AS 1646—1992

Australian Standard®

Elastomeric seals for waterworks purposes

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ELASTOMERIC PACKING FOR SEALING PIPELINE SYSTEMS
(ANI: Packing, preformed (INC: 04521) NSC 5330)]

This Australian Standard was prepared by Committee WS/10, Flexible Jointing Gaskets. It was approved on behalf of the Council of Standards Australia on 7 May 1992 and published on 20 July 1992.

The following interests are represented on Committee WS/10:

Australian Clay Pipe Manufacturers Association

Brisbane City Council

Concrete Pipe Association of Australia

Confederation of Australian Industry

Engineering and Water Supply Department, S.A.

Melbourne Water

Plastics and Rubber Institute

The Plastics Industry Association

Rubber Manufacturers' Association, Australasia

Rural Water Commission, Vic.

Water Board, Sydney – Illawarra – Blue Mountains

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Elastomeric seals for waterworks purposes

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PREFACE

This Standard was prepared by the Standards Australia Committee on Flexible Jointing Gaskets to supersede AS 1646–1987, *Rubber joint rings for water supply, sewerage and drainage purposes*.

The principal changes to this edition are –

(a) deletion of some prescriptive requirements relating to composition of the elastomer, or allowance of alternatives;

(b) extension to include seals other than those for pipe joints;

(c) inclusion of properties for ethylene propylene–diene terpolymers (EPDM) and nitrile–butadiene rubber (NBR) and deletion of butyl rubber (IIR);

(d) inclusion of a Clause describing imperfections and criteria for acceptance;

(e) inclusion of requirements for seals to be used or which may be used for the conveyance of potable water;

(f) inclusion of appropriate test methods from AS 1683, *Methods of test for elastomers* where available instead of BS 903, *Methods of testing vulcanized rubber* and ASTM D1149–1986, *Test method for rubber deterioration – Surface ozone cracking in a chamber (flat specimen)*; and

(g) inclusion of alternative methods for determining seal hardness.

Some requirements, relating to the manner in which seals are to be used with a product, are specified in the relevant Australian Standard for that product.

The Standard retains a number of prescriptive requirements and short-term property tests because acceptable performance requirements are not available. Examples are resistance to bacterial attack, where the problem has been addressed overseas but not resolved, resistance to UV radiation and combined effects of environment and strain. Elimination of further prescriptive requirements from future editions of this Standard will depend on the availability of acceptable performance requirements.

CONTENTS

FOREWORD

A designer of an installation should among other duties, evaluate the possible conditions to which the seals will be exposed.

The type of elastomer and its properties should be selected with consideration of several factors including the following:

(a) The requirements of the regulatory authority within whose jurisdiction the seals are to be used.

(b) Where appropriate the effects of the seal on the water conveyed.

(c) Selection for particular environments:

- (i) Internal – due to liquid conveyed, e.g. sewage at variable depths.
- (ii) External –
  - (A) below ground due to –
    - (1) root intrusion;
    - (2) micro-organism attack; and
    - (3) temperature after jointing and before covering with fill; and
  - (B) above ground due to –
    - (1) ultraviolet light;
    - (2) ozone; and
    - (3) temperature.

STANDARDS AUSTRALIA

Australian Standard
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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard specifies requirements for elastomeric seals to be used in pipeline systems which convey aqueous liquids at temperatures of less than 50°C. The Standard also specifies requirements for seals which incorporate root growth inhibitor and which are only intended for the conveyance of sewage or stormwater. The Standard does not specify the physical dimensions or hardness requirements.

NOTES:
1 Guidelines to purchasers on information to be specified at the time of the enquiry or order are given in Appendix A.
2 When seals are intended for use where the likelihood of micro-organism attack is high, special precautions may need to be taken.

1.2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS
1291 Wooden and synthetic material folding rules

1683 Methods of test for elastomers
1683.11 Part 11: Tension testing of vulcanized rubber
1683.13 Part 13: Compression set of vulcanized rubber under constant deflection
1683.15.1 Part 15.1: International rubber hardness
1683.15.2 Part 15.2: Durometer hardness
1683.23 Part 23: Rubber — Vulcanized — Determination of resistance to liquids
1683.24 Part 24: Rubber — Vulcanized — Determination of resistance to ozone cracking — Static strain test

2193 Methods for calibration and grading of force-measuring systems of testing machines

3855(Int) Suitability of plumbing products for contact with potable water

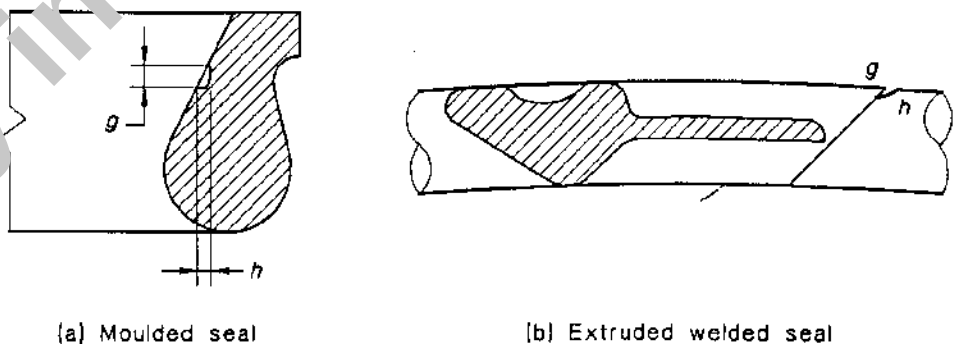
ASTM
D1278 Standard test methods for rubber from natural sources — Chemical analysis

BS
903 Methods of testing vulcanized rubber
903.A6 Part A6: Method for determination of compression set at ambient, elevated or low temperatures.
903.A39 Part A39: Determination of compression set under constant deflection at low temperatures
903.A42 Part A42: Determination of stress relaxation

2494 Elastomeric seals for joints in pipework and pipelines.

1.3 DEFINITIONS For the purposes of this Standard, the definitions below apply.

1.3.1 Backrind — a longitudinal imperfection in which the elastomer adjacent to the mould parting line shrinks below the level of the moulding and has 'U' or 'W' shape cross-section with the flash frequently being ragged or torn (see Figure 1.1).



(a) Moulded seal (b) Extruded welded seal

FIGURE 1.1 BACKRIND AND PARTING LINE INDENTATION