



Test of Electrochemical Resistance of Elastomeric Compounds

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 test procedure determines the electrochemical resistance of elastomeric compounds used for coolant hoses.

1.2 Applicability. This test procedure is applicable to all coolant hoses.

1.3 Remarks. The electrochemical degradation of coolant hose materials is caused by a galvanic reaction between the metal fitting and the carbon black in the rubber. This causes cracks in the Ethylene Propylene Diene Terpolymer (EPDM) elastomer, which are not formed by thermal ageing. They require a low electrical potential. This test procedure is to simulate these conditions to test the resistance of a compound to electrochemical degradation.

2 References

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

2.1 External Standards/Specifications.

EN 10088-2 ISO 188

2.2 GM Standards/Specifications.

GMW16955

3 Resources

3.1 Facilities. Not applicable.

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 Thirty (30) V direct current (DC) power supply.

3.2.2 Automotive Engine Antifreeze Concentrate per GMW16955 Code E.

3.2.3 End plugs chemically resistant, made of electrically nonconductive thermoplastic as polyamide, Polytetrafluoroethylene (PTFE) or polypropylene, suitable for isolating voltage applied to end of hose from the liquid test media inside the hose. Electrical contact surface for applied voltage should be the inside circumference of test hose. The hose plug (Figure 1), and the hose test electrode, (Figure 2), are connected with a screw to form the end plug assembly and are shown for hoses with 34 mm inside diameter, which is preferred, but other sizes can also be used.

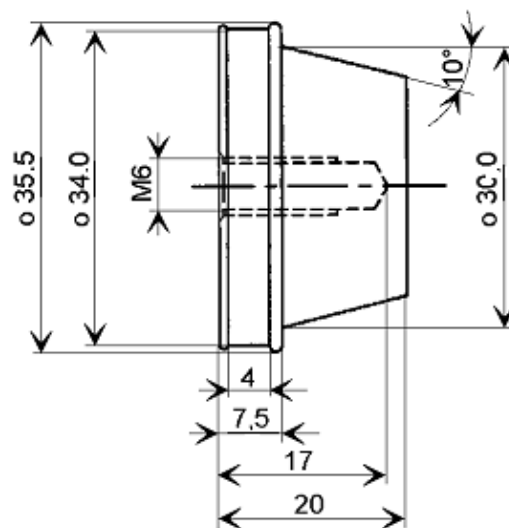


Figure 1: Hose Plug (Material, e.g., Polyamide)

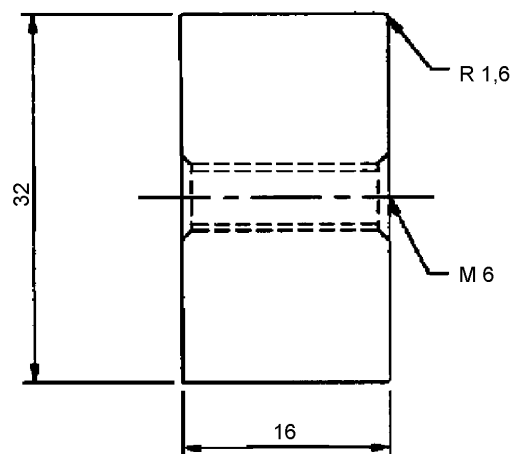


Figure 2: Hose Test Electrode Material:
Stainless Steel (EN 10088-2-X6CrNiTi18-10)

3.2.4 Glass tube for electrical isolation (Figure 3).

3.2.5 Suitable hose clamps for size of hose used.

3.2.6 Heating oven capable of maintaining the required temperatures within the specified tolerances (e.g., heat oven to ISO 188 Method B) configured with wooden or other non-conducting surface for complete electrical isolation of test assembly.

3.2.7 Suitable electrical leads and clips for connecting power source to end plug.

3.2.8 Microscope capable of 10x to 20x magnification and a fiber optic light source that can be adjusted for low angle to examine specimens after test.

3.2.9 Multimeter with suitable connectors.