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İşin Adı : Mersin-Adana-Osmaniye-Gaziantep Yüksek Standartlı Demiryolu Hattı
The Name of the Job : İnşaatı ile Elektromekanik Sistemlerinin Temini
Construction of Mersin-Adana-Osmaniye-Gaziantep Hight Standard Railway Line
With Supply Of Electromechanical Systems

Rapor Adı : PROCEDURE FOR WORKING WITH
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1.0 PURPOSE

The purpose of the working procedure with chemicals is to protect the health of employees from the existing or potential risks arising from the effects of chemical substances within the scope of all activities to be carried out with all chemical substances in the MAOG Project operating under the REC, to prevent damage to the machine and the environment, to prevent the effects of chemical substances on health. It is to determine the procedures and principles in the works carried out during the construction in order to minimize it.

2.0 SCOPE

This procedure covers the minimum occupational health and safety principles and requirements regarding working with chemicals and the management of work with chemicals in the MAOG Project operating within the REC.

3.0 AUTHORITY AND RESPONSIBILITIES

Project Management is responsible for the implementation of the rules and requirements defined by the procedure and its annexes in the projects.

Also; The main roles and responsibilities for the implementation of this procedure are summarized below.

Role	Responsibilities
REC Project Manager	<ul style="list-style-type: none"> Overall responsibility for the development, review, approval and coordination of various activities for initiation, execution and completion of construction activities. Ensuring that this procedure is prepared and updated as necessary based on the activities and operations undertaken by the REC as part of the project. Ensuring that adequate resources are available to implement the procedures and guidelines outlined in this plan.
REC HSE Manager	<ul style="list-style-type: none"> Initiation, development, implementation and coordination of the procedure during the project. Ensuring that adequate training has been given to all site personnel, including procedures and guidelines under this plan. Establishing appropriate control procedures and performing necessary audits. Ensure that employees and contractors are trained in emergency response management in the event of an evacuation. Comply with applicable legal requirements for the management of hazardous materials, including transport, occupational health and public health. Developing the necessary monitoring and reporting forms, establishing appropriate document control procedures, Hiring, training and supervising the HSE Supervisor and assisting with their responsibilities where necessary. Conducting environmental studies and monitoring programs. Management of external environmental consultants/experts.

Role	Responsibilities
	<ul style="list-style-type: none"> Environmental reporting required within the framework of permits and authorizations. To cooperate with regulatory authorities on all environmental issues.
HSE Supervisor	<ul style="list-style-type: none"> Implementation of the procedural provisions in the field during their activities.
Subcontractors and employees	<ul style="list-style-type: none"> Understanding and acting in accordance with the guidelines outlined in this procedure. Understanding the hazardous material management conditions related to the job and acting in accordance with this plan during their duties. Following the instructions or recommendations of the supervisors within the scope of the hazardous materials management conditions. Accordingly, those who are unsure of their legal, administrative or political practices are responsible for taking administrative or supervisory direction. All subcontracted personnel will be considered on an equal footing with REC personnel in terms of environmental management and control and will be included in the workplace induction process. The responsibilities of subcontractors include: <ul style="list-style-type: none"> Performing regular workplace inspections to ensure regular maintenance and development work has been undertaken to minimize potential environmental impacts; Conducting appropriate environmental safety/background meetings and trainings with personnel, and Collaborating and proactively working with the HSE Supervisor to facilitate the implementation of the above.

Headquarter E&S Manager

Responsible for managing infrastructure and superstructure projects regarding environmental and social governance issues and member of the Executive E&S Committee on behalf of the REC.

PIU (PROJECT IMPLEMENTATION UNIT)

- PIU Department Manager (Superstructure / Civil Engineer)** will be responsible for overseeing the implementation of all health, safety and social measures, as specified within the disclosure package of the Project, and regular reporting to AYGM PIU.
- PIU Physics Engineer** who is responsible for supervising health and safety for the Project.
- PIU Department Manager (Environmental and Feasibility / Environmental Engineer)** will be responsible for supervising the implementation of all environmental and biodiversity measures, as specified within the disclosure package of the Project, and regular reporting to AYGM PIU.



3.1 EXECUTIVE ENVIRONMENTAL AND SOCIAL MANAGEMENT COMMITTEE

- **Executive E&S Committee Project Manager (Department Head / Branch Manager /Head of Department)** will be ultimately responsible for overseeing the activities undertaken by the AYGM/TCDD specialists (listed below), overseeing the implementation of mitigation measures and management procedures specified within the disclosure package of the Project, and overseeing the preparation and implementation of a CESMP, which will be based on this ESMP.
- **Executive E&S Committee Environmental, Health and Safety, and Social (EHSS) Manager (Specialist / Engineer)** will be responsible for overseeing all matters that relate to environment, health, safety and social aspects of the Project. Also, s/he will be appointed to be responsible for supporting the implementation of the SEP, by conducting regular consultation with affected communities on any concern regarding the Project. CLOs will also have responsibility for disseminating the Project disclosure package as described in the SEP. They will also conduct regular inspections of records relating to grievances received and their resolution. S/He will report regularly to AYGM PIU.
- Further technical staff may be required during the course of the Project, who will be assigned internally by the AYGM, either by means of permanent or temporary basis until the completion of relevant tasks under the Project whilst they undertake their current responsibilities

4.0 DEFINITIONS AND ABBREVIATIONS

HSE: Occupational Health and Safety and Environment

MAOG: MERSİN-ADANA-OSMANİYE-GAZİANTEP High Standard Railway Project

REC: REC Uluslararası İnşaat Yatırım San. Ve Tic. A. Ş.

PPE: Personal Protective Equipment

ILO (International Labour Organization): International Labour Organization

EN (European Norms): European Norms

ANSI (American National Standards Institute): American National Standards Institute

OSHA (Occupational Safety & Health Administration): US Occupational Health and Safety Administration

CE (European Conformity): European Conformity

GBF (SDS): Safety Data Sheet,

BM GHS: United Nations Global Harmonized System; It provides a basis for hazardous chemicals to contain the same physical, environmental, health and safety information globally, through the harmonization of classification and labeling criteria.

CLP: Regulations issued by the European Union (classification, labeling, packaging of substances and mixtures)



ADR Convention: European Convention on the Carriage of Dangerous Goods on International Roads

IMDG Code: IMDG Code - International Maritime Dangerous Goods Code

RID: The Regulation concerning the International Carriage of Dangerous Goods by Rail

ICAO: ICAO Technical Instructions for the carriage of dangerous goods by air

CAS Number: It refers to the service registration number given by the Chemical Abstracts Service according to the structural feature of the chemical substance.

EINECS: The descriptive list of all substances on the European Community market as of 18 September 1981 refers to the European Inventory of Existing Commercial Chemical Substances.

ATEX: European Union Directive on Equipment and Protective Systems Used in a Potentially Explosive Atmosphere

PPM: The amount in milliliters of the substance in 1 m³ of air (ml/m³)

EC Number: The number assigned by the European Commission according to the structural feature of the substance.

TWA: Time-weighted average measured or calculated for a specified reference period of 8 hours.

STEL: The upper limit value for exposure that should not be exceeded for a period of 15 minutes, unless another time is specified.

mg/m³: The amount of substance in milligrams in 1 m³ of air at 20°C and 101.3 KPa. pressure (760 mm mercury pressure).

ppm (parts per million): The amount in milliliters of the substance in 1 m³ of air (ml/m³).

ATE: Acute Toxicity Estimate

Occupational Exposure Limit Value: Unless otherwise stated, it is the upper limit of the time-weighted average of the concentration of chemical substances in the air in employees' respiratory tracts over an 8-hour period.

Handling: It means stacking, relocating, transferring from large containers to small containers, renewing or repairing containers, aeration, sifting, mixing and similar operations without changing the essential qualities of the substance or preparation.

Respiratory zone: The center of it is the face remaining on the front of the head and the sphere with a 30 cm of radius which is the midline of the line connecting the ears of the person.



Health surveillanceIt refers to the evaluations made to determine the health status of the employees in relation to their exposure to a certain chemical.

Chemical SubstanceChemical substance All kinds of elements, compounds or mixtures which are found in nature or are produced or that occur accidentally as a result of any process or as a waste.

Mixture:It means that two or more substances come together or form a solution without losing their chemical properties.

Preparations: It refers to mixtures or solutions consisting of at least two or more substances.

Hazardous Chemical Substance: Substances and preparations having one or more of the characteristics of explosive, oxidizing, highly flammable, highly flammable, flammable, toxic, very toxic, harmful, corrosive, irritating, allergic, carcinogenic, mutagenic, toxic for reproduction and dangerous for the environment or the above-mentioned Although not included in the classifications, it refers to substances that may pose a risk to the health and safety of employees due to their chemical, physico-chemical or toxicological properties and the way they are used or kept in the workplace, or substances with occupational exposure limit values.

Allergic Substance:It is a substance which, when inhaled, has the property of causing excessive sensitivity when penetrating to the skin and causing characteristic adverse effects in case of subsequent exposure.

Flammable substance:It refers to substances in liquid form with a flash point between 21°C and 55°C.

Abrasive Substance: It refers to substances that can cause tissue destruction in contact with living tissue.

Environmentally Hazardous Substance: These are the substances that demonstrate short or long term hazards against one or several elements of the environment.

Very Easily Flammable Substance: It refers to liquid substances with a flash point lower than 0°C and boiling point lower than 35°C, and gaseous substances that can burn in contact with air at room temperature and pressure.

Very Toxic Substance: These are the substances that cause acute or chronic damage or death to human health when inhaled in small quantities, taken orally, when absorbed through the skin

Carcinogen Substance: Substances or preparations that may cause or accelerate the formation of cancer when inhaled, ingested, or penetrated the skin, ureamine production, processes that cause exposure to polycyclic aromatic hydrocarbons found in coal soot, coal tar and pitch, are exposed in the roasting and electro-refining process of copper-nickel ore. It refers to works that cause exposure to dust, spray and smoke, production of isopropyl alcohol by strong acid treatment, works and processes that cause exposure to hard wood dust, and the substance or preparation that comes out during these operations.



Highly Flammable Substance: Without the application of energy, a substance that can heat up in contact with air at ambient temperature and ignite as a result, or a solid substance that can spontaneously burn in short-term contact with a fire source and continues to burn after the source of fire is removed, or a liquid substance with a flash point below 21°C or means substances which, in contact with water or moist air, emit dangerous amounts of highly flammable gases.

Oxidizing Substance: They are substances that cause significant exothermic reaction in particular with other substances, especially flammable substances.

Explosive Substance: It refers to substances in solid, liquid, pasty, gelatinous state, which can react exothermically with the sudden release of gas even in the absence of atmospheric oxygen and/or spontaneously explode with heating when partially closed, or explode under specified test conditions, quickly glowing.

Corrosive Substance: They are substances that are not classified as abrasive, which can lead to the formation of local erythema, eschar or edema in the immediate, long-lasting or repeated manner directly on the mucosa or skin.

Toxic Substance: These are the substances that cause acute or chronic damage or death to human health when inhaled in small quantities, taken orally, when absorbed through the skin

Noxious Substance: These are the substances that cause acute or chronic damage or death on human health when inhaled, when taken orally, when absorbed through the skin.

Supplier: Means a manufacturer, importer, downstream user or distributor who places a substance or a mixture on the market on its own or in a mixture.

Hazard symbol: Refers to a graphical form, containing a symbol and other graphic elements such as a border, background motif or color, intended to convey specific information regarding the damage in question.

Liquefied Gases: Gases that are stored as liquids under pressure in a cylinder at normal temperature. Liquid gas is in equilibrium in the cylinder. Initially, the cylinder is almost filled with liquid. As gas is removed from the cylinder, the liquid evaporates, filling the cylinder so that the pressure of the cylinder remains constant. Anhydrous ammonia, chlorine, propane, nitrogen oxides and carbon dioxide are examples of liquefied gases.

Non-Liquid Gases: these are also called compressed or pressurized gases. These gases are gases that do not liquefy at normal temperature, even under great pressure. Oxygen, nitrogen, helium and argon are examples of these gases.

Dissolved Gases: Acetylene is the only known dissolved gas. Acetylene is chemically very unstable, even at atmospheric pressure acetylene can explode. However, acetylene can be stored in cylinders at high pressure (up to 250 psi and at 21°C) and can be used safely. Because acetylene cylinders are completely filled with inert, porous absorption material. This material is saturated with acetone or other suitable solutions. When acetylene gas is added to the cylinder, the gas becomes stable by dissolving in acetone.



Flammable Gases: Flammable gas is a gas or gas mixture with a flammability range at a standard pressure of 101.3 kPa and air at 20°C.

Oxidizing Gases: An oxidizing gas is any gas or gas mixture that, by giving oxygen, causes or contributes to the combustion of other materials more than air.

Flammable Aerosol: If aerosols contain any component from flammable solids, liquids and gases, they should be considered in flammable classification.

Aerosols: Aerosols, also meaning aerosol machine, are non-reusable containers made of metal, glass or plastic, and contain a gas dissolved, liquefied or compressed under pressure, with or without foam, paste or a powder. Aerosols are equipped with a release device that allows the contents to be removed as particles, solid or liquid in suspension in the gas, such as gas or liquid or foam, paste or a powder.

Flammable Liquids: Flammable liquids are liquids with a flash point lower than 60°C.

Flammable Solids; A flammable solid is one that is easily combustible or that can cause or contribute to a fire due to friction. Easily combustible solids are harmful substances or mixtures in powdered, granular or pasty form that ignite easily and spread rapidly when in contact with a burning source, such as a lit match, for a short time.

Self-reactive Substances and Mixtures Self-reactive substances or mixtures are thermally unstable liquid or solid substances or mixtures that can undergo strong exothermic decomposition even without the participation of oxygen (air). This definition does not cover substances and mixtures classified as explosive, organic peroxide or oxidizer according to this classification.

Pyrophoric Liquids: A pyrophoric liquid is a liquid substance or mixture that can ignite within five minutes after coming into contact with air, even in very small quantities.

Pyrophoric Solids: A pyrophoric solid is a solid or mixture that can ignite within five minutes after contact with air, even in very small quantities.

Self-Heating Substances and Mixtures: A self-heating substance or mixture is a liquid or solid substance or mixture, other than a pyrophoric liquid or solid, which is liable to spontaneously heat up by reaction with air and without requiring energy; This substance or mixture differs from pyrophoric liquids or solids in that it ignites only in large quantities (kilograms) and over a long period of time (hours or days). production process. If the rate of heat generation exceeds the rate of heat loss, the temperature of the substance or mixture in question will rise and may cause self-ignition or combustion after an induction time.

Substances and Mixtures that Emit Flammable Gases in Contact with Water: Substances or mixtures which, in contact with water, emit flammable gases, are solid or liquid substances or mixtures which, by reaction with water, are liable to become suddenly flammable or to emit flammable gases in dangerous quantities.

Oxidizing Liquids: An oxidizing liquid is a liquid substance or mixture that does not burn very well on its own, but generally creates oxygen, causing or contributing to the combustion of other materials.



Oxidizing Solid: Oxidizing solid means a solid substance or mixture that is not self-flammable but can generate oxygen, causing or contributing to the combustion of other materials.

Organic Peroxides: Organic peroxides are liquid or solid organic substances that contain a bivalent-OO- structure and can be considered derivatives of hydrogen peroxide when one or two hydrogen atoms are replaced by organic radicals. Organic peroxide mixtures (formulations) containing at least one organic peroxide are considered organic peroxides. Organic peroxides are thermally unstable substances or mixtures that can undergo self-accelerated exothermic decomposition. In addition, they may have one or more of the following characteristics:

- prone to explosive decomposition;
- burning fast;
- sensitive to impact or friction;
- which may be dangerous in interaction with other substances.

Abrasive for Metals: A substance or mixture that is corrosive to metals is a substance or mixture that chemically damages metals or even destroys them.

Acute Toxicity: Acute toxicity is adverse effects that occur following oral or dermal administration of a single dose of a substance or mixture, or following multiple doses administered within 24 hours, or following a 4-hour inhalation exposure. The Acute Toxicity hazard class is divided into three as follows:

- Acute oral toxicity;
- Acute cutaneous toxicity;
- Acute inhalation toxicity

Skin corrosion / irritation Skin abrasion means irreversible damage to the skin, ie visible necrosis throughout the epidermis and within the dermis, following application of a test substance for up to 4 hours. Corrosive reactions are typically seen in the form of ulcers, bleeding, bloody/scaly wounds and skin bleaching after a 14-day observation period resulting in discoloration, overall hair loss, and areas of scarring. Histopathology is considered for the evaluation of suspicious lesions. Skin irritation refers to the occurrence of reversible skin damage following application of a test substance for up to 4 hours.

Serious Eye Damage/Eye Irritation: Serious eye damage is complete irreversible tissue damage or severe loss of physical vision in the eye that occurs within 21 days of application of a test substance to the anterior surface of the eye.

Eye irritation is the occurrence of completely reversible changes in the eye within 21 days of application following application of a test substance to the anterior surface of the eye.

Respiratory or Skin Sensitization: A respiratory sensitizer is a substance that causes hypersensitivity in the respiratory tract after inhalation. A skin sensitizer is a substance that, in contact with the skin, causes an allergic response.

Carcinogenicity: Carcinogen means a substance or a mixture of substances that triggers cancer or increases its incidence. Substances that induce benign and malignant tumors from well-conducted experimental studies in animals are also assumed or suspected to be carcinogenic to humans unless there is strong evidence that the mechanism of tumorigenesis is not relevant for humans.



Reproductive Toxicity: Reproductive toxicity includes adverse effects on sexual function and reproduction in adult males and females, and developmental toxicity in offspring.

Specific Target Organ Toxicity - Single Exposure: Specific target organ toxicity (single exposure) is defined as specific and non-lethal target toxicity occurring at a single exposure to a substance or mixture.

Specific Target Organ Toxicity - Repeated Exposure Specific target organ toxicity (repeated exposure) is specific target organ toxicity resulting from repeated exposure to a substance or mixture. All major health effects, whether reversible or irreversible, immediate and/or delayed that may impair function, are included.

Aspiration Damage: "Aspiration" means that a liquid or solid or mixture enters the oral or nasal cavity directly or indirectly through vomit into the trachea and lower respiratory tract.

Hazardous to the Aquatic Environment: "Acute aquatic toxicity" is the intrinsic property of a substance that is harmful to the aquatic environment with short-term exposure. "Chronic aquatic toxicity" is the intrinsic property of a substance to cause adverse effects to aquatic organisms during exposure determined in relation to the organism's life cycle.

Label Elements for Hazards to the Ozone Layer: A substance should be classified as Ozone Harmful (Category 1) if evidence of its properties and predicted or observed environmental characteristics and behavior indicates that it may pose a hazard to the structure and/or function of the stratospheric ozone layer.

Gas: i) having a vapor pressure of more than 300 kPa (absolute) at 50°C; or
ii) means a substance that is completely gaseous at 20°C at a standard pressure of 101.3 kPa;
Liquid: i) having a vapor pressure of not more than 300 kPa (3 bar) at 50°C;
ii) not completely gaseous at 20°C at a standard pressure of 101.3 kPa; and
iii) means a substance or mixture with a boiling point or initial boiling point of 20°C at a standard pressure of 101.3 kPa.

Solid: It means a substance or mixture that does not meet the definitions of liquid or gas.

Boiling Point: The temperature at which the vapor pressure of the liquid is equal to the atmospheric air pressure surrounding the liquid. Atmospheric air pressure is accepted as 14.7 psia (760 mm Hg) to define the boiling point. Since the boiling point will not be constant in the mixtures, the point where 20% of the mixture is distilled as specified in ASTM D 86 (Distillation of Petroleum Products Under Atmospheric Pressure Standard) is used as the boiling point.

Burning Point: When a liquid is exposed to fire according to ASTM D 92 test method; The lowest temperature at which it starts to ignite and decompose chemically.

Flash Point: The lowest temperature at which a liquid or solid begins to emit gases from its surface at which its mixture with air will form an ignitable mixture.

Stable Matter: Substances that have the capacity to remain without deteriorating their chemical structure against external factors such as air, water, heat.



Unstable (Reactive) Substance: They are pure or compound substances that decompose, condense or become self-reactive under severe chemical environment changes such as shock, pressure, and temperature.

Simple Asphyxia (Asphyxiating) Gas: Gases that do not allow enough oxygen to sustain life in the environment and do not have any other physical or life-threatening hazards.

LD50 Acute Oral Toxicology Value: The dose of the tested substance that, when administered orally for 14 days to a population of young male and female albino mice, results in the death of half of the mice in the population.

LD50 Acute Dermal Toxicology Value: It is the dose of the tested substance that results in the death of half of the animals in contact with the bare skin of albino rabbits for 24 hours, as a result of continuous contact within 14 days.

LC50 Acute Respiratory Toxicology Value: The concentration of the tested gas, dust, or mist substance on a population of male and female young albino mice upon inhalation for 1 hour resulting in the death of half of the mice in the population within 14 days.

Asbestos: Actinolite Asbestos, CAS No 77536-66-4, Anthophyllite Asbestos, CAS No 77536-67-5, Grünerite Asbestos (Amosite), CAS No 12172-73-5, Chrysotile, CAS No 12001-29-5, CAS No 132207-32-0, Crocidolite, CAS No 12001-28-4, Tremolite Asbestos, CAS No 77536-68-6 covers fibrous silicates.

Hazard: It refers to potential harm or injury that may either occur in workplace or come from external environment and affect the employees or workplace.

Risk: Indicates the possibility of loss, injury, or other harmful result from the hazard.

Risk Assessment: It means the works required to be performed in order to identify the internal and external hazards, analyse and grade the factors which turn such hazards into risks and the risks arising from such hazards, and determine control measures,

Prevention: It refers to all the measures planned and taken to eliminate or reduce the risks related to occupational health and safety at all stages of the work carried out in the workplace.

Permit to Work (PTW): It is an authorization document approved by the supervisor or manager that specifies the precautions and conditions that require the execution of potentially dangerous or interfering activities. At the same time, it is a written document that authorizes the designated people to carry out the work in the determined time frame and area. It is a formal written system that provides control of certain types of work identified as potentially dangerous. Based on the risk analysis, it defines how the work for which permission is requested will be done, includes general information about the work to be done, site preparations, occupational safety measures and requirements, and the signatures of the relevant persons.

Authorized Gas Measurement Personnel: He is an expert who will test the presence of flammable gas or steam, toxic gases and oxygen, especially in "closed areas". This person may also be an in-house trained person authorized by the project or a third party.



Control: Inspection to evaluate the suitability of the process and procedures for working with chemicals.

Authorized Person: Within the scope of this standard, it is the person authorized by the project to handle hazardous chemicals and/or control the work with chemicals.

Competent Person: Person authorized in accordance with local HSE legislation and international HSE standards (certificate, etc.), who has received adequate and necessary training, has technical and appropriate practical and theoretical experience, and can detect dangerous or risky situations.

Expert Person: A valid license, associate degree, professional certificate, extensive knowledge, education and experience is a person who has the competence to solve or troubleshoot related issues, projects or work.

HSE Monitoring System: It is the system where the competent person(s) is responsible for the introduction, implementation and control of the system.

Project / Business Management: It represents all project responsible manager and/or subordinates depending on the organizational structure of the Project/Enterprise. (In projects; Project Manager, Assistant Project Manager, Site Chiefs, Department Chiefs, etc. In enterprises; Operations Manager, Technical Manager, etc.)

5.0 IMPLEMENTATION AND GENERAL RULES

Principles and minimum requirements set out in this procedure; It has been prepared on the basis of ILO, EN and other international standards. It is obliged to establish the minimum HSE requirements to be provided to the project in a way that covers the following principles, and can detail these requirements and/or exceed these requirements.

5.1 GENERAL RULES

- For all hazardous chemicals, a good hazardous materials minimization program focusing on life cycle management principles should be implemented for the purpose of chemical management from the identification stage to the disposal stage.
- By applying the substitution method, non-hazardous or less dangerous chemicals are used instead of dangerous chemicals in terms of health and safety of employees.
- Appropriate process and engineering control systems are selected and appropriate machinery, materials and equipment are used in working with hazardous chemicals, including maintenance and repair works that may pose a risk to the health and safety of employees, and taking into account technological developments.
- Job-specific risk analysis is mandatory in all working areas. It is necessary to carry out a separate risk assessment for each dangerous chemical and the scope of the risk assessment should not be less than that specified in the standard. A new activity involving dangerous chemicals should only be started after all kinds of precautions determined by risk assessment have been taken. In order to prevent the risk at its source; Collective protection measures such as proper work

organization and establishment of adequate ventilation systems are implemented. In cases where the precautions for the collective protection of employees from the adverse effects of hazardous chemical substances are not sufficient, personal preventive precautions/ measures shall be applied together with these precautions. In order to ensure the effectiveness and continuity of the measures that have been taken, sufficient checks, inspections and supervision have to be employed.

- It is forbidden to work alone while working with chemicals.
- It is forbidden to eat, drink and smoke in chemical substances or in storage areas.
- It is obligatory to use personal protective equipment suitable for the hazards of the chemical substance or mixture during work and handling with chemical substances.
- All employees with hazardous chemicals cannot work without receiving relevant training.

5.2. Application

5.2.1. Risk Assessment:

In the risk assessment to be carried out in working with chemical substances, the following points should be taken into account in particular:

- Hazards and harms of the chemical substance in terms of health and safety
- Material safety data sheet prepared in the language of the employees to be provided from the manufacturer, importer or seller
- Type, level and duration of exposure
- Amount of chemical substance, conditions of use and frequency of use
- Occupational exposure limit values and biological limit values given in international and local legislation
- The effect of preventive measures taken or to be taken
- Results of previous health surveillance, if any
- In works with more than one chemical substance, each of these substances and their interactions with each other.

5.2.2. Classification and Labeling of Chemical Substances

- The potential hazards of chemicals are determined by classification. These potential hazards are; It is divided into three groups as physico-chemical, toxicological and environmental-related. Information on potential hazards is included in the Chemical Safety Data Sheet (SDS) or on the chemical's label.
- The purpose of the classification is to describe the physico-chemical, toxicological and ecotoxicological properties of the substance that may pose a risk during normal handling or use. Once the substance or mixture has been identified, it should be labeled to indicate the hazards to protect users, the public and the environment.

- Classification of a product is based on available data. The source of this data is the legislation on dangerous goods or the label legislation in transportation and the material safety data sheet. In a non-hazardous product, the information provided by the supplier or the information obtained from the experience can also be used.
- Classification of chemicals and mixtures is given in Annex 3 Table 1.

5.2.3. Transport of Chemicals

- In the transportation of dangerous chemical substances by road, transportation should be provided according to the provisions of the ADR contract. Dangerous goods transportation signs and their meanings are given in Annex 3 Table 4.
- In the transport of dangerous chemical substances by sea, transportation should be provided in accordance with the provisions of the IMDG Code.
- In the transportation of dangerous chemical substances by air, transportation should be provided in accordance with the provisions of ICAO Technical Instructions.
- Transportation of dangerous chemicals by rail should be provided in accordance with the provisions of RID.

5.2.4. Hazard Communications

- All chemicals should be used after the project's HSE Departments and Workplace Physician's review.
- It should be kept up-to-date and in writing by the project, along with the inventory and SDS of all chemicals. Safety data sheets for all chemical substances must be requested from suppliers in a language that all employees can understand.

The chemical inventory should contain at least the following;

- Date,
 - Chemical name,
 - Brand,
 - Packaging (g, kg, ml, L etc.),
 - Hazard Class,
 - Quantity
- It should be ensured that the inventory and safety data forms of all chemical substances belonging to the subcontractors are forwarded to the project HSE departments and the Workplace Physician.
 - All chemical substance safety data sheets should be easily accessible at all times for routine operations and emergencies.
 - The hazards of all chemical substances and the precautions to be taken should be determined and conveyed to all employees, including subcontractor personnel.

- If the safety data sheet of a chemical cannot be provided by the supplier; The following should be known:
 - Composition of the substance
 - Health Hazards
 - First aid and emergency treatment procedure
 - Flammability and reactivity information
 - Firefighting and emergency response requirements
 - Personal Protective Equipment
 - Safe storage and disposal information
-
- All chemicals or mixtures should be stored and stored in their original containers with closed lids. If it is required to be placed in another container in smaller quantities for use in the work area, labeling should be done and the suitability of the container for that chemical should be evaluated. The container is not used if there is a suspicion of being contaminated or containing another chemical.
 - All chemical substances should have labels with substance or mixture identification, warning phrases, hazard marking and warning phrases on their containers.
 - Pictograms for hazard communication and their meanings are given in Tables 2 and 3 of Annex 3.
 - All labels must be visible and legible, understandable by all employees and easily readable in the container.
 - In the areas where the chemical is stored and handled, the above-mentioned warning signs of the chemical or the mixture, the mandatory PPE(s), emergency response equipment must be visibly marked.
 - Hazardous chemical waste containers should be labeled in the same way.
-
- All employees must have received training on particularly hazardous chemicals before starting to work.

5.2.5. Storage

- Storage of dangerous substances and mixtures should be done within the scope of local regulations.
- Along with the SDS and chemical inventory, chemicals and mixtures should be classified according to their hazard characteristics (based on the physical and chemical properties of the chemical substance or mixture) for storage safety, and compatible and incompatible chemical substances should be separated by evaluating the interaction of chemicals and mixtures with each other. While doing this, the hazard properties that require special fire and explosion precautions should be taken into consideration (eg explosiveness, very flammability, easy flammability, flammability or oxidation). In addition, very toxic, toxic and corrosive properties should be taken into account when storing dangerous products. Since irritant, harmful and environmentally hazardous characteristics are not related to the mixed storage rule, they do not cause separate storage.

- Chemical substances and mixtures that should not come into contact with each other should be stored in separate warehouses.
 - Separate storage; Separate storage means keeping them in separate storage areas. Storage Area
 - The rooms in the buildings are separated from each other by fire resistant walls and ceilings,
 - It is defined as being at the required distance from each other in the open environment or separated by a fire resistant wall.
 - Separate storage may be required in order to prevent the risks that may increase if products belonging to different storage classes come into contact with each other.
 - Segregation; It means that products are stored in the same storage area at a distance from each other or with an obstacle between them (eg wall, non-combustible products of storage class 12 or 13). In principle, products belonging to the same class can be stored together. It may be necessary to apply segregation in the same area, for example, some products belonging to the same or different storage class may contain different structural features, they can be stored mixed together according to the storage table.
- Information on products can be found at the following sources:
- Warning phrases on the labels of dangerous substances or mixtures
 - safety data sheets
- If the storage class of a product conforms to the classification of a similar product, similar safety measures are required for that product. To be able to place a product in a storage class, the following rules apply:
 - Explosive, radioactive and infectious materials are subject to special storage regulations. So each class is stored separately (with exceptions).
 - The physical and chemical hazards of the products precede their toxicological hazards.
 - Products with no hazard characteristics are considered secondary.
- The order of importance in storage is as follows
 - Infectious Substances
 - Radioactive Substances
 - Explosive substances
 - Compressed, liquefied and dissolved gases and compressed small gas packages
 - Spontaneously Combustible Substances
 - Substances which, in contact with water, form flammable gases
 - Organic Peroxides
 - Oxidizing Substances
 - Flammable solids
 - Flammable Liquids
 - Flammable Liquids
 - Flammable toxic substances
 - Non-flammable toxic substances
 - Flammable Corrosive Substances
 - Non-flammable corrosive substances
 - Flammable liquids, if not included in 3 A or 3 B



- Flammable Solids
- Non-flammable liquids
- Non-flammable solids

- In mixed storage, information is given in Appendix 4 for each storage class as those that are allowed to be stored together, those that are not allowed (separate storage required), and those that can be stored together under some restrictions (segregation in the same storage area).
- Dangerous concentrations of flammable and explosive substances and chemically unstable substances in dangerous quantities must be prevented. If this is impossible,
- The presence of ignition sources that may cause fire or explosion is avoided. Conditions that may cause harmful effects of chemically unstable substances and mixtures should be eliminated. If this also is impossible,
- Necessary precautions should be taken to prevent or minimize the harm to workers in case of fire or explosion caused by flammable and/or explosive materials or from the harmful physical effects of chemically unstable substances and their mixtures.
- The design, manufacture and supply of work equipment and protective systems provided for the protection of workers are carried out in accordance with applicable international and local legislation in terms of health and safety. It should be ensured that all equipment and protective systems to be used in explosive atmospheres comply with international standards and local regulations. Arrangements are made to reduce the effect of burst pressure. Hazard zones must be determined in potentially explosive atmospheres, and all protective systems, including electrical and ventilation installations suitable for the hazard zones, must be ensured to be suitable for this. (ATEX)
- Flammable and inflammable liquids cannot be stored in corridors, transitions, stair landings, under stairs, in basements, in halls and foyers where everyone can enter, in escape routes, in working places, in public places such as restaurants.
- Emergency exits and walkways should be kept open at all times in chemical substance or mixture storage areas.
- Chemical substance identification should be made in places and shelves where chemical substances and mixtures are present. All necessary warning signs should be posted.
- Especially flammable chemicals should be stored in a way that is protected from heat sources and sunlight.
- Precautions should be taken to prevent the material from falling from the storage shelves.
- Glass-type, breakable containers should generally be stored below eye level.
- SDSs will be kept at easy access points by employees in the storage area.



- Sufficient amount of spill kits and emergency PPEs for hazardous chemical substances or mixtures for emergencies (required barrier material against chemical spills and leaks) will be available.
- Chemical substances and mixtures should not come into direct contact with the ground. It should be in a secondary container against the danger of spillage.

Hazardous Substance or Mixture Storage Properties;

- In order to prevent the risk at its source; Collective protection measures such as proper work organization and establishment of adequate ventilation systems are implemented. A ventilation system suitable for the characteristics of the chemical substance should be installed. The ventilation system should be selected according to the characteristics of the stored chemicals.
- Hazardous chemicals and mixtures should be kept away from open fire sources.
- Warehouse racks and doors must be grounded.
- Fire safety measures must be taken with mobile and/or fixed systems in the warehouse.
- The warehouse floor should be made of non-slip and easy-to-clean material.

Storage of Compressed Gas Cylinders;

- Warehouse Area; Gas cylinders should be stored in a ventilated, well-lit place away from flammable materials. Gases should be stored in easily distinguishable places determined according to their types. Cylinders containing flammable gas; They must be separated from oxygen and other oxidant cylinders by a fireproof wall or there must be a distance of at least 6.1 meters between them. Toxic, cryogenic and inert gases should be stored separately.
- The labels of the cylinders should never be removed.
- Cylinders should be stored out of reach of unauthorized personnel. Storage areas; It should be closed in a place away from excessive heat and open fire sources. It should be dry, cool and well ventilated. Outdoor storage should be dry and protected from the air. All cylinders should be protected from direct sunlight. Cylinders should be protected from direct sunlight and should not be stored at temperatures above 50°C.
- For the safety of the cylinders in the storage area, the cylinder must be tied with a chain or linen strap to prevent it from tipping over. When the cylinders are in the storage area, the head of the valves must be absolutely connected.
- Flammable and combustible gas cylinders must be stored separately from other flammable materials.
- In areas where there is no flammable material near the cylinders and open to air flow from above and below, the cylinders should be stored vertically, there should be no open flames where the cylinders are stored, smoking should not be allowed near the cylinders, there should be warning signs in the storage area according to the gas type.

- It is forbidden to store in narrow courtyards, pedestrian and traffic crossings, excavations, canals, and river sides in open storage.
- In outdoor storage; There should be a safety distance of 5 m against the possibility of heat dissipation near the warehouse. For the safety of the warehouses built adjacent to the wall of the workplace building, there must be a fire-resistant wall of at least 2 m from the right and left of the warehouses. Cylinders stored in the open area should be surrounded by wire fence mesh and locked in order to prevent them from tipping over outside the area. In addition, these cylinders should be protected against corrosion and heavy weather conditions (sun, snow, storm, etc.), and should not be kept in environments and forms that will cause corrosion.
- The floor of the area where the cylinders are stored should not be soil, slopes, pits, cracks, etc. should not exist.
- Cylinder storage areas should be kept clean and orderly, and unauthorized persons should be prevented from entering them. Signs indicating that the cylinder is stored here and that it should not be approached with fire should be hung visibly.
- In order to provide ease of access to the cylinders, space should be left for walkways in the storage area. There should be no ground on the walkways that would damage the cylinders.
- The cylinder temperature should not be allowed to exceed 52°C. Although steel cylinders are more durable than aluminum cylinders, they should not be stored near steam pipelines or in direct sunlight. There should not be a source around the cylinder that will raise any part of it above 52°C.
- Empty cylinders and filled cylinders should always be stored separately from each other, and the use of full cylinders should be started with the ones that come first.
- For empty cylinders, the cylinders must first be sorted into the storage area so that old production cylinders can be used. Empty cylinders should be stored separately and easily identifiable. Empty cylinders should be brought to the storage area immediately. It should be left slightly pressurized so that the emptied cylinder will absorb the air back and not get moisture and dust. The above-mentioned segregation should also be done in the storage of empty cylinders.
- Fire extinguishers (containing carbon dioxide or dry chemical) must be available in the cylinder storage area for emergency response to fire. In order to use it in the cylinder cooling process in case of fire, there should be a hydrant or a pressurized water source at a distance that can reach the cylinder storage area.
- Fire extinguishers to be kept in the storage area should not be kept locked in the same area as the cylinders.

5.2.6. Handling:

- It is obligatory to use PPE specified in the SDS specific to each substance in all chemical substance or mixture handling.

- Within the scope of the project chemical inventory, the PPE matrix should be created and all employees should inform before handling.
- Before the use of PPEs, employees should be informed of their correct use.
- Employees should be informed about the maintenance of PPE.
- By the project, the workplace physician will be informed about the characteristics of the chemical, how often and for how long, including the respiratory hazards of the chemical.
- Selection of respiratory protection should be based on, at a minimum, the following;
 - The content of the operation in which the dangerous substance will be used
 - Hearing Protection
 - The closest distance of the hazardous area to breathable air
 - How long will respiratory protection be used?
 - What the user will do in the danger area
 - Capacity and limitations of respiratory protection
 - Protection factors for respiratory protection
 - Respiratory Protection requirements (compliance with standards or legislation)
- The use of appropriate type of eye protection is obligatory when handling all chemicals and mixtures that pose a risk of splashing into the eyes.
- Hand protection, foot protection, body protection should be provided in the appropriate type in all chemical handling.

5.2.7. Storage/Use of Flammable and Combustible Liquids with Underground and Aboveground Tanks

- All flammable and combustible liquids will be stored in tanks within the scope of local legislation.
- Above ground tanks minimum requirements are specified including but not limited to;
 - All tanks will be located in an overflow pool sized to contain at least 110% of the largest tank's volume. Tanks and storages should be installed on concrete surfaces that slope towards internal drains that will divert leaking liquids to collection areas.
 - The floor must be impermeable to prevent spreading into the soil.
 - Roof covering should be done to protect from weather conditions.
 - Diesel fuel tanks should have properly sized vent lines that terminate in the open air and at a height such that overfilling does not cause the tank to rupture.
 - The tank(s) will be located at a suitable distance from any sensitive receptors (eg soil stack, springs) and in safe locations against impacts from construction operations.
 - Appropriately designed spill response kits should be located near stored materials.
 - Level indicators must be installed in storage tanks.
 - Reserve fuel, oil and grease drums will be stored in the secondary container; drip pans should

be provided.

- Access by unauthorized persons should be prohibited.
- It should be stored away from open fire sources and any source of ignition.
- All necessary warning signs must be visibly placed.
- Environmental safety precautions should be taken in the storage area.
- Tanks should be properly grounded and inspected periodically. Grounding measurements should be made by experts at regular intervals.
- Ventilation should be of sufficient capacity to prevent steam or liquid backflow at the filler neck while the tank is being filled.
- All electrical equipment must be of suitable specification.

5.2.8. Compressed Gas Cylinders

- The classification of gases according to their chemical properties is in 6 categories;
- Corrosive Gases; Gases that damage material or tissue when they come into contact with them are classified as corrosive gases. They can also be reactive, toxic and flammable or oxidizing. Although most of them are in low concentration, they cause dangerous results in long-term contact. For example; Nitrogen dioxide, phosgene, sulfur dioxide etc.
- Combustible Gases; Gases that form a flammable gas mixture of 13% or less when mixed with air under atmospheric pressure and temperature, or that have a flammability rate of more than 12% in air, regardless of the lower flammable limit, are classified as flammable gas. They can be toxic, reactive or displace oxygen from the air at high pressures. For example; Acetylene, hydrogen, butane, propane, methane etc.
- Noble Gases; They are classified as gases that do not react with other substances under ordinary temperature and pressure. Although they are non-flammable and non-toxic, they are colorless and odorless. These gases are usually stored at 2000 psi (138 bar) and above. For example; Helium, argon, Xenon, neon etc.
- oxidants; Gases that are not combustible but are classified as gases that support combustion. For example; Oxygen, Ammonium sulfate, barium chlorate etc.
- Cryogenic Gases; Gases with a boiling point below 90 °C under atmospheric conditions. These gases are extremely cold and are produced in an intense flame and can cause very severe tissue necrosis. Cryogenic liquids are obtained at high pressure. Parts of the system may break or crack at cryogenic temperatures. For example; Nitrogen, nitrogen, oxygen, argon etc.
- Toxic or Toxic Gases; Gases that have lethal or harmful effects on humans are classified as toxic or poisonous gases. They can be reactive, non-flammable, flammable and/or oxidizing under high pressure, depending on toxicity. Depending on the gas, the degree of toxicity and effects may vary, but can be fatal if inhaled in sufficient quantities. For example; Phosgene, hydrogen fluoride etc.
- It is forbidden to work with cylinders without a pressure regulator. The most ideal regulator for the use of high purity gases are those with a stainless steel diaphragm. Regulators should be cleaned at



regular intervals. The replacement interval of the regulators should be determined by consulting the authorized services.

- Check valves should be used between each hose between the regulator and the hose and where the hoses connect to the torch. Check valves should be used as recommended by the manufacturer, of the correct type and size.
- Cylinder valves must be undamaged, without cracks, complete and intact. The protective caps of the cylinders must be attached when the cylinders are not in use and during storage.
- Hoses used for Gas Cylinders should be inspected prior to use for cracks, deterioration, damage and leaks. If there is any, the hose should be replaced with a good one immediately. Hoses should not be wrapped with tape; these tapes may contain flammable hydrocarbons. For acetylene gas, copper pipe should not be used against the potential explosion hazard. Hoses must be protected from heat, oil, grease and mechanical damage.
- The torches used should not be used without check valves. A check valve must be attached to the oxygen group and LPG cylinder connected to the torch. There should be no leaks in the hoses and the torch connected to the torch. The hoses to be connected to the torch should be connected with clamps and it should be ensured that they do not leak gas. The oxygen collector used should also be blue in color. The main oxygen hose connected to the collector should also be blue in color. It should be noted that the hoses used do not leak gas. Ignitable substances, especially oils, should be away from oxygen. Inscriptions should not be written on the cylinder in such a way as to damage the cylinder wall. Full cylinders must be protected against temperature changes, sunlight and radiation light. Oxygen should never be used instead of compressed air.
- Cylinders should always be in an upright position when used and stored.
- Usually, cylinder pressures are given in kilopascals (kPa) or (psi). However, even if the pressure in the cylinder is read as 0, it does not mean that the cylinder is empty, the cylinder still contains gas at atmospheric pressure.
- If there are dents on the surface of the cylinder, if its permanent marks are corroded, if there is an unclear marking (weight, test date, etc.), if the color of the gas inside the cylinder and the outer surface are incompatible, the cylinder should not be taken from the gas filling company and the unsuitable cylinders should be returned. Depending on the type of gas inside, the cylinders should be tested periodically every 5 or 10 years, and the test dates should be permanently marked on the cylinder.
- It should be ensured that all parts and connections are made properly, but never force should be used. A simple valve connection must be assigned to the regulator, even if it is designed for different gases. The outer connections of most cylinder valves are marked with a metal seal. In such cases the washer should only be used in the marked areas. Teflon tape should not be used on the valve threads to prevent leakage. Pipe paste should never be used on pipe threads. Pipe threads should not be rotated in the opposite direction.

- Flame Arrestor; When combustible gas or oxygen is used, the return of a potential flame can cause a fire event. A flame arrester should be used against this situation. It prevents reverse flow, in which case the control valve stops the reverse flow of gas. It suppresses the returning flame, directs the flame in another direction and prevents explosions in the regulator, pipes and cylinder. It stops the gas flow, the shock wave before the flame comes back closes and locks the valves.
- A flame arrester should be placed on the downstream side of the regulator to prevent a flame from reaching the cylinder.
- Flame arresters increase the temperature of the flame in non-flammable carbon dioxide or argon gas cylinders and increase the pressure by increasing the kinetic energy of the gas with the effect of temperature, and this is mandatory in the regulator against the danger of explosion from the regulator, which is the upper part of the cylinder.
- In order to prevent backfire, it is necessary to clean the hoses or the torch well, not to apply the wrong gas pressure, not to use the wrong nozzle, not to use the wrong nozzle, to the torch valves that are not damaged, not to block the gas passage in the torch, to prevent the hoses from bending.
- Cylinders must be permanently marked according to the mandatory EN ISO 13769 standard. These markings should be made with 0.5 mm deep engraving on the cylinder neck.
- What Should Be On One Lateral Side Of The Cylinder Throat;
 - The company's commercial title, name, address and registered brand, if applicable,
 - Mark and number of this standard
 - Heat treatment
 - Yield limit of steel; (N/mm²)
 - Minimum wall thickness (mm)
 - Empty mass of the cylinder (kg) (excluding valve and cap)
 - Registered trademark of the inspection company or organization
 - It must be permanently marked by the manufacturer of the cylinder.
- What should be on the other lateral side of the cylinder throat;
 - Cylinder owner, company name and brand
 - The cylinder number of the cylinder owner company
 - Test pressure (DB), (bar)
 - Operating pressure (IB), (bar)
 - Cylinder empty mass (kg) (including valve and cap)
 - Type of gas
 - Net mass of gas in cylinder, (kg)
 - Year and month of the first inspection
 - Registered trademark of the inspection company or organization
 - Subsequent examinations; year and month
 - Registered trademark of the inspection company or organization
 - The cylinder must be permanently marked by the supplier.
- If the contents of the cylinder are not clearly written, use should not be allowed. There must be warning labels on the gas cylinders in accordance with the EN ISO 7225 standard.



- The cylinders must be transported by the car in such a way that they do not fall with the cylinder fixer.
- Cylinders should be kept away from any impact, puncture effect. The valve of the cylinder should be checked for oil, grease, dirt and damage. Dirt and dust should be removed with a clean cloth. Cylinders with oil and grease on the valve of cylinders containing oxygen or other oxidants should never be used.
- When using all gases, the use of PPE specified in the SDS is mandatory.

General Precautions to be Taken in the Use of Compressed Gas Cylinders;

- Corrosive Gases
 - Cylinder valves should be checked regularly to ensure they are not worn. In case of detection of wear on the cylinder or its valves, the supplier should be notified and necessary actions should be taken in accordance with their instructions.
 - The employee should be aware that there may be a blockage in the valve in cases where the gas flow does not start immediately when the valve is opened slowly.
- Flammable Gases
 - All possible sources of ignition; Proper design of facilities should be countered by the restriction of smoking and open flames.
 - For the evacuation of these gases, ventilation and flame arrester made of steel should be used.
 - In areas where these gases are stored and used, a fire extinguisher and, if applicable, a suitable detector should be available.
 - It should be constantly remembered that the flammable gas source should be kept closed when not in use.
- Oxidizers
 - Where there is a possibility of rapid reaction by oxygen and other oxidants, all sources of ignition should be eliminated.
 - They should not be stored together with flammable materials.
 - Care should be taken not to lubricate the cylinders or other equipment used in work with such gases. In addition, the contact of these gases with grease or other flammable materials should be prevented.
 - Only equipment suitable for the job should be used.
 - Only the regulator clearly specified for the work performed should be used.

5.2.9. Working with Asbestos

- In the works of asbestos removal, demolition, repair, maintenance and removal, minimum specified precautions should be taken to prevent exposure to asbestos dust and to protect it from health risks arising from this exposure, including but not limited to the following;

- Project(s)/Enterprise(s) should carry out risk assessments, taking into account the type and physical properties of asbestos and the degree of exposure of workers, in works that have the risk of exposure to asbestos dust.
- Before starting the dismantling, demolition, repair, maintenance and removal works, a determination should be made before starting the work to determine the materials that may contain asbestos and their locations.
- Warning signs should be posted if there is a possibility that the exposure limit values specified in local legislation may be exceeded.
- Appropriate respiratory protection should be provided to workers. Chest X-ray is mandatory in the health examination.
- Asbestos or dust from asbestos-containing materials should be prevented from spreading outside the facility or work area. (Ex: Continuous irrigation of the working area, irrigation of waste, excavation, etc. loaded on trucks, etc.)
- Only authorized persons are allowed to work with asbestos.
- It is allowed to carry out work under the supervision of a specialist.
- Fiber count should be done in asbestos samples taken regularly from the working environment.
- Studies should be carried out with as few employees as possible.
- It should be ensured that the cleaning and maintenance works of the places where the work with the risk of exposure to asbestos are carried out and the equipment used are carried out regularly and effectively.
- Asbestos or dust-generating asbestos-containing materials are transported in suitable sealed packages and should be stored separately from other materials.
- Wastes containing asbestos should be collected immediately, labeled using the markings in the relevant legislation to show that it contains asbestos, and removed from the workplace as soon as possible in sealed packages and should be disposed of in accordance with the relevant legislation.
- In case the limit value is exceeded; The reasons for exceeding the limit value are determined and the necessary measures are taken immediately to reduce the asbestos concentration below this value. Work cannot be carried out in the affected area until appropriate measures are taken to protect workers. To determine whether the measures taken are adequate or not, the asbestos concentration should be measured again in the ambient air. In cases where it is not possible to reduce the exposure with other measures and it is only possible to comply with the limit value by using a respiratory system protection, the work of the employees with the protector cannot be continuous, the maximum time that each employee will work is determined in advance and this period cannot be exceeded. Appropriate rest breaks should be given, taking into account the physical conditions, climatic conditions, and the views of the employees or their representatives, during the work carried out using protective equipment.
- In the work areas determined to be asbestos;
 - Necessary markings are made and warning signs should be placed.
 - Employees other than those on duty should be prevented from entering.
 - Areas where smoking is prohibited should be determined.
 - 4) Places dedicated for dining are selected from the places apart from those with the risk of asbestos powder pollution.
- In workplaces working with asbestos;



- Employees are provided with appropriate personal protective equipment such as protective clothing and respirators.
- Personal protective equipment cannot be taken out of the workplace. Protective clothing is cleaned in the workplace or where cleaning work is carried out and should only be removed from the workplace in closed containers.
- Protective clothing and the personal clothing of the employees are kept in separate places.
- Employees should be provided with suitable hand and face washing facilities, and shower facilities in dusty jobs. The personal protective equipment used should be stored in specially designated places, checked, cleaned, repaired and maintained after each use.

5.2.10. Training and Competence of Employees in the Scope of Working with Chemicals

- Persons working in the handling, storage, use and transportation of chemicals should be trained by expert person(s) and be aware of the potential hazards associated with these activities. Authorized personnel should only be experienced and trained employees selected by the expert for this purpose.
- Authorized persons cannot be authorized by the project to implement the chemical work program without receiving training in working with chemicals to undertake the responsibilities defined in this standard.
- Trainings on working with chemicals will be given to all employees at least once during the project. Refresher training will be provided as needed. Employees will be evaluated by the HSE department for renewal.
- Training on working with chemicals should also cover all subcontractor personnel who will work on the project.
- These trainings and briefings include in particular the following:
 - Information obtained as a result of risk assessment.
 - Recognition of hazardous chemical substances present or that may arise in the workplace, information on health and safety risks, occupational diseases, occupational exposure limit values and other legal regulations.
 - Necessary precautions and actions to be taken so that employees do not endanger themselves and other employees.
 - Information on safety data sheets (SDS) in employee language available from the supplier for hazardous chemicals.
 - Information on labeling/locking in accordance with the legislation on sections, containers, piping and similar installations containing hazardous chemicals.
- The basic structure of the trainings is designed by the Project HSE Trainer and sent to all projects.

5.2.11. Waste Disposal

- Disposal of chemicals or mixtures will be carried out by the project within the scope of local legislation.



- If the wastes of dangerous chemicals or mixtures are temporarily stored in the project, all precautions are taken, including but not limited to the following;
 - It should be stored according to the storage compatibility matrix of the chemical or mixture.
 - Chemical substances should be stored in accordance with storage precautions.
 - The lid of the chemicals in the container must be closed.
 - In order not to mix with the soil, the wastes should be stored in a sealed floor.
 - Appropriate ventilation should be provided.
 - Access by unauthorized persons must be blocked and must be in a locked area.
 - It should be stored in such a way that it will not be affected by weather conditions and not exposed to sunlight.
 - It should be stored away from open fire sources.
 - PPE of the chemical substance must be in the storage area.
 - Wastes should be identified by making necessary markings.
 - Necessary fire precautions must be taken. Portable fire extinguishers should be available.

6.0 IMPLEMENTATION CONTROL

- Chemical storage areas and chemical work will be inspected by the Project HSE Unit at regular intervals.
- Project Supervisors and the HSE Unit will conduct regular internal audits on chemicals and the findings of work program audits to ensure that any critical situations or practices within the system have been identified and that appropriate measures have been or are being taken.

7.0 RELATIONSHIP WITH OTHER PROCEDURES

In case this procedure conflicts with other HSE Procedures, is below the procedures, and contains less precautions, the provisions of this procedure are applied.

8.0 MONITORING, ASSURANCE AND VERIFICATION

Key success indicators (KPIs) of this procedure will be monitored, verified and evaluated by the relevant parties in accordance with their responsibilities set forth in the E&S Governance document, within the scope of the MAOG-RECU-GB-GNL-IS-PRG-0007-0 HSE Monitoring, Assurance and Verification Procedure.

9.0 REFERENCE AND RELATED DOCUMENTS

ILO Convention on Health and Safety in Construction No 167

Occupational Health and Safety Law No 6331

Regulation on Classification, Labeling and Packaging of Substances and Mixtures

Regulation of health and safety measures in working with chemical substances



CLP Regulations

NFPA Publications

European Occupational Safety Legislation

Environmental Law and Related Legislations

10.0 APPENDICES

Appendix-1 Classification and Labeling of Chemical Substances

Appendix -2 Hazard Statements

Appendix -3 Classification, Signs and Meanings of Hazardous Substances or Mixtures

Appendix -4 Compatibility Matrix for Storage

Appendix- 5 Safe Practice Methods

APPENDICES

Appendix-1 Classification and Labeling of Chemical Substances

- The basic classification criteria for physical hazards of chemicals and mixtures (not limited to those listed below – detailed in CLP regulations) are given below;
- Explosives
Substances and mixtures in this class that are not classified as unstable explosives are classified in one of the following six categories according to their hazardous properties:
 - Section 1.1; Substances, mixtures and articles subject to mass explosion hazard (mass explosion is an explosion that immediately affects almost all available quantity);
 - Section 1.2; Substances, mixtures and articles with reflection hazard but not mass explosion hazard;
 - Section 1.3; Substances, mixtures and articles with a fire hazard and a minor explosion hazard and a minor reflection hazard but not a mass explosion hazard;
 - (i) substances, mixtures and articles which, on combustion, give rise to significant radiant heat; or
 - (ii) sequential combustion of substances, mixtures and articles producing minor blast or reflective effects, or both;
 - Section 1.4; Substances, mixtures and articles which present no significant hazard:
 - substances, mixtures and articles which in the event of ignition or ignition present only minor hazards. Effects are largely confined to the packaging and no reflection of particles of appreciable magnitude or distance is expected. An external fire will not cause the immediate explosion of almost all the contents of the package;
 - Section 1.5, Extremely sensitive substances or mixtures with mass explosion hazard:
 - Substances and mixtures which have a mass explosion hazard but whose probability of explosion or transition from combustion to explosion under normal conditions is extremely low due to their insensitivity;
 - Section 1.6; Non-mass explosion hazard and highly sensitive items:

– Articles containing highly sensitive explosive substances and mixtures with a negligible possibility of accidental explosion or release.

- Labeling for Explosives;

Classification	Unstable Explosive	Section 1.1	Section 1.2	Section 1.3	Section 1.4	Section 1.5	Section 1.6
GHS Signs							
Warning Text	Danger	Danger	Danger	Danger	Attention	Danger	Warning Text not available
Hazard Statement	H200: Unstable Explosive.	H201: Explosive; mass explosion damage.	H202: Explosive; serious reflection damage.	H203: Explosive; fire, explosion or reflection damage.	H204: Fire or reflection damage.	H205: May cause mass explosion in fire.	No hazard statement available.
Precautionary Statement	P201 P202 P281	P210 P230 P240 P250 P280	P210 P230 P240 P250 P280	P210 P230 P240 P250 P280	P210 P240 P250 P280	P210 P230 P240 P250 P280	Precautionary statement not available
Precautionary Statement Intervention	P372 P373 P380	P370+P380 P372 P373	P370+P380 P372 P373	P370+P380 P372 P373	P370+P380 P372 P373	P370+P380 P372 P373	Precautionary statement not available
Precautionary Statement Storage	P401	P401	P401	P401	P401	P401	Precautionary statement not available
Precautionary statement Disposal	P501	P501	P501	P501	P501	P501	Precautionary statement not available

- Flammable Gases:**

- Category 1; at 20°C and a standard pressure of 101.3 kPa
 - (a) flammable gases in a mixture of 13% by volume or less in air; or
 - (b) gases with a flammability range of at least 12 percent regardless of the lower flammability limit value.
- Category 2; Gases with a flammability range when mixed with air at 20°C and a standard pressure of 101.3 kPa, except those in category 1.
- Labeling for Flammable Gases;

Classification	Category 1	Category 2
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Classification	Category 1	Category 2
GHS Sign		No sign available
Warning Text	Danger	Attention
Hazard Statement	H220: Extremely flammable gas	H221: Flammable gas
Precautionary Statement	P210	P210
Precautionary Statement Intervention	P377 P381	P377 P381
Precautionary Statement Storage	P403	P403
Precautionary statement Disposal		

- Flammable Aerosols;**

- Aerosols are classified as flammable according to heading 2.3.2.2 of the second part of this Annex if they contain any component that is classified as flammable according to the criteria in this section, e.g.:
 - Liquids with a flash point $\leq 93^{\circ}\text{C}$ containing flammable liquids according to heading 2.6 of the second part of this annex
 - Flammable gases
 - Flammable solids

Pyrophoric, self-heating or water-reactive substances and mixtures are not included in the scope of flammable components, as they are not used in aerosols. Flammable Aerosols, flammable gases, flammable liquids, flammable solids are not included.

- Labeling for Flammable Aerosols;

Classification	Category 1	Category 2
GHS Signs		
Warning Text	Danger	Attention
Hazard Statement	H222: Extremely flammable aerosol.	H223: Flammable Aerosols;
Precautionary Statement Precautionary	P210 P211 P251	P210 P211 P251
Precautionary Statement Intervention		
Precautionary Statement Storage	P410 + P412	P410 + P412
Precautionary statement Disposal		

- Oxidizing Gases;**

- Category 1; Any gas that, by giving off oxygen, causes or contributes to the combustion of other materials more than air

- Labeling for Oxidizing Gases;

Classification	Category 1
GHS Sign	
Warning Text	Danger
Hazard Statement	H270: May cause or intensify fire; oxidizer
Precautionary Statement - Precautionary	P220 P244
Precautionary Statement - Intervention	P370 + P376
Precautionary Statement - Storage	P403
Precautionary statement - Disposal	

- Gases
Pressure

Under

- Compressed gas; A gas that is completely gaseous at -50°C when packaged under pressure, including all gases at a critical temperature of -50°C.

- liquefied gas; A gas that is partially liquid at temperatures above -50°C when packaged under pressure. There is a distinction between the following two items:
 - high pressure liquefied gas: a gas with a critical temperature between -50°C and +65°C, and
 - low pressure liquefied gas: A gas with a critical temperature above +65°C.
 - refrigerated liquefied gas; A gas that becomes partially liquid when packaged due to low temperature.
 - dissolved gas; A gas that dissolves in a liquid phase solvent when packaged under pressure.
- Labeling for Gases under Pressure;

Classification	Compressed gas	Liquefied Gas	Refrigerated liquefied gas	Dissolved gas
GHS Signs				
Warning Text	Attention	Attention	Attention	Attention
Hazard Statement	H280: Contains pressurized gas; may explode when heated.	H280: Contains pressurized gas; may explode when heated.	H281: Contains refrigerated gas; may cause frostbite or injury.	H280: Contains pressurized gas; may explode when heated.
Precautionary Statement Precautionary			P282	
Precautionary Statement Intervention			P336 P315	
Precautionary Statement Storage	P410 + P403	P410 + P403	P403	P410 + P403
Precautionary statement Disposal				

- Flammable Liquids:**
 - Category 1; Flash point < 23°C and initial boiling point ≤ 35°C
 - Category 2; Flash point < 23°C and initial boiling point > 35°C
 - Category 3; Flash point ≥ 23°C and ≤ 60°C°

Classification	Category 1	Category 2	Category 3
GHS Signs			
Warning Text	Danger	Danger	Attention
Hazard Statement	H224: Highly flammable liquid and vapor.	H225: Flammable liquid and vapor.	H226: Flammable liquid and vapour.
Precautionary Statement	P210 P233 P240 P241 P242 P243 P280	P210 P233 P240 P241 P242 P243 P280	P210 P233 P240 P241 P242 P243 P280
Precautionary Statement Intervention	P303 + P361 + P353 P370 + P378	P303 + P361 + P353 P370 + P378	P303 + P361 + P353 P370 + P378
Precautionary Statement Storage	P403 + P235	P403 + P235	P403 + P235
Precautionary statement Disposal	P501	P501	P501

- Flammable solids**

Category 1; Burn rate test

Substances and mixtures other than metal powders:

- (a) the wet area is unable to extinguish the fire, and
- (b) if burn time < 45 seconds or burn rate > 2.2 mm/s

Metal powders

burning time 5 minutes

Category 2; Burn rate test

Substances and mixtures other than metal powder

- (a) the wet area is unable to extinguish the fire for at least 4 minutes; and
- (b) if burn time < 45 seconds or burn rate > 2.2 mm/s

Metal powders

burning time > 5 minutes and 10 minutes

- Labeling for Flammable Solids;

Classification	Category 1	Category 2
GHS Signs		
Warning Text	Danger	Attention
Hazard Statement	H228: Flammable Solid	H228: Flammable Solid
Precautionary Statement - Precautionary	P210 P240 P241 P280	P210 P240 P241 P280
Precautionary Statement - Intervention	P370 + P378	P370 + P378
Precautionary Statement - Storage		
Precautionary statement - Disposal		

- Self-reactive Substances and Mixtures

All self-reactive substances or mixtures shall be classified as self-reactive substances or mixtures, except:

- Being explosive according to the above criteria;
- If they are oxidizing liquids or solids according to the criteria specified in 2.13 or 2.14, excluding mixtures of oxidizing substances that meet the criteria for oxidizing substances and are classified as self-reactive substances in accordance with the specified criteria and contain 5% or more combustible organic matter;
- If it is organic peroxide according to the criteria specified in the classification;
- (d) the decomposition temperature is less than 300 J/g; or
- if the self-accelerating decomposition temperature (KHAAS) is more than 75°C for a 50 kg package.

- Labeling for Self-Reactive Substances and Mixtures;

Classification	Type A	Type B	Type C and D	Type E and F	Type G
GHS Signs		 			There is no label element belonging to this hazard class. Note: Type G does not have any hazard communication elements assigned, but it is considered to have properties belonging to other hazard classes.
Warning Text	Danger	Danger	Danger	Attention	
Hazard Statement	H240: Heating may cause an explosion.	H241: Heating may cause fire or explosion.	H242: Heating may cause fire.	H242: Heating may cause fire.	
Precautionary Statement	P210	P210	P210	P210	
Precautionary Statement	P220	P220	P220	P220	
Precautionary Statement	P234	P234	P234	P234	
Precautionary Statement	P280	P280	P280	P280	
Precautionary Statement Intervention	P370 + P378 P370 + P380 + P375	P370 + P378 P370 + P380 + P375	P370 + P378	P370 + P378	
Precautionary Statement Storage	P403 + P235 P411 P420	P403 + P235 P411 P420	P403 + P235 P411 P420	P403 + P235 P411 P420	
Precautionary statement Disposal	P501	P501	P501	P501	

• **Substances and Mixtures that Emit Flammable Gases in Contact with Water;**

Category 1; A substance or mixture that reacts vigorously with water at ambient temperature and which generally tends to spontaneously ignite the gas formed or readily reacts with water at ambient temperature such that the rate of formation of flammable gas is equal to or greater than 10 liters per kilogram per minute .

Category 2; A substance or mixture that does not meet the criteria of Category 1 which readily reacts with water at ambient temperature such that the maximum rate of flammable gas formation is equal to or greater than 20 liters per kilogram per hour.

Category 3; A substance or mixture which does not meet the criteria of Categories 1 and 2, which reacts slowly with water at ambient temperature such that the maximum rate of flammable gas formation is equal to or greater than 1 liter per kilogram per hour.

- Labeling for Substances and Mixtures that Emit Flammable Gases in Contact with Water;

Classification	Category 1	Category 2	Category 3
GHS Signs			
Warning Text	Danger	Danger	Attention
Hazard Statement	H260: In contact with water, it emits flammable gases that can ignite spontaneously.	H261: Releases flammable gases when in contact with water.	H261: Releases flammable gases when in contact with water.
Precautionary Statement Precautionary	P223 P231 + P232 P280	P223 P231 + P232 P280	P231 + P232 P280
Precautionary Statement Intervention	P335 + P334 P370 + P378	P335 + P334 P370 + P378	P370 + P378
Precautionary Statement Storage	P402 + P404	P402 + P404	P402 + P404
Precautionary statement Disposal	P501	P501	P501

- Oxidizing Liquids:**

Category 1; Average pressure rise time of a 1:1 mixture, by mass, of substance (or mixture) and tested cellulose, which is self-igniting or of a 1:1 mixture, by mass, of substance (or mixture) and cellulose less than a 1:1 mixture of 50% perchloric acid and cellulose, by mass a substance or mixture.

Category 2; A substance or mixture that does not meet the criteria for Category 1 and exhibits a mean pressure rise time less than or equal to a 1:1 mixture by mass of 40% aqueous sodium chlorate solution and cellulose in a 1:1 mixture, by mass, of the substance (or mixture) and tested cellulose. .

Category 3; A substance that does not meet the criteria of Categories 1 and 2 and exhibits a mean pressure rise time less than or equal to a 1:1 mixture by mass of 65% aqueous nitric acid and cellulose in a 1:1 mixture, by mass, of the substance (or mixture) and tested cellulose; or mixture.

- Labeling for Oxidizing Liquids;

Classification	Category 1	Category 2	Category 3
GHS Signs			
Warning Text	Danger	Danger	Attention
Hazard Statement	H271: May cause fire or explosion; strong oxidizer.	H272: It can strengthen the fire; oxidizer.	H272: It can strengthen the fire; oxidizer.
Precautionary Statement Precautionary	P210 P220 P221 P280 P283	P210 P220 P221 P280	P210 P220 P221 P280
Precautionary Statement Intervention	P306 + P360 P371 + P380 + P375 P370 + P378	P370 + P378	P370 + P378
Precautionary Statement Storage			
Precautionary statement Disposal	P501	P501	P501

- Oxidizing Solids:

Category 1; A substance or mixture (by mass) with a lower average burning time than a 3:2 mass mixture of potassium bromate-cellulose in a mixture with a sample-to-cellulose ratio of 4:1 or 1:1 under test.

Category 2; A substance or mixture that does not meet the criteria of Category 1 and has an average combustion less than or equal to a mixture of potassium bromate - cellulose of 2:3 by mass, in a mixture with a sample-to-cellulose ratio of 4:1 or 1:1 (by mass).

Category 3; A substance or mixture (by mass) that does not meet the criteria of Category 1 and 2 with an average burn time equal to or less than 3:7 by mass of a potassium bromate-cellulose mixture in a 4:1 or 1:1 sample-to-cellulose ratio tested .

- Labeling for Oxidizing Solids;

	Category 1	Category 2	Category 3
GHS Signs			
Warning Text	Danger	Danger	Attention
Hazard Statement	H271: May cause fire or explosion; strong oxidizer.	H272: It can strengthen the fire; oxidizer.	H272: It can strengthen the fire; oxidizer.
Precautionary Statement Precautionary	P210 P220 P221 P280 P283	P210 P220 P221 P280	P210 P220 P221 P280
Precautionary Statement Intervention	P306 + P360 P371 + P380 + P375 P370 + P378	P370 + P378	P370 + P378
Precautionary Statement Storage			
Precautionary statement Disposal	P501	P501	P501

- Abrasive for Metals:
Category 1; On steel or aluminum surfaces, wear rate exceeding 6.25 mm per year when tested on both materials at a test temperature of 55°C.
- Labeling for Corrosive for Metals;

Classification	Category 1
GHS Sign	
Warning Text	Attention
Hazard Statement	H290: It can corrode metals.
Precautionary Statement - Precautionary	P234
Precautionary Statement - Intervention	P390
Precautionary Statement - Storage	P406
Precautionary statement - Disposal	

- The basic classification criteria for the health hazards of chemicals and mixtures (not limited to those listed below – detailed in the CLP regulations) are given below;
- Acute Toxicity:
It is classified as Category 1, Category 2, Category 3 and Category 4 by various tests specified in the CLP Regulations.
- Labeling for Acute Toxicity;

Classification	Category 1	Category 2	Category 3	Category 4
GHS Signs				
Warning Text	Danger	Danger	Danger	Attention
Hazard Statement - Oral	H300 Can be fatal if swallowed	H300 Can be fatal if swallowed	H301 Toxic if swallowed.	H302 Harmful if swallowed.
- Skin tract	H310: Contact with skin can be fatal	H310: Contact with skin can be fatal	H311: Toxic in contact with skin.	H312: Harmful in contact with skin.
- Inhalation (see Note 1)	H330: Fatal if inhaled.	H330: Fatal if inhaled.	H331: Toxic if inhaled.	Harmful if inhaled.
Precautionary Statement Precautionary	P264 P270	P264 P270	P264 P270	P264 P270
Precautionary Statement Intervention (oral)	P301 + P310 P321 P330	P301 + P310 P321 P330	P301 + P310 P321 P330	P301 + P312 P330
Precautionary statement Storage (oral tract)	P405	P405	P405	
Precautionary statement Disposal (oral tract)	P501	P501	P501	P501
Precautionary Statement Precaution (skin tract)	P262 P264 P270 P280	P262 P264 P270 P280	P280	P280
Precautionary Statement Intervention (skin tract)	P302 + P350 P310 P322 P361 P363	P302 + P350 P310 P322 P361 P363	P302 + P352 P312 P322 P361 P363	P302 + P352 P312 P322 P363

Classification	Category 1	Category 2	Category 3	Category 4
Precautionary statement Storage (skin tract)	P405	P405	P405	
Precautionary statement Disposal (skin tract)	P501	P501	P501	P501
Precautionary Statement Precaution (inhalation)	P260 P271 P284	P260 P271 P284	P261 P271	P261 P271
Precautionary Statement Intervention (inhalation)	P304 + P340 P310 P320	P304 + P340 P310 P320	P304 + P340 P311 P321	P304 + P340 P312
Precautionary Statement Intervention (inhalation)	P403 + P233 P405	P403 + P233 P405	P403 + P233 P405	
Precautionary Statement Intervention (inhalation)	P501	P501	P501	

- Skin corrosion / irritation**

It is classified as Category 1A, 1B, 1C and Category 2 by various tests specified in the CLP Regulations.

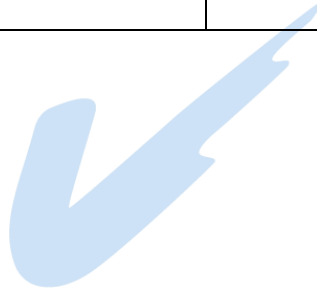
- Labeling for Skin Corrosion/Irritation;

Classification	Category 1 A/1 B/1 C	Category 2
GHS Signs		
Warning Text	Danger	Attention
Hazard Statement	H314: causes severe skin burns and eye damage	H315: Causes skin irritation.
Precautionary Statement Precautionary	P260 P264 P280	P264 P280
Precautionary Statement Intervention	P301 + P330 + P331 P303 + P361 + P353 P363 P304 + P340 P310 P321 P305 + P351 + P338	P302 + P352 P321 P332 + P313 P362
Precautionary statement Storage	P405	
Precautionary statement Disposal	P501	

- **Serious Eye Damage/Eye Irritation:**

It is classified as Category 1 and Category 2 by various tests specified in the CLP Regulations.

Classification	Category 1	Category 2
GHS Signs		
Warning Text	Danger	Attention
Hazard Statement	H318: Causes serious eye damage.	H319: Causes serious eye irritation.
Precautionary Statement Precaution	P280	P264 P280
Precautionary Statement Intervention	P305 + P351 + P338 P310	P305 + P351 + P338 P337 + P313
Precautionary Statement Storage		
Precautionary statement Disposal		



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- Respiratory or Skin Sensitization;
It is classified as Category 1, 1A, 1B separately for respiratory and skin by various tests specified in the CLP Regulations.
- Labeling for Respiratory or Skin Sensitization;

Classification	Respiratory Sensitization	Skin Sensitization
	Category 1 and Subcategories 1A and 1B	Category 1 and Subcategories 1A and 1B
GHS Signs		
Warning Text	Danger	Attention
Hazard Statement	H334: May cause breathing difficulties, asthma attacks or allergies if inhaled.	H317: It causes allergic skin reactions.
Precautionary statement Precaution	P261 P285	P261 P272 P280
Precautionary Statement Intervention	P304 + P341 P342+ P311	P302 + P352 P333 + P313 P321 P363
Precautionary Statement Storage		
Precautionary statement Disposal	P501	P501

- Carcinogenicity:
It is classified as Category 1A, 1B and Category 2 according to various data specified in the CLP Regulations.
- Labeling for Carcinogenicity;

Classification	Category 1A or Category 1B	Category 2
GHS Signs		
Warning Text	Danger	Attention
Hazard Statement	H350: It can cause cancer. <If none of other ways of exposure is proved not to cause this harm specify the way of exposure>	H351: Suspected of causing cancer <If none of other ways of exposure is proved not to cause this harm specify the way of exposure >
Precautionary statement Precaution	P201 P202 P281	P201 P202 P281
Precautionary statement Intervention	P308 + P313	P308 + P313
Precautionary statement Storage	P405	P405
Precautionary statement Disposal	P501	P501

- Specific Target Organ Toxicity - Single Exposure:
It is classified as Category 1, Category 2 and Category 3 according to various data specified in the CLP Regulations.
- Specific Target Organ Toxicity – Labeling for Single Exposure;

Classification	Category 1	Category 2	Category 3
GHS Signs			
Warning Text	Danger	Attention	Attention
Harm Statement	H370: Causes damage to organs < if known, specify all organs affected>. < If it has been proven that none of the other routes of exposure cause this hazard, specify the route of exposure>	H371: May cause damage to organs < specify all organs affected, if known>. < If it has been proven that none of the other routes of exposure cause this hazard, specify the route of exposure>	H335: It may cause the irritation of the respiratory tract. or H336: May cause drowsiness or dizziness
Precautionary statement Precaution	P260 P264 P270	P260 P264 P270	P261 P271
Precautionary statement Intervention	P307 + P311 P321	P309 + P311	P304 + P340 P312
Precautionary statement Storage	P405	P405	P403 + P233 P405
Precautionary statement Disposal	P501	P501	P501

- Specific Target Organ Toxicity - Repeated Exposure
It is classified as Category 1 and Category 2 according to various data specified in the CLP Regulations.
- Specific Target Organ Toxicity – Labeling for Repeated Exposure

Classification	Category 1	Category 2
GHS Signs		
Warning Text	Danger	Attention
Hazard Statement	H372: Causes damage to organs through prolonged or repeated exposure <indicate all organs affected, if known>. < If it has been proven that none of the other routes of exposure cause this hazard, specify the route of exposure>	H373: May cause damage to organs through prolonged or repeated exposure <indicate all organs affected, if known>. < If it has been proven that none of the other routes of exposure cause this hazard, state the route of exposure.
Precautionary statement Precaution	P260 P264 P270	P260
Precautionary statement Intervention	P314	P314
Precautionary statement Storage		
Precautionary statement Disposal	P501	P501

- Aspiration Damage:
Category 1; Substances known or presumed to cause aspiration toxicity hazards in humans
One substance:
(a) Based on reliable and good quality human evidence; or
(b) If it is a hydrocarbon and its kinematic viscosity is 20.5 mm²/s or less (40°C), it is classified in Category 1.
- Labeling for Aspiration Hazard;

Classification	Category 1
GHS Sign	
Warning Text	Danger
Hazard Statement	H304: May be fatal if inhaled and swallowed
Precautionary Statement Precaution	
Precautionary Statement Intervention	P301 + P310 P331
Precautionary Statement Storage	P405
Precautionary statement Disposal	P501

- The basic classification criteria for environmental hazards of chemicals and mixtures (not limited to those listed below – detailed in CLP regulations) are given below.
- Hazardous to the Aquatic environment
According to various data specified in CLP Regulations, Acute Aquatic Hazard is classified as Acute 1 and Long Term Aquatic Hazards as Category 1, Category 2, Category 3 and Category 4.
- Labeling for Harmful to the Aquatic Environment;

Acute Aquatic Hazard	
	Acute 1
GHS Sign	
Warning Text	Attention
Hazard Statement	H400: Very toxic to aquatic life.
Precautionary Statement Precaution	P273
Precautionary Statement Intervention	P391
Precautionary Statement Storage	
Precautionary statement Disposal	P501

LONG-TERM AQUACITY HAZARD				
	Category 1	Category 2	Category 3	Category 4
GHS Signs			The sign is not used.	The sign is not used.
Warning Text	Attention	The tex Warning is not used.	The tex Warning is not used.	The tex Warning is not used.
Hazard Statement	H410: Very toxic to aquatic life with long lasting effects.	H411: Toxic to aquatic life with long lasting effects	H412: Harmful to aquatic life with long lasting effects.	H413: May cause long lasting harmful effects to aquatic life.
Precautionary Statement Precaution	P273	P273	P273	P273
Precautionary Statement Response	P391	P391		
Precautionary Statement Storage				
Precautionary statement Disposal	P501	P501	P501	P501

- Harm to Ozone Layer;
Category 1; C > %0,1
- Labeling for Hazards to the Ozone Layer;

Symbol/Sign	
Warning Text	Attention
Hazard Statement	H420: It harms public health and the environment by destroying the ozone layer in the upper atmosphere.
Precautionary statement	P273 P501

Appendix -2 Hazard Statements

H200 Series: Physical harm statements and codes

H200 Unstable explosive.

H201: Explosive; mass explosion damage.

H202 Explosive; serious reflection damage.

H203 Explosive; fire, explosion or reflection damage.

H204 Fire or reflection damage.

H205 May cause mass explosion in fire.

H220 Extremely flammable gas.

H221 Flammable gas.

H222 Extremely flammable aerosol.

H223 Flammable aerosol.

H224 Extremely flammable liquid and vapour.

H225 Highly flammable liquid and vapour.

H226 Flammable liquid and vapour.

H228 Flammable solid.

H240 Heating may cause an explosion.

H241 Heating may cause fire or explosion.

H242 Heating may cause fire.

H250 May cause flash fires in contact with air.

H251 Self-heating; may catch fire.

H252 Self-heats in large quantities; may cause fire.

H260 In contact with water, emits flammable gases that can ignite spontaneously.

H261 Releases flammable gases in contact with water.

H270: May cause or intensify fire; oxidizer

H271 May cause fire or explosion; strong oxidizer.

H272 May intensify fire; oxidizer.

H280 Contains compressed gas; may explode when heated.

H281 Contains refrigerated gas; may cause frostbite or injury.

H290 May corrode metals.

H300 Series: Health hazard statements and codes

H300 Fatal if swallowed.

H301 Toxic if swallowed.

H302 Harmful if swallowed.

H304 May be fatal if swallowed and enters the respiratory tract.

H310 Fatal in contact with skin.

H311 Toxic in contact with skin.

H312 Harmful in contact with skin.

H314 Causes severe skin burns and eye damage.

H315 - Causes skin irritation.

H317: It causes allergic skin reactions.

H318: Causes serious eye damage

H319: Causes serious eye irritation.

H330 Fatal if inhaled.

H331 Toxic if inhaled.

H332 Harmful if inhaled.

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

H335; May cause the irritation of the respiratory tract.

H336: May cause drowsiness or dizziness

H340 May cause genetic damage.

H341 Suspected of causing genetic defects.
 H350 May cause cancer.
 H351: Suspected of causing cancer
 H360 May damage fertility or the unborn child.
 H361 Suspected of damaging fertility or the unborn child.
 H362 May cause harm to a breastfed child.
 H370 Causes damage to organs.
 H371 May cause damage to organs.
 H372 Causes damage to organs through prolonged or repeated exposure.
 H373 May cause damage to organs through prolonged or repeated exposure.
 H300+H310 Fatal if swallowed or in contact with skin.
 H300+H330 Fatal if swallowed or inhaled.
 H310+H330 Fatal in contact with skin or if inhaled.
 H300+H310+H330 Fatal if swallowed, in contact with skin or if inhaled.
 H301+H311 Toxic if swallowed or in contact with skin.
 H301+H331 Toxic if swallowed or inhaled.
 H311+H331 Toxic in contact with skin or if inhaled.
 H301 +H311+H331 Toxic if swallowed, in contact with skin or if inhaled.
 H302+H312 Harmful if swallowed or in contact with skin.
 H302+H332 Harmful if swallowed or inhaled.
 H312+H332 Harmful in contact with skin or if inhaled.
 H302+H312+H332 Harmful if swallowed, in contact with skin or if inhaled.
 H350I May cause cancer by inhalation.
 H360F May damage fertility.
 H360D May cause damage to the unborn child.
 H361f Suspected of damaging fertility.
 H361d Suspected of damaging the unborn child.
 H360FD May damage fertility. May cause damage to the unborn child.
 H361fd Suspected of damaging fertility. Suspected of causing damage to the unborn child.
 H360Fd May damage fertility. Suspected of causing damage to the unborn child.
 H360Df May damage the unborn child. Suspected of damaging fertility.

H400 Series: Environmental hazard statements and codes

H400: Very toxic to aquatic life.
 H410 Very toxic to aquatic life with long lasting effects.
 H411: Toxic to aquatic life with long lasting effects
 H412 Harmful to aquatic life with long lasting effects.
 H413 May cause long lasting harmful effects to aquatic life.

Additional hazard statements and codes

The following other H-phrases are also used in the European Union.

Physical characteristics

EUH001 Explosive when dry.
 EUH006 Explosive in contact with air and in the absence of air.
 EUH014 Reacts violently with water.
 EUH018 May form flammable/explosive vapour-air mixture during use.

EUH019 May form explosive peroxides.
 EUH044 Risk of explosion when heated indoors.

Health-related features

EUH029 Releases toxic gas in contact with water.
 EUH031 Releases toxic gas in contact with acids.



EUH032 Releases very toxic gas in contact with acids.
EUH066 Repeated exposure may cause skin dryness or cracking.
EUH070 Toxic in contact with eyes.
EUH071 Causes respiratory corrosion.

Additional label elements/information on some mixtures

EUH 201/201A Contains Lead. It should not be used on surfaces that can be chewed or sucked by children.

Attention! Contains lead.

EUH202 Cyanoacrylate. Harmful. Bonds skin and eyes in seconds. Keep out of reach of children.

EUH203 Contains Chromium (VI). May cause allergic reactions.

EUH204 Contains Isocyanate. May cause allergic reactions.

EUH205 Contains Epoxy components. May cause allergic reactions.

EUH206 Attention! Do not use with other products. May release dangerous gases (chloride).

EUH207 Attention! Contains cadmium. Dangerous fumes are produced during use. Consult the information provided by the manufacturer. Respect safety instructions.

Contains EUH208 (Name of sensitizing agent). May cause allergic reactions.

EUH209/209A May become very flammable during use. May become flammable during use.

EUH210 Safety data sheet available on request.

EUH401 To avoid risks to human health and the environment, follow the instructions for use.

Precaution Statements

P100 Series: General purpose precautionary statements and codes

P101 If medical advice is needed, keep the container or label.

P102 Keep out of reach of children.

P103 Read the label before use.

P200 Series: General purpose precautionary statements and codes

P201: Read special instructions before use

P202 Do not handle until all safety precautions have been read and understood

P210 Keep away from heat / sparks / flames / hot surfaces. - No smoking

P211 Do not spray into flames or other sources of ignition.

P220: Keep/Store away from clothing/combustible materials.

P221 Take all precautionary measures to prevent mixing/mixing with combustibles.

P222 Do not allow contact with air.

P223 Avoid any possible contact with water, due to the possibility of violent reaction and ignition.

P230 Keep wet with ...

P231 Handle with inert gas.

P232 Protect from moisture.

P233 Keep container tightly closed.

P234 Store only in original container.

P235 Keep it cold.

P240 Fit/connect container and receiving equipment to ground

P241 Use explosion-proof electrical/ventilation/igniter/.../material.

P242 Use only non-flammable tools.

P243 Take preventive measures against static discharge.

P244 Keep valves and fittings free from oil and grease.

P250 Do not subject to grinding/shock/.../friction.

P251 Pressure vessel: Do not pierce or burn, even after use.

P260 Do not breathe dust/fume/gas/mist/vapor/spray.

P261: Avoid breathing dust / fume / gas / mist / vapor / spray.

P262 Avoid contact with eyes, skin or clothing.

PROCEDURE FOR WORKING WITH HAZARDOUS SUBSTANCES

P263 Avoid contact during pregnancy/while breastfeeding.
P264 Wash thoroughly with water after handling
P270 Do not eat, drink, or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P272 Do not allow take the contaminated clothes out of the workplace.
P273 Avoid release to the environment
P280 Wear protective gloves/protective clothing/eye protection/face shield
P281 Wear personal protective equipment.
P282 Wear cold-proof gloves/face shield/eye protection.
P283 Wear fire/flame resistant/retardant clothing.
P284: Wear respiratory protection.
P285 In case of insufficient ventilation wear respiratory protection.
P231+P232 Handle with inert gas. Protect from moisture.
P235+P410 Store cold. Protect from sunlight.

P300 Series: Intervention precautionary statements and codes

P301 If swallowed:
P302 If on the skin:
P303 If on skin (or hair):
P304 If inhaled:
P305 In case of eye contact:
P306 In contact with clothing:
P307 On exposure:
P308 IF exposed or interact:
P309 IF exposed or feeling unwell:
P310 Immediately call a POISON CENTER or doctor/physician.
P311 Call a POISON CENTER or doctor/physician.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P313 Get medical advice/consult your doctor.
P314 Get medical advice/attention if you feel unwell.
P315 Get medical advice/attention immediately.
P320 Specific treatment is urgent (see label).
P321 Specific treatment is required (see label).
P322 Special precautions (see label)
P330 Rinse mouth.
P331 Do not induce vomiting.
P332 If skin irritation occurs:
P333 In case of skin irritation or rash:
P334 Soak in cold water or wrap in wet bandage.
P335 Remove any remaining parts from the skin.
P336 Thaw frozen parts with warm water. Do not wipe the affected area.
P337 If eye irritation persists:
P338 If there is a contact lens and if it is easy to remove them, remove them. Shake constantly.
P340 Remove person to fresh air and keep at rest in a position comfortable for breathing.
P341 If breathing is difficult, remove person to fresh air and keep at rest in a position comfortable for breathing.
P342 If respiratory symptoms occur:
P350 Wash thoroughly with plenty of soap and water.
P351 Rinse carefully with water for a few minutes.
P352 Wash with plenty of soap and water.
P353 Rinse skin with water/shower.
P360 Rinse contaminated clothing and skin immediately with plenty of water before removing clothing.
P361 Remove / take off all contaminated clothing immediately.
P362 Take off all contaminated clothing and wash them before reuse

P363 Wash contaminated clothing before reuse.
 P370 In the event of fire:
 P371 In case of large fire and large quantities:
 P372 Risk of explosion in case of fire.
 P373 DO NOT interfere with fire when fire reaches explosives.
 P374 Respond to fire using normal precautions from a reasonable distance.
 P375 Fight fire remotely against the risk of explosion.
 P376 If safe, stop leak.
 P377 Gas leaking fire: Do not extinguish until the leak has been safely stopped.
 P378 Use ... to extinguish.
 P380 Clear space.
 P381 If safe, remove all sources of ignition.
 P390 Clean up liquid spills to prevent property damage.
 P391 Collect spillage.
 P301+P310 IF SWALLOWED: Call a POISON CENTER or doctor/physician.
 P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
 P301+P330+P331 IF SWALLOWED: rinse mouth. DO NOT try to vomit.
 P302+P334 IF CONTACT WITH SKIN: Soak in cold water/wrap with wet cloths.
 P302+P350 IF CONTACT WITH SKIN: Wash thoroughly with soap and running water.
 P302+P352 IF CONTACT WITH SKIN: Wash thoroughly with soap and running water.
 P303+P361+P353 IF CONTACT WITH SKIN (or hair): Immediately remove/take off all contaminated clothing. Rinse skin with water/shower.
 P304+P340 IF INHALED: If breathing is difficult, move victim to fresh air and keep in a position comfortable for breathing.
 P304+P341 IF INHALED: If breathing is difficult, move victim to fresh air and keep in a position comfortable for breathing.
 P305+P351+P338 IF IN CONTACT WITH EYES: Rinse carefully with water for a few minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P306+P360 IF IN CONTACT WITH CLOTHING : Immediately rinse contaminated clothing and skin with plenty of water before removing your clothing.
 P307+P311 On exposure: Call a POISON CENTER or doctor/physician.
 P308+P313 IF exposed or interacting: Get medical advice/attention.
 P309+P311 If exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.
 P332+P313 If skin irritation occurs: Get medical advice/attention.
 P333+P313 If skin irritation or itching occurs: Get medical advice/attention.
 P335+P334 Gently remove particles from skin. Soak in cold water/wrap with wet cloths.
 P337+P313 If eye irritation persists: Get medical advice/attention.
 If P342+P311 shows respiratory signs: Call a POISON CENTER or doctor/physician.
 P370+P376 In case of fire: If safe, stop the leak.
 P370+P378 In case of fire: Use... for extinguishing, (appropriate material specified by the manufacturer).
 P370+P380 In case of fire: Evacuate the area.
 P370+P380+P375 In case of fire: Evacuate the area. Fight fire remotely against the risk of explosion.
 P371+P380+P375 In case of large fire and large quantities: Evacuation area. Fight fire remotely against the risk of explosion.
 400 Series: Precautionary statements and codes related to storage
 P401 ... store, (specified by the manufacturer).
 P402 Store in dry place.
 P403 Store in a well ventilated place.
 P404 Store in closed container.
 P405 Lock it up.
 P406 Store in a corrosive-resistant/resistant inner liner ... container.
 P407 Provide air space between stacks/pallets.
 P410 Protect from sunlight.
 P411 ... °C/... °F. Store at temperatures not exceeding these



P412 Do not expose to temperatures exceeding 50 °C/122 °F.
P413 Store in mass amounts greater than ... kg/... lbs under temperatures not exceeding ... °C/... °F
P420 Store away from other materials.
P422 Store contents under
P402+P404 Store in dry area. Store in a closed container.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
<g id="1">P403 + P235 </g>Stored in a well ventilated area. Keep it cold.
P410+P403 Protect from sunlight. Store in a well-ventilated area.
P410+P412 Protect from sunlight. Do not expose to temperatures exceeding 50 °C/122 °F.
P411+P235 Store at temperatures not exceeding °C/... °F. Keep it cold.

500 Series: Disposal precautionary statements and codes

P501 (Dispose of contents / container....)

P502 Request information from your manufacturer/supplier for recycling/recovery.



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Appendix -3 Classification, Signs and Meanings of Hazardous Substances or Mixtures

Table 1 – Hazardous Substance or Mixture Classification Table

Physical Hazards:	Health Hazards	Environmental hazards
Explosives (Unstable explosives, Sections 1.1, 1.2, 1.3, 1.4, 1.5, and 1.6)	Acute toxicity, (Category 1, 2, 3 and 4)	Hazardous to the aquatic environment (Acute Category 1)
Flammable gases (Category 1 and 2)	Skin corrosive/irritant, (Category 1A, 1B, 1C and 2)	
Flammable aerosols (Category 1 and 2)		Hazardous to the aquatic environment (Chronic Category 1, 2, 3, and 4)
Oxidizing gases (Category 1)		
Gases under pressure (Compressed gas, liquefied gas, refrigerated liquid gas, dissolved gas)		
Flammable liquids (Category 1, 2 and 3)	Respiratory or skin sensitizer(Category 1)	R59 Dangerous for the ozone layer
Flammable solids (Category 1 and 2)	Germ cell-mutagen (Category 1A, 1B and 2)	Hazardous to the aquatic environment (Chronic Category 1, 2, 3, and 4)
Easy reagents and mixtures (Type A, B, C, D, E, F, and G) (Type A and B)	Carcinogen, (Category 1A, 1B and 2)	
Pyrophoric liquids (Category 1)	Reproductive toxic (Category 1A, 1B and 2) D also additional category for effects on or through lactation	
Pyrophoric solids (Category 1) Easily heated substances and mixtures (Category 1 and 2)		
Substances and mixtures which, in contact with water, emit flammable gases (Category 1,2 and 3)	Specific target organ toxicity (STOT) – single exposure ((Category 1, 2) D and Category 3 for stun effects and respiratory irritation only	
Oxidizing liquids (Category 1, 2 and 3) (Category 1 and 2)		
Oxidizing solids (Category 1, 2 and 3) (Category 1 and 2)	Specific target organ toxicity (STOT) – repeated exposure (Category 1 and 2)	
Organic peroxides, (Types A, B, C, D, E, F and G) (Types A to F)		
Metal abrasives (Category 1)	Aspiration hazard (Category 1)	

Table 2 – Hazardous Substance or Mixture Marks and Meanings According to CLP Regulations

SIGN	NAME	REMARKS:
Physical Hazards:		
	Explosive material	An explosive substance (or mixture) is a solid or liquid substance, or a mixture thereof, that produces a chemical reaction capable of spontaneously producing gas at such a temperature and pressure at a rate that is harmful to the environment.
	Flammable/Flammable	<p>Flammable gas: A flammable gas is a gas that can burn in air at a standard pressure of 101.3 kPa and at 20°C.</p> <p>Flammable liquid: A flammable liquid means a liquid with a flash point of not more than 93°C.</p> <p>Flash point: The flash point of a flammable liquid is the lowest temperature in air at which a flammable mixture can be formed.</p> <p>Flammable solid: A flammable solid is one that can contribute to, cause, or burn easily due to friction. Easily combustible powder, granular or pasty substances are dangerous if the flame spreads quickly and can be easily ignited by brief contact with the ignition source, such as another combustible substance.</p> <p>Flammable aerosol: If aerosols contain any component from flammable solids, liquids and gases, they should be considered in flammable classification.</p> <p>Aerosols: Aerosols, also meaning aerosol machine, are non-reusable containers made of metal, glass or plastic, and contain a gas dissolved, liquefied or compressed under pressure, with or without foam, paste or a powder. Aerosols are equipped with a release device that allows the contents to be removed as particles, solid or liquid in suspension in the gas, such as gas or liquid or foam, paste or a powder.</p> <p>Self-reactive substances and mixtures: Self-reactive substances or mixtures are thermally unstable liquids, solids or mixtures that tend to undergo a strong exothermic decomposition even in the absence of oxygen (air). This definition excludes substances and mixtures classified as explosives, organic peroxides or oxidizers.</p> <p>Pyrophoric liquid: A pyrophoric liquid is a liquid that tends to ignite within five minutes of contact with air, even in small quantities.</p> <p>Pyrophoric solid: A pyrophoric solid is a solid that tends to ignite within five minutes of contact with air, even in small quantities.</p>
	Oxidizing	<p>Oxidizing gas: An oxidizing gas is any gas that can cause more combustion than air does or contribute to the combustion of other materials, usually by supplying oxygen.</p> <p>Oxidizing liquid: An oxidizing liquid is one that, while not necessarily flammable, is one that can cause or contribute to the combustion of other materials, usually by supplying oxygen.</p> <p>Oxidizing solid: An oxidizing solid is one that, while not necessarily combustible, is one that can cause or contribute to the combustion of other materials, usually by supplying oxygen.</p>

	Gases	<p>Gas under pressure: Gases under pressure are those contained as a refrigerated liquid or in a container at a pressure of not less than 280 kPa (2.8bar) at 20°C. They consist of compressed, liquefied, dissolved and cooled liquefied gases.</p> <p>Compressed gas: A gas packed under pressure is completely gas at -50°C; Including all gases with a critical temperature of -50°C (eg nitrogen in a 200bar cylinder)</p> <ul style="list-style-type: none"> • Liquefied Gas A gas packed under pressure is partially liquid at temperatures above -50°C (eg LPG). • Refrigerated liquefied gas: Because of its low temperature, a gas is partially liquid when packaged (for example: liquid oxygen). • Dissolved gas: A gas packed under pressure is dissolved in a liquid phase solvent (for example, acetylene). <p>Critical Temperature: It is the temperature below the temperature at which gases can be liquefied at a given pressure.</p>
	Corrosive Substances	<p>Corrosive to metals: A metal abrasive substance or a mixture is a substance or a mixture that will cause significant damage or even destruction of metal by chemical action.</p>
Health Hazards		
	Toxic:	<p>Acute toxicity: Acute toxicity refers to side effects that occur after a single dose or multiple doses of a substance within 24 hours of oral, dermal or 4-hour inhalation exposure.</p>
	Corrosive	<p>Skin corrosion/irritation: Skin corrosion is the production of irreversible damage to the skin; to name a visible necrosis in the skin and on the epidermis following application of a test substance for up to 4 hours. Corrosion reactions are assessed by bleaching of the skin, areas of complete alopecia and discoloration from wounds, as well as ulcers, bleeding and bloody crusts at the end of the 14-day observation. Histopathology should be considered to evaluate suspicious lesions.</p>
	Irritant	<p>Serious eye damage/irritation Serious eye damage is the occurrence of serious physical damage to the image or tissue damage within the eye after application of a test substance that acts completely irreversibly to the anterior surface of the eye within 21 days.</p>
	Harmful	<p>Respiratory or skin sensitization: Respiratory sensitization is a substance that, after inhalation, will cause hypersensitivity of the airways. Skin sensitization is a substance that, after contact with the skin, will trigger an allergic response.</p> <p>Germ cell mutagen: This hazard class is primarily related to chemicals that can cause mutations in human reproductive organs that can be transmitted to the lineage.. However, in vitro mutagenicity / genotoxicity and in vivo somatic mammalian cells are also considered substances and mixtures classified within this hazard class. The term mutagenic and mutagen shall be used for</p>

		<p>agents that cause an increased generation of mutations in cells and/or populations of organisms. The more general terms genotoxic and genotoxicity apply to reagents and processes that alter DNA separation, information content, or structure, including those that interfere with normal replication processes, cause DNA damage, or alter their replication non-physiologically (temporarily). Genotoxicity test results are often taken as indicators for mutagenic effects.</p> <p>Carcinogenic effect: The term carcinogen refers to a chemical or a mixture of chemicals that cause or increase the incidence of cancer.. Substances that cause benign and malignant tumors in appropriate animal experimental studies are also considered suspected or presumed human carcinogens unless there is strong evidence that the tumorigenesis mechanism is unsuitable for humans. Classification of a chemical as it does not pose a carcinogenic hazard depends on the properties of the substance and does not provide information about the level of human cancer risk that the use of the chemical may show.</p> <p>Specific target organ systemic toxicity (single exposure / repeated exposure): The classification defines the chemical as a specific target organ/systemic poison and may show a potential for adverse health effects in persons actually exposed to it.</p> <p>Respiratory hazard: Respiratory toxicity includes severe acute effects such as chemical pneumonia, varying degrees of lung injury, or death following aspiration. Aspiration refers to the introduction of a liquid or solid chemical product directly into the oral or nasal cavity, or indirectly into the vomit, trachea, and lower respiratory tract.</p>
Environmental hazards		
	Harmful for environment	<p>Hazard to the aquatic environment: Acute aquatic toxicity is the peculiarity of a substance that is harmful to the organism in case of short-term exposure. Chronic aquatic toxicity means the potential or actual properties of a substance that cause adverse effects to aquatic organisms during established exposure in relation to the organism's life cycle.</p>

Table 3 – Signs Continuing to Use in Some Countries and Hazardous Substance or Mixture Signs and Meanings under GHS (Comparative)

PHYSICAL DANGER			HEALTH HAZARD		
Etiket Ögeleri (ESKİ)	Tehlike Sınıfları ve Kategorileri*	Etiket Ögeleri (YENİ)**	Etiket Ögeleri (ESKİ)	Tehlike Sınıfları ve Kategorileri*	Etiket Ögeleri (YENİ)**
Patlayıcı  (R2, R3)	Patlayıcılar - Kararsız patlayıcılar - Patlayıcılar, bölüm 1.1-1.3 Kendinden reaktif maddeler/karışımlar, tip A ve B Organik peroksitler, tip A ve B	Tehlike  H200 H201, H202, H203 H240, H241 H240, H241	Çok Toksikite  R28 R27 R26	Akut toksisite, kategori 1, 2 - Oral - Dermal - Solunum	Tehlike  H300 H310 H330
Sınıflandırma Yok	Patlayıcılar, bölüm 1.4	Uyarı  H204	Toksikite  R25 R24 R23	Akut toksisite, kategori 3 - Oral - Dermal - Solunum	Tehlike  H301 H311 H331
Ağır Alevlenir  (R12) (R12) R12	Alevlenir gazlar, kategori 1 Alevlenir aerosoller, kategori 1 Alevlenir sıvılar, kategori 1	Tehlike  H220 H222 H224	Toksikite  R46 R45, R49 R60, R61 R39 R48	Üreme hücreleri mutajenliği, kategori 1A, 1B Kanserojenlik, kategori 1A, 1B Üreme toksisitesi, kategori 1A, 1B STOT***, tekli maruziyet, kategori 1 STOT***, tekrarlı maruziyet, kategori 1	Tehlike  H340 H350 H360 H370 H372
Çok Alevlenir  R11 (R11) (R11)	Alevlenir sıvılar, kategori 2 Alevlenir katılar, kategori 1 Alevlenir katılar, kategori 2	Uyarı  H225 H228 H228	X  R42 R65	Solunum hassaslaştırma, kategori 1 Aspirasyon tehlikesi, kategori 1	Uyarı  H334 H304
Alevlenir Sembol yok (R10) Sınıflandırma yok parlama noktası 56-60°C	Alevlenir aerosoller, kategori 2 Alevlenir sıvılar, kategori 3	Uyarı  H223 H226	Zararlı  R68 R40 R62, R63 R68 R48	Üreme hücreleri mutajenliği, kategori 2 Kanserojenlik, kategori 2 Üreme toksisitesi, kategori 2 STOT***, tekli maruziyet, kategori 2 STOT***, tekrarlı maruziyet, kategori 2	Uyarı  H341 H351 H361 H371 H373
Çok Alevlenir  R17 R17 (R15) (R15) (R15)	Piroforik sıvılar, kategori 1 Piroforik katılar, kategori 1 Su ile temas ettiğinde alevlenir gazlar çıkaran maddeler/karışımlar, kategori 1, 2 ve kategori 3	Tehlike  H250 H250 H260 H261 H261	X  R22 R21 R20	Akut toksisite, kategori 4 - Oral - Dermal - Solunum	Uyarı  H302 H312 H332
Ağır Alevlenir  R12 R12	Kendinden reaktif maddeler/karışımlar, tip B Kendinden reaktif maddeler/karışımlar, tip C ve D ve tip E ve F Kendinden reaktif maddeler/karışımlar, kategori 1 ve kategori 2	Uyarı  H241 H242 H242 H251 H252	Korozif  R34, R35	Cilt aşındırma, kategori 1A, 1B, 1C	Tehlike  H314
Oksitleyici  R7 R7	Organik peroksitler, tip B Organik peroksitler, tip C ve D Organik peroksitler, tip E ve F	Uyarı  H241 H242 H242	Tahriş Edici  R41	Ciddi göz hasarı, kategori 1	Tehlike  H318
Oksitleyici  R8 R8, R9 R8, R9	Oksitleyici gazlar, kategori 1 Oksitleyici sıvılar, kategori 1, 2 ve kategori 3 Oksitleyici katılar, kategori 1, 2 ve kategori 3	Tehlike  H270 H271, H272 H272 H271, H272 H272	Tahriş Edici  R38 R36 R43 R37	Cilt tahrişi, kategori 2 Göz tahrişi, kategori 2 Cilt hassaslaşması, kategori 1 STOT***, tekli maruziyet, kategori 3 - Solunum yolları tahrişi	Uyarı  H315 H319 H317 H335
Sınıflandırma Yok	Basınç altında gaz - Sıvılaştırılmış gaz - Sıvılaştırılmış gaz - Soğutulmuş sıvılaştırılmış gaz - Çözünmüş gaz	Uyarı  H280 H280 H281 H280	Sembol yok R67	- Uyuşturucu etkiler	H336
Sınıflandırma Yok	Metaller için aşındırıcı maddeler/karışımlar, kategori 1	Uyarı  H290	ENVIRONMENTAL HAZARDS		
Çevre için Tehlikeli  R50 R50/53	Sucul ortam için tehlikeli, akut, kategori 1 Sucul ortam için tehlikeli, kronik, kategori 1	Uyarı  H400 H410	Çevre için Tehlikeli  R51/53	Sucul ortam için tehlikeli, kronik, kategori 2	Uyarı  H411
Sembol yok R52/53	Sucul ortam için tehlikeli, kronik, kategori 3 / kategori 4	Piktogram yok H412	Sembol yok R53	Piktogram yok H413	

* Regulation (EC) No 1272/2008 Ek I'e dayalı GHS piktogramları tüm tehlike kategorileri için
 ** Regulation (EC) No 1272/2008 Ek V'e dayalı piktogramlar
 *** Specific Target Organ Toxicity (Spesifik Hedef Organ Toksisitesi)

Table 4 – Dangerous Goods Transportation (ADR) Signs and Meanings

Class 1		flammable explosive substances
Class 2		gases 2.1flammable gases 2.2flammable and non-toxic gases 2.3toxic gases
Class 3		flammable liquids
Class 4		4.1 flammable solids 4.2self-degradable substances 4.3Substances that produce flammable gases in contact with water

Table 5 – Hazardous Chemical Signs and Meanings According to NFPA

Labelling Examples

“4 diamond marking”

HEALTH EFFECT

- 0: Not Harmful to Health
- 1: Slightly harmful to health
- 2: Harmful to Health
- 3: Extremely harmful to health
- 4: Fatal

FLAMMABLE HAZARD

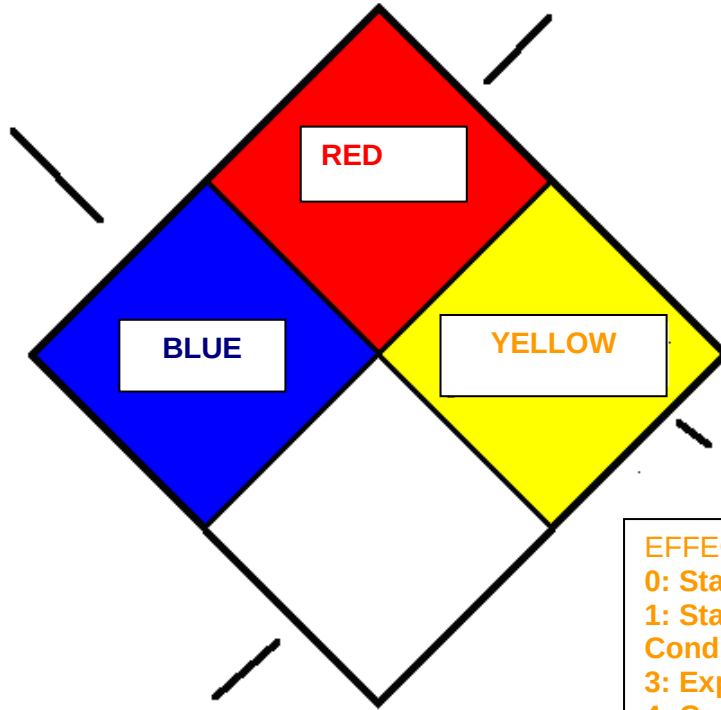
- 0: Non-flammable
- 1: Flammable above 93°C
- 2: Flammable below 93°C
- 3: Flammable below 37°C
- 4: Flammable below 22°C



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EFFECTS ON REACTION
0: Stable
1: Stable under Normal Conditions
3: Explosive material
4: Can explode

ÖZEL TEHLİKELER



OX: Oksitleyici

 : Radyoaktif

COR: Aşındırıcı

ACD: Asit

ALK: Alkali

P: Polimerizasyon

 : Su ile temas etmesi yasak

is

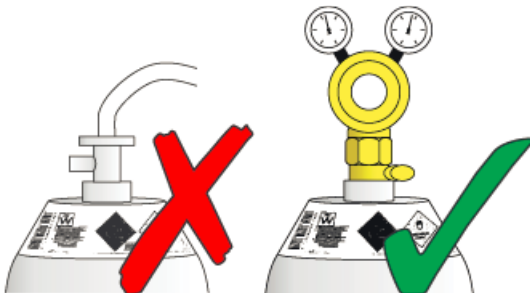
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Appendix -4 Compatibility Matrix for Storage

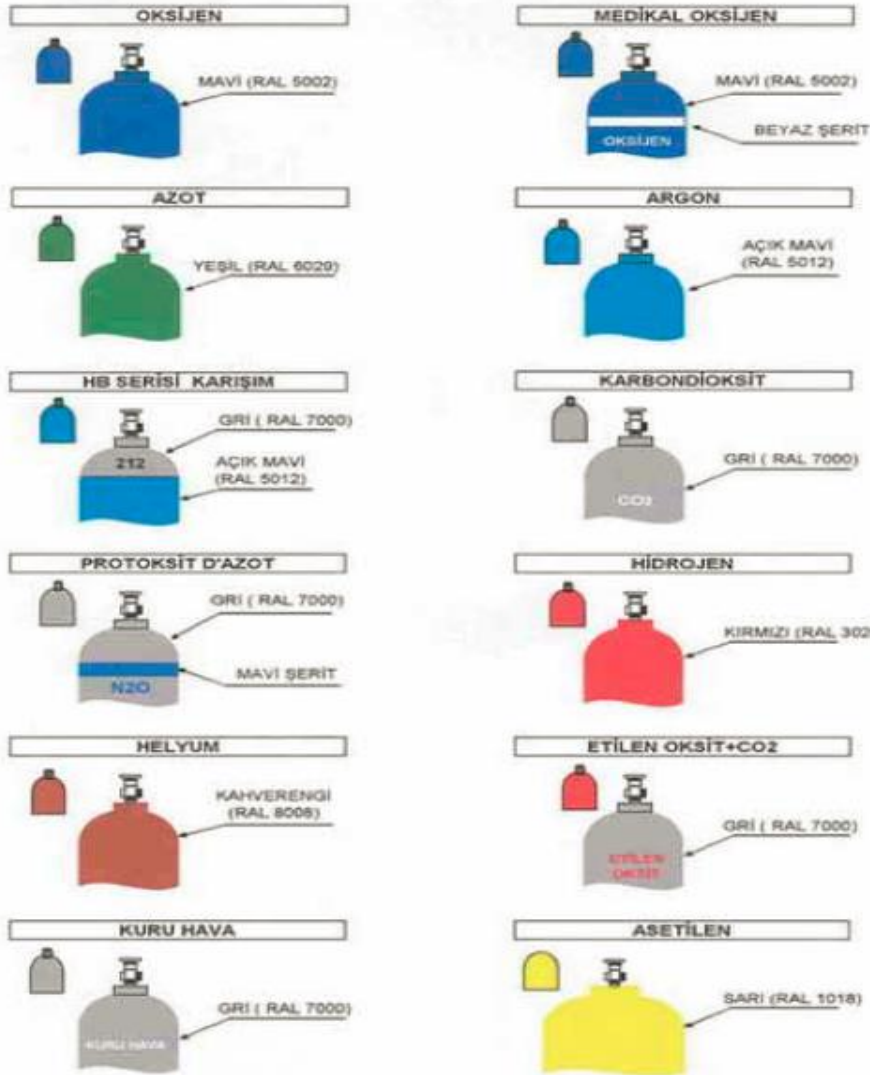
Chemical Hazard Always refer to the SDS	Flammable	Acid	Base	Oxidizer	Toxic
Flammable 					
Acid 					
Base 					
Oxidizer 					
Toxic 					

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APPENDIX 5 - Safe Practice Methods

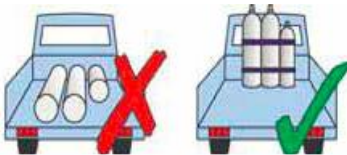


Example 1 – Pressure Gas Cylinder Manometer



Example 2 – Color Coding of Compressed Gas Cylinders

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Example 3 – Transporting Compressed Gas Cylinders Example 4 – Transporting Compressed Gas Cylinders



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genleşme valfi



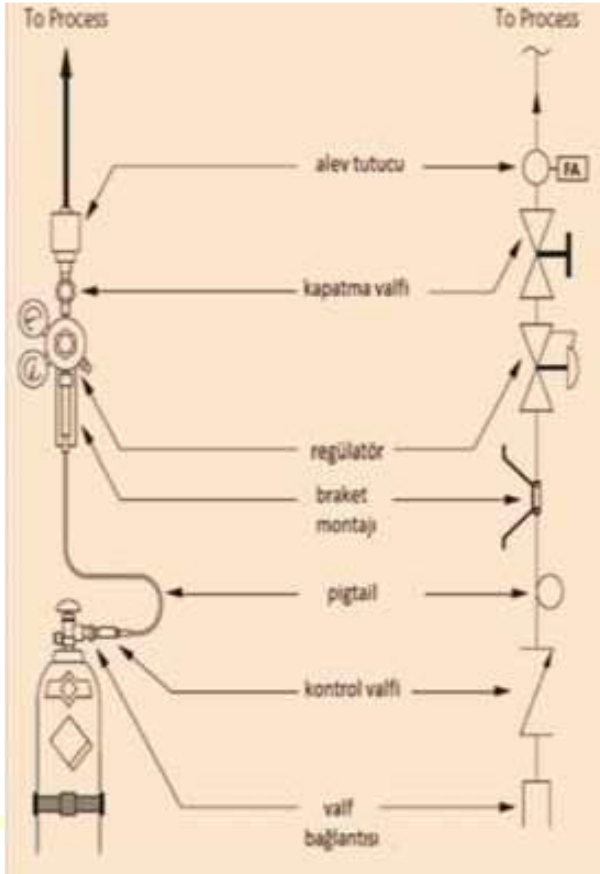
kontrol valfi



akış sınırlayıcı kapatma valfi



alev tutucu



Example 5 - Compressed Gas Cylinders System

Example 5 - Basic Industrial Gases and Their Properties

GAS	PRIORITY HAZARD	PROPERTIES
CARBON DIOXIDE	ASPHYXIAN	HEAVY THAN AIR CAUSES LOSS OF CONSCIOUSNESS IN HIGH CONCENTRATION. CAUSES BURNING IN THE NOSE
NITROGEN	ASPHYXIAN	HEAVY THAN AIR CAUSES LOSS OF CONSCIOUSNESS IN HIGH CONCENTRATION. ODOR FREE

ARGON	ASPHYXIAN	HEAVY THAN AIR CAUSES LOSS OF CONSCIOUSNESS IN HIGH CONCENTRATION. ODOR FREE
HELIUM BALLOON GAS	ASPHYXIAN	LIGHTWEIGHT THAN AIR
LPG	EXPLOSIVE	HEAVY THAN AIR. RISK OF FIRE AND EXPLOSION IS HIGH
ACETYLENE	EXPLOSIVE	RISK OF FIRE AND EXPLOSION IS HIGH
HYDROGEN	EXPLOSIVE	LIGHTWEIGHT THAN AIR ODOR FREE
OXYGEN	OXIDIZING	CONSIDERED NON-TOXIC AT ATMOSPHERIC PRESSURE

Example 6 - Color Codes for Hoses

Gaz	Kaplama rengi ve işareti
Asetilen, diğer yanıcı gazlar ^a (LPG, MPS, doğal gaz, metan hariç)	Kırmızı
Oksijen	Mavi
Basınçlı hava, azot, argon, CO ₂	Siyah
LPG, MPS, doğal gaz, metan	Portakal rengi
Katkılı yakıt gazı	Kırmızı-katkılı
Katkılı yakıt gazı hariç bu tabloda verilen bütün yakıt gazları	Kırmızı/portakal rengi
^a Hortumun hidrojen için kullanmaya uygunluğu konusunda imalatçının görüşü alınmalıdır.	

Example 7 – Compressed Gas Cylinders Example 8 – Transporting Hazardous Chemicals



Example 9 – Example of Pallet in Storage of Hazardous Chemicals



Example 10 - Hazardous Chemical Storage Container



Example 11 - Example AB for Storage Classes

Storage Class 1: Explosives,

Storage Class 2 A: Compressed, liquefied and dissolved gases

Storage Class 2 B: Small containers under pressure (aerosol containers)

Storage Class 3 A: Flammable Liquids

Storage Class 3 B: Flammable Liquids

Storage Class 4.1 A and 4.1 B: Flammable solids

Storage Class 4.1 A

Storage Class 4.1 B

Storage Class 4.2: Spontaneously Combustible Substances

Storage Class 4.3: Substances which, in contact with water, form flammable gases

Storage Class 5.1 A, 5.1 B and 5.1 C: Oxidizing Substances

Storage Class 5.1 A

Storage Class 5.1 B

Storage Class 5.1 C

Storage Class 5.2: Organic Peroxides

Storage Class 6.1 A and 6.1 B Toxic substances

Storage Class 6.1 A: Flammable toxic substances

Storage Class 6.1 B: Non-flammable toxic substances

Storage Class 6.2: Infectious Substances

Storage Class 7: Radioactive Substances

Storage Class 8 A and 8 B: Corrosive Substances

Storage Class 8 A: Flammable corrosive substances

Storage Class 8 B: Non-flammable corrosive substances

Storage class 9: (Not Used)

Storage Class 10: Flammable liquids not classified in Class 3 A and 3 B

Storage Class 11: Flammable Solids

Storage class 12: Non-flammable liquids.

Storage Class 13: Non-flammable solids