

TECHNIGRAPHICS COSMETIC SPECIFICATIONS - 2/1/93 Rev. A

I. General Statement

Cosmetic Inspection of all products shall use the "Time and Distance" Inspection procedure described below and also shall rely on the judgment of trained inspectors and suppliers. (18-24 inches, 10 seconds)

No specification can be written to take into account all combinations of conditions that might exist. The Cosmetic Reference Standard defined in this specification is to be used in training and guiding inspection personnel and will be used in making an accept/reject decision.

II. Judging Criteria

The clarity and completeness of screen copy, the consistency of color in copy and background, the surface finish and registration ALL shall be examined within the allotted time. Color matching will be judged separately on a single or sample basis. Measurement and documentation of print to film registration and color-to-color registration shall require additional time.

- A. Accept/Reject Decision - When flaws are observed within the specified time and distance and the accept/reject decision is difficult to make, refer to Sections V thru VIII. Parts are often cosmetically acceptable even though flaws are noticeable.
- B. Repetitive Inspection - A flaw that occurs repeatedly in the same surface location becomes more easily noticed. If this same cosmetic flaw was judged acceptable at the beginning of the run or lot inspection, It shall also be acceptable at the end.

III. Viewing Conditions/Time

All parts shall be viewed stationary or on a fixture or held at 45 degrees to the horizontal. The line of sight shall be perpendicular to the plane of the part and at a distance of 18 inches, 10 seconds. When evaluating surface finishes of metal panels the distance shall be 24 inches, 10 seconds. Lighting conditions shall be uniform (diffused) fluorescent light from 80 to 150 footcandles.

With the exception of panel windows with gloss coatings and metal surface finishes, the parts shall NOT be manipulated to reflect a light source. Panel windows with gloss coatings and metal surface finishes may be rotated up to a maximum of 30 degrees in any axis.

Panels with large amounts of small type may require more time for adequate inspection; less complex panels may require less time. Any variation from 10 seconds of inspection time must be approved in advance by the department supervisor.

IV. Registration Guidelines

- A. Screen printing to screen printing (color to color): +/- .010"
- B. Screen printing to sheared or diecut holes and/or edges: +/- .015"
- C. Screen printing to embossing: +/- .015

V. Inspection Guidelines for Screen Printing of Text, Numbers and Lines

Type of Nonconformance	Number Allowable
Broken letters, numbers and lines that affect legibility.	None
Broken letters, numbers and lines that do not affect legibility and are no wider than .004"	Three
Smearing, streaking, reduction, bleeding, haze	None
Total flaws permissible within any 4.0" x 4.0" area and a minimum distance of 2.0 inches apart	Three

Flaws of any size that are invisible under the time and distance specification, viewing angle and lighting conditions shall be considered acceptable.

VI. Inspection Guidelines for Surface Finish Flaws, Base Material Flaws and Printed Background Flaws.

A. Contrasting In Color (generally in the screen printed background or the plastic material itself).

Type of Nonconformance	Number Allowable
Smearing, Bleeding, Flow Marks, Inconsistency	None
Voids, Fill-ins, and, Specks (includes areas where contrasting colors join): Circular Maximum Diameter - .015" Linear Maximum Dimension - .010" x .030"	Three Three
Scratches: Width up to .005" up to a total accumulated length of .500" Width of .005" - .010" up to a total accumulated length of .100" Width greater than .010".	Three Three None
Maximum "A" Flaws in a panel	Three

B. Non-contrasting In Color (generally in the coating or the surface of plastic materials)

Type of Nonconformance	Number Allowable
Smearing, Bleeding, Flowmarks, Inconsistency, Haze, Streaking	None
Voids, Spots, Fill-ins Circular maximum diameter - .030" Linear maximum dimension -.010" x.040"	Four Four
Scratches: Width up to .005" up to a total accumulated length of .500" Width .005" -.010" up to a total accumulated length of .100" Width greater than .010"	Three Two None
Maximum number of "B" Flaws In a panel	Four

C. Total flaws permissible within any 4.0" x 4.0" area or in any single word or name – Three (3)

D. Total Number of Combined "A" and "B" flaws permissible in a panel - Six (6)

Flaws of any size that are invisible under the time and distance specification, viewing angle and lighting conditions shall be considered acceptable.

VII. Inspection Guidelines for Panel Windows

This specification applies to two types of windows:

- #1 - clear or tinted plastic or
- #2 - transparent screenprinted windows.

A. Judging Criteria

Both types of windows shall be inspected only in conditions that simulate actual display use. They shall not be examined by attempting to look through them as you would look through a pair of glasses or a picture window or on a light table. Parts shall not be manipulated to reflect a light source except for gloss coatings, which may be rotated up to a maximum of 30 degrees in any axis.

B. Viewing Conditions

All panel windows shall be viewed stationary on a fixture or held at 45 degrees to the horizontal. The line of sight shall be perpendicular to the plane of the part and at a distance of 18 inches. Lighting conditions shall be uniform (diffused) fluorescent light from 80 - 150 footcandles. Viewing time shall be 10 seconds.

C. Inspection Guidelines for Surface Finish and Coating Flaws, Material Flaws, and Screen Printed Flaws

Type of Nonconformance	Number Allowable
Smearing, Bleeding, Flowmarks, Inconsistency	None
Scratches – maximum of .010” x .030”	Three
Voids, spots, Specks – maximum diameter of .010”	Three
Total flaws permissible in any window area up to 9 square inches.	Three

Flaws of any size that are invisible under the time and distance specification, viewing angle and lighting conditions shall be considered acceptable.

VIII. Inspection Guidelines for Metal Surface Finishes

A. Viewing Conditions

All parts shall be viewed stationary on a fixture or held at 45 degrees to the horizontal and must be rotated 30 degrees on the X-axis. The line of sight shall be perpendicular to the plane of the part and at a distance of 24 Inches. Lighting conditions shall be uniform (diffused) fluorescent light from 80 - 150 footcandies. Viewing time shall be 10 seconds.

Type of Nonconformance	Number Allowable
Smearing, Bleeding, Flowmarks, Inconsistency	None
Voids, Fill-ins, Specks (includes areas where contrasting colors join): Circular maximum diameter -.020"	Three
Scratches: Width up to .005" up to a total accumulated length of .100"	Three
Inconsistency after rotating	None
The maximum number of allowable flaws in the surface finish of a panel	Four

IX. Worst Condition

The worst acceptable condition when inspecting parts under the previous specifications, allowing time for the panel as well as time for the window is a maximum of six (6) flaws per panel as described in Sections V - VIII.

Definition Of Terms

Bleeding-	The evidence of one color usually altering another color where they overlap.
Contamination-	The presence of impurities or foreign material on or in the graphic image. It can be: <ol style="list-style-type: none">1. Embedded in the graphic Ink.2. Embedded in the adhesive ink.3. Embedded in between the graphic material and the premask.4. External contaminates.
Cuts-	A break in the feature. The lack of continuity in the entire feature.
Density-	The opacity of an ink, the ability of the ink to block the transmission of light. Density is assigned a value as measured on a densitometer.
Fill-ins -	An excess of ink that alters the form of a screen printed feature not affecting legibility.
Flow Marks-	Waviness of edge or excessive linear surface texture of screen printed areas.
Haze-	Cloudiness on an otherwise transparent part.
Inconsistency-	Variation of gloss, thickness of line or surface texture not called for by master artwork.
Jagged Edge-	Edge(s) of a feature that are ragged or appear to have a saw tooth effect.
Nicks-	A notch or partial cut on a graphic character or border which causes the feature to be substandard in quality.
Pinholes-	The absence of ink on the graphic image which allows light to pass through the image when held up to the light or when the image is placed on a light table with no release liner on it. Pinholes will have a circular geometry

Pits-	Minute circular imperfections on the graphic base material.
Reduction-	A feature, whole or in part, that has been decreased in size, but still wholly intact; i.e. a border with an hourglass effect.
Registration-	The orientation of one feature to another; usually specified with physical tolerance limits.
A. Print Registration-	The orientation of features screened by different passes during the process.
B. Diecut Registration-	The orientation of a screenprinted feature to a diecut feature such as a hole or edge.
Scratches-	A linear gouge of varying degrees in the ink or base material.
Skips-	Linear series of defects where the graphic or adhesive ink is missing.
Smears-	An area on the graphic image that was rubbed while the ink was wet causing the clarity of the image to be blurred and substandard in that area.
Spots-	The presence of unwanted ink dots on a graphic image, i.e. white ink spots where there should be just a dark background color.
Streaking-	Long, narrow, varying marks, creating an uneven appearance.
Void-	The absence or lack of material in certain areas.