



Liberty Liège-Dudelange

**GENERAL HEALTH AND
SAFETY INSTRUCTIONS**

PREPARATION OF THE SAFETY PASSPORT TEST

Version 5, 20 February 2020

1. Personal Protective Equipment

Requirements for workers in all facilities

■ helmet



■ safety boots



■ working clothes



■ safety glasses

Specific requirements :

■ hot steel making process : - a fire retardant suit

■ if high noise levels : - ear protection



Mandatory in all blue noise risk zones

1. Personal Protective Equipment

- Dangerous atmosphere (dust, gases, fumes, HAP):

- Mask P3 (dust)



- Protection against HAP (aromatic polycyclique hydrocarbon) : mask P3 or A2P3



- Breathing equipment

- Risk of projectiles (solid or liquid)

- Protective goggles



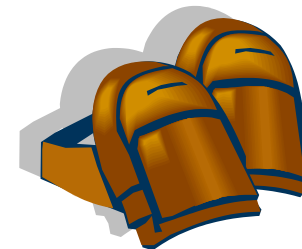
- Welding or flame cutting

- Protective goggles with filtering eyepieces



- During arc welding :

- Face mask with colorless visor + visor filter



1. Personal Protective Equipment

- Handling of objects :

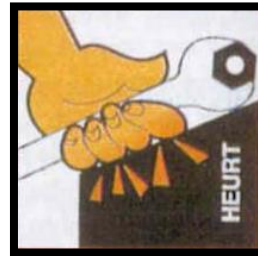
Risks of :



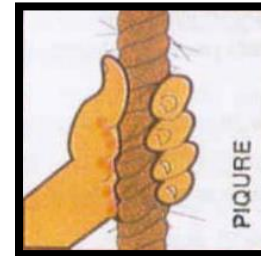
Crushing



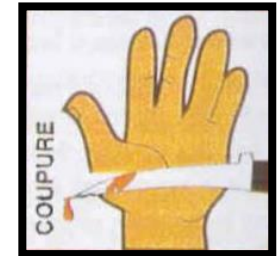
Burning



Impact



Friction



Cutting

Wear appropriate gloves !!!

The type of glove should be chosen depending on the risk encountered.





What basic personal protective equipment is obligatory in all installations ?

a) Safety boots, a helmet, working clothes and safety glasses

b) Safety boots, a helmet and auditive protections

c) Safety boots, working clothes and gloves



A dust mask protects you against :

a) Lack of oxygen

b) Certain types of dust

c) A specified gas



If I do not wear my personal protective equipment (PPE) :

a) I cannot enter Liberty Liège-Dudelange's sites

b) Regulations do not apply if I do not work for Liberty Liège-Dudelange

c) I can work in the zones where there is no risk

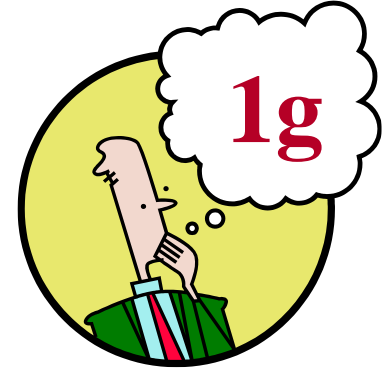
In areas exposed to noise, hearing protection equipment is :



a) Advised

b) Forbidden

c) Obligatory



The mask P3 protects you against :

a) CO

b) Dust

c) All gases

2. Isolation

Observe the 6 golden rules

To carry out tasks / for any work on (or near) facilities

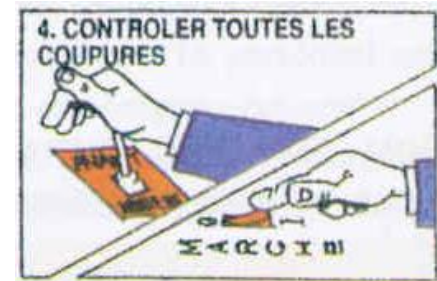
All work subject to isolation requires a valid green autorisation sheet

1



Request for isolation
before the start of the work

4



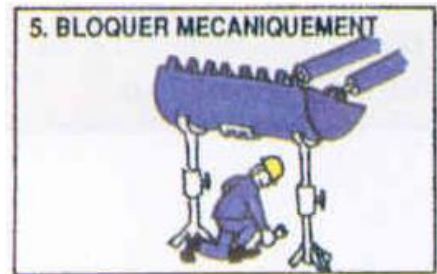
Check that
all the
energy has
been cut off

2



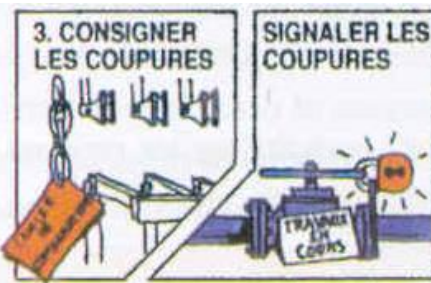
Use means of locking
that will withstand the
loads to which they
could be subjected.

5



Lock
mechanically

3



Only personnel of
Liberty Liège-
Dudelage are
allowed to cut off
energy supplies

6



Demarcate
the working
areas

2. Isolation

Working close to railway lines (1.5 m) :



- Isolate the track
(specific isolation issued
by the Railway
Department)
- Obtain the agreement of
the Railway Department

It is just as important to cancel the isolation as to request it in the first place !!!



Who is authorised to cut off energy sources of Liberty Liège-Dudelange installation ?

- a) The specialist staff of Liberty Liège-Dudelange
- b) All workers
- c) Workers from external firms



All work subject to isolation requires :

a) A fire permit

b) A valid green autorisation sheet

c) A permit from the Railway Department



When there is a risk of persons or objects falling into an excavation, effective warning signs must be set up. Those signs should be located :

- a) At the excavation
- b) A minimum of 0.5 m from the excavation
- c) A minimum of 1.5 m from the excavation

Isolation is :



a) Determining the parts to be removed from a machine

b) Stopping a line to maintain it

c) Making working equipment safe before working on it

**To work on isolated work equipment,
I must be in possession of :**



a) A valid green autorisation sheet

b) The verbal authorisation of the foreman Liberty
Liège-Dudelange

c) The authorisation of the team leader of my company

3. The equipment used

- It is prohibited to loan equipment or tools
- The equipment must comply with the prevailing regulations
- The equipment must be in good condition
- The equipment must be fitted with original safety features
- Wear PPE depending on the risk encountered



Provision of
energy by
Liberty Liège-
Dudelage

Check the tools before use !!!



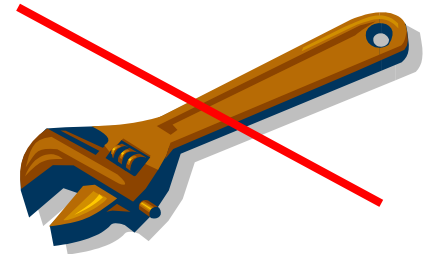
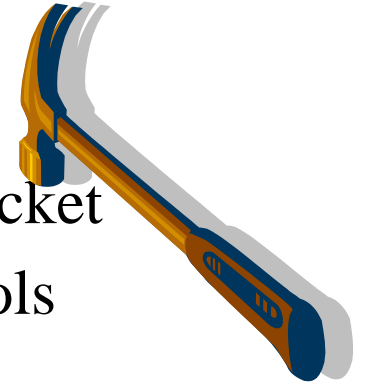
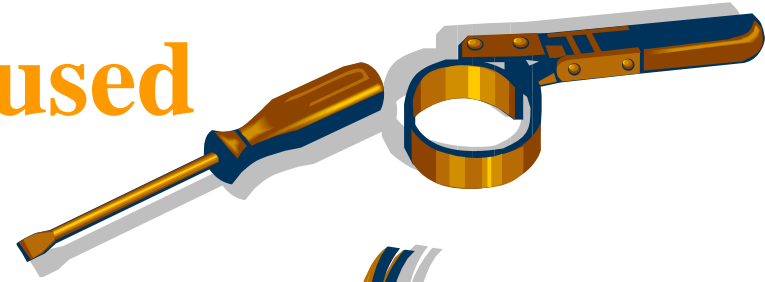
3. The equipment used

Hand tools

- Use the tools for their intended purpose
- Putting away :- Do not put tools in your pocket
 - Protect pointed or sharp tools
 - Do not abandon tools

- Do not use adjustable spanners

Use special tools in explosive atmospheres



3. The equipment used

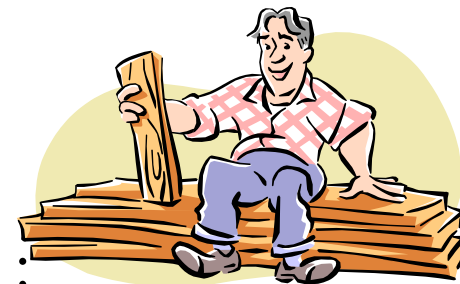
Sealing machines and stud guns

- Instructions necessary for operation and maintenance
- The operator must be at least 18 years of age and have received appropriate training
- Transport in a rigid case
- No shooting in dangerous areas :
 - persons, electricity, fire hazard, ...



It is strictly prohibited to aim
a stud gun at anyone !!!

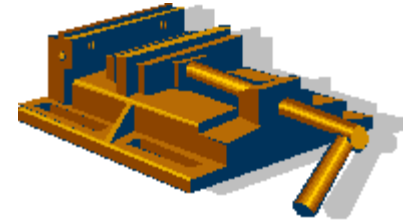
3. The equipment used



Sealing machines and stud guns

- Check the nature and the thickness of the material :
 - ~~Existing holes~~
 - ~~Iron or sheet steel less than 5 mm thick~~
- Unload immediately after use
- When a cartridge has not exploded
 - 1 – Fire again in that position.
 - 2 – If the shot is still not fired, hold the gun firmly against the work surface for at least 15 seconds.
 - 3 – Hold the stud gun for 2 minutes in a position so that all accidents are ruled out.
 - 4 - Unload the pistol
 - 5 - Do not re-use cartridges that did not explode, but send them back to the supplier.

3. The equipment used



Portable machines

- Immobilise the parts to be worked on
- Wait for the portable machine to come to a standstill before putting it down

Do not wear clothes that fit so loosely that they could become entangled in machinery !!!

Electric machines

- Use machines with double insulation
- Make sure that the power supply is protected by a circuit-breaker



Do not handle or hang machines by the power cord !!!

3. The equipment used



Disk grinders

- Before fitting a new disk

Check :

- Number of rpm shown on the machine
- Quality of material
- Age of disk : < 3 years

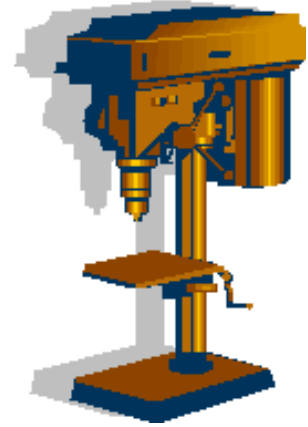
- Use

- Do not put excessive pressure on one side of the disk
- Preferably use disks with an offset hub, otherwise provide special flanges for flat disks

Pneumatic machines

- Check the rotation speed once a week
- Check the condition of pipes, connectors and cocks

3. The equipment used



Stationary machines

- Do not short-circuit the safety systems
- Do not carry out cleaning, greasing, etc of parts that are moving
- Always contact specialists for fitting, alignment and checking of grinding wheels
- Use a hook or brush to remove filings and turnings



3. The equipment used

Torch welding or cutting

- Cylinders : see « **13. Gases and hazardous fluids** »
- Fit flame checks on the gas and oxygen hoses
- Use the correct clamps
- Do not join two hoses with a copper or brass fitting
- Always have 2 suitable fire extinguishers close to hand and ready to use



3. The equipment used

Arc welding and cutting

- Use welding set transformers with a low open-circuit voltage
- Use power cables of adequate cross-section, and of the shortest length possible
- Same cross-section for electrode holder and earth
- Connect the welding set correctly to earth using an appropriate plug and clamp
- Apply the earth clamp directly to the part to be welded
- Keep gloves dry in the case of work on metal structures or in damp places



- Evacuate smoke





The discs from angle grinders are :

a) Universal for all types of work

b) Different depending on the speed of the angle grinder and the material to be worked

c) Different depending on the angle grinder voltage

**To remove a bolted part, I preferably
use :**



a) A closed wrench

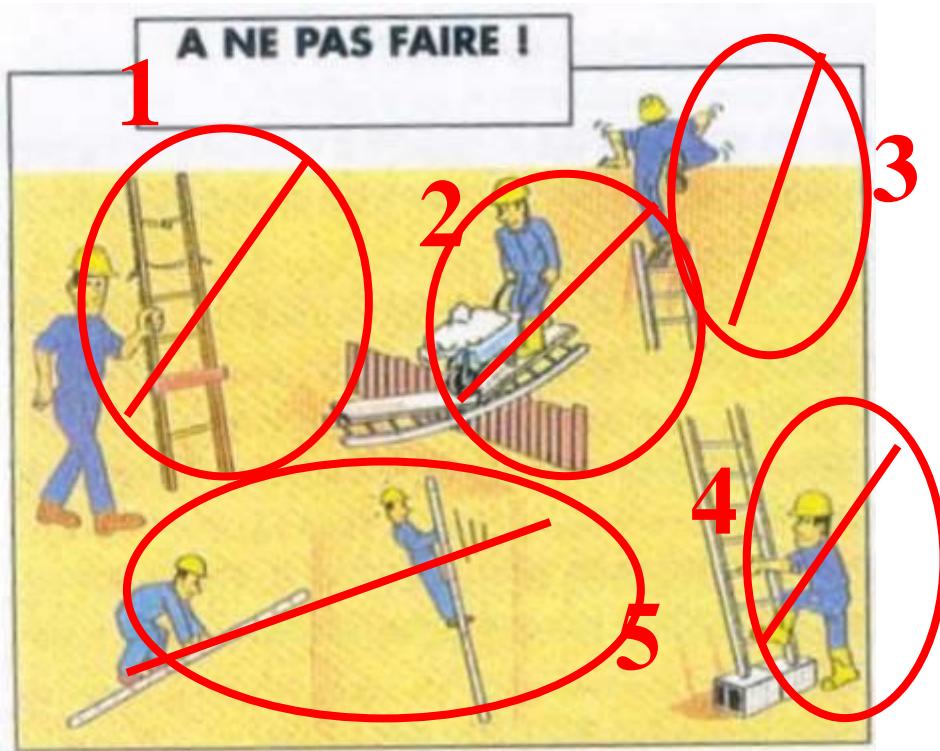
b) An adjustable wrench

c) Pipe pliers

4. Ladders and scaffolding

Ladders

WHAT NOT TO DO

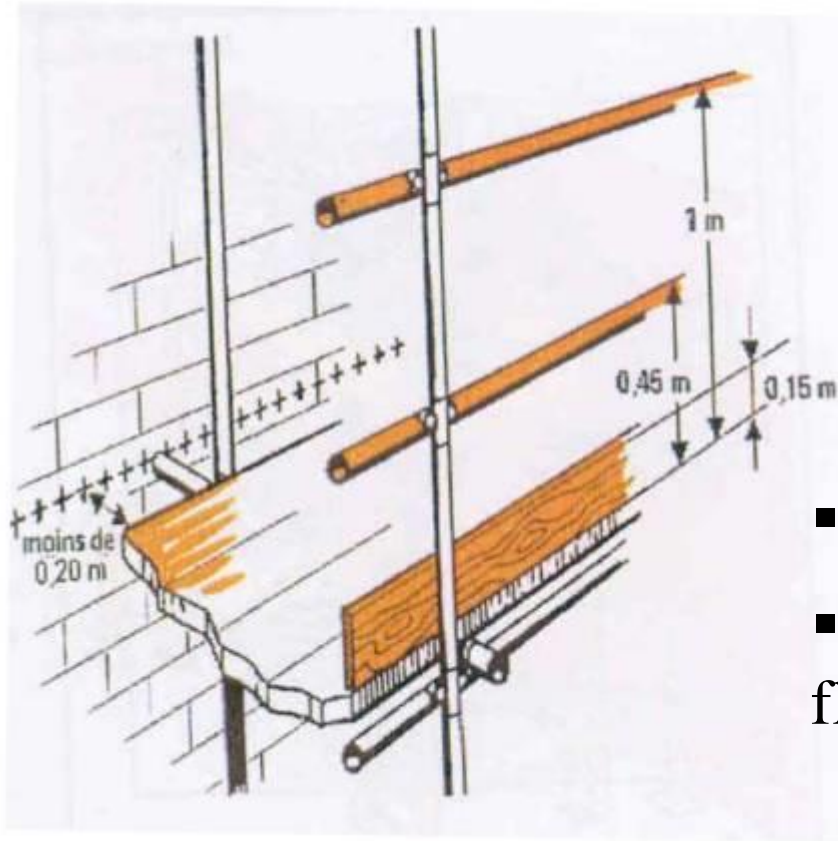


TO DO

1. Use if in good condition and have been checked
2. Only use ladders for their intended purpose
- 3-4. Ladders must exceed the access level by at least 1 metre and the desired angle
5. Use ladders on a stable surface
6. Ladders must be lashed if they exceed 25 rungs

4. Ladders and scaffolding

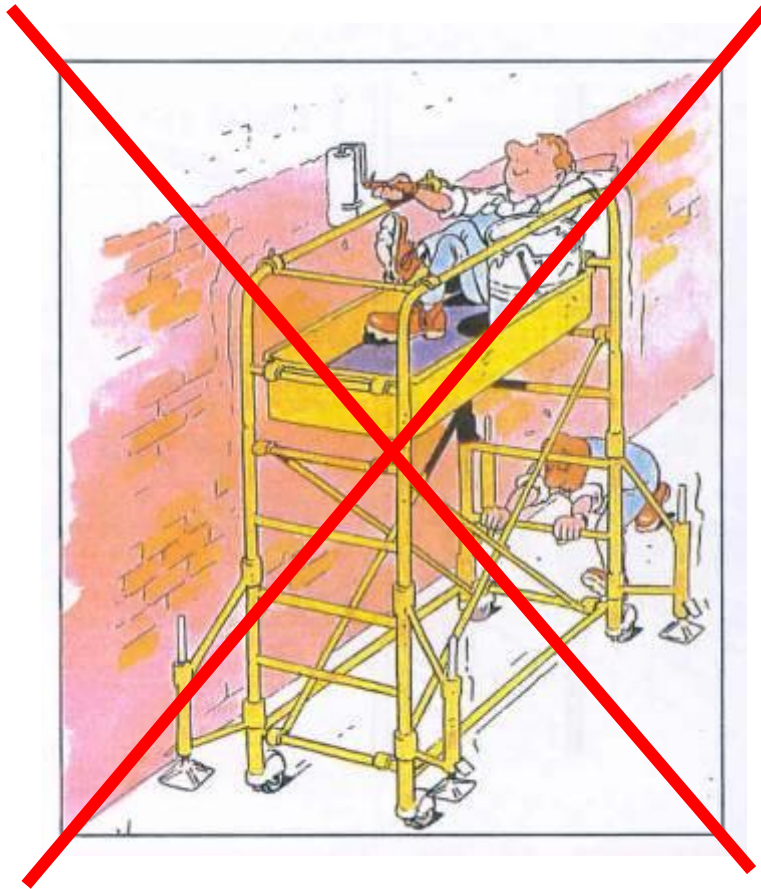
SCAFFOLDING : can only be used by trained persons



- On stable surface
- Must be anchored
- Secure the floors
- Guard rail
- **Check : before every use**
- Use the means of access provided
- Warning : do not overload the floors

4. Ladders and scaffolding

ROLLING SCAFFOLDING



- Lock the wheels of the scaffolding before climbing onto it
- Ensure that there is nobody on the rolling scaffolding before moving it

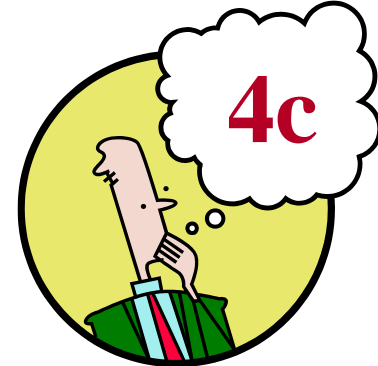
The ladder should exceed the working platform to be reached by at least ...m



a) 0,5 m

b) 1 m

c) 3 m



When must scaffolding be checked ?

a) Before every use

b) Never

c) Every 3 months



Indicate the correct statement

- a) Moving scaffolding has no guard rail
- b) A person can be on the scaffolding during its movement.
- c) Moving scaffolding must not be moved with personnel on it

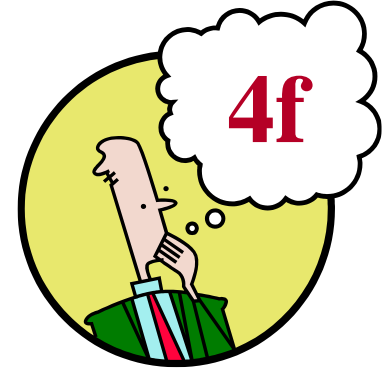


Can we work on a ladder :

a) If it does not exceed 10 rungs

b) If it is fixed

c) Only with exceptional written authorisation

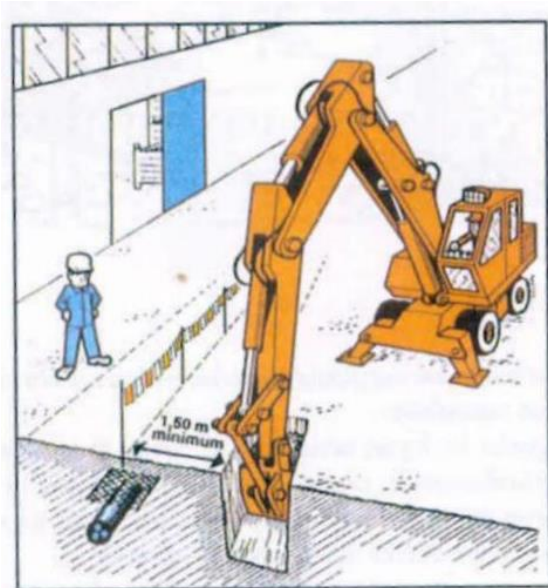
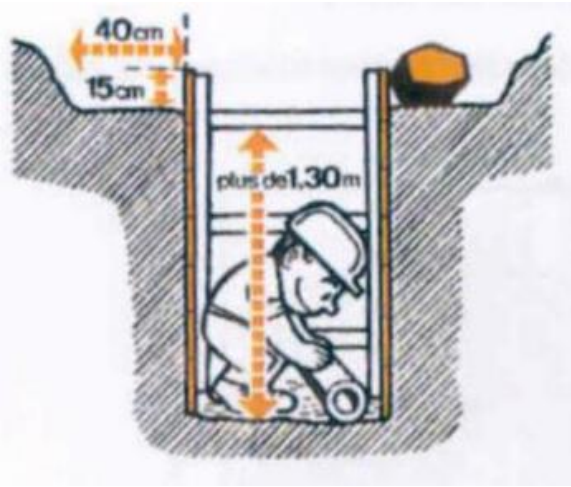


Scaffolding :

- a) Must never be fixed or anchored
- b) May not have a guard rail
- c) Must be inspected before every use

5. Excavations, holes and demolitions

Excavations



- Any excavations to a depth greater than 1.20 metres must be notified to the administration in writing
- Protect with guard-rails or appropriate signage positioned at least at **1.5 m** away
- Check the position of pipes and cables
- Prevent any landslide and that anything can fall in

5. Excavations, holes and demolitions

Holes

- platform
- tank
- stairwell



- Protect with guard-rails
- Covering : strength, rigidity, fixing



Light

Marking positioned for max 8 hours and at least 1.5 m from the hole



5. Excavations, holes and demolitions

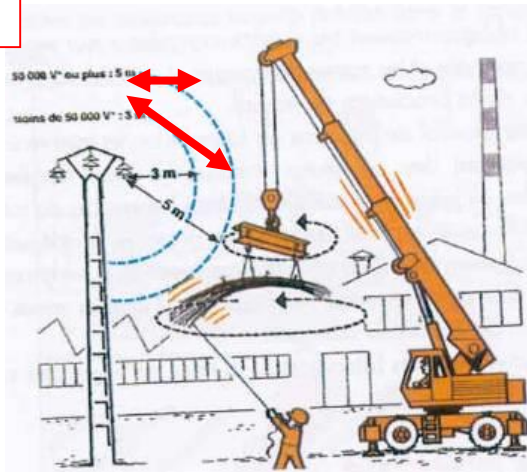
Demolitions



- Ensure that all the supplies connected inside (gas, electricity, oxygen, water, etc...) have been properly neutralised

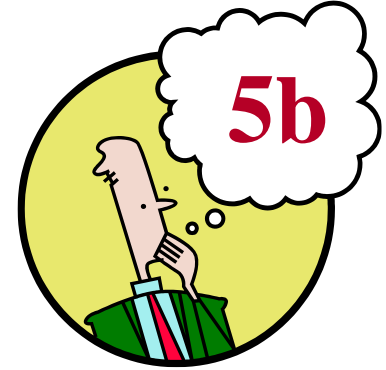
- 50.000 V: 3 m

+ 50.000 V: 5 m



- Demarcate the dangerous areas
- Fence off and mark the site with signs
- High voltage: respect safety distances

Report the lines in service !!!



What is the duration of a tagging by a two colored band ?

a) The hole work time

b) 8 hours

c) 24 hours



I protect an opening in the ground :

a) When its depth exceeds 50 centimetres

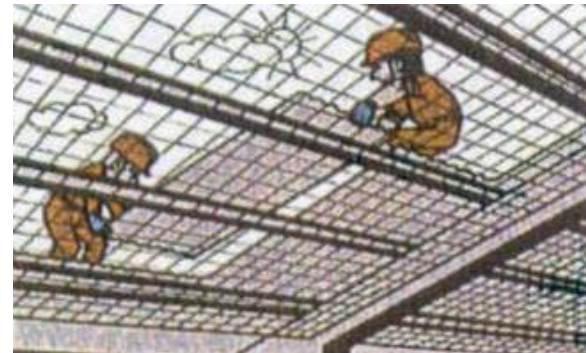
b) When its depth exceeds 1 metre

c) Whatever its depth

6. Working at height (> 1.8 m)

Hierarchy of protections

1. **Collective protection equipment** to prevent any falls (guard-rails)



2. Collective protection equipment to reduce the consequences of the fall (nets)

3. Personal protective equipment (harness)

Anchorage points must be sufficiently strong and arranged so as not to allow falls of more than one meter



6. Working at height (> 1.8 m)

Working on the roof (access permit is compulsory):

- Before the work

- It is compulsory to call in the relevant department (danger zones, working procedures)
- Inspect the general condition of the roof (fragile materials !)
- Mark the danger zones on the ground using appropriate signs

- While working

- Use **collective** and personal protective equipment
- Do not work alone
- Ensure that the equipment, materials, tools cannot fly off





What type of protection against falls should be preferred :

a) Personal protective equipment (harness)

b) Collective protection (guard-rail)

c) Leave a free choice



From what height is anti-falls protection obligatory ?

a) 1.5 m at foot level

b) When the risk of falling is present

c) 3 m at foot level

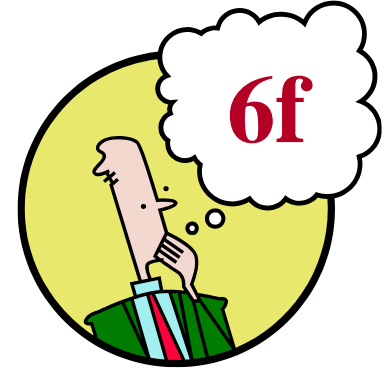


To work on a roof :

a) You must be alone

b) You can be alone

c) There must be at least two people



A regulation guard rail must have :

a) Height of at least 50 cm

b) Height of at least 1 m

c) Height of at least 2 m

In the absence of collective protection, the wearing of an attached harness is obligatory for working at heights, it means :



- a) From 1,8 m height to foot level
- b) From 3 m height to foot level
- c) From 5 m height to foot level

7. Lifting equipment and accessories

Lifting equipment

- Must be inspected by an external testing body every three months
- Can only be used by trained personnel (appropriate permit)
- Only one person can give instructions



Do not leave a load hanging from lifting equipment if the equipment is not under the control of the operator !!!

7. Lifting equipment and accessories

Do not park underneath a hanging load ; keep as far away as possible

Do not transport people on a travelling crane or on a hanging load.

Do not go onto the runway or the travelling crane without having received authorisation from the crane operator.

7. Lifting equipment and accessories

Lifting accessories

- Always equipped with a safety latch
- Inspected by an external testing body (every 3 months)
- Used only for a designated purpose and must not exceed the maximum permissible load
- Ensure that all components of the load are attached together
- It is prohibited to short-cut the safety devices



Warning : avoid overloading !!!



Which statement is **correct ?**

During lifting operations :

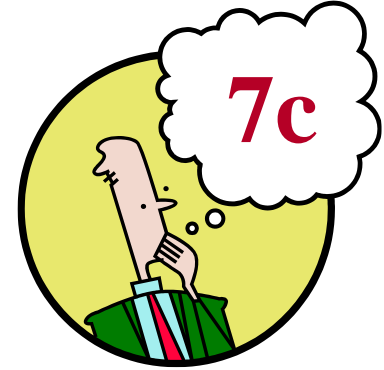
- a) You can park under a suspended load
- b) A suspended load can be left on lifting equipment without supervision
- c) It is forbidden to carry persons on a travelling crane

All lifting equipment requires every 3 months :



- a) A favourable inspection report from an external technical inspection department
- b) A Liberty Liège-Dudelange's inspection report
- c) A manufacturer's inspection report

Is it permitted to park under a suspended load ?



a) No

b) Yes

c) Only if you have authorisation from the crane operator

How should instructions be given to a crane operator ?

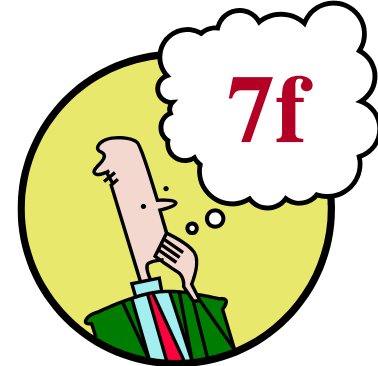


- a) Obligatory by radio
- b) Always by several persons
- c) By a single man using regulation hand signals

If I must stop a handling operation in progress when :



- a) I lift the load at maximum
- b) I leave the load suspended outside the pedestrian route
- c) I place the load on the ground



To use Liberty Liège-Dudelange's handling equipment :

- a) I need the agreement of my boss
- b) I need the agreement of the sector manager
- c) I need a specific Liberty Liège-Dudelange's permit

8. Handling operations

6 Golden rules of the hook-up man

Assess the load and the stresses



Consult the hoisting table



Wear gloves



Check the slings



Protect sharp edges



Give clear instructions for manoeuvring



Only allow the lifting equipment, the lashing of the load, and the communication by signalling to be controlled by competent people who have been authorised to do that job.

Truck drivers and co-drivers are prohibited from being in the cab or on the trailer during (un)loading operations.

8. Handling operations

Handling machines



GET OFF !

It is prohibited to travel as a passenger on a goods handling machine except if it is specially equipped with a passenger seat



By whom and when must slings be inspected ?

- a) By the company's safety department
- b) By the department's manager every day
- c) By the user before each use, by an external technical inspection department (every 3 months)



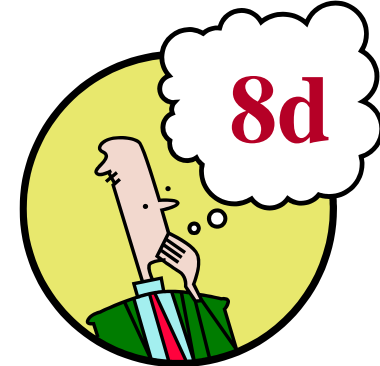
How do you determine the maximum authorised load for a sling ?

- a) By calculation
- b) By observing its colour
- c) By consulting the slinging table



As operator of handling equipment :

- a) You can transport persons, if you limit your speed
- b) You can always transport persons, if your passenger hangs on
- c) You can transport persons, if your handling equipment is fitted with a passenger seat and the passenger is in training.

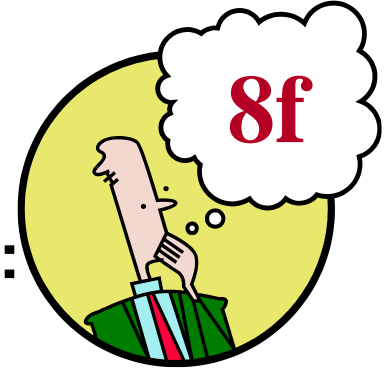


**During loading or unloading a lorry,
the driver must :**

a) Be in the cab

b) Be on his trailer

c) Keep as far as possible from his vehicle



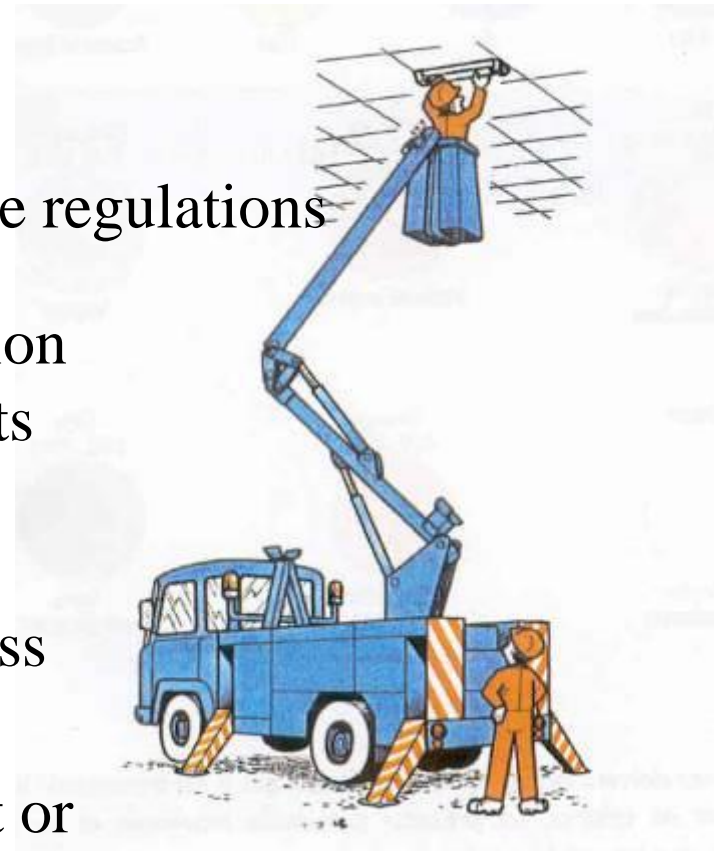
During handling operations, you must :

- a) Leave the crane operator to work alone
- b) Get several people to direct the operation
- c) Ensure only one man runs the operation

9. Gondolas and elevator trucks

Gondolas and cradles

- Equiped with guard-rails as required by the regulations
- Inspected by an external technical inspection body every 3 months and relevant documents available
- It is compulsory to attached a harness
- 2 persons maximum + 50 kg of equipment or material
- Gas cylinders are prohibited inside the gondola



9. Gondolas and elevator trucks

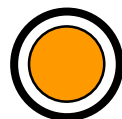
Elevator trucks with platforms for persons

- Appropriate driving licence
- System to prevent sudden fall of forks due to hydraulic failure must be implemented (either non-return system or a diaphragm system)
- Inspected by an external technical inspection body every 3 months



While working with platform for persons :

- A flashing light



- Driver is not allowed to leave his position for any reason

- Driving wheels must be blocked

It is strictly prohibited to move the truck while persons are on the raised platform



What is the maximum load for a cradle ?

a) 1 person

b) 2 persons

c) 2 persons + 50 kg of equipment



When working in a cradle, you use :

a) No personal protective equipment

b) A safety belt

c) A safety harness with the attachment point fixed to the cradle



**During the use of a fork lift truck,
you must :**

- a) Operate a flashing light continuously
- b) Operate a sound signal continuously
- c) Mark out a zone 1.5 m around the automatic lift



If I am in a cradle, I must attach my harness :

a) Permanently

b) If the height exceeds 5 metres

c) If the cradle does not have a door

10. Indications

Colour coding to identify fluids



Exemple:



**Hazard
pictogramme**

**Name of the
fluid**

**Maximum
potential
pressure**

**Direction of
flow**

10. Indications

Colour coding for cylinder heads of gas containers

Nouveau code couleur pour les bouteilles de gaz (extrait)

Inflammable

Hydrogène H_2
Formiergas inflammable
 N_2/H_2 ($H_2 > 5\%$)
Méthane CH_4
 Ar/H_2
 H_2/CH_4



RAL 3000 rouge

Nocif, corrosif

Ammoniac NH_3
Chlore Cl_2
Chlorure d'hydrogène HCl



RAL 1018 jaune

Argon Ar



RAL 6001 vert foncé

Inerte

Air
 Ar/CO_2
 N_2/CO_2
 CO_2/O_2 ($O_2 \leq 21\%$)



RAL 6018 vert vif

CO_2/O_2 ($O_2 > 21\%$)



RAL 5012 bleu clair

10. Indications

Colour coding for cylinder heads of gas containers

Carbon monoxide

Protoxyde d'azote N_2O



RAL 5010 bleu

Oxygen

Oxygène O_2



RAL 9010 blanc

Dioxide de carbone

Dioxyde de carbone CO_2



RAL 7037 gris

Helium

Hélium He



RAL 8008 brun

Acetylene

Acétylène C_2H_2



RAL 3009 marron

Source: NF EN 1089-2

10. Indications

PROHIBITORY SIGNS



No smoking



Fire, naked flames and smoking prohibited



No pedestrians

10. Indications

PROHIBITORY SIGNS



Do not use water to extinguish



Not drinking water



No entry for unauthorised persons

10. Indications

PROHIBITORY SIGNS



No goods handling vehicles



Do not touch

10. Indications

MANDATORY SIGNS



Eye protection compulsory



Helmet compulsory



Ear protection compulsory

10. Indications

MANDATORY SIGNS



Breathing apparatus compulsory



Protective footwear compulsory



Protective gloves compulsory

10. Indications

MANDATORY SIGNS



Body protection compulsory



Face protection compulsory



Personal protection equipment against falls compulsory

10. Indications

MANDATORY SIGNS



Compulsory route for pedestrians



General obligation

(plus an additional sign if appropriate)

10. Indications

WARNING SIGNS



Flammable materials or high temperatures



Explosive substances



Toxic substances

10. Indications

WARNING SIGNS



Corrosive substances



Radioactive materials



Hanging loads

10. Indications

WARNING SIGNS



Goods handling vehicles



Danger : electricity



General hazard

10. Indications

WARNING SIGNS



Laser radiation



Oxidising substances



Non-ionising radiation

10. Indications

WARNING SIGNS



Strong magnetic Field



Risk of tripping



Fall from elevation

10. Indications

WARNING SIGNS



Biological hazard



Low temperature



Harmful or irritating substances

10. Indications

WARNING SIGNS



Explosible zone

10. Indications

RESCUE OR EMERGENCY SIGNS



Direction of an exit



Direction of an emergency exit



First Aid

10. Indications

RESCUE OR EMERGENCY SIGNS



Stretcher



Emergency shower



Eye irrigation

10. Indications

RESCUE OR EMERGENCY SIGNS



Emergency and first aid telephone



Direction to follow (to be used with another of the signs)



Automated external defibrillator

10. Indications

RESCUE OR EMERGENCY SIGNS



Meeting point (PR1 – PR2)

10. Indications

FIRE FIGHTING SIGNS



Fire hose



Ladder



Extinguisher

10. Indications

FIRE FIGHTING SIGNS



Fire service phone



Direction to follow (to be used with another signs)

10. Indications

SIGNS SPECIFIC TO LIBERTY LIEGE-DUDELANGE



Risk of crushing by travelling cranes



Risk of crushing between cylinders



Fire permit compulsory

10. Indications

SIGNS SPECIFIC TO LIBERTY LIEGE-DUDELANGE



Hoppers - Silos



Stop ! Automatic plant

10. Indications

SIGNS SPECIFIC TO LIBERTY LIEGE-DUDELANGE



Risk of asphyxia



Asbestos



Marking of permanently dangerous locations

10. Indications

SIGNS SPECIFIC TO LIBERTY LIEGE-DUDELANGE



Hollow body

Sound Signal : A horn warns about starting of conveyor belt!



The blue pictograms for the use of personal protective equipment are :

- a) Prohibition indications
- b) Recommendation indications
- c) Obligatory indications



A yellow painted pipe contains :

a) Acid

b) Gas

c) Oil

What does this black warning on a yellow background indicate ?



-
- a) Danger of explosion
 - b) Radioactive materials
 - c) Laser radiation

What fluid is indicated by this symbol ?



RAL 3009 marron

a) Carbogen

b) Acetylene

c) Oxygen

The red paint on a pipe corresponds :

a) To the fire circuit

b) To a toxic product

c) To an inflammable product

What does this panel indicate at Liberty Liège-Dudelange ?



- a) Risk of crushing between cylinders
- b) Biological danger
- c) High magnetic field



A blue painted pipe contains :

a) Water

b) Compressed air

c) Paint

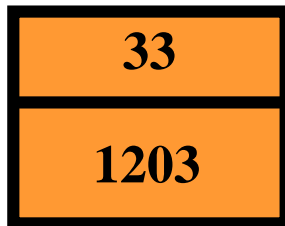
A yellow triangle with “EX” written in it indicates :



- a) The presence of an extinguisher
- b) An exit to the outside
- c) An explosion risk zone

11. Road traffic

- The highway code is applied on the site
 - Valid driving licence
 - Vehicles must have valid technical inspection certificates, be registered, insured and in good working order.
 - The speed limits must be strictly observed
 - Parking of vehicles is only allowed in areas designated for this purpose



- Any vehicle fitted with an orange ADR sign must stop at the security guards' office to obtain an (un)loading permit

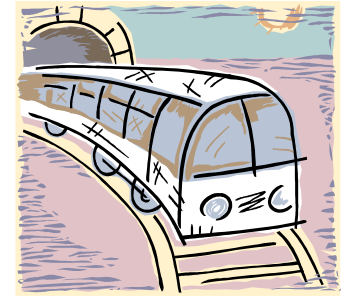
- Any accident must be reported to the security guards



Obligation to comply with the orders of the security guards

11. Road traffic

Rail traffic



- White light : locomotive is heading towards you
- Red lights : locomotive is moving away from you

Road vehicles must observe the absolute priority allowed to trains.



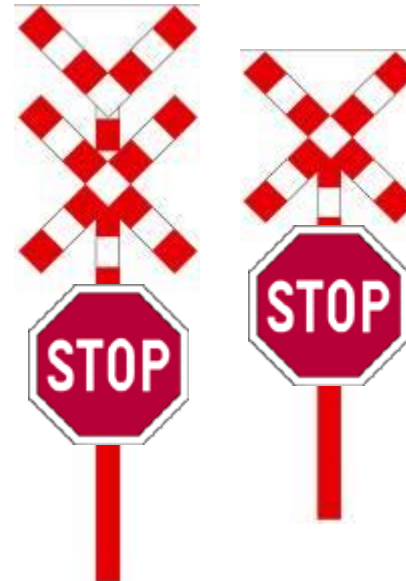
11. Road traffic

**Respect the light signal when crossing a level crossing.
When you approach a crossing where the 2 red lights are
flashing alternately, you can not cross the level crossing.
This prohibition also applies to pedestrians!**



**The flashing white light means that you
can cross the level crossing, you don't
need to stop (but remain cautious!)**

**If the crossing is not equipped with a light
signal or if it is off, the stop sign must be
respected ==> you must stop before crossing !**



11. Road traffic



When you see this panel, **you can not enter the area (except for the machinist) a locomotive and wagons are there!**

Indeed, in the presence of the locomotive and / or wagons on the track, these areas have narrow spaces (less than 1.5 m), which pose a significant risk of crushing between a fixed and moving-point

- It is prohibited to park along the tracks less than 1.5 metres from the nearest rail.
- It is prohibited to climb onto a wagon, pass underneath a wagon or its fastenings, even if it is at a standstill and if it is not part of your job.
- The driver can not cross if traffic congestion is such that he would likely be immobilized on this passage.

Who has absolute priority inside of installations :



a) Rail traffic (train)

b) Road vehicles

c) All vehicles fitted with an orange ADR plate

**On the roads of Liberty Liège-Dudelange
the speed of vehicles is always limited
to :**



a) At 20 km/h

b) According to speed limit signs

c) At 50 km/h

**It is forbidden to park along ways
unless ... meters of the nearest rail :**



a) 1 m

b) 1.5 m

c) 3 m at foot level



When does the traffic code apply in the factory :

a) Yes

b) No

c) When indicated



Does rail traffic have priority :

- a) Never
- b) When indicated
- c) Always

12. Electrical risks

The dangers: shocks, burns, explosions, ...

- Working on facilities:



- Qualified persons

- Appropriate personal protective equipment

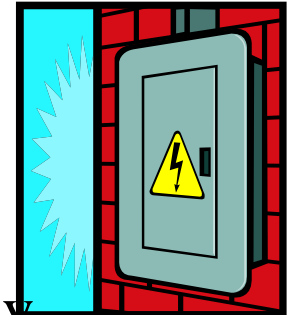
- Power switched off (rules of isolation)

- Access to electrical service rooms is strictly regulated, and reserved for authorised persons BA4 or BA5.

- Facilities and distribution panels on site

- In perfect condition

- Inspected by an external technical inspection body



- Respect protective devices

12. Electrical risks

The dangers: shocks, burns, explosions, ...

- Respect safety distances

$2.5 \text{ m} + 1 \text{ cm per Kv}$

Examples :

➔ For 50.000 V = $2.5 \text{ m} + 50 * 1 \text{ cm} = 3 \text{ m}$

➔ For 150.000 V = $2.5 \text{ m} + 150 * 1 \text{ cm} = 4 \text{ m}$

12. Electrical risks



- Portable machines

- CE

- double insulation 

- Portable electrical lighting : max. 12 V in normal conditions, max. 6 V in wet conditions

In case of accident :

EMERGENCY PHONE NUMBER = 123

- Cut off the electric power supply
- If the voltage is higher than 1000 volts, keep your distance and call the service responsible

Be aware of the possibility of internal injuries



What is the most important measure to prevent accidents when working on electrical installations ?



a) Use insulated tooling (pliers, screwdriver)

b) Isolated working

c) Wear safety boots and insulated gloves

Which persons can enter into premises of electrical department ?



a) Any worker

b) Non one

c) Sufficiently trained – informed and qualified persons (BA4 and BA5)

13. Gases and hazardous fluids

Dangers

Risk of asphyxiation or poisoning

Nitrogen (N_2) : reduces the level of oxygen in the air

Carbon dioxide (CO_2) : is used to fight fire by reducing the oxygen level in the air

CO : Toxic

Ammonia (NH_3) : very irritating



odourless !!!



Characteristic odour !!!

13. Gases and hazardous fluids

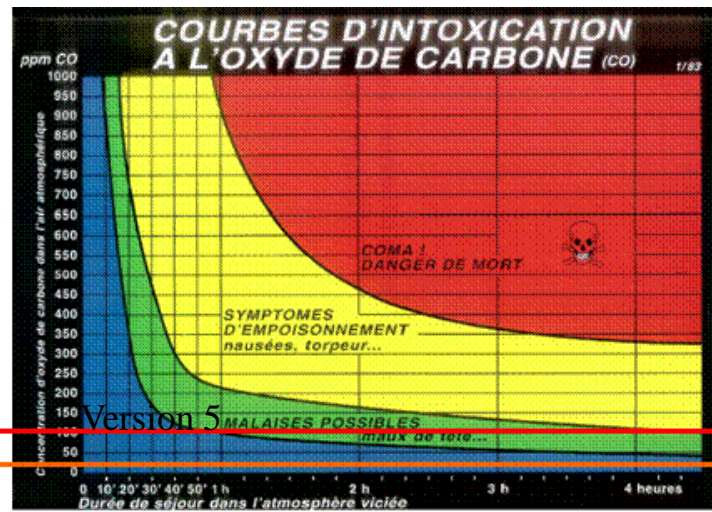
Dangers Risk of asphyxiation or poisoning

CO : Toxic !!

→ When limit 1 (LOW) of CO is reached **25 ppm**, this anomaly should be notified to your manager and must be communicated to the hierarchy. Work can continue, but with major attention concerning the risk.

→ When limit 2 (HIGH) of CO is reached **100 ppm**, work must be immediately stopped and the area should be evacuated calmly.

This anomaly must be immediately notified to your manager and must be communicated to the hierarchy. Leak must be dealt with immediately.



13. Gases and hazardous fluids

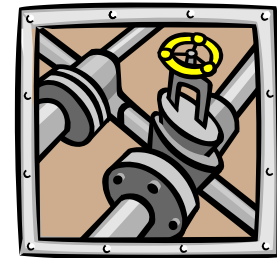
To breathe correctly we need between 19% and 21% oxygen:

If you are in a room containing less than 19% oxygen
→ autonomous mask connected to a medical air rack
is necessary

Dangers

Burns

- Corrosive and irritating fluids
- Steam
- Thermal fluid

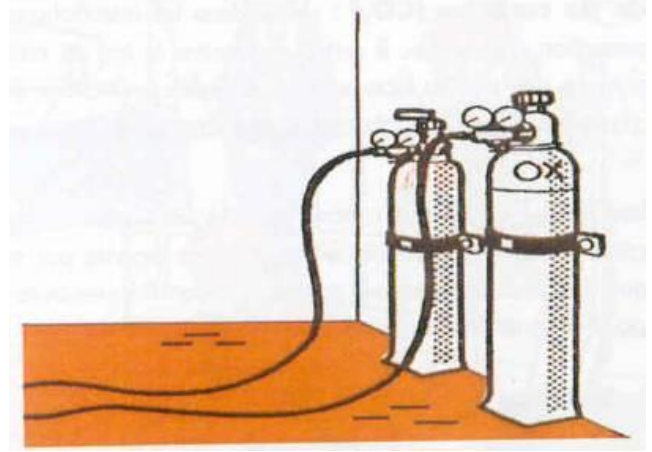


13. Gases and hazardous fluids

Gas cylinders

Storage

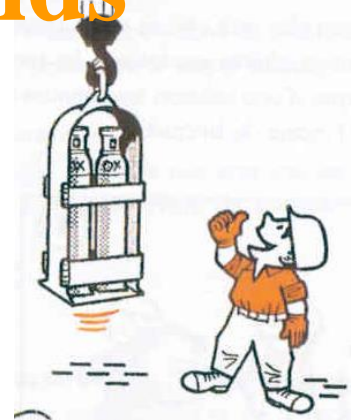
- Protect from sunlight and heat sources
- Do not store them in greasy locations
- Keep all combustible products away
- Never smoke nearby
- Store cylinders upright and attached in secured storage area
- Separate the empty cylinders from the full ones
- Do not store more than 10 cylinders in the same place



13. Gases and hazardous fluids

Gas cylinders Handling

- Secure cylinders when transporting (attached)
- Use special trolleys for transport (never roll cylinders)
- Always have a fire extinguisher nearby or on the trolley



Gas cylinders During use

Only search for leaks using a soapy solution

- Natural gas - Formation of explosive atmosphere
- Propane
 - Do not store and do not use at levels below the general floor level and if possible outside
 - Keep cylinders upright

13. Gases and hazardous fluids

Gas cylinders

During use

- Acetylene :
 - Never lean acetylene bottles at an angle of more than 30° !
 - Avoid copper / brass connectors
 - In the event of fire, cool the bottles by spraying them with water for at least 2 hours, and call the fire service
- Oxygen :
 - Avoid oil or grease coming into contact with a valve, a cock or the gas itself
 - Do not use instead of air



- Hydrogen :
 - Do not create flames or heat sources

Highly flammable !!!





Carbon monoxide (CO) is :

a) Very bad for the ozone layer but does not represent an immediate danger to health

b) An odourless, colourless and fatal gas

c) Harmless

What percentage of oxygen must be guaranteed in a normal working area ?



a) 15 % oxygen

b) 21 % oxygen

c) 25 % oxygen

How should acetylene cylinders be stored ?



RAL 3009 marron



a) Inclined at 45°

b) Upright and tied

c) Laid on the ground

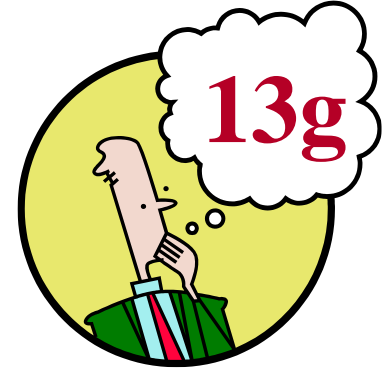


I store my propane cylinders :

a) In a cellar

b) At ground level, if possible outside

c) In a completely closed room



**When CO detector indicates 100 ppm,
I must :**

- a) Leave the place, and wait in the dining room.
- b) Leave the place and go home
- c) Leave the place and warn the hierarchy

**The pre-alarm level of the CO detector
is :**



a) 25 ppm

b) 50 ppm

c) 100 ppm

Carbon monoxide (CO) is :

a) Is odourless

b) Has a bad egg smell

c) Has a gassy smell

Nitrogen (N₂):



a) Is odourless

b) Has a bad egg smell

c) Has a gassy smell

14. Fire and explosions

Fire : prevention

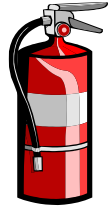
- Ensure that fire hydrants, extinguishers and emergency exits are easily accessible at all times.
- Store flammable products in appropriate, designated places.
- Observe the symbols, signs and notices banning fires and flames.



Fire : before work

- Remove, protect or cover combustible materials close to work area.
10m ↔
- Clear the path of the pipe or object being worked on of all combustible materials.
- Seal holes, cracks, gaps etc. in the walls near the work area.

14. Fire and explosions



Fire : before work

- Set up nearby, ready for use, equipment to put out a fire.
- Empty, clean and ventilate the containers that contained flammable materials.
- Obtain a fire permit.

Fire : during work

- Do not leave lit blow-torch unattended.
- Only put hot objects down on surfaces that can withstand heat and which do not spread it.
- Dispose of electrode waste in an appropriate container.

14. Fire and explosions

Fire : after work

- Advise the appropriate persons in charge
- Perform a meticulous inspection of the work area
- Maintain surveillance of the premises for at least two hours after stopping work

Many fires break out during the hours following completion of work

- Only reposition objects that have been moved out after a period of 24 hours.
- Request re-activation of the detection and protection systems as soon as the break in work is over.

Water in the first minute



Water in the second minute



Water in the third minute



After



14. Fire and explosions

In case of fire

- Phone the emergency service immediately
- State precisely the place and the nature of the fire
- Send a person to meet the emergency services to guide them to the place of the fire
- Immediately start firefighting actions :
 - **Cut off the energy supplies (gas, electricity)**
 - **Safeguard human life**
 - **Limit the fire with the means available**
 - **Facilitate the task of the emergency services**
- Notify the person responsible for monitoring the work at Liberty Liège-Dudelange



123



14. Fire and explosions

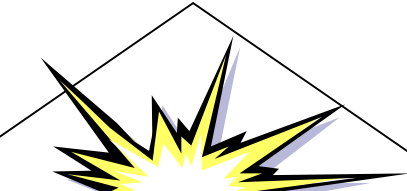
Explosions:

Very rapid and very violent ignition

= EXPLOSION

Source of energy

Flame
Sparks
Hot spots
Cigarettes
...



Fuel

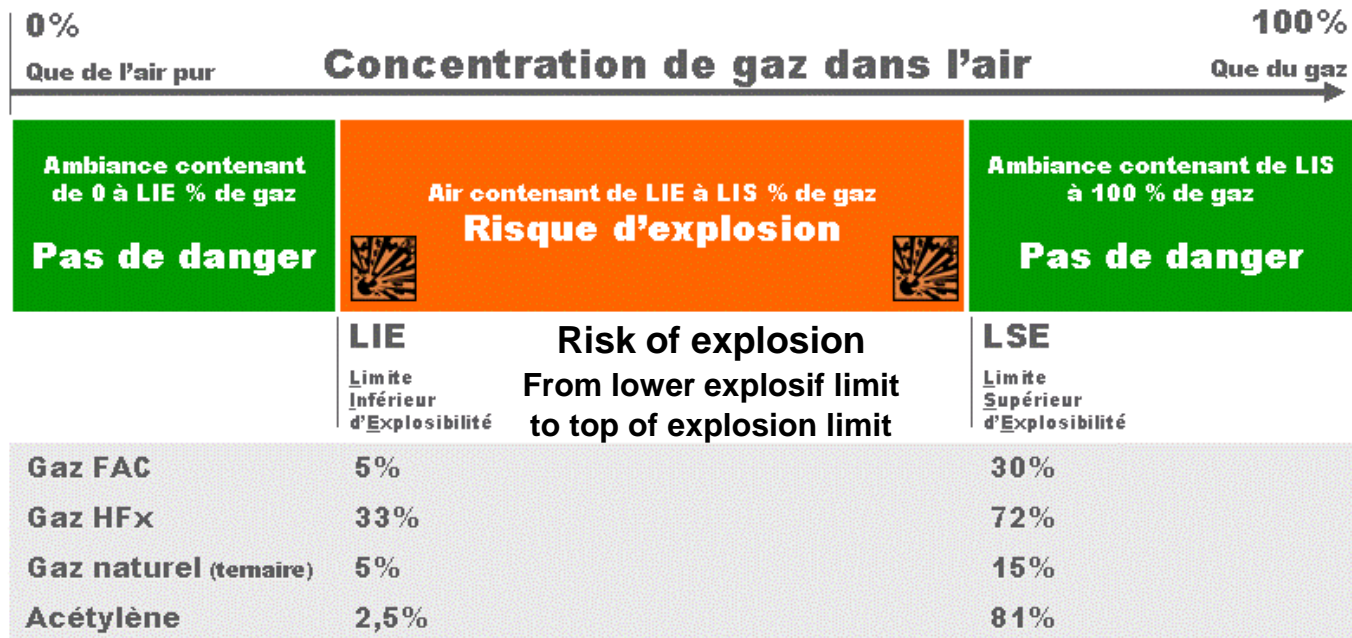
Hydrogen	4 – 75 %
Blast furnace gas	33 – 2 %
Coke oven gas	5 – 30 %
Acetylen	2,5 – 81 %
Tetrene	1,9 – 13,5%
Benzene	1,4 – 8%
Natural gas	5 – 15%

Combustion

oxygen

14. Fire and explosions

Explosions : Concentration of gas in the air



No danger

From 0 to lower explosif limit

No danger

At top of explosion limit
100% of gas

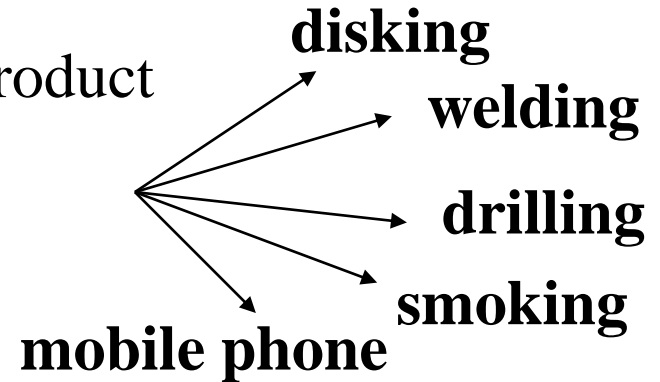
« Ex zone » indicated by this icon are areas where gas or air mixture are explosive or could be explosive under some conditions (temperature, mixture, air ...)



14. Fire and explosions

Explosions : precautions

- Avoid any leak of flammable product
- Avoid any source of ignition
- Use spark-proof tools
- Respect safety devices
- Apply safety procedures
- Neutralisation only by authorised persons



Beware of « empty » drums or pipes which previously contained a flammable product : they may still contain vapour in an explosive mixture with air !

14. Fire and explosions



Explosions : detection of leaks

- The smell : but not all flammable gases have a smell !
- Permanent detectors
- Mini CO for gas leaks containing CO (blast furnace gas, coke oven gas)
- An explosimeter



Explosions : in case of alert

- If possible, stop the leak and ventilate the area
- Do not produce fire, sparks or a flame

!!!! RUN !!!!

- Immediately warn the hierarchy, the Energy department and the security guard service

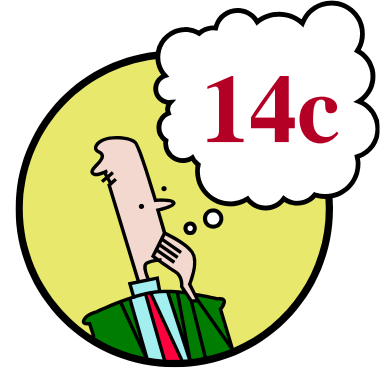


What does the panel below indicate :



-
- a) An extinguisher
- b) A gas cylinder
- c) A danger of explosion

When must you have a fire permit ?



- a) Never
- b) Only for work in confined spaces
- c) For work with a naked flame

What conditions lead to an explosion ?



a) Gas

b) Gas, air, a source of heat

c) Gas and air

If I have to weld, drill or disk in a marked zone EX, I must :



a) Use tools in good condition

b) Have a fire permit

c) Have a fire extinguisher nearby

Before working on a pipe that has contained an inflammable product, I must :



- a) Take an explosion risk meter measurement
- b) Measure the oxygen content
- c) Measure the temperature

**For work with a naked flame,
I must have :**



a) A confined spaces work permit

b) A fire permit

c) A pipework permit



To work with a naked flame, I must :

- a) Have the necessary extinguishing equipment
- b) Be a first aider
- c) Warn the nearest firemen

15. Emergency services, first aid and hygiene

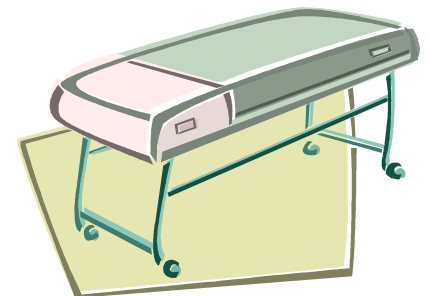
Emergency Services

- Any injury or any contact with hazardous product (corrosive, irritant) must be treated in the sick bay
- In the event of a serious injury :



Emergency services = 123
Mobile phone : 04 / 236 4123

- Comfort and reassure the injured person
- Do not move the victim
- Call in the industrial first-aiders
- Guide the emergency services to the location
- Notify the hierarchy



15. Emergency services, first aid and hygiene



Internal Emergency Plan :

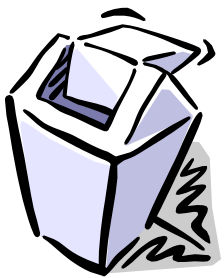
The Internal Emergency Plan is triggered when a modulated siren is resounding.

- ➔ In that event, you must walk to the PR1 (point of meeting 1) or PR2 after having secured your work place on instructions of the hierarchy
- ➔ Panels show you the location of PR1 and PR2
- ➔ For contractors, information can also be found on the building site opening document or from the hierarchy

15. Emergency services, first aid and hygiene

Care and hygiene :

- Wash your hands before eating, drinking, smoking (in particular, workers who are exposed to hazardous products and HAP)
- Do not eat meals in the workshop (strictly prohibited)



- Place waste in a container provided for that purpose
- Keep the amenities clean
- Take a shower as soon as the working day ends
- Change regularly your working suit and do not go home with it





What is the internal emergency service phone number at Liberty Liège-Dudelange ?

a) 132

b) 321

c) 123

Which is the hot line dialed by mobile phone ?

a) 100

b) 0.4.100.4.123

c) 0.4.236.4.123



A simple scratch :

- a) Must be immediately treated at the infirmary
- b) Need not be treated
- c) Must be treated by yourself

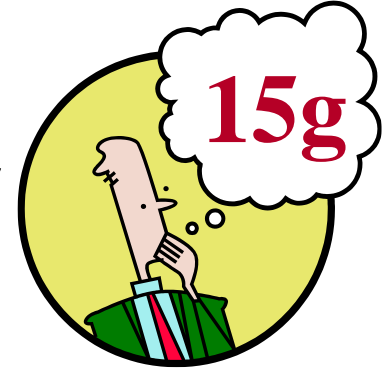
What does "PR1" signify?

a) Point of rotation 1

b) Meeting point 1

c) Point of provisioning 1

In case of starting up of the emergency plan, I must :



a) Leave the factory and stay safe at home

b) Walk to the PR1 (PR2 if announced) after having secured my work place

c) Lock myself into my office



How can I know where the PR1 and the PR2 are ?

a) On the building site opening document
(or from hierarchy)

b) I look around me at the indications

c) I know that it is always at the main gate

16. Hazardous products

Packed products :

Poisons control centre : 070/245.245

- Label :
 - Each hazardous product must be labelled
 - Read before using (symbols, precautions of using)
- Safety Information Sheet :
 - Instructions (handling, storage, first aid, ...)
- Transport :
 - Permit of (un)loading given by responsible person at Liberty Liège-Dudelange
 - Specific regulations ADR / RID



16. Hazardous products

This		kills		This		poisons you
Toxic (T)				Harmful (Xn)		

- Avoid inhaling
- Avoid contact with skin – use personal protective equipment
- Preferably work outdoors or in a well-ventilated place
- Wash your hands after use
- Never eat or smoke when using these products



16. Hazardous products

This  catches fire

Easily flammable (F)



This  oxidizes

Oxidizing (O)



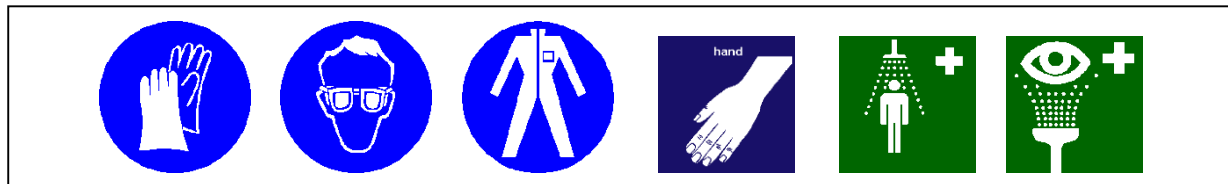
- Store products in well-ventilated place
- Never use near a heat source, a hot surface, near sparks or a naked flame – No smoking
- Do not wear nylon clothes
- Keep a powder type fire extinguisher
- Separate completely easily flammables products from oxidizing products



16. Hazardous products

This		eats away at you	This		stings
	Corrosive (C)			Irritant (Xi)	

- Keep products in their original packaging : well closed containers, safety lids
- Protect your skin and eyes - **use personal protective equipment**
- Be very careful when pouring the product
- Do not inhale products (they are dangerous for the respiratory tract)
- Wash your hands after use
- In the event of contact with your skin or eyes, rinse thoroughly with water



16. Hazardous products

This  **explodes**
Explosive (E)



- Avoid overheating
- Protect against sunlight
- Never put them close to heat sources, lamps, radiators, etc.
- Never smoke or produce heat



16. Hazardous products

Products distributed by pipes and mains

Warning : 2 distributed fluids are lethal :

- **blast furnace gaz (22% CO)**
- **coke oven gas (5% CO)**



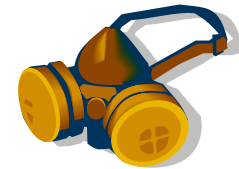
- Identify the pipes surrounding the future work area, by consulting the colour code and calling in the relevant department if necessary
- Notify the department responsible and follow their recommendations for working in the vicinity of pipes or mains
- Carry a CO detector
- Take compressed-air breathing apparatus with you into the work area

16. Hazardous products

Aromatic polycyclique hydrocarbon (HAP):

At the coke plant distillation of coal produces gases and smoke. These fumes are responsible for different elements harmful to health such as HAP.

- Wearing a mask P3 (dust) is obligatory
- Wearing a mask A2P3 is obligatory in some areas which are more exposed to the risk of HAP
- Rules of hygiene are the best measure to prevent HAP
 - ➔ wash your hands
 - ➔ regularly change your working clothes



If this symbol is found on a package,
this means that its content is :

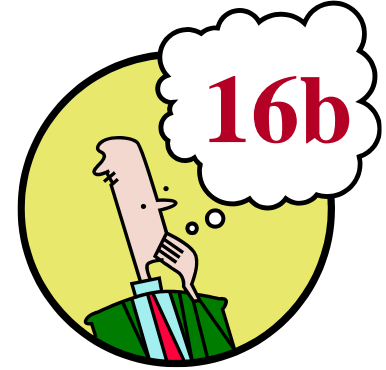


a) Oxidising

b) Explosive

c) Easily inflammable

What instruction is very important for working with corrosive products ?

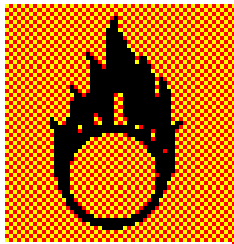


a) Protect the skin and the eyes

b) Protect the products against solar radiation

c) Keep these products well separated from irritant products

If this symbol is found on a package,
this means that its content is:



a) Explosive (it explodes)

b) Oxidising (it makes things burn)

c) Easily inflammable (it catches fire)

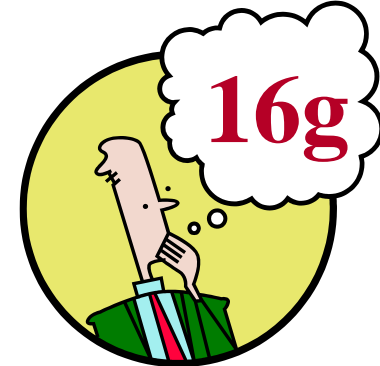
A label with a skull signifies that the product is :



a) Inflammable

b) Toxic

c) Corrosive



Before using an unknown product :

- a) I smell the odour that it releases
- b) I look at its colour
- c) I read the label

17. Ionising radiation and lasers

Ionising radiation :

- Strictly follow the instructions given by the hierarchy
- Never handle a source of radiation with your hands ! If the source has to be handled, it should be done with forceps
- Use the personal protective equipment provided (clothing, aprons, protective gloves, etc.)



In the event of accident :

- Mark the area and prohibit access
- Warn the approved organisation



17. Ionising radiation and lasers

Lasers:

Danger : burning of eyes and skin

- Do not enter the enclosed area where the lasers operate unless your work requires it
- Area where the lasers operate requires :
 - Wearing personal protective equipment



Warning :

Find out exactly what kind of goggles are required. Goggles are designed for a particular type of radiation. So they may be completely ineffective for another device emitting laser radiation.

- Wearing special gloves for manual intervention

Equipment fitted with this sign :



a) Is ionising radiation equipment

b) Is laser radiation equipment

c) Is double insulated equipment

18. Working in confined spaces and on pipes

Warning ! Working in confined spaces or on pipes may cause explosions or serious accidents !

Instructions before working (on basis of risk assesement

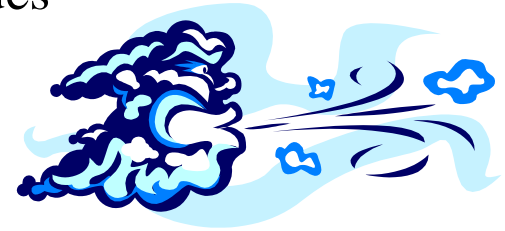
- Gather necessary personal protective equipment, harness, detector...
- Obtain the appropriate licenses
- Check the isolation of the equipment (fluids, energies).
- Purge and decontaminate the hollow volume
- Carry out atmospheric tests by an appropriate method
- Ventilate for minimum 24 hours in the case of toxic products
- Ensure the continuous surveillance of working persons by the trained lookout(s)
- Means of access, alert, emergency and evacuation



18. Working in confined spaces and on pipes

Instructions during working :

- At least 2 persons – continuous surveillance of the lookout(s)
- Ensure suitable products capable of neutralising residues
- Use appropriate equipment (harness, ...)
- Carry out permanent atmospheric tests
- Ventilate appropriately during the work ($30 \text{ m}^3/\text{hour}/\text{man}$) + gas removing
- Use the 12V equipment fitted with double insulation associated with the differential protection
- Provide non-sparking tools



Always follow the operating instructions and regulations

18. Working in confined spaces and on pipes

Forbidden :

- producing fire without a fire permit (propane-butane)



Before putting the equipment back to use :

Ensure that nobody is inside and that there is no equipment, materials or product left inside the enclosure



18. Working in confined spaces and on pipes

Accident :

Many improvised rescue attempts end with fatal issues !

The emergency must be conducted in two phases :

First line intervention (mainly concerns the lookout(s)) :

- 1) Telephone the emergency number (123)**
- 2) Remove the victim from outside (with harness) or by adequate protections defined in the risk assesement**
- 3) First aid**

18. Working in confined spaces and on pipes

2nd line intervention

The second line intervention team completes the action of the first line. This team is formed and trained to intervene inside hollow bodies.





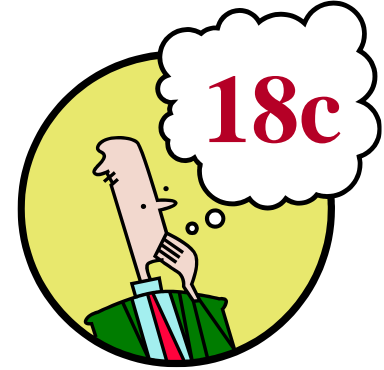
**To make a work in confined space,
it is necessary to be :**

a) Alone

b) Minimum two people

c) Only with a system of call

In a confined space that has been filled with an inert gas (Nitrogen N₂), there is a danger of :



a) Asphyxiation

b) Intoxication

c) Explosion



Work on pipework requires :

a) A pipework permit

b) No permit

c) A confined space work permit



Which authorization do I need when I work under this pannel ?



a) A fire permit

b) A work permit in confined space

c) A licence of site



To work in a tank, I must be in possession :

a) Of a first aid certificate

b) Of a pipework permit

c) Of a confined spaces work permit

19. The golden Rules

These are general rules and safety regulations to be applied at any place and any time.

These fundamental rules are non-negotiable and must be observed!

Their knowledge is frequently checked !



I will come to work in a "fit and able" condition



I will respect all the traffic rules



I will use fall protection or prevention whenever and wherever required according to our standards



I will respect rail priority and stay out of close clearance areas without proper precautions being taken



I will follow the lockout/isolation procedure when working on equipment



I will respect the rules for entering and/or working in hazardous gas areas



I will follow the confined space entry procedure before entering as well as during the full duration of the task



I will not disable safety devices



I will respect all the rules of load handling at all times and never stand under a suspended load



I will respect all the H&S basic rules, standards and signals and I will wear the required PPE



What are the " Golden Rules " ?

a) They are rules dictated by the law

b) They are safety instructions to be respected at all times

c) They are panels which indicate the way to follow

20. CLEANLINESS AND TIDINESS

Untidiness is an accident waiting to happen !!!



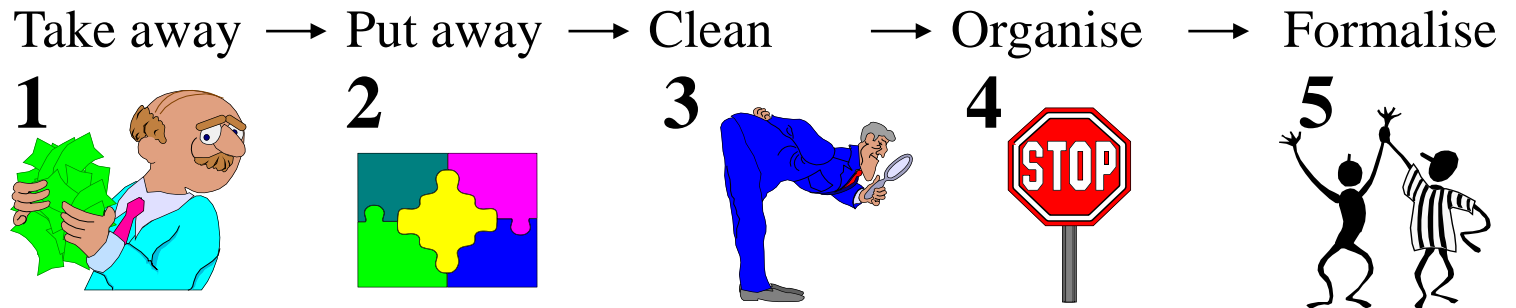
- Do not pile anything which could collapse
- Follow the storage rules meticulously



- Do not abandon materials during or after work
- Clean the place where you have just been working
- Do not block aisles and roads
- Avoid accumulating materials in electric sub-stations

20. CLEANLINESS AND TIDINESS

The **5 Ss** (secrets) :



RULES FOR STORING COILS :

- Ensure that the floor and the « Vs » on which the coils rest are in good condition.
- Check that the coils are properly strapped.
- Maintain a slight gap between the coils on the lower layer, so that they rest properly on their « V ».
- Store the coils by making stable piles.



Disorder :

a) Is a case of force majeure

b) Often the cause of an accident

c) Part of the work

Who must clean the work place ?



a) The next worker

b) The cleaning team

c) The worker himself

21. External contractors

Any work by an external firm within the walls of Liberty Liège-Dudelange must be covered by a start of work form

➔ including all important information

(PR1, procedures, risks assesement, skills, licences, required autorizations, ...)



21. External contractors

- External firms and their subcontractors must be known and approved (VCA, OHSAS, ...) by a start of work form
- The presence of a person in charge from each firm at all coordination meetings is compulsory



The level of safety of sites depends heavily on the quality of the information about the risks given to external firms



During work for Liberty

Liège-Dudelange, a co-contractor :

- a) Can use all the tools available at Liberty Liège-Dudelange
- b) Makes the necessary electrical connections himself
- c) Uses equipment exceptionally provided for his disposal



Any work by an external firm must be covered by :

- a) A fire permit
- b) A document from this firm
- c) A start-of work form, an operating procedure and a risk analysis

When can a co-contractor use Liberty Liège-Dudelange's equipment ?



- a) Always
- b) If he puts it back in the same place
- c) Never, except in exceptional circumstances and in compliance with procedures