



WINDSHIELD WASHER SOLVENT PERFORMANCE

WSS-M14P19-A

1. SCOPE

This specification defines the minimum performance requirements of WWS (Windshield Washer Solvent).

2. APPLICATION

This specification defines minimum performance requirements of all initial fill (water diluted) alcohol based WWS solutions.

3. REQUIREMENTS

3.1 APPROVED SOURCES

This specification requires the use of approved sources. Only the sources identified on the Ford Approved Source List (ASL) can be used when this specification is listed on the drawing, CAD file, or other documents. The list of approved sources is located within Ford at www.mats.ford.com or available externally through a Ford Materials Engineer.

3.2 FINISHED PARTS

Testing must be done on actual production parts or a section of the part whenever possible. Where part dimensions limit equipment access, representative panels or plaques may be substituted for production parts. Production parts, panels, and plaques shall be referred to as "specimens" throughout the specification.

3.3 TYPES OF WWS

The type of WWS fluids used in the testing will depend on the market that the vehicle is intended to be sold. If the vehicle is being sold in several markets the fluids representative of each market must be tested.

3.4 TESTING REQUIREMENTS

All of the requirements listed in section 3.5 - 3.10 must be performed in triplicate. All weights should be to the nearest milligram. Approximately 3.8 L of windshield washer solvent is needed to meet the testing requirements of this specification. The ratio of water to alcohol-based concentrates for final initial fill use will be determined by local market requirements. Contact the Design and Release Engineer for dilution rate.

Date	Action	Revisions	Ver. 2
2015 10 01	Revised	Revised section 3.9.2	C. McComb, NA
2008 07 22	Revised	Added Table 1	C. McComb, FNA
2007 11 29	Activated		C. McComb, FNA



3.5 CLEANABILITY

Perform test on transparent glass test plates that measure approximately 50 mm x 80 mm.

Test Method

- To clean thoroughly, place the glass plates in a 10% IPA solution for 12 hours.
- Remove and rinse with DI water. The glass plates should be water break free of droplets when held vertically.
- Air dry the plates and then completely immerse each plate in mineral oil (approximate viscosity of 10 mm²/sec at 40 °C). Remove and allow the plates to drain for 1 hour.
- Using clean tongs, fully immerse each plate from item c. in 1 liter of 40% fresh WWS concentrate and 60% DI water. Move each plate back and forth a distance of 25 - 50 mm 100 times in approximately 3 minutes. Rinse each plate for ½ minute with DI water.
- Determine for each glass plate the percentage surface area which is water repellant. Use an appropriate grid as a guide to calculate percentage.

Acceptance Criteria:

Average for the three tests must show 80% minimum of surface area is water-break free after completing Cleanability test.

3.6 BODY EXTERIOR COMPATIBILITY

Perform the test on any vehicle exterior surfaces that may come into contact with the fluid. Interaction between the WWS and the windshield system and adhesives should be tested by the component supplier.

Test Method

- Place a few drops of each initial-fill WWS of approximately 5 mm in diameter on two panels of actual or simulated production parts. Body enamels should be prepared per FLTM BI 103-02. Other panels should be prepared simulating production processes.
- Allow the fluid to remain on test specimens until dry.
- Expose specimens to fluorescent light per FLTM BU 105-01 for 24 hours at 80 °C.
- Remove specimens, wash with approximately 5% mild detergent solution (for example, mild dishwashing soap). Rinse thoroughly with DI water and pat dry with a soft cloth or tissue.

Acceptance Criteria

- The spotted areas of the specimen shall show no color change, dulling, surface distortion, spotting, softening, or cracking when compared to the unspotted areas of the same specimen.
- AATCC gray scale rating of 4 - 5 or 5.

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3.7 METAL CORROSIVENESS

Perform test on production representative metals in the windshield washer system. Metals to be included are, but not limited to, aluminum alloys, brass, stainless steel, galvanized steel, cast iron, and chrome plated steel. The coupons shall be 5 cm x 4 cm or other dimensions to equal area of 20 cm².

Test Method

- All test coupons must be clean of foreign coatings or contaminants.
- Weigh, then totally immerse each test coupon in individually sealed glass jars containing initial fill WWS for a period of 168 hours at 50 °C.
- Remove coupons and rinse with DI water. Dry for 1 hour at 100 °C. Cool and weigh.
- Inspect test coupons for surface imperfections.

Acceptance Criteria

- There shall be no surface imperfections such as pitting or surface corrosion.
- Weight change shall be within 3% of original weight.

3.8 EFFECT ON RUBBER AND HOSES

Perform test on specimens that have approximate dimensions of 5 mm x 50 mm x 2 mm. The rubber specimens shall be representative of vehicle production rubber and must be identified by the manufacturer's material codes.

Test Method

- Determine IRHD of materials to be tested per ASTM D 1415.06.
- Weigh, then immerse each test specimen in individually sealed glass jars containing initial-fill WWS and hold for period of 168 hours at 50 °C.
- Remove specimens then allow to air dry for one hour at room temperature and inspect for stickiness, exfoliation, swelling or cracking.
- Measure IRHD and weight.

Acceptance Criteria

- There shall be no evidence of surface stickiness, exfoliation, or cracking.
- Hardness shall be within 3 IRHD of the original hardness.
- Weight shall be within 3% of the original weight.
- Volume shall be within 3% of the original volume.

3.9 EFFECT ON PLASTIC

3.9.1 Effect of WWS on Surface Appearance and Weight

Perform test on specimens that have approximate dimensions of 25 mm x 50 mm x 2 mm. All plastic specimens and nozzles shall be representative of vehicle production parts.