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Australian Standard®

Transport packaging for dangerous goods—Plastics compatibility testing

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- ACCORD Australia
- Agsafe
- Australasian Fire Authorities Council
- Australian Institute of Petroleum
- Australian Paint Manufacturers' Federation
- Consumers Federation of Australia
- Department of Consumer and Employment Protection, WA
- Department of Emergency Services, Qld
- Department of Environment and Conservation, NSW
- Department of the Premier and Cabinet, SA
- Engineers Australia
- New Zealand Chemical Industry Council
- Plastics and Chemicals Industries Association
- Tranz Rail (New Zealand)
- Victorian WorkCover Authority

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Transport packaging for dangerous goods—Plastics compatibility testing

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PREFACE

This Standard was prepared by Standards Australia/Standards New Zealand Committee CH-009, Safe Handling of Chemicals. It is identical with, and has been reproduced from, ISO 16101:2004, *Packaging—Transport packaging for dangerous goods—Plastics compatibility testing*.

As this Standard is reproduced from an international standard, the following applies:

(a) Its number appears on the cover and title page while the international standard number appears only on the cover.

(b) The words 'this European Standard' should be replaced with 'this Australian Standard' wherever they appear.

(c) A full point substitutes for a comma when referring to a decimal marker.

References to European and International Standards should be replaced by references to Australian Standard, as follows:

Reference to European/International Standard		*Australian Standard*	
EN ISO		AS	
291	Plastics—Standard atmospheres for conditioning and testing	1327	Plastics—Standard atmospheres for conditioning and testing
527	Plastics—Determination of tensile properties	1145	Determination of tensile properties
527-2	Part 2: Test conditions for moulding and extrusion plastics	1145.2	Part 2: Test conditions for moulding and extrusion plastics
16104	Packaging—Transport packaging for dangerous goods—Test methods	16104	Transport packaging for dangerous goods—Test methods
EN ISO/IEC		AS ISO/IEC	
17025	General requirements for the competence of testing and calibration laboratories	17025	General requirements for the competence of testing and calibration laboratories

Only references that have been adopted as Australian Standards have been listed.

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

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INTRODUCTION

This standard was developed to provide requirements and test procedures to meet the compatibility provisions for plastics packagings to contain liquids as set out in:

The European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) (covering most of Europe) [2] and

Regulations concerning the International Carriage of Dangerous Goods by Rail (RID) (covering most of Europe, parts of North Africa and the Middle East) [5].

This procedure is an alternative option to that set out in the UN Recommendations on the Transport of Dangerous Goods [1].

Plastics packaging material can be attacked by the chemical contents of the package. Such effects are caused by different mechanisms such as environmental stress cracking (ESC) chemical degradation and swelling.

The UN Recommendations and the associated modal regulations require that all packagings shall be assessed for compatibility with the substances which they are to contain. The UN text makes special reference to plastics packagings for liquids. The procedure therein contains details of testing for six months at ambient temperature with the liquid to be carried. RID/ADR permits as an alternative the use of standard liquids to which this document refers.

The UN Recommendations are given legal entity not only to ADR and RID but also to:

The International Civil Aviation Organisations Technical Instructions for the SafeTransport of Dangerous Goods by Air (ICAO Tis) (worldwide) [3] and

The International Maritime Dangerous Goods Code (IMDG Code) (worldwide) [4].

These two modal rules do not refer to the standard liquid tests but they may still be acceptable as the UN provisions do not make the six month test a mandatory requirement.

The application of this standard will need to take account of the requirements of these international agreements and the relevant national regulations [6] [7] for domestic transport of dangerous goods.

Although not stipulated in the UN Recommendations or the modal regulations, these tests may be applied, where deemed appropriate, to inner packagings of combination packagings. However, for this purpose, the standard liquid tests may not be applicable to all types of plastics materials, since the tests were originally created for high molecular weight high density polyethylene (PE-HD-HMW).

WARNING — The use of this International Standard may involve hazardous materials and equipment. This International Standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this International Standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

AUSTRALIAN STANDARD

Transport packaging for dangerous goods— Plastics compatibility testing

1 Scope

This standard specifies the requirements and test methods for compatibility testing of polyethylene based plastics packagings and composite packagings with plastic inners containing liquids. The testing involves storage with the packaged substance, or with a standard liquid as defined in annex A. Annex B describes small scale laboratory tests, which may be used to determine the assimilation of those products to be carried with the standard liquids.

NOTE This standard should be used in conjunction with one or more of the International Regulations set out in the Bibliography

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 291, *Plastics - Standard atmospheres for conditioning and testing*

EN ISO 527-2, *Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2:1993)*

EN ISO 1133, *Plastics - Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics (ISO 1133:1997)*

EN ISO 1183-1, *Plastics - Methods for determining the density of non-cellular plastics – Part 1: Immersion method, liquid pyknometer method and titration method (ISO 1183-1:2004)*

EN ISO 1628-3, *Plastics - Determination of the viscosity of polymers in dilute solution using capillary viscometers - Part 3: Polyethylenes and polypropylenes (ISO 1628-3:2001)*

EN ISO 1872-2, *Plastics — Polyethylene (PE) moulding and extrusion materials — Part 2: Preparation of test specimens and determination of properties (ISO 1872-2:1997)*

EN ISO 2818, *Plastics – Preparation of test specimens by machining (ISO 2818:1994)*

EN ISO 11403-3 *Plastics - Acquisition and presentation of comparable multipoint data - Part 3: Environmental influences on properties (ISO 11403-3:1999)*

EN ISO 11542-2:1998, *Plastics - Ultra-high-molecular-weight polyethylene (PE-UHMW) moulding and extrusion materials - Part 2: Preparation of test specimens and determination of properties (ISO 11542-2:1998)*

EN ISO 16104:2003, *Packaging – Transport packaging for dangerous goods – Test methods (ISO 16104:2002)*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:1999)*

ISO 16770, *Plastics - Determination of environmental stress crack (ESC) of polyethylene – Full-notch creep test (FNCT)*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.