

ENGINEERING REFERENCE / 01

Surface Finishes Specification Sheet

Six finish options for sheet metal parts — compared by build-up, substrate, function and the drawing notes needed to define the result.

At a glance

Use this matrix to shortlist a finish. The finish-specific pages identify the details that should be stated on the engineering drawing.

FINISH	BUILD-UP	BASE METALS	PRIMARY FUNCTION	REFERENCE / STANDARD	DRAWING PRIORITY
Powder coating	60–120 µm	Steel, stainless, aluminium, copper & brass	Exterior barrier + colour	Qualicoat-class systems; RAL / Pantone	Colour + finish type; mask threads, bores and earth points
Anodizing	5–25 µm (II) 25–50 µm+ (III)	Aluminium only	Corrosion, wear, appearance	MIL-PRF-8625 Type II / III	Type + thickness; state sealing
Electroplating	Per ASTM B633 class	Steel, copper, brass	Protection, conductivity, solderability, wear	ASTM B633 (class + thickness)	Deposit + class + thickness; mask contacts
Brushed	None — mechanical texture	Stainless, aluminium	Cosmetic grain	No. 4 / hairline designation	Grain designation + direction
Bead blasting	None — surface texture	Stainless, aluminium, most metals	Cosmetic matte / preparation	Bead media specification	Specify media; Ra if needed
Laser engraving	0.01–0.2 mm removal	All — anodised, steel, coated, plated	Permanent marking / traceability	Depth + character height on drawing	Text + height + font; depth; datum; timing

Important specification notes

The source page lists salt-spray figures of 300–1000 hours for powder coating, 336+ hours for anodizing (MIL-PRF-8625), and 96–200 hours for electroplating (ASTM B456). Brushed and bead-blasted finishes carry the base-metal rating; laser engraving is listed as not applicable (mark only). Wear is rated High for powder coating, anodizing and electroplating; Medium for brushed and bead blasting; not applicable for engraving.

Standards named here are specifications the relevant finish is worked to, not finish-specific certifications held by WERIX. The source page states ISO 9001 is WERIX's management-system certification and that several finishing operations are partner-executed under WERIX specification and inspection.

Source: WERIX Metal, "Surface Finish Data Sheets: All 6 Finishes." All technical values and drawing notes in this document are taken from that page.

FINISH DETAILS / 02

Powder coating

An electrostatic polymer film cured at temperature, typically 60–120 µm thick. It covers laser heat marks and weld dressing, accepts RAL colours, and is described as the default exterior finish for steel enclosures.

SUBSTRATE / PRETREATMENT

Substrate	Pretreatment	Source note
Cold-rolled steel (SPCC)	Degrease + phosphate conversion	Cut edges unprotected
Galvanised / zinc-coated (SGCC, SECC)	Degrease + zinc-matched conversion	Skipping matching chemistry can cause blistering
Stainless 304 / 316	Degrease + adhesion promoter	For colour, not corrosion protection
Aluminium 5052 / 6061	Degrease + chromate conversion	Required for adhesion
Copper / brass	Degrease + adhesion promoter	Plating may be the better route

SPECIFICATION POINTS

- Film thickness: 60–120 µm; measured per batch.
- Qualicoat-class powder systems are a product-selection specification, not a certification held by WERIX.
- Colour reference: RAL / Pantone. Finishing is partner-executed under WERIX specification.

DRAWING CHECKLIST

- State the RAL or Pantone reference and finish type: gloss, satin, matt or textured.
- Add film-thickness range when required by the environment or customer specification.
- Identify cosmetic class A faces and faces that may be coated freely.
- Mask threads, bores, gasket lands, mating faces and earth points.
- State whether conversion coating is required for the substrate.

FINISH DETAILS / 03

Anodizing

Anodizing converts the aluminium surface into an oxide layer rather than applying a film. It is specified where appearance, corrosion resistance or wear resistance matters on aluminium.

ALLOY SUITABILITY

Alloy / assembly	Type II	Type III	Note
5052	Good	Available	Usual choice for formed parts; clear or dyed
6061-T6	Good	Good	Colour differs from 5052; cross-alloy matching is limited
3003	Good	Limited	Soft, decorative applications
7075	Acceptable	Preferred	Hard anodize usual for high-strength grades
Cast / welded assemblies	Acceptable	Acceptable	Weld zones take colour differently

SPECIFICATION POINTS

- MIL-PRF-8625 Type II / Type III; specification, not certification held by WERIX.
- Thickness: 5–25 µm (Type II) / 25–50 µm+ (Type III), measured and reported per batch.
- Sealing stage is declared; anodizing is partner-executed under WERIX specification, inspection and delivery control.

DRAWING CHECKLIST

- Specify Type II or Type III and the thickness range.
- State whether the finish is sealed.
- Give a colour standard where dye is required; allow for differences across alloys.
- Mask threads, bores, mating faces and electrical contact areas.
- Identify dimensions that must remain within tolerance after coating growth.

FINISH DETAILS / 04

Electroplating

A metal layer — zinc, nickel, chrome, copper or tin — is deposited onto a conductive sheet-metal surface. It is used where conductivity, solderability, wear or sacrificial corrosion protection matters, and is applied after forming.

DEPOSIT BY FUNCTION

Deposit	Why specified	Source note
Zinc	Sacrificial protection for steel	Default for enclosures; cut edges stay protected
Zinc-nickel	Higher corrosion resistance than zinc	Higher cost; aggressive environments
Nickel	Wear resistance and appearance	Often used on hardware and inserts
Chrome	Hardness and decorative brightness	Decorative chrome is thin; hard chrome is a different specification
Tin	Solderability and low-resistance contact	Busbars and connector tabs
Copper	Conductivity or underlayer	Also selected for thermal conductivity

SPECIFICATION POINTS

- ASTM B633 is the zinc electrodeposit specification where the customer requires it.
- Declare thickness class on the drawing and verify per batch. Typical salt-spray performance listed: 96–200 hours per ASTM B456.
- Plating is partner-executed under WERIX specification and inspection.

DRAWING CHECKLIST

- State the deposit and, where applicable, the standard, class and thickness.
- Mask areas that must remain bare, especially electrical contacts and bonding faces.
- Specify a post-plating bake where warranted by high-strength / high-tensile steel.
- State that plating follows all forming operations.

FINISH DETAILS / 05

Brushed

A mechanical abrasive operation creates a directional satin grain. It changes appearance but adds no protective layer and no corrosion resistance beyond that of the underlying alloy.

COMMON DESIGNATIONS

Finish / substrate	Character	Note
Hairline — 304 / 316 stainless	Fine, subtle directional grain	State designation and direction
No. 4 — 304 / 316 stainless	Coarser, more visible grain	Industry default described by WERIX
Brushed aluminium — 5052 / 6061	Decorative grain	Adds no protection to the alloy
Carbon steel	Rarely used as final finish	Usually painted over

SPECIFICATION POINTS

- No. 4 and hairline are not interchangeable.
- Grain direction is visible and should be specified per face.
- Brushing is partner-executed where an industrial belt line is involved.

DRAWING CHECKLIST

- Identify brushed faces and faces left at mill finish.
- Specify hairline or No. 4, plus grain direction.
- State whether weld-dressed zones must blend to one texture.
- Specify any further treatment required by the environment.
- For cosmetic faces, state whether peel-coat protection is needed through fabrication.

FINISH DETAILS / 06

Bead blasting

Fine glass or ceramic beads are propelled at the surface to create a uniform, non-directional matte finish. Beadspeen the surface; abrasive media such as aluminium oxide cuts a coarser profile.

MEDIA AND RESULT

Media	Action	Typical result
Glass bead	Peening	Fine uniform matte; default decorative blast
Ceramic bead	Peening	Longer media life; similar finish, more consistent over time
Aluminium oxide	Cutting	Coarser profile; adhesion preparation rather than appearance
Sand / silica	Cutting	Coarser finish; residue risk on stainless
Bead + anodize	Peening then conversion	Matte anodised appearance on aluminium

SPECIFICATION POINTS

- Declare the bead media where the surface is cosmetic.
- Use dedicated stainless media; cross-contamination can cause rust spotting.
- Specify and check Ra where measurable surface roughness is required.
- Blasting is partner-executed where an industrial cabinet is involved.

DRAWING CHECKLIST

- Specify the media — bead, ceramic bead or abrasive — not simply “blasted”.
- Identify faces to blast and faces to protect.
- Add an Ra value if measurable roughness matters.
- State whether blasting is the final finish or preparation for anodizing / coating.
- For corrosion-critical stainless parts, require dedicated media.

FINISH DETAILS / 07

Laser engraving

Laser engraving removes or alters a shallow layer of material, typically 0.01–0.2 mm deep. It provides permanent marking for part numbers, ratings, data plates and traceability without consumables.

MARK TYPE BY SUBSTRATE

Substrate	Mark mechanism	Contrast
Anodised aluminium	Dye layer removed	High — pale mark on coloured surface
Bare stainless	Texture change	Moderate; reads under raking light
Powder-coated steel	Coating removed	High, but coating is breached
Bare steel	Surface displacement	Low until colour fill or coating is applied
Plated steel	Deposit removed	Moderate; exposes substrate

SPECIFICATION POINTS

- Engraving depth: 0.01–0.2 mm typical; deeper engraving requires multiple passes.
- Character height and font govern legibility and minimum markable size.
- Position from the same datum as functional features, not from an edge.
- Laser marking is run in-house on WERIX fibre equipment.

DRAWING CHECKLIST

- Provide exact text and character height / font, or the artwork file.
- State engraving depth or a depth range.
- Locate the mark from a datum.
- Specify whether marking occurs before or after the surface finish.

Source and scope

Source: <https://www.werixmetal.com/finishes/data-sheets/>

This document reproduces reference information from the source page. It does not replace a project-specific drawing, approved finish sample or batch inspection report. Where the source page does not provide a value, none has been inferred here.