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Rubber materials — Chemical resistance

Matériaux en caoutchouc — Résistance chimique



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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Types of chemical and physical change	1
3 Rubber polymers	2
4 Chemicals	3
5 Effect of service conditions	3
6 Criteria applied for the ranking of chemical resistance	3
7 Chemical resistance of rubber materials	4
8 Methods for the evaluation of chemical resistance	5
9 Chemical resistance	8
Annex A (informative) Effect of compounding variations on chemical resistance	32
Annex B (informative) References in Table 2	34
Annex C (informative) References in Table 3	35

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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/TR 7620 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 4, *Products (other than hoses)*.

This second edition cancels and replaces the first edition (ISO/TR 7620:1986), which has been technically revised.

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Introduction

A wide range of rubber products are used in contact with liquids and other chemicals, in some cases throughout their service life, and thus require suitably resistant rubber formulations. Rubber hoses are used to convey a range of fluids from hot water to fuels, conveyor belting may have to carry aggressive slurries, seals and gaskets are installed to prevent leakage of gases and liquids, rubber-covered rollers manipulate webs as diverse as printing inks, paper pulp and textiles, and rubber-lined tanks are used to store industrial chemicals, including corrosive alkalis and acids, for prolonged periods without risk of contamination. Other products, ranging from tyres to flexible roofing membranes, are exposed to rainfall and atmospheric pollutants.

It is essential a suitably resistant rubber be used because contact with a chemical, whether in the form of a liquid or gas, can lead to deterioration of properties through swelling, extraction of additives and polymer degradation. The rate and extent of such attack depends not only on the chemical composition of the rubber polymer and other compounding ingredients but also on the nature of the liquid or gas, its concentration, temperature, pressure and the duration of contact. The thickness of the rubber must be taken into account since the time of penetration of the swelling fluid is dependent on product dimensions, and the bulk of a very thick rubber product may remain unaffected for the whole of the projected service life.

This document has been prepared to assist the selection or evaluation of rubber for chemical resistance. It includes an extensive classification of resistance based on information in over 20 sources and involving about 400 chemicals and up to 25 types of rubber.