AS/NZS 4020:2018

Australian/New Zealand Standard™

Testing of products for use in contact with drinking water

STANDARDS Australia

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This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee CH-034, Materials in Contact with Drinking Water. It was approved on behalf of the Council of Standards Australia on 12 June 2018 and by the New Zealand Standards Approval Board on 2 May 2018.
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The following are represented on Committee CH-034:

Association of Accredited Certification Bodies
Australian Building Codes Board
Australian Chamber of Commerce and Industry
Australian Industry Group
Australian Paint Manufacturers' Federation
International Copper Association Australia
Ministry of Health, New Zealand
Plastics Industry Pipe Association of Australia
Plastics New Zealand
Plumbing Products Industry Group
Water Services Association of Australia

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We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of Standards Australia or the New Zealand Standards Executive at the address shown on the back cover.

This Standard was issued in draft form for comment as DR AS/NZS 4020:2017.

Australian/New Zealand Standard™

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CH-034, Materials in Contact with Drinking Water, to supersede AS/NZS 4020:2005, *Testing of products for use in contact with drinking water*.

The objective of this Standard is to specify requirements for the suitability of products for use in contact with drinking water, with regard to their effect on the quality of water.

In preparing this Standard, consideration has been given to comparable overseas Standards, to minimize duplication of effort and to maintain commonality, wherever reasonable, with those Standards. Particular consideration has been given to the various parts of BS 6920, *Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water*. Several of the test procedures and criteria given in BS 6920 have been adopted or modified for Australian and New Zealand requirements.

This Standard departs from BS 6920 as follows:

(a) This Standard provides a method of testing for the leaching of compounds for elastomeric materials that may produce a mutagenic effect.

(b) The requirement for products to be tested at surface area-to-volume ratios that are not less than those in the intended end-use exposure (with the exception of the test for growth of aquatic micro-organisms). Where there is a difference between test and end-use exposures, provision is made for a scaling factor to be applied to the test result.

(c) The inclusion of testing for metals extracted from metal products that are often components of products in contact with drinking water.

Significant changes from the previous edition include the following:

(i) The inclusion of guidance on retesting requirements when there is a change in formulation of products not listed on the Watermark Scheme of Products.

(ii) The inclusion of informative guidelines for applying and interpreting AS/NZS 4020.

(iii) A revision of Table 1 to more clearly define the different types of products to be tested.

(iv) The allowance of reduced testing for very small area to volume metal and inorganic products.

(v) A reduction in the range of products required to be tested for a mutagenic effect.

(vi) The inclusion of a test for leachable organic compounds.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendices to which they apply. A 'normative' appendix is an integral part of the Standard, whereas an 'informative' appendix is for information and guidance only.

Statements expressed in mandatory terms in Notes to Figures and Tables are deemed to be requirements of this Standard.

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FOREWORD

Guidelines for drinking water quality in Australia have been prepared by the National Health and Medical Research Council (NHMRC). In New Zealand, drinking water quality is subject to the Drinking Water Standards for New Zealand prepared by the Ministry of Health. The Australian Drinking Water Guidelines (ADWG) and Drinking Water Standards for New Zealand (DWSNZ) cover a range of physical, chemical, microbiological and radiological characteristics relevant to the health and aesthetic concerns of consumers, and recommended values for those characteristics.

One of the important factors influencing the quality of water supplied to consumers is the effect of the various materials that come into contact with the water as it passes through the system. The potential effect becomes more critical as the size of the system decreases from water supply to reticulation to plumbing systems, and the residence time in contact with these systems increases. This Standard provides a means to test such materials in order that the achievement of the appropriate national recommended water quality values is not jeopardized. The Standard prescribes methods of testing and conformance limits for the effects of a product on the taste and appearance of water, the ability of a product to support the growth of aquatic micro-organisms and the quantity of toxic metals and non-metallic substances leached from the product when exposed to the test water. In addition, the Standard prescribes extraction procedures for products in contact with hot water and in end-of-line situations. The hot water tests apply where water has the potential for human consumption, food preparation, utensil washing and oral hygiene.

Not all of the physical and chemical characteristics listed in the NHMRC/ARMCANZ guidelines and the DWSNZ are specifically referred to in this Standard. For those characteristics not listed, it is envisaged that the methods of testing given in this Standard and the recommended values given by NHMRC/ARMCANZ or the DWSNZ will be sufficient and readily adapted by the responsible authority.

The dominant principle of this Standard is to allow water quality requirements, as adopted by the particular authority responsible for water supply quality, to be met at consumers' taps by specifying a range of tests. Besides the effects of materials, this quality will depend on other factors, including commissioning and operational procedures such as flushing of mains, which are the responsibility of the local water agency.

This Standard is published for use by manufacturers, water agencies and regulators in Australia and New Zealand to allow for the selection of materials exposed to drinking water, and as a basis for identifying the performance that can be expected by purchasers of products used in water supply systems.

It is intended that appropriate Australian and New Zealand Standards and other specifications will refer to this Standard if they specify requirements for the effects of a particular product on the quality of drinking water.

The Standard applies only to water quality at customer taps with respect to general health requirements for the consumer. It is not intended as either a long-term indication of the corrosion resistance of the material itself or any short-term effects due to highly localized and unpredictable conditions of water chemistry.

It is the understanding of the Committee that prepared this Standard that, in line with the intention of the ADWG and the DWSNZ, the only products that are required to satisfy the provisions of this Standard are products that are in contact with drinking water during service.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard
Testing of products for use in contact with drinking water

1 SCOPE

This Standard specifies requirements for the suitability of products for use in contact with drinking water, with regard to their effect on the quality of water. These products include pipes, fittings, components, and materials used in coating, protection, lining, jointing, sealing and lubrication applications in the water supply and plumbing industry. This Standard requires that products intended for use in contact with drinking water be tested by exposure to test water. Where appropriate, a scaling factor is applied to such tests to compensate for differences between laboratory and field conditions.

NOTE: This Standard may be used to test the suitability of products intended for use in contact with types of water other than drinking water.

This Standard does not take into account possible changes in installation practices or environmental factors not directly associated with the product. As required, re-verification testing of products to this Standard is desirable after a period of five years.

NOTES:

1 Products captured by the Plumbing Code of Australia (PCA) or by other regulatory requirements may have specific reverification testing requirements, but they are beyond the scope of this Standard.

2 For products that are not captured by the PCA, guidance on when reverification testing is required due to a formulation change is provided in Appendix O.

3 Chemicals used directly for treating raw water to provide a suitable drinking water supply are not covered by this Standard.

4 Guidelines for applying and interpreting this Standard are provided in Appendix R.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

1012 Methods of testing concrete

1012.8.1 Part 8.1: Method for making and curing concrete—Compression and indirect tensile test specimens

1012.8.2 Part 8.2: Method for making and curing concrete—Flexure test specimens

2031 Water quality—Sampling for microbiological analysis

2567 Laminar flow cytotoxic drug safety cabinets

4276 Water microbiology

4276.2 Part 2: Culture media, diluents and reagents

5082 Polybutylene (PB) plumbing pipe systems—Metric series

5082.1 Part 1: Metric polybutylene (PB) pipes for hot and cold water applications

5082.2 Part 2: Mechanical and fusion jointing systems

AS/NZS

1477 PVC pipes and fittings for pressure applications

2243 Safety in laboratories

2243.3 Part 3: Microbiological safety and containment

2492 Cross-linked polyethylene (PE-X) pipes for pressure applications