

Withdrawn.

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 635

CODE OF SYMBOLS FOR COVERED ELECTRODES
FOR ARC WELDING OF MILD STEELS
AND LOW ALLOY HIGH TENSILE STEELS

1st EDITION

November 1967

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Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

BRIEF HISTORY

The ISO Recommendation R 635, *Code of Symbols for Covered Electrodes for Arc Welding of Mild Steels and Low Alloy High Tensile Steels*, 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 1953 and led, in 1957, to the adoption of a Draft ISO Recommendation.

In September 1957, this Draft ISO Recommendation (No. 178) 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:

Bulgaria	India	Portugal
Burma	Israel	Romania
Czechoslovakia	Italy	Spain
Denmark	Japan	Sweden
Finland	New Zealand	Switzerland
France	Norway	United Kingdom
Greece	Poland	Yugoslavia

Four Member Bodies opposed the approval of the Draft.

Belgium
Netherlands
Republic of South Africa
U.S.S.R.

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.

CODE OF SYMBOLS FOR COVERED ELECTRODES FOR ARC WELDING OF MILD STEELS AND LOW ALLOY HIGH TENSILE STEELS

FOREWORD

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

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 632, *Methods of Test for Determining whether an Electrode is a Deep Penetration Electrode,*

ISO/R ..., * *Special Method of Mechanical Testing to Determine the Coding for Deep Penetration Electrodes.*

INTRODUCTION

This ISO Recommendation deals with the coding of covered electrodes for the manual arc welding of mild steels and low alloy high tensile steels.

It should be noted that this Code should be considered only as a guide which may be adopted by all countries for the purpose of describing electrodes to users, more particularly by means of symbols. It is in no way designed to be a specification intended to furnish guarantees.

In order to avoid complicating the codification, it has been necessary to disregard certain special conditions existing only in a small number of countries. In spite of these imperfections however, this codification may be expected to fulfil its purpose, which is to facilitate mutual understanding among welding people of the various countries.

The codification is divided into three parts.

The first part gives a general symbol indicating the scope of the codification. The second part describes the mechanical properties of the deposited metal, by means of three symbols, and is intended for the information of designers, authorities, etc. who have to select the strength and quality required for given welds.

These first two parts give enough information for the indications which should be given in drawings, specifications, etc., while the third part, relating to welding characteristics, is of interest to welders.

More generally, in some cases, an abbreviated codification can be used, the symbols which are not used being replaced by crosses, for example.

This codification for covered electrodes should be applied by electrode manufacturers. The latter are not bound hereby to comply with requests made by users for electrodes designated by any combination whatever of symbols.

* At present Draft ISO Recommendation No. 1040.

1. GENERAL SYMBOL FOR ARC WELDING ELECTRODES AND SPECIAL SYMBOL FOR DEEP PENETRATION ELECTRODES

1.1 General symbol for covered electrodes for arc welding

E (placed at the beginning of the designation)

The letter *E* is separated from the symbols following it by a dash signifying that the electrode is for welding a mild steel or a low alloy high tensile steel. The purpose of the letter *E* is to establish a difference between the designation of arc welding electrodes and notations which may be adopted for other processes.

For instance, where the letter *E* symbol appears on drawings, it will be possible to distinguish the designation from those used for gas welding filler wire.

1.2 Special symbol for deep penetration electrodes

P (placed at the end of the designation)

The expression "deep penetration" is used for designating a type of electrode which, under the optimum operating conditions stated by the maker, can be used for welding

- (a) a close square *T* joint giving a penetration of not less than 4 mm, as measured along the joint (Fig. 1, page 5), the gap between the plates not exceeding 0.25 mm and the thickness of the plates being at least equal to twice the diameter of the electrode core wire *d*, and/or
- (b) a close square butt joint performed in two runs (one on each side of the joint), the joint thus obtained presenting no lack of penetration, and the thickness of the plates being at least equal to twice the diameter of the electrode core wire *d* plus 2 mm, i.e. $2d + 2$ mm, with a gap between the plates not exceeding 0.25 mm (Fig. 2, page 5).

2. SYMBOLS RELATIVE TO THE MECHANICAL PROPERTIES OF THE DEPOSITED METAL

2.1 Tests on the deposited metal

In order to make possible a code of symbols based upon comparable figures, the tests on the deposited metal should be carried out and interpreted under the conditions specified in ISO Recommendation R 615, *Methods for Determining the Mechanical Properties of the Weld Metal Deposited by Electrodes 3.15 mm or more in Diameter*.

ISO Recommendation R 615 specifies that the mechanical tests should be carried out at a temperature of 20 ± 2 °C in temperate climates and 27 ± 2 °C in tropical climates. It also states all the necessary requirements under which the metal should be deposited, and how the test pieces should be selected.

2.2 Symbolization of results

In selecting a symbol for each of the mechanical properties, the symbol corresponding to the lowest of the values obtained by testing all sizes of the electrode should be taken from the Tables given below.