RID (Appendix C to COTIF)
Regulations concerning the International Carriage of Dangerous Goods by Rail

Jochen Conrad
Head of the RID department
What are dangerous goods?

Substances or articles that when carried may pose a risk to people, property or the environment, due to their chemical or physical properties.
Examples of dangerous goods

• Explosives substances and articles:
  • TNT, dynamite, fireworks

• Flammable gases:
  • Natural gas compressed (CNG) or liquified (LNG)
  • Liquified Petroleum Gases (LPG) – propane, butane
Examples of dangerous goods

- **Flammable liquids:**
  - Gasoline (petrol), kerosene, diesel, acetone

- **Toxic substances:**
  - Pesticides

- **Radioactive substances**
Examples of dangerous goods

- Corrosive substances:
  - Acids, alkalis

- Miscellaneous substances:
  - Lithium batteries, asbestos, air-bag inflators, dry ice
Dangerous goods in our daily life
Dangerous goods in our daily life
Dangerous goods in our daily life
COTIF 1999

COTIF
Convention concerning International Carriage by Rail

Appendix A
CIV
Uniform Rules concerning the Contract of International Carriage of Passengers by Rail

Appendix B
CIM
Uniform Rules concerning the Contract of International Carriage of Goods by Rail

Appendix C
RID
Regulation Concerning The International Carriage of Dangerous Goods by Rail

Appendix D
CUV
Uniform Rules concerning Contracts of Use of Vehicles in International Rail Traffic

Appendix E
CUI
Uniform Rules concerning the Contract of Use Of Infrastructure in International Rail Traffic

Appendix F
APTU
Uniform Rules concerning the Validation of Technical Standards and Adoption of Uniform Technical Prescriptions applicable to Railway Material intended to be used in International Traffic

Appendix G
ATMF
Uniform Rules concerning the Technical Admission of Railway Material used in International Traffic
• Regulations Concerning the International Carriage of Dangerous Goods by Rail
• Appendix C to COTIF 1999
• since 1893
• first restructured edition 1 July 2001
• 44 RID Contracting States (three Contracting States with suspended membership)
• Responsible OTIF Committee: RID Committee of Experts
• revision every two years
Scope of application of RID - Appendix C to COTIF

SCOPE OF APPLICATION OF RID
APPENDIX C TO COTIF

SITUATION ON
1 MAY 2019

COTIF - RID
COTIF without RID
Associate Members
Membership suspended
Regulations for the Transport of Dangerous Goods
Regulations for the Transport of Dangerous Goods

UN Recommendations on the Transport of Dangerous Goods (Model Regulations)

ICAO Technical Instructions (aviation)

IMDG Code (maritime)

Regulations for the (European) Land Modes

Annex 2 to SMGS (rail OSJD)

RID (rail)

ADR (road)

ADN (inland waterways)

In the scope of Directive 2008/68/EC → applicable for EU domestic traffic
Regulations for the Transport of Dangerous Goods

UN Recommendations on the Transport of Dangerous Goods (Model Regulations)

- ICAO Technical Instructions (aviation)
- IMDG Code (maritime)
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In the scope of Directive 2008/68/EC → applicable for EU domestic traffic
UN Model Regulations

- ECOSOC Committee of experts on the TDG and on the GHS
  - 36 members with voting right
  - Other observer states without voting right
  - International governmental organisations (IMO, ICAO, WHO, ILO, OTIF, ...)
  - International non-governmental organisations (NGOs) (chemical industry, gas industry, packaging industry, carrier, ...)


UN Recommendations on the Transport of Dangerous Goods

- Two sub-committees
  - UN Sub-Committee on the transport of dangerous goods (27 members)
  - UN Sub-Committee on the globally harmonized system of classification and labelling of chemicals (32 members)
- Twice a year (June and December) UN Sub-Committee of Experts on the Transport of Dangerous Goods
- Tasks: Common provisions for all modes, in particular classification, packing provisions
- At the end of a biennium (pair years) one session of the Committee of Experts on the Transport of Dangerous Goods
Regulations for the Transport of Dangerous Goods
UN Model Regulations

"Orange Book"

"Purple Book"
Regulations for the Transport of Dangerous Goods

UN Recommendations on the Transport of Dangerous Goods (Model Regulations)

ICAO Technical Instructions (aviation)
IMDG Code (maritime)

Regulations for the (European) Land Modes

RID (rail)
ADR (road)
ADN (inland waterways)

Annex 2 to SMGS (rail OSJD)

In the scope of Directive 2008/68/EC → applicable for EU domestic traffic
Organisation of RID/ADR/ADN

- Twice a year (March and September) RID/ADR/ADN Joint Meeting
- Once a year (November) standing working group of the RID Committee of Experts
- Every two years just before the notification of the new amendments RID Committee of Experts meeting
- Every two years, notification of the new amendments to RID/ADR/ADN at least 5 months before entry into force
Tasks of the RID/ADR/ADN Joint Meeting

- Harmonisation with UN Model Regulations
- Common provisions for RID, ADR and ADN
  - RID/ADR tanks
  - Reference to European standards
  - Integration of EU Directives
  - Transport conditions for inland transport
Working groups of the RID/ADR/ADN Joint Meeting

- Permanent working groups on tanks and on standards
- Working group on telematics
- Objectives:
  - Availability of all dangerous goods related information in electronic form (UN number, proper shipping name, class, quantity, …)
  - Electronic transmission of information between consignor, railway companies, infrastructure manager, …
  - Facilitation and acceleration of emergency services in case of an accident
  - Localisation of wagons carrying dangerous goods
Common Parts of RID and ADR

- Part 1 (General requirements): 70% identical
- Part 2 (Classification): 90% identical
- Part 3 (Dangerous goods lists, special provisions and exemptions related to limited and excepted quantities): 80% identical
- Part 4 (Use of packagings, intermediate bulk containers (IBCs), large packagings and tanks): 90% identical
- Part 5 (Consignment procedures): 70% identical
- Part 6 (Construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks): 90% identical
- Part 7 (Conditions of carriage, loading, unloading and handling): 60% identical
- Parts 8 and 9 of ADR do not exist in RID
Regulations for the Transport of Dangerous Goods

UN Recommendations on the Transport of Dangerous Goods (Model Regulations)

- ICAO Technical Instructions (aviation)
- IMDG Code (maritime)
- Regulations for the (European) Land Modes

- RID (rail)
- ADR (road)
- ADN (inland waterways)

In the scope of Directive 2008/68/EC → applicable for EU domestic traffic
Tasks of the RID Committee of Experts

- Prepared by the RID Committee of Experts’ standing working group (one one-week meeting per year (November))
- Interpretation of RID
- Consideration of the general EU railway law
- Limited provisions on the construction of wagons
- Training provisions
- Operational provisions
- Provisions for hand luggage and registered luggage
- Accident analysis
Time schedule for amendments to RID/ADR/ADN

UN Biennium 22nd edition

Biennium of the RID/ADR/ADN Joint Meeting

UN Biennium 23rd edition

Work on RID 2021

Last decisions for RID 2021

2019
01.01.2020
March 2020
May 2020
RID Committee of Experts

2020
01.07.2020

2021
01.01.2021

22nd edition of UN Model Regulations

2021
May 2021
01.01.2021

22nd edition of RID 2021

Entry into force of RID 2021

2021
01.07.2021

WG on Harmonisation with UN

2022
31.12.2021

Mandatory application of RID 2021

23rd edition

Work on RID 2023

May 2020
RID Committee of Experts

2022

2023

March 2022

Entry into force of RID 2021

May 2021

01.01.2023

31.12.2022

Work on RID 2023
Languages

- **UN Model Regulations:**
  - English, French, Russian, Spanish, Arabic, Chinese

- **ADR, ADN:**
  - English, French, Russian (in addition available in all official languages of the EU Member States)

- **RID:**
  - English, French, German, (Russian) (in addition available in all official languages of the EU Member States)
RID – Annex 2 to SMGS

- Annex 2 to SMGS contains Regulations concerning the international carriage of dangerous goods by rail in OSJD Member States
- Alignment of Annex 2 to SMGS with the structure of RID 2001
- Quicker incorporation of amended RID provisions into SMGS
- Simplification of traffic between COTIF and SMGS Member States
- Start of wider harmonisation procedure in November 2012
OTIF – OSJD – EU Member States
- Actual version: RID 2019
- Applicable since 01.01.2019
- Transitional period until 30.06.2019
- Mandatory application of RID 2019 from 01.07.2019
Current work topics

- Extra-large tank-containers
RID

- Divided in 7 parts
  - **Part 1**: General requirements
  - **Part 2**: Classification
  - **Part 3**: Dangerous goods lists, special provisions and exemptions related to limited and excepted quantities
  - **Part 4**: Packing and tank provisions
• **Part 5**: Consignment procedures

• **Part 6**: Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

• **Part 7**: Provisions concerning the conditions of carriage, loading, unloading and handling
Part 1 - General requirements

- Chapter 1.1: Scope and applicability
  - Structure
  - Scope
  - Exemptions
  - Applicability of other regulations

- Chapter 1.2: Definitions
  - Units of measurement

- Chapter 1.3: Training of persons involved in the carriage of dangerous goods
Chapter 1.4: Safety obligations of the participants

- Main participants: consignor, carrier, consignee
- Other participants: loader, packer, filler, tank-container operator, tank-wagon operator, railway infrastructure manager, unloader
Part 1 - General requirements

• Chapter 1.5: Derogations
  – Temporary derogations (multilateral special agreement)

• Chapter 1.6: Transitional measures

• Chapter 1.7: General provisions concerning radioactive material
  – developed by IAEA for all modes of transport
Part 1 - General requirements

- Chapter 1.8: Checks and other support measures to ensure compliance with safety requirements
  - Safety adviser
  - Report on occurrences during transport of dangerous goods
Chapter 1.9: Restrictions on carriage imposed by the competent authorities

- additional safety requirements or restrictions on
  - using certain structures (bridges, tunnels)
  - using combined transport installations
- prohibitions on sections with special and local risks
  - residential areas, environmentally sensitive areas, …
- exceptional provisions specifying the routing
Part 1 - General requirements

• Chapter 1.10: Security provisions
  – Security training
  – High consequence dangerous goods
  – Security plans

• Chapter 1.11: Internal emergency plans for marshalling yards
Part 2 - Classification

• **Chapter 2.1: General provisions**
  – Different classes
  – Entries
    • Single entries
    • Generic entries
    • Specific n.o.s. entries
    • General n.o.s. entries
  – Principles of classification

• **Chapter 2.2: Class specific provisions**
Part 2 - Classification

Class 1:
Explosive substances and articles (e.g. fireworks)
Class 2: Gases
(e.g. butane, propane)
Part 2 - Classification

**Class 3:** Flammable liquids
(e.g. diesel fuel, gasoline)
**Class 4.1:** Flammable solids, self-reactive substances and solid desensitized explosives (e.g. sulphur)
Class 4.2: Substances liable to spontaneous combustion (e.g. phosphorus)
Class 4.3: Substances which, in contact with water, emit flammable gases (e.g. lithium)
Class 5.1: Oxidizing substances (e.g. perchloric acid)
Class 5.2: Organic peroxides
Part 2 - Classification

Class 6.1: Toxic substances
(e.g. strychnine, nicotine)
Class 6.2: Infectious substances
(e.g. clinical waste)
Class 7: Radioactive material
(e.g. uranium)
Class 8: Corrosive substances
(e.g. sulphuric acid)
Class 9: Miscellaneous dangerous substances and articles (e.g. Lithium batteries, asbestos)
Part 2 - Classification

• Chapter 2.2 Class specific provisions
  – Criteria
  – Substances not accepted for carriage
  – List of collective entries
# Part 2 - Classification

## 2.2.8.3 List of collective entries

<table>
<thead>
<tr>
<th>Classification code</th>
<th>UN No.</th>
<th>Name of the substance or article</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Corrosive substances without subsidiary risk and articles containing such substances**

- **Liquid C1**
  - 2584 ALKYSULPHONIC ACIDS, LIQUID with more than 5% free sulphuric acid or
  - 2584 ARYLSULPHONIC ACIDS, LIQUID with more than 5% free sulphuric acid

- **Inorganic**

- **Acid**
  - 2693 BISULPHITES, AQUEOUS SOLUTION, N.O.S.
  - 2837 BISULPHATES, AQUEOUS SOLUTION
  - 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.

- **Solid C2**
  - 1740 HYDROGEN DIFLUORIDES, SOLID, N.O.S.
  - 2583 ALKYSULPHONIC ACIDS, SOLID with more than 5% free sulphuric acid or
  - 2583 ARYLSULPHONIC ACIDS, SOLID with more than 5% free sulphuric acid
  - 3260 CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.
Part 2 - Classification

• Chapter 2.3 Test methods
Part 3 - Dangerous goods lists, special provisions and exemptions related to limited and excepted quantities

• Chapter 3.1 General
  – Proper shipping name
  – Use of technical names for generic or n.o.s. entries

• Chapter 3.2 Dangerous goods lists
  – Table A: List of dangerous goods in UN number order
**Part 3 - Dangerous goods lists, special provisions and exemptions related to limited and excepted quantities**

- **Table A**
  - (1): UN number
  - (2): Name and description
  - (3a): Class
  - (3b): Classification code
  - (4): Packing group
  - (5): Labels
  - (6): Special provisions (Chapter 3.3)
  - (7a): Limited quantities (Chapter 3.4)
  - (7b): Excepted quantities (Chapter 3.5)
Part 3 - Dangerous goods lists, special provisions and exemptions related to limited and excepted quantities

- **Table A (cont’d)**
  - (8): Packing instructions (Chapter 4.1)
  - (9a): Special packing provisions (Chapter 4.1)
  - (9b): Mixed packing provisions (Chapter 4.1)
  - (10): Portable tank and bulk container instructions (Chapters 4.2 and 7.3)
  - (11): Portable tank and bulk container special provisions (Chapter 4.2)
  - (12): Tank codes for RID tanks (Chapter 4.3)
  - (13): Special provisions for RID tanks (Chapter 4.3)
Part 3 - Dangerous goods lists, special provisions and exemptions related to limited and excepted quantities

- **Table A (cont’d)**
  - (15): Transport category (1.1.3.1 c))
  - (16): Special provisions for carriage – Packages (Chapter 7.2)
  - (17): Special provisions for carriage – Bulk (Chapter 7.3)
  - (18): Special provisions for carriage – Loading and unloading (Chapter 7.5)
  - (19): Colis express (express parcels) (Chapter 7.6)
  - (20): Hazard identification number (Chapter 5.3)
Table A: List of dangerous goods in UN number order

<table>
<thead>
<tr>
<th>UN No.</th>
<th>Name and description</th>
<th>Class</th>
<th>UN classification code</th>
<th>Packing group</th>
<th>Labels</th>
<th>Special instructions</th>
<th>UNI code</th>
<th>Special packing provisions</th>
<th>Special specifications</th>
<th>Special provisions for damage</th>
<th>Transport category</th>
<th>Special provisions to avoid damage</th>
<th>Code express (if export parcel)</th>
<th>Placard identification A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1202</td>
<td>GAS OIL or DIESEL FUEL or HEATING OIL, LIGHT (flash-point not more than 60 °C)</td>
<td>3</td>
<td>F1</td>
<td>III</td>
<td>3</td>
<td>365</td>
<td>E1</td>
<td>P001</td>
<td>LB03</td>
<td>R001</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1202</td>
<td>DIESEL FUEL complying with standard EN 690.2009 + A1:2010 or GAS OIL or HEATING OIL, LIGHT with a flash-point as specified in EN 690:2009 + A1:2010</td>
<td>3</td>
<td>F1</td>
<td>III</td>
<td>3</td>
<td>365</td>
<td>640L</td>
<td>E1</td>
<td>P001</td>
<td>IBC03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1202</td>
<td>GAS OIL or DIESEL FUEL or HEATING OIL, LIGHT (and not more than 100 °C)</td>
<td>3</td>
<td>F1</td>
<td>III</td>
<td>3</td>
<td>363</td>
<td>640M</td>
<td>E1</td>
<td>P001</td>
<td>R001</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1203</td>
<td>MOTOR SPIRIT or GASOLINE or PETROL</td>
<td>3</td>
<td>F1</td>
<td>II</td>
<td>3</td>
<td>243</td>
<td>363</td>
<td>534</td>
<td>E2</td>
<td>IBC02</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1204</td>
<td>NITROGLYCERIN SOLUTION IN ALCOHOL with not more than 1% nitroglycerin</td>
<td>3</td>
<td>D</td>
<td>II</td>
<td>3</td>
<td>601</td>
<td>1L</td>
<td>E0</td>
<td>P001</td>
<td>IBC02</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part 3 - Dangerous goods lists, special provisions and exemptions related to limited and excepted quantities

- Chapter 3.2: Dangerous goods lists
  - Table B: Alphabetical list of dangerous goods
    - (1): Name and description
    - (2): UN number
    - (3): Note
    - (4): NHM code
Table B: Alphabetical list of dangerous goods

<table>
<thead>
<tr>
<th>Name and description</th>
<th>UN No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DICHLOROSILANE</td>
<td>2189</td>
</tr>
<tr>
<td>1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE</td>
<td>1958</td>
</tr>
<tr>
<td>DICYCLOHEXYLAMINE</td>
<td>2565</td>
</tr>
<tr>
<td>DICYCLOHEXYLAMMONIUM NITRITE</td>
<td>2687</td>
</tr>
<tr>
<td>DICYCLOPENTADIENE</td>
<td>2048</td>
</tr>
<tr>
<td>1,2-DI-(DIMETHYLAMINO) ETHANE</td>
<td>2372</td>
</tr>
<tr>
<td>DIDYMULUM NITRATE</td>
<td>1465</td>
</tr>
<tr>
<td>DIESEL FUEL</td>
<td>1202</td>
</tr>
<tr>
<td>1,2-Diethoxyethane: see</td>
<td>1153</td>
</tr>
<tr>
<td>DIETHOXYMETHANE</td>
<td>2373</td>
</tr>
<tr>
<td>3,3-DIETHOXYPROPENE</td>
<td>2374</td>
</tr>
<tr>
<td>DIETHYLAMINE</td>
<td>1154</td>
</tr>
<tr>
<td>2-DIETHYLAMINOETHANOL</td>
<td>2686</td>
</tr>
<tr>
<td>3-DIETHYLAMINOPROPYLAMINE</td>
<td>2684</td>
</tr>
</tbody>
</table>
Part 3 - Dangerous goods lists, special provisions and exemptions related to limited and excepted quantities

• **Chapter 3.3 Special provisions applicable to certain articles or substances**
  – indicated in column (6) of Table A
  – mainly connected with e.g. carriage prohibitions, exemptions from requirements, explanations concerning the classification of certain forms of the dangerous goods concerned and additional labelling or marking provisions
  – SP 1 to 499: applicable for all modes
  – SP 500 to …: applicable for land modes
Part 3 - Dangerous goods lists, special provisions and exemptions related to limited and excepted quantities

• **Chapter 3.4 Dangerous goods packed in limited quantities**
  – Quantity limit per inner packaging indicated in column (7a) of Table A (ml/g)
  – Total gross mass of the package: 30 kg
    (in case of shrink-wrapped or stretch-wrapped trays: 20 kg)
  – only some provisions of RID must be applied
• Chapter 3.4 (cont’d)
  – mark (instead of labels):
Chapter 3.5 Dangerous goods packed in excepted quantities

- Only a few provisions of RID must be applied
  - Training of persons involved
  - Classification procedures
  - Basic packaging requirements
- Not more than 1000 packages per wagon or container
Part 3 - Dangerous goods lists, special provisions and exemptions related to limited and excepted quantities

• Chapter 3.5 (cont’d)
  – Codes E0 to E5 (see column (7b) of Table A)

<table>
<thead>
<tr>
<th>Code</th>
<th>Maximum net quantity per inner packaging (in grams for solids and ml for liquids and gases)</th>
<th>Maximum net quantity per outer packaging (in grams for solids and ml for liquids and gases, or sum of grams and ml in the case of mixed packing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E0</td>
<td>Not permitted as Exected Quantity</td>
<td>1000</td>
</tr>
<tr>
<td>E1</td>
<td>30</td>
<td>500</td>
</tr>
<tr>
<td>E2</td>
<td>30</td>
<td>300</td>
</tr>
<tr>
<td>E3</td>
<td>30</td>
<td>500</td>
</tr>
<tr>
<td>E4</td>
<td>1</td>
<td>300</td>
</tr>
<tr>
<td>E5</td>
<td>1</td>
<td>300</td>
</tr>
</tbody>
</table>
• Chapter 3.5 (cont’d)
  – Mark
Part 4 - Packing and tank provisions

• Chapter 4.1
  – Packing instructions concerning the use of packagings
  – Code \textbf{P} xxx (see column (8) of Table A)
  – Type of packagings
  – Maximum net mass
  – P099: packagings approved by the competent authority
  – Special packing provisions \textbf{PP} x (see column (9a) of Table A)
• Chapter 4.1 (cont’d)
  – Packing instructions concerning the use of IBCs
  – Code IBC xx (see column (8) of Table A)
  – Type of IBCs
  – IBC99: IBCs approved by the competent authority
  – Special packing provisions B x (see column (9a) of Table A)
Part 4 - Packing and tank provisions

- Chapter 4.1 (cont’d)
  - Packing instructions concerning the use of large packaging
  - Code LP xx (see column (8) of Table A)
  - Type of large packagings
  - Maximum capacity
  - LP99: large packagings approved by the competent authority
  - Special packing provisions L x (see column (9a) of Table A)
Part 4 - Packing and tank provisions

• Chapter 4.1 (cont’d)
  – Special packing provisions for different classes
  – Special provisions for mixed packing
    • **MP x** (see column (9b) of Table A)
Part 4 - Packing and tank provisions

• Chapter 4.2: Use of portable tanks and UN multiple-element gas containers (MEGCs)
  – identical with Chapter 4.2 of the IMDG Code
  – multimodal tanks
  – portable tanks instructions T1 – T23 (see column (10) of Table A)
    • minimum test pressure
    • minimum shell thickness
    • pressure-relief requirements
    • bottom opening requirements
    • degree of filling
• Chapter 4.2 (cont’d)
  – hierarchy of tanks
  – portable tank special provisions TP x (see column (11) of Table A)
Chapter 4.3 Use of tank-wagons, demountable tanks, tank-containers and tank swap bodies with shells made of metallic materials, and battery-wagons and multiple-element gas containers (MEGCs)

Part of the text in two columns

- left-hand column: tank-wagons, demountable tanks, battery-wagons
- right-hand column: tank-containers
Chapter 4.3 (cont’d)
- Coding of tanks, battery-wagons and MEGCs (Class 2)

The four parts of the codes (tank codes) given in Column (12) of Table A in Chapter 3.2 have the following meanings:

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
<th>Tank Code</th>
</tr>
</thead>
</table>
| 1    | Types of tank, battery-wagons or MEGC | C = tank, battery-wagon or MEGC for compressed gases; 
|      |             | P = tank, battery-wagon or MEGC for liquefied gases or dissolved gases; 
|      |             | R = tank for refrigerated liquefied gases. |
| 2    | Calculation pressure | x = value of the minimum relevant test pressure according to the table in 4.3.3.2.5; or 
|      |             | 22 = minimum calculation pressure in bar. |
| 3    | Openings (see 6.8.2.2 and 6.8.3.2) | B = tank with bottom filling or discharge openings with 3 closures; or battery-wagon or MEGC with openings below the surface of the liquid or for compressed gases; 
|      |             | C = tank with top filling or discharge openings with 3 closures with only cleaning openings below the surface of the liquid; 
|      |             | D = tank with top filling or discharge openings with 3 closures; or battery-wagon or MEGC with no openings below the surface of the liquid. |
| 4    | Safety valves/devices | N = tank, battery-wagon or MEGC with safety valve according to 6.8.3.2.9 or 6.8.3.2.10 which is not hermetically closed; 
|      |             | H = hermetically closed tank, battery-wagon or MEGC (see 1.2.1); |
Part 4 - Packing and tank provisions

The four parts of the codes (tank codes) given in Column (12) of Table A in Chapter 3.2 have the following meanings:

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
<th>Tank code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Types of tank</td>
<td>L = tank for substances in the liquid state (liquids or solids handed over for carriage in the molten state); S = tank for substances in the solid state (powdery or granular).</td>
</tr>
<tr>
<td>2</td>
<td>Calculation pressure</td>
<td>G = minimum calculation pressure according to the general requirements of 6.8.2.1.14; 1.5; 2; 65; 4; 10; 15 or 21 = minimum calculation pressure in bar (see 6.8.2.1.14).</td>
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<tr>
<td>3</td>
<td>Openings (see 6.8.2.2.2)</td>
<td>A = tank with bottom-filling or bottom-discharge openings with 2 closures; B = tank with bottom-filling or bottom-discharge openings with 3 closures; C = tank with top-filling and discharge openings with only cleaning openings below the surface of the liquid; D = tank with top-filling and discharge openings with no openings below the surface of the liquid.</td>
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<td>4</td>
<td>Safety valves/devices</td>
<td>V = tank with a breather device, according to 6.8.2.2.6, but no device protecting against the propagation of a flame; or non-explosion pressure shock resistant tank; F = tank with a breather device, according to 6.8.2.2.6, fitted with a device protecting against the propagation of a flame; or explosion pressure shock resistant tank; N = tank without a breather device according to 6.8.2.2.6 and not hermetically closed; H = hermetically closed tank (see 1.2.1).</td>
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</tbody>
</table>

- Chapter 4.3 (cont’d) – Coding of tanks (classes 3 - 9)
Part 4 - Packing and tank provisions

- Chapter 4.3 (cont’d)
  - Tank codes indicated in column (12) of Table A
  - Hierarchy of tanks
    - Part 1: Types of tanks
      S → L
    - Part 2: Calculation pressure
      G → 1.5 → 2.65 → 4 → 10 → 15 → 21 bar
    - Part 3: Openings
      A → B → C → D
    - Part 4: Safety valves/devices
      V → F → N → H.
Part 4 - Packing and tank provisions

• Chapter 4.3 (cont’d)
  – Special provisions
    TU x (see column 13 of Table A)
Chapter 4.4 Use of tank-containers including tank swap bodies with shells made of fibre-reinforced plastics (FRP)

Chapter 4.5 Use of vacuum-operated waste tanks
Part 5 - Consignment procedures

- Chapter 5.1 General provisions
  - Use of overpacks
  - Empty uncleaned packagings (including IBCs and large packagings), tanks, wagons and containers for carriage in bulk
  - Mixed packing
Part 5 - Consignment procedures

- **Chapter 5.2 Marking and labelling**
  - UN number on packages
  - Proper shipping name on packages for classes 1 and 2
  - Class 7 mark
Chapter 5.2 (cont’d)
– Special marking provisions for environmentally hazardous substances
Chapter 5.2 (cont’d)
– Orientation arrows on certain packages
Part 5 - Consignment procedures

• Chapter 5.2 (cont‘d)
  – Labelling provisions
    • Labels indicated in column (5) of Table A
    • on one side (packagings)
    • on two opposite sides (IBC > 450 litres and large packagings)
    • on a background of contrasting colour or dotted or solid outer boundary line
    • dimension: 100 x 100 mm
Danger labels
Chapter 5.3 Placarding and marking

- on both (lateral) sides of wagons (= 2)
- on all lateral sides of containers (= 4)
- dimensions: 250 mm x 250 mm
Part 5 - Consignment procedures

- Chapter 5.3 (cont‘d)
  - Orange-coloured plate marking on
    - tank-wagons
    - battery-wagons
    - wagons with demountable tanks
    - tank-containers
    - portable tanks
    - MEGC
    - wagons or containers for carriage in bulk
Chapter 5.3 (cont’d)

- Orange-coloured plate marking
  - upper half: hazard identification number (see column (20) of Table A)
  - bottom half: UN number (see column (1) of Table A)
Part 5 - Consignment procedures

• Chapter 5.3 (cont’d)
  – Elevated temperature substance mark
Part 5 - Consignment procedures

• Chapter 5.3 (cont’d)
  – Shunting labels (see column (5) of Table A)
Part 5 - Consignment procedures

• **Chapter 5.4: Documentation**
  – UN number preceded by the letters "UN"
  – Proper shipping name
  – Label numbers indicated in column (5) of Table A
  – Packing group
  – Number and description of packages
  – Total quantity of each dangerous good
  – Name and address of consignor and consignee
  – Hazard identification number
Part 5 - Consignment procedures

• Chapter 5.4 (cont’d)
  – Special provisions
    for example
    • wastes
    • empty means of containment
  – Additional provisions for different classes
  – One or more languages but at least in English, French or German
### Part 5 - Consignment procedures

- **Chapter 5.4 (cont’d)**
- Instructions in writing for the locomotive driver

<table>
<thead>
<tr>
<th>Hazard characteristics</th>
<th>Additional guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explosive substances and articles</td>
<td>May have a range of properties and effects such as mass separation, projection of fragments, intense heat, formation of light, loud noise or smoke, sensitive to shocks or other impacts and/or near.</td>
</tr>
<tr>
<td>Flammable gases</td>
<td>Risk of fire.</td>
</tr>
<tr>
<td>Non-flammable, non-oxidising gases</td>
<td>Risk of asphyxiation.</td>
</tr>
<tr>
<td>Flammable liquids</td>
<td>Risk of fire.</td>
</tr>
<tr>
<td>Flammable solids, self-reactive substances and solid desensitised explosives</td>
<td>Risk of fire.</td>
</tr>
<tr>
<td>Substances liable to spontaneous combustion</td>
<td>Risk of fire by spontaneous combustion if packages are damaged or contents spilled.</td>
</tr>
<tr>
<td>Substances which, in contact with water, emit flammable gases</td>
<td>Risk of fire and explosion in contact with water.</td>
</tr>
</tbody>
</table>

**Additional guidance to show on the hazard characteristics of dangerous goods to users and on safe transit to prevailing circumstances**

- Take cover if day away from vehicle.
- Take cover if kept out of low areas.
- Take cover if day away from vehicle.
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

- Chapter 6.1: Requirements for the construction and testing of packagings
  - Kinds of packagings
    - drum, jerrican, box, bag, composite packaging, light gauge metal packaging
  - Types of material
    - steel, aluminium, other metal, natural wood, plywood, reconstituted wood, fibreboard, plastics material, textile, multiwall paper, glass, porcelain or stoneware
Chapter 6.1 (cont’d)
  – Marking of packagings
    • Example: un 4G/Y145/S/02
      NL/VL823
  – Requirements for packagings
  – Test requirements
    • drop test, leakproofness test, internal pressure test, stacking test
  – Test report
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

- Chapter 6.2: Requirements for the construction and testing of pressure receptacles, aerosol dispensers, small receptacles containing gas (gas cartridges) and fuel cell cartridges containing liquefied flammable gas
  - Requirements for UN pressure receptacles
  - Differing requirements for non-UN pressure receptacles
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

- Chapter 6.3 Requirements for the construction and testing of packagings for class 6.2 infectious substances of Category A
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

• Chapter 6.4 Requirements for the construction, testing and approval of packages for radioactive material and for the approval of such material
  – Requirements developed by IAEA for all modes of transport
Chapter 6.5 Requirements for the construction and testing of intermediate bulk containers (IBCs)

- Types of IBCs
  - rigid and flexible
- Types of material
  - steel, aluminium, other metal, natural wood, plywood, reconstituted wood, fibreboard, plastics material, textile, multiwall paper
- Marking of IBCs
  - Example: 4G/Y145/S/02 NL/VL823
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

• **Chapter 6.5 (cont’d)**
  – Requirements for different types of IBC
  – Test requirements
    • bottom lift test, top lift test, stacking test, leakproofness test, internal pressure test, drop test, tear test, topple test, righting test, vibration test
  – Test report
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

• **Chapter 6.6 Requirements for the construction and testing of large packagings**
  – Types of large packagings
    • rigid and flexible
  – Types of material
    • steel, aluminium, other metal, natural wood, plywood, reconstituted wood, fibreboard, plastics material, textile, multiwall paper
Chapter 6.6 (cont’d)

- Marking of large packagings
  - Example: 50A/X/0501/N/PQRS
    - Requirements for different types of large packagings
  - Test requirements
    - bottom lift test, top lift test, stacking test, drop test
  - Test report
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

- Chapter 6.7 Requirements for the design, construction, inspection and testing of portable tanks and UN multiple element gas containers (MEGCS)
  - identical with Chapter 6.7 of the IMDG Code
  - Requirements for portable tanks for classes 1 and 3 to 9
  - Requirements for portable tanks for non-refrigerated liquefied gases
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

• **Chapter 6.7 (cont’d)**
  • Requirements for portable tanks for refrigerated liquefied gases
  • Requirements for UN multiple-element gas containers for non-refrigerated liquefied gases
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

- Chapter 6.7 (cont’d)
  - Example of mark
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

- Chapter 6.8 Requirements for the construction, equipment, type approval, inspections and tests, and marking of tank-wagons, demountable tanks and tank-containers and tank swap bodies, with shells made of metallic materials, and battery-wagons and multiple element gas containers (MEGCs)
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

- **Chapter 6.8 (cont’d)**
  - Part of the text in two columns
    - left-hand column: tank-wagons, demountable tanks, battery-wagons
    - right-hand column: tank-containers
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

- **Chapter 6.8 (cont’d)**
  - Marking provisions
    - approval number, manufacturer, year of manufacture, test pressure, external design pressure, capacity of the shell, design temperature, material
    - vehicle keeper, tank code, codes of special provisions, date of the next inspection
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

- **Chapter 6.8 (cont’d)**
  - Special provisions (see column (13) of Table A)
    - **TC xx**: construction
    - **TE xx**: equipment
    - **TA xx**: type approval of the tank
    - **TT xx**: tests
    - **TM xx**: marking
Example for provisions on the construction of wagons – Device to protect against the overriding of buffers
Example for provisions on the construction of wagons – Protective shield
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

• Chapter 6.8 (cont’d)
  – Examples of special provisions **TE**
    • Crash buffers
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

• Chapter 6.9: Requirements for the design, construction, equipment, type approval, testing and marking of fibre-reinforced plastics (FRP) tank-containers including tank swap bodies
  – Reference to certain provisions of Chapter 6.8
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

• Chapter 6.10: Requirements for the construction, equipment, type approval, inspection and marking of vacuum-operated waste tanks
  – Complement or modification of Chapter 6.8 with regard to provisions concerning construction, equipment and inspection
Part 6 - Requirements for the construction and testing of packagings, intermediate bulk containers (IBCs), large packagings and tanks

• Chapter 6.11: Requirements for the design, construction, inspection and testing of bulk containers
  – applicable to all modes of transport
Part 7 - Provisions concerning the conditions of carriage, loading, unloading and handling

- **Chapter 7.1: General provisions**
- **Chapter 7.2: Provisions concerning carriage in packages**
  - Requirements concerning wagons to be used for certain packages
  - **W xx** (see column (16) of Table A)
• **Chapter 7.3: Provisions concerning carriage in bulk**
  – only possible if a BK code or VC code is indicated in Table A
  – divided in two parts
    • Use of BK containers (multimodal container for carriage in bulk)
      • Code **BK 1** or **BK 2** indicated in column (10) of Table A
      • Additional requirements for certain classes
Part 7 - Provisions concerning the conditions of carriage, loading, unloading and handling

- **Chapter 7.3 (cont’d)**
  - Use of wagons or containers
    - Code **VC 1, VC 2 or VC 3** indicated in column (17) of Table A
    - Additional provisions **AP x** for certain classes indicated also in column (17) of Table A
Part 7 - Provisions concerning the conditions of carriage, loading, unloading and handling

• **Chapter 7.4: Provisions concerning carriage in tanks**
  – only possible if a code is indicated in column (10) or (12) of Table A
Part 7 - Provisions concerning the conditions of carriage, loading, unloading and handling

- Chapter 7.5: Provisions concerning loading, unloading and handling
  - Mixed loading prohibition

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Part 7 - Provisions concerning the conditions of carriage, loading, unloading and handling

- Chapter 7.5: Provisions concerning loading, unloading and handling
  - Mixed loading prohibition for Class 1

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<tr>
<th>Compatibility Group</th>
<th>B</th>
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Part 7 - Provisions concerning the conditions of carriage, loading, unloading and handling

• Chapter 7.5: Provisions concerning loading, unloading and handling
  – Protective distance between wagons carrying certain substance of Class 1 (1, 1.5 or 1.6) and wagons carrying flammable substances (2.1, 3, 4.1, 4.2, 4.3, 5.1 or 5.2)
  – Precautions with respect to foodstuffs
Part 7 - Provisions concerning the conditions of carriage, loading, unloading and handling

- Chapter 7.5: Provisions concerning loading, unloading and handling
  - Handling and stowage
  - Cleaning after unloading
  - Additional provisions for certain goods
    - CW xx (see column (18) of Table A)
Chapter 7.6: Provisions for carriage as colis express (express parcels)
   – Carriage in passenger trains
   – only if a CE xx code is indicated in column (19) of Table A
   – CE codes contain quantity limits
Part 7 - Provisions concerning the conditions of carriage, loading, unloading and handling

• Chapter 7.7: Piggyback transport in mixed trains (combined passenger and freight transport)
  – Reference to the conditions fixed by the competent authority
Thank you very much for your attention!
Unified railway law to connect Europe, Asia and Africa

Organisation intergouvernementale pour les transports internationaux ferroviaires
Zwischenstaatliche Organisation für den internationalen Eisenbahnverkehr
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