



Vehicle Suspension U-Bolt Coating

1 Scope

1.1 Material Description. This specification covers the materials and performance requirements for a black waterborne organic coating over a zinc phosphate surface. The coating is specified for vehicle suspension U-Bolt applications where ultraviolet (UV) resistance is not required.

1.2 Symbols. Not applicable.

1.3 Applicability. Vehicle Suspension U-Bolt.

2 References

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

2.1 External Standards/Specifications.

ANSI B18.18.2M ISO 3892

2.2 GM Standards/Specifications.

GMW3059	GMW14270	GMW15272
GMW3286	GMW14872	GMW16551

2.3 Additional References.

- General Motors Part Number 11502646
- General Motors Part Number 11516092
- General Motors Part Number 11516107

3 Requirements

3.1 Requirements on Test Specimens. Not applicable.

3.2 Production Coated Parts. Specific material requirements and appropriate test methods are listed under 3.4 and 3.5. These requirements shall be determined by tests performed on production parts coated on the production line.

3.3 Critical Surfaces and Cure. The requirements listed in 3.4 and 3.5, shall be met on all critical surfaces after coating application, cure and 30 minutes at room temperature.

3.4 Physical Properties.

3.4.1 Cleaning.

3.4.1.1 The use of mineral acids, such as hydrochloric acid, is not allowed. Diluted citric acid cleaners may be used to remove process oils.

3.4.1.2 Rust preventatives which are used to prevent corrosion during shipment of the bare U-Bolt to the paint applicator must be capable of being completely removed by the cleaning systems in use.

3.4.2 Zinc Phosphating.

3.4.2.1 Zinc Phosphate Coating Weight. The zinc phosphate shall have a coating weight of 27.5 g/m² minimum as tested per ISO 3892. The test shall be conducted on a section of the U-Bolt or test panel.

3.4.2.2 Uniformity. The coating shall be uniform and with 100% coverage, visual estimation, over the surface of the U-Bolt.

3.4.2.3 Zinc Phosphate Processing. Application of the zinc phosphate coating may be made according to the parameters set forth by the zinc phosphate supplier.

3.4.3 Organic Coating.

3.4.3.1 The organic coating shall be uniform and continuous with no evidence of voids, craters, sags, run out, blisters, or other surface defects when visually examined.

3.4.3.2 The color shall be black.

3.4.3.3 Application. Application may be made by the dip spin or dip drain process.

3.5 Performance Requirements. The coated U-Bolt shall meet the performance requirements defined in Table 1.

Table 1: Performance Requirements

Thickness	Neutral Salt Spray	Red Rust
8 μ m minimum ^{Note 1}	600 h	< 5% Visual Estimation

Note 1: Coating thickness to be measured on the non-threaded section of the U-Bolt leg.

3.5.1 Coating Rub Off. Coated parts should be dry to touch and not exhibit softening, swelling or change in adhesion when a coated part is rubbed ten (10) times with a clean, dry cloth using only the weight of the coated part to supply pressure. Some minor rub-off onto the cloth is allowed.

3.5.2 Salt Spray Resistance. Parts coated to this specification shall be capable of withstanding the neutral salt spray (NSS) test requirements listed in Table 1 when tested per GMW3286. Parts shall not show any blistering after NSS testing. Evaluation shall be performed on the unthreaded areas of the fastener.

3.5.2.1 For initial approval, the parts must be tested per GMW3286 to meet the corrosion resistance requirements when sampled per American National Standards Institute (ANSI) B18.18.2M.

3.5.2.2 Normal production processes that are in statistical process control shall yield parts that are capable of meeting the salt spray requirements.

3.5.2.3 A periodic NSS test of the parts being processed on each production line running this coating should be conducted per Table B, Appendix I from ANSI B18.18.2M. The sample size shall be three (3) pieces minimum per line, per shift.

3.5.2.4 Process control checks are to be made and recorded according to the coating manufacturer's instructions.

3.5.3 Initial Source Qualification. For initial source qualification only, a production U-Bolt shall be subjected to cyclic corrosion per GMW14872, (underbody, All, four (4) salt sprays, Method 1/2, Exposure A). The U-Bolt shall be capable of meeting a rating of seven (7) or higher as defined in GMW15272, for a low/medium visibility component.

3.6 Fastener Requirements.

3.6.1 When applied to threaded products, the coating shall not have an adverse effect on normal installation and removal practices.

3.6.2 The maximum thickness of coating which may be applied to threads on threaded products is limited by the basic thread size (tolerance h or H). After coating, parts must gage with the appropriate basic size of a **GO** thread gage per GMW16551. Threads may be produced undersize/oversize (before coating) to accommodate the coating thickness, providing the finished product (after coating) meets all specified mechanical properties. Where mechanical properties are not specified, undersizing/oversizing is subject to approval by pertinent engineer, and all undersizing/oversizing shall be within permissible limits as agreed upon between the producer and the purchaser.

3.6.3 Torque/tension testing shall be performed as follows:

3.6.3.1 Regardless of U-Bolt thread size, coat a surrogate bolt, Part Number (PN) 11516107.

3.6.3.2 The test washer shall be PN 11502646, and the test nut shall be PN 11516092.

3.6.3.3 A tension test fixture with a load cell shall hold the test nut, bolt and washer, and measure the tension produced by tightening the bolt.

3.6.3.4 The load cell shall have a full scale accuracy of $\pm 0.5\%$. Test bolts shall be driven using a fixtured direct current (DC) electric nut runner. The nut runner shall have a capability for producing torques greater than the specified torque range and shall be run at a continuous speed of 100 rpm $\pm$ 10 rpm.

© Copyright 2017 General Motors Company All Rights Reserved