

# International Standard



# 6133

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

## Rubber and plastics — Analysis of multi-peak traces obtained in determinations of tear strength and adhesion strength

*Caoutchouc et plastiques — Analyse des tracés multi-pics obtenus lors des déterminations de la résistance au déchirement et de la force d'adhérence*

First edition — 1981-04-15

UDC 678.4/.8 : 620.179.4

Ref. No. ISO 6133-1981 (E)

**Descriptors** : rubber, plastics, coated fabrics, tests, tear tests, adhesion tests, test results, computation.

Price based on 3 pages

ISO 6133-1981 (E)

## 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 6133 was developed by Technical Committee ISO/TC 45, *Rubber and rubber products*, and was circulated to the member bodies in January 1979.

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

|                     |                        |                |
|---------------------|------------------------|----------------|
| Austria             | Hungary                | Sri Lanka      |
| Belgium             | India                  | Sweden         |
| Brazil              | Italy                  | Switzerland    |
| Bulgaria            | Libyan Arab Jamahiriya | Thailand       |
| Canada              | Malaysia               | Turkey         |
| China               | Netherlands            | United Kingdom |
| Czechoslovakia      | Poland                 | USA            |
| Denmark             | Romania                | USSR           |
| Egypt, Arab Rep. of | South Africa, Rep. of  |                |
| Germany, F.R.       | Spain                  |                |

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

France

# Rubber and plastics — Analysis of multi-peak traces obtained in determinations of tear strength and adhesion strength

## 1 Scope and field of application

This International Standard specifies three methods of calculating, after testing, the tear strength and adhesion strength of vulcanized rubber or fabrics coated with or adhered to rubber or plastics. The results are calculated by determining the median and range of peak values from a graphical plot of force versus time recorded during the test.

A trace for an adhesion strength test or tear strength test may show few or many force peaks, depending on the material under investigation. The choice of the method of calculation depends on the number of peaks in the trace.

The purpose of this International Standard is to obtain more uniformity in the evaluation and presentation of test results. It is applicable only, however, when specified in another International Standard, i.e. a method of test or a specification.

For other details, such as apparatus, test piece preparation, conditioning, procedure, etc., requirements given in the relevant International Standard shall apply.

NOTE — In certain cases the methods of analysis given may not be adequate, for example for peak values showing a trend with time. In cases where the minimum force values are of interest, it is possible to use the same methods of calculation as when determining from a range of peak values.

## 2 Definitions

**2.1 peak :** A point at which the slope of a trace changes from positive to negative.

**2.2 median :** If  $n$  measured values are arranged in increasing order of magnitude and numbered 1 to  $n$ , the median of these  $n$  values is the  $\left(\frac{n+1}{2}\right)^{\text{th}}$  value, if  $n$  is odd.

If  $n$  is even, the median lies between the  $\left(\frac{n}{2}\right)^{\text{th}}$  and  $\left(\frac{n}{2} + 1\right)^{\text{th}}$  values and is not defined uniquely. Unless otherwise specified, it may be taken to be the arithmetic mean of these two measured values.

**2.3 range :** The difference between the greatest and the smallest observed values of a quantitative characteristic.

**2.4 complete trace :** The section of the graphical plot of force versus time between the time at which the first peak occurs and the time at which the test is terminated.

## 3 Procedure

From the force peak values of the trace for adhesion strength or tear strength, determine the median peak force (see 2.2) and the range (see 2.3) of peak force values by the appropriate method specified in 3.1, 3.2, or 3.3.

NOTE — In applying the methods described in this International Standard, it should be assumed that the trace being evaluated is a time record of the variation of force during the period of test.

### 3.1 Method A (for traces having less than five peaks)

Determine the median and range of the values of the force peaks in the trace.

If there is only one force peak, consider its value to be the median.

### 3.2 Method B [for traces having five to twenty peaks (see figure 1)]

Consider only the peak values of the central 80 % of the complete trace and determine the median peak force and range of these values.

### 3.3 Method C [for traces having more than twenty peaks (see figure 2)]

Draw a series of nine vertical lines by starting at the centre of the complete trace and drawing four more lines on each side at equal distances of one-tenth of the length of the trace, to the nearest 1 mm. Consider only the peak value situated closest to each of the vertical lines. Determine the median peak force and the range of these nine values.

## 4 Test report

The test report shall include the following particulars :

- a reference to this International Standard;
- the method of calculation used (A, B or C);
- the median peak force;
- the range of peak values.

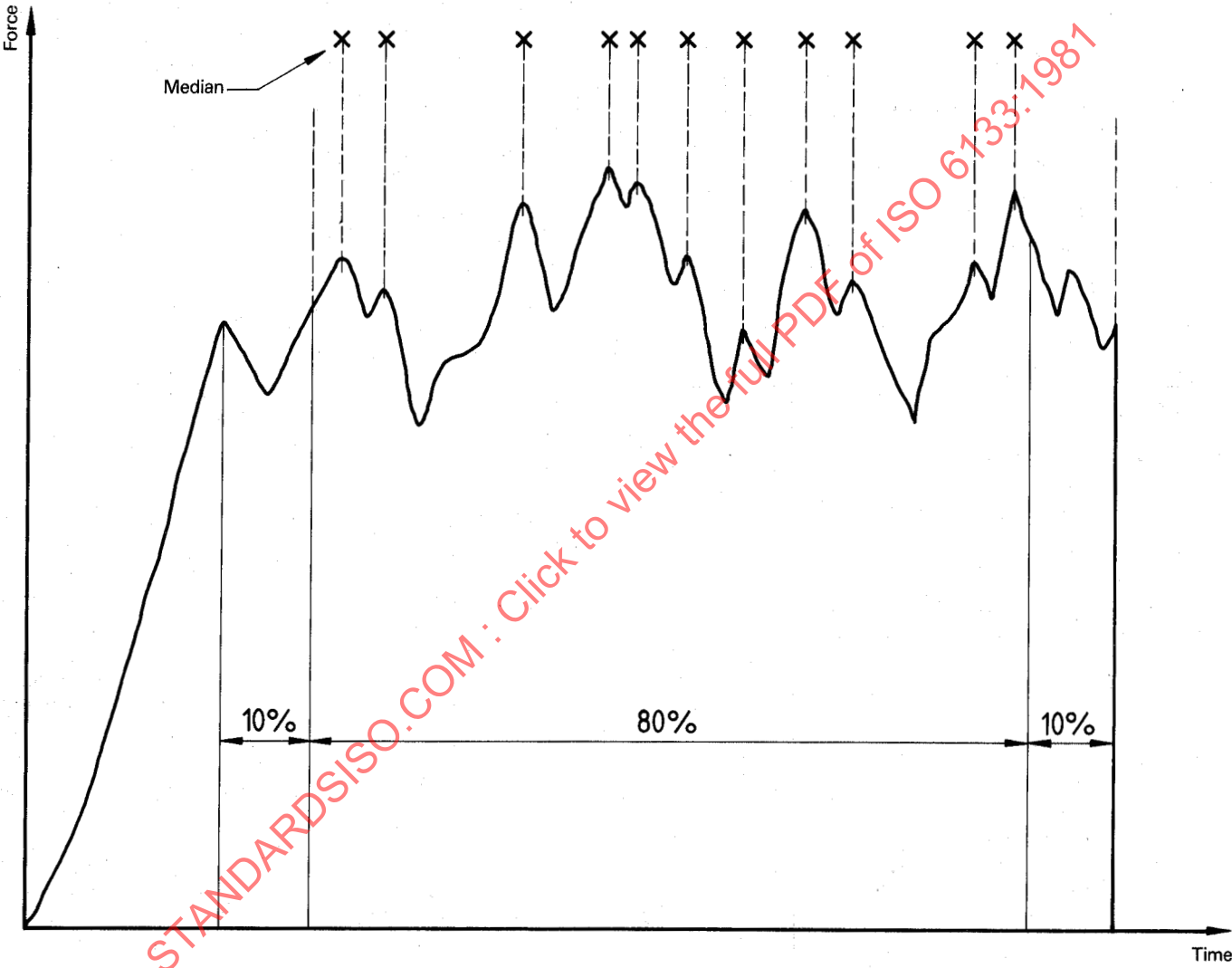


Figure 1 — Evaluation of a trace with five to twenty peaks

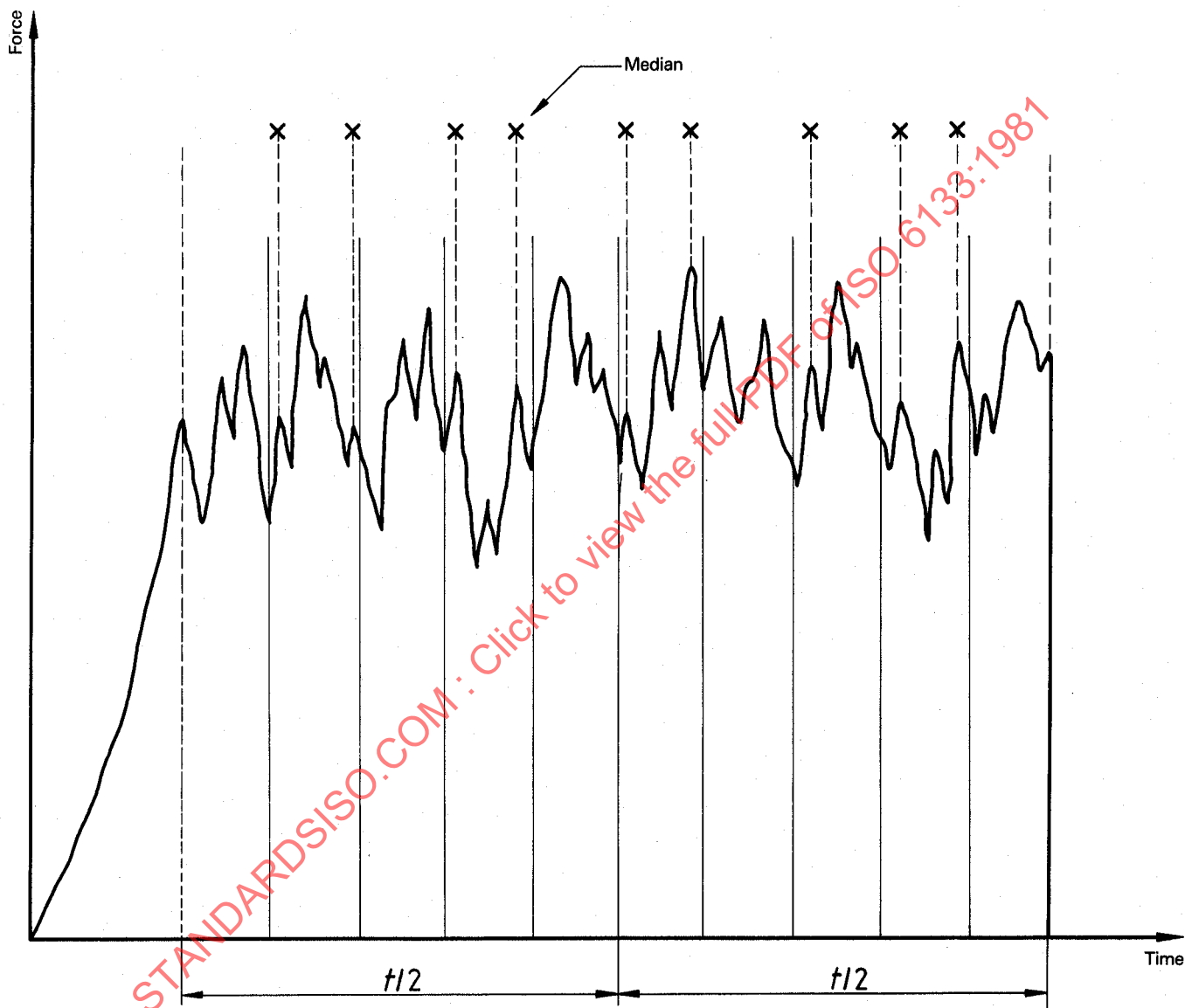


Figure 2 — Evaluation of a trace with more than twenty peaks

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