

Australian/New Zealand Standard™

**Testing of products for use in contact
with drinking water**



AS/NZS 4020:2005

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 20 October 2005 and on behalf of the Council of Standards New Zealand on 4 November 2005.
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The following are represented on Committee CH-034:

AUSTRAP
Australian Chamber of Commerce and Industry
Australian Electrical and Electronic Manufacturers Association
Australian Industry Group
Australian Paint Manufacturers' Federation
Australian Society for Microbiology Incorporated
Certification Bodies (Australia)
Copper Development Centre of Australia
Health Department of Western Australia
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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 4020:2002, *Testing of products for use in contact with drinking 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 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) Inclusion of a colorimetric method for determination of cytotoxic activity.
- (ii) Inclusion of an appendix on the structure of test reports.
- (iii) Revision of the appendix on product submission information.
- (iv) Altered requirements for testing non-metallic products for leaching of metals.

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 a Standard, whereas an 'informative' appendix is for information and guidance only.

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FOREWORD

Guidelines for drinking water quality in Australia have been prepared conjointly by the National Health and Medical Research Council (NHMRC) and the Australian Water Resources Council (AWRC), which combined in 1993 with the Agricultural Council and the Soil Conservation Council to form the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ). 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 recommend 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 compliance 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. 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 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 in contact with drinking water.

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 all items such as pipes, fittings, components, and materials used in coating, protection, lining, jointing, sealing and lubrication applications in the water supply and plumbing industry. The Standard requires that products intended for use in contact with drinking water be tested by exposure to extractant waters. 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 materials, methods of manufacture or installation, nor is any consideration given to the frequency of testing of products. These should be covered by relevant product Standards. As a guide, re-verification testing of products to this Standard is generally desirable after a period of five years. This is consistent with the requirements of overseas bodies such as the Drinking Water Inspectorate in the United Kingdom.

Chemicals and media used directly for treating raw water to provide a suitable drinking water supply (e.g. lime, coagulants, activated carbon, ion-exchange resins) are not covered by this Standard.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

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| 1012 | Methods of testing concrete |
| 1012.8.1 | Part 8.1: Method of making and curing concrete—Compression and indirect tensile test specimens |
| 1012.8.2 | Part 8.2: Method of making and curing concrete—Flexure test specimens |
| 2567 | Laminar flow cytotoxic drug safety cabinets |
| 4276 | Water microbiology |
| 4276.2 | Part 2: Culture media, diluents and reagents |
| 5601 | Gas installations (AG 601) |

AS/NZS

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| 1477 | PVC pipes and fittings for pressure applications |
| 2031 | Selection of containers and preservation of water samples for microbiological analysis |
| 2243 | Safety in laboratories |
| 2243.3 | Part 3: Microbiological aspects and containment facilities |
| 3350 | Safety of household and similar electrical appliances |
| 3350.2.21 | Part 2.21: Particular requirements—Storage water heaters |
| 3500 | Plumbing and drainage |
| 3500.4 | Part 4: Heated water services |