1.0 Scope

TE Connectivity has adopted high quality standards for connector product appearance to meet the expectations of customers world-wide. This document describes the visual appearance requirements specified to ensure TE connectors meet this high standard.

TE recognizes that connector components, being machined components, are manufactured in a machine shop environment and while expecting parts to be handled with reasonable care, accept that normal day to day handling, particularly during assembly and testing, may cause parts to become marked. This procedure is not intended to limit acceptance of these parts, but to define visual flaws in such a way that clarifies what is and is not acceptable. Unacceptable parts normally have flaws that seriously detract from the visual appearance of the part or could affect performance of the part in its use.

2.0 Purpose

Visual Inspection Procedure to be followed when deciding the acceptability of visual imperfections on TE Connectors.

3.0 Related Documents

DWI 10-10-0001 – Contacts Visual Workmanship Standard

4.0 Responsibilities

4.1 Suppliers Must:

Ensure that parts meet these requirements before shipping. Identification of a visual defect and the decision on whether it meets the acceptance criteria or not can be subjective. In the event of a dispute, clarification must be sought from TE Quality Assurance, whose decision will be final.

Ensure that packing and shipping methods as defined in the purchase specification protect parts such that they meet these requirements when received by TE.

Seek clarification from TE on visual appearance requirements for imperfections not expressly covered by this document.

Prepare and maintain, in conjunction with TE Quality Assurance, suitable visual standards that compliment this document, clarify the definitions, and remove uncertainty.

4.2 TE Connectivity

Quality Assurance is responsible for working with suppliers to further clarify this document, and assist in the preparation of visual standards. See paragraph 6.0

5.0 Safety and Environmental Impact

Manufacturing process, materials, and packaging consistent with minimal potential environmental impact shall be used. Class 1 ozone depleting substances, as defined by the United States Environmental Protection Agency, shall not be used.

6.0 Requirements

6.1 Visual Imperfections

Condition described in Table 1 are unacceptable.
See Appendix for photo examples of acceptable and unacceptable conditions.

- Inspection Requirements
  - Inspection lighting: 1000 LUX (unless otherwise specified in an adhered standard or on the product specification)
- Inspection Distance:
  - All Contacts: ring magnification light/stereoscope at 5x magnification (overrides magnification callout on DWI-10-0-0-1)
  - All other MIL-SPEC parts: ring magnification light/stereoscope at 3x magnification
  - All other parts: unaided eye, 12-18 inches
  - NOTE: Inspection distance callouts above are applicable to ALL purchased parts, unless otherwise specified in an adhered standard or on the product specification/drawing.
- Visual/Cosmetic/Workmanship Inspection Time max: 50 seconds per part (product presented unpackaged)

Table 1: Unacceptable Visual Inspection Findings

	Definition	Cause
Bare Patch	• A region of the part which failed to be fully plated • The region may be dull or shiny	• Grease or oil inhibiting the plating process • Fixtures preventing contact with the plating bath
Blemish	• A region of the part that exhibits an anomaly on base material	• Poor pre-treatment / preparation
Blisters/Bumps	• Localized build-up of plating	• Plating fault / not cleaned properly or etched before plating
Burrs	• Region of a part exhibiting a rough edge or ridge	• Excess material left over from machining
Delamination	• Loss of plating due to flaking	• Improper cleaning prior plating
Dent/Deformation	• Evidence of impact before/after plating	• Dropping or hitting
Scratch	• A bright, narrow line or mark visible to the unaided eye on the surface of the component • Can be felt when crossed with a fingernail	• Poor handling during machining, packaging, or in transit

Table 2: Acceptable Visual Inspection Findings

	Definition	Cause	Extents
Burrs	• Region of a part exhibiting a rough edge or ridge	• Excess material left over from machining	• <.005 in in length on surfaces OTHER than thread for connectors • See DWI 10-10-0001 for contact requirement
Dent/Deformation	• Evidence of impact before/after plating	• Dropping or hitting	• Any dent/ deformation that DOES NOT inhibit core functionality of part
Scratch	• A bright, narrow line or mark visible to the unaided eye on the surface of the component	• Poor handling during machining, packaging, or in transit	• Cannot be felt when crossed with a fingernail • Is not located on any critical sealing surfaces • Does not break through plating

6.2 Surface Finish

- Threads, O-ring and internal sealing surfaces, and external flush-mount surfaces to be free of surface roughness imperfections (unless otherwise specified in an adhered standard or on the product specification)

7.0 Visual Standards

- Visual standards may take the form of example parts, diagrams, or photographs
- Visual standards may be proposed by the Supplier or TE
- Visual standards must be approved by TE Quality Assurance and the supplier
- Five identical standards shall be produced; each assigned a number by TE Quality Assurance
- TE and the supplier are responsible for storing and presenting the standards in such a way as to prevent deterioration and facilitate the inspection process.

8.0 Quality Assurance Provision

8.1 Responsibility for Inspection

The Supplier shall be responsible for all inspection

8.2 Inspection Requirements

In-process inspection shall take place throughout the manufacturing cycle. Test method – visual, see section 6.1 for magnification and lighting requirements.

8.3 Process Control

The supplier shall maintain inspection instructions and records showing that final inspection was carried out in accordance with the instructions. Instructions shall specify the visual inspection requirements.

9.0 Notes

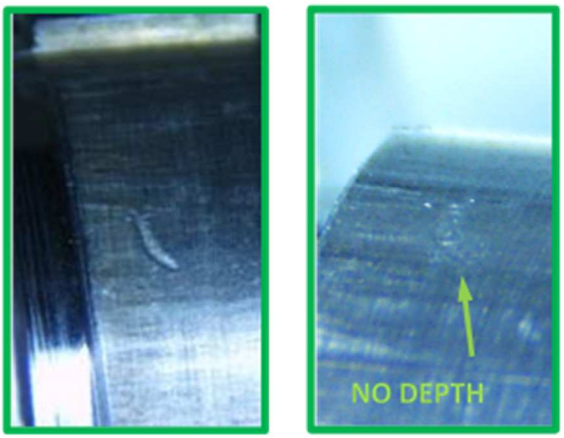
9.1 Custodianship

The TE Oceanside Quality Engineering Group is the custodian of this document and is responsible for any revisions hereto.

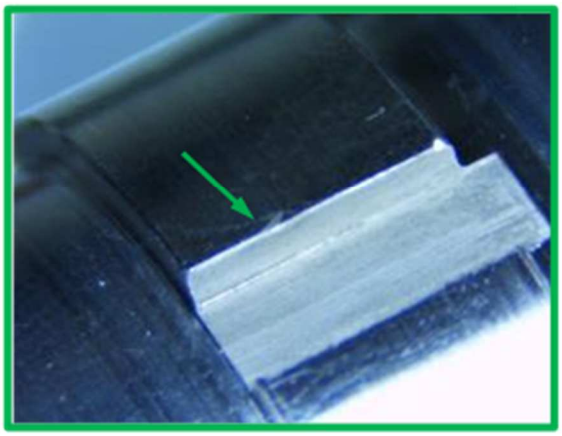
Appendix I – Shell, Ring, Nut Visual Examples

Damage to Key – Only minor, cosmetic defects are acceptable on key OD defects. Defects on edges and corners of keys are not acceptable

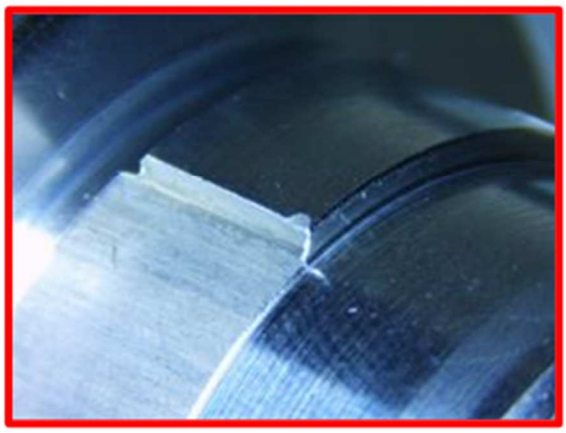
ACCEPTABLE



ACCEPTABLE



NOT ACCEPTABLE



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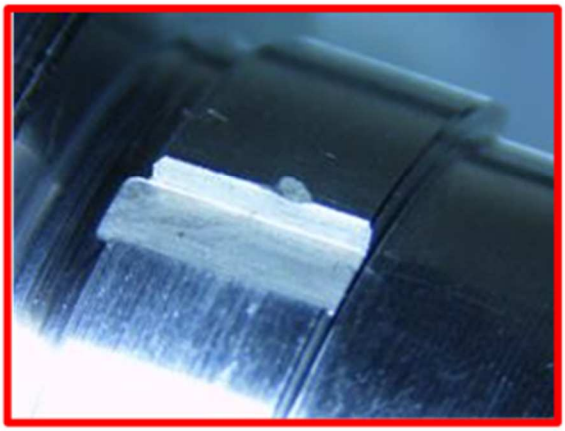

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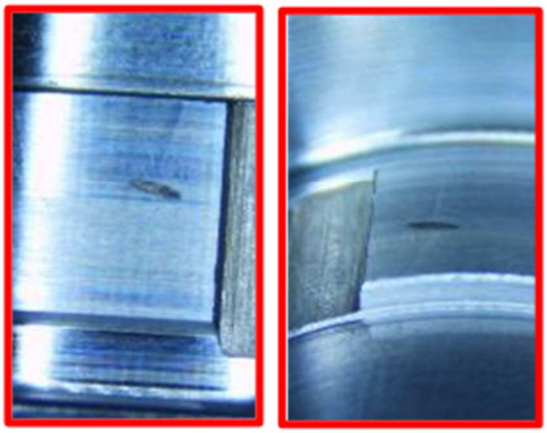
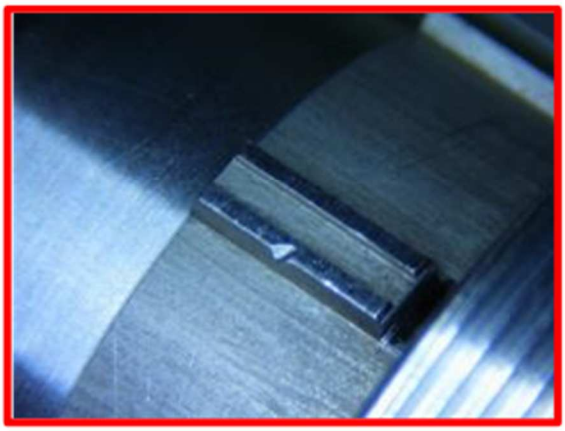
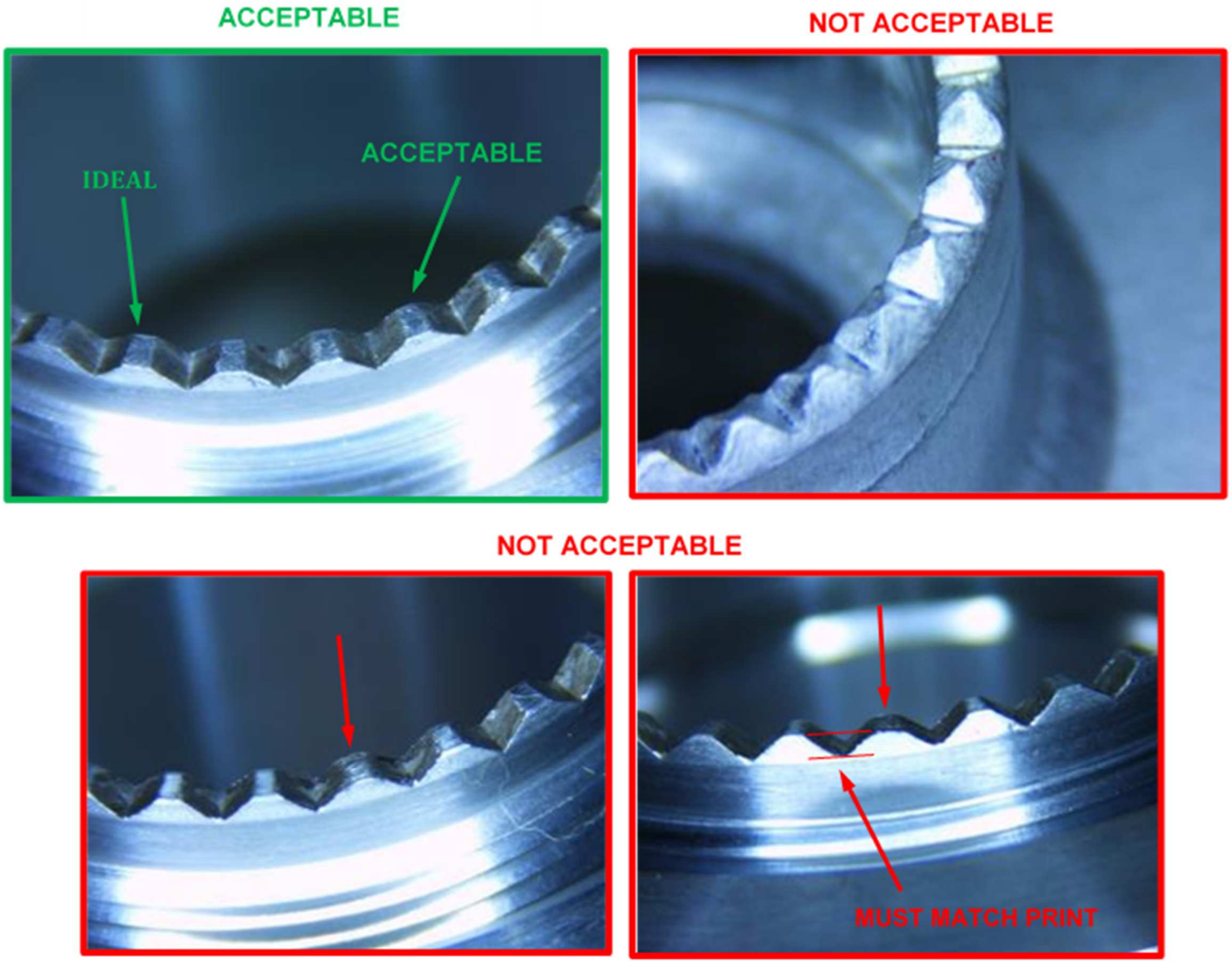


NOT ACCEPTABLE

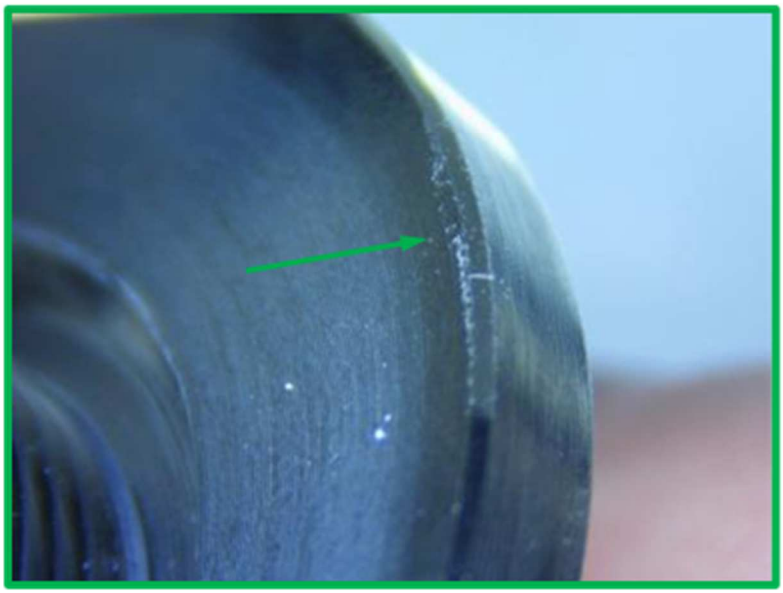


Saw teeth Non-Fill – Saw teeth must be fully formed, non-fill is not acceptable.

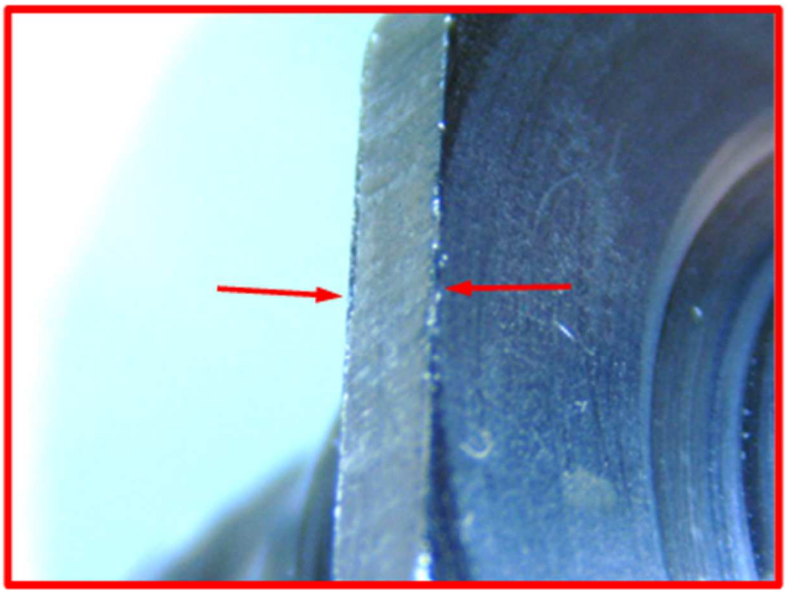


Flange Burrs – Flange edges should be free of burrs larger than .005

ACCEPTABLE

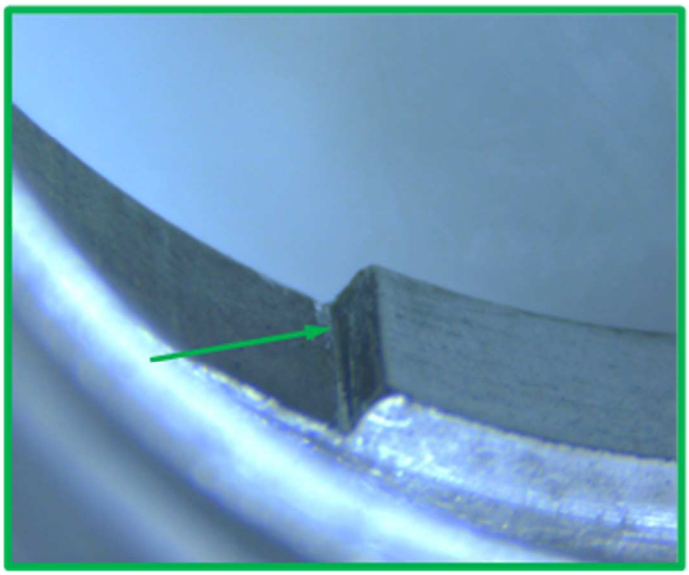


NOT ACCEPTABLE

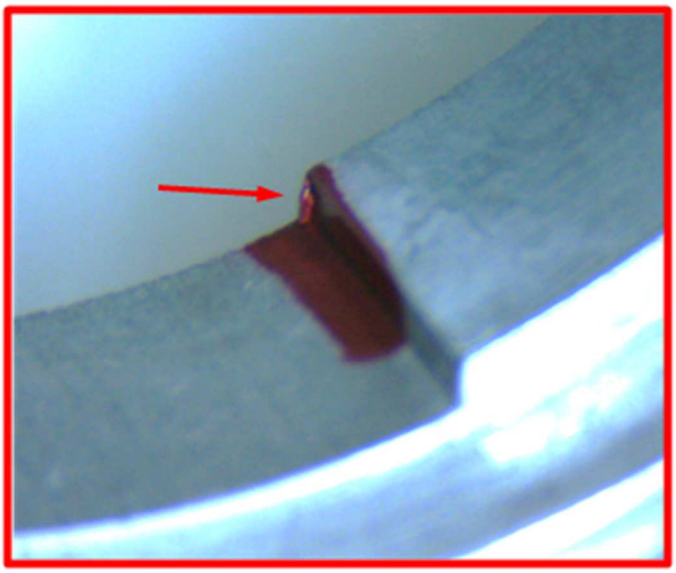


Keyway Burrs – All keyways should be completely free of burrs

ACCEPTABLE

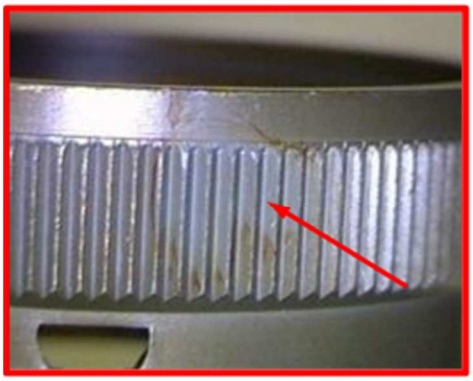


NOT ACCEPTABLE



Plating Contamination – Parts with discoloration from plating are NOT acceptable.

NOT ACCEPTABLE



NOT ACCEPTABLE

NOT ACCEPTABLE

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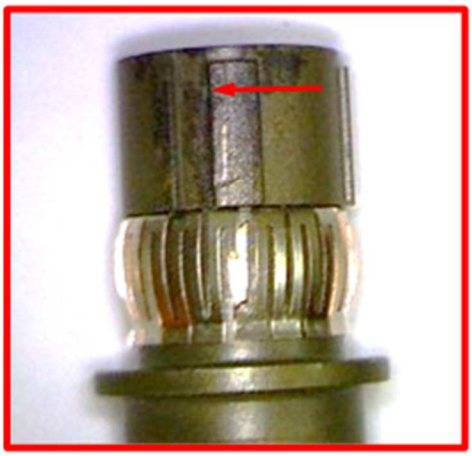
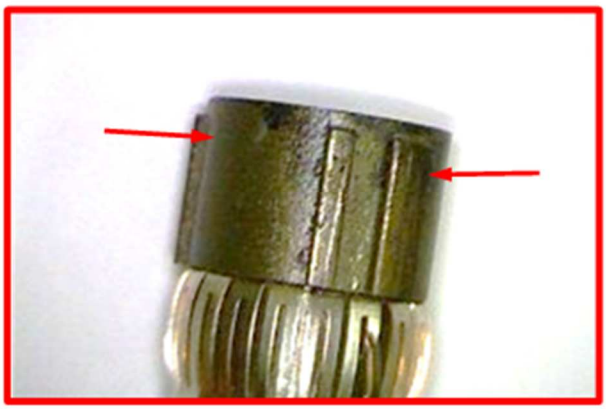
NOT ACCEPTABLE

NOT ACCEPTABLE

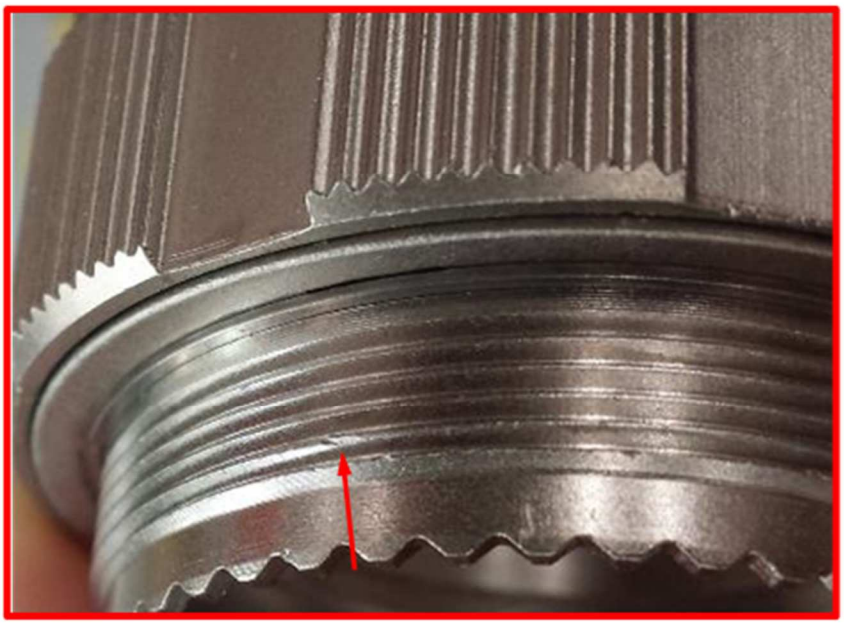




NOT ACCEPTABLE

Plated Shell Damage – Any damage to a plated shell is unacceptable

NOT ACCEPTABLE



NOT ACCEPTABLE