GM	WORLDWIDE ENGINEERING STANDARDS	General Specification	GMW15272

Corrosion Performance Specification

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This document provides the general requirements for the corrosion resistance of components and subsystems used in GM vehicles. This document is to be used when invoked by the program-specific requirement document.

Note: The program-specific requirement document may include additional program-specific requirements that are not referenced in this document and will supercede any requirements included in this document. In the case of any conflicts between this document and the program-specific requirement document, the program-specific requirement document takes precedence.

1.2 Applicability. This standard establishes the requirements for the corrosion performance and validation of the components or systems for which it is referenced. This includes any applicable cosmetic, perforation and/or functional corrosion requirements.

This standard applies to the corrosion resistance of components and subsystems used on GM engineered vehicles.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW3059	GMW14872	GMW15357	GMW15443
GMW3172	GMW15264	GMW15358	GMW15531
GMW8738 (ID)	GMW15356	GMW15359	GMW17026
GMW14101 (ID)			

(ID) = This standard is limited to internal distribution within General Motors and shall not be distributed outside this company. Contact the GM Lead Engineer for further instructions.

2.3 Additional References.

- Program specific Component Technical Specification (CTS).
- Program specific Statement of Requirement (SOR).
- Program specific Subsystem Technical Specification (SSTS).
- Program specific Vehicle Technical Specification (VTS).
- Splash Shielding Best Practices. The supplier shall work with the GM responsible engineer to comprehend this requirement.
- Vehicle Splash Shield Performance Evaluation Procedure.
- Vehicle Technical Specification (VTS) Template.

© Copyright 2018 General Motors Company All Rights Reserved

Documents
Document Sharing Hub

Copyright General Motors Company
Provided by IHS Markit under license with General Motors Company
No reproduction or networking permitted without license from IHS
Full document details: GMW-R GMW15272 2018

Licensee=/, User=,
Not for Resale,

3 Requirements

3.1 System/Subsystem/Component/Part Definition. Not applicable.

3.1.1 Appearance. The requirements for the corrosion resistance of the vehicle/subsystems/components are given in the following paragraphs. The requirements apply to vehicles operated in the appropriate Marketing Region with corresponding Regional Corrosion Classification (see Table 1). The Regional Corrosion Classification is used to characterize the corrosion resistance requirements of each marketing region. The classification takes into account regional differences in environment, Vehicle Technical Specification (VTS) requirements, warranty, market/customer expectations, competitive benchmarking, manufacturing processes/materials usage, and required routine periodic inspections.

Table 1: Regional Corrosion Classification and Marketing Regions Note 1

Class 1	• Europe • Russia
Class 2	• North America • Central America • Korea • Asia • China
Class 3	• Africa • Australia • Middle East • South America

Note 1: For regions that fall outside of the defined regions in Table 1, contact GM Corrosion Engineering.

3.1.1.1 Perforation Corrosion Resistance (VTS Template 3.2.1.7.1.1). The vehicle shall not incur corrosion induced perforations of any body panels within ten (10) years of exposure to the required corrosion environment. Body panels include both non-structural and structural panels.

End-of-test checks for actual perforations are not sufficient to validate field performance. At a minimum, no metal loss (loose/flaking corrosion product or noticeable pitting of the substrate after media blasting the corroded area) is permitted on any sheet metal panels at end-of-test. If any metal loss is observed, additional analysis will be required, and must be conducted with the assistance of GM Corrosion and/or Materials Engineering. Refer to Appendix C for the metal loss measurement procedure.

3.1.1.2 Cosmetic Corrosion Resistance (VTS Template 3.2.1.7.1.2). The vehicle shall satisfy the requirements shown in Appendix A, Table A1 (The supplier shall work with the GM responsible engineer to comprehend this requirement) when exposed to the required corrosion environment. In addition, it covers resistance to cosmetic corrosion resulting from minor vehicle damage that is not the result of an accident, customer abuse, or natural causes (e.g., hail windblown debris, etc.) Examples of the types of vehicle damage comprehended by the specification include:

3.1.1.2.1 Damage to vehicle areas and components as a result of the assembly process.

3.1.1.2.2 Damage to components as a result of shipping and handling prior to assembly into the vehicle or damage to vehicle areas during delivery to the customer.

3.1.1.2.3 Damage to vehicle areas that occurs during normal vehicle operation (e.g., stone chipping, panel-to-panel movement, wear due to normal operation, etc.)

© Copyright 2018 General Motors Company All Rights Reserved

Documents
Document Sharing Hub
Copyright General Motors Company
Provided by IHS Markit under license with General Motors Company
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: GMW-R GMW15272 2018

Note: Exemption table should only be used on component specific Subsystem Technical Specification/Component Technical Specification/Statement of Requirement (SSTS/CTS/SOR) documents (refer to Appendix A, Table A2 (The supplier shall work with the GM responsible engineer to comprehend this requirement) for proper format).

In addition to the preceding, components shall be free of corrosion upon delivery to any suppliers that perform subassembly operations, and to the final assembly plant.

3.1.1.3 Functional Corrosion Resistance (VTS Template 3.2.1.7.1.3). The vehicle shall not incur the corrosion induced loss of function or serviceability of any component within fifteen (15) years of exposure to the required corrosion environment. In addition, components must maintain functionality and serviceability for the target life of the vehicle as found in the SSTS/CTS or VTS.

Depending on the corrosion mechanism(s) involved, end-of-test checks for function may not be sufficient to validate 15 year field performance. At a minimum, no metal loss (loose/flaking corrosion product or noticeable pitting of the substrate after media blasting the corroded area) is permitted on any components at end-of-test. If any metal loss is observed, additional analysis will be required, and must be conducted with the assistance of GM Corrosion and/or Materials Engineering. Refer to Appendix C for the metal loss measurement procedure.

4 Validation

4.1 General. The Global Vehicle Corrosion Validation Plan is shown in Appendix D, Table D1.

4.2 Validation Cross Reference Index. Refer to Table B1 through Table B5 in Appendix B (The supplier shall work with the GM responsible engineer to comprehend this requirement).

4.3 Supporting Paragraphs. Not applicable.

5 Provisions for Shipping

Not applicable.

6 Notes

6.1 Glossary. Not applicable.

6.2 Acronyms, Abbreviations, and Symbols.

C	Component
CTS	Component Technical Specification
DFMEA	Design Failure Mode and Effect Analysis
ELPO	Electrodeposition
EXT	Exterior
I/WS	Inside the Weatherstrip
IMDS	International Material Data System
INT	Interior
IVER	Integration Vehicle Engineering Release
ManVal	Manufacturing Validation
MRD	Material Required Date
N/A	Not applicable
O/WS	Outside the Weatherstrip
PPV	Product and Process Validation
PV	Product Validation
S	Subsystem
SOR	Statement of Requirements
sp	Salt Spray
SS	Secondary Surface

© Copyright 2018 General Motors Company All Rights Reserved

Documents
Document Sharing Hub

Copyright General Motors Company
Provided by IHS Markit under license with General Motors Company
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: GMW-R GMW15272 2018

SSTS	Subsystem Technical Specification
UB	Underbody
UH	Underhood
V	Vehicle
VTC	Validation Test Complete
VTS	Vehicle Technical Specification
WS	Weatherstrip

7 Additional Paragraphs

7.1 All materials supplied to this standard must comply with GMW3059, **Restricted and Reportable Substances**, including the requirement to submit a full material composition disclosure to GM via the International Material Data System (IMDS).

8 Coding System

This standard shall be referenced in other documents, drawings, etc., as follows:

GMW15272

© Copyright 2018 General Motors Company All Rights Reserved

Documents
Document Sharing Hub

Copyright General Motors Company
Provided by IHS Markit under license with General Motors Company
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: GMW-R GMW15272 2018

9 Release and Revisions

This standard was originated in March 2006. It was first approved by GMNA Corrosion Engineering/Global Corrosion Council in September 2006. It was first published in October 2006.

Issue	Publication Date	Description (Organization)
1	OCT 2006	Initial publication.
2	JAN 2008	Updated Referenced GM Standards (Section 2.2) – Removed GMW15359, added GMW15264. Updated Regional Corrosion Classification and marketing Region (Section 3.1.1) – Added Korea to Severe Low. Updated Appendix B – Validation procedures. Updated Section 3.1.1.1 – Analysis Process update. (GMNA Corrosion Engineering/Global Corrosion Council)
3	SEP 2009	Updated Performance Requirements, including Appendix A, to match current VTS Template. Appendix B - Added reference to the use of coupon mass loss when laboratory tests other than those listed are used. Added reference to GMW3172. Added Appendix C and D with appropriate references. Added GMW15359 to Section 2.2. Modified section 3.1.1.2.3 to include sub-assembly operations. Updated Appendix B to match updates to GMW14101 and GMW8738. (Global Corrosion Engineering Council)
4	APR 2013	Updated Table 1 to add Russia. Updated 3.1.1.3 and Table A1 (Underbody (UB) High Visibility definition to match current Vehicle Technical Specification (VTS) wording). Added Exposure 0 to Tables B1 through B5 in Appendix B. Updated Table D1 in Appendix D. (Corrosion Global Subsystem Leadership Team)
5	MAR 2015	Updated section 3.1.1.3 to reflect current VTS template value of 15 years. Removed erroneous text in Table A1. Fixed error in Table B2, Note 3. Added GMW17026 to Appendix B. Added note about GMW14872 and anodized aluminum trim to Appendix B. Changed Exposure D to E in Appendix B based on change in 3.1.1.3. (Materials - Corrosion Global Subsystem Leadership Team)
6	AUG 2018	Updated 3.1.1.1 to remove 12 year requirement. Edited Table A1 headers, and Table A2 – Underbody with new exhaust system requirements. Updated Appendix C to add requirement to collect average metal loss data, and note location in the photographs. Updated some test call-outs in Appendix B. Added how to choose a Corrosion Test Decision Tree as Appendix E. (Materials - Corrosion Engineering and Laboratory)

© Copyright 2018 General Motors Company All Rights Reserved

Documents
Document Sharing Hub
Copyright General Motors Company
Provided by IHS Markit under license with General Motors Company
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: GMW-R GMW15272 2018

Appendix A: Cosmetic Corrosion Resistance Requirements.

The following requirements apply to all marketing regions. Exceptions for specific regions (only) are noted in the Table 1.

Table A1: Cosmetic Corrosion Resistance Requirements (VTS Template Table 3.2.1.7.1.2-I/-II)

VTS Template Requirement Suffix		I	II
		MINIMUM RATINGS Note 1, Note 5	
	EXTERIOR SURFACES: Inspection Years 0 and 5	**Year 0** Note 2	**Year 5**
a	**HIGH/MEDIUM VISIBILITY:** Note 4 Exterior sheet metal and body related components obvious to anyone standing near the vehicle within 5 m while it is on the ground and all swing metal is closed. Examples include the hood, roof, deck, quarter, fender, bumper/fascia, and visible portions of vertical body panels. Also, the brake calipers, rotors and drums visible through the wheel openings.	10/10 Note 3 (Includes both Red and White Corrosion)	10/9 Note 3 (Includes both Red and White Corrosion)
b	**LOW VISIBILITY:** Difficult to view lower exterior sheet metal surfaces and body related components viewed with all swing metal closed (e.g., underside (tuck-under) of quarter, rocker, and fender).	10/10 Note 3	8/7 Note 3
	SECONDARY SURFACES: Inspection Year 0 and 5	**Year 0**	**Year 5**
c	**HIGH/MEDIUM VISIBILITY:** Sheet metal and body-related components easily visible when any swing metal or convertible/movable roofs are open. These are items the customer can readily see by simply entering and exiting the vehicle, loading it, checking underhood, or fueling (e.g., door inner panels, A/B/C pillars, underside of hood/deck/hatch, and fuel filler and sunroof opening areas, rear end carrier).	10/10 Note 3 (Includes both Red and White Corrosion)	10/8 Note 3 (Includes both Red and White Corrosion)
d	**LOW VISIBILITY:** Sheet metal and body-related components visible with considerable effort when any swing metal is open (e.g., underside of door, door-side hinge facings).	10/10 Note 3	8/7 Note 3
	INTERIOR: Inspection Year 0 and 5	**Year 0**	**Year 5**
e	**HIGH/MEDIUM VISIBILITY:** Items visible to driver or passengers while sitting in the vehicle or while entering/exiting/using the vehicle (e.g., dash panel fasteners, head-rest rods, lower brake pedal lever; items visible with: glove-box open, seat hardware with seats folded/full travel, ash-tray bin or fuse-cover removed, etc.)	10 (Includes both Red and White Corrosion)	10 (Includes both Red and White Corrosion)

© Copyright 2018 General Motors Company All Rights Reserved

Documents Document Sharing Hub
Copyright General Motors Company
Provided by IHS Markit under license with General Motors Company
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: GMW-R GMW15272 2018