

Hazardous Substances in the Bitumen Industry

Dangerous Goods

Dangerous Goods should be used to refer to substances/materials that are dangerous for the purposes of transport. Typically, in the case of bitumen this applies to Land Transport. It is similar to Hazardous Substances, but only applies to substances that carry immediate risk, ie highly flammable, highly toxic, highly corrosive etc.

The requirements are specified in the Ministry of Transport “Land Transport Rule, Dangerous Goods 2005, Rule 45001/1”. The current version is dated April 2021.

Bitumen gets a special mention:

- 3.2(4) Bitumen transported at a temperature exceeding its flash point or at an elevated temperature of 100 degrees Celsius or higher must be contained in a tankwagon or spray-wagon that:
- (a) complies with 3.1(1); and
 - (b) is designed and constructed in accordance with industry best practice.

Clause 3.1(1) requires packaging for dangerous goods to comply with:

- (a) it must be appropriate for the nature and quantity of the dangerous goods; and
- (b) if it comes into contact with the dangerous goods, it must not contaminate or react with the dangerous goods; and
- (c) it must be sufficiently robust to remain intact, and continue to contain the dangerous goods safely and without leaking, for normal conditions of loading, transport and unloading, allowing for reasonably foreseeable changes in temperature, humidity or pressure.

“Industry best practice” can presumably be interpreted to be CCNZ BPG01.

Straight bitumen is a Class 9 (Miscellaneous) Dangerous Good when it is a liquid carried at a temperature above 100°C.

Cutback bitumen is a Class 3 (Flammable Liquid) Dangerous Good when it is a liquid with a flash point above 60°C being transported at or above its flash point.

Placarding:

- 7.2(8) A bitumen tankwagon or spray-wagon:(a) that carries dangerous goods that are UN 3256, Hot Cutback Bitumen, Class 3 and UN 3257, Hot Bitumen, Class 9:
- (i) need only display placards and other information specified in 7.2(5)(a), (b), (c), and (e) for UN 3256, Hot Cutback Bitumen, Class 3; and
 - (ii) does not have to comply with 7.2(5)(d);
- (b) that carries bitumen emulsions:

- (i) may have placards and other information specified in 7.2(5)(a), (b), (c), and (e) removed or covered; and
 - (ii) if placards and other information is removed or covered in accordance with 7.2(8)(b)(i), must display a sign that states “BITUMEN EMULSIONS contain spillage” or similar words, and that complies with 7.1(3)(b) to (f);
- (c) does not have to be cleaned between loads of different bitumen products.

Bitumen Emulsion is mentioned also, but only in the above placarding requirements:

When the Hazardous Substances Act was introduced the bitumen industry did not understand that it applied to substances used in the industry beyond the requirements of the long-established world of Dangerous Goods.

So historically the bitumen industry believed it was compliant with transport requirements, until it became apparent that the Health and Safety at Work (Hazardous Substances) Regulations applied to Tank Wagons and Transportable Containers carrying a substance with any hazardous classification.

Hazardous Substances

New Zealand requires all locally manufactured or imported substances and mixtures to be assessed for hazardous properties in accordance with the Globally Harmonized System for Classification and Labelling of Chemicals, Revision 7 (the GHS 7).

The Health and Safety at Work (Hazardous Substances) Regulations – HSW(HS) apply to any substance with a hazardous classification.

Version as at 5 April 2025



Health and Safety at Work (Hazardous Substances) Regulations 2017

(LI 2017/131)

Part 16 applies to all Tank Wagons and Transportable Containers carrying a substance with any hazardous classification, there are no thresholds.

Part 17 applies to Stationary Container Systems, although there is a threshold of application. It does not apply to the storage of a 6.1E, 6.3A, 6.3B, or 6.4A substance, or a substance with any combination of those classifications, providing that it does not have any other hazard classification.

However, **ecotoxicity** is removed from the scope of this Regulation and WorkSafe, who are responsible for workplace safety, will follow the Regulation on that basis.

Regulation 4 defines a hazardous substance:

4 Meaning of hazardous substance

- (1) In these regulations, unless the context otherwise requires, **hazardous substance**—
 - (a) has the same meaning as in section 2(1) of the HSNO Act, as that meaning is modified by subclause (2);
- (2) The meaning of hazardous substance is modified for the purposes of these regulations by omitting paragraph (a)(vi) (ecotoxicity) of the definition of hazardous substance in section 2(1) of the HSNO Act.

The HSNO Act definition is:

hazardous substance means, unless expressly provided otherwise by regulations or an EPA notice, any substance—

- (a) with 1 or more of the following intrinsic properties:
 - (i) explosiveness:
 - (ii) flammability:
 - (iii) a capacity to oxidise:
 - (iv) corrosiveness:
 - (v) toxicity (including chronic toxicity):
 - (vi) ecotoxicity, with or without bioaccumulation

Risk Management

In addition to specific hazardous substances controls covered below, risk management principles are also applicable through:

- The Health and Safety at Work (Hazardous Substances) Regulations - HSW(HS) regulation 3.2 – which requires PCBU to manage risks to health and safety associated with hazardous substances
- Health and Safety at Work (General Risk and Workplace Management) – HSW(GRWM) – regulations – which include identification of any foreseeable hazards and application of hierarchy of controls in controlling those risks
- Key principles of the Health and Safety at Work Act

Ecotoxicity in the workplace is the responsibility of the **Environmental Protection Authority (EPA)**, and the requirements are included in the ***Hazardous Substances (Hazardous Property Controls) Notice 2017*** document.

Part 4 applies to Substances that are hazardous to the environment, and for a workplace this relates to labelling, safety data sheets, stationary container systems, separation distances, secondary containment, emergency response plans and signage. Tank wagons are not included.

Many of the provisions of this subpart refer to certain provisions of the Health and Safety at Work (Hazardous Substances) Regulations and apply them as if they applied to substances with environmental hazards.

- For labelling and safety data sheets the Health and Safety at Work (Hazardous Substances) Regulations are applied as if any reference to a “hazardous substance” includes substances that are hazardous to the environment.

- Part 17 (Stationary Container Systems) of the Health and Safety at Work (Hazardous Substances) Regulations is applied for substances that are hazardous to the environment where any reference in Part 17 is made to a hazardous substance where the class of the hazardous substance is not specified.

However, the following are omitted:

- (i) regulation 17.99 (Requirement to have secondary containment system for pooling substances – *but note below secondary containment is still required under other regulations*); and
- (ii) any reference in those regulations to WorkSafe’s ability to—
 - a) approve a matter:
 - b) grant an exemption from a requirement:
 - c) waive or vary a requirement:
 - d) determine a validity period:
 - e) reduce the required capacity of a secondary containment system:
 - f) increase the capacity of a stationary tank, or the aggregate capacity of a group of tanks within a secondary containment system:
- (iii) any references in those regulations to a compliance certificate.

Any reference in those regulations to a “relevant safe work instrument” is replaced with a reference to any safe work instrument that would be relevant to a substance with a hazard classification in the hazard grouping health hazards.

- Above ground stationary tanks containing substances that are hazardous to the aquatic environment, but without other specified hazardous classifications, shall be separated by a minimum of 1 metre.
- An above ground stationary tank containing a substance that is hazardous to the aquatic environment, but without other specified hazardous classifications, shall be separated from a protected place by not less than the distances:

Container capacity (litres)	Distance (metres)
Up to 3 000	3
3 001 to 50 000	5
Greater than 50 000	8

- Secondary containment systems for pooling substances is required above certain thresholds. The requirements essentially mirror the Health and Safety at Work (Hazardous Substances) Regulations for secondary containment of Class 6 and 8 pooling substances where any reference to a class 6 or 8 substance is replaced with a reference to a pooling substance that is in the hazard class hazardous to the aquatic environment.
- Emergency response plans are required for a substance that is hazardous to the aquatic environment as it is required in the Health and Safety at Work (Hazardous Substances) Regulations.
- Signage is required for a substance that is hazardous to the aquatic environment as it is required in the Health and Safety at Work (Hazardous Substances) Regulations.

Bituminous based Substances

Bituminous based Substances may be Dangerous Goods, Hazardous Substances, both Dangerous Goods and Hazardous Substances or neither Dangerous Goods nor Hazardous Substances.

The hazardous classifications and the Dangerous Goods status (as appropriate) will be specified on the Safety Data Sheet (SDS) for the substance.

Straight run, PMB and Cutback:

1. Straight run or PMB bitumen (above 100°C) is a Class 9 Dangerous Good (Class 9 Miscellaneous DG as liquid above 100°C), but not a Hazardous Substance.
2. Cutback bitumen or PMB (hot) with less than 3 pph of kerosene is generally a Class 3 Dangerous Good (Liquid with a flashpoint above 60°C carried at a temperature above the flashpoint), but not a Hazardous Substance.
3. Cutback bitumen or PMB (hot) with between 3 pph and 7.5 pph of kerosene is a Class 3 Dangerous Good (Liquid with a flashpoint above 60°C carried at a temperature above the flashpoint), but not a Hazardous Substance.
4. Cutback bitumen or PMB (hot) with between 7.5 pph and 11 pph of kerosene is a Class 3 Dangerous Good (Liquid with a flashpoint above 60°C carried at a temperature above the flashpoint), and a Hazardous Substance with 3.1D classification.
5. Cutback bitumen or PMB (hot) with between 11 pph and 25 pph of kerosene is a Class 3 Dangerous Good (Liquid with a flashpoint above 60°C carried at a temperature above the flashpoint), and a Hazardous Substance with 3.1D and 9.1C classifications.
6. The four cutback bitumen classifications above do not change when 0.7 pph of a certain adhesion agent is added, but other adhesion agents may result in hazardous classifications.
7. If greater than 0.1% of diesel is added, then it will, in addition, be a Hazardous Substance with a 6.7B classification.

Typical sealing cutback bitumen or PMB carried in tankers and sprayers will be classified non-hazardous providing:

- Essentially no diesel is added
- Kerosene content is below 7.5 pph
- Adhesion agent type is carefully selected.

Other Specialist Hot Bitumen Products may be classified with hazardous classifications of various classes, and will probably be Dangerous Goods.

Bitumen Emulsions:

1. "Conventional roading emulsions" (and polymer modified emulsions) are unlikely to be Dangerous Goods, and when classified by the GHS mixture rules will probably be non-hazardous or generate ecotoxic classifications. Laboratory testing may prove that an ecotoxic classification is not justified.
2. More niche emulsion products such as mixing grade or emulsified primers tend to have higher solvent contents and are therefore likely to generate some hazardous classifications. They may also be Dangerous Goods.

3. Hazardous classification is dependent on the classifications of the ingredients so careful selection of these is required if the mixture is to be non-hazardous, and this may impact on the product performance.

Implications of Hazardous Classifications on Bitumen Based Substances:

Should a product have no hazardous classifications, then it is non-hazardous and neither the Health and Safety at Work (Hazardous Substances) Regulations nor the EPA Hazardous Substances (Hazardous Property Controls) Notice are applicable.

Should a bitumen-based substance have class 9 ecotoxic classification (and no other hazardous classifications) then static storage will require compliance with the EPA Hazardous Substances (Hazardous Property Controls) Notice. There are no controls specified for tank wagons, sprayers or transportable tanks.

Should a bitumen-based substance have any hazardous classifications other than ecotoxic classifications (or both ecotoxic and any other hazardous classification) then:

- a) Static tank storage will require compliance with the Health and Safety at Work (Hazardous Substances) Regulations, and
- b) Tank wagons, sprayers and transportable tanks will require compliance with the Health and Safety at Work (Hazardous Substances) Regulations as modified by the Health and Safety at Work (Hazardous Substances—Additional and Modified Requirements for Tank Wagons) Safe Work Instrument 2023.

Health and Safety at Work (Hazardous Substances—Additional and Modified Requirements for Tank Wagons) Safe Work Instrument 2023

Bitumen industry tankers and sprayers cannot comply with the entirety of Part 16 of the Health and Safety at Work (Hazardous Substances) Regulations, eg the volume limitation of 10,000 litres (and other clauses).

Hence the “Health and Safety at Work (Hazardous Substances—Additional and Modified Requirements for Tank Wagons) Safe Work Instrument 2023” has been developed to modify some of the Part 16 clauses when carrying (transporting and transferring) a “hazardous bituminous substance” (the definition of which is: a substance with a flashpoint above 60°C used in roading that contains bitumen and is a hazardous substance under the Regulations).

The definition of a tank wagon refers to a primary purpose of bulk transport so bitumen sprayers (applicators) would be exempt from Part 16 of the Health and Safety at Work (Hazardous Substances) Regulations as their primary purpose is to apply a substance to a road surface, not to transport substances in bulk from one location to another.

However, the Health and Safety at Work (Hazardous Substances - Additional and Modified Requirements for Tank Wagons) Safe Work Instrument 2023 explicitly includes requirements for tank wagons designed and constructed to spray or apply Hazardous Bituminous Substances onto road surfaces.

Neither the Health and Safety at Work (Hazardous Substances) Regulations nor the Health and Safety at Work (Hazardous Substances—Additional and Modified Requirements for Tank Wagons) Safe Work Instrument 2023 apply to hazardous bituminous substances with only an ecotoxic classification.

To certify a tank wagon to carry a Hazardous Bituminous Substance will require demonstrating compliance with Part 16 of the Health and Safety at Work (Hazardous Substances) Regulations including where certain clauses are modified by the Health and Safety at Work (Hazardous Substances—Additional and Modified Requirements for Tank Wagons) Safe Work Instrument 2023.

The compliance certifier may issue a pre-commissioning certificate for an **existing** tank wagon if satisfied that each design component of the tank wagon specified in Schedule 24 as requiring a pre-commissioning compliance certificate has been constructed and installed in accordance with—

- (i) a design for which a design compliance certificate has been issued under regulation 16.31; or
- (ii) the standard applying to the tank wagon at the time of its construction