

hazardous facilities screening procedure appendix - glossary

For the purposes of this Guideline the following definitions apply:

ACCIDENT

A sudden event causing harm to people, property or the natural environment.

ACUTE TOXICITY

Adverse *effects* caused by a toxic agent occurring within a short time following exposure to that agent.

ADJUSTED THRESHOLD

The amount (mass in tonnes or m³, at 101.3 kilopascals and 20°Celsius, for compressed gases) of a substance that has been assessed as generating no significant *off-site effects* in a heavy industrial area after site- and substance-specific considerations have been taken into account.

ADJUSTMENT FACTOR

The product of the individual factors for each *Effects Group* (ie Fire/Explosion, Human Health and Environment) that increase or decrease the likelihood and consequences of the release of a hazardous or environmentally damaging substance.

BASE THRESHOLD

The amount (mass in tonnes or m³, at 101.3 kilopascals and 20°Celsius, for compressed gases) of a substance that has been assessed as generating no significant *off-site effects* in a heavy industrial area before site and substance-specific considerations have been taken into account.



BIOACCUMULATION

Accumulation of a substance within the tissues of living organisms.

BOD₅

The biochemical oxygen demand (measured over a five day period) which is the amount of dissolved oxygen in a body of water required for the breakdown of organic material in the water.

CARCINOGEN

A carcinogenic substance causes a statistically significant increase in the incidence of tumours.

CHRONIC TOXICITY

Adverse *effects* caused by a toxic agent which occur either after prolonged exposure or an extended period after initial exposure.

CLEANER PRODUCTION

The use of techniques to reduce the need for raw materials and energy and the amount of wastes generated. These techniques may include the use of recyclable materials, the use of less *hazardous substances*, and the use of renewable resources.

COD

Chemical oxygen demand is a measure of the oxygen equivalent of the organic matter content of a water sample that is able to be oxidised by a strong chemical oxidant.

EC₅₀

The effective toxicant concentration resulting in a 50% response of a given parameter (for example, reproduction rate, mobility) in a given period.

ECOTOXICITY

Adverse toxic *effects* on ecosystems or ecological communities, harmful to any living organism or ecosystem.

EFFECTS GROUPS

The *effects* generated when a hazardous or environmentally damaging substance is released:

- Fire/Explosion Effects Group - concerned with damage to property, the built environment and people;
- Human Health Effects Group - concerned with the well-being, health and safety of people;
- Environmental Effects Group - concerned with damage to ecosystems and natural resources.

EFFECTS RATIO

A dimensionless number representing the proposed quantity of a substance or group of substances to be used or stored, divided by the Adjusted Threshold.

EFFECTS RATIO TRIGGER LEVEL

The value of the *Effects Ratio* is used in the Consents Status Matrix to define whether a proposed development requires a land use resource consent. The *Effects Ratio* Trigger Level differs for different land uses to account for the difference in acceptable levels of risk.

EMERGENCY PLANS

A regularly updated document serving as an emergency response guide by identifying and cataloguing the elements required to respond to an emergency, and defining responsibilities and specific tasks in an emergency.

ENVIRONMENTALLY DAMAGING SUBSTANCE

Any substance which, by effects other than toxicity, is able to damage an aquatic ecosystem (for example, milk or oil).

ENVIRONMENTALLY PERSISTENT SUBSTANCE

A substance resistant to natural breakdown in the environment.

ENVIRONMENTALLY SENSITIVE AREAS

Areas that, in the judgement of the local community and/or regulatory authority, should not be subject to more than a specified low risk, or where additional safeguards are required when undertaking activities exceeding the specified low risk. Environmentally sensitive areas may include aquifers, waterways, wetlands, coastal environments, special ecosystems or species habitats.

HAZARD

Any intrinsic property of a substance which makes it capable of causing adverse *effects* on people, the *environment* or property.

HAZARDOUS ACTIVITY

Activities which do not use, store, transport or dispose of *hazardous substances* but which pose a risk to the *environment* or the community (for example, *earthworks*).

LD₅₀

A measure of acute toxicity. It stands for the lethal dose of a substance at which 50% of the test organisms die in a given period.

PESTICIDE

Any substance used for the prevention or control of any pest including herbicides, fungicides, defoliant and desiccants, but not including any fertiliser or animal remedies.

RISK

The likelihood of occurrence of an adverse *effect* from a substance combined with the magnitude of the consequences of that adverse *effect*.

SEPARATION DISTANCE

The distance from the edge of the area where *hazardous substances* are used, stored or otherwise handled to the edge of the area exposed to adverse *effects*.

SITE MANAGEMENT SYSTEM

The means of ensuring the ongoing **safety** of a hazardous facility through sound management. A site management system should include safety policy, provide a description of organisational structure and responsibilities, include operating, emergency and monitoring procedures, and carry out regular performance auditing.

SPILL CONTAINMENT SYSTEM

A structure which will contain liquids or solids in the event of a spill, and prevent them from entering the stormwater system or a natural **water body**.

STORAGE

The containment of a substance or mixture of substances, either above ground or underground, which is not being used for manufacturing or altered to another substance, but does not include substances used as a cooling or heating medium. Storage does include the filling and emptying of the container.

UNINTENTIONAL RELEASE

Unplanned or unwanted releases of *hazardous substances* that may or may not be detected immediately.

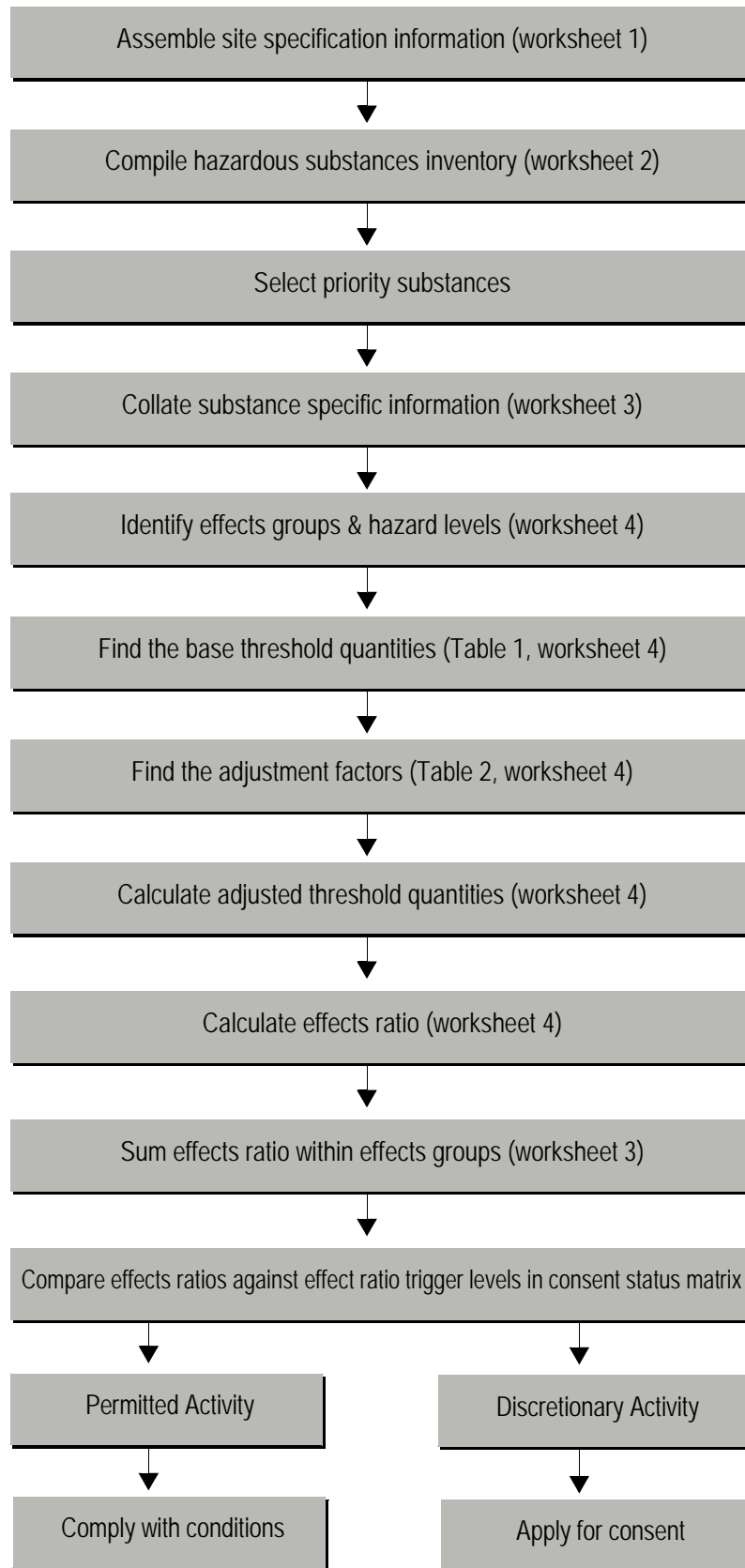
USE

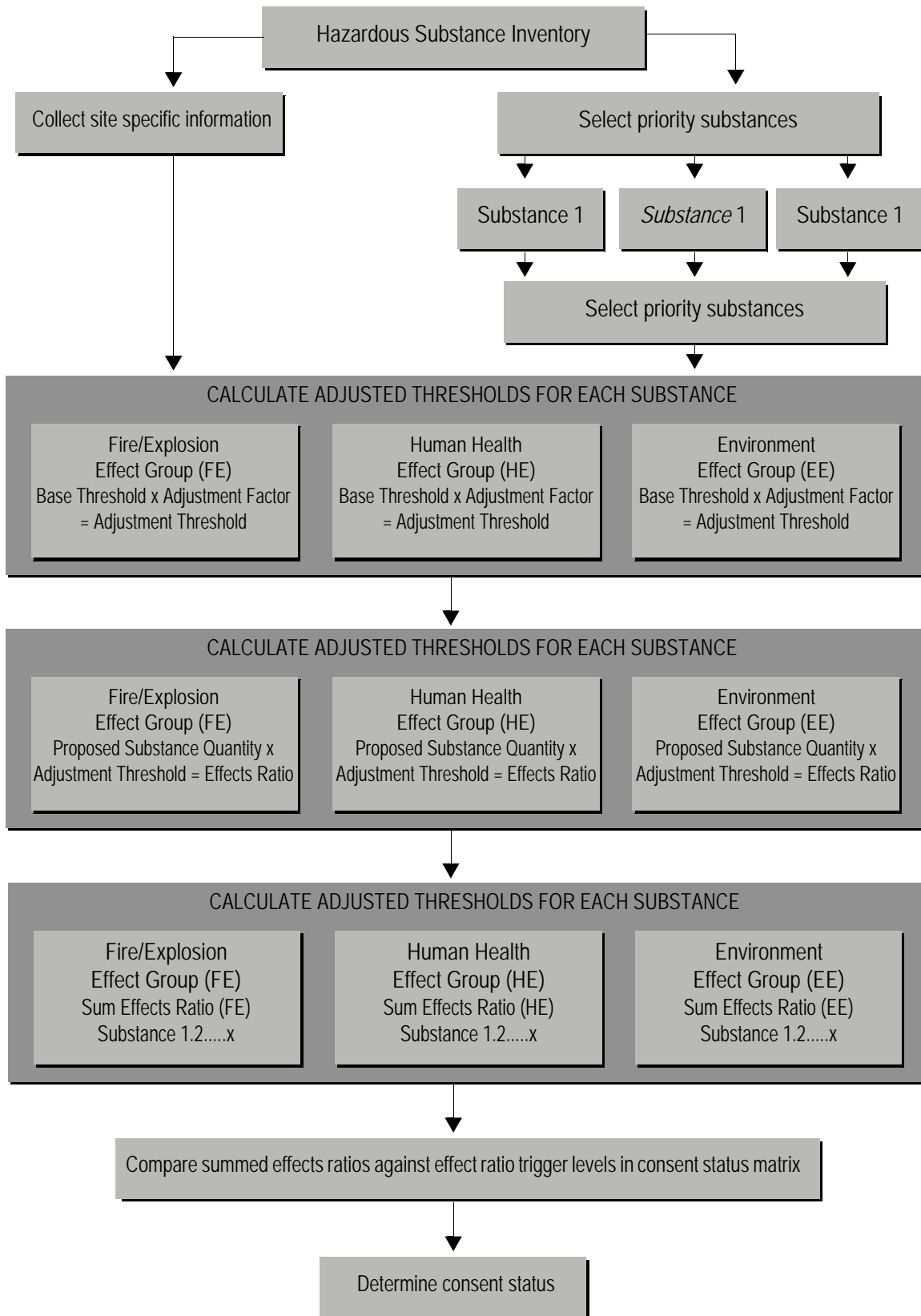
The manufacturing, processing or handling of a substance or mixture of substances for a particular activity without necessarily changing the physical state or chemical structure of the substance involved. This includes mixing, blending and packaging operations, but does not include the filling or drawing of substances from bulk storage tanks unless the processing is permanently connected to the bulk storage, and does not include loading out and dispensing of petroleum products.



STEP BY STEP GUIDE: HAZARDOUS FACILITY SCREENING PROCEDURE

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WORKSHEET 1: SITE INFORMATION SHEET

Facility name	
Address	
Map reference	
Description of activity	
Nature of adjoining land use	
Proximity to potable water resource ¹	
Within 20 metres of a waterbody ²	

Map of site (show adjoining land uses and location of waterbodies)

¹ Groundwater reservoir/aquifer as identified by the regional council.
² "Waterbody" includes streams, springs, lakes, wetlands, sea and estuaries, but does not include aquifers and entry points to the stormwater drainage network.

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WORKSHEET 3: HAZARDOUS SUBSTANCE WORKSHEET

1 SUBSTANCE DESCRIPTION						
Substance Name						
Proprietary Name and Supplier						
Substance Form [Gas, liquid, solid, powder]						
2 AVAILABLE INFORMATION						
[Extract from packaging material, MSDS, UN Recommendation for the Transport of Dangerous Goods (8 th edition)]						
UN Number						
UN Primary Class						
UN Subsidiary Class						
Packaging Group(s)						
3 ADDITIONAL INFORMATION REQUIREMENTS					DATA SOURCE	
[Extract from data sources listed in Appendix C and Material Safety Data Sheets]						
Physical Parameters	Initial boiling point (°C)					
	Flash point (°C)					
	Specific gravity @ 20°C					
	Molecular weight					
	Vapour pressure (mm Hg at 20°C)					
Toxicity Data ¹	Oral toxicity LD ₅₀ (mg/kg)					
	Dermal Toxicity LD ₅₀ (mg/kg)					
	Inhalation Toxicity LC ₅₀ (ppm)					
	Carcinogen ² [yes/no]					
Ecotoxicity Data ³	LC ₅₀ (Salmonid fish) (mg/l)					
	EC ₅₀ (Daphnia) (mg/l)					
	EC ₅₀ (Algae) (mg/l)					
	BOD ₅ (mg/kg)					
Pesticide [yes/no]						
Other						
4 ASSESSMENT						
[Extract from information in categories 2 and 3 above and Appendix A]						
Hazard	UN Class	Division/ Packaging Group	Does hazardous property apply? [yes/no]	Effects Groups and Hazard Level ⁴		
				Fire/Explosion	Human Health	Environmental
Explosive	1.1-1.3					
Flammable Gas	2.1					
Flammable Liquid	3					
Flammable Solid	4.1-4.3					
Oxidiser	5.1-5.2					
Toxic Gas	2.3					
Toxic Material	6.1					
Corrosive	8					
Ecotoxic						

- 1 List lowest level available for human or mammalian species, type of species, test duration and data source.
- 2 See Appendix B.
- 3 For LC₅₀ and EC₅₀ list lowest levels for indicated or other aquatic species, type of species and data source.
- 4 Use E for extreme hazard level, H for high, M for medium, L for low and OSL if hazard is outside specified levels.

**WORKSHEET 4:
SUMMARY SHEET
FOR MANUAL HFSP
CALCULATIONS**

SUBSTANCE	Step 4		HAZARD LEVEL	Step 6 BASE THRESHOLD B (t/m ³)	Step 7 ADJUSTMENT FACTORS				PRODUCT OF ADJUSTMENT FACTORS FF, FH, FE	Step 8 ADJUSTED THRESHOLD T (t/m ³)	PROPOSED QUANTITY Q (t/m ³)	Step 9 EFFECTS RATIO $R = \frac{Q}{T}$
	EFFECTS GROUP				F1	F2	F3	F4				
1	Fire/Explosion Human Health Environment											
2	Fire/Explosion Human Health Environment											
3	Fire/Explosion Human Health Environment											
4	Fire/Explosion Human Health Environment											
5	Fire/Explosion Human Health Environment											
6	Fire/Explosion Human Health Environment											
7	Fire/Explosion Human Health Environment											
8	Fire/Explosion Human Health Environment											
9	Fire/Explosion Human Health Environment											
10	Fire/Explosion Human Health Environment											



**WORKSHEET 5: TOTAL EFFECTS RATIOS:
MANUAL CALCULATION SHEET**

SUBSTANCE	Fire/Explosion Effects Ratio	Human Health Effects Ratio	Environmental Effects Ratio
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
Total Effects Ratios			

Note: Only fill out those sections applicable to the substance being assessed: for example, non-flammables need not be assessed in the *Fire/Explosion Effects Group*.

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APPENDIX D: HAZARDOUS SUBSTANCE PROFILES

Legend: E: Extreme
H: High
M: Medium
L: Low
OSL: Outside Specified Levels
* : Classified according to precautionary approach due to unavailability of relevant data.
- : Not applicable to this Effects Group

Substance Name	UN No.	Substance Form	Specific Gravity	Primary Classification	Packaging Group	Subsidiary Classification	Effects Groups and Hazard Levels	
							Fire/Explosion	Human Health Environment
acetaldehyde	1089	Liquid	0.780	UN 3	I	-	H	L
acetone	1090	Liquid	0.791	UN 3	II	-	H	OSL
acetone Cyanohydrin	1541	Liquid	0.925	UN 6.1	I	-	-	H*
acetonitrile	1648	Liquid	0.787	UN 3	II	UN 6.1	H	M
<i>synonym: Methyl Cyanide]</i>								H*
acetylene	1001	Gas	-	UN 2.1	-	-	H	-
acrolein	1092	Liquid	0.843	UN 3	I	UN 6.1	H	M
<i>synonym: Acrylic Aldehyde]</i>								E
aluminium Chloride (anhydrous)	1726	Solid	-	UN 8	II	-	-	M
ammonia (anhydrous, liquefied)	1005	Gas	-	UN 2.3	-	-	-	H
ammonium Hydroxide (>10%, ≤35% ammonia in solution)	2672	Liquid	0.880 - 0.957	UN 8	III	-	-	-
ammonium Nitrate (≤0.2% combustible material, see from other added matter)	1942	Solid	-	UN 5.1	III	-	H	-
argon	1006	Gas	-	UN 2.2	-	-	-	-
arsenic Trioxide	1561	Solid	-	UN 6.1	II	-	-	M
benzene	1114	Liquid	0.879	UN 3	II	UN 6.1	H	M
boric Acid	-	Solid	-	-	-	-	-	OSL
boron trichloride	1744	Liquid	3.120	UN 8	I	UN 6.1	-	M
butane	1011	Gas	-	UN 2.1	-	-	H	L

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Substance Name	UN No.	Substance Form	Specific Gravity	Primary Classification	Packaging Group	Subsidiary Classification	Effects Groups and Hazard Levels		
							Fire/Explosion	Human Health	Environment
Cadmium Chloride	2570	Solid	-	UN 6.1	I/II/III	-	-	H	E
Calcium Hypochlorite (> 39% available chlorine)	1748	Solid	-	UN 5.1	II	-	H	L	H
Carbofuran	2757	Solid	-	UN 6.1	-	-	-	H	H
Carbon Dioxide	1013	Gas	-	UN 2.2	-	-	-	OSL	-
Carbon Disulphide	1131	Liquid	1.260	UN 3	I	UN 6.1	H	OSL	L
Carbon Tetrachloride	1846	Liquid	1.597	UN 6.1	II	-	-	H	H*
Chlordane	2762	Liquid	1.600	UN 6.1	-	UN 3	M	H	E
Chlorine	1017	Gas	-	UN 2.3	-	UN 6.1	-	E	-
Chloroform	1888	Liquid	1.500	UN 6.1	II	-	-	H	H*
Cresol [Synonym: Cresylic Acid]	2022	Liquid	1.050	UN 6.1	II	UN 8	-	M	H
Cypermethrin	2783	Liquid	1.240	UN 6.1	-	-	-	H	E
Diazinon	2783	Liquid	1.116	UN 6.1	II	-	-	M	L
Dicamba	2769	Solid	-	UN 6.1	III	-	-	OSL	M
Dichlorobenzene (m, o)	1591	Liquid	1.307	UN 6.1	III	-	-	L	M
Dichlorvos	2783	Liquid	1.415	UN 6.1	II	-	-	M	H*
Diesel (Fuel, Flashpoint > 62°C)	1202	Liquid	0.850	UN 3	-	-	L	OSL	M
Diethylene Glycol	-	Liquid	1.118	-	-	-	-	OSL	OSL
Epichlorohydrin	2023	Liquid	1.180	UN 6.1	II	UN 3	M	H	H*
Ethane	1035	Gas	-	UN 2.1	-	UN 3	H	-	-
Ethanol [Synonym: Ethyl Alcohol]	1170	Liquid	0.790	UN 3	II	-	H	OSL	H*
Ethyl Acrylate	1917	Liquid	0.923	UN 3	II	UN 6.1	H	H	H*
Ethylene Glycol	1962	Gas	-	UN 2.1	-	-	H	-	-
Ethylene Glycol	-	Liquid	1.113	-	-	-	-	OSL	OSL
Ethyleneimine	1185	Liquid	0.832	UN 3	II	UN 6.1	H	H	H*
Fluorine	1045	Gas	-	UN 2.3	-	UN 5.1	H	E	-
Formaldehyde (37% - 50%)	1198	Liquid	1.100	UN 3	III	UN 6.1	M	H	L
Glyphosate	-	Liquid	1.170	-	-	-	-	OSL	M
Hexane	1208	Liquid	0.659	UN 3	II	-	H	OSL	H*
Hydrazine (anhydrous)	2029	Liquid	1.008	UN 3	I	UN 6.1	H	H	H
Hydrochloric Acid	1789	Liquid	1.190	UN 8	II	-	-	M	H

Substance Name	UN No.	Substance Form	Specific Gravity	Primary Classification	Packaging Group	Subsidiary Classification	Effects Groups and Hazard Levels	
							Fire/Explosion	Human Health Environment
Hydrogen	1049	Gas	-	UN 2.1	-	-	H	-
Hydrogen Chloride	1050	Gas	-	UN 2.3	-	UN 8	-	H
Hydrogen Cyanide [Synonym: Hydrocyanic Acid]	1051	Liquid	0.689	UN 6.1	I	UN 3	H	H*
Hydrogen Fluoride (anhydrous)	1790	Liquid	0.950	UN 8	I	UN 6.1	-	M
Hydrogen Peroxide (>60%)	2015	Liquid	1.290	UN 5.1	I	UN 8	H	M
Hydrogen Sulfide	1053	Gas	-	UN 2.1	-	UN 2.3	H	H
Iodine	1759	Solid	-	UN 8	I	-	-	M
Lauryl Mercaptan	1228	Liquid	0.850	UN 3	II	UN 6.1	H	L
LPG	1075	Gas	-	UN 2.1	-	-	H	-
Methanol [Synonym: Methyl Alcohol]	1230	Liquid	0.792	UN 3	II	UN 6.1	H	OSL
Methyl Bromide	1062	Liquid	1.680	UN 2.3	-	UN 6.1	-	H
Methyl Chloride	1063	Gas	-	UN 2.1	-	UN 2.3	H	H
Methyl Ethyl Ketone	1193	Liquid	0.806	UN 3	II	-	H	OSL
Methyl Isobutyl Ketone	1245	Liquid	0.802	UN 3	II	-	H	M
Methyl Isocyanate	2480	Liquid	0.960	UN 3	I	UN 6.1	H	M
Methyl Mercaptan	1064	Gas	-	UN 2.1	-	UN 6.1	H	M*
Methylene Chloride [Synonym: Dichloromethane]	1593	Liquid	1.326	UN 6.1	III	-	-	H
Milk	-	Liquid	1.032	-	-	-	-	-
Nitric Acid	2031	Liquid	1.490	UN 8	I	-	-	M
Nitroglycerine	0143	Liquid	1.599	UN 1.1	-	UN 6.1	E	L
Oxygen	1072	Gas	-	UN 2.2	-	UN 5.1	H	-
Pentachlorophenol	2020	Solid	-	UN 6.1	III	-	-	M
Petrol	1203	Liquid	0.703	UN 3	II	-	H	OSL
Phenol	1671	Solid	-	UN 6.1	II	-	-	M
Phosgene	1076	Gas	-	UN 2.3	-	8	-	H
Phosphoric Acid	1807	Solid	-	UN 8	II	-	-	M
Phosphorus (white, yellow)	1381	Solid	-	UN 4.2	-	UN 6.1	E	H
Potassium Hydroxide [Synonym: Caustic Potash]	1813	Solid	-	UN 8	II	-	-	M
Potassium Permanganate	1490	Solid	-	UN 5.1	II	-	H	L

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Substance Name	UN No.	Substance Form	Specific Gravity	Primary Classification	Packaging Group	Subsidiary Classification	Effects Groups and Hazard Levels	
							Fire/Explosion	Human Health
Hydrogen Peroxide	1280	Liquid	0.830	UN 3	I	UN 6.1	H	H*
Hydrogen Sulfide	1823	Solid	-	UN 8	II	-	-	M
Hydrogen Selenide	2630	Solid	-	UN 6.1	I	-	-	H
Hydrogen Monomer	2055	Liquid	0.910	UN 3	III	-	M	OSL
Hydrogen Dioxide	1079	Gas	-	UN 2.3	-	-	-	H
Sulfuric Acid (≥ 33%)	1830	Liquid	1.840	UN 8	II	-	-	M
1,1-Dichloroethane	1702	Liquid	1.590	UN 6.1	II	-	-	M
1,2-Dichloroethane	1294	Liquid	0.867	UN 3	II	-	H	OSL
1,1,1-Trichloroethane	2078	Liquid	1.220	UN 6.1	II	-	-	H
1,1,2-Trichloroethane	-	Liquid	1.442	UN 6.1	III	-	-	L
1,1-Dibromoethane	1710	Liquid	1.460	UN 6.1	III	-	-	L
1,1-Dichloroethane	1299	Liquid	0.860	UN 3	III	-	M	OSL
1,1-Dichloroethane (m.o.p)	1307	Liquid	0.870	UN 3	II, III	-	M	OSL
Ammonium Chloride (powder or dust)	1436	Powder	-	UN 4.3	II	UN 4.2	E	-
Ammonium Chloride	-	Solid	-	-	-	-	-	OSL

APPENDIX F: CONVERSION OF MEASUREMENT UNITS

1 Conversion of temperature

To convert degrees Fahrenheit to degrees Celsius, use the following formula:

$$^{\circ}\text{C} = \frac{5}{9} \times (\text{F} - 32)$$

2 Conversion of measurements for solids

$$1 \text{ ppm} = 1 \text{ mg/kg}$$

3 Conversion of measurements for liquids

$$1 \text{ ppm} = 1 \text{ mg/l}$$

$$1 \text{ ppb} = 1 \mu\text{g/l}$$

$$1 \text{ ppm} = 1 \text{ g/m}^3$$

$$1 \text{ ppb} = 1 \text{ mg/m}^3$$

4 Conversion of measurements for gases and vapours

$$\text{mg/m}^3 = \text{ppm} \times \frac{\text{molecular weight}}{24.04}$$

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