GENERAL SAFETY
EDUCATIONAL MATERIALS

KAYA

A New Proactive Training Programme
For Work Safety in High Places

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1.1. INFORMATIONS ABOUT WORKING LEGISLATION

Occupational Health and Safety Law No. 6331

Specialized personnel like work safety expert, occupational physician will work in all workplaces.

Employers is able to use the service of common health and safety units.

State will support the occupational health and safety services expenses of the workplaces where at least 10 people work in it.

Risk assessment will be done in order to prevent accidents and occupational diseases.

Staff will take health checks at regular intervals.

Records of the accidents and occupational diseases will be made more effective and up to date.

Occupational health and safety committees will be created in the workplaces where 50 or more people work in it.

Emergency plans will be prepared in all workplaces.

Employers will inform all the workers about their rights and responsibilities of occupational health and safety and working life.

Staff will actively participate in the occupational health and safety activities in the workplaces.

Worker is able to use his/her right to stop working in case of facing a serious and imminent threat.

Coordination will be provided about occupational health and safety in the workplace where more than one employer there are.

In case of a life-threatening risk, work will be able to be stopped at all or some part of the workplace.

According to Article 5237 of Law No. 85.

The person who caused the death of a person by negligence, shall be punished with imprisonment of up to two to six years.

If act of a person causes the death of more than one people or injuries one or more than one people with the death of more than one people, the person shall be punished by imprisonment of up to two to fifteen years.

(Law No. 5510), Article 13

When insured is in the workplace.

If the insured is not in the workplace due to the work being carried out by the employer or the insured is working not in the workplace because of his/her duty.

In the times that the insured do not work in his real work because of to be sent another location outside of the workplace.

In reserved times for breastfeeding insured women to breastfeed her child.

Events that occur during the transportation with the vehicle provided by employer is that make the insured physically and spiritually damaged.

1.2 Legal Rights and Responsibilities of the Employee

Rights and Responsibilities of the Employee Clearly stated in the Article 8:

The employee may demand taking necessary precautions by declaring the situations to occupational health and safety committee, and in the absence of the committee to the employer which may be dangerous for their health and safety.

The employee follow the instructions given in compliance with the legislation related occupational health and safety by occupational safety expert or employer; in order to protect and develop healthy and safe work environment.

The person appointed by the employer to fulfill the occupational health and safety services, work in a cooperation with common health and safety unit.

The employee participates in studies related occupational health and safety, health checks, informative and training programs.

The employee uses machines, installations, personal protective equipments in line with the instructions and their purpose of production.

The employer and employee representative make cooperation to eliminate the irregularities and deficiencies which have been identified by the inspector with competent authority.

The employee immediately inform the employer when they saw a serious and imminent danger about health and safety in the buildings and plant, equipments, tools, machinery, and apparatus in the workplace.

1.3 General Rules of The Occupational Health and Safety

In The Development of Occupational Safety Culture; State, Employer, Employees/Unions, Universities,

To summarize the tasks of professional organizations;

State

- Prevention of the unregistered employment

- Elimination of child labor

- Elimination of gender discrimination

- Supporting social security

- Reduction of inequality of income distribution

- Determination of a livable minimum wage

The Role of Employers;

Employers should not avoid to make spending on occupational safety. In order to prevent occupational accidents and diseases;

In production processes, the approach which asserts the idea "person is most important" must be accepted rather "efficiency is most important".

Accepting the approach which put forward the risk assessment and risk management.

The Role of the Employee/Unions;

Having knowledge about workplace, the line of work, and production process.

Participation in risk assessment and risk management processes.

"Scientific" analysis of work accidents.

Activities towards the purpose of making occupational safety the priority of life.

The Role of Universities;

Providing scientific support to OHS-Social Policies.

Providing a reliable scientific basis for the establishment of a registration system,

"Scientific" analysis of work accidents.

Basic education of the manpower which will employ in OHS field.

Finally;

Some of the new approach, and method suggestions for creating a Safety Culture listed below;

OHS proactive approach based on knowledge must be generalized.

Close cooperation with the Ministry of Education must be provided. Curriculums must include the OHS lessons.

- A national information network must be established.
- Interactive OHS training methods must be used in schools.

1.4 Order, and Cleaning of the Workplace:

1.5 Ergonomics:

Ergonomics is a research and development tool trying to reveal fundamental laws of system efficiency, and human-machine-environment compliance against organic and, psycho-social stress may be under the effect of the all factors in industrial work environment by taking into considerations of human's anatomical features, anthropometric characteristics, physical capacities and tolerances.

Ergonomics in Offices

Change your position at least 2-4 times per hour.

Standing up several times for a short time is much better than just sitting.

Standing should not be more than 20 minutes.

1.6 Health and Safety Signs

Indicating a specific purpose, activity, or situation

Panle,

Color,

Audible and / or light signal,

Through verbal communication or hand-arm sign

Signs providing informations about occupational health and safety, warning against dangers or, giving instructions.

1.7 The Use of Personal Protective Equipment

We can classify the constantly developing personal protectors according to body parts they protect;

Head and Face Protectors

Ear and Eye Protectors

Respiratory Tract Protectors

Hand and Foot Protectors

Body Protectors

Head and Face Protectors;

Helmet;

That equipment is used to prevent;

Hitting an object falling from a high place to head of someone.

Hitting the head to a hard ground.

Hitting a thrown object to head.

Hitting head to a moving load or being carried material.

Hitting head to the ground by falling somewhere high.

Types and Features of Helmets

Plastic Helmets

Insulator-Plastic Helmets

Aluminum Helmets

Heat Visor:

Protects the face against heat. Provides %50-60 decrease in temperature in the environment with extremely hot ambient temperature like furnace.

Transparent Face Visor:

Is used for protecting face and eyes against chemical and metal splashes and sparks.

Earplugs and similiar devices

Full-Acoustic Helmets

Earmuffs matching to industrial helmets

Closed-circuit ear protectors having communication receiver

Ear protectors equipped with internal communication.

This type of protector does not remove our hearing sensation. Decreases level of noise in proportion to 20-30 decibels.

Noise level should not exceed 80 decibels where not very dangerous works performed.

The upper limit can be 95 decibel where very dangerous works are performed, or noise cannot be prevented because of some machines.

Eye Protectors

Eyeglasses

Helmets with visor

Hand and face visor

Eye Protectors

Eye is the organ which is in danger with physical, chemical and radiation effects. Eyes should be seriously protected against physical and chemical effects.

Hand and Face Visor

Hand Visors

Are used in screening and monitoring the welding process. Difference in helmet, their ends are flame-proof and not head-fitted.

Face Visors

Is used against dangerous flying parts. Used in hot metal processing workplaces.

Face visor must be insulator and flame-proof. must be labels on them indicationd that these features.

Welding Face Shield

Is used for protecting eyes and face against radiation of electricity source and heat.

Mountable to helmet types can be slid towards the top of the head.

Respiratory Tract Protectors

Air Cleaning Masks

Air-Fed Masks

Clean air by itself contained breathing apparatus.

(Oxygen-fed)

Dust Masks

Generally, simple masks which are made with cellulosic fiber

Is used against 0,2-5 micron dust.

Using time is very short, just cover the mouth and nose area.

Gas Mask with Filter Box;

Whole-face covering organic steam is used against acid gases, NH_3, CO or harmful compositions of these.

Is used in wide areas with low density of the gas.

For short term emergency situations, not for continuous use.

Would not be useful in case of a lack of oxygen.

Hand Protectors

Special Protector Gloves

Gloves protecting against machines, chemicals, electricity and heat.

Mittens

Finger Covers

Arm Covers

Wrist protectors for heavy duties (wristband)

Fingerless Gloves

Protector Gloves

Foot and Leg Protectors

Regular shoes, boots, long boots, safety boots

Shoes with quickly openable ties and hooks.

Shoes with finger protectors

Shoes with heat-resistant base and shoe cases

Heat-resistand shoes, boots and leggings

Termal shoes, boots and their cases

Vibration-resistant shoes, boots and their cases

Anti-static shoes, boots and their cases

Insulator shoes are the protectors in electric shock accidents.

base and heel are produced with special rubber, the top with leather.

Provides an effective protection when they are dry and robust.

Non-sparking shoes are safely used for cleaning gasoline and hydrocarbon tanks and production of explosive materials.

Body Protectors

Work Clothes

Work clothes are produced with different materials according to work to be done and seasonal conditions.

Work clothes protect the worker against mechanical influences, dust and dirty air.

Clothes should be tight against the wrapping and grabbing risk from rotating machines. There must not be sagged parts of the clothes.

Overalls are preferred because skirts of jackets and vests can stick to a turning part of something. Loose clothes are preffered in foundries against to contact with hot materials.

Equipment used against falls

Fall Prevention Equipment (Together with all necessary accessories)

Braking equipment absorbing kinetic energy (Together with all necessary accessories)

Equipment can hold the body in space (parachutist belt)

2. HEALTH ISSUES

2.1. Reasons of Occupational Diseases

Reasons of Occupational Diseases are disease, disability or mental illness situations which are suffered by insured because of a repeated reason depending on the nature of the work or execution conditions of the work.

Stress;

May facilitate the occurrence of any disease. But that alone is not a cause of disease..

Physical activities (sports, yoga), regular and healthy eating, social activities (cinema, concerts) may recommended to deal with the stress.

Ergonomics:

Especially ergonomic working environment should be made. Adjustable chairs and tables should be used. Muscles should be operated by moving occasionally. Should be walked in lunch break. Muscles should be strengthened by sport.

Varicosity is seen frequently on the people who constantly standing because of their professions (teachers, surgeons).

Noise;

If there is constant noise in the workplace, hearing disorders may be seen(eg, deafness).

In the environments where machines running constantly, noise measurement can be made. If level of noise is harmful for human health, earplug or earmuff can be used to protect ears.

Air-Ventilation of Workplace Environment:Extreme cold or hot, smoking in a work area may cause a lot of lung disease (asthma, COPD, etc.)

To minimize the occupational diseases, workplaces must be set appropriate work environments for the people.

Personal Protectives;

Working without the necessary personal protective equipments. Lack of controls.

Long Working Hours;

Extended work hours and working without rest regardless to the danger level of the work.

Health Checks;

Failure to do necessary health checks according to nature of the work.

2.2 Techniques of Disease Protection

Protection Techniques:

Protection at source

Protection in environment

Protection of Person

Protection Principles

Workplace planning during establishment

Replacing of harmful substances (substituted)

Working off

Separation-Isolation methods

Local ventilation

General ventilation

Moist-wet work

Cleaning and maintenance of the workplace

Workplace environment analysis

Personal Protectors

Technical Protection

Athmosphere of the workplace should be kept under constant supervision and surveillance, and necessary measurements and improvements should be made.

Personal protectors must be used after taking those precautions.

Medical Protection

Pre-employment medical examinations

Periodic examinations

Education and excitation

Operation at short intervals

Rotational operation

Personal Protection

Respiratory Protection

Eye Protection

Protection of the skin

Protection of the head

Protection of feet

Face Protection

Immunization

2.3 Biological Risk Factors

Biological risk factors are micro-organisms, cell cultures and human parasites(including those are genetically modified) causing any infection, allergy or toxicity.

Sectors exposed to occupational biological risks:

Cultivating and harvesting of agricultural products. (Workers in the agriculture: bronchitis, asthma, hypersensitivity pneumonitis, organic dust syndrome, COPD, conjunctivitis, rhinitis, allergic dermatitis.)

Processing Agricultural Products

- Food Packaging
- Storage: grain silos, tobacco and so on.

Livestock,

Processing of animal hairs and skin,

Fishery

Forestry,

Woodworking: Carpentry,

Textile Factories,

Care of Laboratory Animals.

Health Care: (Hospital Workers: HIV, Hepatitis B, Herpes virus, rubella and tuberculosis)

- Medical Patient Care,
- Clinical and Research Laboratories,
- Dental Examination,
- Disposal of hospital waste.

Personal Care:

- Hair Care,
- Body Care,

Biotechnology manufacturing processes,

Pharmaceutical,

Daily Care Centers,

Building refurbishment works,

Disposal of solid and liquid waste,

Disposal of industrial waste.

Precautions Against Infections

General Precautions

Detection of sensitive person by using periodic checks,

Staff training,

Determination of the patterns of movement at work,

Compatibility of the architectural stuctures of the laboratories and their functions,

Proper insulation and disinfection precautions,

Epidemiological system for detection of infection,

Active immunization (vaccination).

2.4 First Aid For Trade Accidents:

First aid for trade accidents aim

1. Provide basic first aid organization and delivery of
2. To develop an understanding of what to do if there is a In case of accident or other incident work

First aid for trade accidents

First aid - aid which victim (sick) life or critical to the health of their knowledge and to the extent provided by persons with qualifications in medicine or not, regardless of the training and equipment

First aid is simply

Action on the scene

What to do?

Maintain peace of mind!

- Assess the situation, including the current and imminent danger!
- Act quickly and safely!
- Take action targeted !
- Do not be afraid of mistakes!
- Protect yourself!

Action on the scene

Rescue the chain." The basic principles

I. The immediate actions

II. Call for assistance

III. first aid

IV. Transport the victim to a hospital

V. Hospital (Medical Assistance)

Each chain is only as strong as the weakest chain stage

The immediate actions

I. Immediate measures – measures complex to be carried out before the aid is call to save the victim or sick life.

II. Call for assistance

- cry for help around!

- emergency medical services ("FAC") to called another, not you! Can you do to help!

HR controller reported:

- Which happened

- What happened

- The number of victims or suffering, etc.

Do not interrupt the conversation, if it has not done so controller!

III. First Aid -

- skilled assistance to emergency services present.

Your task to run the first 3, in rare and exceptional cases within the first 4 stages!

ABC scheme

- Most critical positions assessment of the preservation of life and maintenance.

ABC scheme comes into force if the victim unconscious!

- Based on consciousness and vital functions this quarterly and circulatory control, and replacement

A "-

1) Try to establish contact with the victim:

- Victim speaks out loud, "What sleep?", "What happened? "

- Shaking the victim. If the victim, speaking to him, and is not responsible shaking

- Does not respond, then he is unconscious and in the future act on the principles of the ABC scheme

A – Airways

B – Breathing

C- Circulation

2) Immediately called to the aid of others. put a call an ambulance, informing unconsciousness. Exhorts him to come back because:

- You'll find out that the ambulance is already called,
- He shall be thy helper, providing the first help.

If you are one and the phone is in your immediate vicinity - HR called himself!
If the phone is not near, nor any mate, the ABC measures should be initiated. when the measures taken for 1 minute, ambulance or assistants to call himself by consuming a short time of time.

3) Place the victim on his back, on a solid basis - it will be necessary for future assistance.
4) Release the victim's airway

- inspection and, if necessary, clean the mouth cavity,
- tilted his head, highlighting the mandible

5) Controlled breathing seeing, hearing and feeling - 10 seconds:

- or are the breathing movements?
- or audible breathing sounds?
- or felt breath on your cheek?

6) If the victim breathes his stable-placed side recumbent position (SSG).
Remember - even a temporary loss of consciousness fainting!
Below - periodically by the victim consciousness, breathing. Protect the victim from cooling.

"B"
So - the victim breathing, although airways are exempt.

7) Deal 2 respiration of word of mouth in anticipation of the victim passive breath.

8) Control the circulation for 10 seconds – or not breathing, move (breast thoracic parts of the body movements).

9) If the circulation is continue artificial respiration 12 times per minute (once every 5 seconds). every a few (approximately two) minutes check signs of circulation.

"C"
Massage storage location:
- the strongest forefinger at the place where interlock rib circles,
- closely adjacent to the finger bends the two weakest fingers on the breastbone,
- upstream of these fingers directly on the sternum placed strong-arm base. Here is a massage place.

10) Start your cardio-pulmonary resuscitation:
- 15 times massaged firmly vertically 4-5 cm deep with frequency of 90 to 110 times per minute,
- 2 times ELPINA,
- over 15 times massages
Resuscitate continue until:
- resuscitation takes professionals
- loss of thy forces
- The moment when you feel that the victim renewed signs of life (movement, coughing, breathing).

If no signs of circulation – keep respiration and heart massage.
- If signs of circulation - check breathing.
- If the circuit features include, but are not breathing
- keep only the respiration ELPINA around once every 5 seconds to every few minutes checking circulation.
- If breathing is - place the victim in a stable side recumbent position (except for trauma patients) and periodically check breathing and circulation.
- If recovering consciousness - care for victims and periodically by consciousness.

Life-threatening bleeding
Help:

If the wound in your arm or leg -

1) aizspied wound with a finger, palm, fist;

2) pick up the limb;

3) place the victim lying down;

4) aizspied artery:

- hand-arm artery

- leg-inguinal arteries;

5) Put a pressing bandage, then released presses the artery;

6) and find out if bleeding does not continue. If continues recharge compression bandages structures with one more a pressing object.

Life-threatening bleeding

If the wound is in the body, neck, head -

1) aizspied wound with a finger, hand, fist and hold until the arrival of HR,

2) if possible, pressing the wound using gauze or clean cloth.

Life-threatening bleeding

Tourniquet is a last resort:

- life-threatening bleeding if not managed

stop using other methods

- If the wound is a foreign object,

- if there is an open fracture,

- amputation injuries.

thermal damage

overheating

- Contributing factors signs

Help:

1) is placed in a cooler place in the shade, lying with raised

bedhead

2) atģērb,

3) cools the forehead, neck, chest with wet compresses,

4) Drink cold drinks,

5) shall be ventilated, cool, create air flow
6) ABC if necessary.

burns
- Contributing factors signs
Help:
1) to discard the burning clothing:
• burning of people knock the ground and stifle the flame
blanket or gate
• Pour water in the victim, but do not do it if burning oil
products
• Try not to use special extinguishing equipment, but if
do it - respect the face;

2) as soon as possible burnt place for at least 10 min.
cooling with cold water, if possible to pour water between
apparel and leather;
3) The victim is placed in a warm place, allowing to cool
the body;
4) The victims' clothing carefully take off, off of NEPL
Burnt body garments, but if
possible, take off shoes, rings;
5) does not open blisters;
6) ABC if necessary.

If you burn more than the victim's hands - leading to
to the doctor!
- facial burns always burns
airways!
Special case: airway burn - always
calls around the risk of choking

cooling
- Contributing factors signs

Help:

1) The victim is placed in a warm room or at the shelter,

2) take off wet clothes, shoes,

3) sasedz with warm, dry clothing,

4) gives a sugary drink, but do not drink alcohol,

5) nemasē, nesēdini raise no standing,

6) ABC, if necessary,

7) HR calls.

frost-bite

- Contributing factors signs

Help:

1) hugging clothes, shoes,

2) wrapped in a frost-bitten parts of dry clothes,

3) In the cold frost-bitten spot

4) gives a warm, sweet drinks, do not drink alcohol,

5) HR calls.

chemical burns

If damaged skin -

Help:

1) dry matter nopurini,

2) Wash the affected area thoroughly with water,

3) bandage with a clean bandage.

If the damaged eye -

Help:

1) Wash with running water for 20 minutes,

2) Wash so that water does not run into the common eye,

3) do not rub,

4) bandage with a dry bandage both eyes,

5) HR calls or deliver to a medical institution.

If the damage to the digestive tract:

- Acids, alkalis,
- Detergents
- Gasoline,
- Solvents.

Help:

- does not cause vomiting!
- not give anything other than cool water, not more than 200 ml ..

If damaged airways -

Help:

- moved to another facility,
- Provides fresh air
- Calm!

Poisoning

Through the digestive tract

- Contributing factors signs

Help:

- prefer to drink warm water from 0.5 to 1.0 liters, emesis and all repeated 10 times in a row,
- collect the drugs found in the surroundings, vomit or other evidence to help identify the poison
- ABC, if necessary,
- HR calls.

Inhalational

- Contributing factors signs

Help:

- before assisting relatives room drafts,
- better to go in a room with a link, another assistant control of the remain in the fresh air
- before entering the room several times a deep inhaling fresh air and then gasp,
- fear of explosion if there are combustible gases (does not turn on and exclude electricity, Do not burn open fires)
- transport victims out of danger zone

- ABC, if necessary,
- HR calls.

Electrocution

Low voltage (1000 V)

Help:

1) guards yourself!

2) cut off the power!

3) ABC, if necessary,

4) HR calls!

High voltage (above 1000 V)

Help:

1) shall not be stored goest killed himself!

2) HR calls, the notification of high voltage

injuries

Limb injuries

These can include:

- Bruises,
- Sprains,
- Dislocations,
- Fractures.

Do not try to distinguish between different types of injuries!

Always assume that trauma may fracture!

Help:

If the injured arm or leg -

- moved, moved,
- HR calls.

If the injured forearm -

- immobilizes the hand, for example. with two scarves, and can transport the victim himself.

Spinal injuries

If an accident caused by one of the the following situations, it is presumed that

the victim may be injured spine:

- a fall from a height
- jump in the water,
- fallen victim to high severity
- car accident, motorcycle accident,
- blow to the head, neck or back,
- suffered an explosion.

Help:

1) moved, not moving!
2) moves only when in danger life
3) moving respect the backbone
4) ABC, if necessary,
5) HR calls.

Freeing the airways - just return the head and originating the mandible and not be placed in stable lateral recumbent position!

Closed chest trauma

Help:

- placed in a sitting position or deposited into an angle, to the affected thoracic hand,
- HR calls.

Head injury

It is dangerous because it can cause life-threatening interference.

Also, insignificant head contusion later (after hours, days) can become dangerous.

This is evidenced by:

- Consciousness,
- Vomiting
- Convulsions,
- Headache,
- Facial appearance asymmetry.

Help:

1) depositing a patient with a raised trunk,

2) If the victim vomits-turn on the one side,

3) is usually bleeding from wounds on his head is not dangerous:

- keep calm!

- bandage!

4) ABC, if necessary,

5) Call HR.

Foreign Objects

airway

Danger-possible choking!

Help:

If the victim is a foreign body is unable to cough,

then help him:

- tap several times between the shoulder blades,

- used Heimliha techniques.

Savior security

1. Do not be afraid to help!

2. Be careful!

3.Remember that the victim may have been infected with various infectious diseases (AIDS virus Hepatitis, etc.)!

4. ELPINA used masks!

5. Bandage used gloves!

3. Technical Issues

3.1 Chemical And Physical Risk Factors

Chemical Risk Factors;

Hazardous Chemicals on Human Health

Can be classified as:

- Very Toxic
- Toxic

- Harmful
- Corrosive
- Irritant
- Sensitizing(Allergic)
- Carcinogenic
- Mutagenic
- Reprotoxicant

HAZARDOUS PROPERTY	MARK	SYMBOL (Black print on the orange ground)
EXPLOSIVE	E	
OXIDIZING	O	
HIGHLY FLAMMABE	F	
EXTREMELY FLAMMABLE	F+	
TOXIC	T	
VERY TOXIC	T+	

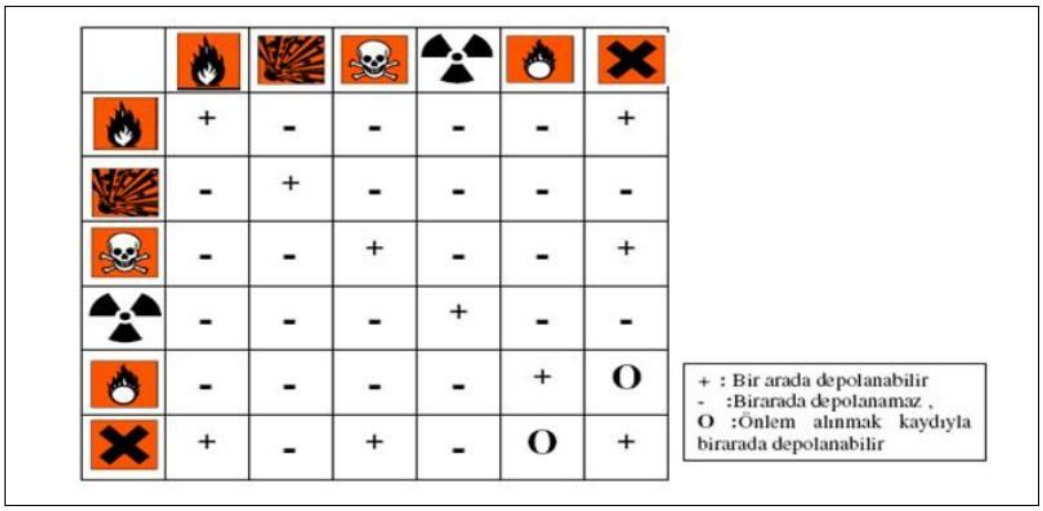
CORROSIVE	**C**	

HARMFUL	**Xn**	
IRRITATING	**Xi**	
SENSITIZING **Sensitization by inhalation**	**Xn**	
SENSITIZING **Sensitization by skin contact**	**Xi**	
CARCINOGENIC **Category 1 and 2**	**T**	
CARCINOGENIC **Category 3**	**Xn**	

MUTAGENIC **Category1 and 2**	**T**	
MUTAGENIC **Category 3**	**Xn**	

REPROTOXICANT **Category1 and 2**	**T**	
REPROTOXICANT **Category 3**	**Xn**	
HAZARDOUS FOR ENVIRONMENT	**N**	

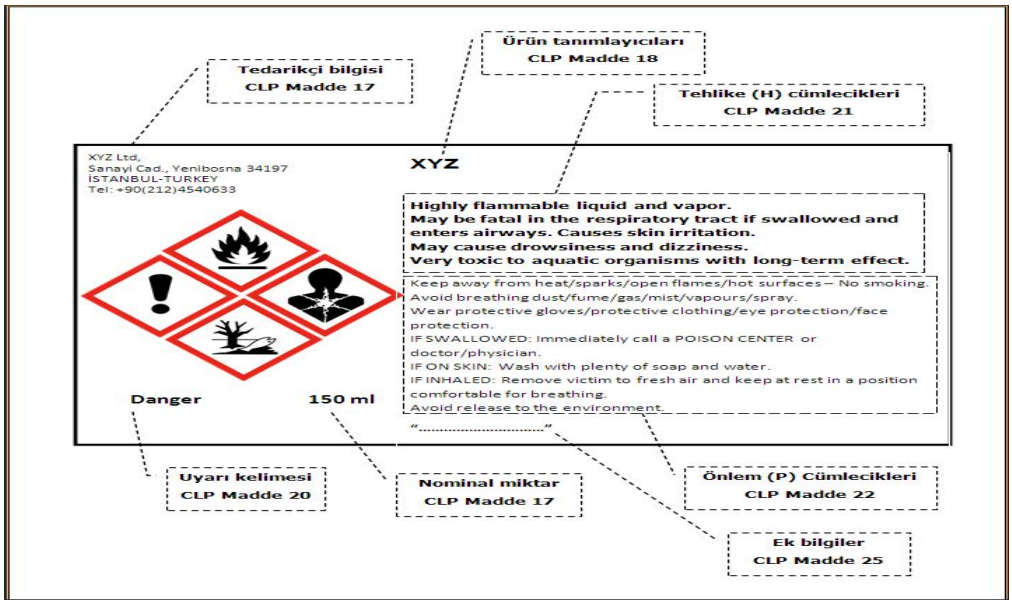
Can not be stored together with which chemical substances



Material Safety Data Sheets(msds)

- **Safety data sheet is prepared to include the following foreseen informations;**
- Description of Substance/Preparation and Company/Employer,
- Information on composition/content,
- Hazards Identification,
- First Aid Measures,
- Fire-Fighting Measures,
- Accidental Release Measures,
- Handling and Storage,

- Exposure Controls / Personal Protection,
- Physical and Chemical Properties,
- Stability and reactivity,
- Toxicological Informations
- Ecological Information,
- Disposal Considerations,
- Transportation Information,
- Regulation Informations,
- Other Informations



3.1.2 Physical Risk Factors

Noise

Vibration

Ventilation

Thermal comfort

Lighting

Noise;

The human ear is able to hear 20-20000 hz 0-140 db..

Negatively effects the hearing function as discomfort on 120 db, as significant pain on 125-130 db, as rupture of eardrum on 140 db..

Determination of Exposure which affect to the worker:

Exposure limit value applies by taking into consideration the protection effects of personal ear protectors used by the worker. [msd= 87 dB(A)]

If there is active exposure; effect of ear protectors are not considered.[med=85 dB(A) ve 80 dB(A)]

Vibration

Deformation of some tissue structures,

Increase in respiratory rate,

Increase in energy expenditure due to the increase of oxygen consumption,

Increase in blood pressure due to the increasing nummber of heart beats.

Decline in performance,

Subjective perception distortion,

Can be caused disruption in functions of central nervous system cells.

Vibration Limit Value

For hand-arm vibration;

Daily exposure limit value for eight-hour work duration is 5 $m/s^{2,}$

Daily exposure limit value for eight-hour work duration is 2,5 m/s^2.

For whole body vibration;

Daily exposure limit value for eight-hour work duration is 1,15 m/s^2,

Daily exposure limit value for eight-hour work duration is 0,5 m/s^2

Ventilation

An adult person needs 30 cubic meters fresh air per hour.

Under normal conditions, the environment air is considered to change 2-3 times per hour by natural ventilation.

Air volume per capita must be 10 cubic meters at working places.

Under normal conditions, height of the ceiling must be at least 3 meters.

In the presence of harmful dust and gases, height of the ceiling must be at least 3,5 meters.

The amount of free space per capita in the workplace must be at least 2.5 square meters.

Thermal Comfort

Thermal comfort means that being in a certain comfort while carrying out physical and mental activites in terms of climatic conditions such as temperature, humidity, air flow.

Air temperature, humidity, air flow rate, thermal radiation are the factors that affect thermal comfort. If those factors are not appropriate, it reduces human working capacity and the efficiency of the business.

Factors affect to Thermal Comfort are ;

- Temperature
- Humidity
- Air Flow Rate

Temperature:

Temperature in very misty workplaces will not be more 30 Celsius degrees, and will not be less than 15 Celsius degrees

Extreme heat has a detrimental effect on production.

If temperature becomes 29 degree, performance will drop %5.

If temperature becomes 30 degree, performance will drop %10.

If temperature becomes 31 degree, performance will drop %17.

If temperature becomes 32 degree, performance will drop %30.

Humidity

The value of the relative humidity is important in terms of occupational health and safety. When relative humidity of a workplace is being evaluated; temperature, air flow rate must be taken into consideration. However, in general, relative humidity must be between %30 and %80 in any workplace.

High relative humidity overwhelms if ambient temperature is high.

Air Flow Rate

An adequate ventilation must be exist in the environment for disposal of contaminated air out of the workplace to be replaced with fresh air. There has to be an appropriate air flow.

However, if that air flow exceeds 0,3 to 0,5 meters / sec irritating breezes occur.

Lighting

Lighting values in the workplace according to the size of the workpiece :

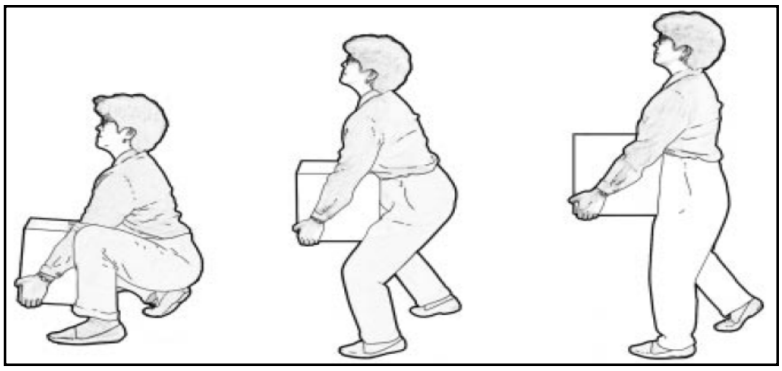
Workpiece Size	Minimum Allowed Lighting	Suggested Lighting
Smaller than 0,2 mm	200 lüx	280 lüx
0,2 mm-1 mm	150 "	200 "
1 mm -10 mm	100 "	150 "
10 mm -100mm	60 "	100 "
Bigger than 100mm	40 "	60 "
Big and Larger in volume	20 "	40 "

3.2 Manual Lifting And Carrying

Must be approached as much as possible to the load.

The necessary power for lifting must be taken from legs, not waist.

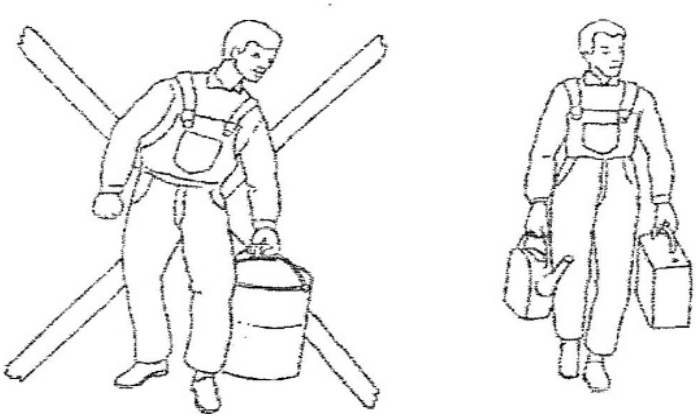
The weight of the load must be shared by two legs equally.



Max. Loads Suggested by International Work Organization

- Men;
    - Occasional Liftings 55 kgr.
    - Frequent Liftings 35 kgr.
- Women;
    - Occasional Liftings 30 kgr.
    - Frequent Liftings 20 kgr.

Possibility of waist's being crushed towards load's direction should be noted. and false positions are below.



3.3 Fire And Fire Protection

Burn

A chemical reaction caused by the combination of flammable substance and oxygen under the heat by specific proportions.

Deflagration

The event of flaming of a flammable substance by a contact with air and a ignition factor.

Flammable substance

Under normal conditions, a volatile or gaseous substance with a low ignition point.

Explosion

Revealing a too fast and uncontrollable energy by ignited flammable substance in ideal mixture.

Explosion intensity is directly proportional to closeness status of the place.

Fire Safety

To be protected against fire:

Workplaces must be kept cleaner

Flammable and inflammable liquides and gas cylinders (oxygen, propan, acetylene) must be preserved in special stores.

Never smoking in the areas which flammable, inflammable and explosive gases and liquides are used in.

Fire Classes:

- A Class: Wood, Paper, Trash, Plastic etc.
- B Class: Chemical Liquides
- C Class: Chemical Gasses
- E Class: Electricity

Appropriate type of fire extinguishers should be used according to the class of fire.

Extinguisher's status can be monitored by using the indicator upon it. The red zone means that extinguisher is empty.

3.4 Safe Use of Work Equipments

Work Equipment:

Any machinery, tool and plant used for making a work.

The use of work equipments

All the activity related work equipments such as running, stopping, use, transportation, repair, modification, mainanence etc.

The Check of Work Equipments

The installation of the work equipments must be done by qualified personnel and the first run must be carried out by them.

Periodic maintenance should be done by experts.

If equipments have not been used for a long time, necessary maintenance should be made in order to protect the health and safety conditions.

Issues about the use of work equipments

Work equipments must be placed, installed and operated minimizing the risk for the users.

In cases where the use of hand ladders, ladders must be placed a firm ground steps should be smooth, sway avoided.

3.5 Working With Screens

In the control cabinets and the cab of the driver of the mobile machinery and vehicles,

In computer systems inside of transportation vehicles,

Computer systems which is open to the public use,

In the portable systems in workplaces,

In the calculators, cash registers and so on.

Screen typewriters,

Neck muscle strain,

Pinched nerve on wrist.

Inflammation on the thumb and wrist tendon

inflammation on shoulder and elbow tendon

Issues to be follow in order to protect the eyes:

Eye examinations of the workers should be done;

Before starting to work with screened instruments,

Periodically

Workers should be subjected to the ophthalmologic test, if required by the result of examination.

Proper materials and tools will be given to the workers, if necessary.

3.6. **Electrical Safety Basics**

Aim:

To provide basic knowledge organizational and technical measures and instruments
form of ensure the protection of electric shock and hazardous hazardous exposure.

Electric current and its characteristics

The concept of power

Current intensity and duration of contact.

The human body's electrical resistance

Voltage and frequency

Current flowing through the human body

Output current and contact time

Electrical contact hazard determinants:

- through the human body flowing currents

- the flow duration

Characterizing the hazards of using:

- the perception current

(~ I = 0,6 – 1,5 mA, - I = 5 – 7 mA; t > 30 sek.)

- Spotting current

(~ I = 5 – 25 mA, - I = 50 – 80 mA; t = 1 – 30 sek.)

- deadly current

(~ I = 100 mA, - I = 300 mA; t = 0,5 - 3 sek.)

The human body electric resistance 1:

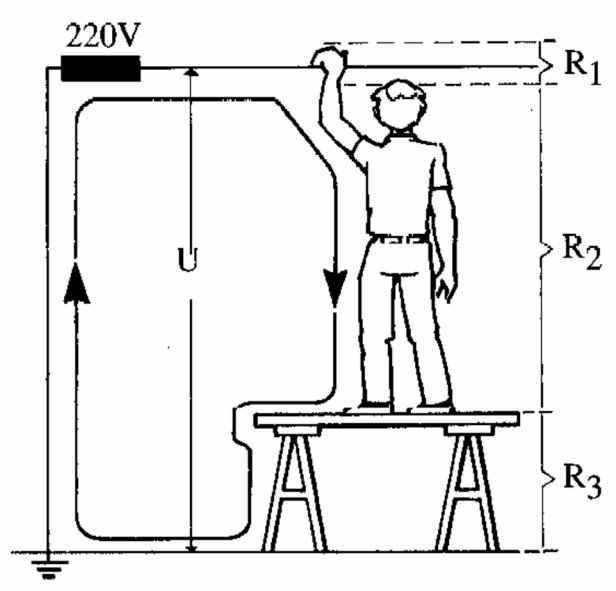
size is determined:

- skin resistance

- internal tissue resistance

Affect:

- skin condition
- human physiological state
- The environment
- contact area and place



R1 contact resistance

R2 human body resistance

R3 eliminated resistance

Voltage and frequency

- safe voltage
- contact voltage
- fault voltage
- step voltage

Frequency effect:

- dangerous 50 Hz AC
- danger several times reduced if f = 200 Hz 400
- above 500 Hz hazards practically disappear

Current paths of human body

right arm - leg;

Left arm leg;

leg - leg;

head legs;

head - hands;

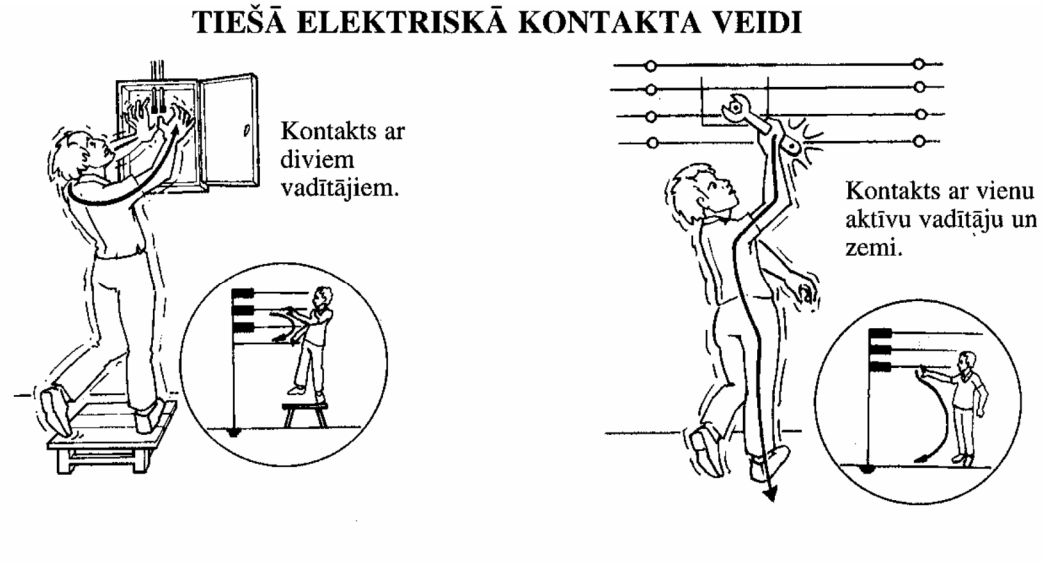
Other tracks.

Direct electrical contacts:

- Tapping the two phase wires;
- Touch one phase wire network with a Neutral point clamped;
- Touch one phase wire network with a isolated neutral;
- Touch one DC cable network

Indirect electrical contacts:

- Internal insulation failure;
- External damage as a result;
- The protective head contact with surfactant voltage driver;
- Result of damage to the protective conductor and voltage surfactant drivers



Electrocution and their types

Electric shocks (26%)

Local electric shock (19%)

The same time, electric shocks and local electric shock (55%)

Electric shocks

Tier I - spasmodic muscle contractions without loss of consciousness;

Tier II - spasmodic muscle contractions with loss of consciousness;

Tier III - loss of consciousness and disturbance breathing or heart rate;

Tier IV- clinical death

Local electric shock

Burns:

Tier I - pink leather;

Tier II - sunburn blisters;

Tier III - skin charring;

Tier IV - tissue, muscle and bone charring.

The distribution of space electrical hazard

Space without increased electrical hazard;

rooms with high electrical hazards;

particularly dangerous to the country;

Working with electrical equipment outdoors

Defense Technical Measures

The use of low voltage;

- electrical network protection gat-sharing; Current
- leading provider of unprotected principles of transparency services;
- conductance of the insulation;
- behind sargze attempts off;
- to the protection leg off;
- Remedies.

Safety Signs

Warning sign: "DANGER ELECTRICITY"

Prohibition signs: "NO", "NOT OPEN" and "DO NOT CLOSE"

Remedies

The main remedies:

- Dielectric gloves;
- Tools with insulated handles;
- Voltage bearers;
- Insulating rods, etc.

In addition to the remedies:

- Dielectric overshoes and carpets;
- ground connections;
- safety signs;
- Insulating spacers, etc.

3.7 REASONS OF WORK ACCIDENTS

What is Accident?

Undesirable events caused damage, loss and injuries as a result of preventable causes.

Escaping with little or no harm

Escaping with little or no harm (Hazardous Condition / Behaviors) means that the accident is near.

We are able to prevent the work accidents by investigating and eliminating the causes (Hazardous Condition / Behaviors).

If escapings with little or no harm are not reported, reasons cannot be investigated, problems cannot be known.

The situation which

Can be caused loss of life or propery, or injuiries,

Unpredictable

Even if predicted, if necessary precautions are not taken, there are the danger of accident or near miss.

Are concerned as Hazardous Condition / Behaviors

3.8 Reasons of Accident And Injury

Reasons of Accidents 1/3

Unsafe and Wrong Acts(individual)

- Irresponsible operation without complying with the guidelines
- Using wrong tool
- Unsafe Loading
- Ignoring Safety
- Not using PPEs

Unsafe Conditions(Environment)

- Environment without protection
- Inadequate Lighting
- Inadequate Ventilation
- Messy and poorly maintained environment
- Non-ergonomic Machine

Reasons of Accidents 2/3

Being not be aware of the dangers of working conditions

Lack of knowledge about usage and importance of the PPEs

Lack of professional experience

Lack of knowledge about machinery protectors

Being excited or hasty

To be inadequate in terms of health

Habit or addiction

Physiological or chronic fatigue etc.

Reasons of Accidents 3/3

Work which is carried out by sharp instruments such as knives, saws etc.

Pressing or compression works which requires presses, vices etc.

Works which the potential energy turns into kinetic energy

Physiological stresses such as the fear of exposure to violence.

3.9 Work Hygiene:

Work Hygiene;

Work hygiene is art and science which detects, evaluates and controls the environmental factors which is caused deterioration on the health and unrest.

Work hygiene is determining the factors occured in the work and knowing them how to effect to the human health.

Determining the level of harmful factors by experiments.

Developing new methods to eliminate their harmful effects.

Harmful Factors

- **Chemical Factors**

- Liquid,
- Dust,
- Metal Smokes,
- Acid Particles,
- Steam and Gases,

- **Physical Factors**

- Noise,
- Thermal Comfort Conditions,(temperature, humidity, air flow velocity),
- Lighting,
- Vibration,
- Electromagnetic and ionizing radiations,

- **Biological Factors**

- Flies,

- Bugs,
- Mushrooms,
- Bacterias,
- Viruses,

➢ **Ergonomic Factors**

- Human-Machinery Relations,
- Monotony,
- Frustration and Exhaustation etc.