



Performance Requirements for Engine Plastic Parts

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 standard includes the performance requirements of plastic parts installed directly in an engine environment, whereby the applied mechanical and thermal loads are typical of those experienced in both light and heavy duty over the road automotive applications. The parts may be functional within themselves or they may be a subassembly of, or attached to, metallic, or non-metallic functional parts.

Note: Additional requirements for coated or painted plastic parts (e.g., emblems, painted engine covers) are given in the relevant performance specifications; not by this specification.

Note: All materials used in parts or components in contact with the air of the interior compartment must additionally conform to the interior requirements as specified in GMW14444, Code E.

1.2 Applicability. This standard provides the standard material performance requirements for engineered plastic parts for use on an engine and/or near the exhaust system. Typical applications on an engine include cam covers, oil pans, front cover rear covers, etc. This specification is intended to provide functional guidelines that enable/support the manufacturing process and control plan validation. It is **not** intended to specify validation requirements as they relate to product performance.

1.3 Remarks. The operating characteristics of parts covered by this standard are operating continuous temperature of -40 °C up to a maximum continuous temperature according to Table 1. Peak temperatures can exceed the maximum continuous temperature by 20 °C. These peaks can make up 60 h in the lifetime of the vehicle. Based on the maximum continuous temperature in installed position on the engine or near the exhaust system, the parts are identified by Class 1 to Class 4 according to Table 1. Unless otherwise specified, all engine mounted components are expected to meet Class 3 environmental requirements with the exception of those located in close proximity to the engine exhaust.

Table 1: Operating Temperatures

Class	Maximum Continuous Temperature in Degrees Celsius (°C)	Peak Temperature in Degrees Celsius (°C)
1	≤ +110	+130
2	+110 to +130	+130 to +150
3	+130 to +150	+150 to +170
4	> 150	> 165

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

GMW14093

GMW14444

GMW16955

GMW3155

GMW14334

2.3 Additional References.

- API CH-4 (contact Materials Engineer for further information)
- API CI-4 (contact Materials Engineer for further information)
- GM Part Number (P/N) US Canada 89021807
- GM Part Number (P/N) US 89021806

3 Test Preparation and Evaluation

3.1 Resources.

3.1.1 Facilities. Not applicable.

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

3.1.1.2 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.

3.1.2 Equipment. Not applicable.

3.1.3 Test Vehicle/Test Piece. Unless otherwise specified in the relevant test method for the property concerned, either the complete component or a section therefrom shall be used for test pieces. Unless otherwise specified in the appropriate test methods, at least one (1) test piece shall be tested. Test pieces shall not be tested within 72 h of manufacture.

3.1.4 Test Time. Conforming to the relevant test procedures.

3.1.5 Test Required Information. Conforming to the relevant test procedures.

3.1.6 Personnel/Skills. Conforming to the relevant test procedures.

3.2 Preparation. Conforming to the relevant test procedures.

3.3 Conditions.

3.3.1 Environmental Conditions. Conforming to the relevant test procedures.

3.3.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

3.4 Instructions. Not applicable.

3.5 Data. Not applicable.

3.6 Safety. This Engineering Standard may involve safety requirements for hazardous materials, the method of operations and equipment. This standard does not propose to address all the safety issues associated with its use. It is the responsibility of the user of this standard to ensure compliance with all appropriate safety and health practices. This would include any specific training that may be required. The safety and health standards include site specific rules and procedures, company rules and procedures, and Government Standards. Contact shall be made with the appropriate site Safety and Health personnel for further direction and guidance in these matters.

3.7 Documentation. Samples of components or material released to this standard shall be tested for conformity with the requirements of this standard and approved by the responsible GM Department prior to the start of delivery of production level components or materials.

Any change to the component or material, e.g., design, function, properties, manufacturing process and/or location of manufacture requires a new release of the product. It is the sole responsibility of the supplier to