

EDS

Engineering,
GM DAEWOO Auto & Technology.
Standards

TEST METHOD FOR PLASTIC STRAIN RATIO(r) FOR SHEET METAL

EDS-T-7189

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1. PURPOSE

This standard specifies the method of obtaining plastic strain ratio of thin metal test samples using tension tester to enable correct testing

2. SCOPE

This standard applies to thin metal materials used on motor vehicles.

3. TERM

3.1. Plastic Strain Ratio (r)

This refers to the ratio of true Strain in the width direction of test sample against true Strain in the thickness direction when plastic deformation occurs by applying contraction tension stress on a tension test sample of panel shape.

3.2. Average Plastic Strain Ratio (Weighted Average of r values, $\bar{r}$ or r_m)

Weighted average of plastic strain ratios measured at 0, 45 and 90 degrees from the compression direction of test sample panel.

3.3. Internal Anisotropy Coefficient (Δr)

This value indicates the tendency of non-uniform formation of panel when a circular panel is subject to deep drawing.

4. TEST SAMPLE

Refer to EDS-T-7113 "METHOD OF TENSILE TEST FOR METALLIC MATERIALS" Appendix 1 "Metal Material Tension Test Sample." For other details, follow the rules below.

- 1) Test sample collection method shall follow each material standard specifications. If no specific rules, follow agreement between supplier and GMDAT.
- 2) Test sample shape shall follow each material's standard specification, If no specific rules, use the shape of EDS-T-7113, item 5, samples 13A or 13B.
- 3) Width dimension change of parallel areas of a test sample shall be within 0.1% of average width between indicated points.
- 4) When no specific rule on test sample thickness, use the original material thickness.
- 5) There shall be no scratches or other defects that impact test results negatively on test sample surfaces.

5. TEST EQUIPMENT

5.1. Tension Tester shall follow KS B 5521, ASTM E4 or DIN 51221 and shall consist of main body, load transport device, Load Measurement Device, Test Sample Jig and Elongation Ratio measuring device.