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Identification of major hazard installations for hazardous chemicals

危险化学品重大危险源辨识

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Identification of major hazard installations for hazardous chemicals

1 Scope

This Standard specifies the basis and method for identifying major hazard installations for hazardous chemicals.

This Standard applies to production and business organizations which produce, store, use, and operate hazardous chemicals.

This Standard does not apply to:

a) Nuclear facilities, factories which process radioactive substances, except for the sectors which process non-radioactive substances in these facilities and factories;

b) Military installations;

c) Mining industry, except for processing technology and storage activities involving hazardous chemicals;

d) Off-plant transportation of hazardous chemicals (including railways, roads, waterways, aviation, pipelines, and other modes of transportation);

e) Offshore oil and natural gas exploration activities.

2 Normative references

The following documents are indispensable for the application of this document. For the dated references, only the editions with the dates indicated are applicable to this document. For the undated references, the latest edition (including all the amendments) are applicable to this document.

GB 30000.2 Rules for classification and labelling of chemicals - Part 2: Explosives

GB 30000.3 Rules for classification and labelling of chemicals - Part 3: Flammable gases

GB 30000.4 Rules for classification and labelling of chemicals - Part 4: Aerosols

3.2 Unit

Production and storage devices, facilities, or sites involving hazardous chemicals, which are divided into production unit and storage unit.

3.3 Threshold quantity

The minimum quantity specified for a hazardous chemical or class of hazardous chemicals to constitute a major hazard installation.

3.4 Major hazard installations for hazardous chemicals

Unit which produces, stores, uses, and operates hazardous chemicals on a permanent or temporary basis, and of which the quantity of hazardous chemicals equals or exceeds the threshold quantity.

3.5 Production unit

Devices and facilities for the production, processing, and use, etc. of hazardous chemicals. When there is a shut-off valve between the device and the facility, USE the shut-off valve as separation boundary to divide into independent units.

3.6 Storage unit

A relatively separate area of storage tanks or warehouses used to store hazardous chemicals. The area of storage tanks, using the fire dike of the tank area as the boundary, is divided into independent units. The warehouse, using independent storehouse (independent building) as the boundary, is divided into independent units.

3.7 Mixture

A mixture or solution which consists of two or more substances.

4 Identification of major hazard installations for hazardous chemicals

4.1 Identification basis

4.1.1 Hazardous chemicals shall, based on their hazard characteristics and their quantities, be identified for major hazard installations. SEE Table 1 and Table 2 for details. The pure substances and mixtures of hazardous chemicals shall be classified in accordance with the provisions of GB 30000.2, GB 30000.3, GB 30000.4, GB 30000.5, GB 30000.7, GB 30000.8, GB 30000.9, GB 30000.10, GB 30000.11, GB 30000.12, GB 30000.13, GB 30000.14, GB 30000.15, GB

Table 1 (continued)

No.	Hazardous chemical name and description	Alias	CAS number	Threshold quantity/t
18	Acetone cyanohydrin	Acetone cyanohydrin; 2-hydroxyisobutyronitrile; cyanopropanol	75-86-5	20
19	Acraldehyde	Allyl aldehyde; acrolein	107-02-8	20
20	Hydrogen fluoride		7664-39-3	1
21	1-chloro-2,3-epoxypropane	Epichlorohydrin (3-chloro-1,2-epoxypropane)	106-89-8	20
22	3-bromo-1,2-epoxypropane	Epoxy bromopropane; Bromomethyl oxirane; epibromohydrin	3132-64-7	20
23	Toluene diisocyanate	Toluene diisocyanate; TDI	26471-62-5	100
24	Sulfur monochloride	Sulfur chloride	10025-67-9	1
25	Hydrogen cyanide	Anhydrous hydrocyanic acid	74-90-8	1
26	Sulphur trioxide	Sulfuric anhydride	7446-11-9	75
27	3-aminopropene	Allyl amine	107-11-9	20
28	Bromine	Bro	7726-95-6	20
29	Ethyleneimine	Ethylene imine; 1-azacyclopropane; aziridine	151-56-4	20
30	Methyl carbimide	Methyl isocyanate	624-83-9	0.75
31	Barium azide	Bariumazid	18810-58-7	0.5
32	Lead azide		13424-46-9	0.5
33	Fulminating mercury	Mercury sulphate, Mercury acid	628-86-4	0.5
34	Trinitroanisole	Trinitro-methoxybenzene	28653-16-9	5
35	2,4,6-trinitrotoluene	Trinitrotoluene; TNT	118-96-7	5
36	Nitroglycerin	Nitrating glycerol; glycerin trinitrate	55-63-0	1
37	Nitrocellulose [dry or containing water (or ethanol) <25%]	Nitro-cotton	9004-70-0	1
38	Nitrocellulose (unmodified, or plasticized, containing plasticizer <18%)			1
39	Nitrocellulose (containing ethanol ≥25%)			10
40	Nitrocellulose (containing nitrogen ≤12.6%)			50
41	Nitrocellulose (containing water ≥25%)			50

Table 1 (continued)

No.	Hazardous chemical name and description	Alias	CAS number	Threshold quantity/t
64	Toluene	Methylbenzene; phenylmethane	108-88-3	500
65	Methanol	Wood alcohol; wood spirit	67-56-1	500
66	Gasoline (ethanol gasoline, methanol gasoline)		86290-81-5 (gasoline)	200
67	Ethanol	Alcohol	64-17-5	500
68	Ether	Diethyl ether	60-29-7	10
69	Ethyl acetate	Acetic ether	141-78-6	500
70	N-hexane	Hexane	110-54-3	500
71	Peracetic acid	Acetic peracid; peroxyacetic acid; acetyl hydrogen peroxide	79-21-0	10
72	Methyl ethyl ketone peroxide (10%<effective oxygen content≤10.7%, containing A type diluent ≥48%)		1338-23-4	10
73	White phosphorus	Yellow phosphorus	12185-10-3	50
74	Alkyl aluminum	Trialkylaluminium		1
75	Pentaborane	Pentaborane	19624-22-7	1
76	Potassium peroxide		17014-71-0	20
77	Sodium peroxide	Sodium dioxide; Sodium dioxide	1313-60-6	20
78	Potassium chlorate		3811-04-9	100
79	Sodium chlorate		7775-09-9	100
80	Fuming nitric acid		52583-42-3	20
81	Nitric acid (except for red fuming nitric acid, containing nitric acid >70%)		7697-37-2	100
82	Guanidine nitrate	Guanidine mononitrate	506-93-4	50
83	Calcium carbide	Acetylenogen	75-20-7	100
84	Potassium	Potassium metal	7440-09-7	1
85	Sodium	Sodium metal	7440-23-5	10

(t);

Q_1, Q_2, …, Q_n - The threshold quantity corresponding to each hazardous chemical, in tons (t).

4.2.2 The actual quantity of hazardous chemicals present in hazardous chemical storage tanks and other containers, equipment, or warehouse areas is determined according to the design maximum.

4.2.3 For mixtures of hazardous chemicals, if the mixture is of the same hazard category as its pure substance, the mixture is considered as a pure substance and is calculated as a whole. If the mixture is not of the same hazard category as its pure substance, then according to the new hazard category, its threshold quantity shall be considered.

4.2.4 SEE Appendix A for the identification procedures for major hazard installations for hazardous chemicals.

4.3 Grading of major hazard installations

4.3.1 Grading index of major hazard installations

USE the ratio OF the actual quantity of each hazardous chemical in the unit TO its corresponding threshold quantity. The sum R of the ratios corrected by the correction coefficient is used as the grading index.

4.3.2 Calculation method for grading index of major hazard installations

Grading index of major hazard installations is calculated according to formula (2).

$$R = \alpha\left(\beta_1 \frac{q_1}{Q_1} + \beta_2 \frac{q_2}{Q_2} + \cdots + \beta_n \frac{q_n}{Q_n}\right) \qquad \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (2)$$

Where:

R - Grading index of major hazard installations;

α - Correction coefficient for exposed people outside the plant of the major hazard installations for hazardous chemicals;

β_1, β_2, …, β_n - Correction coefficient corresponding to each hazardous chemical;

q_1, q_2, …, q_n - The actual quantity of each hazardous chemical present, in tons (t);

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