COSMETIC SPECIFICATIONS

FINISHES

- Unless otherwise specified, dimensions of a part or thread to which finishes are applied such as plating, oxides, powder/wet paint coatings, or other similar finishes, shall be the finished product dimensions PRIOR to the finish application.

  - Inorganic finishes shall comply with applicable ACE specifications as defined in the drawing, if surface designations exist (grades A-C).
  - Powder/wet paint coatings shall comply with the following requirements and applicable ACE specifications as defined in the drawing:
  - Unless otherwise specified, the entire surface area of the part shall be coated completely to the required thickness.
  - Unless otherwise specified, cutout edges shall be coated and hole diameter edges may be coated. Coverage need not be to thickness requirements.
  - Unless otherwise specified, countersunk holes are to be coated.
  - Unless otherwise specified, inserted threads, inserted hardware such as Pems - and all other threads - must be free of coating.

COSMETIC SPECIFICATIONS

When viewing parts for cosmetic defects, the following criteria should be used:

SURFACE DESIGNATIONS

All surfaces are designated as 'C' unless otherwise specified on the print.

- **Grade A Surface**: This surface is a high user contact surface or is highly visible to the user in any use position

- **Grade B Surface**: This surface is usually visible, though not normally directly facing the user while the product is in use. It may be somewhat shadowed by other parts. This surface may or may not come into contact with the user.

- **Grade C Surface**: This surface is usually hidden by other parts of the assembly or is the inside surface of the assembly. It is not visible in the normal use position, but may be visible during service. This surface grade requires coverage *for protection purposes only*.

NOTE: For item drawings where no finish grade designations exist (not listed on the drawing), the evaluator should examine the item under the specified material's grade C criteria table.

EVALUATION PROCEDURE

Defect Evaluation:

- For the purpose of evaluating a part, the part shall be placed in the "IN-USE" position under STANDARD VIEWING CONDITIONS (standard fluorescent cool white light – minimum of 100 fc). "IN-USE" refers to both the item being inspected, as well as the assembler/supplier evaluating the item. In every case, parts will be held such that the light is NOT REFLECTED directly to the viewer. Parts should be inspected to comply with Surface Grade requirements detailed in the material specific tables attached to this document. For surface grade specifications, refer to the drawing.

NOTE: When the "IN-USE" position is not specified, the evaluator should refer to the following:

Large Components:

- Large components are defined as being equal to or greater than 24 inches by 24 inches square OR greater than 36 inches in length. These parts are to be viewed from a distance of 4 feet. This is to assure that the total surface of the plane is viewed at the same time. Surface examination time should be no longer than **10** seconds.

Small Components:

- Small components are components smaller than those listed above (in the Large Components category) and shall be viewed at a distance of 24 inches (arm's length). This is to assure that the total surface of the plane is viewed at the same time. Surface examination time should be no longer than **5** seconds.

Final Assemblies:

- Final assemblies will be evaluated via the same specifications listed in this document, however, the surface and material specifications will be called out in a top level engineering document.

Defect Size/Spacing Evaluation:

- Irregularities found on parts during evaluation shall be measured and compared with the acceptance criteria for the specified surface. Use the "DEFECT ESTIMATION CHART" (55246-060) to evaluate defect size. Please contact your supervisor or quality representative to request an inspection chart (55246-060).

- To use the transparent "DEFECT ESTIMATION CHART" (55246-060), it is to be placed over the defect for size determination. The number of defects and minimum spacing for such defects shall be taken from the part appropriate table. The maximum number of defects cannot exceed the amount allowed in the minimum spacing area outlined in the same part appropriate table, in any position of this area relative to the part.

- To use the transparent "DEFECT ESTIMATION CHART" (55246-060) using the diameter indications, it is to be placed over the defect for size determination. The chart contains several diameters ranging from 0.5 mm to 0.8mm and a scale depicted in mm. The diameters are used for estimating defects such as nicks or pits. The diameters are also used for estimating the width of a scratch. The length of the scratch can then be estimated using the graduated scale. Irregular shaped defects shall be judged to the closest diameter that would encompass the total area of the shape.

Contrast Evaluation:

- Contrast levels of defects (specks, depressions, protrusions, blush, etc.) are categorized according to how much the defect stands out against the background surface. A defect's level of contrast should be evaluated under standard cool white fluorescent light (100 fc minimum).

Color Evaluation:

- Reference ACE QAP 70-004

Texture Evaluation:

- Smooth or textured powder coatings can be achieved for the final appearance. The customers/ACE will specify the texture profile required. The desired texture will be formulated when the powder coat lab sample is created and will be submitted to the customer for approval of the color, gloss, and texture. Wet coat textures or spatter coat will be matched to a sample provided on the master chip.

Gloss Evaluation:

- Gloss approval can be made based on samples from each lot. Determination of gloss is to be made using a suitable gloss-meter at 60 degrees (see QA for assistance). If gloss-meter is unavailable, judgment shall be made by eye against gloss standards approved by ACE under STANDARD VIEWING CONDITIONS.

DEFECT DEFINITIONS:

- **BLUSHING**: A milky gray cloud appears on the surface of the paint film immediately or shortly after application.
- **BUBBLES**: Pockets of air/voids underneath a surface or coating
- **BURN MARKS**: Would appear as a light brown area on the painted surface – caused by spray/touch-up paint not being sanded off of the part prior to repaint
- **CONTAMINATION**: Any substance underneath the paint that would compromise the integrity of the coating (such as oil or grease)
- **CRAZING/CRACKING**: Breaks in the integrity of the coating
- **CURE FAILURE**: The paint does not fully harden/harden properly and decreased solvent resistance would be an indication of this
- **DEPRESSION**: A subtle dip in a surface which is measurable
- **DIRT**: Foreign particles that get stuck in the paint – often dark in color
- **FABRICATION/PROCESS MARKS**: Marks that occur in the raw part due to other processes upstream (such as forming die marks, weld fillets, spot weld craters, etc – THESE MUST NOT COMPROMISE THE INTEGRITY OF THE STRUCTURE NOR FUNCTION OF THAT RAW PART)
- **FISHEYES**: The paint is pushed in the form of craters. These craters vary in thickness, density, and size (from a pinhole up to a diameter of 1 cm). A close inspection with a magnifier shows the presence of a small impurity in the center
- **NICKS**: Deeper than a scratch (depth is measurable) and of short length. Caused by impact rather than abrasion
- **ORANGE PEEL**: The paint is slightly granulated resembling the outside of an orange
- **OVERSPRAY**: A light dusting of the powder over a surface not intended to be fully covered by that powder
- **PAINT BUILD-UP**: A variation in surface height or a ridge due to excessive paint thickness. Different from runs in that paint build-up occurs specifically on the edges of the painted surface.
- **PROTRUSION**: A variation in surface height or surface uniformity, sometimes due to a burr or damage on the raw part
- **RUNS/SAGS/SURGE**: 1) Over reduction and/or too slow evaporating thinner/reducer. 2) Applying paint materials without proper flash time between coats. 3) Applying excessive wet coats due to: Holding the gun too close to the surface, slow gun speed, or double coating. 4) Air pressure too low during spray application. 5) Improper spray gun set-up or an unbalanced spray pattern. 6) Material and/or substrate temperature too cold.
- **RUST/CORROSION**: The raw material is disintegrating
- **SCRAPE**: Damage to the surface coating due to excessive surface abrasion or scoring
- **SCRATCH**: A thin cut or mark on (a surface) typically made with a sharp object
- **SCUFF**: Light marring of the surface – affected area becomes worn or rough – less damaging than a scrape/scratch
- **STAR BURSTING**: KV bites or bursting occurs when the gun KV's or static charge has caused a "Starring" or "Frosted" appearance on the coated part – most commonly seen with re-coated product
- **WATER SPOTS**: Water spots are areas under the coating where water dried and left a residue – most commonly seen with re-coated product

2.3 INDEX TO FINISH TYPES

2.3.1 Powder coated – Machined and Sheet Metal Components

- Table 2.3.1 Grade A Surface
- Table 2.3.1 Grade B Surface
- Table 2.3.1 Grade C Surface

2.3.2 Powder Coated – Metal Cast Components

- Table 2.3.2 Grade A Surface
- Table 2.3.2 Grade B Surface
- Table 2.3.2 Grade C Surface

2.3.3 Plated Components – Metal Cast or Forged

- Table 2.3.3 Grade A Surface
- Table 2.3.3 Grade B Surface
- Table 2.3.3 Grade C Surface

2.3.4 Plated Components – Machined from Bar Stock

- Table 2.3.4 Grade A Surface
- Table 2.3.4 Grade B Surface
- Table 2.3.4 Grade C Surface

2.3.5 Anodized Components

- Table 2.3.5 Grade A Surface
- Table 2.3.5 Grade B Surface
- Table 2.3.5 Grade C Surface

2.3.6 Mechanically Finished Components

- Table 2.3.6 Grade A Surface
- Table 2.3.6 Grade B Surface
- Table 2.3.6 Grade C Surface

2.3.7 Molded/Extruded Plastic or Elastomeric Components

- Table 2.3.7 Grade A Surface
- Table 2.3.7 Grade B Surface
- Table 2.3.7 Grade C Surface

2.3.8 Silk Screening

TABLE 2.3.1 POWDER COATED - MACHINED & SHEET METAL COMPONENTS

GRADE A SURFACE

ACCEPTANCE CRITERIA

- ✓ Paint coverage to be complete over the specified area.
- ✓ The coating must exhibit uniformity in color, paint texture, and gloss throughout the surface.

ALLOWABLE IMPERFECTIONS

IMPERFECTION TYPE	ALLOWANCE	
	MAXIMUM SIZE	MIN. SPACING PER SURFACE CRITERIA
NON-CONTRASTING DEFECT - defect's color and gloss are same as the larger powdered surface		
✓ Nick, pit, depression, etc (base material MUST BE COVERED)	.05 inch	6 inches
✓ Star bursting, fisheyes, cratering bubbles	.08 inch	6 inches
MODERATELY CONTRASTING DEFECT - defect's color and/or gloss are not consistent, but this *is not* visible beyond 2 feet		
✓ Nick, pit, depression, etc (base material MUST BE COVERED)	.05 inch	12 inches
✓ Star bursting, fisheyes, cratering bubbles	.06 inch	12 inches
HIGHLY CONTRASTING DEFECT - defect's color and/or gloss are not consistent and this *is* visible beyond 2 feet		
✓ Nick, pit, depression, etc (base material MUST BE COVERED)	.04 inch	18 inches
✓ Star bursting, fisheyes, cratering bubbles	.04 inch	18 inches

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)

- Ø The metal surface (to be painted) **cannot exhibit** die and gouge marks, dents, mill scale, and rust.
- Ø Scratches, pinholes
- Ø Solvent popping or cratering, crazing or cracking, rust and corrosion, cure failure or improper adhesion, and contamination resulting in loosened paint

TABLE 2.3.1 POWDER COATED - MACHINED & SHEET METAL COMPONENTS

GRADE B SURFACE

ACCEPTANCE CRITERIA

✓ Scuff marks that do not expose bare metal or primer, rough spots, and base metal fab marks caused by punching, forming, welding, grinding, etc. are allowed provided there are no more than 3 blemishes within a 12 inch square area, each not closer than 6 inches from each other.

ALLOWABLE IMPERFECTIONS

IMPERFECTION TYPE	ALLOWANCE	
	MAXIMUM SIZE	MIN. SPACING PER SURFACE CRITERIA
NON-CONTRASING DEFECT - defect color and gloss are same as the larger powdered surface		
✓ Nick, pit, depression, etc (base material MUST BE COVERED)	0.1 inch	6 inches
✓ Starbursting, fisheyes, cratering bubbles	0.1 inch	6 inches
MODERATELY CONTRASING DEFECT - defect color and/or gloss are not consistent, but this *is not* visible beyond 2 feet		
✓ Nick, pit, depression, etc (base material MUST BE COVERED)	.05 inch	6 inches
✓ Starbursting, fisheyes, cratering bubbles	.1 inch	6 inches
HIGHLY CONTRASING DEFECT - defect color and/or gloss are not consistent and this *is* visible beyond 2 feet		
✓ Nick, pit, depression, etc (base material MUST BE COVERED)	.05 inch	12 inches
✓ Starbursting, fisheyes, cratering bubbles	.1 inch	12 inches

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)

Ø The metal surface (to be painted) **cannot exhibit** die and gouge marks, dents, mill scale, and rust.

Ø Scratches, pinholes

Ø Solvent popping or cratering, crazing or cracking, rust and corrosion, cure failure or improper adhesion, and contamination resulting in loosened paint

TABLE 2.3.1 POWDER COATED - MACHINED & SHEET METAL COMPONENTS

GRADE C SURFACE

ACCEPTANCE CRITERIA
✓ Paint coverage to be complete over the specified area except where noted on drawing/work instr.
✓ Scratches, abrasions, smears, machine marks, dents (provided they do not affect fit/form/function of component), pits, nicks, etc are allowed providing there are no sharp burrs in the metal that result in injury to an operator or end user
REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)
Ø THE FOLLOWING DEFECTS ARE **NOT ALLOWED**: Solvent popping or cratering, crazing or cracking, rust and corrosion, cure failure or improper adhesion, and contamination resulting in loosened paint

TABLE 2.3.2 POWDER COATED - METAL CAST COMPONENTS

GRADE A SURFACE

ACCEPTANCE CRITERIA

- ✓ Paint coverage to be complete over the specified area.
- ✓ The coating must be uniform in color, underlying metal texture (brushed, shot, etc), paint texture, and gloss throughout the surface.
- ✓ Surfaces must be flat with uniform features and no visual distortion. A slight surface contour irregularity is acceptable with no evidence of grinding such as gouging.
- ✓ External edge radii must be uniform with no visual distortion.
- ✓ Nicks or blemishes that can be repaired to Grade A quality with a maximum of two applications of touch-up paint are acceptable.

ALLOWABLE IMPERFECTIONS

IMPERFECTION TYPE	ALLOWANCE	
	MAXIMUM SIZE	MIN. SPACING PER SURFACE CRITERIA
NON-CONTRASTING DEFECT - defect's color and gloss are same as the larger powdered surface		
✓ Nick, pit, depression, etc (base material MUST BE COVERED)	.05 inch	6 inches
✓ Star bursting, fisheyes, cratering bubbles	.08 inch	6 inches
MODERATELY CONTRASTING DEFECT - defect's color and/or gloss are not consistent, but this *is not* visible beyond 2 feet		
✓ Nick, pit, depression, etc (base material MUST BE COVERED)	.05 inch	12 inches
✓ Star bursting, fisheyes, cratering bubbles	.05 inch	12 inches
HIGHLY CONTRASTING DEFECT - defect's color and/or gloss are not consistent and this *is* visible beyond 2 feet		
✓ Nick, pit, depression, etc (base material MUST BE COVERED)	.04 inch	18 inches
✓ Star bursting, fisheyes, cratering bubbles	.04 inch	18 inches

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)

- Ø Scratches, abrasions, grind marks, pin holes
- Ø The metal surface (to be painted) **cannot exhibit** die and gouge marks, dents, mill scale, and rust.
- Ø Solvent popping or cratering, crazing or cracking, rust and corrosion, cure failure or improper adhesion, and contamination resulting in loosened paint
- Ø Evidence of surface or edge distortion caused by "mold coating" build-up
- Ø Corrosion of the underlying metal is **NOT ALLOWED**

TABLE 2.3.2 POWDER COATED - METAL CAST COMPONENTS

GRADE B SURFACE

ACCEPTANCE CRITERIA

- ✓ Paint coverage to be complete over the specified area.
- ✓ Slight surface or edge contour irregularity is acceptable with no evidence of grinding or gouging
- ✓ Slight evidence of surface or edge distortion caused by "mold-coating" build-up is acceptable as long as it appears uniform ini a localized area not exceeding 1.5 square inches in total
- ✓ Slight sink marks are acceptable providing there are no more than 2 per surface
- ✓ Nicks or blemishes that can be repaired to Grade B quality with a maximum of 2 applications of touch-up paint are acceptable.

ALLOWABLE IMPERFECTIONS

IMPERFECTION TYPE	ALLOWANCE	
	MAXIMUM SIZE	MIN. SPACING PER SURFACE CRITERIA
NON-CONTRASING DEFECT - color and gloss are same as the larger powdered surface		
✓ Nick, pit, etc (base material MUST BE COVERED)	.05 inch	8 inches
✓ Starbursting, fisheyes, cratering bubbles, depression	.1 inch	8 inches
MODERATELY CONTRASING DEFECT - color and/or gloss are not consistent, but this *is not* visible beyond 2 feet		
✓ Nick, pit, etc (base material MUST BE COVERED)	.05 inch	12 inches
✓ Starbursting, fisheyes, cratering bubbles, depression	.1 inch	12 inches
HIGHLY CONTRASING DEFECT - color and/or gloss are not consistent and this *is* visible beyond 2 feet		
✓ Nick, pit, etc (base material MUST BE COVERED)	.05 inch	18 inches
✓ Starbursting, fisheyes, cratering bubbles, depression	.1 inch	18 inches

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)

- Ø The metal surface (to be painted) **cannot exhibit** die and gouge marks, dents, mill scale, and rust.
- Ø Scratches, abrasions, grind marks, pinholes
- Ø Solvent popping or cratering, crazing or cracking, rust and corrosion, cure failure or improper adhesion, and contamination resulting in loosened paint
- Ø Protruding flash, paint, nicks, pits, or burrs that result in snagging when wiped with cheesecloth.
- Ø Any surface irregularity caused by the ejectors immediately below the surface
- Ø Pitting, finish porosity, or grinding causing surface gouging

TABLE 2.3.2 POWDER COATED - METAL CAST COMPONENTS

GRADE C SURFACE

ACCEPTANCE CRITERIA
✓ Paint coverage to be complete over the specified area except where noted on drawing/work instr.
✓ Scratches, abrasions, smears, machine marks, dents (provided they do not affect fit/form/function of component), pits, nicks, etc are allowed providing there are no sharp burrs in the metal that result in injury to an operator or end user
REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)
Ø THE FOLLOWING DEFECTS ARE **NOT ALLOWED:** Solvent popping or cratering, crazing or cracking, rust and corrosion, cure failure or improper adhesion, and contamination resulting in loosened paint

TABLE 2.3.3 PLATED COMPONENTS - METAL CAST OR FORGED

GRADE A SURFACE

ACCEPTANCE CRITERIA

✓ The coating must be uniform in color, texture (brushed, shot or bead blasted, etc), and brightness throughout the surface and needs to have complete coverage over the area specified except for rack mounting points.

ALLOWABLE IMPERFECTIONS

IMPERFECTION TYPE WITHIN BASE MATERIAL (METAL)	ALLOWANCE	
	MAXIMUM SIZE	MIN. SPACING PER SURFACE CRITERIA
✓ Nick, pit, depression, etc	.05 inch	6 inches

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)

- Ø Scratches, abrasions, grind marks, pin holes
- Ø The metal surface (to be painted) **cannot exhibit** die and gouge marks, dents, mill scale, and rust.
- Ø Solvent popping or cratering, crazing or cracking, rust and corrosion, cure failure or improper adhesion
- Ø Evidence of surface or edge distortion caused by "mold coating" build-up
- Ø Corrosion of the underlying metal
- Ø Blisters, burning, cracks, and other defects
- Ø Residues left by the plating process
- Ø Corrosion (as seen by crystalline growth)
- Ø Improper adhesion, loose or flaking finish
- Ø Oxidation or signs of oxidation

TABLE 2.3.3 PLATED COMPONENTS - METAL CAST OR FORGED

GRADE B SURFACE

ACCEPTANCE CRITERIA

- ✓ The coating must be uniform in color, texture (brushed, shot or bead blasted, etc), and brightness throughout the surface and needs to have complete coverage over the area specified except for rack mounting points.
- ✓ Surface scale is acceptable as long as it appears uniform in a localized area not exceeding 1.5 square inches total

ALLOWABLE IMPERFECTIONS

IMPERFECTION TYPE WITHIN BASE MATERIAL (METAL)	ALLOWANCE	
	MAXIMUM SIZE	MIN. SPACING PER SURFACE CRITERIA
✓ Nick, pit, etc	.08 inch	6 inches
✓ Depression	.1 inch	4 inches
✓ Scratches	.05" *w* x .5" *l*	</= 2 per 1 square inch of surface area
✓ Abrasions	</= .5" x .5" abrasion per 4 square inches of surface area with *NO MORE THAN* two separate areas per surface	

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)

- Ø Grind marks, pin holes
- Ø Nicks or pits that raise the substrate metal causing a burr that results in potential injury to an operator or end user
- Ø The metal surface (to be painted) **cannot exhibit** die and gouge marks, dents, mill scale, and rust.
- Ø Solvent popping or cratering, crazing or cracking, rust and corrosion, cure failure or improper adhesion
- Ø Evidence of surface or edge distortion caused by "mold coating" build-up
- Ø Corrosion of the underlying metal
- Ø Blisters, burning, cracks, and other defects
- Ø Residues left by the plating process
- Ø Corrosion (as seen by crystalline growth)
- Ø Improper adhesion, loose or flaking finish
- Ø Oxidation or signs of oxidation

TABLE 2.3.3 PLATED COMPONENTS - METAL CAST OR FORGED

GRADE C SURFACE

ACCEPTANCE CRITERIA
✓ The coating coverage must be complete over the area specified except for rack mounting points.
✓ Scratches, abrasions, smears, machine marks, dents (provided they do not affect fit/form/function of component), pits, nicks, etc are allowed providing there are no sharp burrs in the metal that result in injury to an operator or end user.
✓ Surface scale is acceptable as long as it appears uniform in a localized area not exceeding 1 square inch in total.

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)
Ø Blisters, burning, cracks, and other defects
Ø Residues left by the plating process
Ø Corrosion (as seen by crystalline growth)
Ø Improper adhesion, loose or flaking finish
Ø Oxidation or signs of oxidation

TABLE 2.3.4 PLATED COMPONENTS - MACHINED FROM BAR STOCK

GRADE A SURFACE

ACCEPTANCE CRITERIA

✓ The coating must be uniform in color, texture (brushed, shot or bead blasted, etc), and brightness throughout the surface and needs to have complete coverage over the area specified except for rack mounting points.

ALLOWABLE IMPERFECTIONS

IMPERFECTION TYPE WITHIN BASE MATERIAL (METAL)	ALLOWANCE	
	MAXIMUM SIZE	MIN. SPACING PER SURFACE CRITERIA
✓ Nick, pit, depression, etc	.02 inch	6 inches

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)

- Ø Scratches, abrasions, grind marks, pin holes
- Ø The metal surface (to be painted) **cannot exhibit** die and gouge marks, dents, mill scale, and rust.
- Ø Solvent popping or cratering, crazing or cracking, rust and corrosion, cure failure or improper adhesion, and contamination resulting in loosened paint
- Ø Corrosion of the underlying metal
- Ø Blisters, burning, cracks, and other defects
- Ø Residues left by the plating process
- Ø Corrosion (as seen by crystalline growth)
- Ø Improper adhesion, loose or flaking finish
- Ø Oxidation or signs of oxidation

TABLE 2.3.4 PLATED COMPONENTS - MACHINED FROM BAR STOCK

GRADE B SURFACE

ACCEPTANCE CRITERIA

- ✓ The coating must be uniform in color, texture (brushed, shot or bead blasted, etc), and brightness throughout the surface and needs to have complete coverage over the area specified except for rack mounting points.
- ✓ Surface scale is acceptable as long as it appears uniform in a localized area not exceeding 1.5 square inches total

ALLOWABLE IMPERFECTIONS

IMPERFECTION TYPE WITHIN BASE MATERIAL (METAL)	ALLOWANCE	
	MAXIMUM SIZE	MIN. SPACING PER SURFACE CRITERIA
✓ Nick, pit, depression, etc	0.05	1.5 inches
✓ Scratches	.05" *w* x .5" *l*	</= 2 per 1 square inch of surface area
✓ Abrasions	</= .5" x .5" abrasion per 1 square inches of surface area with *NO MORE THAN* two separate areas per surface	

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)

- Ø Scratches, abrasions, grind marks, pin holes
- Ø The metal surface (to be painted) **cannot exhibit** die and gouge marks, dents, mill scale, and rust.
- Ø Solvent popping or cratering, crazing or cracking, rust and corrosion, cure failure or improper adhesion, and contamination resulting in loosened paint
- Ø Corrosion of the underlying metal
- Ø Blisters, burning, cracks, and other defects
- Ø Residues left by the plating process
- Ø Corrosion (as seen by crystalline growth)
- Ø Improper adhesion, loose or flaking finish
- Ø Oxidation or signs of oxidation
- Ø Nicks or pits that raise the substrate metal causing a burr that results in potential injury to an operator or end user are **NOT ALLOWED**.

TABLE 2.3.4 PLATED COMPONENTS - MACHINED FROM BAR STOCK

GRADE C SURFACE

ACCEPTANCE CRITERIA	
✓	The coating coverage must be complete over the area specified except for rack mounting points.
✓	Scratches, abrasions, smears, machine marks, dents (provided they do not affect fit/form/function of component), pits, nicks, etc are allowed providing there are no sharp burrs in the metal that result in injury to an operator or end user.
✓	Surface scale is acceptable as long as it appears uniform in a localized area not exceeding 1 square inch in total.

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)	
Ø	Blisters, burning, cracks, and other defects
Ø	Residues left by the plating process
Ø	Corrosion (as seen by crystalline growth)
Ø	Improper adhesion, loose or flaking finish
Ø	Oxidation or signs of oxidation

TABLE 2.3.5 ANODIZED COMPONENTS

GRADE A SURFACE

ACCEPTANCE CRITERIA

✓ The coating must be uniform in color, texture (brushed, shot or bead blasted, etc), and brightness throughout the surface and shall have complete coverage over the area specified

ALLOWABLE IMPERFECTIONS

IMPERFECTION TYPE WITHIN BASE MATERIAL (METAL)	ALLOWANCE	
	MAXIMUM SIZE	MIN. SPACING PER SURFACE CRITERIA
NON-CONTRASTING DEFECT - defect's color and gloss are same as the larger powdered surface		
✓ Nick, pit, depression, etc	.02 inch	6 inches
MODERATELY CONTRASTING DEFECT - defect's color and/or gloss are not consistent, but this *is not* visible beyond 2 feet		
✓ Nick, pit, depression, etc	.02 inch	12 inches
HIGHLY CONTRASTING DEFECT - defect's color and/or gloss are not consistent and this *is* visible beyond 2 feet		
✓ Nick, pit, depression, etc	.02 inch	18 inches

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)

- Ø Scratches, abrasions, grind marks, pin holes
- Ø Residues left by the anodizing process
- Ø Corrosion (as seen by crystalline growth)
- Ø Loose, powdery, contaminated, gritty or flaking finish
- Ø Blisters, burning, cracks, and other defects
- Ø Improper adhesion, loose or flaking finish

TABLE 2.3.5 ANODIZED COMPONENTS

GRADE B SURFACE

ACCEPTANCE CRITERIA

- ✓ The coating must be uniform in color, texture (brushed, shot or bead blasted, etc), and brightness throughout the surface and shall have complete coverage over the area specified
- ✓ Darker and lighter areas of coverage are acceptable at corners and edges provided coverage is complete.

ALLOWABLE IMPERFECTIONS

IMPERFECTION TYPE WITHIN BASE MATERIAL (METAL)	ALLOWANCE	
	MAXIMUM SIZE	MIN. SPACING PER SURFACE CRITERIA
NON-CONTRASTING DEFECT - color and gloss are same as the larger powdered surface		
✓ Nick, pit, depression, etc	.08 inch	6 inches
MODERATELY CONTRASTING DEFECT - color and/or gloss are not consistent, but this *is not* visible beyond 2 feet		
✓ Nick, pit, depression, etc	.05 inch	12 inches
HIGHLY CONTRASTING DEFECT - color and/or gloss are not consistent and this *is* visible beyond 2 feet		
✓ Nick, pit, depression, etc	.03 inch	18 inches

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)

- Ø Scratches, abrasions, grind marks, pin holes
- Ø Residues left by the anodizing process
- Ø Corrosion (as seen by crystalline growth)
- Ø Loose, powdery, contaminated, gritty or flaking finish
- Ø Blisters, burning, cracks, and other defects

TABLE 2.3.5 ANODIZED COMPONENTS

GRADE C SURFACE

ACCEPTANCE CRITERIA
✓ The coating must have complete coverage over the area specified.
✓ Darker and lighter areas of coverage are acceptable at corners and edges provided coverage is complete.
✓ Scratches, abrasions, smears, machine marks, dents, pits, nicks, etc. are allowed providing that no sharp burrs are raised and could injure someone handling the part

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)
Ø Residues left by the anodizing process
Ø Corrosion (as seen by crystalline growth)
Ø Loose, powdery, contaminated, gritty or flaking finish
Ø Residues left by the plating process
Ø Improper adhesion, loose or flaking finish
Ø Oxidation or signs of oxidation
Ø Blisters, burning, cracks

TABLE 2.3.6 MECHANICALLY FINISHED COMPONENTS

GRADE A SURFACE

ACCEPTANCE CRITERIA

- ✓ These components are generally stainless steel with a brushed, grained, or glass/shot beaded external finish.
- ✓ For this type of component, scratches are considered acceptable only when "superficial" and must fall within the specifications indicated in the table below.

ALLOWABLE IMPERFECTIONS

IMPERFECTION TYPE	ALLOWANCE	
	MAXIMUM SIZE	MIN. SPACING PER SURFACE CRITERIA
NON-CONTRASTING DEFECT - color and gloss are same as the larger powdered surface		
✓ Nick, pit, depression, scratch, etc.	.02 inch	6 inches
✓ Scratches	.002 inch wide .002 inch deep <= 1.0 inch long	12 inches

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)

MODERATELY CONTRASTING DEFECT - color and/or gloss are not consistent, but this *is not* visible beyond 2 feet		
Ø Nicks, pits, depressions, scratches, abrasions, grind marks, pin holes		
HIGHLY CONTRASTING DEFECT - color and/or gloss are not consistent and this *is* visible beyond 2 feet		
Ø Nicks, pits, depressions, scratches, abrasions, grind marks, pin holes		

TABLE 2.3.6 MECHANICALLY FINISHED COMPONENTS

GRADE B SURFACE

ACCEPTANCE CRITERIA

- ✓ These components are generally stainless steel with a brushed, grained, or glass/shot beaded external finish.
- ✓ For this type of component, scratches are considered acceptable only when "superficial" and must fall within the specifications indicated in the table below.

ALLOWABLE IMPERFECTIONS

IMPERFECTION TYPE	ALLOWANCE	
	MAXIMUM SIZE	MIN. SPACING PER SURFACE CRITERIA
NON-CONTRASTING DEFECT - color and gloss are same as the larger powdered surface		
✓ Nick, pit, depression, scratch, etc.	.1 inch	6 inches

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)

MODERATELY CONTRASTING DEFECT - color and/or gloss are not consistent, but this *is not* visible beyond 2 feet		
✓ Nick, pit, depression, scratch, etc.	NOT ALLOWED	
HIGHLY CONTRASTING DEFECT - color and/or gloss are not consistent and this *is* visible beyond 2 feet		
✓ Nick, pit, depression, scratch, etc.	NOT ALLOWED	

TABLE 2.3.7 MOLDED/EXTRUDED PLASTIC OR ELASTOMER COMPONENTS

GRADE A SURFACE

ACCEPTANCE CRITERIA

- ✓ Part must have uniform surface texture, gloss, and color.
- ✓ If painted, the part must have complete paint coverage over specified area. Nicks or blemishes that can be repaired to Grade A quality with a maximum of 2 applications of touch-up paint are acceptable.

ALLOWABLE IMPERFECTIONS

IMPERFECTION TYPE	ALLOWANCE	
	MAXIMUM SIZE	MIN. SPACING PER SURFACE CRITERIA
NON-CONTRASTING DEFECT - color and gloss are same as the larger powdered surface		
✓ Physical imperfections in opaque parts (nicks, depressions, protrusions, specks, bubbles, inclusions, etc)	.04 square inch .02" depth/height	2 per 5 square inches
✓ Physical imperfections in transparent and translucent parts (nicks, depressions, protrusions, specks, bubbles, inclusions, etc)	.02 square inch	1 per 5 square inches
MODERATELY CONTRASTING DEFECT - color and/or gloss are not consistent, but this *is not* visible beyond 2 feet		
✓ Physical imperfections in opaque parts (nicks, depressions, protrusions, specks, bubbles, inclusions, etc)	.03 square inch .01" depth/height	2 per 8 square inches
✓ Physical imperfections in transparent and translucent parts (nicks, depressions, protrusions, specks, bubbles, inclusions, etc)	.02 square inch	1 per 5 square inches
HIGHLY CONTRASTING DEFECT - color and/or gloss are not consistent and this *is* visible beyond 2 feet		
✓ Physical imperfections in opaque parts (nicks, depressions, protrusions, specks, bubbles, inclusions, etc)	.01 square inch .01" depth/height	2 per 8 square inches

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)

- Ø Subtle changes in surface geometry (paint build-up, sink, etc.)
- Ø Changes in gloss or surface texture (orange peel, etc)
- Ø Non-uniform translucency in translucent part or color variation in an opaque part
- Ø Physical imperfections in transparent and translucent parts (nicks, depressions, protrusions, specks, bubbles, inclusions, etc)

TABLE 2.3.7 MOLDED/EXTRUDED PLASTIC OR ELASTOMER COMPONENTS

GRADE B SURFACE

ACCEPTANCE CRITERIA

- ✓ Part must have uniform surface texture, gloss, and color.
- ✓ If painted, the part must have complete paint coverage over specified area. Nicks or blemishes that can be repaired to Grade B quality with a maximum of 2 applications of touch-up paint are acceptable.

ALLOWABLE IMPERFECTIONS

IMPERFECTION TYPE	ALLOWANCE	
	MAXIMUM SIZE	MIN. SPACING PER SURFACE CRITERIA
NON-CONTRASTING DEFECT - color and gloss are same as the larger powdered surface		
✓ Physical imperfections in opaque parts (nicks, depressions, protrusions, specks, bubbles, inclusions, etc)	.08 inch .02" depth/height	1 per 4" x 4" area
✓ Physical imperfections in transparent and translucent parts (nicks, depressions, protrusions, specks, bubbles, inclusions, etc)	.03 inch	1 per 4" x 4" area
MODERATELY CONTRASTING DEFECT - color and/or gloss are not consistent, but this *is not* visible beyond 2 feet		
✓ Physical imperfections in opaque parts (nicks, depressions, protrusions, specks, bubbles, inclusions, etc)	.08 inch .01" depth/height	1 per 8" x 8"
✓ Physical imperfections in transparent and translucent parts (nicks, depressions, protrusions, specks, bubbles, inclusions, etc)	.03 inch	1 per 8" x 8" area
HIGHLY CONTRASTING DEFECT - color and/or gloss are not consistent and this *is* visible beyond 2 feet		
✓ Physical imperfections in opaque parts (nicks, depressions, protrusions, specks, bubbles, inclusions, etc)	.04 square inch .01" depth/height	1 per 12" x 12" area
✓ Physical imperfections in transparent and translucent parts (nicks, depressions, protrusions, specks, bubbles, inclusions, etc)	.03 inch	1 per 8" x 8" area

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)

- Ø Subtle changes in surface geometry (paint build-up, sink, etc.)
- Ø Changes in gloss or surface texture (orange peel, etc)
- Ø Non-uniform translucency in translucent part or color variation in an opaque part
- Ø Physical imperfections in transparent and translucent parts (nicks, depressions, protrusions, specks, bubbles, inclusions, etc)
- Ø Cloudiness in transparent part

TABLE 2.3.7 MOLDED/EXTRUDED PLASTIC OR ELASTOMER COMPONENTS

GRADE C SURFACE

ACCEPTANCE CRITERIA
✓ If painted, the part must have complete paint coverage over specified area.
✓ Nicks, depressions, protrusions, specks, orange peel, burn marks, sink, scratches, abrasions, smears, machine marks, dents, etc. are allowed providing that no sharp burrs are raised in the material that result in an injury to someone handling the part.

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)
Ø Improper adhesion, loose or flaking finish

TABLE 2.3.8 SILK SCREENING - PAD PRINTING - ACCEPTANCE CRITERIA

GRADE A SURFACE

ACCEPTANCE CRITERIA
✓ Screen/ink coverage to be complete throughout the printed area.
✓ Decals and labels must have complete adherence to the bonded surface
✓ Labels and decals must be applied with the approved adhesives and materials specified on the drawing.

REJECTABLE IMPERFECTIONS (*NOT* ALLOWED)
Ø Raggedness, closed or missing letters, unequal spacing, smears, characters with variation and foreign material in the paint or ink, blurred characters, light or uneven color within the print, wrinkles, tears, or evidence of separation.
Ø Dirt or debris under the print