GM	WORLDWIDE ENGINEERING STANDARDS	Material Specification	GMW16882

Appearance Standard for Decorative Chrome-plated Metals and Plastics

1 Scope

This standard describes the surface appearance and quality requirements for evaluating the appearance of production-level, chrome-plated, interior and exterior metal and plastic parts.

Criteria is established for the determination of allowable appearance criteria based upon the significance of the chrome-plated surface as outlined in standard specifications for electrodeposited coatings for plastic and metal parts (ASTM B604 and ASTM B456, respectively). This specification defines appearance definitions for chrome-plated parts covered under GMW14668, GMW14672, GMW15613, and any other decorative chrome-plated performance specifications. ASTM B456 and ASTM B604 define significant surfaces as those surfaces normally visible (directly or by reflection) that are essential to the appearance and/or serviceability of the component when assembled in normal position, or that can be the source of corrosion products that have the potential to deface visible and significant surfaces on the assembled component.

If, after field exposure or accelerated corrosion testing, product corrosion is experienced but not previously considered for degree of visibility, surfaces are permitted to be redefined on the drawing. Contact GM Materials Engineering or the part Subsystem Management Team (SMT) if assistance is needed in defining part surfaces.

Table 1 defines minimum appearance criteria for surfaces based upon degree of visibility. These significant surfaces are to be defined by degree of visibility and indicated on the part drawings.

Note: When defining these visible surfaces, the **appearance of corrosion** as a result of accelerated testing or field performance can affect the degree of visibility of that surface and is also considered as part of the criteria defining the significance of that surface.

1.1 Material Description. Not applicable.

1.2 Symbols. Not applicable.

1.3 Applicability. Electroplated parts of the copper-nickel-chromium type as used on plastic or metal components where a bright or low-gloss decorative and/or protective finish is required.

1.4 Remarks.

1.4.1 Deviations. Deviations accepted by GM require, in every case, GM signed boundary samples that are stored by the supplier and accepted by both GM Design Appearance Quality and the respective assembly plant. The visual comparison to accepted boundary samples is always the most decisive method. For evaluating appearances that are subject to interpretation, pick master and boundary samples that are acceptable to all parties involved through assembly. The supplier and GM assembly plant should agree on target, upper limit, and lower limit boundary samples. Appearance Approval Report (AAR) samples should be used for standard reference and initial part submissions. The effects of potential corrosion need to be taken into account for any deviation consideration.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

ASTM B456	ASTM B604

2.2 GM Standards/Specifications.

GMW3059	GMW14668	GMW15613
GMW6992	GMW14672	

© Copyright 2014 General Motors Company All Rights Reserved

Documents
Document Sharing Hub

Copyright General Motors Company
Provided by IHS Markit under license with General Motors Company
Reproduction, distribution or publication of these standards is expressly prohib
Licensee=/, User=,
Not for Resale,
Full document details: GMW GMW16882 2014

2.3 Additional References.

TMC003 Material Safety Data Sheet guidance documents (available at www.gmsupplypower.com).

3 Requirements

3.1 Requirements on Delivery. Exterior body parts are divided into different appearance zones to set the quality requirements of each zone separately (see Table 1). The zones are also specified on the drawing by the respective commodity authority. This is a macro perspective on appearance as it pertains to significance of the surface. The GM Materials Engineer or SMT may also take into consideration the proximity of the part to the vehicle body position. Care must be taken in this case to account for any corrosion products that may affect the appearance after test or field performance. If the proximity of the part relative to on-vehicle position is to be taken into account, it must also be noted on the drawing. Any exclusions or deviations to this specification must be noted appropriately. Figures A1 through A4 contain examples of appearance zones for various exterior parts.

Table 2 defines the quality criteria under which appearance can be based upon degree of visibility of the significant surface. Appendix A provides examples of common surfaces and how they can be rated by degree of visibility in determining quality criteria for that surface. If necessary, contact the GM Materials Engineer. Figure A5 provides guidelines for zoning an exterior part based on line of sight (for reference).

Table 1: Appearance Zones of a Part

Zone	Definition	Description
A	Very High Visibility	A very highly visible surface is one that is fully exposed and fully visible. It is not recessed in any manner and stands proud of the vehicle, i.e., frontal grille surround, grille, lighting bezel frontal surfaces, bumper frontal surfaces and any chrome surface not angled or recessed from the outer extremes of the vehicle and in full view.
B	High Visibility	Surfaces may be highly visible; however, some degree of angled recess makes these surfaces less apparent than Zone A, i.e., upper or lower recesses of a grille surround with a highly visible back-protruding angle.
C	Moderate Visibility	Significant surfaces that may be somewhat hidden from the more visible surfaces (i.e., surfaces that are near 180° from front-facing surfaces), surfaces that are not clearly seen from a partial front view, and side walls of a part feature not seen from a frontal view.
D	Hidden After Installation	These surfaces are totally hidden from the customer, i.e., side flanges, back side of part, and chrome surfaces intentionally covered by other decorative parts. These surfaces are insignificant unless corrosion products can propagate to any visible surface.

Refer to GMW6992 for lighting and other required methods of evaluation.

Deviations to this light source may be needed due to part design and environment, but this needs to be agreed upon with the affected GM personnel. For an outside evaluation, northern sky-oriented assessment direction at approximately 11:00 A.M. is preferred.

The evaluation shall be performed at arm's length of 0.75 m to 1 m and viewed in appropriate car position.

3.1.1 Additional Requirements. See Table 2 for quality requirements.

© Copyright 2014 General Motors Company All Rights Reserved

Documents
Document Sharing Hub

Copyright General Motors Company
Provided by IHS Markit under license with General Motors Company
Reproduction, distribution or publication of these standards is expressly prohib
Licensee=/, User=,
Not for Resale,
Full document details: GMW GMW16882 2014

Table 2: Quality Requirements for Appearance Attributes

	Appearance Attribute	Description	Zone A	Zone B	Zone C	Zone D
1	Peeling (Plate Lifting) or Cracks	Adhesion loss between substrate and plating.	None allowed.	None allowed.	None allowed.	Only allowed if it cannot be a source of corrosion product to any significant surface.
2	Blisters	Adhesion loss between substrate and plating.	None allowed.	None allowed.	None allowed.	Only allowed if it cannot be a source of corrosion product to any significant surface.
3	Pits, Dents	Voids in the metal surface, other irregularities due to handling, sinks, shrinking or tooling imperfections upon gunsighting.	0.75 mm, maximum two (2) allowed per 400 mm. Uncounted under 0.25 mm and not felt by fingernail.	1.0 mm, maximum two (2) allowed per 50 mm. Uncounted under 0.25 mm and not felt by fingernail.	1.0 mm, maximum two (2) allowed per 50 mm. Uncounted under 0.25 mm.	Allowed but must not be visible to the customer.
4	Skip Plate (Exposed Substrate, Lack of Plate)	Area not covered by plate.	None allowed.	None allowed.	None allowed.	Only allowed if it cannot be a source of corrosion product to any significant surface.
5	Rough Surface	Superficial abrasion or rough feel on the surface.	Must not retain fibers from a cotton cloth when wiped, and not felt by fingernail or deface the attractiveness of the surface.	Must not retain fibers from a cotton cloth when wiped, and not felt by fingernail or deface the attractiveness of the surface.	Must not retain fibers from a cotton cloth when wiped, and not felt by fingernail or deface the attractiveness of the surface.	Allowed but must not retain fibers from a cotton cloth when wiped.

© Copyright 2014 General Motors Company All Rights Reserved

Documents
Document Sharing Hub
Copyright General Motors Company
Provided by IHS Markit under license with General Motors Company
Reproduction, distribution or publication of these standards is expressly prohib
Licensee=/, User=,
Not for Resale,
Full document details: GMW GMW16882 2014