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# International Standard



# 2566/1

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## **Steel — Conversion of elongation values — Part 1: Carbon and low alloy steels**

*Acier — Conversion des valeurs d'allongement — Partie 1: Aciers au carbone et aciers faiblement alliés*

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**Descriptors :** metals, steels, unalloyed steels, low alloy steels, tests, tension tests, test specimens, elongation.

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2566/1 was developed by Technical Committee ISO/TC 17, *Steel*, and was circulated to the member bodies in April 1983.

It has been approved by the member bodies of the following countries:

Australia	Hungary	Poland
Austria	India	Romania
Belgium	Iran	South Africa, Rep. of
Bulgaria	Italy	Spain
Canada	Japan	Tanzania
China	Kenya	Thailand
Czechoslovakia	Korea, Dem. P. Rep. of	Turkey
Egypt, Arab Rep. of	Korea, Rep. of	United Kingdom
Finland	Mexico	USSR
France	Netherlands	
Germany, F.R.	Norway	

The member body of the following country expressed disapproval of the document on technical grounds:

Sweden

This second edition cancels and replaces the first edition (i.e. ISO 2566/1-1973).

# Steel — Conversion of elongation values — Part 1: Carbon and low alloy steels

## 0 Introduction

Several different gauge lengths are commonly in use for the determination of percentage elongation of steels in tensile testing. Fixed gauge lengths of 50, 80, 100 and 200 mm are used; proportional gauge lengths of  $k\sqrt{S_0}$  are also used for flat and round test pieces, where  $k$  may be one of a number of values, i.e. 4; 5,65; 8,16; and 11,3.

The value  $5,65\sqrt{S_0}$  is adopted as the internationally preferred proportional gauge length.

Arising from this choice and the existence of specifications stipulating minimum percentage elongations on different gauge lengths, a growing need has been evident for an International Standard which could be used to convert test results into values based on the different gauge lengths. This part of ISO 2566 accordingly includes tables of conversion factors, tables of actual conversions for some of the most commonly used gauge lengths and elongation values, and figures which may also be used for such conversions. When using these conversions, however, note should be taken of the limitations on their applicability as stated in clause 1.

While, as indicated, the conversions are considered to be reliable within the stated limitations, because of the various factors influencing the determination of percentage elongations, they shall be used for acceptance purposes only by agreement between the customer and supplier.

In cases of dispute, the elongation shall be determined on the gauge length stated in the relevant specification.

## 1 Scope and field of application

This part of ISO 2566 specifies a method of converting room temperature percentage elongations after fracture obtained on various proportional and non-proportional gauge lengths to other gauge lengths.

The formula (see clause 4) on which conversions are based is considered to be reliable when applied to carbon, carbon manganese, molybdenum and chromium molybdenum steels within the tensile strength range 300 to 700 N/mm<sup>2</sup> and in the hot-rolled, hot-rolled and normalized or annealed conditions, with or without tempering.

These conversions are not applicable to

- a) cold reduced steels;
- b) quenched and tempered steels;
- c) austenitic steels.

Neither should they be used where the gauge length exceeds  $25\sqrt{S_0}$  or where the width to thickness ratio of the test piece exceeds 20.

Care should be exercised in the case of strip under 4 mm thickness, as the index in the formula given in clause 4 increases with decreasing thickness; the value to be used shall be the subject of agreement between the customer and the supplier.

## Symbols

In this part of ISO 2566, the symbols shown in table 1 are used.

Table 1 — List of symbols

Symbol	Description
$A$	Percentage elongation on gauge length, $L_0$ , after fracture, obtained on test
$A_r$	Percentage elongation on a different gauge length, required by conversion
$d$	Diameter of test piece
$L_0$	Original gauge length
$S_0$	Original cross-sectional area of test piece

## 3 Definitions

For the purpose of this part of ISO 2566, the following definitions apply:

**3.1 gauge length:** Any length of the parallel portion of the test piece used for measurement of strain.

The term is hereafter used in this part of ISO 2566 to denote the original gauge length,  $L_0$ , marked on the test piece for the determination of percentage elongation after fracture,  $A$ .