

Appendix D – Workmanship Requirements

General

All finished surfaces shall be protected against foreign material and damage during manufacture and storage prior to delivery. Material shall not be treated or touched up in any manner to conceal defects and shall be free from defects which adversely affect the safety, function, performance, serviceability, interchangeability, appearance or longevity of the item. Unless otherwise allowed per the drawing, finished items shall not have the following conditions: delaminations, cracks, voids, extraneous material, visible irregularities, sharp edges and corners. Evidence of poor workmanship include the following: scratches in excess of drawing and specification requirements, burrs, nicks, corrosion and non-specified oxidation (rust), tool scores, gouges, deformations, missing operations, improper assembly, missing units, stains, knife edges, extraneous material, and missing or damaged protective finish.

Protective finish and/or coating shall be visually examined for completeness, uniformity in appearance and color, and for freedom from pits, corrosion, scratches, and worn or bare spots. Touch up may be used with the approval of Engineering, in lieu of refinishing with the original finish, for restoration of small areas of finish as long as form, fit, and function are not affected.

1. Welding

All welds shall comply with Key Technology Visual Weld Inspection Standard, 06-002. Where designated by engineering drawings as being in the food contact zone, product shall also comply with the appropriate Key Technology Enhanced Sanitation Fabrication Standard.

- 06-101: Basic Sanitary Equipment Design and Manufacture
- 06-102: Standard Sanitary Equipment Design and Manufacture
- 06-103: Standard-Plus Sanitary Equipment Design and Manufacture
- 06-104: Enhanced Sanitary Equipment Design and Manufacture
- 06-095: Enhanced Sanitation Fabrication Standard - Pharma

2. Electrical/Electronics

All electrical/electronic processes shall comply with Key Technology Electrical/Electronic Process Standard 7-0004, which specifically includes IPC-600, IPC-A-610, BS EN 60204-1, and UL508A.

3. Visible Surfaces, Including Plated and Painted Products

- A. General** – The criteria provided in this section relates to visual appearance of parts and assemblies which have customer visible surfaces, including surfaces which have been plated, painted, or both. Of major importance are those surfaces that will be highly visible on critical surfaces; somewhat less stringent requirements are imposed in other areas.

Normal Viewing Plane: The normal viewing plane is defined as the view obtained when observing the assembled unit top, front, sides, and back exterior surfaces in a plane perpendicular to these surfaces. The part will not be rotated except to eliminate any glare from surrounding light that tends to produce a “highlighted” condition.

Light condition: 75 – 90 foot candles

Viewing distance: These surfaces should be viewed at these distances.

Surface Class A: 18 inches

Surface Class B: 36 inches

Surface Class C: in excess of 36 inches if possible, many times not applicable

Viewing Time All surfaces 10 seconds maximum

- B. Surface Classification** - Surfaces are grouped into three categories for inspection purposes. Examples given are for standard uses and could vary depending on the customer’s installation, or how the product is shipped. For example, the underside of a shaker bed would normally be a class B surface, but if the installed location puts the underside where it would be frequently viewed by the customer, it would be classified as a class A surface.

Class A – User's Primary Product Exterior:

Any surface that is normally and immediately visible to the customer or end user while the product is viewable on the production floor (as in a Factory Acceptance Test), as received by the customer before installation, or while being used in its normal operating condition and visible to the user without opening service doors.

Doors, all surfaces of shaker beds except the underside, the exterior of all shaker frames, the exterior of all sorters, rack mount flanges, control panels, exposed areas of cabinet frames.

These surfaces will be free of all major defects and reasonably free of any minor defects. Defects on these surfaces are likely to be seen and associated with a perceived reduction in the overall quality or appearance of the product.

Note: Slight imperfections characteristic of individual process capabilities may be visible on Class A surfaces. Acceptance of these slight imperfections shall be judged on an individual basis.

Class B – User Access Interior:

Areas which are visible when the user access doors are open; areas that the user would view infrequently.

Undersides of shaker beds, internal control panels, shipped loose parts, interior side of enclosure and card cages, power distribution, and interior items with user information / silk-screening.

Expected to appear consistent, of good integrity, and with limited appearance of flaws.

These surfaces may have some minor defects but will be free of all major defects. Minor defects on these surfaces are not likely to be seen or viewed as a perceived reduction in the overall quality or appearance of this product.

Class C – Structural Interior:

Areas not visible without disassembly. Coatings are for corrosion protection only.

Class C surfaces may have any or all minor defects and some major defects. Defects on these surfaces, if seen by the customer, are not likely to be regarded as detracting from the overall cosmetic or functional quality of the product.

Interior surfaces or areas to be covered by labels or other panels are examples of “C” surfaces.

- C. Acceptance Criteria** – Three acceptance designations are used in the following table to describe the criteria.

None Allowed – No occurrences of the attribute are permissible. Items with this designation are typically functional in nature, and will result in product degradation. These attributes are not subject to the cursory inspection described below.

Not Apparent – Attribute is not discernible in the final application of the part. Attributes with this designation are aesthetic in nature. Visual inspection for aesthetics is to be conducted in a manner which best duplicates the end use of the part. The preferred viewing angle and distance being that which would exist if the part was installed in its final location, and the inspector is standing where the operator would stand while using or accessing the equipment. Minimum viewing distance should be three feet. The intention of the aesthetic inspection is to avoid usage of parts which detract from the appearance of the final product. Inspection time is limited to that which is necessary to scan (cursory inspection) all areas of the part.

Acceptable – Aesthetic in nature; will have no effect on the function of the part and will not detract from the appearance of aesthetic viewpoint. Some flaws may have acceptable as well as not-acceptable attributes, e.g. a scratch which does not break the surface of the coating may be acceptable (depending on the class of surface), whereas if the coating is broken, there is a coverage void (Not Acceptable).

Characteristic	Class A	Class B	Class C
Scratches	None Allowed	Not Apparent	Acceptable*
Tooling Marks	None Allowed	Acceptable (Uniform)	Acceptable (Uniform)
Weld Splatter/BB's	None Allowed	Not Apparent	Acceptable
Sharp Edges	None Allowed	Not Apparent	Acceptable
Weld Inconsistency	None Allowed	Not Apparent	Acceptable
Weld Discoloration	None Allowed	Not Apparent	Acceptable
Hand Tool Marks	None Allowed	Not Apparent	Acceptable
Excess adhesive	None Allowed	Not Apparent	Acceptable
Corrosion	None Allowed	None Allowed	None Allowed**
Coverage Voids	None Allowed	None Allowed	None Allowed**
Non-Adhesion	None Allowed	None Allowed	None Allowed
Blisters	None Allowed	None Allowed	None Allowed**
Burns (Plating)	None Allowed	None Allowed	Acceptable
Color Variegation	None Allowed	Acceptable	Acceptable
Color Deviation	Not Apparent	Not Apparent	Acceptable
Rinse Stains	None Allowed	Not Apparent	Acceptable
Finger Printing	None Allowed	Not Apparent	Acceptable
Orange Peel	None Allowed	Not Apparent	Acceptable
Paint Runs	None Allowed	Not Apparent	Acceptable

* Any apparent scratches after plating will not be allowed. For scratches that are not apparent there cannot be removed metal and the scratches may not be detected by feel.

** Acceptable if repaired, providing that corrosion is removed prior to repair, area void of coating is supplemented with paint, and that the defect is not merely a symptom of further problems with the coating.



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D. Protection Requirements – Packaging/protection must be of adequate strength for the weight of the product and protect it from damage during transit and storage while maintaining the integrity of the product. Packaging shall protect from:

- Moisture
- Contamination
- Warp
- Crushing
- Scratching, marring, or other visual defects
- ESD Protection (where applicable)

4. Refurbished Parts

5. Demo Inventory Sales

6. Parts and Material Transportation & Storage

7. Dimensional Consistency

8. Shipping Prep / Customer Prep

9. Crating

10. Wire Routing & Dressing

11. Surface Protection throughout process

12. Proper Shipping Boxes

13. Documentation Appearance

14. Proper Packing and & of Loose Parts

15. Completion of Checklists