



Detailed Budgetary Quotation

Four separate POC packages with adaptive processing

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We propose one integrated in-house POC programme covering scanning, spraying, composite edge trimming and sanding. The component remains fixed to its removable fixture through the complete process. The R8 baseline includes POC spray-booth provision and separates adaptive trimming at S\$150,000 from adaptive sanding at S\$100,000. It includes the requested pocket opening, selective coating correction and shared decontamination concept. Earlier robot substitution and contact-metrology variations still require a reconciled commercial offer.

POC work package	Qty	Amount SGD
Scanning proof of concept	1 lot	100,000
Spraying proof of concept including POC booth	1 lot	200,000
Adaptive trimming proof of concept	1 lot	150,000
Adaptive sanding proof of concept	1 lot	100,000
Total excluding GST		550,000

R8 pricing status: S\$550,000 is the revised four-package baseline, not a confirmed all-inclusive price for the new IRB 4600 platform and probing scope. R8 variations are listed in the variation schedule with prices to be confirmed.

The S\$550,000 total replaces the earlier S\$450,000 combined-package baseline and S\$441,000 planning envelope. The earlier S\$55,000 provisional sums are absorbed into this revised budget and are not added again. Shared POC resources are allocated once across the packages.

Budgetary basis: the following breakdown allocates each package total for scope review; it is not a set of confirmed supplier quotations. Confirm the booth specification, temporary equipment, material conditions and trial matrix before firm commercial issue. A registered Q number will be assigned before order.

Location: AETEC in-house. Final permanent production equipment, production installation and SAT are separately quoted after the POC.

A Scanning proof of concept

Package total SGD 100,000 excluding GST

Ref	Included development and trial scope	Allocation SGD
A1	Requirements and metrology plan Agree representative parts, reference method, traceable comparison locations, uncertainty study and witness criteria.	10,000
A2	Fixture datum and protected targets Develop fixed fixture references, retained optical targets, sealing adapters, robot-operated caps and repeatable registration. Shared pallet interfaces are coordinated with Package C.	20,000
A3	Scanner and C-Track access Budget for temporary scanner, tracker, software access and application support. Validate mounting permission, protected storage and tracking visibility.	25,000
A4	Scanning integration and software Integrate robot scanning, rigid C-Track support, coordinate registration, pre/post surface comparison and quality masks. Develop the edge-location interface for Package C.	20,000
A5	Repeatability and reference trials Run repeat scans, refixture checks, known-reference comparisons and coating-thickness correlation; record inaccessible or invalid areas.	15,000
A6	Reports and handover Provide measurement maps, uncertainty findings, setup instructions, integrated POC evidence and review sessions.	10,000
	Package subtotal	100,000

Scanning evidence

Establish repeatability and registration in the fixed fixture frame. Compare scans before and after coating against qualified direct references. Surface difference is not automatically coating thickness; deformation, temperature, visibility and reference uncertainty must be assessed.

B Spraying proof of concept including POC booth

Package total SGD 200,000 excluding GST

Ref	Included development and trial scope	Allocation SGD
B1	POC spray booth and extraction Allowance within this package for the POC enclosure/booth, filter and extraction arrangement, lighting, make-up air and agreed duct/service interfaces. Supplier scope and in-house installation are to be confirmed.	80,000
B2	Paint supply and spray tooling One coating system: in-booth batch supply tank, agitation and delivery interfaces, interchangeable nozzle, head shut-off, sealed couplings and contained flushing receiver.	30,000
B3	Robot access and protective package Retained baseline allocation for temporary robot/protection access. The new IRB 4600 package and its accepted protection configuration require supplier and commercial reconciliation.	30,000
B4	Wet tool bay and shared cell integration Dedicated extracted wet nozzle bay on the opposite side, separate from metrology and abrasive bays. Include capped/flush receiver, ventilation permissive and shared frame/service interfaces.	20,000
B5	Spray process research and trials Develop full coating and selective re-spray paths for verified thin regions, overlap, deposition build, flash/cure conditions and clean-release recipes.	25,000
B6	Installation verification and evidence In-house integration, readiness checks, witnessed spray trials, reports, process records and contribution to the complete app/video.	15,000
	Package subtotal	200,000

Booth is included in this package

B1 is an S\$80,000 allocation inside the S\$200,000 spraying package. It covers POC booth/enclosure and associated extraction provision; the previous blanket exclusion of a new POC booth is removed. The exact supplier scope, suitable in-house position and utilities must be reconciled before order.

The earlier specified ATEX protective package does not establish approval for the replacement IRB 4600. Confirm the exact new robot configuration, protective system, certificate scope and supplier installation conditions before live spraying. Coating flash/cure and verified air clearance precede cleaning and optical release.

C Adaptive trimming proof of concept

Package total SGD 150,000 excluding GST

Ref	Included development and trial scope	Allocation SGD
C1	Composite trimming tool and protected bay Interchangeable spindle, composite cutters, local extraction hood, tool identification and standstill feedback.	30,000
C2	Rigid fixture and cut-out support Four-column trial fixture, broad internal expanding shoes, retained screw clamps, pallet interface, pocket cut-out backing and retention concept.	30,000
C3	Adaptive edge and pocket path generation Register mounted scan to approved CAD, map permitted distortion, generate edge and through-opening paths, apply compensation and confidence limits.	35,000
C4	Shared robot and tool decontamination station One extracted hood for the attached tool, wrist and distal arm. Vacuum-first cleaning with captured air jets and closed-dock vacuum interfaces. Shared with sanding, charged once here.	20,000
C5	Trimming trials and verification Coupon and representative-part edge/pocket trials. Assess cut quality, contour error, fibre damage, backing and cut-out retention. Verify in the same fixture frame.	25,000
C6	Trimming evidence and integration Reports, recipes, updated process simulation/video and integrated trimming handover.	10,000
	Package subtotal	150,000

Adaptive edge and pocket opening

Scan the component after final clamping, register its actual position, and adapt approved edge and pocket contours within agreed distortion limits. The black pocket region is a through-opening to be cut, with retained cut-out/backing and qualified edge quality. Its final shape and tolerances follow approved DSO CAD.

Cutting trials determine spindle/tool choice, feed, stock allowance, backing and capture. Record contour error, fibre pull-out, delamination and exposed-core damage; use supplementary inspection where optical surface scanning cannot establish integrity. Keep targets and optics covered during trimming, sanding and cleaning.

D Adaptive sanding proof of concept

Package total SGD 100,000 excluding GST

Ref	Included development and trial scope	Allocation SGD
D1	Compliant sanding head and abrasive bay Force/compliance interface, abrasive tooling, local source capture and isolated abrasive storage.	25,000
D2	Selective sanding path generation Use qualified coating evidence to nominate thick areas. Generate bounded removal paths, protect edges/openings and inhibit uncertain regions.	25,000
D3	Sanding process trials Qualify force, speed, abrasive selection, removal per pass and coating/substrate protection on agreed coupons and parts.	25,000
D4	Clean-release and correction-loop integration Connect sanding to the shared C4 cleaning station. Vacuum dirty dock before opening, verify cleanliness and route thin areas to Package B re-spraying.	15,000
D5	Post-correction verification and handover Final scan comparison, correction records, recipes and witnessed demonstration.	10,000
	Package subtotal	100,000

Adaptive sanding is a separate POC

Use qualified pre/post coating evidence to identify excess material and generate selective sanding paths. Verify after removal. Thin regions route to local re-spraying under Package B, followed by conditioning, cleaning and final verification. Shared C4 decontamination equipment is not charged again.

Sanding trials establish removal per pass, compliant force, abrasive life and substrate protection. Qualify the clean-release sequence and rescan before assigning local re-spray. Record every correction against the same fixture datum.

Integrated trial scope and commercial terms

Trial basis

Retain the earlier bounded programme: one 1.4 m cylinder and up to two open-cover samples, one coating system, 15 metrology coupons and 12 process/sacrificial coupons. Allocate the process coupons between trimming, spray and sanding in the agreed test matrix. DSO supplies representative parts, coupons and process materials; additional consumable parts require agreement.

Plan three full-part executions, up to three correction iterations per family, three refixture checks, ten repeat readings at low/middle/high conditions and at least 60 agreed reference locations. Include one implementation-related correction/retest. Edge acceptance, coating criteria and trial sequencing are agreed before destructive work.

Complete sequence and deliverables

Load and lock the fixture; scan and generate adaptive edge/pocket paths; cover references; trim the edge and pocket opening; clean the attached tool and wrist in the extracted hood; vacuum the closed dirty dock before returning the tool; clean the workpiece; uncover and verify; cover and spray; condition and clean; measure and generate thick/thin correction paths; cover and sand thick areas; repeat attached-tool and dock cleaning; rescan; cover and locally re-spray verified thin areas; condition, clean and verify again; protect targets; run approved needle and optional touch measurements; then unload. Provide paid custom prototype fixtures, reports, maps, recipes, configuration records, processed parts, design sheets, the 108-step web app and narrated video. Include two witnessed reviews and two half-day training sessions.

Baseline payment and programme

Milestone	Share	Amount SGD
PO and kickoff	30%	165,000
Design and test protocol approval	30%	165,000
POC platform and trial readiness	20%	110,000
Agreed tests and report delivered	20%	110,000
Total	100%	550,000

The amounts above apply to the revised S\$550,000 baseline; recalculate milestones after unpriced variations are agreed. Invoices payable within 14 days. GST is additional at the applicable rate. Budget validity: 30 days from 2 October 2026. The previous 12-week target is subject to reconfirmation after booth procurement, equipment access and site readiness; it is not a fixed delivery commitment.

Responsibilities and acceptance

DSO supplies approved CAD, mass/centre of gravity, material and laminate/core details, contact and retention limits, coating SDS/TDS, specimens and consolidated acceptance criteria. Acceptance covers the agreed tests, data, demonstration and report; technical Go / Conditional Go / No-Go is recorded separately. Prototype workmanship warranty remains 90 days; wear, consumables, material outcomes and third-party equipment terms are excluded.

Scope boundaries and design release

Included common infrastructure

The four package totals share one temporary trial platform, common modular frame, adapted vertical C axis, removable fixture interfaces, protected tool exchange, fixed optical references and integrated controls. The POC booth is included through Package B. Temporary robot/metrology access does not include buying a second permanent production set.

Separate scope

Final production robots, permanent pedestal/turntable, purchased production metrology, production manufacture/installation/SAT, endurance testing and guaranteed production takt or coating capability.

Building alterations, landlord approvals, utility upgrades beyond agreed connection points, major external duct/fire-system works and a production booth enlargement. Confirm any such site needs before commitment; POC booth equipment provision remains included in B1.

Actual abrasive sandblasting trials and blast media/recovery equipment. The eight-position R8 separated tool storage includes trimming and both probes; a blasting module remains future expansion.

Pallet stacker/jack/crane supply; coating and cleaning materials; extra part variants or unlimited trials; structural material qualification, NDT certification and production certification.

Enterprise integration, unrestricted background-IP transfer and a fully released robot program for both robot options. ABB IRB 5500 remains a separately engineered spraying alternative.

Release before physical trials

Confirm the robot/protective-package configuration, tooling and service loads, fixed pedestal stiffness and stability, fixture retention, cutting allowances, exact-CAD paths, joint continuity, collisions, dust capture, clean release and C-Track visibility. The raised fixture and final 2.1 m component require a new room-height review. R8 shows a proposed 4.5 m cell with 4.0 m roller-shutter opening; the existing 3.3 m booth is not released for this arrangement. In-house POC headroom requires a site survey.

Ownership and earlier work

DSO receives its parts, paid custom prototype fixtures, project-specific reports/data and an internal-use licence to the compiled POC app. AETEC retains background IP, generic algorithms and interfaces. Temporary equipment remains with its provider. Reconcile previously paid fixture/metrology work and confirmed equipment loans before formal issue to avoid duplicate charging. This POC does not combine the separate Junxiang system, Nomex equipment or wider manufacturing programme.

For Aetec Pte. Ltd.

Name / signature: _____

Date: _____

Customer acknowledgement

Name / signature: _____

Date: _____

Unpriced variations and release items

The four priced R8 packages include the adaptive process and contamination-control development described above. The following earlier hardware substitutions and probing additions remain unpriced pending supplier reconciliation. No supplier offer or approved variation amount has been assumed. Reconcile substitutions, prior payments and temporary equipment loans before issuing a firm R8 quotation.

R8 change	Quantity and scope	Price status
ABB IRB 4600 platform	1 robot access package; 40 kg / 2.55 m; fixed 1.5 m pedestal, load review and accepted protection arrangement. Supersedes the earlier robot/vertical-axis concept.	To confirm
Raised rigid fixture	1 carrier system; four closed box columns, ties/braces, two levels of broad expanding shoes, positive locks, low permanent targets and offset cap gripper.	Reconcile C2/A2
Booth and tool magazine	Full-width roller shutter, proposed higher envelope, eight enclosed tool positions with vertical presentation, clean/abrasive separation and an opposite-side extracted wet bay. Included development allocations require supplier scope reconciliation.	Reconcile B1/B4
Needle thickness probing	1 indicator assembly and controlled needle adapter; 20/32/40-point software plan, reference foot, limits, coupon endpoint validation and penetration report.	To confirm
Optional touch probing	1 touch-trigger head, ceramic sphere/cover, qualification, six fixture checks, 16 component points and drift recheck.	Separate option
Engineering verification	Updated CAD paths, collision/visibility review, tool loads, uncertainty and physical POC verification. Exact sample CAD and engineering release are required.	Reconcile programme

Contamination control and adaptive-path basis

After both trimming and sanding, keep the dirty head attached until the robot wrist, distal arm and tool pass through vacuum-first decontamination with captured air. Vacuum closed docking lids and seal surrounds before opening. Keep metrology, target caps and C-Track sealed until a verified clean release. Dedicated wet-bay extraction controls solvent vapour accumulation; a capped or approved flushing receiver separately addresses nozzle drying and residue. Airflow, capture velocity and hazardous-area equipment require supplier design and commissioning.

The animation uses a parameterised opening and synthetic deviation maps. Customer Parasolid Hole Cutout CAD is identified but native geometry translation, process support and exact collision verification remain release tasks. Surface difference alone does not prove coating thickness; use the qualified reference method before automatically removing material or adding paint.

Contact metrology trial definition

Needle probing follows the final optical scan, with target caps and optical systems protected. Use approved penetration sites on cured coating. Establish substrate endpoint, force/depth limits, compliance correction and repair or coupon disposition. Differential indicator travel from a surface reference foot is the measurement; robot position alone is not coating thickness.

Optional dimensional probing qualifies the stylus on a traceable ceramic sphere at the intended probing conditions, then touches, latches and retracts at fixture/component points. Recheck the sphere for drift. Agree robot-system uncertainty separately from nominal repeatability; the sphere does not confer CMM accuracy.

Commercial release

Revised baseline S\$550,000 excluding GST plus or minus agreed R8 substitutions and additions. Optional touch probing remains separately selectable. Final production supply remains separately quoted. Confirm the complete revised scope and commercial total before purchase commitment.