
INTERNATIONAL STANDARD **ISO** 2573



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

Tensile testing systems — Determination of K -value

Systèmes d'essai de traction — Détermination de la valeur K

First edition — 1977-08-01

UDC 620.172.052

Ref. No. ISO 2573-1977 (E)

Descriptors : iron and steel products, steels, mechanical tests, tension tests, test equipment, tensile testers, determination, elastic properties.

FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (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 set up 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 2573 was developed by Technical Committee ISO/TC 17, *Steel*, and was circulated to the member bodies in July 1976. Subsequently, responsibility for this document was transferred to ISO/TC 164, *Mechanical testing of metals*, which was set up in 1975.

The document has been approved by the member bodies of the following countries :

Australia	India	South Africa, Rep. of
Canada	Italy	Spain
Chile	Iran → Korea, Rep. of	Switzerland
Czechoslovakia	Mexico	Turkey
Denmark	Netherlands	United Kingdom
France	Philippines	U.S.S.R.
Germany	Portugal	
Hungary	Romania	

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Belgium
U.S.A.

Tensile testing systems – Determination of K -value

0 INTRODUCTION*

0.1 The International Standards (see clause 2) for the tensile testing of steel include a requirement that the strain rate during yielding should be controlled when an upper yield stress is to be measured. Some tensile testing systems are so constructed that a predetermined strain rate can be imposed on the test piece. Other systems include ancillary equipment such that the strain rate can be measured directly and its control may therefore be possible.

0.2 A number of tensile systems are used, however, in which there is no possibility of directly maintaining the strain rate. With some of these systems an indirect method has to be employed, this requiring a knowledge of the K -value of the system, namely the apparent elastic compliance of the system (deflection per unit force), determined from a tensile test performed in accordance with clause 8. In order to determine a K -value, it is necessary to perform an actual tensile test using the required method of gripping, measurements made during the course of this test enabling the K -value to be calculated.

0.3 A necessary condition for the method of determining the K -value of a tensile testing machine, as is described below, is an almost constant speed of the moving grip (see clause 7), whilst measurements are made according to 8.1.5. This ensures that the rate of increase of force in the elastic range of deformation of the test piece remains constant.

The following types of machines comply with this requirement:

- a) machines provided with position control;
- b) machines with mechanical driving systems, provided that there is no drop in speed once the driving velocity is set and the force is increased;
- c) some machines with hydraulic driving systems with very slight leakage of oil.

However, if the conditions in clause 7 are given up, it is also possible to test some of the remaining machines concerning their compliance (K -value).

If the machines are equipped with a pace setter or a recording device, a constant speed of the moving grip can be attained up to the limit between the elastic and the plastic range of the test piece by suitable control of the driving system.

Using hydraulic machines with a ground piston, it is therefore permitted to compensate for the leakage of oil by opening the control valve more.

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the method of determining the mechanical characteristic known as the K -value, of tensile testing systems having an essentially constant extension rate when force is increased (used for the determination of yield stresses in accordance with relevant ISO publications).

2 REFERENCES

- ISO 82, *Steel – Tensile testing.*
- ISO 86, *Steel – Tensile testing of sheet and strip less than 3 mm and not less than 0,5 mm thick.*
- ISO 89, *Steel – Tensile testing of wire.*
- ISO/R 147, *Load calibration of testing machines for tensile testing of steel.*
- ISO 375, *Steel – Tensile testing of tubes.*