

SOCIALIST REPUBLIC OF VIETNAM

**QCVN: 2020 / BCT**

**NATIONAL TECHNICAL REGULATIONS**

**ON SAFETY IN PRODUCTION, PRESERVATION, TRANSPORTATION AND USE  
HAZARDOUS CHEMICALS - GENERAL PROVISIONS**

*National technical regulation on safety in the process of producing, storage,  
transportation and use of hazardous chemicals - General regulation*

**Preface**

QCVN .....: 2020 / BCT is constructed by the Drafting Team, approved by the Chemical Department; Evaluation of the Ministry of Science and Technology; The Ministry of Industry and Trade issued together Circular No: ..... / 2020 / TT-BCT, date ..... month ..... year 2020.

**NATIONAL TECHNICAL REGULATION ON SAFETY IN PRODUCTION, STORAGE,  
TRANSPORTATION AND USE OF DANGEROUS CHEMICALS - GENERAL**

*National technical regulation on safety in the process of producing, storage,  
transportation and use of hazardous chemicals –General regulation*

**Chapter I****GENERAL RULES****Article 1. Scope**

This Regulation specifies general requirements on safety in production and maintenance handling, transporting and using dangerous chemicals.

## Article 2. Subjects of application

This regulation applies to organizations and individuals with related activities production, storage, transportation and use of dangerous chemicals on the territory Vietnamese territory and other relevant organizations and individuals.

## Article 3. Normative references

The documents referenced in this Regulation are applicable to the version mentioned in down here. Where the cited documents have been modified, supplemented or replaced, applied use the latest version.

QCVN 03: 2019 / BYT- National technical regulation - Value of exposure limit  
Allows for 50 chemical elements at work.

TCVN 2622: 1995 - Fire prevention and fighting for buildings and structures - Requirements  
Design (Valid)

QCVN 06: 2020 / BXD - National Technical Regulation on Fire Safety for the House  
and works.

TCVN 4604: 2012 - Industrial works - Manufacturer - Standard set  
next;

TCVN 5687: 2010 - Ventilation - Air conditioning - Design standards;

TCVN 7114 - 1: 2008 - Ecgonome - Lighting of the workplace

QCVN 22: 2016 / BYT - National technical regulation on lighting - Level for  
lighting workplaces

TCVN 2290: 1978 - Production equipment - General requirements for safety;

TCVN 6406: 1998 - Use of packaging in production - General requirements for safety;  
(removed - expired, but replaced)

TCVN 3255: 1986 - Explosion safety - General requirements;

TCVN 5945: 2005 - Industrial wastewater - Waste standard;

Karma QCVN 40: 2011 / BTNMT - National technical regulation on public wastewater

TCVN 5939: 2005 - Air quality - Industrial emission standard for dust and inorganic substances;

QCVN 19: 2009 / BTNMT - National technical regulation on public emissions for dust and inorganic substances

TCVN 5940: 2005 - Air quality - Industrial emission standard for some organic substances;

QCVN 20: 2009 / BTNMT - National technical regulation on public emissions for some organic matter

TCVN 4512: 1988 - Rules for the transportation of dangerous goods by sea;

TCVN 3147: 1990 - Safety rules in handling work - General requirements; (removed - expired, no alternative documents)

TCVN 6304: 1997 - Bottles containing liquefied gas - Safety requirements in storage management, loading and unloading and transportation;

#### Article 4. Interpretation of terms and abbreviations

1. In this Regulation, the terms and abbreviations below are construed as follows:

Chemicals are explained in Clause 1 Article 4 of the Law on Chemicals No. 06/2007 / QH12

3. Substances are explained in Clause 2 Article 4 of the Law on Chemicals No. 06/2007 / QH12

4. The mixture of substances is explained in Clause 3, Article 4 of the Law on Chemicals No. 06/2007 / QH12

5. GHS is the abbreviation of the Harmonized Global System of Classification and Labeling Globally Harmonized System of Classification and Labelling of Chemicals).

6. The GHS warning graphic is a picture that provides information about the hazard (s) Potential harms Physical, Health and Environment according to the chemical's GHS and coded Chemical is GHS01; GHS02; GHS03; GHS04; GHS05; GHS06; GHS07; GHS08; GHS09.

7. Hazardous chemicals are chemicals that comply with the classification and labeling criteria for at least one of the GHS warning images.

8. Toxic chemical means a chemical conforming to the classification and labeling criteria for At least one of the warning images. GHS06; GHS07; GHS08; GHS09.

9. Flammable and explosive chemicals are chemicals that comply with the labeling criteria for one in the GHS01 warning images; GHS02; GHS03; GHS04.

10. Corrosive chemicals are chemicals that comply with the labeling criteria for the figure warning GHS05.

11. Chemical production is the activity of creating chemicals through chemical reactions physical, chemical or chemical processes such as extraction, concentration, dilution, mixing...

12. MSDS stands for Material Safe Data Sheet)

#### Article 5. General requirements

1. General requirements for hazardous chemical production workshops and warehouses

a) Factories, warehouses for hazardous chemicals, when designing for construction new or renovated must comply with the provisions of TCVN 4604: 2012 and standards and regulations national technical standards, suitable to the nature, scale and technology of production and storage chemical storage. Flammable and explosive chemicals factories when being designed for new construction or renovating must comply with the provisions of TCVN 2622: 1995;

b) Ventilation system:

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Hazardous chemicals warehouses must meet national technical regulations air speed, microclimate factor - value for microclimate at the place work through natural or forced ventilation measures to ensure said:

- Dispersion or removal of chemical vapors generated (if any) in the process preservation and storage.
- In flammable chemical storage, ventilation must be ensured air to maintain chemical vapor concentrations less than 10% of the gender value lower explosive limit (LEL).
- All areas in chemical storage are well ventilated.

c) The lighting system complies with QCVN 22: 2016 / BYT. Electrical equipment in workshops and warehouses containing flammable and explosive chemicals must meet the requirements standards on fire and explosion prevention and fighting;

d) The floor of workshops and chemical stores must withstand chemicals, loads, Non-slip, with good drainage and collection groove;

g) Workshops and warehouses must have lightning protection or internal systems the area is protected from lightning and is periodically inspected according to existing regulations onions.

e. Exits, exits, and pedestrian walkways are not obstructed goods.

f. In areas where vehicles are open to store or level hazardous chemicals, emergency eye wash or eye wash and shower combination kit must be installed level. Distance from operating area exposed to hazardous chemicals to the device eye wash, emergency shower within a radius of 10 meters, but no closer than 2 meters. The quantity, area and type of equipment are decided based on the evaluation results risks to related work.

i. Use appropriate fire and explosion prevention equipment in storage areas Hazardous chemicals contain combustible dust or flammable vapors or gases. Tools for opening vehicles containing flammable and explosive chemicals must be made of materials No spark due to friction or impact.

2. The investment, construction, repair and renovation of hazardous chemical production establishments; Dangerous chemical storage warehouses must comply with the law provisions investment in construction, environmental protection, safety and fire prevention.

3. Equipment at hazardous chemical facilities

a) Machinery and equipment working in areas with flammable chemicals and explosives must be secure safety against fire and explosion. When designing, manufacturing and operating it must be appropriate requirements of TCVN 3255: 1986;

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b) Tools working in areas with inflammable and explosive chemicals must be made of material does not emit sparks due to friction or impact;

c) Personal protective equipment (PPE): the number and type of PPE appropriate dangerous chemicals are stored as well as a plan to respond to incidents approved substance. Perform periodic inspection to ensure equipment always complete and in good condition, ready to use.

d) Chemical spill response equipment: absorption and collection materials must be complete and ready to use when responding to a chemical spill response the largest volume of the container is being stored. The equipment Basic may include:

- Absorbent materials: dry sand, soil, ...

- Neutralizing solution in case of storage of dangerous chemicals corrosive chemicals:

- Acidic chemical spill neutralizing solution or pesticide:

Calcium hydroxyt ( $\text{Ca}(\text{OH})_2$ ); Sodium carbonate ( $\text{Na}_2\text{CO}_3$ ); Calcium carbonate ( $\text{CaCO}_3$ ).

- Spill alkaline chemical neutralizing solution: Sodium bisulfate ( $\text{Na}_2\text{SO}_4$ ).

- Shovel (for flammable chemicals: made of material that does not emit spark friction or impact)

- Brush.

- Vehicles containing spills chemicals and tools and materials contaminated with chemicals

4. Working, exposed to dangerous chemicals

a) Hazardous chemical facilities must make a list of chemical groups: Chemicals poison; Flammable and explosive chemicals; Corrosive chemicals;

b) Hazardous chemical facilities must be equipped with measures to reduce pollution or provide equipment for workers to ensure limited exposure value allowed at work as specified in QCVN 03: 2019 / BYT;

c) Hazardous chemical facilities must fully comply with legal regulations environmental Protection. Wastewater and exhaust gas must be treated according to the regulations: QCVN 40: 2011 / BTNMT, QCVN 19: 2009 / BTNMT, QCVN 20: 2009 / BTNMT;

d) There are chemical accident prevention and response measures or a prevention plan prevent and respond to chemical incidents according to the provisions of Chapter VI of the Chemical Law;

## chapter II

### TECHNICAL REGULATION

#### SECTION 1. PRODUCTION OF DANGEROUS CHEMICALS

#### **Article 6.- Regulations on construction site and workshop design:**

1. Locations selected for construction of hazardous chemical factories must be located in the planned industrial park, in case the construction site is not located In industrial zones, the investment policy of the Regulatory Authority is required competent state management.

2. Investment projects involving hazardous chemical production must have an approx safe way for residential spots, public works, historical, cultural, and historical sites landscapes, natural reserves, national parks, biosphere reserves, and protected areas to conserve habitat species, marine conservation zones and domestic water sources right in the research report is possible after the effective safety distance specification.

3. Chemical production workshops must be designed in accordance with Article 4 of the Decree 113/2017 / ND-CP requirements for workshops and warehouses in production and business Related substances and other requirements /

**Article 7. Regulations on classification and labeling of chemicals**

1. Chemical production establishments must classify and label chemicals according to Article 6 Circular No. 32/2017 / TT-BCT, the content of instructions on classifying and labeling chemicals at the sub Appendix 8 of Circular No. 32/2017 / TT-BCT.

2. Chemical production establishments must prepare chemical safety sheets according to Article 7 of the Circular Circular No. 32/2017 / TT-BCT. Contents of the chemical safety slip are specified in Appendix 9 of Circular 32/2017 / TT-BCT

**Article 8. Regulations on the release packages of dangerous chemicals**

1. Hazardous chemicals must be packed in convenient packages and containers. safe during storage and transportation. The packaging must be tight, firm, and degree durable to the effects of chemicals, weather and common impacts during handling transport.

2. Chemical containers must have labels with all the prescribed contents on chemical labeling. Chemical labels must be clear, easy to read and durable effects of chemicals, weather and common impacts when loading and unloading.

**Article 9. Professional requirements in chemical production**

1. Organizations and individuals producing chemicals must have people specialized in safety substances with professional qualifications appropriate to the scale and type of chemical production technology, plans and measures to ensure chemical safety.

2. Laborers directly engaged in chemical production must have appropriate qualifications with assigned duties and training in chemical safety.

3. A person directly administering production of a hazardous chemical manufacturer must have University degree or higher in chemistry.

**Article 10. Provisions on toxic chemical production conditions**

1. Toxic chemical production establishments must control chemical distribution

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a) The sale of toxic chemicals must be accompanied by a control slip, certified by the purchaser and the seller as a basis for controlling toxic chemicals circulating in the market.

b) The toxic chemical sale control sheet contains information on the chemical name and quantity chemicals, use purposes; name and signature of buyer and seller; Address, Paper number identity card of buyer and seller representatives; delivery date.

c) Toxic chemicals sale control slips must be kept at the sellers and buyers only maximum 05 years and must present when requested by the competent authority.

**SECTION 2. STORAGE OF DANGEROUS CHEMICALS**

**Article 11. General provisions on storage of dangerous chemicals**

1. Chemical storage must have a system of collection banks and ditches to ensure no chemicals Escape into the environment when a spill occurs:

a) For liquid contained in the vehicle containing less than 10,000 liters, the storage capacity The collection system shall be greater than or equal to 125% of the largest container volume.

b) For liquid contained in the vehicle containing more than 10,000 liters, the storage capacity of The collection system must be 110% or more of the largest container volume.

c) Collection banks / trenches must be made of material that does not react when exposed to chemicals spillage.

d) Having a plan to collect chemicals and fire fighting water in the event of an incident Explosion.

2. Forklifts used in flammable and explosive chemicals storage areas must be secure appropriate fire and explosion prevention requirements. Do not carry out repair operations, Refueling, charging inside the area.

3. Chemical stacking on chemical storage shelves must ensure safe design load and the allowable load of the floor.

4. Stacking of chemical means of transport must ensure load capacity pallets, containers supplied by the manufacturer. Do not stack more than 2 floors for vehicles with a capacity of more than 1,000 liters.

5. Hazardous chemicals must be packed in sufficiently stable containers in order to withstand the impacts and impacts of the weather during transportation, Forward goods between vehicles and loading and unloading into the warehouse manually or motorized equipment. The charging level is in accordance with regulations for each dangerous chemical.

a) The container must be structurally tight enough so that the cargo will not be lost during storage, preparation for transportation or during transport with effects such as vibration, increase in temperature, humidity and pressure.

b) The vehicle's parts in contact with dangerous chemicals must ensure:

- Not affected or deteriorated in quality due to the impact of chemicals packed inside.
- Do not react or catalyze reactions with packaged chemicals.

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- It is allowed to use a suitable inert liner as a protective liner, to isolate packages from type chemicals are packed inside.

6. Develop a process of safety for chemical storage operations:

- a) The process of safely loading and unloading dangerous chemicals.
- b) Arrange goods according to the prescribed area and storage plan.
- c) Periodically inspect the appearance of the media in order to proactively detect and handle leakage problem.
- d) Chemicals are arranged, fixed appropriately, not risk of falling or flowing spill out of storage area. Distance from chemical storage vehicle to the wall Minimum warehouse 500 mm.

7. Chemical storage safety information:

a) There must have regulations on chemical safety and hazard signs in accordance with chemical hazard level, hanging in conspicuous place. Signs represent features Chemical hazard must contain the following information: Chemical identification code; warning graphics, warning word, warning of risk. In the case of chemicals with many other dangerous properties Each other, the warning images must fully show such dangerous characteristics.

b) Emergency response procedures, chemical safety list and sheet must be in a visible and accessible place. The chemical list must contain information about the real name products, categories, warning images according to GHS, maximum amount of storage at a time, storage area.

c) There is a map of the chemical storage area, including the area where fire protection equipment is arranged chemical incident response equipment and personnel.

8. Area isolation and chemical isolation with incompatible properties:

a) Hazardous chemical warehouses must be planned on areas arranged according to their nature each chemical. Hazardous chemicals with incompatible properties must be protected is managed by isolating the area by a safe distance or by isolating the zone separate area.

b) Incompatible hazardous chemical storage detailed in Table 1, Appendix I of this regulation.

c) Ensure a safe distance of at least 3 meters from sources of ignition



electricity.

d) Keep a minimum horizontal safe distance of 5 meters from chemicals danger (encapsulation level II or II) and food, human and livestock food, vehicles, utensils containing food.

9. Develop and implement appropriate measures to ensure security and control access and prevent loss of hazardous chemical storage.

10. Dangerous chemical warehouses must be inspected annually for safety and safety measures before the rainy season.

11. Areas for storing spilled chemicals, discarded chemicals and hazardous wastes  
Comply with the regulations on environmental protection and hazardous waste management.

#### **Article 12. Preservation of flammable and explosive chemicals**

This Regulation applies to commonly used flammable and explosive liquids and solids such as industrial solvents and hydro-carbon. In addition to the general rules described In Article 11 of this regulation, the storage of flammable and explosive chemicals must comply with regulations following:

1. Flammable and explosive chemicals must be stored in separate areas, not together with dangerous chemicals that are incompatible or potentially reactive  
Dangerous by exposure or fire.

2. The electrical tools, equipment, lifting equipment installed and used inside the warehouse must be fire and explosion prevention type.

a) The system of electrical cabinets, portable electrical equipment must ensure safety regulations fire prevention.

b) Lifting equipment and forklift trucks must meet fire and explosion prevention standards current standards or equivalent standards such as ATEX 94/9 / EC, IECEx, ...

c) Tools to open vehicles containing flammable or explosive chemicals must be made of materials No spark due to friction or impact.

3. There must be regulations on chemical safety and fire prevention and fighting and signboards hazard appropriate to the hazard level of the chemical, hang in conspicuous place:

a) **DANGER** warning signboards - **PROHIBITED FIRE, PROHIBITED, PROHIBITED USE YOUR MOBILE PHONE** .

b) Warning signs **WARNING - NO PROHIBITED ACCESS**

c) Have a layout of chemicals, equipment for fire protection and emergency response.

d) Have chemical incident response flowchart or procedure, contact list and phone number Contact in an emergency situation.

4. Safe loading and unloading of flammable and explosive chemicals:

a) Must develop safety procedures for loading and unloading flammable and explosive chemicals.

b) Equipped with appropriate means of response to spills and spills.

c) Means of transport must not go inside the chemical storage area  
Flammable.

d) In the process of loading and unloading flammable chemicals, vehicles must turn off the engine completely or have appropriate fire and explosion prevention measures.

5. Flammable and explosive chemical storage must be isolated from fire and heat sources.

6. When performing work that generates heat or sparks, license must be applied work and implement safety measures to prevent fire and explosion, and control risks.

Minimum safe distance from flammable chemical storage area to source

heat and sparks according to the following table. The safety distance may increase depending on the attack heat generation job risk and fire and explosion prevention measures.

The storage area to another area	Minimum safe distance (m)
Flammable liquid storage area inside sealed container	3
Flammable liquid storage area is leveling extraction, stirring, etc.	8

7. Ventilation system: Flammable and explosive chemical storage must be well ventilated to maintain a chemical vapor concentration less than 10% of the lower explosion limit by means of means legal or forced ventilation.

a) Natural ventilation:

- There are at least two sides of the storage wall facing outside the well-ventilated area.
- Install the bar on opposite sides of the wall.

b) Forced ventilation:

- The exhaust fan system must meet the requirements for safety against fire and explosion.
- Wind speed and capacity are suitable for storage size.
- Where chemical vapors have a density that is heavier than air, the design and install exhaust fan system at low positions inside warehouse, near warehouse floor .

*Figure 1: Example of forced ventilation system for flammable chemical storage.*

*Figure 2: Example of a natural ventilation system.*

8. In case of storage of more than 2,000 liters, emergency eyewash equipment or sets must be installed equipment that combines eye wash and emergency shower. Distance from the area with contact manipulation dangerous chemicals to eye wash equipment, emergency shower within a radius of 10 meters, but not less than 2 meters. The number, area and type of equipment is decided based on the results results of risk assessment for the work involved.

9. Stacking of chemical means of transport must ensure load capacity pallets, containers supplied by the manufacturer. No more than three (3) floors for vehicles with a capacity of less than 1,000 liters. Do not stack more than two (2) floors for vehicles with a capacity of more than 1,000 liters.

10. Chemicals that are incompatible or create hazardous reactions when exposed, Do not store in the same area for storing inflammable and explosive dangerous chemicals as detailed in Table 1, Appendix I of this regulation.

11. Do not leave cleaning cloths, greasy rags in the chemical store, flammable or explosive.

12. Means containing flammable or explosive chemicals under the effect of light must of light-resistant material or shielded with barrier material

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protect against light. Glass doors of the warehouse must be painted against light or use frosted glass.

13. When leveling flammable liquids, the equipment and storage facilities must be grounded. The ground resistance must be consistent with current regulations. Safe isolation from the electrical equipment, minimum of three (3) meters.

#### **Article 13. Storage of corrosive chemicals**

In addition to the general provisions described in Clause 11 of this regulation, preservation corrosive chemicals must satisfy the following regulations:

1. Corrosive chemical storage floor must be made of materials that are not corrosive destruction.

2. Corrosive chemicals are arranged, fixed appropriately, without risk of falling, spill over outside the storage area. Acidic, corrosive inorganic chemicals Alkaline corrosion and other corrosive substances should be stored in separate areas with trays spill-proof filler.

3. Chemical storage racks must be designed and installed to ensure no accumulation of chemicals The substance has incompatible properties. When installing the shelf system, the distance must be ensured a minimum of 1.2 meters from either side of the shelves. Means containing food chemicals worn, should be placed on shelves lower than eye level.

4. Stacking of vehicles containing corrosive chemicals must ensure load capacity permits of pallets and containers. Do not stack more than 3 floors for the opponent capacity of less than 1,000 liters. Do not stack more than 2 floors for storage vehicles capacity per 1,000 liters.

5. Eye wash emergency device or eye wash and shower combination device must be installed emergency. Distance from the area exposed to corrosive chemicals to the equipment eye wash, emergency shower within a radius of ten (10) meters, but not less than two (2) meters. The quantity, area, and type of equipment are determined based on the results of the risk assessment for related work.

6. Chemicals that are incompatible or cause hazardous reactions when exposed, Do not store in the same corrosive chemical storage area:

- a) For incompatible substances:
  - Isolation in separate areas, or
  - Isolation of the area according to a safe distance of at least 5m for corrosive chemicals liquid or 3m for solid corrosive chemical.
- b) For chemicals that create hazardous reactions on contact:
  - Isolate in separate areas, or in the same area but use separate spill or drain collection tray system.
  - Isolation of the area according to a safe distance of at least 5m.

7. Each type of acid must be stored in a separate area in the warehouse. Acid tanks must be stored per batch and must have a stock tag for tracking.

8. Vehicles containing corrosive chemicals must be made of materials that are not eaten by chemicals corrosive and always sealed;

#### **Article 14. Preservation of toxic chemicals**

In addition to the general provisions described in Clause 11 of this regulation, preservation Toxic chemicals must satisfy the following regulations:

1. Toxic chemicals must be stored in a warehouse with a waterproof, non-waterproof wall and floor affected by the flood, away from densely populated places, schools, hospitals and public areas plus, water supply, drainage ditch system, ensure a safe distance full according to regulations. Toxic chemicals storage of more than 500 tons must be assessed for risk determine a safe distance from residential areas and public areas.

2. Do not store toxic chemicals in the same warehouse with flammable or explosive chemicals. The Incompatible chemicals or hazardous reactions when exposed:

- a) For incompatible chemicals:
  - Isolation in separate areas, or
  - Isolate the area according to a safe distance of at least 5m for toxic chemicals in body liquid or 3m for solid chemical toxic.
- b) For chemicals that create hazardous reactions on contact:
  - Isolate in separate areas, or in the same area but use Separate sub tray system collects spillage or drainage.
  - Isolation of the area according to a safe distance of at least 5m.

3. Toxic chemicals warehouses must have collection banks and ditches to ensure chemicals Do not release to the environment when a spill occurs:

- a) For toxins at packing level I: the storage capacity of the collection system is calculated equal to 100% of the total volume of the goods.
- b) For toxins at packing levels II and III: storage capacity of the collection system

calculated by 25% of the total volume of the cargo.

4. Eye wash emergency equipment or combined eye wash and shower kit must be installed emergency. Distance from the area exposed to corrosive chemicals to the equipment eye wash, emergency shower within a radius of seven (7) meters, but not less than two (2) meters. The quantity, area, and type of equipment are determined based on the results of the risk assessment for related work.

5. Ventilation system: Toxic chemicals storage must be well ventilated measures for natural or forced ventilation to secure toxic chemicals (vapors, dust, gases) is controlled according to current regulations on national technical regulations - Gender values Permissible exposure limits for chemical elements in the workplace.

6. Eating and resting areas and changing rooms must be located in separate rooms or outside of toxic chemical storage.

7. Toxic chemicals in storage cabinets must have spill-proof sub-trays.

8. When storing, if it is necessary to level and repack the vehicle, do not manipulate it in a warehouse that must be done in a well-ventilated, hygienic, or equipped place toxic gas exhaust system.

9. Toxic chemical storage establishments must control chemical distribution:

a) The purchase and sale of toxic chemicals must have a control slip, certified by the purchaser, sellers as a basis for controlling toxic chemicals in the market.

b) The certificate of control of purchase and sale of toxic chemicals, including information on the chemical name and number quantity of chemicals, purpose of use; name and signature of buyer and seller; Address, Paper number identity card of buyer and seller representatives; delivery date.

c) The certificate of control of purchase and sale of toxic chemicals must be kept at the seller and purchaser at least five (5) years and must be presented upon request by the competent authority.

**Article 15. General provisions on outdoor chemical storage tanks:**

1. Outdoor chemical storage tanks when new construction design or renovation meets the current regulations on construction, relevant national standards and technical regulations fire safety, environmental protection.

2. Tanks must be of durable materials (painted with suitable inert materials), do not corrode or cause chemical reactions with chemicals contained inside.

3. The tank must have a dyke / wall system and impervious foundation to ensure chemical substance is not released to the environment when a spill occurs:

a) The storage capacity of the ring dike system is calculated by the sum of 110% of the tank capacity maximum volume of extinguishing water and 20 minutes.

b) For toxic chemicals of category 6.1, packing level I: storage capacity of the dike system The bag is calculated as the total storage capacity of the tanks of this heading.

c) For corrosive chemicals, packing level I: storage capacity of the ring dike system is calculated as the total storage capacity of the tanks of this heading.

d) Dykes / walls must be made of non-reactive materials when exposed to chemicals beetle.

4. The tank must be designed with a liquid display mark and a suitable spill-proof system suitable for filling pump.

5. The connecting pipes and valves must be of material compatible with the tank or not corroded, creating chemical reactions with chemicals inside.

6. Tanks are affixed with appropriate safety warning images according to the Harmonized System global chemical classification and labeling (GHS). Location with easy-to-see warning pictures observed from the entrance to the tub area.

a) For tanks with a diameter of six (6) meters or more: Dimensions of the sides in the diagram warning not less than 500 mm.

b) For tanks with a diameter of six (6) meters or more: Dimensions of the sides in the diagram warning not less than 150 mm.

### **SECTION 3. TRANSPORT OF HAZARDOUS CHEMICALS**

#### **Article 16. General provisions on transport of dangerous chemicals**

1. When transporting dangerous chemicals, the provisions of TCVN 4512 must be complied with: 1988, current regulatory documents and regulations in this standard.

2. When transporting dangerous chemicals, the agency having the goods must enclose the papers According to the current regulations, notify the receiving agency and the responsible agency loading.

3. When transporting dangerous chemicals, escorts or carriers, must *be trained to* know the chemical and physical properties of chemicals, precautions and how solving problems. When traveling in cargo, the escort or carrier must carry it according to full personal protection.

4. When transporting dangerous chemicals, the requirements for the containers must be met The medium contains the following:

a) The container must be made of a material that does not react chemically with substances liquid, not destroyed by chemicals inside;

b) If a vehicle is made of wood, it must be lined with a durable material inside impervious chemicals, seeping out;

c) Glass and porcelain containers must be of good quality, sealed and not cracked. These jars should be placed in crates, boxes or wooden cribs inserted with soft material;

d) Metal containers must have tight lids, if it is necessary to seal pairs style;

Means containing liquid chemicals and colloids must be sealed, ensuring no chemical exposure seepage seeps out. Packages must be tightly packed for easy loading and unloading;

The container is pressure-resistant to insert, shockproof.

e) Empty packages previously contained dangerous chemicals, only after cleaning them both inside and outside, when being transported will be considered as normal goods, If not cleaned, they must still be considered as dangerous goods.

f) Before the cargo arrives at a station or port, the carrier must notify the agency receive goods to know to have timely reception plan.

#### **Article 17. Requirements when loading and unloading**

a) Before loading and unloading, the person in charge of loading and unloading must check the packages and labels Effective and direct controls guide safe work measures.

b) It is forbidden to classify chemicals with the ability to react with each other, repellent or other Different firefighting on the same vehicle, a wagon, a barge, a boat. The lawsuits rows must fit snugly together; must insert to avoid rolling, moving.

c) When loading and unloading goods, it must comply with TCVN 3147: 1990.

On the way of transportation, if loading or unloading goods, the rest must be tied  
Be careful not to roll or fall before being transported.

d) Not dragging during the loading and unloading process; throw, crash, crash. Are not being carried dangerous chemicals on people. The packages are solid in accordance with the specified mark.

e) It is necessary to check the safe lifting equipment before loading and unloading packages.

#### **Article 18.- Safety requirements in transportation**

a) Before loading dangerous chemicals on the means of transport, people with goods and the person in charge of the transport vehicle must check together, if the means of transport New safety guarantees are lined up.

b) When transporting compressed gas cylinders, the liquefied gas shall comply with the following regulations: Security requirements in transport of TCVN 6304: 1997.

c) It is forbidden to transport oxygen cylinders together with flammable gas cylinders and flammable substances other.

d) Specialized vehicles transporting dangerous chemicals must be stuck with logos according to regulations determination; Specialized vehicles transporting flammable liquids in addition to having logos must be present use ground wire. The vehicle must be equipped with an appropriate emergency aid.

e) When transporting dangerous chemicals, the vehicle must have a hood or canvas to shield from the rain. sunny...

f) Prohibit the transportation of dangerous chemicals with people, livestock and cargoes other.

g) On the road transporting dangerous chemicals, the vehicle owner must not park stop the vehicle in a crowded public place (market, school, hospital ...). For

Dangerous chemicals have many impacts, when the transportation is not stopped, parked where it arises Heat source and must not park in hot sun for long.

### **Chapter III**

#### **REGULATIONS ON MANAGEMENT**

##### **Article 19. Provisions on regulation conformity announcement**

1. To publish regulation conformity according to the provisions of law on goods quality management and implement the labeling in accordance with Decree No. 43/2017 / ND-CP dated 14 April 2017 of the Government on goods labels.

2. Announcing regulation conformity for chemicals in the process of producing, preserving and using hazards dangerous

3. To register for regulation conformity announcement according to the provisions of law.

### **Chapter IV**

#### **IMPLEMENTATION ORGANIZATION**

##### **Article 20. Implementation responsibility**

1. The Chemical Department shall assume the prime responsibility for, and coordinate with concerned agencies and units to guide, inspect, examine and supervise the implementation of this Regulation nationwide.

2. Departments of Industry and Trade of provinces and cities are responsible for coordinating with relevant agencies agencies to guide, inspect and examine the implementation of this Regulation under their management according to the law.

3. Organizations and individuals doing work related to dangerous chemicals must do so present all contents related to their work specified in this Regulation.

##### **Entry into force**

1. This Regulation takes effect from the date of year 202.

2. Organizations and individuals in the course of implementing this Regulation, if any Unsuitable things should be reported to the Ministry of Industry and Trade for consideration, study and article

correction./.

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## APPENDIX 1

*Table 1. Division of chemicals with incompatible properties*

Note :

SIGNALS / COLOR	EXPLAIN
<b>Compatible</b>	Hazardous chemicals are compatible, can be stored in the same area.
<b>*</b>	Hazardous chemicals of the same type / group but may be incompatible enjoy or react dangerously on contact. Need a reference Additional information on the Chemical Safety Sheet for each category.
<b>Approx minimum isolation</b>	Dangerous chemicals belonging to these groups should be isolated. Join Refer to the chemical safety sheet for more information.
<b>Apply a gap Minimum 3 meter isolation</b>	Keep a safe distance of at least 3 meters from groupings This dangerous substance. See more information in the sheet An all chemicals.
<b>Apply a gap Minimum insulation of 5 meters stored in the area private.</b>	These dangerous chemicals must ensure a distance Minimum cup 5m and isolated in different warehouses.
<b>Store in cabinets or separate storage</b>	Applicable to organic peroxides. Store in cabinets separate storage or storage.

**How to look up the table :**

Examples: There are two chemicals, flammable liquid and organic peroxide. To determine if these two chemicals have



can be stored in the same storage area, according to the following flowchart instructions:

Table 1. Division of chemicals with incompatible properties

Classification of hazardous chemicals insurance under GHS			Easy gas Fire	Pneumatic	Liquid flammable	Flammable solids		Oxidants and Peroxides Organic	Single-level count	Food substa trail		
Gas bear Pressure	Flammable	Easy gas Fire	Easy gas Fire	Air does not flammable, Non-toxic harm	Liquid flammable	Easy solids fire, substance self-reflection application	Possible substance self-impulse Fire	Quality when contact water created flammable gas	Oxygen chemical	Organic peroxide muscle	Toxic	Food trail
			Compatible	Apply range dark isolation minimum 3 meters	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Preservation in the cabinets or warehouse separate container special	Apply range dark isolation minimum 3 meters
	Pneumatic	Air does not flammable, Non-toxic harm	Apply range dark isolation minimum 3 meters	Compatible	Apply range dark isolation minimum 3 meters	May apply Use approx isolation minimum	Apply range dark isolation Min 5 meters and preservation in the zone private sector	May apply Use approx isolation minimum	May apply Use approx isolation minimum	Apply range dark isolation Min 5 meters and preservation in the zone private sector	May apply Use approx isolation minimum	Apply range dark isolation minimum 3
			Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation minimum 3 meters	Compatible	Apply range dark isolation minimum 3 meters	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Preservation in the cabinets or warehouse separate container special	Apply range dark isolation minimum 3 meters	Apply range dark isolation minimum 3
Liquid flammable	Liquid flammable and explosives reducing liquid sensitive	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation minimum 3 meters	Compatible	Apply range dark isolation minimum 3 meters	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Preservation in the cabinets or warehouse separate container special	Apply range dark isolation minimum 3 meters	Apply range dark isolation minimum 3	
Solid flammable		Apply range dark isolation Min 5 meters and preservation	May apply Use approx isolation minimum	Apply range dark isolation minimum 3 meters	Compatible	Apply range dark isolation minimum 3 meters	Apply range dark isolation Min 5 meters and preservation	Apply range dark isolation Min 5 meters and preservation	Apply range dark isolation Min 5 meters and preservation	Apply range dark isolation minimum 3 meters	May apply Use approx isolation minimum	
		Easy solids fire, substance self-reflection application	in the zone private sector					in the zone private sector	in the zone private sector	in the zone private sector		
		Possible substance self-impulse Fire	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation minimum 3 meters	Compatible	Apply range dark isolation minimum 3 meters	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Preservation in the cabinets or warehouse separate container special	Apply range dark isolation minimum 3 meters	Apply range dark isolation minimum 3
		Quality when contact water created flammable gas	Apply range dark isolation Min 5 meters and preservation in the zone private sector	May apply Use approx isolation minimum	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation minimum 3 meters	Compatible	Apply range dark isolation minimum 3 meters	Apply range dark isolation Min 5 meters and preservation in the zone private sector	May apply Use approx isolation minimum	May apply Use approx isolation minimum

<b>Oxygen chemical.</b>	Oxygen chemical	Apply range dark isolation Min 5 meters and preservation in the zone private sector	May apply Use approx isolation minimum	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation minimum 3 meters	*	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation minimum 3 meters	Apply range dark isolation minimum 3
<b>Peroxide Organic</b>	Organic peroxide muscle	Preservation in the cabinets or warehouse separate container special	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Preservation in the cabinets or warehouse separate container special	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Preservation in the cabinets or warehouse separate container special	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Apply range dark isolation Min 5 meters and preservation in the zone private sector	Compatible	Apply range dark isolation minimum 3 meters	Apply range dark isolation minimum 3
<b>Single-level count</b>	Toxic	Apply range dark isolation minimum 3 meters	May apply Use approx isolation minimum	Apply range dark isolation minimum 3 meters	Apply range dark isolation minimum 3 meters	Apply range dark isolation minimum 3 meters	May apply Use approx isolation minimum	Apply range dark isolation minimum 3 meters	Apply range dark isolation minimum 3 meters	Compatible	May apply Use approx isolation minimum
<b>Substances corrosive</b>	Food trail	Apply range dark isolation minimum 3 meters	Apply range dark isolation minimum 3 meters	Apply range dark isolation minimum 3 meters	May apply Use approx isolation minimum	Apply range dark isolation minimum 3 meters	May apply Use approx isolation minimum	Apply range dark isolation minimum 3 meters	Apply range dark isolation minimum 3 meters	May apply Use approx isolation minimum	*

**Table 2: Some incompatible chemicals**

The list below shows some common incompatible chemicals. Chemicals listed in Column A should not be stored with or used near chemicals in Column B

Column A	Column B
Acidic acidic	Chromic acid, nitric acid, hydroxyl compound, ethylene glycol, perchloric acid, peroxide, permanganate
Acetic anhydride	Hydroxyl compounds such as ethylene glycol, acids perchloric
Acetone	A mixture of nitric and concentrated sulfuric acid, hydrogen peroxide
Acetylene	Chlorine, bromine, copper, fluorine, silver, mercury
Alkaline and alkaline earth metals such as magnesium, powdered form, sodium, potassium	Water, carbon tetrachloride or chlorinated hydrocarbon other, carbon dioxide, halogen
Ammonia (anhydrous)	Mercury, halogen, calcium hypochlorite, acid hydrofluoric
Ammonium nitrate	Acids, metal powders, flammable liquids, chlorates, nitrites, Sulfur, organic material is broken down or easy
Anilin	Fire
Arsenic materials	Nitric acid, hydrogen peroxide
Azides	Any reducing agent
Calcium oxide	Acids, heavy metals and their salts, oxygen agents chemical
Activated carbon	Country
Carbon tetrachloride	All oxidizing agents, calcium hypochlorite
Chlorate	Sodium
Chlorine dioxide	Ammonium salts, acids, metal powders, sulfur, materials Organic or flammable
Chromic acid and chromium trioxide	Ammonia, methane, phosphorus, hydrogen sulfide
Copper	Acetic acid, alcohol, camphor, glycerol, naphthalene, Flammable liquids in general
Cumene hydroperoxide	Acetylene, hydrogen peroxide
Cyanide	Acid (organic or inorganic)
Flammable liquid	Acid
Flo	Ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogen, other oxidizing agents
	All other chemicals

Hydride	Country
Hydrocarbons (for example, butane, propane, benzene)	Fluorine, chlorine, bromine, chromic acid, peroxide
Hydrocyanic acid	Nitric acid, alkali
Hydrofluoric acid (anhydrous)	Ammonia (aqueous or anhydrous solution)

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Hydrogen peroxide	Copper, chromium, iron, most metals or salts of them, any flammable liquid (e.g. alcohol, acetone), flammable material, aniline, nitromethane
Hydrogen sulphide	Fuming nitric acid, oxidizing gas
Hypochlorites	Acid, activated carbon
Iodine	Acetylene, ammonia (aqueous or anhydrous solution), hydrogen
Mercury	Acetylene, fulminic acid, ammonia
Metal hydride	Acid, water
Nitrate	Acid
Nitric acid (concentrated)	Acetic acid, acetone, alcohol, aniline, chromic acid, acid hydrocyanic, hydrogen sulfide, flammable liquid, flammable gas fire, copper, brass, any heavy metal
Nitrite	Acid
Nitroparaffin	Basic inorganic chemicals, amines
Oxalic acid	Mercury and silver and their salts
Oxygen	Oils, fats, hydrogen; Flammable liquid, solid or gas
Perchloric acid	Acetic anhydride, alcohol, bismuth, paper, wood, grease, oil
Purple medicine	Concentrated sulfuric acid, glycerol, ethylene glycol, benzaldehyde
Peroxide, organic	Acid (organic or mineral), avoid friction, protect cold management
Phosphorus, white	Air, oxygen, alkali, reducing agent
Potassium	Carbon tetrachloride, carbon dioxide, water
Potassium chloride	Sulfuric and other acids, ammonium salts, metal powders, sulfur, finely divided organic matter, easy substance Fire
Potassium perchlorate (see also chlorate)	Sulfuric and other acids
Potassium permanganate	Glycerol, ethylene glycol, benzene, sulfuric acid
Silver and silver salt	Acetylene, oxalic acid, tartaric acid, ammonium compounds, Fulminic acid
Sodium	Carbon tetrachloride, carbon dioxide, chlorinated hydrocarbons other chemistry, water
Sodium nitrate	Ammonium nitrate and other ammonium salts
Sodium peroxide	Ethyl or methyl alcohol, glacial acetic acid, anhydride acetic, benzene, carbon disulfide glycerin, ethylene glycol, ethyl acetate, methyl acetate, furfural
Sulfide	Acid
Sulfuric acid	Chlorates, perchlorate, permanganate

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Table 3. Classification by basic chemicals

Groupization dangerous substances dangerous	Stable method offer	For example	Not compatible
Compressed air - Fire	Store in an area Dry, cool, avoid oxygen chemical. Safety strap or cylinder chain to wall or bench.	Methane gas, Acetylene propane	Oxidizing and toxic compressed air Harmful, oxidized solids.
Compressed air - chemical	Store in an area Dry, cool, keep away from substances easy gas and liquid Fire. Safety strap or cylinder chain to wall or bench.	Oxygen, Chlorine Bromine	Flammable gas
Pneumatic - Toxic	Store in an area Dry, cool, keep away from substances easy gas and liquid Fire. Safety strap or cylinder chain to wall or bench.	Carbon monoxide Hydrogen sulphide Nitrogen dioxide	Flammable gas and / or oxidize.
Corrosive - Acid	Store separately in storage cabinets acid. Separation of oxidized acids (for example, chromic, nitric acid, sulfuric and perchloric) from organic acids	Acetic acid, Chromurge Sulfuric acid, Nitric acid, Perchloric acid, Acid Chromic, Acid hydrochloric	Flammable liquid, substance Flammable solid, base, substance oxidize
Corrosion - Apart just	Store in food storage cabinets separate wear. Store solution of inorganic hydroxides in the containers labeled polyethylene.	Ammonium hydroxide, Sodium hydroxide, Calcium hydroxide	Flammable liquid, substance Oxidizers, toxins and acids
Easy liquid Fire	Store in easy storage cabinets Fire and keep away from sources to cause fire. Liquid storage flammable is very volatile in volatile explosion-proof refrigerator.	Acetone, Benzene Diethyl Ethanol, Ethanol , Toluene, Acetic acid	Acids, bases, oxidants and poison
Easy solids Fire	Store in an area Dry, cool separately, avoid the oxidizing agents, corrosive substances flammable liquid	Phosphorus, yellow, Calcium carbide, Acid peric, Benzoyl peroxide	Acids, bases, oxidants and poison
Total chemicals - No react	Store on the inner bench general laboratory or preferably behind the door glasses and under eye level.	Agar, sodium chloride, Sodium bicarbonate, Almost all non-reactive salts application	See MSDS for detail.

Oxidant	Store in an overflow tray inside a chemical storage cabinet Easy to remove from the material flammable and flammable.	Ammonium sulphate, Iron Chloride, Iodine, Sodium hypochlorite, Benzoyl peroxide, Potassium permanganate, Potassium dichromate, the following substances these are generally considered Oxidants: Peroxide, perchlorate, chlorates, nitrates, bromates, superoxide.	Separation from reducing agents, Flammable and flammable substances Fire.
Toxic / Toxic compounds / harm	Separate storage in zones dry, cool area, in the containers secondary chemical resistance unbreakable and consistent with the dangerous nature of chemistry.	Aniline, Carbon tetrachloride, chloroform, Cyanide, Compounds heavy metal, that is cadmium, mercury, osmium, Oxalic acid, Phenol, Formic Acid	Flammable liquids, acids, bases and oxidants. See MSDS for detail.
Anti-chemical water resistance	Store in a dry place, cool, protected from the tap fire fighting water spray.	Metal sodium, Metal Potassium, Lithium Metal, Aluminum aluminum hydride	Separated from all aqueous and substance solutions oxidize.
Carcinogens letters	Label all directions "The suspect substance cause cancer. "Store under dangerous properties of chemistry quality, use the security like when necessary.	Benzidine, Beta-naphthylamine, benzene, Methylene chloride, Beta-propiolactone	See MSDS for detail.
Monster substances pregnancy	Label all directions Convenience is "Suspected poison reproduction. "Stored by calculation dangerous substances of chemicals, Use appropriate security when necessary.	Lead and aqua compounds mercury, benzene, aniline	See MSDS for detail.
Chemical creation Fort peroxide	Store in the means Airtight storage facilities in one dry, dark, cool area batch. See Table 3 for gender The storage period is recommended export.	Diethyl ether, acetaldehyde, Acrylonitril	See MSDS for detail.
Reducing substances strong	Store in a dry place, cool. React country. Separation from all chemical other substances.	Acetyl chloride, Thionyl chloride, Namic hydride, sulfide of iron	See MSDS for detail.

**Table 4. Recommended storage and storage time limits for pine peroxide compounds****often**

Under the right conditions, these chemicals will form peroxides that can explode by either shock heat.

**DANGER DANGER:** Cancellation after 3 months.

Dangerous peroxide forms during storage.

Diisopropyl ether	Potassium metal
Acetylene acid	Sodium amite
Isopropyl ether	Vinyl chloride

**DANGER:** Cancellation after one year.

Risk of peroxide formation during storage and on concentration (ie distillation) matter.

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Acet	Dicyclopentadiene	Methyl cyclopentane
Acetaldehyde	Diethyl ether	Methyl isobutyl ketone
Cumene	1,4-Dioxane	Tetrahydrofuran
Xyclohexene	Ethylene glycol dimethyl ether	Tetrahydronaphthalene
Diacetylene	Methyl acetylene	Ete vinyl

**DANGER:** Cancellation after one year.

The peroxide formation causes a dangerous polymerization initiation.

Acrylic acid	Cloropren	Tetrafluoroethylene
Acrylonitril	Chlorotrifluoroethylene	Vinyl acetate
1,3-Butadien	Methyl methyl methacryite	Vinyl acetylene
2-Butanol	2-Propanol	Vinyl chloride
	Styrofoam	Pyridin vinyl