

# Australian Dangerous Goods Code Comprehensive Review

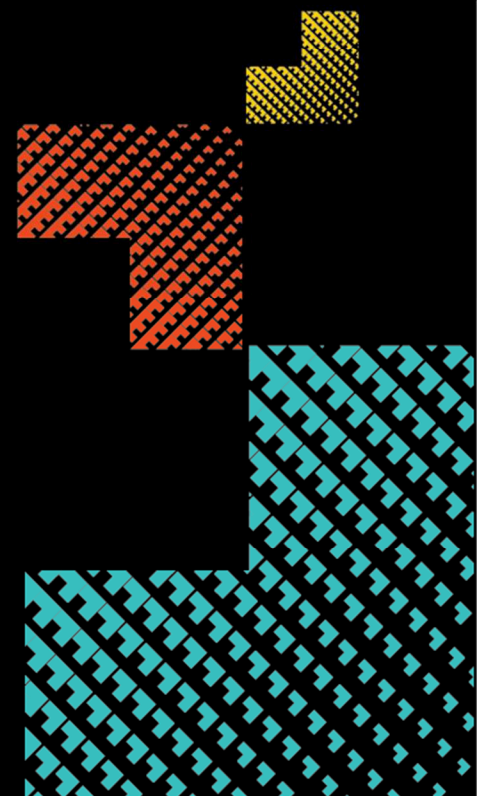
Working group paper #1



## Classification of dangerous goods

January 2023

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# Report outline

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<b>Title</b>	Classification of dangerous goods
<b>Type of report</b>	Discussion paper
<b>Purpose</b>	For public consultation
<b>Abstract</b>	<p>In November 2020, transport and infrastructure ministers approved the NTC's recommendation to conduct a comprehensive review of the Australian Code for the Transport of Dangerous Goods by Road and Rail (the Code).</p> <p>This paper is the first of a series of topic specific discussion papers. This paper should be read in conjunction with Part 2 – Classification of the draft code. Part 2 of the draft code is based on part 2 of the ADR.</p>
<b>Submission details</b>	<p>The NTC will accept submissions until 17 March 2023 online at <a href="http://www.ntc.gov.au">www.ntc.gov.au</a> or by email to: <a href="mailto:dkirk@ntc.gov.au">dkirk@ntc.gov.au</a></p>
<b>Attribution</b>	<p>This work should be attributed as follows, Source: National Transport Commission, Classification of dangerous goods, discussion paper #1.</p> <p>If you have adapted, modified or transformed this work in anyway, please use the following, Source: based on National Transport Commission, Classification of dangerous goods, discussion paper #1.</p>
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# Have your say

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## What to submit

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This paper is the first of a series of topic specific discussion papers relating to the comprehensive review of the Australian Code for the Transport of Dangerous Goods by Road and Rail.

The paper examines the structure and benefits of the restructured Part 2 – Classification of the draft code. This paper should be read in conjunction with Part 2 – Classification of the draft code.

We are seeking stakeholder views on the eight consultation questions in the Executive Summary and throughout the document. We are also interested in any additional information submitters could provide to support their views.

## When to submit

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We are seeking submissions on this issues paper by 17 March 2023.


## How to submit

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Any individual or organisation can make a submission to the NTC.

### Making a submission

 Email your submission to [dkirk@ntc.gov.au](mailto:dkirk@ntc.gov.au)

 Send a hard copy to:

National Transport Commission  
Public submission – <insert project/report name>  
Level 3, 600 Bourke Street  
Melbourne VIC 3000.

Where possible, you should provide evidence, such as data and documents, to support the views in your submission.

### Publishing your submission

Unless you clearly ask us not to, we publish all the submissions we receive online. We will not publish submissions that contain defamatory or offensive content.

The *Freedom of Information Act 1982* (Cwlth) applies to the NTC.

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# Purpose of this paper

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The National Transport Commission (NTC) is conducting a comprehensive review of the Australian Code for the Transport of Dangerous Goods by Road & Rail (the Code).

In conducting the review, the NTC will seek to achieve greater alignment with the internationally recognised land mode-specific requirements contained in the Agreement for the International Transport of Dangerous Goods by Road (ADR) and the Agreement for the International Transport of Dangerous Goods by Rail (RID).

The review is focused on outcomes that serve the best interest of all parties involved in the transport of dangerous goods. This includes those parties on which the requirements are imposed, those who regulate and administer the requirements, and those who must maintain them.

This paper is the first of a series of topic specific discussion papers. This paper should be read in conjunction with Part 2 – Classification of the draft code. Part 2 of the draft code is based on part 2 of the ADR.

The purpose of this discussion paper is to examine the structure and benefits of the restructured Part 2 – Classification of the draft code. It examines the key differences between the way the current code presents information on the classification of dangerous goods with how this is done in the draft code. More specifically it provides information relating to:

- the structure and content of part 2 of the draft code (Classification)
- classification codes
- implementation of special provisions (SP) relating to additional hazards (SP 63 and SP 204).

This paper is accompanied by a draft of Part 2 – Classification, of the draft code.

This paper relates to:

the Code – Part No.	<input checked="" type="checkbox"/>	Working group	<input type="checkbox"/>	Discrete issue	<input type="checkbox"/>
Part 2 - classification					

# Executive summary

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## Context

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A full review of the Australian Dangerous Goods Code (the Code) has not been conducted for over a decade.

The Code is applicable across Australia, and adherence to it by all relevant parties ensures specific risks posed through transport of dangerous goods by land are effectively managed.

In 2020, transport and infrastructure ministers agreed for the NTC to conduct a full review of the Code. The NTC's responsibility for the Code's content and stakeholder engagement over several years, highlighted that the road and rail specific requirements of the Code in particular, do not fully support the smooth and safe movement of dangerous goods across borders and transport modes.

The purpose of the review, therefore, is to ensure that the Code is reflective of the Australian transport environment, draws upon road and rail mode specific concepts used elsewhere in the world where appropriate, and considers inclusion of explosives as regulated dangerous goods under the Code's requirements.

Given the scale of the review, the content of the code has been broken into a series of topics. This paper focuses on the classification of dangerous goods.

## Themes

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### **Chapter 1 – Project to Review the Australian Dangerous Goods Code**

In November 2020, transport and infrastructure ministers approved the NTC's recommendation to conduct a comprehensive review of the Code.

The review seeks to better align Australia with international practices contained in the road and rail mode specific versions of the UN Model Regulations and will focus on improving transport of dangerous goods safety outcomes.

The review also aims to deliver more than just a cohesive and contemporaneous code aligned with international standards.

### **Chapters 2 and 3 – Current Classification Content and Structure**

Classification criteria and procedures are the basis for all dangerous goods transport. The Code outlines the steps in the classification process, however, there is a lack of clarity, and the steps are incomplete.

While the current Code's classification content aligns with international standards, the way additional information is placed and structured in the Code, increases the risk of goods otherwise considered too dangerous to transport entering the transport network. Further, the current Code does not contain additional hazards information that is valuable in determining how dangerous goods should be placed and loaded onto vehicles and rolling stock.

The way classification requirements are presented in the current Code needs to be examined so that classification steps for duty holders are easy to follow and classification information is seamlessly connected.

### **Chapters 4 and 5 - New Classification Information to Improve Risk Mitigation**

While the current Code applies classification criteria and processes in line with international standards, it does not provide additional classification information about the assignment of classification codes or the application of special provisions relating to classification. Nor does the Code structure the classification process in a logical and easy to follow format.

It is proposed that new information about classification code assignment be incorporated. The additional information would cover detail about hazards and provide additional physical descriptions and compatibility information.

The inclusion of classification codes and information would be new for dangerous goods stakeholders; however, the proposed structure and sequencing of the inclusions would facilitate easy identification of key attributes of dangerous goods, The ability to identify these attributes is key to ensuring how a dangerous good must be transported safely

## Next steps

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Consultation on this issues paper will close on 17 March 2023.

Submissions received will help inform how classification codes and information may be re-drafted in the code.

Opportunities to comment on other provisions in the code will be provided over the next 12 months. A complete draft code will be released for public comment in early 2024.

### List of questions

- Question 1:** Which of the three options do you prefer? Include your reasoning. .... 18
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- Question 3:** Are you aware of a publicly accessible Australian inventory of substances classified as acute toxic category 1, 2 or 3 according to the GHS?..... 19
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- Question 8:** Are there any impacts you believe have not been identified? ..... 26

# 1 About this project

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## Key points

- In November 2020, transport and infrastructure ministers approved the NTC's recommendation to conduct a comprehensive review of the Australian Code for the Transport of Dangerous Goods by Road and Rail (the Code).
- Mode-specific requirements of the current code consist of a repository of often disjointed, contradictory requirements that fall apart when closely examined.
- The review seeks to better align Australia with international practices as set out in the ADR and RID.
- The review will focus on outcomes that serve the best interest of all parties involved in the transport of dangerous goods.
- Given the scale of the review, the content of the code has been broken into a series of topics, each allocated to a topic specific working group

## 1.1 Project objectives

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In November 2020, transport and infrastructure ministers approved the NTC's recommendation to conduct a comprehensive review of the Australian Code for the Transport of Dangerous Goods by Road and Rail (the Code). Ministers also supported the proposal to incorporate into the Code principles from both:

- the Agreement for the International Transport of Dangerous Goods by Road (ADR)
- the Agreement for the International Transport of Dangerous Goods by Rail (RID).

The ADR and RID are used extensively throughout Europe, Africa and Asia. As with the Australian code, both the ADR and RID are based on the United Nations Recommendations on the Transport of Dangerous Goods - Model Regulations (UN Model Regulations). In general, the requirements of the ADR and RID are the same. They only differ where requirements need to apply specifically to either road transport or rail transport.

Stakeholder feedback over the years and a literature review of relevant materials suggests that the mode-specific requirements of the current code consist of a repository of often disjointed, contradictory requirements that fall apart when closely examined. In many instances, there was no supporting evidence or data for their introduction and there is no evidence that they have contributed to safer outcomes. The lack of consistency and cohesiveness in these requirements coupled with a lack of framework for maintaining the mode-specific requirements results in a continuing cycle of ad-hoc, random amendments without consideration of the consequential inconsistencies or contradictions.

### Goal of the review

The goal of the review is to deliver a code that:

- addresses the specific risks of transport by land, while also recognising any risks unique to the Australian transport environment
- remains contemporary
- is aligned to international practices that support the smooth and safe movement of dangerous goods across borders and transport modes.



The review is focused on outcomes that serve the best interest of all parties involved in the transport of dangerous goods. This includes:

- parties that must meet the requirements
- parties that regulate and administer the requirements
- parties that must maintain the requirements.

The aim of the review is to deliver more than just a cohesive and contemporaneous code. We also aim to deliver a framework for making sure the Code remains up to date and aligned with international standards.

## 1.2 Background

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In 2020, the NTC released an issues paper on the land transport of dangerous goods. The paper focused on the legislative framework that supports the dangerous goods code. However, the responses we received highlighted several problems with the code itself.

A major concern raised in submissions centred on the Australia-specific chapters of the current code. The biennial maintenance cycle of the Code, which keeps it aligned to the UN Model Regulations, is appreciated. However, many submissions noted the Australia-specific chapters have not been reviewed or revised. Many of these chapters were carried over from the sixth edition of the Code (ADG 6), either in full or in part, without examination. They have not been critically reviewed for over 15 years and are now outdated. In the case of some requirements, no evidence base, or justification can be found to support their original introduction.

Industry and regulators also noted the Australian Explosives Code is outdated and has no responsible agency. They expressed a strong preference for the dangerous goods code to be expanded to include Class 1 Explosives, and for the Australian Explosives Code to be made obsolete.

After analysing the submissions received, the NTC made a number of recommendations to infrastructure and transport ministers. All recommendations were endorsed, including the following:

### **Recommendation 4:**

Conduct a full review of the Australian Dangerous Goods Code to update outdated chapters, identify and correct translation errors, incorporate relevant ADR concepts and incorporate requirements for Class 1 and Division 6.2. Note: the technical requirements for Class 1 and Division 6.2 will be incorporated into the [ADG] Code but the legal requirements will not be incorporated into the regulations.

## 1.3 Approach

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A set of Review Principles has been developed to guide the review and give it the best chance of delivering the right outcome. These principles were developed with regard to the following key considerations:

- Impacts and benefits
- stakeholder engagement
- maintaining currency of the Code and associated model laws.

Given the scale of the review, the content of the code has been broken into a series of topics, each allocated to a topic specific working group.

This discussion paper deals specifically with part 2 of the code, which contains the provisions relating to classification.

## 2 Context of issues

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### Key points

- Classification criteria and procedures developed by the United Nations Sub-Committee of Experts on the Transport of Dangerous Goods are the basis for all dangerous goods transport.
- Requirements relating to classification, contained in part 2 of the code, underpin all other requirements in the code
- The proposed changes provide greater detail to duty holders but do not change the fundamentals of classification.

### Importance of correct classification

Correct classification of dangerous goods forms the starting point for all requirements relating to their safe packaging and transport. The criteria and principles for classification have been developed by the United Nations Sub-Committee of Experts on the Transport of Dangerous Goods. The procedures and criteria for classification are contained in Part 2 – Classification, of the UN Model Regulations.

The dangerous goods list in part 3 of the UN Model Regulations contains a list of known dangerous goods, listed in numerical order of UN numbers. Once the UN number of a specific dangerous substance or article has been determined, the table provides cross-references to specific requirements to be applied for the transport of that substance or article, and to the chapters or sections where these specific requirements can be found.

When goods which are known or suspected to be dangerous goods cannot be found by name in the dangerous goods list, they have to be classified in accordance with part 2. This part contains the relevant procedures and criteria to determine whether such goods are deemed to be dangerous or not and which UN number should be assigned.

### Identifying and managing risks in mode-specific codes

The mode-specific and regional codes, the International Maritime Dangerous Goods (IMDG) Code, the International Civil Aviation Organization Technical Instructions (ICAO TI), ADR, RID, and others replicate the UN Model Regulations classification procedures and criteria. They also include additional information necessary to identify and manage the risks specific to their mode of transport. This additional information may clearly state that certain goods are prohibited from transport or are unregulated. The additional information is also used to provide further detail on the hazards. The UN Model Regulations, mode-specific codes and regional codes all require the classification information. For example, primary and subsidiary hazards and packing groups for the dangerous goods in a consignment, to be included on the dangerous goods transport document (shipping papers).

### Information is overlooked in current code

Australia replicates the content of part 2 of the UN Model Regulations in the current Australian Code for the Transport of Dangerous Goods by Road & Rail (current code). Additional information on goods too dangerous to transport, or unregulated for transport by road or rail is contained in other areas of the current code, meaning it is often overlooked by duty holders. No additional information on hazards associated with a specific dangerous

good is provided. This often makes it difficult for duty holders to apply requirements such as segregation.

### **More detail added to Part 2 of the draft code**

The provisions relating to classification (part 2) of the draft code copy the structure of the ADR and RID. A copy of part 2 of the draft code accompanies this discussion paper. This paper discusses the benefits to Australian duty holders, regulators and policy makers from part 2 of the draft code. While not changing the procedures or criteria for classification, the proposed changes will provide greater detail to duty holders, making it easier to find and comply with, requirements.

### **Interconnection of requirements in the dangerous goods code**

In reviewing part 2 of the draft code, it's important to understand the interconnectedness of requirements throughout the code. Any modifications to structure, numbering, and so on, will impact the cohesiveness and completeness of the overall code. It will also make future updating of the code unnecessarily difficult and introduce unintended consequences to the useability of code itself.

### **Scope of this paper**

Modifications to the procedures and criteria for classification are out of scope of the review. These matters are set at the UN level.

This discussion paper looks at key differences between the way the requirements for classification are presented in the current code with how this is done in the draft code.

# 3 Content and structure of Part 2 Classification

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## Key points

- The classification criteria and process in part 2 of the code, aligns with the UN Model Regulations and other mode-specific and regional codes.
- The structure of part 2 has been improved to provide clearer information and a consistent format and numbering style, making it easy to readily locate specific information.
- Additional detail has been included to provide clear guidance and instruction to aid correct classification.
- The improved readability and ease of locating provisions is expected to reduce the likelihood of incorrect or missed classification.

## 3.1 Content of Part 2 Classification

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Part 2 of the code contains the detailed requirements for classification of dangerous goods. The procedures and criteria for classification copy those in part 2 of the UN Model Regulations. These requirements are also included in other mode-specific and regional codes, for example, IMDG Code, ICAO TI, ADR, RID. The structure of part 2 also aligns with these codes.

It's important to note that the draft code does not provide different information to the current code, it simply provides additional information. There are no material differences in the classification procedures in the current code and that of the draft code. Sections 3.2 and 3.3 of this discussion paper provide a more detailed overview of part 2 of the draft code.

## 3.2 Structure of Part 2 of the draft code

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Part 2 of the draft code follows the same basic structure as the current code. While the structure is the same, the numbering of the chapters and sub-chapters within part 2 are different. The new numbering more accurately reflects the contents of the chapter and sub-chapter. This is expected to make it easier for duty holders to quickly locate the relevant classification requirements. The structure and numbering of part 2 is:

Chapter 2.1 – General Provisions – this chapter contains the following:

- 2.1.1 List of the classes dangerous goods
- 2.1.2 Principles of classification
- 2.1.3 Classification of substances, including solutions and mixtures (such as preparations and wastes), not mentioned by name
- 2.1.4 Classification of samples
- 2.1.5 Classification of articles as articles containing goods, n.o.s.
- 2.1.6 Classification of packagings, discarded, empty, uncleaned

Chapter 2.2 – Class specific provisions

*Note: With the exception of Class 1, the term 'Division' is generally not used. This is the same as the IMDG Code for sea transport.*

- 2.2.1 Class 1 Explosive substances and articles
- 2.2.2 Class 2 Gases
- 2.2.3 Class 3 Flammable liquids
- 2.2.41 Class 4.1 Flammable solids, self-reactive substances, polymerising substances and solid desensitised explosives
- 2.2.42 Class 4.2 Substances liable to spontaneous combustion
- 2.2.43 Class 4.3 Substances which, in contact with water, emit flammable gases
- 2.2.51 Class 5.1 Oxidizing substances
- 2.2.52 Class 5.2 Organic peroxides
- 2.2.61 Class 6.1 Toxic substances
- 2.2.62 Class 6.2 Infectious substances
- 2.2.7 Class 7 Radioactive material
- 2.2.8 Class 8 Corrosive substances
- 2.2.9 Class 9 Miscellaneous dangerous substances and articles

Chapter 2.3 Test methods

## 3.3 Structure and content of Chapters in Part 2 Classification

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### 3.3.1 Classification steps

#### Problem with the current code

The steps in the classification process in the current code lack clarity and are incomplete. The primary information about classification is contained in Chapter 2.0. Chapter 2.0 provides information such as classification-related definitions, Classes and Divisions, UN numbers, and proper shipping names. The basic principles of classification are also contained in Chapter 2.0 but the steps in the classification process are unclear.

Duty holders find it difficult to find and interpret the order in which classification principles are to be applied. This can lead to dangerous goods being assigned to the incorrect UN Number entry from the dangerous goods list.

Chapter 2.0 also contains information relating to the application of criteria for specific Classes. For example:

- 2.0.2.3 All self-reactive substances of Division 4.1 are assigned to one of twenty generic entries in accordance with the classification principles and flow chart described in 2.4.2.3.3 and Figure 2.4.1.
- 2.0.2.4 All organic peroxides of Division 5.2 are assigned to one of twenty generic entries in accordance with the classification principles and flow chart described in 2.5.3.3 and Figure 2.5.1. adding

This information is out of context with the surrounding provisions, adding confusion to the reader. This information belongs in the chapters containing specific classification criteria for Class 4.1 and Class 5.2, respectively. The poor placement of these provisions has also resulted in them not being updated to reflect changes in the specific classification chapters. There are now 22 UN entries for organic peroxides of Division 5.2.

The above is not an exhaustive list but rather, provides examples of the problems in the current code.

#### Chapter 2.1 of the draft code

Chapter 2.1 of the draft code covers the general classification related information and principles of the Chapter 2.0 of the current code but with greater detail on the principles of classification, and in a more logical sequence. The structure of the chapter follows the

process steps a person would apply for classification, with information grouped into the following (in order):

- Introduction
- Principles of classification
- Classification of substances, including solutions and mixtures (such as preparations and wastes), not mentioned by name
- Table of precedence of hazards
- Classification of samples
- Classification of articles as articles containing dangerous goods, not otherwise specified (n.o.s).
- Classification of packages, discarded, empty, uncleaned

Additional detail is included to provide clear guidance and instruction to aid correct classification, as shown in the following examples:

#### Example 1 – extract from 2.1.2 – Principles of classification

2.1.2.4 Dangerous goods which are listed or defined in sub-section 2.2.x.2 of each class are not to be accepted for carriage.

2.1.2.5 Goods not mentioned by name, i.e. goods not listed as single entries in Table A of Chapter 3.2 and not listed or defined in one of the above-mentioned sub-sections 2.2.x.2 shall be assigned to the relevant class in accordance with the procedure of section 2.1.3. In addition, the subsidiary hazard (if any) and the packing group (if any) shall be determined. Once the class, subsidiary hazard (if any) and packing group (if any) have been established the relevant UN number shall be determined. The decision trees in sub-sections 2.2.x.3 (list of collective entries) at the end of each class indicate the relevant parameters for selecting the relevant collective entry (UN number). In all cases the most specific collective entry covering the properties of the substance or article shall be selected, according to the hierarchy indicated in 2.1.1.2 by the letters B, C and D respectively. If the substance or article cannot be classified under entries of type B or C according to 2.1.1.2, then, and only then shall it be classified under an entry of type D.

2.1.2.6 On the basis of the test procedures of Chapter 2.3 and the criteria set out in sub-sections 2.2.x.1 of classes when it is so specified, it may be determined that a substance, solution or mixture of a certain class, mentioned by name in Table A of Chapter 3.2, does not meet the criteria of that class. In such a case, the substance, solution or mixture is deemed not to belong to that class.

#### Example 2 – Examples provided with the *table of precedence of hazards* (Table 2.1.3.10 of the draft code) to explain its use.

##### **Classification of a single substance**

Description of the substance to be classified:

An amine not mentioned by name meeting the criteria for Class 3, packing group II as well as those for Class 8, packing group I.

Procedure:

The intersection of line 3 II with column 8 I gives 8 I.

This amine has therefore to be classified in Class 8 under:

UN No. 2734 AMINES LIQUID, CORROSIVE, FLAMMABLE, N.O.S. or UN No. 2734 POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S. packing group I

##### **Classification of a mixture**

Description of the mixture to be classified:

Mixture consisting of a flammable liquid classified in Class 3, packing group III, a toxic substance in Class 6.1, packing group II and a corrosive substance in Class 8, packing group I.

Procedure:

The intersection of line 3 III with column 6.1 II gives 6.1 II.

The intersection of line 6.1 II with column 8 I gives 8 I LIQ.

This mixture not further defined has therefore to be classified in Class 8 under:

UN No. 2922 CORROSIVE LIQUID, TOXIC, N.O.S. packing group I.

### 3.3.2 Class specific classification criteria

#### Problem with the current code

The problems with the structure and content of the Class-specific classification chapters in part 2 of the current code are not necessarily significant but they do create difficulties for duty holders.

- The information is poorly located, with incorrect or misleading headings, making it difficult to find and easy to overlook.
- Provisions relating to what a given Class includes are often broken up and interspersed with unrelated information.
- Information within each chapter follows no consistent structure or numbering.

The following two examples demonstrate the problem. There are multiple occurrences of similar issues throughout part 2 of the current code.

#### Example 1 – Chapter 2.2. – Class 2 Gases

Provision 2.2.2.1 states that Class 2 Gases are classified into one of the following three divisions:

- Division 2.1: Flammable gases
- Division 2.2: Non-flammable, non-toxic gases
- Division 2.3: Toxic gases

The test criteria for determining the toxicity or flammability of a gas are located in 2.2.3 which is headed *Mixtures of Gases*. The intervening provisions between 2.2.2.1 and 2.2.3 contain information on exemptions relating to Division 2.2 gases.

#### Example 2 – Substances not accepted for transport

There is inconsistency in the way information is provided on substances not accepted for transport. For instance, provisions 2.3.5 and 2.8.5 provide clear statements that chemically unstable substances of Class 3 or Class 8, respectively are not to be accepted. However, no such statement is provided for Division 5.1. Many chemically unstable substances of Division 5.1 are included in Appendix A: Goods Too Dangerous to be Transported, but this list is not exhaustive. Additionally, it relies on the duty holder being aware of the list and remembering to consult it.

### Chapter 2.2 of the draft code



Chapter 2.2 contains the detailed Class specific classification provisions. It follows the same general flow as the current code but with greater consistency and logic. Rather than each Class having a separate chapter, each Class is a separate section of Chapter 2.2. The third number in the numbering sequence is the number of the Class that is the subject of the section. For example, the section containing the classification provisions for Class 4.1 is 2.2.41.

The number format and provision numbers are consistent across all class related sections of the chapter.

The following are common to all Classes.

- 2.2.x.1 Criteria
  - 2.2.x.1.1 General information on the substances and articles that the Class covers
  - 2.2.x.1.2 Overview of how the Class is subdivided, based on their hazards, including classification codes
  - 2.2.x.1.x Definitions, properties, classification, assignment of packing groups, and so on, as relevant.
- 2.2.x.2 Substances not accepted for carriage
- 2.2.x.3 List of collective entries

## **Benefits**

The flow and numbering of each Class specific section follows a consistent format and numbering style, making it easy to readily locate specific information. As an example, substances of a Class that are prohibited for carriage are clearly identified and are always numbered 2.2.x.2. The list of collective entries for a given Class will always be found in 2.2.x.3.

The improved readability and ease of locating provisions is expected to reduce the likelihood of incorrect or missed classification. Each improvement in the classification of dangerous goods reduces the risk during transport.

### **3.3.3 Chapter 2.3**

Chapter 2.3 contains test methods that support the tests in Chapter 2.2 and the Manual of Tests and Criteria. It contains the following test methods:

- Exudation test for blasting explosives of Type A
- Tests for nitrated cellulose mixtures of Class 1 and Class 4.1
- Tests relating to flammable liquids of Classes 3, 6.1 and 8
  - Determination of flash-point
  - Determination of initial boiling point
- Test for determining fluidity
- Classification of organometallic substances in Classes 4.2 and 4.3

## **3.4 Issues needing resolution**

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The following differences between classification criteria in the draft code and that of the current code have been identified as issues requiring specific discussion or resolution.

### Issue 1 – Classification of toxic substances

#### **Problem**

The ADR and RID provide an additional pathway for the classification of some toxic substances. This pathway is not included in the current code but has been included in the draft code as provision 2.2.61.1.14.

The provision contains a reference to European Commission [Regulation \(EC\) No 1272/2008](#). The objective of Regulation (EC) No 1272/2008 is to harmonise the criteria for classification of substances and mixtures, and the rules on labelling and packaging for hazardous substances and mixtures. It also aims to establish a classification and labelling inventory of substances. The inventory is contained in Table 3 of the regulation. The regulation maps to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) classification categories.

A decision is required whether provision 2.2.61.1.14 should be retained in the draft code, or if it should be deleted. If it is retained, the reference to Regulation (EC) No 1272/2008 will need to be replaced with a suitable alternative.

Provision 2.2.61.1.14 of the draft code states:

2.2.61.1.14 Substances, solutions and mixtures, with the exception of substances and preparations used as pesticides, which are not classified as acute toxic category 1, 2 or 3 according to Regulation (EC) No 1272/2008, may be considered as substances not belonging to class 6.1.

### **Option 1**

Retain provision 2.2.61.1.14 and replace the reference to 'Regulation (EC) No 1272/2008' with a reference to the GHS.

All Australian jurisdictions use the GHS for classification of hazardous chemicals but may reference different versions.

Work is ongoing at the UN level to align dangerous goods classification criteria and GHS classification criteria, but some differences may remain. If this option is adopted, we would like to ensure any unintended consequences are identified and addressed.

### **Option 2**

Retain provision 2.2.61.1.14 and replace the reference to 'Regulation (EC) No 1272/2008' with a reference to a suitable Australian inventory or regulation.

The NTC is unaware at this time of a publicly available Australian inventory of substances mapped to GHS classification categories.

### **Option 3**

Delete provision 2.2.61.1.14 from the draft code.

Deleting the provision would not result in any reduction from the current code but may result in potential benefits not being realised.

**Question 1:** Which of the three options do you prefer? Include your reasoning.

**Question 2:** Are you aware of any instances where a substance, solution or mixture which is not classified as acute toxic category 1, 2 or 3 according to the GHS would meet the classification criteria for dangerous goods class 6.1?

**Question 3:** Are you aware of a publicly accessible Australian inventory of substances classified as acute toxic category 1, 2 or 3 according to the GHS?

## Issue 2 – Classification of environmentally hazardous substances (aquatic environment)

### **Problem**

The draft code includes an additional step (provision 2.2.9.1.10.5) for when the classification criteria in 2.2.9.1.10.3 and 2.2.9.1.10.4 (which are identical to the provisions in 2.9.3.3 and 2.9.3.4 of the current code) have been exhausted. The provisions contained in 2.2.9.1.10.3 and 2.2.9.1.10.4 contain the classification steps, criteria, and classification scheme for the classification of substances that are hazardous to the aquatic environment.

Provision 2.2.9.1.10.5 applies only after the previous classification steps have been followed and applied. It does not provide an alternative for the classification of environmentally hazardous substances (aquatic environment). Provision 2.2.9.1.10.5 in the draft code provides additional guidance and may prevent substances that should be classified as dangerous goods from going unclassified.

A decision is required whether provision 2.2.9.1.10.5 should be retained in the draft code, or if it should be deleted. If it is retained, the reference to Regulation (EC) No 1272/2008 will need to be replaced with a suitable alternative. The most appropriate reference appears to be the GHS.

Provision 2.2.9.1.10.5 of the draft code states:

2.2.9.1.10.5 Substances or mixtures classified as environmentally hazardous substances (aquatic environment) on the basis of Regulation 1272/2008/EC

If data for classification according to the criteria of 2.2.9.1.10.3 and 2.2.9.1.10.4 are not available, a substance or mixture:

- (a) Shall be classified as an environmentally hazardous substance (aquatic environment) if it has to be assigned category(ies) Aquatic Acute 1, Aquatic Chronic 1 or Aquatic Chronic 2 according to Regulation 1272/2008/EC;
- (b) May be regarded as not being an environmentally hazardous substance (aquatic environment) if it does not have to be assigned such a category according to the said Regulation.

### **Option 1**

Retain provision 2.2.9.1.10.5 and replace the reference to 'Regulation (EC) No 1272/2008' with a reference to the GHS.

This option will provide the best outcome and reduce the possibility of substances that should be classified as environmentally hazardous from going unclassified.

All Australian jurisdictions use the GHS for classification of hazardous chemicals but may reference different versions.

Work is ongoing at the UN level to align dangerous goods classification criteria and GHS classification criteria, but some differences may remain. We would like to ensure any unintended consequences are identified and addressed.

### **Option 2**

Retain provision 2.2.9.1.10.5 and replace the reference to 'Regulation (EC) No 1272/2008' with a reference to a suitable Australian inventory or regulation.

The NTC is unaware at this time of a publicly available Australian inventory of substances mapped to GHS classification categories.

### **Option 3**

Delete provision 2.2.9.1.10.5 from the draft code.

Deleting the provision would not result in any reduction from the current status but may result in potential benefits being missed.

**Question 4:** Which of the three options do you prefer? Include your reasoning.

**Question 5:** Are you aware of a publicly accessible Australian inventory of substances classified as Aquatic Acute 1, Aquatic Chronic 1 or Aquatic Chronic 2?

## 4 Additional classification information in the draft code

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### Key points

- Additional classification requirements previously imposed via special provisions have now been incorporated into part 2 of the code.
- Classification codes have been included in part 2 to provide additional hazard information.
- The inclusion of classification codes will help address requests from stakeholders to provide additional physical descriptions and compatibility information.

Both the draft code and the current code apply the classification criteria and process as per the UN Model Regulations. There is no material difference to the classification of entries. All substances must be assigned to a UN Number, Class or Division and Packing Group (if relevant). While the criteria and process are the same, the draft code structures the process steps in a logical and easier to follow format.

In addition to assigning a substance to a Class or Division based on its primary hazard, subsidiary hazards (if any) must be identified and assigned.

There are two specific areas where the draft code provides additional classification information:

- the assignment of classification codes
- the application of special provisions relating to classification.

### 4.1 Classification codes

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The draft code includes the assignment of classification codes. The classification codes are used to communicate hazard information, including additional information not readily ascertained from the Class or Division, Subsidiary Hazards and Packing Group. This information includes, among others, whether a substance is a liquid or a solid, organic or inorganic, whether a gas is liquefied, refrigerated, compressed, dissolved, adsorbed, and so on. Table 1 provides a snapshot of classification codes for some UN entries and their meaning. A full list of classification codes can be found in Appendix A.

**Table 1. Snapshot of classification codes**

UN No	Class (Sub hazard)	Proper Shipping Name	Classification Code	Interpretation
1732	8 (6.1)	ANTIMONY PENTAFLUORIDE	CT1	This substance is a corrosive, toxic, liquid

UN No	Class (Sub hazard)	Proper Shipping Name	Classification Code	Interpretation
1716	8	ACETYL BROMIDE	C3	This substance is an organic, liquid, acid
1026	2.3 (2.1)	CYANOGEN	2TF	This gas is a liquefied gas, that is toxic and flammable
1884	6.1	BARIUM OXIDE	T5	This substance is a toxic inorganic solid

Classification codes are used extensively throughout the code. They are particularly important in assigning suitable tank or pressure vessel types.

While some stakeholders may need time to become familiar with the classification codes, we believed that once they do, the benefits will be appreciated.

### **Benefits of classification codes**

We anticipate the inclusion of classification codes will provide many benefits to duty holders and address some of the issues raised by stakeholders, particularly the desire to provide physical descriptions in the dangerous goods list and the ability to distinguish between acids and alkalis in Class 8.

Another example of how duty holders would benefit from classification codes is in the ability to readily identify the physical state of a gas. Provision 2.2.1.2 of the current code states that the transport condition of a gas is described according to its physical state as:

- Compressed gas
- Liquefied gas
- High pressure liquefied gas
- Refrigerated liquefied gas
- Dissolved gas
- Adsorbed gas

For most Class 2 gases in the dangerous goods list there is no way for transport companies or drivers to easily identify what the physical state is. This becomes a particular issue where requirements are specific to the physical state. For example, the orientation requirements in provision 7.1.4.3 of the current code, which apply to liquefied gases. Most duty holders would readily recognise a gas as being liquefied when 'liquefied' is included in the proper shipping name, but would they recognise UN 1013 CARBON DIOXIDE as a liquefied gas. The classification codes for Class 2 in the draft code provide clear information on the physical state of the gas.

A full understating of the benefits will become known as additional parts of the code are reviewed.

**Question 6:** What benefits do you think including the assignment of classification codes in the Code might have?

**Question 7:** What supporting guidance or information should be provided to assist industry with the familiarisation of classification codes?

## 4.2 Implementation of classification-related special provisions

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### 4.2.1 Special provisions 63 (UN 1950) and 303 (UN 2037)

Both the UN Model Regulations and the current code contain a single entry in the dangerous goods list for UN 1950 AEROSOLS, recording the Class as '2'. Special provision (SP) 63 is then assigned to the entry. SP 63 requires that Aerosols of UN 1950 be further classified, based on their contents. While the dangerous goods list has only a single entry, there are 12 possible classification outcomes.

Where the consignor of UN1950 is not the original manufacturer, they generally need to rely on the safety data sheet (SDS) for the product to ascertain the correct classification. Most SDS simply record 'Class 2'. While the duty holder can often ascertain the correct classification by looking at what the SDS has for the IMDG Code or ICAO TI, this may not always be possible. An SDS is not a legal requirement for transport of dangerous goods by road or rail.

In the draft code, the additional classification requirements are included in Part 2 - Classification (see provision 2.2.2.1.6). This approach requires the person undertaking the classification to undertake the full classification based on the contents of the aerosol. All 12 possible classification outcomes are then listed as separate entries in the dangerous goods list.

This same approach is taken for the additional classification requirements in SP 303 for UN 2037 RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES) without a release device, non-refillable. When classified as required by SP 303, there are 9 possible classification outcomes. As with UN 1950, Note 2 of provision 2.2.2.1.3 of the draft code requires the additional classification to be undertaken at the initial classification stage and the appropriate classification assigned. All possible outcomes are listed as separate entries in the dangerous goods list.

### 4.2.2 Implementation of special provision 204 (UN 0015, 0016 and 0303)

Both the UN Model Regulations and current code assign SP 204 to UN numbers 0015, 0016 and 0303. SP 204 requires additional warning labels, depending on the additional hazards the dangerous goods present.

SP 204      Articles containing smoke producing substance(s) corrosive according to the criteria for Class 8 must be labelled with a "CORROSIVE" subsidiary hazard label (Model No.8, see 5.2.2.2.2).

Articles containing smoke-producing substance(s) toxic by inhalation according to the criteria for Division 6.1 shall be labelled with a "TOXIC" subsidiary hazard label (Model No 6.1, see 5.2.2.2.2), except that those manufactured before 31 December 2016 may be transported until 1 January 2019 without a "TOXIC" subsidiary hazard label.

Unlike the current code, the draft code provides separate entries in the dangerous goods list for each possible outcome of the application of SP 204. This places the onus on the person undertaking the classification in part 2 to identify the additional hazard(s) and assign the correct entry. This eliminates the need for SP 204 and reduces the risk of the requirements for the additional warning label being missed.



# 5 Expected impacts of changes to Part 2 Classification

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## Key points

- The improved structure and flow of requirements in part 2 of the draft code is expected to make identifying, understanding and applying classification easier for duty holders.
- There are no anticipated costs associated with the proposed changes to part 2 of the code.
- Consequential changes to the dangerous goods list in part 3 of the code are likely to impose costs associated with updating of stakeholder databases. These costs will be assessed as part of a future options paper for part 3.

## Benefits of the proposed changes

The classification criteria in the draft code are the same as in the UN Model Regulations and the current code, meaning there should be no difference in the classification of dangerous goods substances and articles.

The improved structure and flow of requirements in part 2 of the draft code is expected to make identifying, understanding and applying classification easier for duty holders. We also expect the structure will make it considerably easier for duty holders to locate the relevant requirements.

Consignors and other duty holders will be able to readily identify if a substance or article is prohibited from being transported or if it is not subject to the requirements. We expect this to have a positive impact on compliance.

The inclusion of classification codes will assist duty holders in understanding the hazardous properties of specific dangerous goods. This will make it easier to identify incompatible substances, particularly within the same Class. The full range of benefits will be better understood as the review progresses.

## Consequential amendments

The dangerous goods list in chapter 3.2 will require changes to accommodate the additional information in part 2. These changes are likely to include:

- additional entries for UN numbers with special provisions relating to additional hazard classification
- an additional column for recording classification codes
- modifications to the subsidiary hazards column to implement additional hazard classifications resulting from special provisions.

Options for how to do this will form part of a separate discussion paper and consultation.

## Anticipated costs

We do not foresee any costs associated with the proposed revision of part 2 of the code. Any consequential changes to the structure of the dangerous goods list in part 3 of the code is

likely to impose costs associated with updating of stakeholder databases. These costs will be assessed as part of a future options paper for part 3.

### **Functionality and readability of the Code**

The structure of part of the draft code and the inclusion of classification codes, is expected to have a positive impact on the readability and cohesiveness of the code.

If it's determined that classification codes should be removed from part 2, this would result in major consequential impacts on the cohesiveness of the code and make maintaining the code difficult and resource intensive. Australia would not be able to take advantage of international frameworks for ongoing maintenance. Without a sound framework for maintaining the mode-related provisions for the Code, we would quickly revert to the broken and missing linkages of the current code.

**Question 8:** Are there any impacts you believe have not been identified?

## 6 Next steps

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Consultation on this issues paper will end at 5:00 pm 17 March 2023.

Submissions received will help inform the final draft of Part 2 – Classification of the code. Opportunities to comment on other provisions in the code will be provided over the next 12 months. A complete draft code will be released for public comment in early 2024.

# Appendix A Classification Codes

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**Key to classification Codes and groups used in the ADR (RID) to denote the hazardous properties.**

## **Class 1 – Explosives**

The Division number and compatibility group letter

## **Class 2 – Gases**

Class 2 is further divided into the following sub-groups

- 1 Compressed gas
- 2 Liquefied gas
- 3 Refrigerated liquefied gas
- 4 Dissolved gas
- 5 Aerosol dispensers and receptacles, small, containing gas (gas cartridge)
- 6 Other articles containing gas under pressure
- 7 Non-pressurised gases subject to special requirements (gas samples)
- 8 Chemicals under pressure: liquids, pastes or powders, pressurised with propellant that meets the definition of a compressed or liquefied gas and mixtures thereof
- 9 Adsorbed gas

Each Class 2 substance or article is assigned a classification based on the following:

Substances and articles (except aerosols and chemicals under pressure) are assigned to one of the following groups based on their hazardous properties

- A asphyxiant;
- O oxidizing;
- F flammable;
- T toxic;
- TF toxic, flammable;
- TC toxic, corrosive;
- TO toxic, oxidizing;
- TFC toxic, flammable, corrosive;
- TOC toxic, oxidizing, corrosive.

Aerosols are assigned to one of the following groups based on their hazardous properties

- A asphyxiant;
- O oxidizing;
- F flammable;
- T toxic;
- C corrosive;
- CO corrosive, oxidizing;
- FC flammable, corrosive;
- TF toxic, flammable;
- TC toxic, corrosive;
- TO toxic, oxidizing;
- TFC toxic, flammable, corrosive;
- TOC toxic, oxidizing, corrosive.

Chemicals under pressure are assigned to one of the following groups based on their hazardous properties

- A asphyxiant;
- F flammable;
- T toxic;
- C corrosive;
- FC flammable, corrosive;
- TF toxic, flammable.

### **Class 3 – Flammable Liquids**

Substance and articles of Class 3 are subdivided as follows:

- F Flammable liquids, without subsidiary hazard and articles containing such substances:
  - F1 Flammable liquids having a flash-point of or below 60 °C;
  - F2 Flammable liquids having a flash-point above 60 °C which are carried or handed over for carriage at or above their flash-point (elevated temperature substances);
  - F3 Articles containing flammable liquids;
- FT Flammable liquids, toxic:
  - FT1 Flammable liquids, toxic;
  - FT2 Pesticides;
- FC Flammable liquids, corrosive;
- FTC Flammable liquids, toxic, corrosive;
- D Liquid desensitised explosives.

### **Class 4.1 – Flammable solids, self-reactive substances, polymerising substances and solid desensitised explosives**

The substances of Class 4.1 are subdivided as follows:

- F Flammable solids, without subsidiary hazard:
  - F1 Organic;
  - F2 Organic, molten;
  - F3 Inorganic;
  - F4 Articles;
- FO Flammable solids, oxidizing;
- FT Flammable solids, toxic:
  - FT1 Organic, toxic;
  - FT2 Inorganic, toxic;
- FC Flammable solids, corrosive:
  - FC1 Organic, corrosive;
  - FC2 Inorganic, corrosive;
- D Solid desensitised explosives without subsidiary hazard;
- DT Solid desensitised explosives, toxic;
- SR Self-reactive substances:
  - SR1 Not requiring temperature control;
  - SR2 Requiring temperature control.
- PM Polymerising substances
  - PM1 Not requiring temperature control;
  - PM2 Requiring temperature control.

## **Class 4.2 – Substances liable to spontaneous combustion**

The substances of Class 4.2 are subdivided as follows:

- S Substances liable to spontaneous combustion, without subsidiary hazard:
  - S1 Organic, liquid;
  - S2 Organic, solid;
  - S3 Inorganic, liquid;
  - S4 Inorganic, solid;
  - S5 Organometallic;
  - S6 Articles
- SW Substances liable to spontaneous combustion, which, in contact with water, emit flammable gases;
- SO Substances liable to spontaneous combustion, oxidizing;
- ST Substances liable to spontaneous combustion, toxic:
  - ST1 Organic, toxic, liquid;
  - ST2 Organic, toxic, solid;
  - ST3 Inorganic, toxic, liquid;
  - ST4 Inorganic, toxic, solid;
- SC Substances liable to spontaneous combustion, corrosive:
  - SC1 Organic, corrosive, liquid;
  - SC2 Organic, corrosive, solid;
  - SC3 Inorganic, corrosive, liquid;
  - SC4 Inorganic, corrosive, solid.

## **Class 4.3 – Substances which, in contact with water, emit flammable gases**

The substances of Class 4.3 are subdivided as follows:

- W Substances which, in contact with water, emit flammable gases, without subsidiary hazard, and articles containing such substances:
  - W1 Liquid;
  - W2 Solid;
  - W3 Articles;
- WF1 Substances which, in contact with water, emit flammable gases, liquid, flammable;
- WF2 Substances which, in contact with water, emit flammable gases, solid, flammable;
  - WS Substances which, in contact with water, emit flammable gases, solid, self-heating;
- WO Substances which, in contact with water, emit flammable gases, oxidizing, solid;
  - WT Substances which, in contact with water, emit flammable gases, toxic:
    - WT1 Liquid;
    - WT2 Solid;
- WC Substances which, in contact with water, emit flammable gases, corrosive:
  - WC1 Liquid;
  - WC2 Solid;
- WFC Substances which, in contact with water, emit flammable gases, flammable, corrosive.

## **Class 5.1 – Oxidising substances**

The substances of Class 5.1 and articles containing such substances are subdivided as follows:

- O Oxidizing substances without subsidiary hazard or articles containing such substances:

- O1 Liquid;
- O2 Solid;
- O3 Articles;
- OF Oxidizing substances, solid, flammable;
- OS Oxidizing substances, solid, self-heating;
- OW Oxidizing substances, solid which, in contact with water, emit flammable gases;
- OT Oxidizing substances, toxic:
  - OT1 Liquid;
  - OT2 Solid;
- OC Oxidizing substances, corrosive:
  - OC1 Liquid;
  - OC2 Solid;
- OTC Oxidizing substances, toxic, corrosive.

### **Class 5.1 – Organic peroxides**

The substances of Class 5.2 are subdivided as follows:

- P1 Organic peroxides, not requiring temperature control;
- P2 Organic peroxides, requiring temperature control.

### **Class 6.1 – Toxic substances**

The substances of Class 6.1 are subdivided as follows:

- T Toxic substances without subsidiary hazard:
  - T1 Organic, liquid;
  - T2 Organic, solid;
  - T3 Organometallic substances;
  - T4 Inorganic, liquid;
  - T5 Inorganic, solid;
  - T6 Liquid, used as pesticides;
  - T7 Solid, used as pesticides;
  - T8 Samples;
  - T9 Other toxic substances;
  - T10 Articles;
- TF Toxic substances, flammable:
  - TF1 Liquid;
  - TF2 Liquid, used as pesticides;
  - TF3 Solid;
- TS Toxic substances, self-heating, solid;
- TW Toxic substances, which, in contact with water, emit flammable gases:
  - TW1 Liquid;
  - TW2 Solid;
- TO Toxic substances, oxidizing:
  - TO1 Liquid;
  - TO2 Solid;
- TC Toxic substances, corrosive:
  - TC1 Organic, liquid;

- TC2 Organic, solid;
- TC3 Inorganic, liquid;
- TC4 Inorganic, solid;
- TFC Toxic substances, flammable, corrosive;
- TFW Toxic substances, flammable, which, in contact with water, emit flammable gases.

**Class 6.2 – Infectious substances**

The substances of Class 6.2 are subdivided as follows:

- I1 Infectious substances affecting humans;
- I2 Infectious substances affecting animals only;
- I3 Clinical waste;
- I4 Biological substances.

**Class 8 – Corrosive substances**

Substances and articles of Class 8 are subdivided as follows:

C1-C11 Corrosive substances without subsidiary risk and articles containing such substances:

- C1-C4 Acid substances:
  - C1 Inorganic, liquid;
  - C2 Inorganic, solid;
  - C3 Organic, liquid;
  - C4 Organic, solid;
- C5-C8 Basic substances:
  - C5 Inorganic, liquid;
  - C6 Inorganic, solid;
  - C7 Organic, liquid;
  - C8 Organic, solid;
- C9-C10 Other corrosive substances:
  - C9 Liquid;
  - C10 Solid;
  - C11 Articles;
- CF Corrosive substances, flammable:
  - CF1 Liquid;
  - CF2 Solid;
- CS Corrosive substances, self-heating:
  - CS1 Liquid;
  - CS2 Solid;
- CW Corrosive substances which, in contact with water, emit flammable gases:
  - CW1 Liquid;
  - CW2 Solid;
- CO Corrosive substances, oxidizing:
  - CO1 Liquid;
  - CO2 Solid;
- CT Corrosive substances, toxic and articles containing such substances:
  - CT1 Liquid;
  - CT2 Solid;
  - CT3 Articles;



- CFT Corrosive substances, flammable, liquid, toxic;
- COT Corrosive substances, oxidizing, toxic.

### **Class 9 – Miscellaneous dangerous substances and articles**

The substances and articles of Class 9 are subdivided as follows:

- M1 Substances which, on inhalation as fine dust, may endanger health;
- M2 Substances and articles which, in the event of fire, may form dioxins;
- M3 Substances evolving flammable vapour;
- M4 Lithium batteries;
- M5 Life-saving appliances;
- M6-M8 Environmentally hazardous substances:
  - M6 Pollutant to the aquatic environment, liquid;
  - M7 Pollutant to the aquatic environment, solid;
  - M8 Genetically modified microorganisms and organisms;
- M9-M10 Elevated temperature substances:
  - M9 Liquid;
  - M10 Solid;
- M11 Other substances and articles presenting a danger during carriage, but not meeting the definitions of another class.

## Appendix B Glossary

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Term	Definition
the Code	Refers to the Australian Code for the Transport of Dangerous Goods by Road and Rail – no specific version
current code	Refers to edition 7.8 of the Code
draft code	Refers to the draft of the revised Code
ADR	Agreement Concerning the International Carriage of Dangerous Goods by Road
RID	Convention concerning International Carriage by Rail (COTIF) Appendix C – Regulations concerning the International Carriage of Dangerous Goods by Rail

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