | 10.5 | 1 | 2 | 1.5 |
| 30 | 3.15 | 12.5 | 1.5 | 2 | 2 |
| 33 | 4.5 | 17.5 | 2 | 3 | 2.5 |
| 36 | 6.3 | 24 | 2.5 | 4 | 3 |
| 39 | 9 | 34 | 3 | 5 | 4 |
| 42 | 12.5 | 48 | 4 | 6 | 5 |
| 45 | 18 | 69 | 5 | 7 | 6 |

## 4.4 Balance Appearance, Cost, and Production Volume

A higher surface finish grade usually requires longer processing time, higher labor cost, and stricter process control. Mirror polishing, precision texturing, deep texture, and custom laser texturing can all increase mold manufacturing cost and lead time.

For premium cosmetic parts, transparent components, or brand visible surfaces, a higher surface finish grade may be necessary. However, for internal structural surfaces, non cosmetic areas, or surfaces with low appearance requirements, an excessively high finish grade may not provide practical value and may instead add unnecessary cost.

A more practical approach is to define different surface finish requirements by area. For example, A surfaces, B surfaces, internal surfaces, and functional surfaces can be assigned different finish grades, rather than applying the highest finish requirement to the entire mold. For long term mass production projects, surface stability, maintenance cost, and mold life should also be considered. For low-volume or validation stage projects, a more practical and cost effective surface requirement should be selected.

## 4.5 Validate Before Tooling and Trial Molding

Surface finish requirements should be confirmed before tooling begins, rather than being decided after the mold has been completed. For critical cosmetic surfaces, the finish grade, texture code, roughness requirement, or approved sample should be clearly specified in the drawing, DFM report, or tooling review.

During mold trials, if drag marks, scratches, flow marks, sink marks, or local gloss variation appear, it is necessary to determine whether the issue comes from the surface requirement, mold structure, material selection, or molding process.

For high-gloss surfaces, transparent parts, deep textures, or large decorative texture areas, sample approval is recommended before formal mass production. Stable production should begin only when the specified surface finish, molded part appearance, demolding performance, and customer approved samples are consistent.

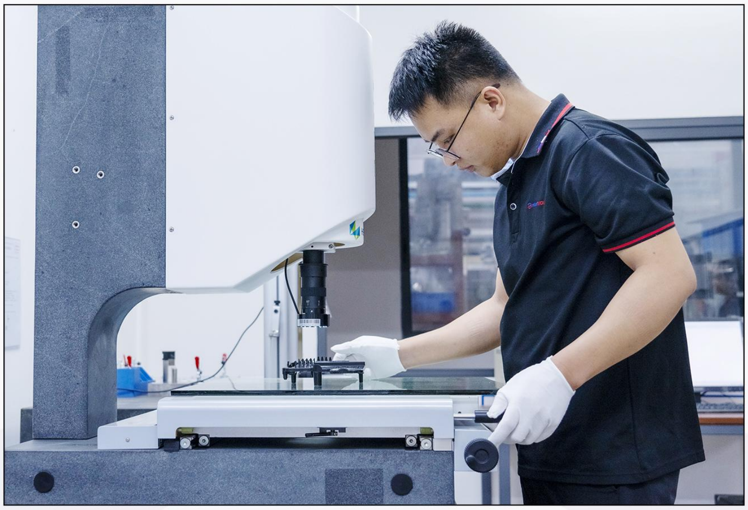

*Figure 13. Part inspection during trial molding validation.*

# 5. Conclusion

Surface finish should be treated as a critical engineering requirement rather than a cosmetic adjustment applied after mold completion. Because the mold surface is directly replicated on every injection molded part, defining these requirements before tooling begins is essential for project success.

A well-defined surface specification must go beyond expected appearance to include surface grades, roughness references, texture samples, inspection methods, and any tooling or demolding constraints. Establishing these parameters early enables the moldmaker to select the optimal finishing process, significantly reducing the risk of cosmetic defects, molding instability, and costly late-stage adjustments.

## Let’s Talk About Your Next Project.

First Mold brings over a decade of experience in mold making and injection molding, supporting projects from initial DFM review to final production. For cosmetic, transparent, textured, or customized surface requirements, our engineering team is ready to help you evaluate SPI grades, VDI textures, and finishing methods.

FIRSTMOLD
FIRST YOUR NEED • MOLD YOUR PART

# First Your Need
# Mold Your Part

## Contact Details

https://firstmold.com

sales@firstmold.com

+86 13925326660


Mold Making


Injection Molding


CNC Machining


3D Printing


Die Casting


Sheet Metal