



Plastic Part Properties

1 Scope

1.1 Material Description.

1.1.1 Material Identification.

1.1.1.1 Marking of Parts. All plastic parts shall be marked using the latest version of ISO 11469.

For example, polycarbonate would be indicated as follows: > PC <.

1.1.1.1.1 All Parts. Marking is required on all plastic parts except in cases where fit, function, or appearance is compromised. Extruded parts are also excluded from this requirement.

1.1.1.1.2 Composite Parts. A molded part that is manufactured using more than one polymer type shall have the plastic symbols for each polymer type identified on the part. Examples of manufacturing using more than one polymer type are co-injection molding and two-shot molding.

1.1.1.1.3 Small Parts. In cases where the letter height must be smaller than 1.5 mm in order to fit on the part, marking is not required. For ease of locating for recycling, make the marking as large as possible without hindering appearance or function.

1.1.1.1.4 Relationship to Other Markings. 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.

1.1.1.2 Standard Drawing Notes. Mark all plastic parts per ISO 11469.

1.2 Symbols. A symbol for the general type of plastic resin is to be used and a letter-number symbol for each quality level of each property or characteristic.

For example, an automotive interior part might be specified as follows: GMW17081 ABS (DSB83, RE20). Refer to 3.2.1.

Note: While this format provides the means for characterization and specification of each property and combination of properties for a broad range of materials, it is subject to possible misapplications since impossible property combinations can be coded if the user is not familiar with available commercial materials.

1.3 Applicability. Plastic parts that have additional requirements beyond the material properties.

1.4 Remarks. Plastics should be described in terms of specific performance characteristics desired in the molded part. An infinite number of such descriptions can be formulated by the use of one or more standard statements (based on standard tests) each designating a quality level of a property or characteristic. Users of plastic parts can, by selecting different combinations of performance characteristics, specify different combinations of properties desired in various parts. This standard provides a system for specifying significant properties of commonly used plastics, including unpigmented and pigmented, unfilled and filled products. It is intended to apply to parts (not resins) used in the automotive and related industries. It is also intended to be used either as the sole descriptor of a material or within the body of a specification covering the common standard characteristics required where additional specialized requirements are detailed.

2 References

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

2.1 External Standards/Specifications.

ASTM D792	ASTM D3763	ISO 176	ISO 4577
ASTM D1505	ISO 62	ISO 1183	ISO 11469
ASTM D3012			

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2.2 GM Standards/Specifications.

GMW3013

GMW3116

GMW14093

GMW14672

GMW3059

GMW3221

GMW14124

GMW15424

3 Requirements**3.1 Requirements on Test Specimens.** Reference GMW3221.**3.2 Physical Requirements.****3.2.1 Suffix Requirements.** See Table 1 for a summary of the suffix symbols.**Table 1: Suffix Symbol Characteristics**

Suffix Symbol	Characteristic
D	Density
DS	Dimensional Stability
H	Oxidative Stability
PL	Parting Lines
PR	Impact Resistance
PS	Multi-Axial Instrumented Impact
RE	Regrind
TC	Thermal Cycle Resistance
VL	Volatile Loss
WA	Water Absorption
Z	Other Characteristics

3.2.1.1 Suffix D – Density. As determined by ASTM D792, Method A, or Density by ISO 1183/A, density shall be within the tolerance indicated by the letter following the D-suffix (see Table 2), and the value shall be indicated by the numerals following the amended D-symbol times the factor 0.001. ASTM D1505 may be used in place of ASTM D792 or ISO 1183/A providing the density is converted to specific gravity by the following:

$$\text{sp gr } 23/23\text{ }^{\circ}\text{C} * 0.9975 = \text{D}23\text{ }^{\circ}\text{C}, \text{ g/m}^3$$

Example: DE895 = (0.895 ± 0.003)

Table 2: Tolerances for Density

Designation	Tolerance
DA	Minimum Value
DB	Maximum Value
DC	± 0.02
DD	± 0.03
DE	± 0.05
DF	± 0.001
DG	± 0.002
DH	± 0.003
DJ	± 0.004
DK	± 0.005