COMPLETE TECHNICAL GUIDE / ENGLISH

Finishing and powder coating

Appearance, protection and assembly after coating



Illustrative process image.

Information for design and quotation
Technical explanations, tables, diagrams and practical examples. Preliminary recommendations are checked for the project material, tooling and geometry. Tolerances and the final manufacturing route are confirmed in the quote.

lasermet.ro/en/guides
info@lasermet.ro · +40 723 644 039
Workshop: Bd. Dimitrie Pompeiu 10, Bucharest 020337, Romania

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How to use this guide
Consult the geometry chapters before finalising the drawing. Check tables and examples, then use the quotation checklist. Example numbers illustrate calculations; they do not implicitly represent guaranteed capacities or tolerances.

Specify the result

Final appearance

State RAL colour, texture, gloss and visible faces. RAL code alone does not define texture or gloss. For matching an existing product, provide an accepted sample.

Service environment

State indoor/outdoor use and exposure to moisture and chemicals. Preparation and coating system are selected for material and use; colour does not define corrosion resistance.

Operations before finishing

Plan deburring, welding, grinding and machining before coating. Weld marks or substrate defects may remain visible without appropriate preparation requirements.

Fits and masking

Coating changes dimensions

The applied layer affects diameters, slots and assembly clearances. Request system thickness in the quote and check final fit. Do not use a universal value for every finish.

Uncoated areas

Identify threads, contact, grounding and sealing surfaces requiring masking. State whether tolerance is required before or after finishing.

Hanging points

Parts need positioning during the process. Agree hanging holes or points and areas where marks are acceptable, especially on design features.

Material and geometry

Substrate preparation

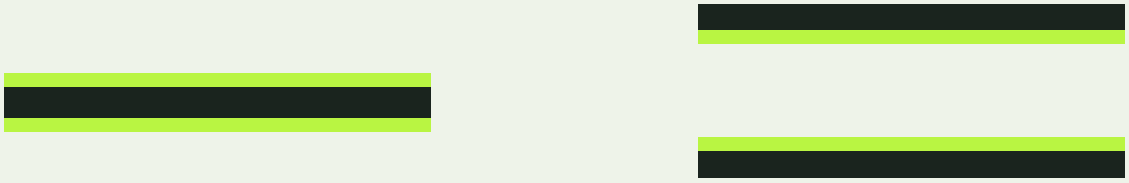
Steel, stainless steel and aluminium need appropriate preparation. Do not prescribe identical preparation for every material. State existing coatings and any repairs.

Edges and cavities

Very sharp edges and difficult-to-reach areas can complicate uniform coating. Provide safe edges and discuss deep cavities during design.

Hollow assemblies

For sections and enclosed volumes, assess ventilation, drainage or access-hole needs with the workshop according to the process. Do not close the geometry before this check.



Tab: thickness grows by 2h

Slot: clearance falls by 2h

Illustrative diagram; not to scale. This is not a manufacturing drawing.

Coating system, colour and environment

The system is more than RAL

Electrostatic powder coating applies powder to a substrate, followed by a curing cycle appropriate to the product. Material grade, preparation and powder type affect results. RAL describes reference colour, rather than corrosion protection or overall system performance.

Service environment

State indoor or outdoor use, exposure to water, sunlight, chemicals and installation conditions. Water-retaining surfaces and contact between dissimilar materials can change behaviour. Identical durability is not promised in every environment simply because a part is coated.

Texture and gloss

Describe shade, texture and gloss together. Fine-textured black and smooth glossy black can look different despite sharing the same RAL. For adjacent products, approve a sample and agree comparison criteria.

Specification	Example request field
Material	S235JR, stainless steel or aluminium alloy
Environment	Outdoor, water / sun / identified agents
Appearance	RAL + smooth/textured + gloss
System	Preparation and coating confirmed in quote

Surface preparation before coating

Cleaning

Grease, dirt, oxides and residues can affect adhesion or appearance. Preparation is selected for material and substrate condition. An apparently clean part may retain contamination; state material history, oils and previous coatings.

Cutting and welding

Check edges and weld areas before finishing. Dross, spatter, burrs and sharp corners do not automatically disappear under powder. A coating may emphasise substrate defects; request grinding or surface restoration where appearance requires it.

Special substrates

Galvanised materials, castings and porous surfaces may need particular assessment and preparation. Curing conditions must be compatible with the assembly. State adhesives, plastics and installed components before selecting the process.

Substrate condition	What to assess
Oiled	Suitable degreasing
Oxidised / rusted	Removal and substrate integrity
Welded	Spatter, marks, corners and flatness
Previously coated	Compatibility or removal

Edges, cavities and surface access

External edges

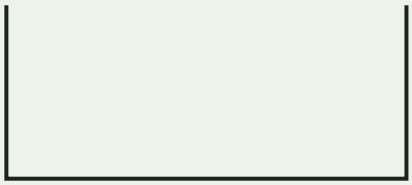
Very sharp edges can affect coating behaviour and are undesirable for handling. Provide appropriately prepared edges without changing functional areas. A dimensioned chamfer and simple deburring are distinct operations.

Internal corners and pockets

In electrostatic application, deep or shielded areas can be harder to coat uniformly. Do not assume a cavity interior receives the same layer as the outside face. If internal coating is critical, specify the area and verify process feasibility.

Enclosed volumes

Washing, drainage, drying, ventilation and heating require geometry checks. Process holes are established according to process and product. Avoid liquid-trapping cavities or configurations that cannot be cleaned or inspected; approve any geometry change before manufacturing.



Cavity: access, drainage and venting

Check according to the process

Illustrative diagram; not to scale. This is not a manufacturing drawing.

Layer thickness and assembly clearances

Specified thickness

Layer thickness is established for the coating product and system. We do not publish a universal thickness for every part. If critical, agree the range and measurement areas before quotation. Flat faces, edges and internal corners can have different conditions.

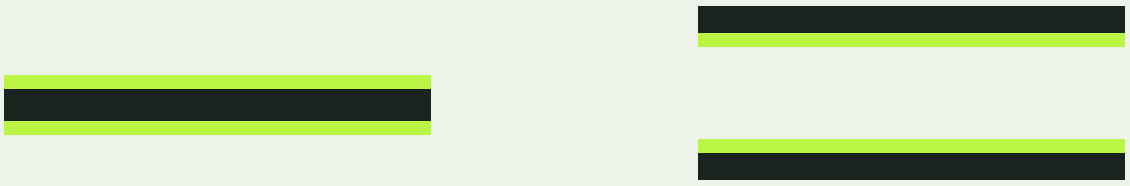
Calculating clearance

A slot coated on both opposing surfaces loses approximately twice the layer thickness from its clear width. A tab coated on both faces grows by the same effect. For a joint coated on both components, these effects accumulate.

Actual variation

The idealised calculation supports design but does not include all dimensional variation, burrs and local non-uniformity. Check part tolerances together with finishing-system tolerances. For a close fit, a finished sample is useful before production.

EXAMPLE / APPLICATION
Hypothetical example: 3.00 mm tab, 3.40 mm slot, 0.08 mm coating on each of the four opposing joint surfaces. Nominal clearance falls from 0.40 to 0.08 mm. The 0.08 mm layer is for calculation only, not a LaserMet specification.



Tab: thickness grows by 2h

Slot: clearance falls by 2h

Illustrative diagram; not to scale. This is not a manufacturing drawing.

Masking, threads and contacts

Assembly areas

Identify threads, bores, recesses, sealing surfaces and contact faces that must remain uncoated. Supplement the 3D model with a PDF view or masking map. Colour alone does not define whether an area requires masking.

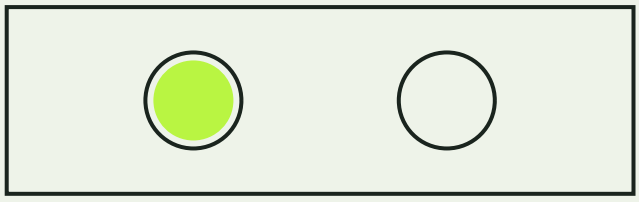
Electrical contact

For grounding or conductive contact, state area and function. Ordinary powder is not assumed conductive. Make and verify the contact according to design requirements; an unmasked screw hole alone does not guarantee electrical continuity.

Operation sequence

Establish whether threads and bores are made before finishing with masking, or afterwards with protection restored where needed. Cleaning a thread after coating can remove local protection. Include this in the manufacturing route rather than at receiving.

Area	Instruction
Thread	Masking or agreed later operation
Fit bore	Final dimension and protected area
Sealing	Surface and coating criterion
Electrical contact	Position, function and verification



Green: area identified for masking

Each area has a stated function

Illustrative diagram; not to scale. This is not a manufacturing drawing.

Hanging and the curing cycle

Hanging points

The part must be supported and positioned during processing. Identify areas where hanging marks are accepted and whether process holes are allowed. For a cosmetic face, discussing hanging points before cutting can avoid a visible defect.

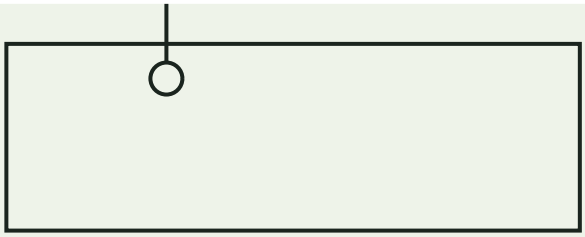
Temperature and time

Curing follows the product technical datasheet; oven air temperature and actual part temperature are different. Mass and thickness affect heating. A generic time cannot be applied to every assembly without checking the system.

Assembly compatibility

Assess sensitive components, plastics, adhesives, fillers and enclosed volumes before processing. State whether the part can be disassembled. Repair of a finished coating is not automatically equivalent to a complete cycle on a prepared substrate.

EXAMPLE / APPLICATION
For a decorative panel, identify visible face A and hidden area B where hanging is permitted. This allows process support to be planned without affecting required appearance.



Agreed hanging point

Keep the visible face identified

Illustrative diagram; not to scale. This is not a manufacturing drawing.

Appearance acceptance and measurement

Sample and assessment conditions

For cosmetic products, agree a sample, viewing distance, lighting and orientation. Screens and photographs are not sufficiently stable colour and gloss references. For metallic effects or textures, orientation and process can influence perception.

Visible and hidden areas

Classify areas by appearance importance. A main visible face may have different requirements from an area hidden after assembly. Define whether hanging marks, local repairs or small imperfections are accepted and where; “perfect appearance” is not a measurable criterion.

Agreed inspection

If layer thickness, adhesion, colour or other tests are required, specify methods, areas and documents. A complete report is not assumed for every order. Results for a system or sample do not automatically replace verification of the requested batch.

Check	To agree
Colour	Sample and comparison conditions
Appearance	Faces, distance and acceptable defects
Layer	Range and measurement points
Tests	Method, batch and requested report

Packaging, repairs and maintenance

Protect the final surface

Separators, edge protection and individual packaging reduce scratching risk. Avoid metal-to-metal contact and check whether film or packaging material can affect the finish. State whether products will be stored or installed immediately.

Installation

Screws, washers and tools can damage the layer. Plan contact faces and protective elements in the design. For outdoor coated parts, installation damage and water retention in joints can affect durability; assess installation details.

Repair and cleaning

If repair is needed, request a solution compatible with the applied system and required appearance level. Follow system cleaning instructions and avoid unvalidated aggressive agents. Local repair can differ in colour, texture or performance and must be accepted.

EXAMPLE / APPLICATION
For 20 coated panels, specify separators, corner protection, packaging codes and visible faces. A coating quote without these details may omit a significant part of delivery cost.

Acceptance and packaging

Checklist

Material; required system; service environment; RAL; texture; gloss; visible faces; masking; final dimensions; hanging points; acceptance criteria.

Production sample

For visible products, approve a representative sample and agree assessment conditions. Appearance requirements must be measurable and identical throughout the batch.

Protecting parts

State individual packaging, separators and sensitive areas. Avoid metal-to-metal contact in transport; include part-identification requirements.