

Withdrawn.

# ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

## ISO RECOMMENDATION R 632

METHODS OF TEST FOR DETERMINING  
WHETHER AN ELECTRODE  
IS A DEEP PENETRATION ELECTRODE

1st EDITION  
November 1967

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## BRIEF HISTORY

The ISO Recommendation R 632, *Methods of Test for Determining Whether an Electrode is a Deep Penetration Electrode*, was drawn up by Technical Committee ISO/TC 44, *Welding*, the Secretariat of which is held by the Association Française de Normalisation (AFNOR).

Work on this question by the Technical Committee began in 1957 and led, in 1965, to the adoption of a Draft ISO Recommendation.

In October 1965, this Draft ISO Recommendation (No. 844) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies:

Australia	India	Romania
Austria	Ireland	Spain
Belgium	Israel	Switzerland
Brazil	Italy	Sweden
Canada	Japan	U.A.R.
Chili	Netherlands	United Kingdom
Denmark	New Zealand	U.S.S.R.
France	Portugal	Yugoslavia
Germany	Republic of South Africa	

One Member Body opposed the approval of the Draft:

U.S.A.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in November 1967, to accept it as an ISO RECOMMENDATION.

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## METHODS OF TEST FOR DETERMINING WHETHER AN ELECTRODE IS A DEEP PENETRATION ELECTRODE

### FOREWORD

This ISO Recommendation is one of a set which also comprises the following:

ISO/R 635, *Code of Symbols for Covered Electrodes for Arc Welding of Mild Steels and Low Alloy High Tensile Steels;*

ISO/R 615, *Methods for Determining the Mechanical Properties of the Weld Metal Deposited by Electrodes 3.15 mm or more in Diameter;*

ISO/R...\*, *Special Methods of Mechanical Testing for Determining the Coding for Deep Penetration Electrodes.*

### 1. SCOPE

This ISO Recommendation describes methods for determining whether an electrode is a deep penetration electrode (i.e. capable of being supplemented by the symbol *P*).

### 2. CHARACTERISTICS OF PARENT METAL

For the following tests, the parent metal should be killed or semi-killed mild steel, with a tensile strength between 42 and 50 kgf/mm<sup>2</sup> (26 to 32 tonf/in<sup>2</sup>) as rolled, and its chemical composition should correspond to the following:

Carbon  $\leq 0.18\%$

Sulphur  $\leq 0.04\%$

Phosphorus  $\leq 0.04\%$

### 3. DETERMINATION OF THE PENETRATION OBTAINED BY THE CONDITIONS LAID DOWN BY THE DEFINITIONS (see ISO Recommendation R 635, clauses 2.2 (a) and (b))

According to the type of electrode, the following tests should be carried out:

- (a) a fillet weld made in the horizontal-vertical position, as indicated in the Code of symbolization (see Fig. 1), and/or
- (b) a square butt weld made in the flat position with a single run of weld on each side of the joint, as indicated in the Code of symbolization (see Fig. 1).

The penetration should be measured or verified at three sections uniformly distributed along the weld, each end section being 35 to 40 mm from the end or the beginning of the weld.

An electrode should be considered as a deep penetration electrode if, in a fillet weld, the penetration *P* in each section is

$$P \geq 4 \text{ mm}$$

\* At present Draft ISO Recommendation No. 1040.

An electrode should be considered as a deep penetration electrode if, in each of the three sections cut from the square butt weld, complete fusion is obtained between the two runs when using a plate of a thickness not less than  $2d + 2$  mm ( $d$  being the diameter of the core wire in millimetres).

#### 4. PREPARATION OF THE TEST PLATES

(see Fig. 1 and 2)

Two plates of sufficient length to conform to the deposition requirements of section 5 should be square cut by machining or by machine gas cutting.

For fillet welds and for square butt welds, the plates should be tack-welded on both sides of the joints.

Tack-welding should be carried out with other than deep penetration electrodes.

#### 5. DEPOSITION OF THE WELD

##### (a) Horizontal-vertical fillet weld (see Fig. 1)

The length of the plates should be sufficient to allow for a complete electrode, excluding a stub-end of not more than 50 mm (2 in), to be deposited in one run with the start and finish of the run not less than 30 mm (1¼ in) from each end.

##### (b) Flat square butt weld (see Fig. 2)

The length of the plates should be sufficient to allow for a complete electrode, excluding a stub-end of not more than 50 mm (2 in), to be deposited in one run with the start and finish of the run not less than 30 mm (1¼ in) from each end. Between the completion of the run on the first side and the start of the run on the reverse side, the plates should be allowed to cool in still air to a temperature not exceeding 100 °C. The run on each side should be started at the same end of the plates.

For each of the tests the electrodes should be used in accordance with the recommendations of the manufacturer.