

SPECIFICATIONS FOR SEGREGATION DEVICES

Supplement 3 to the Australian Code for the Transport of Dangerous Goods

Approved by Advisory Committee on the Transport of Dangerous Goods
June 2000

(Pending approval by the Australian Transport Council)



COMMONWEALTH DEPARTMENT OF
**TRANSPORT AND
REGIONAL SERVICES**

© Commonwealth of Australia 2000
ISBN 0 642 44460 9

This work is copyright. Apart from any use permitted under the *Copyright Act 1968*, no part may be reproduced by any process without prior written consent from the Commonwealth available from AUSINFO. Requests and inquiries concerning reproduction and rights should be addressed to the Manager, Legislative Services, AUSINFO, GPO Box 1920, Canberra ACT 2601 or by e-mail: Cwealthcopyright@dofa.gov.au.

Published by the Commonwealth Department of Transport and Regional Services.

This is Supplement 3 to the Australian Dangerous Goods Code (6th Edition). It is available at no charge for downloading from the Internet:

<http://www.dotrs.gov.au/dgoods>

Any queries regarding this document can be raised with:

Secretariat

Competent Authorities Panel

Dangerous Goods Policy Unit

Land Division

Department of Transport and Regional Services

GPO Box 594

CANBERRA ACT 2601

Ph: (02) 6274 7474

Fax: (02) 6274 7979

TABLE OF CONTENTS

SECTION 1 - PREAMBLE.....	2
SECTION 2 - APPLICATION.....	3
SECTION 3 - OVERPACKING DRUM SEGREGATION DEVICE.....	4
SECTION 4 - TYPE I SEGREGATION DEVICE.....	5
SECTION 5 - TYPE II SEGREGATION DEVICE.....	6
5.1 DESIGN-TYPE TEST REQUIREMENTS.....	6
5.2 QUALITY ASSURANCE	6
5.3 GENERAL REQUIREMENTS.....	6
5.4 GENERAL CONSTRUCTION REQUIREMENTS.....	7
SECTION 6 - TEST REQUIREMENTS FOR A TYPE II SEGREGATION DEVICE.....	8
6.1 DESIGN TYPE TESTS.....	8
6.2 PREPARATION OF TEST SAMPLES.....	9
6.3 BOTTOM LIFT TEST	9
6.4 TOP LIFT TEST	11
6.5 STACKING TEST	11
6.6 DROP TEST	12
SECTION 7 - CERTIFICATION OF TYPE II SEGREGATION DEVICES.....	13
7.1 APPROVAL CERTIFICATE	13
7.2 APPLICABILITY OF APPROVAL	13
COMPETENT AUTHORITIES	14

SECTION 1 - PREAMBLE

1.1 The Advisory Committee on the Transport of Dangerous Goods has prepared these 'Specifications for Segregation Devices' and this document was approved by the Australian Transport Council on 2000. This document is Supplement 3 to the 'Australian Code for the Transport of Dangerous Goods by Road and Rail , Edition 6' (ADG Code).

1.2 The ADG Code provides that Segregation Devices complying with these Specifications may be used for the transport of incompatible dangerous goods of Packing Group II and III, or for the segregation of other incompatible goods (eg. foodstuffs, other products for human or animal consumption, or foodstuff empties) in accordance with the ADG Code.

Note: Segregation Devices are not appropriate for Packing Group I dangerous goods but the ADG Code contains additional segregation requirements to assist the transport of incompatible Packing Group I dangerous goods.

1.3 The purpose of the Segregation Device is to provide an additional level of all-round protection to its contents in the event of an abnormal situation. It provides an additional barrier against the contact of incompatibles or the contamination of foodstuffs, etc.

1.4 The provisions of these Specifications set out general requirements for multimodal transport and do not establish special requirements that may be required for a particular mode.

1.5 Exceptionally, segregation devices and their service equipment not conforming strictly to the requirements of these specifications but considered to provide an equivalent level of protection may be approved by the Competent Authority. In addition, in order to take into account progress in science and technology, the Competent Authority may approve the use of alternative arrangements provided that they offer at least equivalent safety in respect of:

- (i) compatibility with the properties of the substances carried; and
- (ii) resistance to impact, loading and fire.

1.6 The Australian Dangerous Goods Code provides instruction on the use of Segregation Devices.

SECTION 2 - APPLICATION

- 2.1 Subject to the requirements of the ADG Code or these Specifications, acceptable segregation may be achieved by any of the following:
- (a) the use of packaging approved for segregation in accordance the ADG Code; or
 - (b) the use of an Overpacking Drum Segregation Device as detailed in Section 3 of these Specifications; or
 - (c) the use of a Type I Segregation Device as detailed in Section 4 of these Specifications; or
 - (d) the use of an approved Type II Segregation Device in accordance with Section 5 of these Specifications.
- 2.2 This supplement contains requirements for the construction, use and approval of Overpacking Segregation Devices, Type I Segregation Devices and Type II Segregation Devices. Performance requirements for packagings approved for segregation are provided in the ADG Code.
- 2.3 A segregation device may contain any component of the incompatible load.

SECTION 3 - OVERPACKING DRUM SEGREGATION DEVICE

Incompatible goods may be segregated by the use of an *Overpacking Drum Segregation Device* as detailed in this Section.

- 3.1 In this Section, overpacking means the stowing of the incompatible goods within a drum used as a segregation device and transported in accordance with the ADG Code.
- 3.2 The overpacking container must be a removable head drum approved for dangerous goods transport (Type Designator 1A2, 1B2 or 1H2).

SECTION 4 - TYPE I SEGREGATION DEVICE

A Type I Segregation Device shall be constructed and installed in accordance with this Section. It shall be used for segregation in accordance with the ADG Code and these Specifications.

- 4.1 A Type I Segregation Device shall not exceed 450 litres in capacity. It need not be performance tested.
- 4.2 It shall be rigid, of substantial construction, liquid tight, with a permanently attached hinged lid and at least two suitable securing devices.
- 4.3 It shall be fixed to the vehicle by bolting, clamping or other suitable means.
- 4.4 It shall not be lifted onto or from the vehicle when filled.
- 4.5 The interior of the Segregation Device shall be smooth and free of any protrusion or fitting likely to cause damage to the packages within. It shall allow for easy cleaning and be free of any cavities wherein spillage, dirt or contaminants might collect.

SECTION 5 - TYPE II SEGREGATION DEVICE

A Type II Segregation Device shall be design-type approved in accordance with these specifications. Each design type shall be capable of successfully passing the design type tests specified in Section 6 of these Specifications and be approved by the Competent Authority. Type II Segregation Devices shall be constructed in accordance with the design approval and shall be used for segregation in accordance with the ADG Code and these specifications.

5.1 Design-Type Test Requirements

- 5.1.1 Tests shall be successfully performed on each Segregation Device design-type before such a segregation device is used. A Segregation Device design type is defined by the design, size, materials, thickness and manner of construction and may include various surface treatments. A design-type may also include Segregation Devices which differ only in their lesser design dimensions.
- 5.1.2 Tests shall be conducted on a Segregation Device design-type as it would be if prepared for transport.
- 5.1.3 A Competent Authority may, on application, approve a design for a Type II Segregation Device for use in the transport of dangerous goods if:
- (a) The applicant has carried out the tests required in Section 6 of this Supplement; and
 - (b) The Competent Authority considers that a segregation device of that design-type would be safe for use in the transport of dangerous goods.
- 5.1.4 The approval of a segregation device design-type may be subject to any condition necessary for the safe transport of dangerous goods in a device of that design-type.

5.2 Quality Assurance

Each type of Segregation Device shall be designed, manufactured and tested under a quality assurance program in order to ensure that each meets the requirements of this Specification.

5.3 General Requirements

- 5.3.1 A Type II Segregation Device shall not exceed 3000 litres in capacity.
- 5.3.2 These Segregation Devices are approved by the Competent Authority on the basis of performance tests detailed in Section 6 of these Specifications and are not built to a design specification.
- 5.3.3 A Type II Segregation Device may include a packaging, a tank, an Intermediate Bulk Container or a freight container provided it meets the requirements of this Specification and is approved by the Competent Authority.
- 5.3.4 A Type II Segregation Device shall be designed to be lifted mechanically when fully loaded.
- 5.3.5 In approving a Type II Segregation Device the Competent Authority may restrict the use of a particular device to certain specified dangerous goods or specified classes of dangerous goods.

5.4 General Construction Requirements

- 5.4.1 All body panels shall be solid, substantial and resistant to penetration. Mesh, crate construction or similar is not acceptable but mesh reinforcing layers may be used.
- 5.4.2 The device may be of fixed construction or may be designed to be folded, dismantled or collapsed for return transport.
- 5.4.3 The device shall incorporate a base (which may also function as a lifting device) which raises the floor of the device at least 100mm above the floor of the transport vehicle at all times.
- 5.4.4 The device must be designed for safe mechanical handling when fully loaded.
- 5.4.5 The Segregation Device shall be of suitable design, construction, materials and strength for the intended service. The body and panels shall be resistant to or adequately protected from environmental deterioration.
- 5.4.6 If intended to be stacked the device must be designed for safe stacking and be sufficiently strong to support the load imposed by similar devices to the maximum height likely to occur in transport.
- 5.4.7 The device shall be able to be secured, restrained or attached to the transport vehicle. Securing features shall be of sufficient strength to securely restrain the device when it is loaded to twice the approved gross load. They shall be of a type and so positioned that no distortion or undue stress shall be imposed on the device.
- 5.4.8 The interior of the Segregation Device shall be smooth and free of any protrusion or fitting likely to cause damage to the packages transported within. It shall allow for cleaning and be free of any cavities in which spillage, dirt or contaminants may collect.
- 5.4.9 Each Segregation Device manufactured in accordance with an approved design-type shall be clearly and permanently marked on each side in lettering not less than 25mm high with the identification:

**"AUSTRALIAN COMPETENT AUTHORITIES
APPROVED SEGREGATION DEVICE
FOR USE IN AUSTRALIA ONLY
APPROVAL XXX TARE YYY GROSS ZZZ"**

Where:

XXX is the unique number issued by the Competent Authority

YYY is the Tare Mass of the segregation device

ZZZ is the maximum permitted gross mass of the segregation device and contents.

SECTION 6 - TEST REQUIREMENTS FOR A TYPE II SEGREGATION DEVICE

6.1 Design Type Tests

6.1.1 One segregation device of each type, size and manner of construction intended for use in the segregation of dangerous goods, as provided by the ADG Code, shall be subjected to the tests specified in order in the table below and as set out in the clauses indicated in the table.

Test	Reference Clause	Applicability
Bottom Lift	6.3	required*
Top Lift	6.4	required*
Stacking	6.5	required**
Drop	6.6	required

* When device is designed for this means of lifting

** When device is designed to be stacked.

6.1.2 A Segregation Device shall be design type tested to a minimum rating of 0.75kg per litre of available capacity. The person submitting the segregation device for approval shall nominate any higher test rating required, before testing is initiated.

6.1.3 These tests shall be repeated after each modification which significantly alters the design, material or manner of construction of the device.

6.1.4 The Competent Authority may at any time require proof, by tests in accordance with this section, that a Type II Segregation Device meets the requirements of the design type tests.

6.1.5 The design type tests shall be performed:

- (a) by a testing laboratory registered by the National Association of Testing Authorities (NATA) for the relevant tests and the results reported on a NATA endorsed test certificate;
- (b) by a testing laboratory located overseas and recognised by the Competent Authority;
or
- (c) where no such laboratory is available, by any other testing facility, provided a representative witnesses the tests from the Competent Authority and the results are reported on a test certificate in accordance with the ADG Code.

6.1.6 The Competent Authority may permit the selective testing of segregation devices which differ only in minor aspects from the tested design type.

6.2 Preparation of Test Samples

6.2.1 Liner Bag

A 70-micron linear low-density polyethylene bag shall be inserted into the test sample. The liner bag may be a pillow or gusseted bag of the following dimensions:

For pillow bags:

Length	=	H + 1.5 W
Width	=	1.2 (L + W)

For gusseted bags:

Length	=	H + 1.5W
Width + Gusset Width	=	1.2 (L + W)

Where: L = Length of Segregation Device in metres
 W = Width of Segregation Device in metres
 H = Height of Segregation Device in metres

6.2.2 Filling Material

High flow plastic granules of approximately 0.75kg/L bulk density are to be used as the bulk filling material. For lift tests it is permissible to use additives such as bags of lead shot to achieve the requisite total contained mass with the condition that they are placed so that the test results are not affected in any way.

6.2.3 Filling

The Segregation Device is to be filled so that the filling material occupies not less than 95% of the total volume of the test sample. (See paragraph 6.1.2).

6.3 Bottom Lift Test

6.3.1 Applicability

For all design types of segregation devices which are fitted with the means of lifting from the base as a design type test.

6.3.2 Preparation of Segregation Devices for tests

The segregation device shall be loaded to 1.25 times its maximum permissible gross mass, the load being evenly distributed.

6.3.3 Method of testing

The segregation device shall be raised and lowered twice by a lift truck with the forks centrally positioned and spaced at 0.75 times of the dimension of the side of entry (unless the points of entry are fixed). The forks shall penetrate to 0.75 of the direction of entry. The test shall be repeated from each possible direction of entry.

6.3.4 Criteria for passing the test

There shall be:

- (a) no permanent deformation which renders the device unsafe for transport; and

- (b) no loss of contents.

6.4 Top Lift Test

6.4.1 Applicability

For all design types of segregation devices which are fitted with the means of lifting from the top as a design type test.

6.4.2 Preparation of Segregation Devices for test

The segregation device shall be loaded to twice its maximum permissible gross mass, the load being evenly distributed.

6.4.3 Method of Testing

The segregation device shall be lifted in the manner for which it is designed until clear of the floor and maintained for a period of five (5) minutes.

6.4.4 Criteria for passing the test

There shall be:

- (a) no permanent deformation which renders the device unsafe for transport; and
- (b) no loss of contents.

6.5 Stacking Test

6.5.1 Applicability

For all design types of segregation devices which are designed to be stacked on each other, as a design type test.

6.5.2 Preparation of Segregation Devices for test

The segregation device shall be loaded to its maximum permissible gross mass.

6.5.3 Method of testing

The segregation device shall be placed on its base on level, hard ground and subjected to a test load (see paragraph 6.5.4) for a period of 24 hours. The test load shall be imposed in a manner which is the same as a similar segregation device being placed on top.

6.5.4 Calculation of superimposed test load

The load to be placed on the Segregation Device shall be 1.8 times the maximum gross mass of the number of similar devices that may be stacked on top of the device during transport.

6.5.5 Criteria for passing the test

There shall be:

- (a) no permanent deformation which renders the segregation device unsafe for transport; and
- (b) no loss of contents.

6.6 Drop Test

6.6.1 Applicability

The drop test shall apply to all design types of segregation devices as a design type test.

6.6.2 Preparation of Segregation Devices for test

The segregation device shall be loaded to not less than 95% of capacity with a load equal to the intended maximum gross load.

6.6.3 Method of Testing

The segregation device shall be dropped on to a rigid, non-resilient, smooth, flat and horizontal surface in such a manner as to ensure that the point of impact is on that part of the base of the device considered to be the most vulnerable.

6.6.4 Drop Height

800 mm

6.6.5 Criteria for passing the test

- (a) There shall be no loss of contents.
- (b) The device shall maintain sufficient structural integrity to be lifted from the impact surface to a height of 800 mm via slings without loss of contents.

Note: A slight discharge due to pinching of the liner bag on impact shall not be considered to be a failure.

SECTION 7 - CERTIFICATION OF TYPE II SEGREGATION DEVICES

7.1 Approval Certificate

In respect of each design type of a Type II Segregation Device an Approval in writing shall be issued attesting that the design type, including its equipment, meets the test requirements of this Specification. The Competent Authority shall issue the Approval.

The Certificate shall define any limits of the Approval and any special conditions (if any).

7.2 Applicability of Approval

An approved Type II Segregation Device may be used for the transport of incompatible goods in accordance with the conditions of the Approval and in compliance with the ADG Code.

COMPETENT AUTHORITIES

The Competent Authority for road and rail transport in each State and Territory is the authority appointed by the Minister under applicable legislation. The States and Territories have advised that the following people should be contacted for information relating to the road and rail transport of dangerous goods:

<u>Competent Authority Address</u>	<u>Telephone No.</u>	<u>Facsimile No.</u>
Australian Capital Territory		
Chief Inspector of Dangerous Goods A.C.T Workcover PO Box 224 CIVIC SQUARE ACT 2608	02 6207 6355	02 6207 7249
New South Wales		
Chief Inspector of Dangerous Goods Compliance Coordination Team WorkCover Authority NSW Level 3, 400 Kent Street SYDNEY NSW 2000 <i>(Classification, Packaging, Labelling)</i>	02 9370 5164	02 9370 6105
Manager, Transport and Hazardous Materials Environment Protection Authority 59-61 Goulburn St Sydney NSW 2000 <i>(All other matters)</i>	02 9995 5411	02 9995 5859
Northern Territory		
Chief Inspector of Dangerous Goods Work Health Authority GPO Box 4160 DARWIN NT 0801	08 8999 5010	08 8999 5141
Queensland		
Director-General Department of Transport PO BOX 673 FORTITUDE VALLEY QLD 4006	07 3253 4035	07 3253 4943
South Australia		
Manager Dangerous Substances Branch Department for Administrative & Information Services GPO Box 465 Adelaide SA 5001	08 8303 0447	08 8303 0444
Tasmania		

