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**Method for springback evaluation
in stretch bending of aluminium
alloy sheets for automotive use**

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Foreword

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Method for springback evaluation in stretch bending of aluminium alloy sheets for automotive use

1 Scope This Japanese Industrial Standard specifies the method for springback evaluation in stretch bending of aluminium alloy sheets for automotive use.

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS G 0202 *Glossary of terms used in iron and steel (testing)*

JIS Z 2248 *Method of bend test for metallic materials*

JIS Z 8401 *Guide to the rounding of numbers*

3 Definitions For the purposes of this Standard, the definitions given in **JIS G 0202** and the following definitions apply.

- a) **quantity of springback** η That is the quantity calculated according to the following formula (1) from the curvature radius at the time of loading and after unloading as shown in Attached Fig. 1.

$$\eta = \frac{|1/r'_{in} - 1/r_{in}|}{1/r_{in}} = \frac{|r'_{in} - r_{in}|}{r'_{in}} \dots\dots\dots (1)$$

where, η : quantity of springback

r_{in} : curvature radius at the time of loading (mm)

r'_{in} : curvature radius after unloading (mm)

- b) **stretch bending** That is the method for bending of test piece by adding tension in processing or at the proper time.
- c) **curvature radius** That is the value corresponding to the radius at top end of punch in the pressing bend method specified in **JIS Z 2248**, and means the curvature radius, r_{in} and r'_{in} , of inside surface of test piece at the time of loading and after unloading as shown in Attached Fig. 1.
- d) **surface pressure** That is the value of the force loading to the direction of thickness of test piece in order to give tension divided by the apparent area of the loaded test piece. The calculation method is as shown in Annex 1.
- e) **tension** That is the force per unit cross section area acting on the right-angled direction to the bending axis of test piece by the load of surface pressure and the bending deformation. The calculation method is as shown in Annex 2.

4 Principle This method is to add tension to a test piece, to give a bending deformation until it reaches the specified radius and to measure the quantity of springback from the change of curvature radius of test piece at the time of loading and after unloading.