

MKTech Industry Sdn Bhd

TECHNICAL APPLICATION GUIDE

MKTECH INDUSTRY SDN BHD / ILLUSTRATIVE INDUSTRY IMAGE

STAINLESS STEEL WELD BLENDING

Controlled stock removal. Scratch refinement. Matching the approved lay.

For stainless fabricators, finishing operators, manufacturing engineers and appearance inspectors.

MKTECH-TA-MF / REV 02 / NOVEMBER 2026

01 / PURPOSE AND NAVIGATION

Define the release before selecting the abrasive

A fabrication shop produces brushed stainless-steel enclosures. A visible corner weld must blend with the parent sheet while the enclosure keeps its shape and dimensions. A reference panel and a matched trial establish what a repeatable finish looks like.

Give the operator an approved appearance sample and a defined removal boundary. Inspect the cleaned blend under agreed lighting while protecting the panel's form and the required weld geometry.

Use the guide in three passes

Protect the weld and panel form

Record the stainless grade, sheet finish, lay direction and approved weld-removal allowance.

Keep finishing media dedicated

Separate controlled stock removal, scratch refinement and final direction matching.

Match the approved direction

Compare the cleaned surface with the agreed sample. Record geometry and any specified roughness.

Find the right section

WORKFLOW	PAGE	VALIDATION AND FIELD RECORDS	PAGE
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Scope and authority

Use the drawing, approved finish sample and weld instruction to define material removal. Separate fabrication from carbon-steel contamination. Apply the cleaning or chemical treatment specified for the component using its approved procedure.

The example scenario and cover photograph are illustrative. Use the job's approved requirements and record the actual site evidence.

02 / PROCESS AND HANDOVER GATES

Control every release between operations

Give the next operation a measurable condition, a named inspection and the status of any held work. Link each gate to the same part or zone ID.

01 Agree sample | 02 Set boundary | 03 Blend weld | 04 Refine lay | 05 Inspect clean

STAGE	CONTROL THE OPERATION	RELEASE EVIDENCE
Agree the standard	Identify the alloy, incoming finish and protected faces. Agree the appearance sample, lay and inspection lighting.	Signed reference panel or approved sample and job criteria.
Prepare and protect	Clean the work area, mark the blend zone and use dedicated stainless-compatible tooling.	Clean setup, correct material ID and verified tool sequence.
Blend the weld	Remove approved stock using a compatible abrasive. Check contour and heat effects as work proceeds.	Geometry remains within limits and defects are referred.
Refine and match	Progress only after the previous scratch pattern clears. Produce the agreed final lay across the blend.	No visible abrupt transition under the agreed viewing method.
Clean and release	Complete the specified cleaning or treatment. Inspect appearance, shape and roughness if called up.	Accepted inspection record with reference sample and any required readings.

Make the handover traceable

Record the final abrasive, direction, inspection lighting and approved sample ID. Where roughness is specified, retain the method, measurement direction, location and result.

Illustrative handover entry

Panel E-04, approved sample F-02. The cleaned blend matches the specified direction and appearance under the agreed light. The edge and panel flatness checks passed. The recorded final abrasive and inspection conditions travel with the batch.

03 / STARTING CONDITION

Assess the panel and finish before blending

Identical grit labels can produce different finishes when the abrasive construction, support, pressure or direction changes. Start from the actual panel and approved endpoint.

AS-FOUND CONDITION	DECISION BEFORE WORK	CONTROL TO RECORD
Brushed parent sheet	Identify grade, finish, sheet lot, direction and acceptable appearance sample.	Mark the final lay and inspection face on the work card.
Weld proud of the panel	Confirm how much weld material may be removed and which geometry to protect.	Set the permitted blend boundary and stage inspection.
Deep scratch outside the blend	Decide whether the drawing or sample permits local correction or broader refinishing.	Hold for disposition if correction would exceed the allowed removal.
Thin panel or sharp corner	Review heat sensitivity, support, flatness and edge profile.	Use a representative sample before approving any change in contact or abrasive.
Suspected carbon-steel contamination	Check previous tool use, workholding, nearby dust and handling.	Segregate the affected parts and refer the remediation route to QA.
Heat tint or treatment requirement	Identify the finish and corrosion-performance requirements in the job documents.	Record the approved cleaning or treatment route and release method.

Record the starting condition before the first pass

Maintain a protected reference sample that can be viewed alongside the finished part. Record the sample ID and revision, agreed illumination and viewing direction on the traveller.

04 / ABRASIVE AND MACHINE SELECTION

Choose the complete working system

Identify the operation and required endpoint first. Confirm the abrasive, tool, guard, mounting and work control together before evaluating productivity.

OPERATION	FORMAT TO EVALUATE	CHECK BEFORE TRIAL
Approved weld stock	Stainless-suitable flap or other controlled stock-removal abrasive.	Check weld removal allowance, edge shape, heat and panel flatness.
Scratch refinement	Finer coated abrasive on a compatible tool or support.	Inspect the previous scratches before advancing. Trial the progression on comparable work.
Directional finish	Belt, finishing disc or nonwoven abrasive specified for the finish and substrate.	Match the approved lay and finish sample. Verify abrasive type and grade.
Clean handling	Dedicated, clean abrasives, tooling, supports and wipes suitable for stainless.	Prevent carbon-steel contact and debris transfer between stations.

Record these variables

Record the workpiece, abrasive construction and grade, product ID and dimensions, rated speed, tool model and setting, mounting and required guard or backing. Confirm the manufacturer's compatibility instructions for the exact setup.

Record workholding, access, extraction, required PPE and any permit or fire control. Agree the inspection method and abrasive change criterion before starting.

Use the operation to choose the tool

Match abrasive grade to its construction and support. A coated disc, belt and nonwoven finishing abrasive with similar grade descriptions can leave different scratch patterns. Record the actual product and sequence used on the approved sample.

Follow the current machine and abrasive instructions for the exact setup. FEPA product-specific safety guidance is listed on page 15.

05 / STANDARD WORK

Build the blend in separate abrasive stages

Plan the sequence around the visual and geometry requirements. Inspect each stage before a finer abrasive changes the evidence.

01 **Set the reference and boundaries**
Identify the approved sample, sheet finish, direction and protected edges. Mark the blend zone and the weld geometry and material that must remain.

02 **Prepare a clean, dedicated station**
Check the bench, fixtures, abrasives and cleaning materials for suitability for stainless steel. Keep carbon-steel tools and debris away from the part.

03 **Remove the approved excess weld stock**
Trial the selected compatible abrasive on a representative panel. Check contour, edge form and heat effects at intervals set by the approved work instruction.

04 **Refine the preceding scratch pattern**
Use the next approved abrasive and support. Inspect the transition in the agreed light before moving to the next grade. Refer defects that would require more removal.

05 **Establish the final lay**
Finish in the specified direction and maintain a consistent contact method. Inspect the parent sheet, blend and transition against the reference sample.

06 **Clean and inspect the finished part**
Follow specified cleaning or surface treatment. Record the cleaned appearance, geometry and any required roughness or treatment evidence before release.

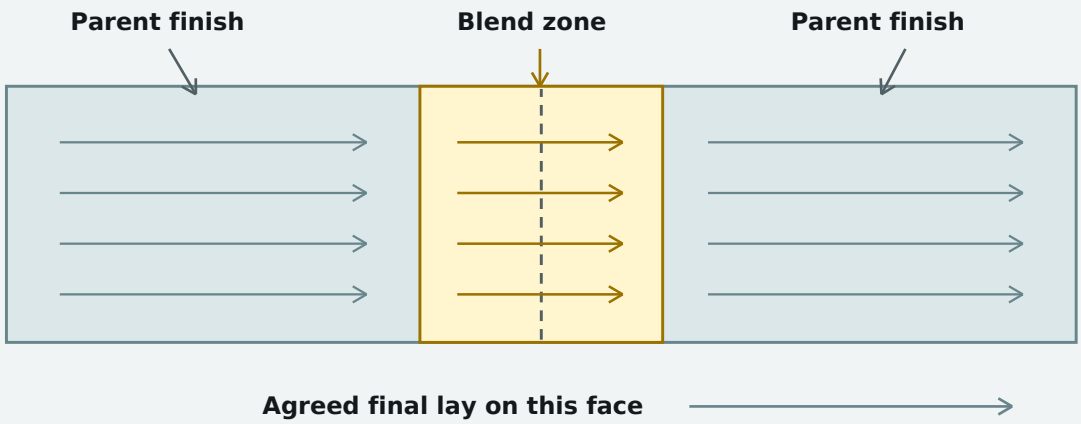
Record the release before proceeding
Record the final abrasive, direction, inspection lighting and approved sample ID. Where roughness is specified, retain the method, measurement direction, location and result.

06 / APPLICATION DETAIL

Inspect the transition across the blend

The plan view represents one visible face of a panel. The central band marks the approved blend area. Inspect the parent finish on both sides and the transition in the same light.

INSPECTION SCHEMATIC



FEATURE OR CHECK	WHAT TO CONTROL
Final lay	The arrows show the agreed direction on this example face. Use the approved sample and drawing to define the actual direction on each face.
Blend boundary	Inspect the scratch pattern across the transition. Stop for a deeper mark, excess stock loss or a change in edge shape that exceeds the approved work instruction.
Acceptance evidence	Record viewing method and sample ID. Where the drawing requires roughness, record instrument settings, trace direction, locations and values.

Use the drawing as an inspection aid

Put the actual dimensions, limits and methods from the approved work instruction on the job card. Mark the feature, inspection location and disposition on the workpiece record.

07 / INSPECTION AND ACCEPTANCE

Check the cleaned panel under repeatable conditions

Set the lighting and viewing method before the trial. Inspect the same features in the same sequence on baseline and candidate panels.

CONTROL POINT	VERIFICATION METHOD	EVIDENCE TO RETAIN
Approved appearance	Compare the cleaned parent surface and blend against the approved sample.	Sample ID, viewing direction, lighting and visual result.
Lay and transition	Check for cross-grain marks, abrupt gloss change and surviving coarse scratches.	Record the location and type of any mark or transition requiring review.
Weld and edge geometry	Check permitted blend, edge shape, flatness and any drawing features affected.	Document gauge or fixture, result and any authorised rework.
Surface roughness	Use the specified instrument, direction and method where the drawing calls for it.	Readings, units, location and acceptance reference.
Cleanliness and treatment	Verify the specified clean or treatment route and traceability.	Treatment record, inspector and release status.

At the hold point

Record actual readings and units where the inspection plan calls for measurements. Record the applicable limit or reference, method, date and reviewer. Retain the rejected or held items in the register until the responsible team records their disposition.

Apply the named requirement

A visual sample governs appearance when specified. Roughness readings complement that inspection where called up. Record both requirements and avoid treating them as interchangeable.

08 / INTERFACE AND RELEASE CONTROLS

Control contamination from handling to release

The final brushed appearance depends on what touches the stainless before, during and after finishing. Document the handoff between stations.

CONTROL POINT	WHAT TO VERIFY	WHAT TO TRANSFER
Material handling	Keep clean supports and handling surfaces for stainless work. Protect visible areas during transfer.	Inspect the incoming and cleaned parts for marks and debris.
Tools and media	Dedicate approved abrasive and tooling to stainless. Identify grades and supports to avoid mix-ups.	Record the actual tools and abrasive sequence by operation.
Cleaning	Use the approved cleaning method and materials for the panel and finish.	Confirm the part is clean enough for the agreed appearance inspection.
Treatment if specified	Use the qualified route for any required treatment, such as pickling or passivation.	Retain the applicable procedure, treatment and verification records.
Storage and packing	Use suitable clean protection after final inspection. Keep the finished face and grain orientation identifiable.	Transfer accepted panels with finish sample and part records.

Transfer the evidence with the work

Assign ownership of the final appearance check after cleaning. Inspection before cleaning can miss contamination and confuse residue with a defect.

09 / TROUBLESHOOTING

Investigate the cause before repeating the work

Record the first stage where the defect appears. Inspect the material, setup and previous operation before changing the abrasive or repeating a pass.

SYMPTOM	CHECK FIRST	CONTROL THE NEXT RUN
Coarse lines show after final pass	A previous scratch pattern survived refinement.	Identify the last affected stage and refine within the approved removal limits.
Blend looks brighter or darker	Lay, abrasive type, pressure or inspection angle changed.	Compare with the reference panel under agreed lighting and verify the final sequence.
Heat tint, distortion or edge thinning	Excess heat or stock removal may have changed the part.	Hold the part for QA and confirm the approved correction route.
Rust-coloured specks	Possible transferred iron or contamination after handling.	Quarantine affected work, review tooling segregation and use the approved remediation procedure.
Directional haze near a corner	Check tool support, edge contact and the approved lay on each face.	Review the blend boundary and approved final pass on a reference sample.
Repeat handling scratches	Trace when the mark first appears from finishing to packing.	Inspect contact surfaces and protection before changing the abrasive.

Keep the as-found evidence

Use a part or area ID and photograph or reading. Record the setup, stage, observed condition and who approved the next action. Compare the first corrected piece with the same acceptance reference.

10 / CONTROLLED VALIDATION

Run a trial that supports a decision

Can the candidate sequence improve first-pass appearance and cost per accepted panel while meeting the same geometry and cleanliness requirements?

01 **Choose matched panels**
Use the same alloy, sheet lot and finish, comparable welds and the same panel geometry.

02 **Hold inspection constant**
Use the approved sample, direction, lighting and acceptance method for both routes. Log measured checks where specified.

03 **Change one decision at a time**
Identify the abrasive stage or sequence under review. Keep cleaning, handling and other process conditions common.

04 **Measure by stage**
Separate stock removal, refinement, changes and rework time. Record abrasive use by stage and why each panel passed or failed.

05 **Prove repeatability**
Review a second representative batch or operator group before release. Retain the approved sequence, sample ID and change triggers.

Write the approval scope in advance

Name the approved material or part family, tool and abrasive setup, acceptance criteria and responsible reviewer. Define the sample and repeat checks around the risk and normal variation of the process.

ACCEPT
All named criteria pass and the result repeats in scope.

EXTEND
The process needs more evidence for a condition or operator group.

HOLD
A quality or operating limit failed. Investigate before release.

11 / QUALITY AND ECONOMICS

Measure cost per accepted result

Compare the same work and inspection scope. Retain time and consumables for all starts, including work that remains held or rejected.

Calculation

Included cost per accepted unit = included consumables and direct labour divided by finally accepted output. Calculate labour from active, changeover and additional rework minutes once.

Hypothetical comparison at RM 48 per labour hour

ILLUSTRATIVE TRIAL	A / CURRENT	B / CANDIDATE
Units started (panels)	18	18
First-pass accepted	13 / 18	16 / 18
Finally accepted after rework	17	18
Held or rejected at close	1	0
Active, changeover and rework minutes	140 + 22 + 46	134 + 19 + 20
Included direct labour	RM 166.40	RM 138.40
Consumables	RM 56.00	RM 71.00
Total included cost	RM 222.40	RM 209.40
Cost per finally accepted unit	RM 13.08	RM 11.63

The example includes abrasive spend and direct finishing labour. Both routes use the same specified cleaning and inspection scope. Different rework and rejection counts must remain visible.

At the example's candidate labour and accepted output, the candidate could spend up to RM 97.08 on consumables before equalling the baseline unit cost. Recalculate when time, acceptance or the cost boundary changes.

Use the arithmetic to compare scope and yield. The values are hypothetical and the approved quality criteria govern release.

12 / REUSABLE FIELD FORM

Preparation and release card

Print one card per job, batch or zone. Attach the drawing or map, abrasive and tool labels, readings and any authorised disposition.

Panel ID, stainless grade, finish and sheet lot

Drawing, weld release, finish sample and lay

Blend zone, geometry and roughness criteria

Tool and abrasive IDs by stage, cleaning method

STAGE	METHOD OR PRODUCT	READING / EVIDENCE
Agree sample		
Set boundary		
Blend weld		
Refine lay		
Inspect clean		

Release checks

- ☐ Dedicated stainless tools and clean setup verified.
- ☐ Stock removal and previous scratch pattern checked.
- ☐ Final lay and appearance compared with the sample.
- ☐ Geometry and specified cleaning or treatment accepted.

Hold, corrective action or referenced attachment

Inspector, date and release status

13 / REUSABLE FIELD FORM

Paired trial and acceptance record

Complete one record per matched comparison. Attach raw observations, inspections and the list of held, rejected or reworked items.

Trial ID, date, location and operator group

Matching conditions and scope of costs

Panel ID, sample and lighting, scratch or lay result, geometry, treatment and disposition

MEASURE OR OBSERVATION	A / CURRENT	B / CANDIDATE
Tool, setup and consumable IDs		
Started / first-pass / final accepted		
Held or rejected and disposition		
Active / changeover / rework minutes		
Consumable quantity and cost		
Inspection method and readings		
Total included cost / accepted output		

- ☐ Comparable work and the same acceptance criteria used.
- ☐ Failures and rework retained in the record.
- ☐ Acceptance, extension or hold decision recorded.

Approved scope, changes requiring revalidation and follow-up

Reviewer and supervisor, date and decision

14 / TECHNICAL REFERENCES

Source notes and further reading

The references describe methods, application boundaries and abrasive selection. Use the current manufacturer data and the project-specified edition and acceptance criteria.

01 **Euro Inox mechanical finishing guide**
Finishing methods, abrasive types and precautions for decorative stainless surfaces.

02 **British Stainless Steel Association finish guidance**
Agreement of appearance samples and precautions against contamination.

03 **MKTECH Weld Grinding**
Material-specific grinding and geometry protection.

04 **FEPA abrasive safety instructions**
Product-specific guidance for bonded wheels, flap discs, fibre discs and belts.

05 **MKTECH Industrial Abrasives Handbook**
Technical RFQ checklist for materials, abrasive type, machine data and required finish.

06 **IMOA fabrication guidance for austenitic stainless steel**
Prevention of iron contamination by dedicated tools, handling and housekeeping.

07 **MKTECH product families**
Abrasive ranges and technical enquiry details. Confirm the current specification before ordering.

Titles link to the reference pages. The application scenario, sketches and trial figures are illustrative.

15 / APPLICATION SUPPORT

Turn the job details into a better specification

A useful enquiry tells MKTECH what the abrasive must do, how the machine is configured and how the result will be accepted.

INPUT	WHAT TO SEND
Workpiece	Stainless grade, sheet lot and finish, weld geometry, panel thickness and affected area.
Current sequence	Tool model, support, abrasive type and grade at each stage, sequence and typical cycle time.
Required endpoint	Approved reference sample, final lay, allowed stock removal, cleaning and inspection criteria.
Trial and supply	Sample panels, operator and reviewer, trial quantity, expected production and delivery location.

Prepare one representative example

Send the stainless grade, incoming sheet finish, weld and part photographs, final appearance sample, tool model, current sequence and quality checks.

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01 **Discuss the application**
Product selection, trial scope and supply enquiry.

02 **Browse MKTECH product families**
Review cutting, grinding, flap and finishing abrasive ranges.

03 **Read the corresponding case study**
Open the illustrated application and its latest guide.