STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
METHODS OF TEST FOR RUBBER

AS 1683.23
RUBBER VULCANIZED—DETERMINATION OF RESISTANCE TO LIQUIDS

PREFACE

At the series of meetings held by the Association's four main rubber committees in September 1979, a unanimous demand was expressed for a general method of test for resistance of vulcanized rubber to liquids.

In response to their demand, this standard has been prepared by the Association's Committee on Rubber Testing and Analysis.

It is generally based on ISO 1817 — 1975, Vulcanized Rubbers — Resistance to Liquids— Methods of Test, but cognizance was also taken of ANSI/ASTM D471-79, Rubber Property—Effect of Liquids, particularly in respect of the method for determining the changes in the physical properties of tensile strength, elongation and hardness after immersion.

FOREWORD

The action of a liquid on a vulcanized rubber generally results in—

(a) absorption of liquid by the rubber;

(b) extraction of soluble constituents from the rubber;

(c) chemical reaction with the rubber.

Usually (a) is greater than (b) so that the net result is an increase in volume, commonly termed 'swelling'. The absorption of liquid can profoundly alter the physical and chemical properties of the rubber such as tensile strength, extensibility and hardness, so that it is important to measure these properties of the rubber after treatment. The extraction of soluble constituents, especially plasticizers, can likewise alter the physical and chemical properties shown by the rubber after drying out the liquid (assuming this to be volatile); physical tests on the rubber after immersion and drying are therefore required. The methods specified in this standard accordingly rely on measurement of the following:

(i) Change in volume or dimensions.

(ii) Soluble matter extracted.

(iii) Tensile strength and ultimate elongation of the rubber after immersion.

(iv) Hardness of the rubber after immersion.

(v) Tensile strength and ultimate elongation of the rubber after drying out the immersion liquid.

(vi) Hardness after drying out the immersion liquid.

Although in some respects these tests may simulate service conditions closely, no direct correlation with service behaviour is implied; thus, the rubber giving the lowest change in volume is not necessarily the best in service. It is known, moreover, that the action of a liquid on rubber, especially at high temperatures, can be markedly affected by the presence of atmospheric oxygen. The tests set out herein, however, can provide valuable information on the suitability of a rubber for use with a given liquid and, in particular, constitute a useful control when used comparatively for developing rubbers resistant to oils, fuels, or other liquids.

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