

EDS

Engineering,
GM DAEWOO Auto & Technology
Standards

TEST METHOD FOR CHEMICAL STRESS RESISTANCE OF PLASTICS

EDS-T-7020

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VERSION: 4

1. PURPOSE

This test method specifies evaluating method for chemical resistance of plastic parts under stress.

2. SCOPE

This test method provides a means for evaluating the susceptibility of plastics to environmental stress cracking under simulated liquid splashing conditions (Method A) or continuous exposure to chemicals (Method B), or continuous exposure to soft trim plastics or other materials in a solid foam (Method C).

3. TEST PIECES

3.1. Test pieces shall be applied to tensile test pieces(Thickness X Width X Length = 3.2 X 12.7 X 216mm) in the EDS-T-7511, Type 1 and approval test is three, quality test or incoming test shall be tested one or more pieces.

3.2. Samples of materials released to this specification shall be tested for conformity with the requirements of this specification and approved by **GMDAT** TECHNICAL CENTER prior to commencement of delivery of bulk supplies.

3.3. Any changes in materials, processing etc. subsequently made require re-approval by **GMDAT** C TECHINAL CENTER. It is the sole responsibility of the supplier to inform the purchaser of any such changes and to resubmit samples for approval.

3.4. Deviations from the requirements of this specification shall have been agreed upon shall be specified on the individual component drawings, material specifications etc. and shall be notes on all test certificates, reports etc.

4. CONDITIONING

Test pieces shall not be tested within 72 hours of manufacture. Unless otherwise specified, conditioning shall be as required by the appropriate test method.

5. APPARATUS AND REAGENTS

5.1. Stainless steel elliptical bending form (See figures 1 ~ 6)

5.2. Pipet, 5 ml.

5.3. Chemically resistance grease (Halocarbon Grease Series 25-5S or equivalent)

5.4. Gauze or sponge

6. PROCEDURE

6.1. METHOD A

6.1.1. Position the test piece on the bending form at the highest strain level of interest by using the wooden tongue depressor to hold the bar firmly against the form while the clamps are tightened onto the test sample. Care should be taken to avoid contaminating the test piece surface by handling. The wooden tongue depressor is removed when the test piece has been secured to the fixture.

6.1.2. For test pieces exhibiting edge cracking, apply chemically resistance grease to the edges of the narrow portion of the test piece bar, as well as around the clamps, to prevent contact with the test fluid.

6.1.3. After a 5-minute time interval from application of stress to the test piece, apply 5 ml of test fluid to the stressed surface of the test piece bar by dipping over the entire narrow portion area of the test piece bar.

6.1.4. Volatile Test Fluids

- (1) After 10 minutes of exposure to the fluid, examine the surface of the bar for crazes and/or cracks. Record the position of the crazes or cracks using the gauge marks on the bending form.
- (2) If no crazes or cracks are observed with no magnification and the surface of the bar is dry, re-apply 5 ml of test fluid and re-examine the test piece after 10 minutes.
- (3) Repeat step 6.1.4.2 if no crazes or cracks are observed after 2 applications of the test fluid (total of 3 applications).

6.1.5. Nonvolatile Test Fluids

Examine the surface of the stressed test piece bar for evidence of crazing and/or cracking after 10 minutes of exposure and again after 30 minutes of exposure.

6.1.6. If crazing or cracking occurs at the high strain position on the fixture, repeat the test using fresh tensile bars at lower strain positions on the fixture until no crazing or cracking occurs.

6.1.7. Determine the critical strain (EC) level using the measured craze/crack position and Table 1.

The reference thickness for the values of E_c in Table 1 is 3.2mm. Correct for thickness other than 3.2mm as shown by the following equation ;

$$E'_c = E_c \times (t_s/t_r)$$

E'_c : corrected critical strain

t_s : sample thickness (mm)

t_r : reference thickness (3.2mm)

E_c : critical strain from Table 1.