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Erichsen cupping testers

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Testing Machinery Association (JTM)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS B 7729 : 1995** is replaced with this Standard.

This revision has been made based on **ISO 20482 : 2003** *Metallic materials—Sheet and strip—Erichsen cupping test* for the purposes of making it easier to compare this Standard with International Standard; to prepare Japanese Industrial Standard conforming with International Standard; and to propose a draft of an International Standard which is based on Japanese Industrial Standard.

Date of Establishment: 1952-02-12

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Technical Committee on Testing and
Measurement Technology

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In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

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Erichsen cupping testers

Introduction This Japanese Industrial Standard has been prepared based on the first edition of **ISO 20482** *Metallic materials—Sheet and strip—Erichsen cupping test* published in 2003 with some modifications of the technical content.

The portions underlined with dots are the matters in which the contents of original International Standard have been modified. A list of modifications with the explanations is given in annex 2 (informative).

1 Scope This Standard specifies Erichsen cupping testers used for the measurement of metallic sheets 0.1 mm to 2 mm in thickness and 90 mm or greater in width. For thicker or narrower materials, jigs for special dimensions are specified, in which case subscripts are used, as shown in table 1.

Remarks 1 The International Standard corresponding to this Standard is as follows.

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

ISO 20482 : 2003 *Metallic materials—Sheet and strip—Erichsen cupping test* (MOD)

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

JIS B 0031 *Geometrical Product Specifications (GPS)—Indication of surface texture in technical product documentation*

JIS B 1501 *Steel balls for ball bearings*

JIS Z 2247 *Method of Erichsen cupping test*

3 Terms and definitions

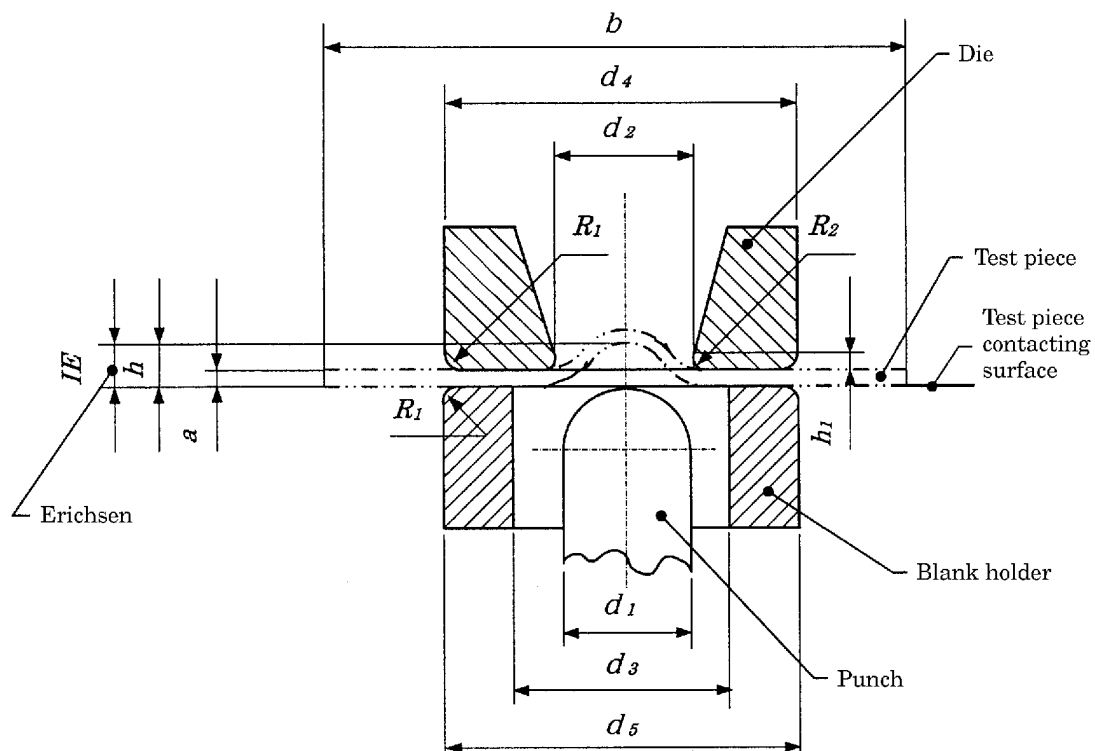
3.1 through cracks crack that goes through the full thickness of the test piece and is just sufficiently wide to allow light to pass through a part of its length

4 Symbols and designations Symbols and designations of principal parts and units shall be as table 1. Corresponding Erichsen cupping indices are decided for the standard test. For thicker or thinner and narrower materials, dimension d_2 is added to the symbol.

Table 1 Symbols and definitions

Dimensions in millimetres

Symbol	Designation	Test piece and tool dimensions, and Erichsen cupping indices			
		Standard test	Tests with thicker or more narrow sheets		
IE	Erichsen cupping indices	IE	IE_{40}	IE_{21}	IE_{11}
a	Thickness of the test piece	$0.1 \leq a \leq 2$	$2 < a \leq 3$	$0.1 \leq a \leq 2$	$0.1 \leq a \leq 1$
b	Width or diameter of the test piece	≥ 90	≥ 90	$55 \leq b < 90$	$30 \leq b < 55$
d_1	Diameter of the spherical end of the punch	20 ± 0.05	20 ± 0.05	15 ± 0.02	8 ± 0.02
d_2	Bore diameter of the die	27 ± 0.05	40 ± 0.05	21 ± 0.02	11 ± 0.02
d_3	Bore diameter of the blank holder	33 ± 0.1	33 ± 0.1	18 ± 0.1	10 ± 0.1
d_4	Outside diameter of the die	55 ± 0.1	70 ± 0.1	55 ± 0.1	55 ± 0.1
d_5	Outside diameter of the blank holder	55 ± 0.1	70 ± 0.1	55 ± 0.1	55 ± 0.1
R_1	Outside corner radius of the die, outside corner radius of the blank holder	0.75 ± 0.1	1.0 ± 0.1	0.75 ± 0.1	0.75 ± 0.1
R_2	Inside corner radius of the die	0.75 ± 0.05	2.0 ± 0.05	0.75 ± 0.05	0.75 ± 0.05
h_1	Height of the inside rounded part of the die	3.0 ± 0.1	6.0 ± 0.1	3.0 ± 0.1	3.0 ± 0.1
h	Depth of the indentation during the test	—	—	—	—



Remarks : For that of width or diameter of test piece is 90 mm and within the tolerance specified in **JIS Z 2247**, the test may be performed with the standard test jig.