

MKTECH INDUSTRY SDN BHD / ILLUSTRATIVE INDUSTRY IMAGE

INDUSTRIAL STEEL COATING REPAIR

Map the patch. Prepare the transition. Prove coating readiness.

For maintenance planners, coating supervisors, plant inspectors and shutdown teams.

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01 / PURPOSE AND NAVIGATION

Define the release before selecting the abrasive

During a planned shutdown, a crew finds local rust and lifting paint on static steel supports. The repair team needs to mark the repair boundary, choose an approved preparation method and hand the treated patch back for coating inspection.

A local coating repair begins with an authorised boundary and a confirmed preparation grade. Inspect the bare area, retained coating transition and conditions before handing the patch over for recoating.

Use the guide in three passes

Confirm coating and asset condition
Identify the support, coating condition, exposure and repair limits. Refer suspected section loss.

Preserve sound retained coating
Use the approved preparation grade and site controls. Treat the edge of sound retained coating as specified.

Release against the named grade
Measure accepted area, labour and consumables. Release each patch against the coating inspection plan.

Find the right section

WORKFLOW	PAGE	VALIDATION AND FIELD RECORDS	PAGE
Process and handover gates	03	Interface and release controls	09
Starting condition assessment	04	Troubleshooting and escalation	10
Abrasive and machine selection	05	Controlled trial design	11
Work instruction	06	Quality and cost comparison	12
Inspection schematic	07	Printable field forms	13-14
Inspection and acceptance	08	References and application support	15-16

Scope and authority
This scenario covers coating repair on static steel supports. The maintenance and coating authorities govern scope, permits, exposure controls and release. Refer suspect section loss, cracks and changes to structural members for assessment.

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 Map patch | 02 Clear permit | 03 Prepare steel | 04 Check edge | 05 Release coat

STAGE	CONTROL THE OPERATION	RELEASE EVIDENCE
Survey and identify	Map failure, retained coating and substrate condition. Confirm coating history or request hazard assessment for unknown layers.	Tagged repair locations, approved limits and disposition of suspect defects.
Plan the repair	Confirm the specified coating system, preparation grade, access and site permit controls. Define required checks and hold points.	Approved repair method and inspection plan.
Prepare the patch	Remove affected coating and corrosion with the authorised method. Feather the transition to sound coating as specified.	Prepared zone, sound edge transition and agreed repair boundary.
Check the surface	Verify the named visual grade, profile and contamination checks where specified. Record conditions at the coating hold point.	Inspector's documented acceptance of the prepared patch.
Hand over and close	Follow coating application, cure and inspection requirements. Record any rework and hand back through the site's release process.	Traceable patch record from initial survey through final acceptance.

Make the handover traceable

Use the asset and patch IDs to link the before-and-after photos, specified grade, readings, inspector and recoat window. Reassess a patch if it becomes wet or contaminated before coating.

Illustrative handover entry

Support PS-08, patch P-03. Site work permit and repair boundary confirmed. The specified grade, transition and profile passed. Ambient and surface readings are on the inspection record. Recheck the patch if conditions change before coating.

03 / STARTING CONDITION

Identify the coating failure and repair limit

The example concerns static steel supports. The maintenance authority defines access, the extent of the repair and any assessment of underlying steel condition.

AS-FOUND CONDITION	DECISION BEFORE WORK	CONTROL TO RECORD
Small zone of lifting paint	Map where failed coating ends and retained coating appears sound.	Obtain approval of the repair boundary and transition method.
Unknown existing coating	Identify coating history and any exposure or disposal hazards with site personnel.	Hold preparation until the site approves the hazard controls and method.
Rust, pitting or suspect section loss	Record the condition and exact location. Request maintenance or engineering assessment as needed.	Use the authorised repair scope after the steel condition is resolved.
Oil, dust or soluble contamination	Identify the exposure and the checks required by the coating plan.	Apply the approved cleaning route and retain the specified evidence.
Restricted access or nearby equipment	Review operating status, work permits, containment and access with site supervision.	Proceed within the authorised method and permitted boundaries.
Unsound coating beyond the patch	Check the retained edge with the specified method and refer any wider failure.	Confirm the revised scope before expanding the work.

Record the starting condition before the first pass

Use the support and patch IDs on the photographs, permit and inspection card. Keep the actual measured area and access restrictions with the trial record.

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
Loose coating removal	Site-approved stripping abrasive or other tool matched to the coating and substrate.	Confirm coating hazards, containment and the named visual endpoint.
Feathered boundary	Suitable blending abrasive for the sound coating transition.	Check adhesion of retained coating and confirm the specified transition and cleanliness.
Profile creation	Approved tool system demonstrated against the named preparation grade.	Measure the profile by the specified method. A smooth-looking surface still needs the required evidence.
Wider or severe corrosion	Escalate to maintenance and the coating authority for the required assessment and method.	Confirm remaining steel condition and the scope of permitted surface work.

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

Select the method from the named preparation grade and coating specification. A stripping abrasive can remove loose coating or help form a transition, while a profile requirement needs a demonstrated tool system and the specified measurement method.

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

05 / STANDARD WORK

Write a patch preparation and release sequence

Use this sequence to plan a site-approved repair on a static support. Confirm the permit, substrate and preparation grade before abrasive work.

01 **Map and photograph the patch**
Record support and patch IDs, coating condition and affected area. Mark retained coating and features that require protection.

02 **Approve the access and repair route**
Confirm site authority, work permits, exposure controls, containment and inspection hold points. Route suspect section loss for assessment.

03 **Clean and prepare the affected steel**
Use the specified cleaning and preparation method. Maintain the marked boundary and verify the named preparation grade on representative and difficult areas.

04 **Feather the retained coating edge**
Treat the transition to sound coating as specified. Check edge condition and any roughening required for the approved coating overlap.

05 **Measure and release the prepared patch**
Verify the specified visual condition, profile, cleanliness and environmental checks. Record any hold and required re-preparation.

06 **Recoat and close the record**
Follow the coating product data and site inspection plan for application, cure and final release. Record the patch disposition and return-to-service authorisation.

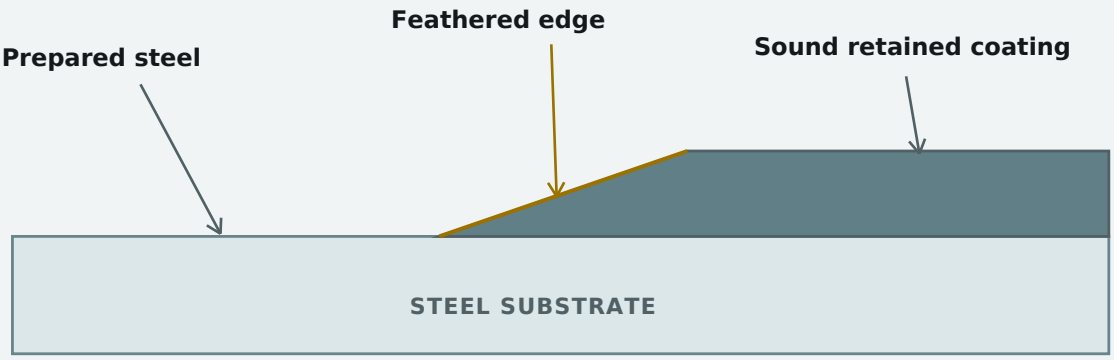
> **Record the release before proceeding**
> Use the asset and patch IDs to link the before-and-after photos, specified grade, readings, inspector and recoat window. Reassess a patch if it becomes wet or contaminated before coating.

06 / APPLICATION DETAIL

Read the transition from bare steel to sound coating

The section shows a feathered transition before application of the repair coating. The specified preparation grade applies to the exposed steel, and the coating system defines the overlap onto sound retained coating.

INSPECTION SCHEMATIC



Use the repair specification to set the overlap and inspection limits.

FEATURE OR CHECK	WHAT TO CONTROL
Prepared steel	Inspect the named cleanliness grade and profile where required. Record the reading and its location before coating.
Feathered edge	Check that the retained coating is sound and the transition meets the approved repair method.
Overlap area	Confirm compatibility, surface treatment and overlap from the product data and work instruction. The diagram provides no prescribed width.

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 patch at the coating hold point

Plan the inspection before preparation. Record the method, limit, location and time so the patch can be rechecked after an interruption or exposure.

CONTROL POINT	VERIFICATION METHOD	EVIDENCE TO RETAIN
Scope and substrate	Check the support ID, approved repair boundary and any structural disposition.	As-found photographs, scope and site release.
Named prep grade	Use the visual method specified for the selected repair route.	Grade, patch location, time and acceptance record.
Profile and cleanliness	Apply the specified profile and contamination checks when required.	Measured values and units, method, instrument and location.
Retained coating edge	Check the feathered transition and retained coating as required by the approved repair procedure.	Inspection result and any approved change to the boundary.
Environment and timing	Compare surface and ambient readings and exposure interval with the coating product data.	Dated readings, release time and any trigger for reinspection.

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

Enter the preparation grade exactly as called up. Power-tool cleaning to remove loose matter and power-tool cleaning to bare metal with a profile have different acceptance requirements.

08 / INTERFACE AND RELEASE CONTROLS

Choose the preparation route by its endpoint

The site repair specification selects the allowed method. Use the named grade, coating data and inspection requirements to decide whether the prepared patch can be coated.

CONTROL POINT	WHAT TO VERIFY	WHAT TO TRANSFER
SSPC-SP 3 when specified	Power-tool cleaning targets loose rust, mill scale, paint and other loose detrimental material.	Use the actual standard and project criteria for allowable adherent material and visual acceptance.
SSPC-SP 11 when specified	Power-tool cleaning to bare metal also requires a specified profile under the standard.	Verify the visual endpoint and profile using the agreed method.
Blast-cleaned repair zone	Use the required blast cleaning where the project calls for it and the site authorises the controls.	Record the actual cleanliness and profile evidence.
Retained coating and overlap	Verify compatibility and the condition of the retained coating. Feather or roughen to the specified endpoint.	Record the approved boundary and the receiving coating system.
Recoat window and cure	Confirm the product data for conditions, intervals and release requirements.	Record any delay, wetting, repair or inspection before final acceptance.

Transfer the evidence with the work

Confirm the current edition of the project standard and product data. Use the same method and limit for comparable baseline and candidate patches.

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
Retained coating lifts at edge	The boundary includes unsound or incompatible coating.	Refer the area to the coating inspector and revise the boundary through the approved method.
Shiny but profile reading fails	The tool smoothed the surface or did not create the required profile.	Hold coating. Review the approved preparation system and repeat the measurement after correction.
Condensation or renewed rust	Exposure, delay or conditions changed after preparation.	Check the coating product data and inspection plan. Reprepare affected patches as instructed.
Deep pits or apparent section loss	Damage may extend beyond the coating system.	Hold the area and obtain maintenance or engineering assessment.
Repeat rust at the repair boundary	Check retained coating, contamination, exposure and the repair overlap record.	Refer the patch and coating record to the coating authority before broadening the repair.
Area per hour varies widely	Compare access, starting coating and corrosion severity, containment and interruptions.	Separate patch groups and repeat with a controlled comparison.

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 preparation route improve cost per accepted patch while meeting the same grade, transition and coating release criteria?

01 **Choose a fair patch unit**
Use similar patch areas and comparable coating condition, corrosion, access and containment. Record actual area as a separate measurement.

02 **Define the approved routes**
Record the current and candidate tools, consumables and permitted preparation methods. Use the same coating system and acceptance checks.

03 **Track access and interruptions**
Separate active preparation, abrasive changes, authorised rework and plant delays. Apply the same cost boundary to both routes.

04 **Inspect at the hold point**
Measure the named preparation and profile requirements, where applicable. Retain every held patch and any repeat inspection.

05 **Review by patch condition**
Check repeatability in the agreed access and condition groups. Document what requires a new trial, such as a different coating system or preparation grade.

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 60 per labour hour

ILLUSTRATIVE TRIAL	A / CURRENT	B / CANDIDATE
Units started (equal-area patches)	16	16
First-pass accepted	12 / 16	14 / 16
Finally accepted after rework	15	16
Held or rejected at close	1	0
Active, changeover and rework minutes	158 + 27 + 44	149 + 19 + 25
Included direct labour	RM 229.00	RM 193.00
Consumables	RM 72.00	RM 90.00
Total included cost	RM 301.00	RM 283.00
Cost per finally accepted unit	RM 20.07	RM 17.69

The example includes direct preparation labour and abrasive consumables. Identical containment and coating costs are outside this example. A site comparison should record any changed costs and use the same boundary.

At the example's candidate labour and accepted output, the candidate could spend up to RM 128.07 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.

Support, patch map and coating history

Repair specification, prep grade and coating product data

Access, work permit and authorised preparation method

Contamination, profile and environmental checks

STAGE	METHOD OR PRODUCT	READING / EVIDENCE
Map patch		
Clear permit		
Prepare steel		
Check edge		
Release coat		

Release checks

- ☐ Repair boundary, steel condition and site release verified.
- ☐ Specified preparation and transition accepted.
- ☐ Required readings recorded at the hold point.
- ☐ Recoat, cure and final release documented.

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

Patch ID, area, access, grade, profile, transition, conditions and coating release status

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 **AMPP overview of surface preparation standards**
Scope of hand-tool, power-tool and blast-cleaning standards. The applicable standard supplies the full requirements.

02 **Jotun coating advisory and inspection practice**
Coating specifications, surface preparation, inspection planning and documentation.

03 **ISO 8502-3**
Pressure-sensitive tape method for assessing dust on prepared steel.

04 **ISO 8502-6**
Field extraction of water-soluble contaminants. Use the analysis method and limits specified in the inspection plan.

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

06 **MKTECH Technical RFQ Checklist**
Inputs for selecting a compatible abrasive and defining site trial requirements.

07 **Hempel surface preparation for repair**
Repair assessment, retained coating, feathering and preparation considerations.

08 **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
Asset and condition	Support and patch photos, substrate, coating history, corrosion condition, actual area and access.
Site and method	Approved preparation grade and method, tool model, current consumables and permitted containment.
Inspection	Profile and cleanliness method, coating compatibility and overlap, environment checks and release owner.
Trial and supply	Representative patches and schedule, planned quantities, delivery location and documentation needed.

Prepare one representative example

Send the asset type, patch condition, approved preparation grade, coating information, permitted tool and access constraints, trial area and inspection method.

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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.