GUIDE OVERVIEW | SIGNED ENGINEERING REQUIREMENTS CONTROL

MIC-6 Plate: Procurement to Release

Use this guide with both Excel workbooks. It links MIC-6 purchase terms to receiving inspection, CNC machining, free-state metrology and final supplier disposition. A stock flatness claim is not a finished-part flatness result.

Three controlled handoffs

STEP	REQUIRED OUTPUT	ACCEPTANCE OWNER
1. Purchase	Material identity, cut size, product condition, explicit stock limits	Purchasing + engineering
2. Receive	Lot link, actual thickness/flatness, method, surface/visual check	Receiving quality
3. Machine	Setup count, support, release and post-machining condition	Manufacturing
4. Inspect	Drawing CTQs, qualified measured results and report IDs	Metrology
5. Release	Contractual rule, uncertainty, signed disposition	Authorized quality reviewer

Quick rule

Do not release from one spreadsheet number. A recorded 0.042 mm finished flatness value can satisfy a 0.080 mm nominal limit in its original case, but another part requires its own measurement method, decision rule and approval.

Who should use it

Mechanical and fixture designers: define critical surfaces and support states. Buyers: obtain comparable quotes and material documentation. Manufacturing engineers: plan setups and release checks. Quality engineers: maintain traceable measurements and sign the disposition.

Workbook files

01 Stock Specification & Incoming Inspection Workbook: 7 tabs. 02 Finished Flatness & GD&T Acceptance Workbook: 7 tabs. Both include a blank reusable workflow and a separate real EPOC CRAFTER case reference.

SUPPLY CONTRACT | MATERIAL IDENTITY

Specify the Stock Before Ordering

Quote a defined MIC-6 product, not a generic aluminum plate. Supplier substitutions, surface treatment, sawing and any additional milling must be stated as separate conditions.

RFQ FIELD	MINIMUM REQUIRED INFORMATION	OWNER
Material identity	MIC-6 trade name, producer, production lot; no unapproved substitution	Buyer
Cut blank	L x W x T nominal, cut direction, edge/trim conditions	Engineering
Thickness	Lower and upper stock limits, agreed method of verification	Engineering
Flatness	As-supplied requirement, measured state, support and scope	Quality
Surface	Both-face milling condition; Ra only where specified	Buyer + quality
Documentation	PO/drawing revision, lot certificate and any report requested	Supplier
Delivery	Quantity, stock form, split lots and confirmed working days	Buyer

Product literature is conditional

Published MIC-6 literature cites **0.005 in (0.127 mm)** maximum stock flatness deviation for plate thicknesses 3/4 in and above, and **0.015 in (0.381 mm)** for 1/4 to 5/8 in. Check the latest material specification supplied for the actual plate and order, including any cutting service or special acceptance condition.

Real case purchase condition. Arconic MIC-6 batch A, dated 2026-10-02; blank 460 x 320 x 25.4 mm; specified thickness 25.273 to 25.527 mm; incoming flatness maximum 0.127 mm; both faces precision milled with specified Ra maximum 0.50 micrometre. These are specification limits, not a fabricated set of receiving measurements.

RECEIVING CHECKLIST | LOT TRACEABILITY

Incoming Material Acceptance

Receiving sequence

CHECK	RECORD TO CAPTURE	HOLD TRIGGER
Identity	Producer, product, batch ID, PO and label/certificate reference	Unmatched batch or wrong grade
Blank geometry	Measured thickness range, length and width, equipment and locations	Outside contractual stock limits
Flatness	Observed value, checked face, support, method, temperature where relevant	Exceeded limit or missing method
Surface & edges	Specified face condition, burrs, dents, scratches, Ra where required	Damage affecting use
Documentation	Supplied certificate, inspection report and accepted deviations	Certificate mismatch
Disposition	Inspector, date, approved decision rule and evidence bundle	Missing approval

Separate numeric comparisons from formal acceptance

The stock workbook compares actual thickness values against lower and upper limits and the measured flatness against the stock limit. **Not Evaluated** means that a required observation is missing. **Numeric Check OK** means the entered numbers satisfy the defined limits; it is not final acceptance.

Straightedge and feeler gauge. A recorded contact check is a receiving method description. It should not be reported as a qualified CMM least-squares flatness result. Agree the measurand and evaluation method before using a result for final product acceptance.

If a manufacturer certificate does not show actual lot-level measurements, record it as product identity evidence rather than inventing flatness, Ra, thickness maps or CMM values.

WORKHOLDING | RELEASE CONDITION

CNC Process and Distortion Control

An as-supplied MIC-6 plate can change after significant edge trimming, pocketing or face machining. Its cast/thermally treated condition can reduce certain residual stress risks; it does not prove zero machining distortion.

Process record required for the RFQ

PROCESS ITEM	REQUIRED DETAIL	REVIEW QUESTION
Stock allowance	Material removed from edges and both faces	Can final size be met from stock?
Pocketing	Count, length, width, depth and minimum ligament	Is the remaining section adequate?
Clamping	Support pad layout, clamp contact and preload	Is the part distorted while cut?
Setup count	Number of setups, datum strategy and reclamping	How is accuracy preserved?
Release	When clamps are removed; any dwell before remeasurement	What condition is accepted?
Operating support	Installed supports, force and service temperature	Does service differ from free state?

Recorded case. Two machining setups; 72 min machining plus 18 min allocated setup per part. Finished 440 x 300 x 24.0 mm with two 160 x 100 x 8.0 mm pockets; 16.0 mm remaining under the pockets. Soft support and low-preload perimeter clamping were recorded. No universal machining allowance or clamp force is implied.

Mandatory distinction

A part restrained by machining clamps is not necessarily identical to the free-state part. Do not accept a flatness reading taken while the plate is forcibly pulled against a fixture as the released free-state result.

CTQ MEASUREMENT | CONTRACTUAL DECISION

Finished Flatness and GD&T

CTQ	SPECIFICATION NEEDED	MEASUREMENT RECORD
Flatness	Maximum deviation, defined face and free/restrained state	Qualified result, point plan, method, supports
Bushing holes	Bore size or 8 H7 only when on the released drawing	Each bore or qualified sampling report
Pattern position	Diameter tolerance, drawing datum reference frame	Qualified result and datum setup
Thread inserts	Insert type/size, installation inspection and load limits	Inspection procedure + verification
Installed fit	Four support locations, mounting preload and service load	Installed functional evidence

Numerical margin is not formal release

Margin to an upper limit = specified maximum minus reported measured value. ISO 1101:2017 addresses geometrical tolerance indications; ISO 12781-2:2011 defines flatness specification operators; ISO 14253-1:2017 addresses conformity decision rules considering measurement uncertainty. Record the agreed rule and supporting measurement evidence.

Do not invent a guard band. The workbook can screen with a guard band only when a signed customer/contract decision rule supplies that value. It does not automatically use the instrument expanded uncertainty as a default guard band or label a numeric screening result as ISO compliance.

The real case recorded a 24-hour post-unclamping interval, 20 +/- 2 deg C environment, three-point free support and 49 points per face. The sampling count is specific to the case, not a general mandatory standard grid.

QUOTE SCOPE | COST AND EVIDENCE

Supplier RFQ Acceptance Schedule

Ask each supplier to quote against the same drawing, purchase specification and measurement schedule. Do not compare prices if one quote excludes release inspection, certificate matching or the requested report.

REQUEST	WHAT THE SUPPLIER MUST STATE	QUOTE / APPROVAL RISK
Material	Arconic MIC-6 or an identified alternative; batch/stock condition	Unapproved substitution
Scope	Stock cutting, both-face machining, pockets, bushing and insert work	Hidden operations
Critical GD&T	Flatness, hole size and pattern position with drawings and datums	Uninspectable callouts
Inspection state	Support, release interval, temperature and technique	Measurement mismatch
Inspection package	Incoming lot report, final report, any first article scope	Unpriced reports
Quality decision	Decision rule, reviewer, deviation authority and acceptance records	Contractual dispute
Delivery / exclusions	Qty, lot size, working-day lead, exclusions and rework terms	Unequal quotes

Supplier response fields

Supplier name; quotation ID; revision; quote date; included stock and machining operations; inspection / FAI charge; included certificates; release condition; process changes; delivery; deviations requiring written approval.

Purchasing rule. A quotation without a stated finished-part inspection scope is not equivalent to a quotation with measured flatness and locating-pattern records. Require a revised quote before comparing delivered cost.

PROVIDED PRODUCTION / TEST CASE | OCTOBER 2026

Real EPOC CRAFTER Engineering Case

Recorded application: automated assembly inspection fixture base; MIC-6 plate identified as Arconic batch A, 2026-10-02. The values below are actual case specifications or reported measurements, each stated with its evidence type.

FEATURE	REPORTED VALUE	EVIDENCE TYPE
Stock blank	460 x 320 x 25.4 mm	Case purchase condition
Stock flatness limit	0.127 mm maximum	Specified limit, NOT measured incoming
Stock thickness band	25.273 to 25.527 mm	Specified limits
Finished part	440 x 300 x 24.0 mm	Reported geometry
Two pockets	160 x 100 x 8.0 mm each	Reported geometry
After unclamping	24 h; 20 +/- 2 deg C; three free supports	Recorded inspection setup
Finished flatness	0.042 mm vs 0.080 mm limit	Measured vs drawing acceptance
Locating position	Diameter 0.029 mm vs 0.050 mm limit	Measured vs drawing acceptance
Insert / bushing count	16 M6 x 1.0; 4 steel 8 H7 bushings	Recorded assembly
Output and lead	8 accepted pieces in 8 working days	Recorded delivery

Reported release. The supplied real case records passing finished flatness and locating position, zero defects, zero rework and zero scrap. No individual 49-point coordinates, expanded uncertainty, or actual incoming flatness value were supplied; none is fabricated here.

PURCHASING | MANUFACTURING | METROLOGY | QUALITY

Final Approval and Release

Release gate: required before approval

GATE	EVIDENCE TO CONFIRM	OWNER
A. Source	MIC-6 producer, batch and stock limits linked to the PO	Purchasing
B. Receiving	As-delivered lot readings, inspection method, damage review	Receiving quality
C. Manufacture	Setups, clamp/support and release timing recorded	Manufacturing
D. CTQ	Latest drawing revision and actual finished measurement reports	Metrology
E. Decision rule	Agreed uncertainty/risk approach, exclusions and deviations	Quality + customer
F. Sign-off	Named reviewer, release date, signed acceptance ID	Quality

Disposition vocabulary

NOT EVALUATED = insufficient actual input. **NUMERIC FAIL** = entered result exceeds a specified limit. **REVIEW REQUIRED** = evidence, measurement rule or disposition incomplete. **RELEASE AUTHORIZED** = required records have been reviewed and approval fields completed by the designated authority.

Standards and product reference register

ISO 1101:2017 (geometrical tolerancing); ISO 12781-2:2011 (flatness specification operators); ISO 14253-1:2017 (measurement conformity decisions); ISO 286-2:2010 (hole/shaft deviations); ASME Y14.5-2018 (R2024) where ASME drawings apply. SAE AS9102C:2023 only when aerospace first article requirements apply. MIC-6 original producer literature applies only to its defined product and thickness bands.

Final decision. Release only after matching the material, drawing, manufacturing state, measured CTQs and required approval evidence. A material certificate alone and a stock flatness figure alone are never substitutes for final-part acceptance.