Dimple Drawing, Inspection & Supplier RFQ Guide

Release checklist, first article expectations and nonconformance control

Use with the Dimple Inspection & RFQ Release Workbook. The worked example is part-specific and contains no simulated measurement results.

1. Engineering drawing release

Communicate dimple geometry by a section view and a datum scheme. Avoid a generic "dimple here" note when head fit, local thickness, feature location or support access controls function.

Required on drawing	Meaning / validation
Feature type	Conical flush-seat dimple, emboss, extruded collar or other specific cross-section
Pilot definition	Pre-form geometry to be controlled by manufacturing operation plan
Finished throat + tolerance	Post-form hole dimension, not pilot diameter
Flare OD / height / seat angle	Finished dimension definition and measurement reference
Form direction / appearance face	Direction relative to face A and functional seating location
Tool/fixture constraints	Approved supplier tool ID and clearance envelope, if process-critical
Hardware assembly	Actual head standard/revision and post-assembly flushness specification
Finish and edge quality	Coating requirements, unacceptable cracks, relevant edge indication

Example engineering callout (descriptive, not a standard symbol)

4X CONICAL FORMED SEAT, FORM DOWN FROM FACE A; PILOT DIA 3.0 BEFORE FORMING; FINISHED THROAT DIA 3.30-3.50; FLARE MAJOR DIA 9.0 NOMINAL; FORMED HEIGHT 1.40-1.60 FROM FACE A; INCLUDED SEAT ANGLE 90 DEG; HEAD FLUSHNESS -0.10/+0.10 RELATIVE TO FACE A WITH SPECIFIED COUNTERSUNK FASTENER. PROVIDE APPROVED SECTION VIEW AND INSPECTION METHOD.

This is a textual engineering example only. Angular, flare OD, feature location and tool control requirements still need explicit tolerances or an approved engineering definition.

2. CTQ definition and first article plan

Characteristic	Example requirement	Measurement / evidence
Finished throat	3.30-3.50 mm	Pin or GO/NO-GO gauge; gage ID and report
Formed height	1.40-1.60 mm	Depth gage relative to face A; all four features
Minimum local t	At least 0.95 mm	Approved local thickness method; identify sampled point
Formed-zone flatness	At most 0.20 mm	Reference plate / feeler; define setup
Overall warp	At most 0.50 mm	Reference plate / height gauge; document support
Fastener head flushness	-0.10 to +0.10 mm	Actual M3 head relative to A; each position
Crack and tear	Zero observed at 10x	All four formed roots, record observation and images
Optional service response	20 N / <=0.80 loaded, <=0.10 residual	Approved three-point fixture and complete conditions

These values come from the published 5052-H32 example and shall not be used as generic dimple tolerances. Critical characteristics must identify drawing revision, inspection method, sample size, gage ID, calibration validity, operator and original evidence file.

3. How to capture reproducible measurement evidence

Field	What to enter
Part / lot identity	Job, part number, revision, serial or batch and supplier lot
Condition at inspection	Post-form, post-bend, post-coating or final assembly state
Feature point / datum	D1..D4 point; A-surface or approved datums
Characteristic and limit	CTQ ID and controlled LSL/USL, including one-sided limits
Gage / traceability	Instrument ID, valid calibration, fixture and operator
Actual result	Measured numeric result with units, not CAD nominal
Pass / Fail calculation	Numeric bounds only; absent bounds -> review
Evidence ID	File name/record number of raw readings, photo or inspection report
Disposition	Accepted, rejected, hold, deviation with approval ID

> Inspection result is not traceable unless the original measurement is accessible. Do not copy a nominal dimension into the Actual cell or treat an empty record as a zero-value measurement.

4. Supplier RFQ technical handoff

An RFQ can be delayed even with a complete nominal model if the vendor cannot determine actual tooling, material condition or acceptance. Require these decisions to be recorded explicitly.

Package category	Required to quote with confidence
Released CAD + drawing	2D toleranced PDF; STEP; revision; final formed view; flat pilot intent
Material supply	Alloy/grade and temper, t range, certificate, source and lot traceability
Tooling	Punch-die availability, tool OD/projection, back access, press capability
Feature inspection	Throat/height/angle/flatness/position and defined methods
Fastener and mating parts	Actual part number and needed flush datum / fit test
Finishing and sequence	Bend, anodize, witness marks, post-process fit requirements
Commercial	Prototype/production quantities, tooling quote, lead time, FAI deliverables

Supplier clarification questions

1. Which approved tool set and revision produces the dimple? Provide actual OD and approach envelope.
2. Can the blank or bent part be supported and accessed on both sides for the planned sequence?
3. Which material/temper/thickness lots are qualified, and what trial evidence supports the risk controls?
4. Which CTQs can be measured directly, and which require destructive cross-sectioning or an approved alternative?
5. Will final assembly use the actual specified screw or rivet; what is the agreed head flushness method?

5. First article and process approval sequence

Step	Entry criteria	Required outcome
Pre-build review	Drawing / CTQ / tool configuration agreed	Open issues tracked, revision locked
Trial setup	Known sheet lot and tool/press configuration	Pilot, forming sequence, access documented
Part inspection	Approved datum setup and calibrated equipment	Measured results, zero unrecorded critical dimensions
Assembly validation	Specified fastener and mating component	Seat, underside and head flushness evidence
Quality disposition	Failures and deviations independently evaluated	Approval or HOLD with authorized evidence
Production repeatability	Change control for tool, sheet condition, forming setup	Required revalidation triggers defined

6. Nonconformance and corrective action

Nonconformance	Immediate action	Verification after action
Crack / tear	Hold affected lot, isolate tool/material setup	Inspect root / hole edge under approved magnification
Thinning below minimum	Hold lot, review tooling and local strain	Repeat thickness with qualified method
Wrong seat / proud head	Quarantine assembly, confirm exact hardware	Re-test head flushness and contact in assembly
Excess warp	Check forming fixture, sequence and datum support	Re-run local and overall distortion inspection
Tool collision risk	Stop process, reconcile tool envelope and CAD	Document clearance with approved setup / fixture

Never disposition a failed characteristic based only on a verbal agreement. Record deviation number, authorized approver, scope, rework procedure and post-rework evidence.

7. Drawing and standards reference control

Reference	Use and caveat
ISO 2768:2026	New general dimensional size specification; do not repurpose old ISO 2768-1:1989 tables.
ISO 1101:2017	Geometric tolerances for form, orientation and location selected on the drawing.
ISO 13715:2017	Representation of edges of undefined shape; not a universal burr limit.
ASME Y14.5-2018 (R2024)	Alternative GD&T system when the contract and drawing use ASME.
ISO 10642:2026	Countersunk fastener head geometry. Dimple head flushness is part-specific.

Standard editions / public scope verified against ISO and ASME catalogs 21 November 2026. Purchase or consult controlled authoritative standards where dimensional requirements depend on normative clauses.

8. Final release checklist

Checklist item	Record to attach
Approved 2D/3D drawings match	Drawing revision / 3D revision
Tooling and material evidence complete	Supplier tool ID, drawing, stock certs
Mandatory CTQs measured and reviewed	Raw data, method, calibration and report
Actual assembly fit documented	Fastener batch, position, seating records
All NCRs resolved with authority	Closed NC/CAPA records and deviation approvals
Supplier quotation includes technical scope	RFQ revision / signed deviation list

Only an authorized signatory can release production. The workbook statuses are administrative checks and never stand in for engineering approval.