

Regulations on Safe Management of Hazardous Substances

[Explosive Substances]

산재사망사고 절반으로 줄입니다!

1 Definition and Characteristics of Explosive Substances

Explosive Substance



- It means solid or liquid substances generating the gas carrying the temperature, pressure and speed capable of damaging neighboring environments through chemical reactions, and the substances used by chemical products are included in the explosive substances even if they do not generate the gas.
- Because of oxygen contained within, when explosive substances are met with heating, friction or shocks or are near the ignition source, they are dissolved from the liquid or gas rapidly into the gas state to generate the heat, which ends up expanding by hundreds or thousands of times and generating a violent shockwave and thunderous roar.

2 List of Major Explosive Substances

Serial No.	CAS No.	Substance	Serial No.	CAS No.	Substance
1	9004-70-0	Nitrocellulose	5	124-47-0	Urea nitrate (wet)
2	88-89-1	Picric acid	6	55-63-0	Nitroglycerin
3	7790-98-9	Ammonium perchlorate	7	628-96-6	Ethylene glycol dinitrate
4	121-82-4	Cyclonite	-	-	-

※ Detailed information on substances will be offered if you search the Material Safety Data Sheets (MSDS) with CAS No. at the chemicals information of the agency (msds.kosha.or.kr).

3 Regulation on Safe Management during Handling

Guideline on Handling

- Strictly prohibit accessing the ignition sources (flame, spark), and prohibit heating, friction and shocks;
- Prohibit mixing foreign substances, such as strong oxidizer, strong acids and metallic oxide;
- Earth for prevention of explosion from static electricity and lightning, use of explosion-proof electric machine/apparatus and installation of lightning protection device;

Guideline on Storage

- A protective wall must be installed and substances kept separate from neighboring facilities, and storing with other hazardous substances at the identical storage locations is prohibited;
- Secure distance between the outer wall of storage places and security buildings based on the storage volume at the chemical's storage places must be maintained;
- Substances are to stored by subdivisions, if possible, and also to implement measures to prevent damages and leakages of containers;
- Must maintain ventilation and dry conditions and to block direct sunlight;
- In order to minimize damages in cases of accidents at storage places, all regulations prescribed by the Act on the Safety Control of Hazardous Substances shall be complied with;

Fire Extinguishing Methods

- Secure a sufficient safety distance and to use unmanned water sprayer, if possible (cover-up measures to be implemented if unavoidable);
- Extinguish fire by means of fire hydrant, water spraying, foam-dried fire-extinguish powder and sand;
- It is better to use a massive volume of water because extinguishment by smothering is ineffective;
- The use of dry chemicals, CO₂ and halogenated compound extinguishing agent (halon 1211, 1301) is prohibited;



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Major Accident Cases

○ Accident Cases in Korea

At the unmanned company located in Taebaek, Gangwon-do on February 21, 2007, the explosion occurred while explosive substances, including chemical ingredients and half-finished products, and the wastes mixed with other wastes were incinerated, which resulted in 2 deaths and 9 injuries.

Cause of Accident



- When explosive substances are incinerated, detonators prone for explosion have to be separated and removed; however, the incineration was executed with defective detonator present due to inadequate sorting and verification of the wastes to incinerate.

Accident Preventive Measures



- During incineration of explosive substances, sufficient examination and separation needs to be conducted to determine whether substances causing explosion are contained before the incineration, and when it is difficult to separate, other disposal methods must be employed.



Site of Explosion Accident

○ Accident Cases in Overseas

After initial explosion occurred from the containers stacked at the hazardous materials loading site of a logistics company in Tianjin, China on August 12, 2015, the explosion spread to other warehouses to incur secondary explosions 30 seconds later, resulting in greater damages.

Damage situation : 139 people killed, including firefighters, 34 missing, 527 injured and over 17,000 people evacuated (as of the end of August).

Accident-causing materials (estimated) : Nitrate ammonium (800 tons), potassium nitrate (500 tons), sodium cyanide (700 tons), etc.



Site of Accident (1)



Site of Accident (2)