GM	WORLDWIDE ENGINEERING STANDARDS	General Specification	GMW15359

White Corrosion Rating Scale Guideline

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. The purpose of the rating scale is to allow comparison between vehicles and consistency between personnel. It is important to recognize that rating corrosion involves perception of an objectionable surface and much of the judgment is subjective. The corrosion scales provide some objective measure that will guide subjective judgment.

1.2 Applicability. The corrosion rating scale guidelines contain corrosion rating scales, rating guidelines, and photographs for the determination of corrosion severity on all vehicular parts, including body and sheet metal, underbody and underhood components, and fasteners. It is intended that the scales are used for both corporate corrosion inspections and field surveys.

1.3 Remarks. This white corrosion rating scale guideline contains plated components including Exhaust Gas Recirculation (EGR) valves, headlamp mounting brackets and additional examples.

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	GMW15356	GMW15357	GMW15358

2.3 Additional References.

- Corrosion Rating Scale Guidelines

3 Requirements

3.1 Using the Rating Scales. When rating parts on a vehicle, one needs to consider the type of part being rated. To a customer, what is objectionable corrosion on a panel differs from that on a component or fastener as far as the total corroded area is of concern. A panel is more likely to perforate, or suffer significant metal loss, long before 100% of its area becomes corroded. Consequently, when rating a panel, one should locate and rate the worst area on the panel. For components and fasteners, rating by estimating the percentage of visible corroded area is meaningful. If the proper rating actually falls between two rating values, the lower of the two rating values shall be used.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.1.3 Guideline Arrangement. The guidelines are arranged in four stand-alone documents. The first three guidelines consist of the cosmetic corrosion rating scale and photographs pertaining to red rust. The fourth guideline provides the same type of rating scale and photographs for white corrosion. The red rust guidelines consist of Sheet Metal (GMW15356), Components (GMW15357), and Fasteners (GMW15358). The White Corrosion Guideline (GMW15359) contains plated components. Use of the white corrosion rating scale is not limited to this material, and can be used on any plating or material that exhibits white corrosion. When rating a

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part, decide what type of part is being rated and use the appropriate section of the guideline. In all cases, use of a pictorial reference ensures consistent ratings and is easier to use than a strict written definition. The rating guidelines may be helpful in determining the range of photographs to use for comparison.

Note: For further information, contact GM Corrosion Engineering.

3.2 Generic Rating Scale. The corrosion rating scale reflects the various degrees of corrosion and ranks them as shown in the rating guidelines (see Table A1 in Appendix A). On a scale of one (1) to ten (10), one (1) represents perforation, two (2) obvious metal loss, and ten (10) no visible corrosion. Ratings from nine (9) to three (3) reflect varying degrees of corrosion from very little to extensive. The photograph guidelines associated with this scale will focus on showing examples of ratings ten (10) through three (3). These ratings are associated with levels of corrosion cosmetic in nature. Ratings of two (2) and one (1) relate to significant metal loss or actual substrate perforation, respectively, and are not included.

3.2.1 White Corrosion Rating Scale. While only photographs of plated parts are shown, the rating scale may be used for any coating or material which shows white corrosion. These parts should be rated using the rating guidelines and by comparing the appearance of the part to the appropriate set of photographs.

3.2.1.1 EGR Valve Rating Scale. Compare component to the series of photographs in Appendix B (Figures B1 thru B8) and select the comparable level for the rating.

3.2.1.2 Headlamp Mounting Bracket Rating Scale. Compare component to the series of photographs in Appendix C (Figures C1 thru C8) and select the comparable level for the rating.

3.2.1.3 Additional White Corrosion Examples Rating Scale. Compare component to the series of photographs in Appendix D (Figures D1 thru D8) and select the comparable level for the rating.

4 Validation

4.1 General. This rating scale along with the three additional rating scales defined in 3.1.3 “Guideline Arrangement” support the corrosion evaluation of all GM laboratory and road corrosion related test procedures in addition to material specifications.

4.2 Validation Cross Reference Index. Not applicable.

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.

EGR	Exhaust Gas Recirculation
GSSLT	Global Subsystem Leadership Team
IMDS	International Material Data System

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).

7.2 Safety. Users of this standard are to follow all local safety instructions, including the use of proper personal protective equipment (e.g., safety glasses) and garage/lab equipment.

8 Coding System

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

Rate per GMW15359

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9 Release and Revisions

This standard was originated in May 2006. It was first approved by Global Laboratory Corrosion Testing Harmonization Team in June 2006. It was first published in November 2006.

Issue	Publication Date	Description (Organization)
1	NOV 2006	Initial publication.
2	MAY 2009	Updated Section 3.1 to clarify how rating scale is to be used. (Material and Corrosion Engineering)
3	JUN 2009	No change to content of document. Republished to revise distribution requirements from internal only to external. (Material and Corrosion Engineering)
4	SEP 2014	5 Year Refresh. (Materials – Corrosion Global Subsystem Leadership Team)
5	OCT 2019	Communized the description with GMW15356. Combined Table A1 and Table A2 in Appendix A. Improved Images of Figures C3 and C4 to better represent R=8 and R=7. Revised Zinc Component Ratings (4 and 5) and re-numbered Figures D4 thru D8. (Materials – Corrosion GSSLT)

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Appendix A: Rating Scale and Guidelines

Table A1: Rating Guidelines

Rating	Corrosion Rating Scale Description	Panels	Components /Fastener
10	No Visible Corrosion	No Visible Corrosion	No Corrosion
9	Trace of Corrosion	One or Two Small White Corrosion Spots	One or Two Small White Corrosion Spots
8	Slight Corrosion	Some Small White Corrosion Spots	< 10% White Corrosion
7	Light Corrosion	Many Small White Corrosion Spots	~ 10% White Corrosion
6	Moderate Corrosion	Medium Sized White Corrosion Spots	25% ± 15% White Corrosion
5	Medium Corrosion	Many Medium Sized White Corrosion Spots	50% ± 10% White Corrosion
4	Mostly Corroded	Large Red White Corrosion	75% ± 15% White Corrosion
3	Totally Corroded	Large Corroded area or Very Large White Corrosion Spots	100% White Corrosion
2	Severe Corrosion [Note 1]	Metal Loss	
1	Perforation	Perforation	

Note 1: Corrosion resulting in obvious metal loss.

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Appendix B: EGR Valve Rating Scale Photographs

Figure B1: EGR Valve Rating 10

Figure B2: EGR Valve Rating 9

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