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**Rubber, vulcanized — Measurement of  
fatigue crack growth rate**

*Caoutchouc vulcanisé — Mesurage du taux de croissance des  
craquelures de fatigue*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 27727 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 2, *Testing and analysis*.

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# Rubber, vulcanized — Measurement of fatigue crack growth rate

## 1 Scope

This International Standard specifies a method for the determination of the fatigue crack growth rate of vulcanized rubber under repeated loading over an extended period of time. The crack starts from the tip of a cut made in the test piece before the test, and grows progressively until it finally becomes large enough for complete fracture to occur. Using a pure-shear test piece, measurements are made to monitor the crack growth under the cyclic loading in order to obtain the crack growth rate, i.e. the increase in crack length per cycle. Tests are carried out at various tearing energies by varying the strain energy density in the test piece. This is done by changing the strain amplitude.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 3.1

#### strain energy density

$W$

elastic energy stored in unit volume of the test piece when in a state of strain and resulting from the work done in deforming the test piece

NOTE It is measured in joules per cubic metre.

### 3.2

#### tearing energy

$T$

amount of energy required to propagate a tear/crack in a test piece

NOTE The tearing energy is expressed as the ratio of the total work done to the surface area of the crack. It is measured in joules per square metre.