Third edition
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Rubber, vulcanized — Determination of creep in compression or shear

Caoutchouc vulcanisé — Détermination du fluage en compression ou en cisaillement

Reference number
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Foreword

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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.

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ISO 8013 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 2, *Testing and analysis*.

This third edition cancels and replaces the second edition (ISO 8013:2006), which has been revised to include a calibration schedule for the apparatus used (see Annex B). In addition, the maximum thickness of test pieces for measurement in shear (see 6.2) has been increased from 12 mm to 13 mm.

Introduction

When a constant stress is applied to rubber, the deformation is not constant but increases gradually with time; this behaviour is called “creep”. Conversely, when rubber is subjected to a constant strain, a decrease in the stress in the material takes place; this behaviour is called “stress relaxation”.

The creep test is of particular interest where vulcanized rubbers are used to support a constant load, such as in bearings or mountings.

The processes responsible for creep can be physical or chemical in nature, and under all normal conditions both processes will occur simultaneously. However, at normal or low temperatures and/or short times, creep is dominated by physical processes, whilst at high temperatures and/or long times, chemical processes are dominant. In general, physical creep is found to be directly proportional to logarithmic time, and chemical creep to linear time; but great care has to be taken in extrapolating time/creep curves in order to predict creep after periods considerably longer than those covered by the test, and in using tests at higher temperatures as accelerated tests to give information on creep at lower temperatures.

In addition to the need to specify the temperature intervals and time intervals in a creep test, it is also necessary to specify the initial strain and the previous mechanical history of the test piece, since these might also influence the measured creep, particularly in rubbers containing filler.