Title

Standard, Cosmetic Acceptance Criteria

Prepared By:	Dept	Date:	Checked By:	Dept	Date:
John Hernandez	125	03-09-2022	Waseem Khan	125	03-09-2022
Approved by:	**Dept**	**Date:**	**Quality Assurance Approval:**	**Dept**	**Date:**
Dan Donati	148	03-09-2022	Andrew Melnyk	125	03-09-2022

Rev	ECN No.	Description of change	Date:	Approved by:
A	EC-026483	Initial Release	05-10-2021	W. Khan
B	EC-100174	Revised class definitions in para. 6.1; Revised acceptance criteria in Appendix B.	03-09-2022	C. Kuzara

1 Purpose

This policy provides the cosmetic acceptance requirements for AMETEK products purchased from suppliers, contract manufacturers, or produced by AMETEK. It defines common defects and establishes the acceptance criteria.

2 Scope

This standard applies to all parts, surface finishes, and labels used in AMETEK products unless otherwise stated in the engineering drawings. If there is a conflict between this standard and the engineering drawing, the engineering drawing will supersede.

PCBA's and cables are not covered by this document. Refer to IPC standards IPC-A-610 and IPC-A-620.

3 Responsibility

3.1 Quality Manager

The Quality Manager is responsible for:

a. Determining the acceptability criteria found in this document.
b. Maintaining and updating this document.
c. Conducting periodic reviews of this policy.

3.2 AMETEK Inspectors

AMETEK Inspectors are responsible for applying the criteria found in this document when inspecting for cosmetic acceptability.

3.3 Purchasing Manager

The Purchasing Manager is responsible for working with suppliers to ensure product shipped to AMETEK meet cosmetic acceptance requirements as defined in this document.

3.4 AMETEK Suppliers

AMETEK suppliers shall use this document to ensure cosmetic acceptability prior to release of product.

4 Reference Documents

0530000, AMETEK Quality Manual
0530020, QP-830, Nonconforming Material
0850002, Supplier Quality Requirements
1006905, Specification, Part Marking

5 Order of precedence

The following specification order of precedence shall apply. In case of any discrepancies among the following documents, contact AMETEK Programmable Power for resolution

a) Purchase order
b) Part drawing
c) This specification, latest revision
d) Documents and standards referenced in this procedure

6 Cosmetic Criteria

The word “shall” indicates a binding requirement to be fulfilled.

6.1 Surface Classifications:

Class	Definition
A	This is the area that is directly exposed to the view of the user. Includes front panels, bezels, and painted (powder and wet) surfaces.
B	This is the area that is normally out of view in the application. Includes chassis top, bottom, side, and rear surfaces.
C	This is the area that is out of view in the finished product. Includes all interior surfaces and parts.

6.2 Viewing Distance, magnification, and time

6.2.1 Personnel

The parts shall be inspected by personnel with normal 20/20 vision or corrected vision to 20/20 with appropriate lenses.

6.2.2 Lighting

The parts shall be viewed under normal, glare free, fluorescent shop lighting. The minimum illumination of 1,000 lu/m2 is required to detect cosmetic defects.

6.2.3 Viewing Angle

The parts shall be inspected with a viewing angle between 40 degrees and 50 degrees.

6.2.4 Viewing Distance and Viewing Time

The viewing distance and viewing time shall be as follows:

Viewing Surface	Class A / 7 sec.	Class B / 5 sec.	Class C / 3 sec.
<12 in. Sq.	12 in. (300 mm)	24 in. (600 mm)	36 in. (900 mm)
>12 in. Sq. <30 in. Sq.	18 in. (450 mm)	30 in. (750 mm)	48 in. (1200 mm)
>30 in. Sq.	24 in. (600 mm)	48 in. (1200 mm)	60 in. (1500 mm)

6.3 Acceptance Criteria

6.3.1 All parts, products and systems shall meet the cosmetic requirements defined in this policy. Where there is a conflict, the supplier should consult AMETEK Quality Assurance for resolution.

6.3.2 If the product does not meet the cosmetic workmanship requirements defined in this standard, the material shall be rejected and reworked or a formal AMETEK deviation shall be issued and approved prior to product release.

6.3.3 During the visual inspection, a judgment must be made as to whether the customer (END USER) would consider the flaw(s) objectionable. During this inspection, only visual qualities are considered.

6.3.4 The acceptable limit of flaw(s) has a significant relationship to the type of area (surface) on which they are found. Flaws on a simple surface are more easily noticed and objectionable, compared to when they occur on a complicated surface. Therefore, each judgment of acceptability must be made in relation to the configuration of the surface in its final assembled form.

6.3.5 When a borderline flaw is found within the specified time and distance, but decision whether to reject is difficult to make due to the subjective nature of some cosmetic defects, the issue should be communicated to AMETEK Quality Assurance and/or Marketing Departments for final decision.

6.4 General Requirements

6.4.1 Cleanliness

The parts shall be free from fingerprints, dirt, grime, grease, oil and other contaminants.

6.4.2 Cosmetic Paint Color and Texture

All painted surfaces shall meet the color requirements specified in the product specification and drawings. All surfaces shall be uniform in color and texture and free of streaks, runs, chips, bubbles, sink marks or any other molding defects. No manual touch-up of class A painted surfaces are allowed without approval by AMETEK Quality Assurance.

6.4.3 Cosmetic Assembly

The assembled parts shall be free from scratches, gouges, dents, dings, cracks, stress marks, abrasions, excessive gaps, or any other defects caused by improper assembly. Dents shall not expose any base metal or causing a critical dimension to be out of tolerance.

6.4.4 Labels and marking.

Labels should be legible and straight with no smearing or printer defects. Labels and part markings shall be in accordance with AMETEK specification 1006905 unless elsewhere specified.

6.4.5 Sheet-Metal Formed

There shall be no defects outside of rejection criteria below; no sharp edges. No rust is allowed on any surfaces, except for untreated cutting edges.

6.4.6 Screws and rivets, including all PEM style hardware inserts

Should be fully seated and flush with the surrounding surface, (refer to Appendix B). Screws should not be excessively marred or stripped. Standoff & Nut riveting tolerance should be +/-0.004” (protruding or sunk from surface 0.1mm).

7 Appendix A

Defect	Description
Abrasion	Surface imperfection, scuff or change in surface texture that does not remove or displace material.
Blister	The raised bumps in the surface, caused by air or solvent vapors forming within or under the coating.
Burr	This defect appears as a rough or sharp edge on metal after it has been cast, cut, drilled, stamped, and so forth. Burrs will usually snag or tear a cleaning cloth.
Contamination	Foreign material on surface.
Crack	A narrow break or split in the base material, plating, or paint.
Dent	Any depression on a surface caused by handling damage. Note: Tooling Marks are not dents.
Discoloration/Stain	Unintended color change, which is not consistent with the normal part color. A cosmetic defect is a visible difference when compared to requirements.
Flaking/Chipping/Peeling	Areas of poor adhesion between the paint and the surface, causing the paint to come off.
Gaps	Any space between two or more normally adjacent surfaces.
Gouge/Nick/Pit/Scratch	A surface imperfection in which small amounts of surface material have been removed.
Label Print Defects	Print defects on the text of the label, smearing, marring, or other cosmetic defect.
Label Poor Registration	Label is not placed in correct location
Label Slant	Label is crooked
Paint Runs	Areas of excess paint that are noticeably thicker.
Rust/Oxidation	Rust is the visible manifestation of corrosion of metal surfaces, usually as a result of exposure to humid surroundings.
Step	The difference in surface alignment between two metal parts.
Tooling Marks	This type of defect is an indentation, depression, or line that occurs in the same location of every part due to damaged tool.
Warpage	Distortion of a part characterized by a bowing or twisted condition.

8 Appendix B

Defect	Defects Allowed by Class (dimension in inches)-		
	Class A	**Class B**	**Class C**
Abrasion	None	6 <= .250 long edge Note 1	No exposed base metal. No oxidation of metal
Blister	None	6 <= .250 area Note 1	8 <= .250 area Note 1
Burr	None	<10% of material thickness, no sharp edges	<10% of material thickness, no sharp edges
Contamination	None	Acceptable <=.040 Note 1	Acceptable <=.20 Note 1
Crack	None	None	None
Dent/Pit	None	6 <= .120 square Note 1	No exposed base metal. No oxidation of metal
Discoloration/Stain	None	None.	No quantity restriction.
Flaking/Chipping/Peeling	None	6 <= .130 Note 1	No exposed base metal. No oxidation of metal
Gaps	Must meet print requirements	Must meet print requirements	Must meet print requirements
Gouge/Nick/Scratch Note 2	2 <= .010 x .030	6 <= .020 x .50	No quantity restriction
Label/Marking Print Defects	None	None	None
Label/Marking Misregistration	.020	.125	Must be legible
Label/Marking Slant	.017 in. Per Inch	.05 in. Per Inch	No restriction
Paint Runs	None	None	None
Rust/Oxidation	None	None	None
Screw/Rivet Not Flush	+/-0.004”	+/-0.004”	+/-0.004”
Step	None	6 <= .130	No quantity restriction
Tooling Marks	None	Minor imprint of text; minor tooling marks at form breaks	No quantity restriction
Warpage	None	< 0.5%	< 1%

Note 1: No exposed base metal. No oxidation of metal

Note 2: Gouges, nicks or scratches through metal finish, exposing the base metal, shall be rejected.