GM	WORLDWIDE ENGINEERING STANDARDS	Test Procedure	GMW17089

Effect Of Purge Solvents on Plastics

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 describes test procedures to evaluate and compare the effect of purge (paint flushing) solvents on sensitive components used in paint delivery and application equipment. Different ingredients in purge solvents can affect plastics differently. Plastic components used in paint applicator equipment may swell or contract differently with a change in purge materials.

1.2 Applicability. This test procedure is one of the testing requirements for equipment compatibility with solventborne purge solvents, waterborne purge solvents, and equipment cleaners covered under standards 9984037, 9984304, 9984482, and 9984488.

1.3 Remarks. Solventborne purges, waterborne purges, and equipment cleaners subject to this test procedure are described as product or products in this test procedure.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

9984037	9984304	9984482	9984488

2.3 Additional References. None.

3 Resources

3.1 Facilities.

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

3.1.2 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.

3.2 Equipment.

3.2.1 Balance. A balance capable of weighing accurately to 0.0001 g.

3.2.2 Micrometer. The micrometer should have an incremental discrimination accuracy of at least 0.0254 mm (0.001 in).

3.2.3 Room or enclosed space capable of being maintained at the ambient laboratory atmosphere.

3.2.4 Containers. Suitable containers for submerging specimens in the test products. Containers must be resistant to corrosive effects of the products being used. Typically, High Density Polyethylene (HDPE) jars of 473 ml (16 oz) or glass jars with closeable lids are suitable. Tightly sealed containers are required for testing to minimize product evaporative loss.

3.3 Test Vehicle/Test Piece. Not applicable.

3.4 Test Time. Timing varies based on the specific materials and test request.

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3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. A person who has completed training on how to run the testing of effect of solvents in plastics components.

4 Procedure

4.1 Preparation.

4.1.1 Test Specimens – Change in Weight or Volume. Use representative specimens from paint delivery and application equipment, otherwise coupons from raw components will be also acceptable. At least three (3) replicate specimens should be used for each product being tested.

4.1.2 Size variation of plastic test specimens should be controlled as closely as possible between products tested. The standard plastic specimen should have approximate dimensions of 25 mm × 50 mm × 2.0 mm ± 0.1 mm for coupons or 50 mm diameter × 12.5 mm diameter for rods. Different samples sizes can be used upon engineering approval (from parties involved) prior to testing. Data obtained on test specimens having different original thicknesses are not comparable.

4.1.3 A control/baseline product or test specimen must be included. Final results will be a comparison to the control/baseline.

4.2 Conditions.

4.2.1 Environmental Conditions. Not applicable.

4.2.2 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.

4.3 Instructions.

4.3.1 Weigh each specimen separately to the nearest 0.1 mg and record the weight. Measure thickness at the center, length, and width or (for round specimens) at two (2) diameters at right angles to each other to the nearest 0.025 mm.

4.3.2 Place the specimens in the products to be tested. Make sure the specimens are completely immersed and containers tightly sealed. The quantity of reagent shall be approximately 40 mL/in^2 of specimen surface area. Typically for rod samples (50 mm diameters × 12.5 mm diameters), 200 ml of product is sufficient in a 473 ml (16 oz.) jar.

4.3.3 Soak the specimens at room temperature for 24 h, 48 h, 72 h, 168 h, and 480 h. The 480 h soak is optional.

4.3.4 Remove specimens from the product. Start timer. Blot lightly with filter paper free of lint and foreign material. Put on scale and wait 3 minutes. Weigh specimens to the nearest 0.1 mg and record weights. Measure the specimens to the nearest 0.025 mm.

4.3.4.1 After weighing and measuring after 24 h of exposure, immerse the test specimens in the same test liquid. Repeat the procedure after 48 h, 72 h, and 168 h.

4.3.5 Record the original weights of the test specimens before immersion and weights after immersion. Express the change in weight as a percentage of the original weight. Report the results as the average of the three (3) test specimens when applicable.

4.3.6 Report visual specimen changes such as cracking, deterioration, discoloration, etc.

4.3.7 Report any notable changes in elasticity, brittleness and strength. Equipment supplier should be contacted for further investigation/testing if any changes are noticed.

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