



Sealer - Anaerobic Gasket

1 Scope

1.1 Material Description. A red anaerobic polyacrylate resin base gel-like compound that solidifies by polymerization when confined between two surfaces in the absence of air or by exposure to high temperatures. When cured, the compound becomes a tough plastic material capable of providing a gasket or flange seal for oil and other automotive powertrain fluids.

1.2 Symbols. Not applicable.

1.3 Applicability. The material shall be capable of sealing gaps up to 0.25 mm between two metal surfaces and withstanding pressure of 35 MPa upon full cure. Cam or bearing cap to block. Excessive amounts of oil and dirt must be removed from the sealing surfaces for maximum results.

1.3.1 Temperature Use Range. It is best suited for application where temperatures range from -54 °C to 150 °C. Low temperature performance is based on maintaining 50% or more of the original minimum static shear strength after 2 h exposure (measure in 30 s or less). The low temperature test is not required for this standard. The upper temperature limit is based on Table three (3) aging requirements.

1.4 Remarks. The words must, shall or will as used in this document mean a mandatory requirement.

1.4.1. Application of the product outside its use category (gasketing) as defined by GMW16800, 7.1.10.2 is strictly prohibited.

1.4.2 Preferential bonding to one surface (adhesive failure) can be an indicator of surface contamination or inactivity if the metal is different.

1.4.3 This gasket anaerobic has air mixed in it and is designed for manual or semi-automatic dispense applications (not fully automated).

1.4.4 Test Result Perspective. Steel forms are used to establish and compare gap limit, cure speed and strength between retaining compounds. Test this product on end use surfaces as the metal reactivity (1.4.6) and production surface cleanliness affecting cure speed and strength to gap may be different from the values in this specification.

1.4.5 Container Size. No anaerobic container is more than 1 L because pressure on the product in the container can cause curing. Do not transfer anaerobic into an unauthorized or contaminated container.

1.4.6 Reactive Surfaces. Anaerobics bond with active metal ions and cure in the absence of air. The following are very reactive; brass, copper, manganese, followed by active; aluminum, bronze, iron, nickel and steel. Inactive metals are anodized aluminum, cadmium, chrome finishes, Inconel, magnesium, plated parts, galvanized steel, stainless steel, titanium and zinc. Small percentages of copper or other active metals are added to inactive compositions to promote anaerobic curing. Borate and nitrate cleaning residues will retard bonding and cure.

2 References

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

2.1 External Standards/Specifications.

ASTM B221	ASTM D2094	ASTM D3278	ISO 4587
ASTM D792	ASTM D2095	ASTM D4562	ISO 10123
ASTM D1084			

2.2 GM Standards/Specifications.

GMW3059	GMW15735	GMW16800	GMW17332
GMW14270	GMW16676	GMW17205	

2.3 Additional References.

Leadership, Performance and Sustainability (LPS) Precision Clean, <http://www.lpslabs.com/>

3 Requirements

3.1 Material to be tested per methods outlined in GMW16800 Gasketing, Appendix A, Table A1. This includes test frequency requirements to be reported to the Powertrain Integration and Sealant Specialist Team based on timing from the initial product approval date (month (mm)/year (yr)).

3.1.1 For all table test methods listing more than one method, note that Note 2 explains that particular method was used to generate that table data property.

3.1.2 Minimum Table Data Requirements. Table 1 and Table 2 are based on the minimum number of batches described in GMW16800, 5.3.2 Initial Approval. Conformance to Table 3 and storage/stability is based on one batch.

3.1.3 Per the Global Subsystem Leadership Team decision in January 2016 submission of data for product compliance is suspended (due to limited supplier testing resources at the time of this refresh). Table 1, Table 2 and Table 3 values are based on previous testing.

Table 1: Initial Qualification Requirements

Properties	Test Method ^{Note 1}	Values
Unpolymerized		
Flash Point	ASTM D3278	90 °C minimum
Specific Gravity	ASTM D792	1.13 sp.g ± 0.05 sp.g
Storage/Stability Viscosity Increase	GMW15735, GMW16800 (4.7)	50% maximum
Toxicity/Health and Safety	GMW3059	
Polymerized		
Static Shear (Pin and Collar)	ASTM D4562 ^{Note 2} , ISO 10123	7.5 MPa minimum
Lap Shear, Cure at 22 °C for 72 h or at 70 °C for 45 minutes.	ISO 4587, Aluminum test panel substrate (ASTM B221, A380)	3400 kPa minimum
Cure Speed , lap shear at 0.125 mm maximum gap. Fixture Time to reach 0.1 MPa. 15 °C 35 °C Time to reach 50% of final strength 15 °C 35 °C Time to reach full strength (90% to 100%) 15 °C 35 °C	ISO 4587, GMW16800 (4.18, 7.1.3), A380 Aluminum test panel substrate,	36 h, maximum 36 h, maximum 168 h, maximum 168 h, maximum 168 h, maximum 168 h, maximum
Fluid Compatibility, 168 h at 150 °C, GMW17332 0W20 Oil	See GMW16800 (4.16), A380 Aluminum test panel substrate	
Lap Shear	ISO 4587 ^{Note 2}	3000 kPa minimum
Corrosion to Metal (Aluminum and Steel)	GMW16800 (4.6)	No corrosion

Note 1: Where more than one method is listed the preferred method is in bold.

Note 2: The particular method used to generate that table data property.