
**Metallic materials — Sheet and strip —
Method for springback evaluation in
stretch bending**

*Matériaux métalliques — Tôles et bandes — Méthodes d'évaluation du
retour élastique lors d'un cintrage sous traction*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 24213 was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 2, *Ductility testing*.

Introduction

This International Standard has been established to evaluate the amount of springback occurring in metallic sheets deformed by stretch-bending. It may be used for specifying a material, directly controlling a forming operation, designing dies, or calibrating finite element programs.

In metallic sheet forming processes, the geometry of the formed parts may deviate from the design geometry after the parts are removed from the dies due to elastic recovery. This phenomenon is referred to as springback.

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Metallic materials — Sheet and strip — Method for springback evaluation in stretch bending

1 Scope

This International Standard specifies a method for evaluating the amount of springback of sheets of metallic materials known to exhibit large amounts of springback subjected to plane-strain stretch bending, which is a typical deformation mode generated in press-formed panels. By using this method, the amount of springback under stretch bending is evaluated accurately and quantitatively.

2 Normative references

The following referenced documents relate to the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 31-0, *Quantities and units — Part 0: General principles*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 curvature

κ

reciprocal of the radius of curvature r determined at the centre of a stretch-bent specimen on the inner surface in the longitudinal direction

$$\kappa = \frac{1}{r} \quad (1)$$

3.2 amount of springback

η

relative change in curvature of a test piece under force and after removal of the force shown in Figure 1

$$\eta = \frac{|\kappa' - \kappa|}{\kappa} = \frac{r' - r}{r'} \quad (2)$$