CÁC TIÊU CHUẨN CHÂU ÂU VỀ BẢO HỘ LAO ĐỘNG
European standards on PPE

BẢO VỆ ĐẦU

SAFETY HELMET

HOW TO PROTECT YOURSELF ?

To choose the correct safety helmet

- To identify the risk: falling bumps or combined risks (hearing protection and face protection).

The safety helmet has three functions:

- Antipenetration for an effective protection of the skull.
- Shock absorber thanks to the cap and the harness which absorb the shocks.
- Deflector thanks to a suitable design which makes it possible to deflect the fall of an object from the top of the head.

There is in addition a selection of accessories which offers a face and hearing protection..

STANDARDS

EN397 : PROTECTIVE HELMETS FOR INDUSTRY

Each helmet must bear a moulded or printed marking: the existing European standard number, the name or reference mark of the manufacturer identification, the quarter and year of manufacture, the helmet type, the size or size range. The instructions or recommendations of adjustment, assembly, use, cleaning, disinfection, maintenance and storage are specified in the instructions of use.

BẢO VỆ TAI

HEARING PROTECTION

HOW TO PROTECT YOURSELF ?

To choose the correct product for hearing protection.

- Identify the nature of the noise: stable, fluctuating, intermittent, pulse.
- Measure the noise at the working station: intensity (dB) and volume (Hz).
- Calculate the attenuation necessary to return on an acceptable ambient level (80-85 dB).

BẢO VỆ MẮT

SAFETY EYEWEAR

Safety eyewear provide protection from spray and spatter from particles, liquids and dust, and from chemical product fumes and radiation.

HOW TO PROTECT YOURSELF?

Select the most suitable protective glasses or shields

- Identify the type of risk: spray, radiation, other, ...
- Determine the type of protection: spectacles-type safety glasses, goggles, face mask, cover goggles, ...
- Note the protective features: scratch-resistant, fog-resistant, tinted, ...
- Select the type of eye-piece: one-piece or double lens
- Choose the frame type: design, classical, ...

STANDARDS

EN166 : applies to all types of individual protection of the eye which protects from hazards likely to damage the eye, except for nuclear radiation, x-rays, laser emissions and infrared emitted by low-temperature sources. Does not apply to eye protection for which separate standards exist (anti-laser eye protection, sunglasses for general use,...).

Symbol meaning

S : Increased robustness : steel ball of 22 mm diameter at 5.1 m/s
F : Low energy impact : steel ball of 6 mm diameter at 45 m/s
B : Medium energy impact : steel ball of 6 mm diameter at 120 m/s
A : High energy impact : steel ball of 6 mm diameter at 190 m/s
3 : Liquid resistance (droplets or splashes)
4 : Large dust particles resistance (size of > 5 µm)
5 : Gas and fine dust particles resistance (size < 50 µm)
8 : Short circuit electric arc resistance
9 : Resistance to splashes of molten metal and penetration of hot solids
T : High speed particles at extremes temperatures
N : Resistance to fogging of oculars
K : Resistance to surface damage by fine particles (anti-scratch)

EN175 : Specifications for the safety requirements for eye and face protection equipment for welding and related techniques.

BẢO VỆ THỞ

RESPIRATORY MASKS

Respiratory masks gives you a protection against the respiratory attacks : dust, aerosols, fume or gas.

HOW TO PROTECT YOURSELF ?

To choose the correct respiratory apparatus (half-mask or complete mask composed of one or two cartridges).

- Identify the type of risk: dust, fume, gas, vapors,...
- Identify the toxic product
- Locate and record its toxicity (concentration)
- Compare with the AVE/LVE
- Determine the type of filters: With, B, C, K and its class 1, 2, 3

This step must hold account of the environment of the exposed place (moisture, temperature...)

THE CHOICE OF A FILTER

Each filter or cartridge is identified with a colour code.

Example for a filter ABEK + P :

Filter use chart

Gas and vapour filters	Colour code	Types of protection
Type A		Protects from organic gases and vapours whose boiling point is > 65°C (solvents and hydrocarbons).
Type B		Protects from inorganic gases and vapours, except for carbon monoxide.
Type E		Protects from sulphur dioxide and some acid vapours and gases.
Type K		Protects from ammoniac and some amine derivatives.

Dust and aerosol filters

Type	Colour code	Protection
P1		Protects from coarse solid particles without specific toxicity (calcium carbonate).
P2		Protects from solid and/or liquid aerosols warned to be hazardous or irritating (silica, sodium carbonate) .
P3		Protects from toxic solid and/or liquid aerosols (beryllium - radioactive particles).

Risks to the eye from harmful radiation *Nguy cơ cho mắt bởi bức xạ nguy hại*

ZONE	WAVE LENGTH	ENVIRONMENT	EYESIGHT DAMAGE
UV-A	315 - 380 nm	Outdoor work	Eye fatigue, partial blindness, cataract. Sunshine
UV-B	280 - 315 nm	Sunlight. Industrial environment. Black light tests.	Cataract. Welder flash. Arc flash.
UV-C	100 - 280 nm	Industrial environment. Arc welding.	Cornea or crystalline lesions. Loss of eyesight.
Blue Light	400 - 480 nm	Industrial environment. Computer work (fatigue, VDU). Electrical installations. Outdoor work	Retinal lesions. Loss of eyesight. Blurring degeneration (age). Retinitis pigmentosis.
Infra-red	780 - 1400 nm (near IR). 1400 - 2000 nm (IR mid).	Electric welding. Molten work (glassmaking, steel production). Micro-wave processes. Sunlight	Retinal lesions Blurring degeneration (age). Retinitis pigmentosis (near-IR). Crystalline and cornea lesions (mid-IR).

BẢO VỆ TAY
HAND PROTECTION

THE EUROPEAN STANDARDS

In order to be approved for Category II ranking, protective gloves are subject to standardized requirements.
They must meet the general requirements contained in EN420, which are as follows :

- Conform to harmlessness (pH, chrome VI levels, etc…)
- Conform to the size charts (see table below))
- Pass the dexterity test (adapting the product to the work station)
- Conform to the labeling, information and identification instructions

Sizes as per standard EN420

Glove size	Fits Hand size	Hand dimensions (mm) Palm circumference	Length	Minimal glove length
6	6	152	160	220
7	7	178	171	230
8	8	203	182	240
9	9	229	192	250
10	10	254	204	260
11	11	279	215	270

MECHANICAL RISKS
EN388

The EN388 standard applies to all types of protective gloves with respect to physical and mechanical aggression from abrasion, cutting from slicing, perforation and tearing.

Mechanical risks:
Standard EN388

See more at page 25 xem trang tiếp 25

FIREMANS RISK
EN659

This standard applies only to protective gloves for firemen, during firefighting and search and rescue operations. It stipulates the test methods and the minimum performances for these gloves (for example, the minimum mechanical resistance levels for the EN388 standard are 2,2,2,2).

CHEMICAL RISK
EN374-3

The standard EN374-3 involves determination of the resistance of the materials making up the gloves to permeation by non-gaseous chemical products which are potentially hazardous in case of continued contact. Emphasis is therefore placed on the fact that this test does not take into account conditions which are likely to be encountered in actual working conditions. It is therefore recommended to only use the test results, which have basically relative values, to compare the materials on the basis of the major categories of passage of time.

See more at page 25 xem trang tiếp 25

HEAT AND FIRE RISK
EN407

The EN407 standard specifies the test methods, the general requirements, the thermal performance and the labeling of gloves to protect from heat and fire. It applies to all gloves which must protect hands from heat and/or flames in any one or several of the following forms: fire, contact heat, convective heat, radiating heat, small spray of molten metal or large spray of melting metal.

Heat and fire thermal risks :
Standard EN407

See more at page 92 xem trang tiếp 92

WELDERS RISK
EN12477

Requirements and test methods for gloves used for manual welding of metals, for cutting and related techniques. Welder gloves are ranked in two types: B when great dexterity is required, and A for other welding processes.

MICRO-ORGANISM RISK
EN374-2

The standard EN374-2 specifies a test method for the penetration resistance of gloves protecting against chemical products and/or microorganisms. When the gloves resist penetration, they are tested according to this part of EN374-2, and they provide an effective barrier against microbiological risks.

COLD RISK
EN511

The EN511 standard defines the requirements and test methods for cold protection gloves from cold transmitted by convection or conduction down to - 50°C. This cold can be from climatic conditions or industrial activity.

Risks from cold :
Standard EN511

PERFORMANCE LEVELS 0 to 4	0 to 4	0 to 1	REQUIREMENTS
			c : IMPERMEABILITY TO WATER
			b : RESISTANCE TO CONTACT COLD
			a : RESISTANCE TO CONVECTIVE COLD

SAFETY SHOES-BOOTS

La norme EN345-1 / EN ISO 20345 Standard

Specification for safety footwear for the workplace.
In reference to standard EN344-1 / EN ISO 20344, this European standard defines the basic and the additional (optional) requirements for safety footwear for the workplace, marked «S».
The shoe was designed, and are equipped with safety toe caps designed to withstand a maximum impact of 200 joules and crushing up to 15 kN.

Size correspondance table

France	39	40	41	42	43	44	45	46	47
UK	6	6 1/2	7	8	9	9 1/2	10	11	12
US	7	7 1/2	8	9	10	10 1/2	11	12	13
Cm	25,9	26,6	27,3	27,9	28,6	29,3	29,9	30,6	31,3

EN346-1 / EN ISO 20346 Standard

Specification for protective footwear marked «P».
The shoe was designed, and are equipped with safety toe caps designed to withstand a maximum impact of 100 joules and crushing up to 10 kN.

EN347-1 / EN ISO 20347 Standard

Specification for occupational shoes marked «O».
These shoes are different from safety/protective footwear in that they have no protective toe cap for impact and crushing.

CHEMICAL PROTECTION CLOTHING

Quần áo chống hóa chất

EN13034 TYPE 6 **PROTECTIVE CLOTHING AGAINST LIQUID CHEMICALS** - Requirements for chemical protection clothing offering limited performance against liquid chemical products (type 6 equipment), including clothing for partial body protection (type PB(6)).
This standard sets out the minimum requirements for limited use and reuseable limited performance chemical protective clothing. Limited use chemical protective clothing is intended for use in cases of a potential exposure to **light sprays**, **liquid aerosols** or low-pressure, **low-volume splashes**, against which a complete liquid permeation barrier (at the molecular level) is not required.

EN13982-1 TYPE 5 **PROTECTIVE CLOTHING FOR USE AGAINST SOLID PARTICLES** - Performance requirements for protective clothing against chemical products offering full body protection against air-borne solid particulates (type 5 clothing).
This standard sets out the minimum requirements for chemical protection clothing resisting penetration of solid particulates suspended in air (type 5). This clothing offers full body protection, including the torso, arms and legs, such as one or two-piece coveralls, with or without hood or face-shield, with or without foot protection.

EN14605 TYPE 4 TYPE 3 **PROTECTIVE CLOTHING AGAINST LIQUID CHEMICALS** - Requirements for chemical protection clothing with liquid-tight (type 3) or spray-tight (type 4) connections, including items providing only partial body protection (types PB (3) and PB (4)).
This standard sets out the minimum requirements for the following types of limited use and re-useable chemical protective clothing :
- Clothing protecting the full body with liquid-tight connections between the various clothing parts (Type 3 : **liquid-tight** clothing) ;
- Clothing protecting the full body with spray-tight connections between the various clothing parts (Type 4 : **spray-tight** clothing) ;

Note: These standards were formerly entitled EN1512 (Type 4) and EN1513 (Type 3).

STANDARD	TYPE	CHEMICAL PROTECTION
EN13034	6	Against splashes
EN13982-1	5	Against dust (asbestos)
EN14605	4	Against mists
EN14605	3	Against sprays
EN943-1	2	Non gas-tight
EN943-1	1	Gas-tight

EN943-2 TYPE 2 TYPE 1 **PROTECTIVE CLOTHING AGAINST LIQUID AND GASEOUS CHEMICALS, INCLUDING LIQUID AEROSOLS AND SOLID PARTICLES** - Performance requirements for gastight (Type 1) chemical protective suits for emergency teams (ET).
This standard sets out the minimum requirements and test methods for ventilated and non-ventilated chemical protective suits, for limited use and re-useable, including items such as gloves and boots.

A difference is made between :
Type 1 – Gas-tight chemical protective overall…
- 1a: with a breathable air supply independent of the ambient atmosphere, e.g. a self-contained open-circuit compressed air breathing apparatus, worn inside the chemical protective suit.
- 1b: with a breathable air supply, e.g. a self-contained open-circuit compressed air breathing apparatus, worn outside the chemical protective suit.
- 1c : with breathable air providing positive pressure, air lines for example.

Type 2 – Non gas-tight chemical protective overall…
Chemical protective suit, « non gas-tight », with breathable air providing positive pressure.

EXAMPLES OF APPLICATIONS		
Applications	**Risks**	**Type of garment**
Work Maintenance	Fouling	Category I / Non P.P.E.
Industrial cleaning	Exposure to hazardous chemical substances and particles	Type 6 Type 5
Asbestos abatement / removal (dust > 1 micron)	Inhalation of particles or fibres	Type 5
Agriculture and horticulture (Handling of herbicides / pesticides / fungicides / fertilizers…)	Exposure to harmful elements	Type 4
Paint spraying (Solvents)	Inhalation of low-concentrate aerosols	Type 4
Paint spraying (Preparation / Mixing)	Inhalation of high-concentrate aerosols	Type 3
Laboratories / Chemical Industries	Projection of chemical products	Type 3
Emergency / Rescue Personnel	Bacteriological contamination	Type 4/Type 3

HEAT PROTECTIVE CLOTHING

Quần áo chống nhiệt

FOR USE IN WELDING AND ALLIED PROCESSES
Marking :

TASOUB Apron
EN 470-1

This standard sets out the performance requirements for protective clothing for use by operators in welding and allied processes with comparable risks.
This type of protective clothing is intended to protect the wearer against molten metal splash, short contact with flame and UV radiation. It is intended to be worn at ambient temperature, continuously for up to 8 hours

PROTECTION AGAINST HEAT AND FLAME
Marking :

HELIAS Parka
EN 533
3/12X75°C

Index : 1 / 2 ou 3
Nb : Number of washes
Tθ : Service temperature

This standard sets out the performance requirements for limited flame spread materials and material assemblies used in protective clothing. Limited flame spread materials and material assemblies are used to make protective clothing in order to reduce the risks of flammability of the garment and the dangers it may cause. They are suitable for protection against accidental contact with small igniting flames, in conditions with no significant heat danger.

Materials	Materials which do not spread flame...
index 1	... but which may form a hole on contact with a flame
index 2	... and do not form a hole on contact with a flame
index 3	... and do not form a hole on contact with a flame. They also give only limited after-flame (≤ 2s)

PROTECTION FOR WORKERS EXPOSED TO HEAT
Marking :

Coverails COMBI193330
EN 531
A B2 C2 D3 E3

This standard applies to protective clothing used by industrial workers exposed to heat.
It sets out the performance requirements and test methods for materials used in protective clothing. Tested are:

See more at page 90 xem trang tiêp 90

Quần áo chống cháy

EN 659 **Fire service protective gloves**

Only applies for fire service protective gloves that protect the hands in normal fire fighting activities including salvage and rescue operations.
Performance levels obtained during laboratory tests can differ from the protection levels in actual conditions of use.
The following important classes are cited in the standard (minimum requirements)

- Abrasion (performance level 3)
- Cut resistance (performance level 2)
- Tear force (performance level 3)
- Pierce resistance (performance level 3)
- Flammability (performance level 4)
- Convective heat (≥ 13s), radiant heat (≥ 22s)
- Contact heat (≥ 10s) and heat resistance of the lining material
- Sense of touch (performance level 1)
- Water permeability

Marking
In accordance with the PSA Ordinance, fire service protective gloves are categorised in EN 659 in Class III.

EN 469 **Protective clothing for the fire service**

Protective clothing that is to protect the body of the fire fighter against the effects of heat and flames.
The clothing does not protect the head, hands and feet.
It does not include clothing for high risk use and long fire fighting operations (e.g. aluminised).
Protection against water penetration can be achieved through the use of a moisture proofing.

EN 1486 **Protective clothing for the fire service Clothing for special fire fighting**

The clothing offers protection against contact with flames and intense radiant heat and is only worn for short periods of time.
It enables the fire fighter to undertake special high risk fire fighting operations and perform fire fighting tasks that require breathing apparatus as well as head, hand and foot protection gear.

PPE FOR FALLS FROM HEIGHT — Chống rơi ngã trên cao

THE DIRECTIVE
89/686 directive is intended for Personal Protective Equipment (PPE) manufacturers and determines conditions for market trade. It defines the essential requirements in terms of design, manufacture and test methods for PPE with which PPE must comply in order to ensure the safety of the users.

STANDARDIZATION
Its aim is to draw up test methods and product standards defining the technical specifications for products. The respect of these standards is evidence of conformity to Directive 89/686 and allows CE marking.

CATEGORIZATION
En fonction du niveau de risque couvert, la Directive définit des catégories d'EPI et fixe des obligations différentes pour le fabricant.

PPE OF 3RD CATEGORY
They are products with the highest level of accident risk protection. The category 3 includes mortal or accidents which can irreversibly harm the user's health.

CERTIFICATION PROCEDURE
Therefore, before putting any 3rd category PPE on the market, the manufacturer must contact a notified body in charge of checking PPE conformity with the relevant standard. The laboratory will issue an EC test certification to the manufacturer after the examination of a full technical report supplied by the manufacturer.

MANUFACTURED PRODUCTS' CONTROL
In order to ensure the homogeneity of its products manufacture, the manufacturer is submitted to an inspection procedure:
- either the final product (11A process)
- or the production process (11B process)

This inspection is carried out by an independent notified body.

STANDARDS FOR ALL PRODUCTS

EN363 : Fall arrest equipment
Set of personal protective equipment against falls from height, linked to one another and intended to stop a fall. A fall arrest equipment must contain at least a full body harness and a fall arrest equipment.

EN364 : Test method
Describes the different test methods of the various PPE against falls from height, as well as the test equipment.

EN365 : General requirements for the instructions for use and the marking
Description of the marking that must figure on the PPE against falls from height and of the information which must appear on the instructions for use.

THE HARMONIZED EUROPEAN STANDARDS

All protective equipment against falls from a height are submit to European standards. You will find, below, a summed up presentation of every standard.

EN353-1 : Mobile fall arrester on rigid anchorage line
Equipment consisting of a mobile fall arrester with self-locking, integral with its rigid anchorage line (rail, cable…). An energy (absorber) reducer can be built-in in the equipment.
Ex : For moving vertically or tilted surface with a large moving space.

EN353-2 : Mobile fall arrester on flexible anchorage line
Equipment consisting of a mobile fall arrester with self-locking, integral withits flexible anchorage line (rope, cable…). An energy reducer (absorber) can be built-in in the equipment.
Ex : For moving vertically or tilted surface with a large moving space.

EN354 : Lanyards
Connection elements or equipment component. A lanyard can be in rope made of synthetic fibers, in metallic rope, in strap or in chain. Maximum length: 2m. **Caution :** A lanyard without energy absorber must not be used as a fall arrest equipment.
Ex : Can be use only to avoid the fall risk access.

EN355 : Energy absorbers
Component of a fall arrest equipment, which guarantees the stop of a fall from a height in safety by reducing the impact of the shock.
Ex : For short and punctual moving. A double lanyard (Y) allows obstacles crossing in complete safety.

EN358 : Work positioning system
A work positioning system consists of components (work positioning belt and lanyard) linked to one another to form a complete equipment.
Ex : To hold you at the work station releasing your hands or to avoid you the access to delimited danger zone.

EN360 : Self-retractable fall
Fall arrester with self- locking device and a self-retractable system for the lanyard. An energy reducer (absorber) can be built-in in the equipment.
Ex : For moving vertically or tilted surface with a large moving space.

EN361 : Full body harness
Body securing device intended to stop falls. The full body harness can be made of straps, buckles and other elements; set and adjusted in a right way on the body of an individual to secure him during a fall and afterwards.

EN362 : Connector
Connection element or equipment component. A connector can be kacarabiner or a snap hook.

EN795 : Anchorage devices
Element to which a personal protective equipment can be fastened.