

	SURFACE VEHICLE RECOMMENDED PRACTICE	 J2996 JAN2013
		Issued 2013-01
Small Diameter Fuel Line Permeation Test Procedure		

RATIONALE

During SAE J30 Permeation testing of small diameter fuel lines, air bubbles can unknowingly form in the fuel line and cause erroneous and inconsistent results. This new and improved weight loss test procedure, has been developed as an alternative to SAE J30, will eliminate air bubble formation resulting in improved permeation test results.

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1. SCOPE

This SAE Recommended Practice is intended for the determination of the losses of hydrocarbon fluids by permeation through small diameter fuel hose typically 4.75mm ID or less and typically used on Small Off-Road Engines (SORE) less than 19 kW as regulated under 40 CFR Part 1054.

1.1 Purpose

This document addresses specific issues associated with weight loss permeation testing of small ID fuel hose. Specifically this document is understood to be an improvement over the SAE J30 weight loss test procedure when used on small ID fuel hoses typically less than 4.75mm ID.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J30 Fuel and Oil Hoses

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 Federal Regulations

Available from Electronic Code of Federal Regulations <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=%2Findex.tpl>

40 CFR Part 1054 Control of Emissions From New, Small Nonroad Spark-Ignition Engines and Equipment

40 CFR Part 1060 Control of Evaporative Emissions From New and In-Use Nonroad and Stationary Equipment

40 CFR 1065 Engine Testing Procedures

2.2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org

ASTM D4806 Standard Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel

3. DEFINITIONS

Fuel Hose is defined as flexible hose used to carry gasoline or a gasoline/alcohol mixture for a spark ignited engine. It may be reinforced or non-reinforced, rubber based, urthane based or other suitable flexible material, it may be single layer or multi-layer construction.

Test Fuel is defined as typically being commercially available gasoline, Indolene, or gasoline meeting the requirements found in 40 CFR 1065.710. Test fuel may also be a mixture of gasoline and ethanol as determined appropriate for the specific test needs. Test fuel can also be test fuel C or C containing ethanol.

Fuel C is an equal mixture of 50% Isooctane and 50% Toluene.

Fuel CE10 is 45% Isooctane, 45% Toluene and 10% ethanol.

Ethanol is defined as fuel grade ethanol meeting the specifications of ASTM D4806 which can also be found in 40 CFR 1060.810.

4. APPARATUS AND EQUIPMENT

A test fixture similar to the one shown in Figure 1 below, is required. The volume of the fuel container must be a minimum of 400 ml $\pm$ 30 ml and the volume of the test fuel is 300 ml $\pm$ 15 ml. The recommended length of fuel line is 300 mm $\pm$ 3 mm. If the test fuel line is not a continuous 300mm length individual line sections may be joined together using proper connection fittings and good engineering judgment to make a 300mm line length.

Test fuel is generally gasoline or a gasoline and ethanol blend as required to meet specific regulations.