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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 1827

DETERMINATION OF MODULUS IN SHEAR
OF VULCANIZED RUBBERS

(BONDED QUADRUPLE SHEAR TEST PIECE)

1st EDITION

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BRIEF HISTORY

The ISO Recommendation R 1827, *Determination of modulus in shear of vulcanized rubbers (Bonded quadruple shear test piece)*, was drawn up by Technical Committee ISO/TC 45, *Rubber*, the Secretariat of which is held by the British Standards Institution (BSI).

Work on this question led to the adoption of Draft ISO Recommendation No. 1827, which was circulated to all the ISO Member Bodies for enquiry in April 1969.

The Draft has been approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	India	Spain
Austria	Iran	Sweden
Brazil	Israel	Switzerland
Canada	Netherlands	Thailand
Ceylon	New Zealand	Turkey
Czechoslovakia	Peru	U.A.R.
France	Poland	United Kingdom
Greece	Portugal	U.S.S.R.
Hungary	South Africa, Rep. of	

No Member Body opposed the approval of the Draft.

This Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided to accept it as an ISO RECOMMENDATION.

DETERMINATION OF MODULUS IN SHEAR OF VULCANIZED RUBBERS

(BONDED QUADRUPLE SHEAR TEST PIECE)

1. SCOPE

This ISO Recommendation describes a procedure for determining the modulus in shear of rubber bonded between four parallel plates.

It is designed primarily to apply to test pieces prepared in the laboratory under standard conditions such as may be used to provide the data for the development and control of rubber compounds.

2. PRINCIPLE

The test consists in measuring the forces required to obtain a range of predetermined shear distortions of a unit of standard dimensions comprising four parallelepipeds of rubber symmetrically disposed and bonded to four parallel plates, the forces being parallel to the bonding surfaces and, as a rule, non destructive, i.e. of maximum values appreciably lower than the bond strength.

3. APPARATUS

- 3.1 *Testing machine*, conforming to the requirements of national standards for verification of testing machines. It should be capable of accurately measuring the deformations and registering the applied forces during the test while maintaining the specified constant rate of separation of the jaws of 25 ± 5 mm per minute.

NOTE. – Inertia (pendulum) type dynamometers are apt to give results which differ because of frictional or inertial effects. An inertialess (for example electronic or optical transducer) type dynamometer gives results which are free from these effects and is therefore to be preferred.

- 3.2 *Fixtures*, for holding the test pieces in the grips, provided with a universal joint to permit accurate centering of the line of action of the applied force.

4. TEST PIECE

4.1 Dimensions of test piece

The standard test piece consists of four identical parallelepipedal rubber elements 4 ± 0.1 mm thick, 20 ± 0.1 mm wide and 25 ± 0.1 mm long, bonded on each of their two largest opposite faces to the mating faces of four rigid plates of the same width, and of appropriate lengths to obtain a symmetrical double sandwich arrangement, means being provided at the free external end of each central plate to secure its further assembly to the corresponding holding fixture. The thickness of the rigid plates should be $5^{+0}_{-0.1}$ mm. A typical test piece is shown in Figure 1.