



Recyclability/Recoverability

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 this specification is to facilitate compliance with current and future legislation regarding Recyclability/Recoverability.

1.2 Applicability. This standard contains requirements to improve the recyclability and recoverability, see Section 3.

1.3 Remarks. The GM designer and the supplier community are to design recyclable/recoverable products that have maximum end of life value. The requirements are written for current technology. As technology progresses the requirements will be updated.

1.3.1 The export compliance review of this document is complete. The rating is: Export Compliance Control Number (ECCN); EAR99.

2 References

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

2.1 External Standards/Specifications.

ASTM D7611/D7611M	Directive 2007/46/EC	ISO 1043-4	Act No. 8405
Directive 70/156/EEC	GB/T 19515-2015	ISO 1629	SAE J2332
Directive 2000/53/EC	ISO 1043-1	ISO 11469	UN R133
Directive 2003/138/EC	ISO 1043-2	ISO 18064	
Directive 2005/64/EC	ISO 1043-3	ISO 22628	

2.2 GM Standards/Specifications.

GMW3059

2.3 Additional References.

Best Practice HYBRPWR-15 (The supplier shall work with the GM Design Responsible Engineer to comprehend this requirement.)

Customer Care and Aftersales Packaging Requirements

Engineering Statement of Requirements (eSOR)

GM International Material Data System (IMDS) Instructions

GM Material Specifications

GM1738G (www.gmsupplypower.com)

3 Requirements

3.1 Marking of Polymeric Parts. Polymeric parts shall be labeled. Legible plastic compound identification symbol must appear on surface by; molded in (typically raised/depressed 0.1 mm deep); or by surface marking. The mark should not affect fit, function, or appearance. See Table 1 for additional requirements.

Table 1: Additional Requirements for Marking of Polymeric Parts

Plastic parts having a weight of more than 100 g must be labeled.
Elastomer parts having a weight of more than 200 g must be labeled.
Parts smaller than the grams listed above should be labeled, if possible (space permitting).
The recommended minimum letter height should be at least 3 mm high. Larger letter sizes should be used on larger parts when there is more space available for the polymeric marking.
Where possible, the International Organization for Standardization (ISO) marking shall be located near the part number, cavity number, molding date, or other markings on the part. If there is not room near the other markings, or there are no other markings on the part, then the ISO marking shall be in an area that can be easily found when the part is disassembled from the vehicle.

3.1.1 Marking of Plastic Parts. See Table 2 for the appropriate reference standard to determine requirements for the labeling and identification of vehicle plastic parts.

Table 2: Reference Standards for Marking of Plastic Parts

Reference	Title/Section
ISO 1043-1	Plastics - Symbols and Abbreviated Terms. Part 1: Basic Polymers and their Special Characteristics
ISO 1043-2	Plastics - Symbols and Abbreviated Terms. Part 2: Fillers and Reinforcing Materials
ISO 1043-3	Plastics- Symbols and Abbreviated Terms. Part 3: Plasticizers
ISO 1043-4	Plastics- Symbols and Abbreviated Terms. Part 4: Flame Retardants
ISO 11469	Plastics - Generic Identification and Marking of Plastic Products
ISO 18064	Thermoplastic Elastomers - Nomenclature and Abbreviated Terms

3.1.2 Marking of Elastomer/Rubber Parts. See Table 3 for the reference standards to determine requirements for the labeling and identification of vehicle elastomer parts.

Table 3: Reference Standards for Marking of Rubber Parts

Reference	Title/Section
ISO 1629	Rubbers and Lattices - Nomenclature. Note: This shall not apply to the labeling of tires
SAE J2332	Marking of Rubber Parts

3.2 Component Parts Deemed to be Non-Reusable. Component parts deemed to be non-reusable according to the Directive 2005/64/EC, Annex V, and its amendments, shall not be reused in new vehicles.

3.3 Material Composition. Material composition information must be provided to GM via the International Material Data System (IMDS) as per the requirements of GMW3059 for full Production Part Approval Process (PPAP) approval. In addition, in order to manage substance content of vehicles during the development process and to comply with recyclability/recoverability requirements, (e.g., Type Approval Directive 70/156/EEC, End of Life Vehicle Directive 2000/53/EC, Act No. 8405 (South Korea), etc.) GM will request IMDS data from suppliers prior to PPAP. The timing for the collection of IMDS submissions will be found in GMW3059 and the GM IMDS instructions.

3.3.1 See additional references pertaining to Type Approval Process and Vehicle Recyclability Calculations.

- Directive 2007/46/EC
- GB/T 19515-2015
- Directive 2003/138/EC
- Directive 2005/64/EC
- UN R133

3.4 Improve Component Recyclability/Recoverability. Improve the recyclability/recoverability of vehicle components during the design process, remembering that GM materials and/or performance requirements in the Engineering Statement of Requirements (eSOR) must be fulfilled.

3.4.1 Material Selection.

3.4.1.1 Standardize Material Selection. Use the same material type(s) on specific components or subsystems across product lines.

3.4.1.2 Select Recyclable Materials. Select materials for which recycling technologies are currently practiced.

3.4.1.3 Minimize the Use of Multi-Material Parts.

3.4.1.4 Limit Material Types Used within Part Assemblies.

3.4.1.5 Reduce or Eliminate Coatings. Uncoated materials are easier and less costly to recycle than coated materials.

3.4.1.6 Reduce Fasteners. Reduce the number and types of fasteners used in vehicle components for easier disassembly for refurbishment or recycling.

3.4.1.7 Adhesive Use. Avoid adhering dissimilar materials together to facilitate sorting/recycling of materials at the end of vehicle life.

3.4.2 Design for Pre-Treatment.

3.4.2.1 Operating Fluids. Provisions shall be made in the part, system and vehicle design for fast and efficient removal of operating fluids from vehicle systems. Examples of these systems include:

- Fuel Tank
- Engine Oil Pan
- Gearbox/Transmission
- Brake System
- Air Conditioning System
- Shock Absorbers
- Engine Cooling System/Radiator
- Battery Cooling System/Radiator
- Power Steering System
- Windshield Washer Fluid
- Engine Mounting System
- Coolant
- Liquid Petroleum Gas (LPG) Tank
- Compressed Natural Gas (CNG) Tank

Note: Draining of fluids may be accomplished using pressure, vacuum or gravity. Fluid containers should have only one low point that is easy to locate.

3.4.2.2 Parts and Components. Provisions shall be made in the part, system and vehicle design for fast removal of the batteries, oil filters, LPG tanks, CNG tanks, tires and catalytic converters during the pre-treatment phase.

3.4.3 Design for Dismantling. Polymeric parts should be designed for dismantling.

3.4.3.1 Dismantling Large, Easy to Access Polymeric Parts. Large polymeric parts may need to be removed from the vehicle and counted toward the recyclable mass of the vehicle in order to meet regulatory requirements