



Plastic Part Properties

1 Scope

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/Material Description. This standard provides a system for specifying material related part performance requirements for automotive plastic components.

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.

1.3 Applicability. This standard covers the performance requirements of plastic parts used in automotive applications. The parts may be functional assemblies or sub-assemblies. This specification may be used when the system part performance specifications are not applicable:

- GMW14444 – Materials Related Interior Part Performance
- GMW14650 – Performance Requirements for Exterior Plastic Parts
- GMW15725 – Performance Requirements for Engine Compartment Plastic Parts
- GMW16882 – Performance Requirements for Engine Plastic Parts

1.4 Material Identification. Reference GMW3116, Recyclability/Recoverability, for requirements for marking of parts for recycling.

2 References

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

2.1 External Standards/Specifications.

ASTM D792	ASTM D3012	ISO 62	ISO 1183-1
ASTM D1505	ASTM D3763	ISO 176	

2.2 GM Standards/Specifications.

GMW3059	GMW14093	GMW14444	GMW15424
GMW3116	GMW14124	GMW14650	GMW15725
GMW3221	GMW14270	GMW14672	GMW16882

2.3 Additional References. Not applicable.

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 1183-1, 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 1183-1 providing the density is converted to specific gravity by the following:

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

Example: DE895 = (0.895 ± 0.05)

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

3.2.1.2 Suffix DS – Dimensional Stability.

3.2.1.2.1 Unrestrained 4 h Exposure. After 4 h exposure in an oven, parts shall conform to the dimensions and tolerances shown on engineering drawings. The oven shall be set at the temperature, in degrees Celsius, indicated by the numerals following the suffix DS-symbol. Where appropriate, parts shall be held during measuring and heating in a manner similar to that encountered during actual use of the part.

For example, DS85 = 4 h at 85 °C.