

## **COSMETIC INSPECTION SPECIFICATION FOR PLATED SHEET METAL PARTS**

### **I. APPLICABILITY**

- A.** This Cosmetic Inspection Specification applies to all requirements for cosmetic inspection for sheet metal parts after chemical coating such as chromate conversion and anodizing. Mechanical drawings for such parts should reference this standard to clarify cosmetic requirements. (see "Examples" in section VI.)

### **II. INSPECTION REQUIREMENTS**

- A.** General: Cosmetic inspection shall use the "Time and Distance" (T&D) inspection procedure described below and shall rely on the judgement of trained inspectors and suppliers. The Cosmetic Reference Standard defined in this specification is to be used for training inspection personnel and may be used to assist in making an "accept/reject" decision.
- B.** Process Control: Manufacturing steps that might affect finished part appearance shall be prepared to enable compliance with this cosmetic specification.
- C.** Order of Inspection: Cosmetic Inspection of finished parts shall be performed as the last inspection by D.S.M. and the first inspection by the customer.
- D.** Viewing Conditions: Parts and products shall be inspected under the following conditions:
  - 1.** Uniform non-directional illumination between 8 and 15 foot-candles. At levels greater than 15 foot-candles, caution should be used to not over inspect.
  - 2.** Parts shall not be manipulated to reflect a single light source in order to accentuate surface flaws. View without directly reflecting a light source.
  - 3.** Magnification is not to be used when inspecting for cosmetic defects.
- E.** Time and Distance Inspection: Parts shall be inspected in accordance with instructions and codes on the part drawing. If the drawing references this specification, the codes will reference Table 1 "VIEWING TIME AND DISTANCE" On drawings referencing this specification surfaces not cosmetically coded shall be considered III-C.
- F.** Accept/Reject Decision: When flaws are observed within the specified time and distance and the accept/reject decision is difficult to make refer to Table 2 "COSMETIC REFERENCE STANDARD" Parts are often cosmetically acceptable even though flaws are noticeable.
- G.** 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 on lot inspection, it shall also be acceptable at the end.
- H.** Reference Dimensions: Dimensions locating cosmetic areas designated by phantom lines are "referenced and should not be measured.

### III. VIEWING TIME AND DISTANCE PER DESIGNATED AREA OR SURFACE.

- A. Table 1 indicates the viewing time and distance to be used for various cosmetic standard codes, refer to section II.D above for information pertaining to the inspection environment.

**TABLE 1  
VIEWING TIME AND DISTANCE**

CODES	EXTERNAL II-A	EXTERNAL OR INTERNAL II-B/III-B	EXTERNAL OR INTERNAL II-C/III-C
VIEWING DISTANCE	18 INCHES	18 INCHES	24 INCHES
VIEWING TIME	10 SECONDS	5 SECONDS	3 SECONDS

**TABLE 2  
COSMETIC REFERENCE STANDARD FOR COATED PARTS**

Flaws per Surface	II-A	II-B	III-B	II-C III-C
Discoloration Glossiness Specks	Two Max. Dim. .02 in.	Four Max. Dim. .06 in.	Six Max Dim. .13 in.	See Note
Lint Scratches	Two Max. Dim. .01x.03 in.	Four Max. Dim. .02x.09 in.	Four Max Dim. .02x.25 in.	See Note
Marks Runs	None	Two Max. Dim. .06 in.	Four Max. Dim. .13 in.	See Note
Non-adhesion, Non-uniform Coverage	None	Two Max. Dim. .09 in.	Four Max. Dim. .13 in.	See Note

NOTE: If a part surface is coded II-C or III-C flaws exceeding those allowed under III-B are permitted however when viewed for the specified time and distance the flaws must not be so obvious as to suggest inferior workmanship or processing.

#### IV. COSMETIC REFERENCE STANDARD

- A. Table 2 lists flaws typically found on coated parts. This table constitutes the reference standard of cosmetic acceptability. The total number of allowable mixed flaws shall not exceed the limit specified for the flaw with the largest allowable quantity limit. Table 2 is primarily used to train personnel involved in inspection and may be used to assist in making an "accept/reject" decision.
- B. DSM employees shall also use the cosmetic reference standard for parts in process. This will ensure a uniform standard throughout all phases of production.
- C. When the customer's specifications exceed this DSM standard, the parts shall be inspected to the customer's standards.

#### V. TERMS AND DEFINITIONS

**DISCOLORATION:** ANY CHANGE FROM ORIGINAL COLOR OR UNINTENDED INCONSISTENT COLOR

**GLOSSINESS:** AN AREA OF EXCESSIVE OR DEFICIENT GLOSS.

**LINT:** ANY UNINTENDED FOREIGN SUBSTANCE IN THE COATING OR ON THE SURFACE.

**MARKS:** PITS SANDING OR OTHER MARKS ON THE BASE MATERIAL THAT REMAIN VISIBLE AFTER COATING.

**NONADHESION:** LACK OF PROPER STICKING OF THE COATING TO THE SURFACE.

**NONUNIFORM COVERAGE:** AREAS THAT HAVE AN INSUFFICIENT OR EXCESSIVE COATING.

**RUNS:** EXCESSIVE COATING THAT CAUSES DRIPS OR NONUNIFORM COVERAGE.

**SCRATCHES:** SHALLOW GROOVES.

**SPECKS:** SMALL PARTICLES.

#### VI. EXAMPLES OF REFERENCING THIS SPECIFICATION ON MECHANICAL DRAWINGS

- A. A front panel (critical cosmetics): GRAIN SIDE SHOWN CLASS II-A 220 GRIT
- B. An internal panel occasionally seen during service: GRAIN CLASS IIIB 180 GRIT
- C. An internal component (cosmetics not critical): DEBURR CLASS III-C