



EGPC Ass. Chairman for HSE Word

Respectfully I want to introduce the PPEs Guideline. I am hopeful that through it we will find a new knowledge and experience to confer through our critical job.

A dedicated team of professionals in the industry were diligent to complete this guideline that have been developed over many years of experience. As we know, Personal protective equipment, or PPE, protects its user against any physical harm or hazards that the workplace environment may present. It is important because it exists as a preventative measure for our industry that is known to be very hazardous.

It's important to know that safety equipment provided on the job should meet Personal Protective Equipment Regulation, and that it is most effective when it meets the correct size, fit and height of its user.

This extraordinary instance of collaboration among the members will have a long-lasting effect on the petroleum industry and our people should never feel like their physical being is likely to be harmed again.

Assistant CEO

for Safety and Environment

Thanks and Appreciation

To achieve such a guideline the team has shown true dedication and determination. The Egyptian General Petroleum Corporation extends its sincere thanks and appreciation to the esteemed members of the committee specially to **Mr. Talaat ElBahloul Occupational safety and health expert** who had made commendable efforts in the preparation of "EGPC PPEs Guideline".

We need to thank everyone in the team for their crucial role in providing full support to the preparation of this guideline. Your dedication and hard work never cease to amaze me. Thank you for being such invaluable assets to our team.

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1. Introduction

Personal Protective Equipment (PPE) is the equipment that is worn by a person at work which protects them against one or more risks to their health. This is achieved by establishing a physical barrier between the hazard and the routes of entry into the human body. Because this barrier has physical limitations in terms of its protection efficiency PPE shall only be considered as a last resort of controlling exposure. PPE shall not be used as an alternative to the implementation of correct, well-designed engineering and administrative controls.

Also, where risk reduction and control are necessary in the workplace, engineering controls and Safe Systems of Work shall always be considered first. Personal Protective Equipment (PPE) are considered as the last resort after all other methods of risk reduction have been explored.

Personal protective equipment provides a barrier between the person at risk and the potential instrument of injury. The provision and use of personal protective equipment do not reduce or replace the need for proper accident prevention methods, such as engineering or administrative controls to be undertaken. Specification of such preventive measures shall always be explored before consideration of issue of personal protective equipment.

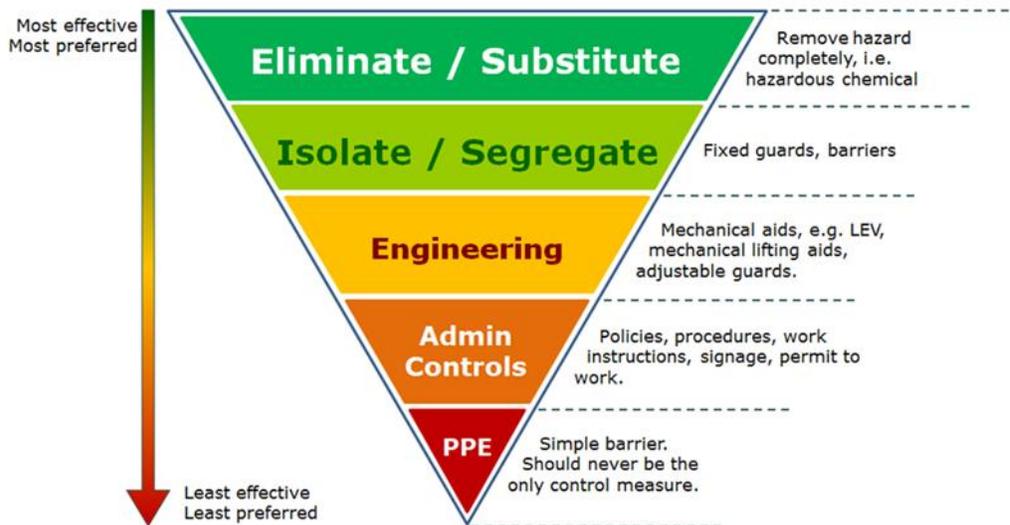
Personal protective equipment is defined as;

all equipment (including clothing affording protection against the weather) which is intended to be worn or held by a person at work and which protects him against one or more risks to his health or

safety, and any addition or accessory designed to meet that objective’.

PPE is intended as the last line of protection and, in accordance with the ‘hierarchy of control’ structure, preventative control measures should be applied through engineering and operating standards and procedures to eliminate or to minimize risk of accident or injury.

The hierarchy of control structure is as follows:



Hazard and Risk Hierarchy of Control

EGPC is committed to protecting the health and safety of all employees and enforces the use of PPE as the last line of defense in the hierarchy of control. The principles of the hierarchy of control; Eliminate, substitute, engineering and administrative controls should be applied first to reduce the risk as low as reasonably practicable.

Other legislation and controlling documents which may also apply depending on the associated hazard(s) includes.

This Guidelines provides information regarding the use of PPE. As PPE is regarded as a last resort to protect against risks to health and safe. Engineering controls and safe systems of work should be considered first.

2. Purpose & Scope

This section of the Guidelines provides guidance on the **use, storage, training** and **issue** of Personal Protective Equipment (PPE) for certain tasks. However, selection of the appropriate PPE for a specific task shall be part of the relevant risk assessment or Job Hazard Analysis (JHA).

Also, EGPC Standards and Guidelines provide structured and managed documents to capture and communicate best practice and lessons learned for all areas of the business, to enhance value and to prevent the repetition of unsatisfactory solutions and erosion of value.

EGPC Guidelines set minimum requirements in key areas of the business, e.g., HSSE and asset integrity, and are mandatory. EGPC Guidelines are provided to support and complement the mandatory standards and to provide advice and examples of recommended practice and are therefore discretionary. Its required, however, that the content and recommendations of the Guidelines shall be understood and considered for implementation.



EGPC policy to comply fully with all applicable statutory and local regulations. Note that if an EGPC Standard or Guideline requires a higher level of safety then it shall take precedence. If a conflict arises whereby an EGPC Standard or Guideline appears to require a lower level of safety, then the applicable statutory and local regulations shall be followed.

International Codes and Standards are referred to in EGPC Standards and Guidelines and underpin many of EGPC's requirements. National Codes and Standards may also be considered where they can be demonstrated to achieve an equivalent technical result.

EGPC Standards and Guidelines shall be used in EGPC's Operated assets including for new developments / facilities and for modifications. Also, the purpose of the Personal Protective Equipment procedure is to protect all from exposure to work place hazards and the risk of injury through the use of personal protective equipment (PPE). PPE is not a substitute for more effective control methods and its use will be considered only when other means of protection against hazards are not adequate or feasible (e.g., using a less toxic chemical, isolation of the hazard, reducing the number of people and extent of exposure etc.). It will be used in conjunction with other controls unless no other means of hazard control exist. Personal protective equipment will be provided, used, and maintained when it has been determined that its use is required to ensure the safety and health of our employees and that such use will reduce the likelihood of occupational injury and/or illness.

The following hierarchy for control of hazards is to apply:

- Eliminate the hazard or exposure.
- Substitute materials or equipment to reduce the hazard or exposure.
- Use engineering controls of the Hazard or exposure (e.g., elimination of overhead hazards, machine guards, ventilation, noise attenuation systems, etc.).
- Use procedural controls (e.g., isolation, designated walkways, shift length or work activity restrictions) to control hazards where engineering controls are insufficient
- Use Personal Protective Equipment (PPE), as a last resort, where engineering and administrative controls are not sufficient to control hazards.

and since the EGPC also is committed to protect the employees from work hazards, and as Personal Protective equipment (PPE) are considered the last line of defense for protecting the employees from such Hazards therefore This Guideline is aiming for setting up criteria for PPE issuing in order to control over the PPE requesting and withdrawal process and ensure the availability of PPE for usage by the employees at any time and consequently provide the needed protection for them

3. Objective:

The objective of this Guideline is to set out the minimum requirements for the selection and use of personal protective equipment (PPE) at all EGPC Companies' locations. Its purpose is to ensure that, when PPE is needed to prevent adverse health effects on personnel from work activities, the correct PPE is readily available and suits the situation.

EGPC Companies' employees, Contractors and Sub Contractors shall ensure that all expectations listed herein are fully understood, implemented.

The requirements of this Guideline shall be applied to all EGPC Companies' employees, Contractors and Sub Contractors, as well as any others who may be exposed to health and safety hazards while visiting or working at Company facilities.



4. Definitions, Abbreviations and References:

4.1 Definitions

Hazard Assessment	The hazard assessment documents potential workplace hazards and the PPE required to control the hazard adequately.
PPE Free Zones	Are areas where individuals are unlikely to be exposed to hazardous conditions or substances and where field work is not routinely performed. These areas are typically described as: <ul style="list-style-type: none">• Office buildings• Lunch rooms• Break areas / rooms• Parking lots• Toilet facilities• While inside vehicles being used for passenger transportation
Work Environment	Are areas inside all production fence lines (excluding marked PPE Free Zones) and areas where field work is being performed on behalf of EGPC. Areas generally included are: <ul style="list-style-type: none">• Inside station yards• On docks



	<ul style="list-style-type: none">• Construction areas• Shops and warehouses• Terminals and truck loading / unloading facilities which includes secondary transport product delivery sites• Tank farms and related equipment• On offshore platforms• Pipeline Right-of Ways• Spill and leak sites• Operating construction / equipment vehicles <p>Specifically excluded from the “Work Environment” are:</p> <ul style="list-style-type: none">• Any PPE Free Zones which are visibly marked as such• Ship and Barge operations (non-USPL personnel)
PPE	Personal Protective Equipment; any device or appliance designed to be worn or held by an individual for protection against one or more health and safety hazards
Correct PPE	The fit for purpose PPE identified for use in accordance with applicable standards and specifications



Basic / Mandatory PPE	The Personal Protective Equipment, which are used permanently by personnel at any work site such as (helmet, safety shoes, gloves,)
Special PPE	The Personal Protective Equipment, which protect personnel performing specific hazardous task such as (safety harness, full / half face mask,)
Industrial area	A work area comprising any activities that occur outside of an office or administrative area
Airlines – Air Purged hoods	Air lines supplying air into a hood via an airline from a compressor. The compressor’s intake must be in an unpolluted atmosphere. NORMAL PLANT SERVICE AIR MUST NEVER BE USED. Suitable filters in compressors must be used. This system is normally used in grit blasting operations.
Employee	An employee is any person directly employed by EGPC companies, whether with an agency, limited company, temporary, permanent staff, part time or full time basis.

4.2 Abbreviations



ANSI	American National Standards Institute
EN	European Committee for Standardization
SDS	Safety Data Sheets
JSA	Job Safety Assessment
TRA	Task Risk Assessment
PTW	Permit to Work
NSI	American National Standards Institute
ASTM	American Society for Testing and Materials
DA	Decibels (Acoustic)
FRC	Flame-Retardant Clothing
JSEA	Job Safety Environmental Analysis
MSDS	Material Safety Data Sheet
NFPA	National Fire Prevention Association
MSA	Master Service Agreement
NIOSH	The National Institute for Occupational Safety and Health
LOLER	Lifting Operations and Lifting Equipment Regulations
BA	Breathing Apparatus
COSHH	Control of Substances Hazardous to Health
HSE	Health, Safety and Environment
RPE	Respiratory Protective Equipment
SCBA	Self-contained Compressed Air Breathing Apparatus
EEBD	Emergency escape breathing device
SEI	Safety equipment institute

4.3 References

Law 12/2003	Egyptian Labor Law and its Executive Decrees
ISO	International Organization for Standardization
EN	European Standards
ASME	American Society of Mechanical Engineers
ANSI	American National Standards Institute

5. Roles and responsibilities

5.1 Chairman and top management

Chairman and top management are responsible for:

1. the implementation of personal protective equipment requirements and its enforcement/ reinforcement.
2. Ensure that suitable personal protective equipment is provided to employees who may be exposed to a risk to their health or safety whilst at work, except where that risk has been adequately controlled by other means which are equally or more effective.

3. Ensure that where the presence of more than one risk to health or safety makes it necessary for their employees to wear or use simultaneously more than one item of personal protective equipment. Such equipment is compatible and continues to be effective against the risk or risks in question.
4. Ensure the suitability of PPE, make sure the right type of PPE is chosen, consider the different hazards in the workplace and identify the PPE that will provide adequate protection.
5. Ensure that any personal protective equipment provided to employees is maintained (including cleaned or replaced as appropriate) in an efficient state, in efficient working order and in good repair.
6. Ensure that appropriate storage is provided for personal protective equipment when it is not being used.
7. Ensure that employees are provided with information, instruction and training as is adequate and appropriate to allow the employee to know;
 - (a) the risk or risks which the personal protective equipment will avoid or limit;
 - (b) the purpose for which and the manner in which personal protective equipment is to be used and
 - (c) any action to be taken by the employee to ensure that the personal protective equipment remains in efficient state, in efficient working order and in good repair and shall ensure that such information is kept available to employees.

8. Where appropriate, and at suitable intervals, organize demonstrations in the wearing of personal protective equipment.
9. Take reasonable steps to ensure that any personal protective equipment provided to employees is properly used.

5.2 HSE Manager

1. Responsible for the implementation of PPE and RPE requirements and its enforcement/ reinforcement.
2. Oversee availability of PPE stock in any given time throughout the year.
3. Oversee PPE availability at all company sites for all employees.
4. Full control over PPE consumption.
5. Verify that PPE provided to all employees are in accordance with standards and specifications using Appendix II.
6. For contractors and subcontractors, this activity is in charge of HSE service of contractors and subcontractors.
7. Prepare and endorse the list and quantity of PPE that will be delivered to HSE personnel, based in job type and risk assessment.
8. Deliver to the Logistics Department the approved list and quantity of PPE and personnel to be given to personnel.
9. Explain the correct use of PPE, their protection Specification, and their limitation.
10. Provide visitors with proper PPE according to the site visited if they do not have.
11. Examine samples of PPE whenever new products are obtained.

12. Approving PPE withdrawal requests from stock.
13. Ensuring that an assessment is made to determine whether the personal protective equipment they intend to provide will be suitable and complies with regulatory standards.
14. Reviewing this policy periodically and identify where any enhancements can be made regarding PPE supplied to employees.
15. Supporting the team to develop appropriate information, instruction and training material regarding the use and wear of personal protective equipment.
16. Ensuring any routine maintenance required to keep the personal protective equipment in efficient state, in efficient working order and in good repair so that the equipment is maintained appropriately.

5.3 General Managers

1. Endorse the list of PPE prepared by HSE Department.
2. Oversee and control that the personnel of his department are using the proper PPE in worksite.
3. Contractor management department is responsible to require and verify the same activities with contractors.
4. Preparing & approving a list of each department personnel according to the nature of work either inside an office or on an operational worksite.
5. Preparing & approving a list of basic / mandatory PPE that will be delivered to personnel.

6. Notifying HSE general manager in case of needing special PPE for special tasks as a short notice.
7. Ensuring proper PPE is used in all worksites under his supervision.
8. Including PPE needs in the approved budget of their concerned branch/area/project.
9. Ensuring conduction of PPE efficiency annual poll whenever requested.
10. Report when stock of PPE reaches minimum level.
11. Ensuring sufficient stock of replacement PPE is available on the store and that a range of PPE is available to cover all tasks conducted that may require the use of PPE.
12. Ensuring that suitable storage is available to staff so that they can store PPE when it is not in use.

5.4 Supervisors

1. Ensuring all personnel under their supervision are provided with their needs of PPE items stated within the task work instructions.
2. Make sure that the proper PPE are worn in his area of responsibility.
3. Approving PTW, verify all risks assessment for the specific jobs and check the choice of contractors/subcontractors PPE for jobs.
4. Promptly report any anomaly inherent in the work means and equipment and the PPE and RPE, or any other dangerous condition that occurs during the work, of which he/she becomes aware on the basis of the training received.
5. Support General Manager in communicating the requirements and ensuring that all new and existing employees as well as contractors are

fully aware of the PPE and RPE requirements and receive the necessary training to comply.

6. Ensure that defective or damaged PPE is immediately replaced.
7. Ensuring all personnel use and maintain their PPE appropriately through regular worksite observations and audits.
8. Ensuring that personal protective equipment is maintained in efficient state, in efficient working order and in good repair.
9. Ensuring that where the presence of more than one risk to health or safety makes it necessary for employees to wear or use simultaneously more than one item of personal protective equipment. Such equipment is compatible and continues to be effective against the risk or risks in question.

5.5 Employee

1. Signing PPE Issuance form & PPE receiving card upon receipt of PPE.
2. PPE received by each employee is to be kept with him/her on moving around different worksites, in case of failure to follow these rules, the employee may be subjected to disciplinary actions.
3. Keeping PPE secured and using it properly taking into consideration their limitations.
4. Keeping PPE clean as per manufacturer recommendations.
5. Checking PPE periodically and notifying direct supervisor in case of the need for replacement.



6. Using basic/mandatory PPE during performing any task in all worksites, in addition to the recommended special PPE in accordance with task risk assessment, work permit and safe system of work.
7. Participating in the annual PPE poll to give their opinions (Comments and/or Complaints) about the received PPE efficiency in order to be considered during the following year.
8. Request the PPE.
9. Inspect the PPE before use and report any critical issues, for example the state of integrity, operation or any contamination by chemical agents.
10. use the PPE made available correctly and appropriately, according to the purpose for which they are intended.
11. provide for the care and adequate conservation of the PPE supplied, without making changes on one's own initiative.
12. promptly return a PPE in the event of defects, deterioration/depletion or nearing the expiry date, and request a new supply.
13. At the end of use, follow the company procedures for the return and disposal of PPE (following the manufacturer's instructions).
14. All personnel identified for compliance with RPE requirements shall fully comply with the requirements.
15. Use personal protective equipment provided to them in accordance with both any training in the use of personal protective equipment provided to them and the instruction which has been provided.
16. Take all reasonable steps to ensure that PPE is returned to the correct storage point provided after use.

17. Report to their employer any loss or obvious defect in the personal protective equipment.
18. Do not misuse supplied PPE, as this could impair its safety function and render it unfit for use.
19. Maintain their PPE in a correct and proper manner and to bring to the attention of their manager or Supervisor when replacement is required.

6. Requirements:

6.1 Use of PPE

- What is PPE?

PPE is defined as „all equipment (including clothing affording protection against the weather) which is intended to be worn or held by a person at work and which protects him/her against one or more risks to his/her health or safety“ e.g., safety helmets, gloves, eye protection, high-visibility clothing, safety footwear and safety harnesses. Ordinary working clothes or clothing not specifically designed to protect the wearer is not within the definition e.g., clothing provided with the primary aim of presenting a corporate image. The need for PPE must be identified through a risk assessment, and you must ensure that the right type and grade of PPE is specified and provided. Five steps to risk assessment PPE must always be regarded as a „last resort“ to protect against risks to safety and health. Engineering controls and safe systems of work must always be considered first. For example, it may be possible to do the job using methods that will not require the use of PPE. If this is not possible, more effective safeguards should be put in place. For example, fixed screens could be provided rather than individual eye

protection. There are a number of reasons why PPE must be considered as a „last resort“:

- PPE only protects the person wearing it, whereas measures controlling the risk at source protect everyone in the workplace
- theoretical maximum levels of protection are difficult to achieve and the actual level of protection is difficult to assess. Effective protection is only achieved by selecting suitable PPE and if it is correctly fitted, maintained and used.
- PPE may restrict the wearer to some extent by limiting mobility or visibility, or by requiring additional weight to be carried. Thus, creating additional hazards.

The requirement is also that PPE: -

- Is properly assessed before use to ensure it is suitable.
- Is maintained and stored properly.
- Is used correctly by employees
- Procedures for use shall be documented and made available to those who need it.
- Every employee shall use any PPE provided to him in accordance with any instructions and training received on the use of PPE.
- Every employee who has been provided with PPE shall take all reasonable steps to ensure that it is returned to the accommodation provided for it after use.

- PPE shall only be used in accordance with the manufacturer's instructions for use.
- Adequate levels of supervision shall be provided to ensure that the training and instructions in use of PPE are being followed.
- It should be used only after adequate training and instructions have been given to the user so they understand why, how, where and when it is to be used.

when to use PPE

After carrying out a risk assessment for the task you must ask yourself:

- Can I get rid of the hazard altogether?
- If not, how can I control the risks so that harm is unlikely?
- In controlling risks, the following principles should be applied, if possible, in the following order: -
 - Try a less risky option, e.g., use lower-voltage tools
 - Prevent access to the hazard e.g., by guarding
 - Organize work to reduce exposure to the hazard e.g., if there is a risk of falling objects, ensure restricted entry to that area if possible If after all the above there is still a residual risk, you will need to provide PPE.

6.2 Suitability of PPE

When selecting PPE, you should consider and take account of the following factors:

- The job itself and the risks for which protection is needed. For example, if there is a risk from falling objects, consider providing suitable industrial safety helmets. Other factors to consider are, for example, the physical effort needed to do the job, how long the PPE needs to be worn, and the requirements for visibility and communication.
- The environment. Consider the surrounding conditions, for example the weather if working outside, heating, noise, atmospheric conditions etc.
- The person. Consider the health of the person wearing the PPE and its ergonomic effects. PPE made of certain materials should not be issued to workers if they are known to cause allergies, for example latex gloves. Heavy or bulky suits can cause or make worse existing musculoskeletal problems and cause thermal comfort problems. The aim should be to choose PPE which will give maximum protection while ensuring minimum discomfort to the wearer, as uncomfortable equipment is unlikely to be worn properly.
- Those who do the job are usually best placed to know what is involved, and they should be consulted and involved in the selection and specification of the equipment – there is a better chance of PPE being used effectively if it is accepted by each wearer.
- There will be considerable differences in the physical dimensions of different workers and therefore more than one type or size of PPE may be needed. The required range may not be available from a single supplier.

- If more than one item of PPE is being worn, the different items of PPE must be compatible with each other. In such cases, when selecting PPE it should be ensured that all items, when used together, would adequately control the risks against which they are provided to protect. For example, certain types of half mask respirator and goggles worn together can prevent one or both items fitting correctly, leading to increased risk of eye injury and/or respiratory exposure

6.3 Selection of PPE

Several types of PPE may be suitable for any particular job. The key issues to be considered when selecting appropriate PPE are:

- Once potential hazards are known, there may be several types of PPE that would be suitable. For example, when assessing the need for eye protection, employers should first identify the types of hazard present, such as liquid splashes and projectiles, and then assess the degree of risk, for example the likely size and velocity of the projectiles. In this case, eye protection designed for chemical splash protection and for different levels of impact resistance should be selected.
- Once a type of CE marked PPE has been selected for a given application, further advice and information may be necessary to ensure that the equipment can provide the required protection to all those who need to wear it in the given working conditions. Manufacturers and suppliers have duties under the Personal Protective Equipment Regulations 2002 to provide information which

will help the employer in this duty. This information is usually in the form of a performance specification based on the essential health and safety requirements of the European PPE Directive. This is usually demonstrated by conforming to European (EN) or International (ISO) standards. Key PPE design requirements include:

- (a) tests of PPE performance;
 - (b) how the PPE should be labelled; and
 - (c) what instructions should be supplied with the PPE.
- At the end of this process, a range of potentially adequate and suitable PPE should be identified. Involving the end users with regard to fit, comfort and wear ability is likely to lead to better levels of user acceptance and therefore better protection.
 - Selection should be seen as only the first stage in a continuing program which is also concerned with the proper use and maintenance of the equipment, and the training and supervision of employees.
 - Consideration shall be given to all aspects of the job including the length of time for which the PPE will be worn, the mobility, vision and communication required by the worker, the physical effort required by the job, and the methods of work.
 - The level of risks likely to be encountered.
 - Any risks not addressed by other methods of risk prevention/reduction should be addressed by the PPE.
 - Risks that the PPE itself might introduce shall also be taken into account.

- The parts of the body to be protected.
- The characteristics that the PPE shall have in order to be effective against the assessed risks.
- Personnel who are required to use PPE should be consulted prior to final selection of the equipment. This will provide useful input to the selection process from those who will know best what is involved during the job. The aim shall always be to choose appropriate PPE that will give the correct level of protection with the least discomfort to the user. Other factors may also need to be considered in the selection process such as:
 - 1- Disposable versus reusable.
 - 2- Maintenance requirements.
 - 3- Durability in use.
 - 4- Availability of equipment in different sizes.
- Where there is more than one risk to health that requires the wearing of more than one type of PPE, it is important that the PPEs selected are compatible with each other and continue to be effective against the risks.

6.4 Storage of PPE

- Company shall ensure that appropriate storage is provided for PPE when it is not in use.
- The storage shall be adequate to protect the PPE from contamination, loss, or damage by harmful substances, damp or sunlight.

- Where PPE becomes contaminated during use, it shall be stored separately from the uncontaminated PPE in a separate area, and suitably labelled.
- If the PPE itself contains hazardous materials, for example asbestos, it shall be sealed in an appropriate container and clearly labelled.
- PPE that is ready for use shall be clearly segregated in the storage area from that which is awaiting repair or maintenance.
- Once a PPE is issued to an employee, it falls upon the employee to ensure the proper storage of PPE for the whole service life of the PPE.

6.5 DISPOSAL OF PPE

Companies shall ensure that when PPEs are no longer fit for use, appropriate disposal methods are adhered to in line with relevant protocols for disposal.

6.6 Maintenance and replacement of PPE

- Every employer shall ensure that any personal protective equipment provided to his employees is maintained (including replaced or cleaned as appropriate) in an efficient state, in efficient working order and in good repair.
- Every self-employed person shall ensure that any personal protective equipment provided to him is maintained (including replaced or cleaned as appropriate) in an efficient state, in efficient working order and in good repair.

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- An effective maintenance system includes the following:
 - (a) examination – checking for faults, damage, wear and tear, dirt etc.;
 - (b) testing – to ensure PPE is operating as intended;
 - (c) cleaning – including disinfection if appropriate;
 - (d) repair;
 - (e) replacement.
 - In general, PPE should be examined to ensure it is in good working order before being issued to the user. Such examinations should be carried out by appropriately trained staff. It should not be issued if found to be defective. most PPE will be provided on a personal basis, some items may be used by a number of people. There should be arrangements for cleaning and disinfecting the PPE so there are no health risks to the next person using it.
 - The responsibility for carrying out maintenance together with the details of the procedures to be followed and their frequency should be put down in writing. Where appropriate, records of tests and examinations should also be kept. The maintenance program will vary with the type of equipment and how it is used. For example, mechanical fall arrestors will require a regular planned preventative maintenance program which will include examination, testing and overhaul, and record keeping. However, abrasion resistant gloves may only require periodic inspection by the user. Manufacturers' maintenance schedules and instructions should be followed.

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- Simple repairs can be carried out by the trained wearer, for example replacing broken laces on safety shoes. More intricate repairs should be done by personnel with the required skills and technical knowledge. Only the correct spare parts as recommended by the manufacturer should be used. It is a good idea to keep a stock of spare parts. If the technical knowledge is not available inside the business, then contract services are available from most manufacturers and suppliers of PPE as well as from specialist maintenance firms.
 - PPE will have a useable 'shelf life'. When it exceeds its shelf life or is so badly damaged that repair is not possible or too costly then it needs to be replaced. In certain circumstances it may be appropriate to provide a supply of disposable PPE (e.g., single use coveralls). If disposable PPE is used it is important that users know when it should be discarded and replaced and how to dispose of it safely.
 - Company shall ensure that any PPE provided to employees is maintained in effective working order and in good repair.
 - An effective system of maintenance of PPE is essential to make sure the equipment continues to provide the degree of protection for which it was designed.
 - Maintenance requirements should include where appropriate, cleaning, disinfection, examination, replacement, repair and testing.
 - The responsibility for carrying out maintenance shall be established and documented, together with the details of the procedures to be

followed and their frequency. Where appropriate, records of tests and examinations shall also be kept.

- The maintenance program will vary with the type of equipment and the use to which it is put.
- PPE shall be regularly examined to ensure that it is in good working order, and always before it is issued to the wearer. PPE shall also be examined before it is put on and shall not be worn if it is found to be defective or has not been cleaned - such examinations shall be carried out by properly trained personnel in accordance with the manufacturer's instructions.
- While most PPE will be provided on a personal basis, some may be used by a number of people. There shall therefore be arrangements for cleaning and disinfecting as necessary before PPE is reissued.
- A sufficient stock of spare parts shall be kept available for repair/replacement as necessary. Only manufacturers designated spare parts shall be used in maintaining PPE, or the equipment may not provide the required degree of protection.
- Manufacturers' maintenance schedules and instructions (including recommended replacement periods and shelf lives) shall be followed at all times.
- Simple maintenance can be carried out by the person who is to wear the PPE provided they have been given suitable training.
- More complex repairs shall only be done by specialist personnel who have received the necessary training.

- In certain circumstances, it may be more appropriate to provide a supply of disposable PPE (e.g., single use coveralls) that can simply be discarded after use. If disposable PPE is used, it is important that users know when it shall be discarded and replaced.

6.7 Reporting loss or defect

- Employees shall take reasonable care of PPE provided and report any loss or obvious defect as soon as possible.
- If employees have any concerns about the serviceability of the PPE, they shall immediately consult their supervisor.
- Company shall establish the necessary procedures to enable their employees (or contractors) to report any loss or defects in PPE.
- These arrangements shall also ensure that defective PPE is repaired or replaced before the employee restarts work.
- Any replacement for PPEs reported lost, damaged or defective shall be subject to approval from relevant parties.
- Every employee who has been provided with personal protective equipment by virtue of regulation 4(1) shall forthwith report to his employer any loss of or obvious defect in that personal protective equipment.
- Employers should make arrangements to ensure that their employees can report to them (or their representative) the loss of or defects in PPE. These arrangements should also ensure that defective PPE is repaired or replaced before the employee concerned restarts work.

- Employees must take reasonable care of PPE provided and report to their employer any loss or obvious defect as soon as possible. If employees have any concerns about the serviceability of the PPE, they should immediately consult their employer or the employer's representative.

6.8 Disciplinary policy

In order to maintain a safe and health workplace, the employees must be aware of all company, Egyptian safety and health regulations as they apply to the specific job duties required.

The following disciplinary policy is in effect and will be applied to all safety and health violations.

The following steps will be applied:

- a) **A first-time violation** will be discussed orally between company supervision and the employee. This will as soon as possible.
- b) **A second time offense** will be followed up in written form and a copy of this written documentation will be entered into the employees' personnel folder.
- c) **A third time violation** will result in time off or possible termination, depending on the seriousness of the violation.

6.9 Information, instruction and Training

- Where an employer is required to ensure that personal protective equipment is provided to an employee, the employer shall also ensure that the employee is provided with such information, instruction and training as is adequate and appropriate to enable the employee to know –
 - (a) the risk or risks which the personal protective equipment will avoid or limit;
 - (b) the purpose for which and the manner in which personal protective equipment is to be used; and
 - (c) any action to be taken by the employee to ensure that the personal protective equipment remains in an efficient state, in efficient working order and in good repair and shall ensure that such information is kept available to employees
- Without prejudice to the generality of paragraph (1), the information and instruction provided by virtue of that paragraph shall not be adequate and appropriate unless it is comprehensible to the persons to whom it is provided.
- Without prejudice to the generality of paragraph (1) the employer shall, where appropriate, and at suitable intervals, organize demonstrations in the wearing of personal protective equipment.
- The Regulation require employers to provide suitable information, instruction and training for their employees, to enable them to make

effective use of the PPE provided to protect them against workplace hazards to their health and safety. A systematic approach to training is needed – this means that everyone who is involved in the use or maintenance of PPE should be trained appropriately.

- Users must be trained in the proper use of PPE, how to correctly fit and wear it, and what its limitations are. Managers and supervisors must also be aware of why PPE is being used and how to use it properly. People involved in maintaining, repairing and testing the equipment and in its selection for use will also need training. Training should include elements of theory as well as practice in using the equipment, and should be carried out in accordance with any recommendations and instructions supplied by the PPE manufacturer.
- The extent of the instruction and training will vary with the complexity and performance of the equipment. For PPE which is simple to use and maintain, such as safety helmets, some basic instructions to the users on the other hand, the safe use of antistatic footwear or laser eye protection will depend on an adequate understanding of the principles behind them. The instruction and training should include both theory and practice.
- A systematic approach to training is needed; this means that everyone who is involved in the use or maintenance of PPE shall be trained appropriately.
- The instruction and training shall include both theoretical and practical elements.

Theoretical training shall include:

1. An explanation of the risks presents and why PPE is needed.
2. the operation, performance and limitations of the equipment
3. instructions on the selection, use and storage of PPE. Written operating procedures such as permits to work involving PPE should be explained;
4. Written operating procedures, such as permits to work, involving PPE shall be explained.
5. Factors, which can affect the protection, provided by the PPE such as: other protective equipment, personal factors, working conditions, inadequate fitting, and defects, damage and wear.
6. Recognizing defects in PPE and arrangements for reporting loss or defects.

Practical training shall include:

1. Practice in putting on, wearing and removing the equipment.
2. Practice and instruction in inspection and, where appropriate, testing of the PPE before use.
3. Practice and instruction in the maintenance that can be done by the user, such as cleaning and the replacement of certain components.
4. Instruction in the safe storage of equipment.
5. The extent of the training that is required will depend on the type of equipment, how frequently it is used and the needs of the people being trained. Many manufacturers of PPE run training courses for

users of their equipment and these courses may be of particular benefit to small users who do not have training facilities.

6. As well as initial training, users of PPE and others involved with the equipment may need refresher training from time to time. Records of training details should be kept to help with the efficient administration of the training program.
7. Employers must ensure, not only that their employees undergo the appropriate training, but also that they understand what they are being taught. Employees may have difficulty in understanding their training for a number of reasons. For example, the risks (and precautions) may be of a particularly complex nature, making it difficult for employees to understand the precise nature of the protective measures they must take. English may not be the first language of some employees who may need the training to be given in a language they understand.

In addition to initial training, refresher training may be required from time to time. Records of training details shall be kept on individual's personnel files, to assist in the administration of the training program.

7. Basic / Mandatory PPE

PPE is defined as any piece of equipment that is designed to be worn for the protection of health and safety and provides employers to help them comply with their duties to select suitable PPE, use and maintain it. It describes the PPE used for different parts of the body (head, eye and face, hand and arm, body (including the legs) and

feet) and then covers PPE used to prevent drowning and falls from height.

Key points of selection, use and maintenance of PPE are:

- (a) PPE should be labelled to show what it protects against and is resistant to. Talk to manufacturers and suppliers on the protection offered by their products before buying. Another useful source of information
- (b) Always use PPE according to the manufacturer's instructions. PPE on the market must be supplied with relevant information in the official language(s) of the country of destination on:
 - (i) storage, use, cleaning, maintenance, servicing and disinfecting;
 - (ii) the level of protection provided by the PPE;
 - (iii) suitable PPE accessories and appropriate spare parts;
 - (iv) limitations on use;
 - (v) the obsolescence period for the PPE or certain of its components.
- (c) Ensure items of PPE used together are compatible with each other to ensure they continue to be effective against the risks.
- (d) Train and instruct workers to put on and remove contaminated clothing without contaminating themselves.
- (e) Do not reuse disposable PPE.

(f) Do not leave contaminated work areas without removing the contaminated clothing in appropriate changing areas.

(g) Do not store PPE in direct sunlight or in hot and humid places as this can cause damage.

(h) Do not use PPE if it is damaged or heavily worn. If it is unfit for use or past its usable protective life, dispose of it properly and replace it.

Basic PPE includes but not limited to:

- 1) Head protection
- 2) Foot protection
- 3) Eye / face protection
- 4) Hearing protection
- 5) Hand protection
- 6) Protective clothing
- 7) Safety Harness / lifelines
- 8) Respiratory Protective Equipment (RPE)
- 9) Flotation safety device

7.1 Head protection: -

There are several types of head protection:

(a) Industrial safety helmets – Protect against falling objects or impact with fixed objects and offer limited resistance to flame. Helmets are also available which give protection against impact at high or low temperatures, against electrical shock from brief contact up to 440 V ac and against molten metal splash.

(b) Bump caps – Protect against bumping the head (e.g. walking into a fixed object) and scalping, and can stop hair getting caught in machinery and moving parts. Bump caps do not offer adequate protection where there is a risk of falling objects or moving or suspended loads.

(c) Firefighters' helmets – These are similar to industrial safety helmets, but cover more of the head and give greater protection against impact, heat and flame.

(d) Transport helmets – Protect against head injuries from falling off a motorcycle or bicycle. The PPE at Work Regulations do not cover the provision of motorcycle and bicycle helmets on the road. Motorcycle crash helmets are legally required for motorcyclists under road traffic legislation. However, in off-road situations, employers should provide suitable transport helmets, for example motorcycle helmets for farm workers who use all-terrain vehicles (ATVs).

(e) Leisure helmets – Helmets used for activities, such as horse riding, canoeing or climbing, which protect against the risks of that particular activity.



Industrial safety helmet with chinstrap

Examples of hazards or situations where head protection may be required are:

- (a) low level fixed objects, for example pipework, machines or scaffolding where there is a risk of collision;
- (b) transport activities, hoists, lifting plant, conveyors etc involving the risk of falling material;
- (c) tree felling;
- (d) blasting work, for example in quarries, opencast mining etc;
- (e) under the Construction (Head Protection) Regulations 1989, employers must take all reasonably practicable measures to ensure that suitable head protection is worn (except by turban wearing Sikhs) on construction sites unless there is no foreseeable risk of head injury other than by falling;

(f) under the Docks Regulations 1988, suitable safety helmets must be worn by those working in docks premises where there is an expected risk of injury to the head and employees must wear the helmets in a proper manner when working there

The Key points to note for head protection are:

- a) Head protection recommended to comply with BS EN 397 or ANSI Z89.1 or equivalent, be manufactured from non-metal material and fitted with a chin strap.
- b) Use an adjustable chinstrap, if fitted, to make sure the helmet does not fall off.
- c) Clean the inside of the helmet and clean or replace sweatbands regularly.
- d) Check regularly that any damage to the outside is no more than shallow scratches or grazes and that the internal harness is not damaged or deformed.
- e) Throw head protection away after significant impact by a fixed or falling object.
- f) Head protection is unfit for use if the outside is deeply scratched, worn or deformed, the harness is damaged or deformed or it is beyond its usable protective life.
- g) Wear the helmet so that the brim is level when the head is upright. Do not wear it sloping up or down as this may significantly reduce the protection it can provide.

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- h) Do not wear head protection back to front – it will not protect you if you do.
 - i) Do not customize head protection, eg make your own ventilation holes, paint, mark or put stickers on it.
 - j) Do not wear a baseball style bump cap where there is a risk of falling objects – wear an industrial safety helmet instead.
 - k) Each helmet recommended to bear a label inside the shell that lists the manufacturer, ANSI designation and the class of hat.
 - l) Local regulations require helmets not to be worn in the vicinity of helicopter operations, except for firemen's helmets worn during fire-fighting operations.
 - m) They should not be stored in direct sunlight and not exposed to high temperature sources.
 - n) It is recommended that they be renewed after a period of 2 to 3 years continuous use (from the date of initial use not from the date of manufacturing), in recognition of normal 'wear and tear'.
 - o) On a two-on, two-off shift cycle, this would equate to a maximum actual life of 5 years.
 - p) Protective helmets are designed to prevent penetration of the object and also to absorb the shock of impact. It is important to know the potential for exposure to falling or flying objects, contact with overhead objects, and electrical hazards (must know the voltage) in order to select the most appropriate type of helmet.



Type	Impact & Penetration Resistance	Electrical Protection
Class A	YES	Low-voltage conductors (UP to 2,200) General Service
Class B	YES	High-voltage conductors (up to 20,000) Utility Service
Class C	YES	None (not designed for electrical exposure) Special Service such as Metal Low helmets

- q) Hard hats should be kept free from abrasion, scrapes, nicks and punctures and should not be dropped, thrown, painted, used as a support or as a seat or used to carry loose materials or liquids.
- r) Hard hat suspensions shall be replaced annually with new suspensions of like design and function
- s) Hard hats shall meet the requirements of ANSI Z89.1 Class E (Electrical).
- t) Conductive (Class C) type helmets and bump caps are not approved head protection for general use.

Where a danger of injury to a worker's head exists or may exist, then the supervisor shall ensure that the worker wears a safety helmet that conforms to:

- a) All personnel must wear approved hard hats whenever they are in areas requiring use of minimum mandatory PPEs.

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- b) Do not use gasoline, solvents, or similar substances on a hard hat for cleaning purposes. Use, instead, mild soap and warm water.
 - c) Never modify the shell of a hard hat, i.e., punching holes in it for additional ventilation or writing on it with marker pens...etc. All of these forms of damage or inappropriate use may reduce the strength of the hard hat or reduce its electrical non-conductivity.
 - d) Don't use the safety helmet against hazardous other than those specified in the user instruction.
 - e) When welding hoods are required, they shall be worn in conjunction with hard hats.
 - f) If a hard hat becomes brittle, cracks, or is otherwise damaged, it shall be replaced immediately
 - g) Employees are required to inspect head protection prior to use to ensure that the equipment is in safe condition. Equipment that is defective or damaged shall not be used and immediately replaced.
Inspect for:
 - Dents,
 - Cracks,
 - Suspension connector cracks,
 - Torn, loose, or worn suspension straps, and
 - Cleanliness / sanitation. Head protection should be clean and not contaminated with oil, grease, chemicals, etc.

SPECIFICATION FOR HEAD PROTECTION:

7.1 Helmets



Staz-On suspension



Fas-Trac suspension

7.1.1 Cap Helmet with Fas-Trac suspension III,

SN	Attribute	Values
1	Design Standard/Spec	ANSI/ISEA Z89.1-2014
2	Design Type	
3	Design Class	Class B (Electrical) proof tested at 20,000 volts and Third Party certified by SEI.
4	Application/Protection Type	-----
5	Style	Non-vented, vented
6	Material	Polyethylene
7	Harness/Suspension	Adjustable with swing & ratchet. Easy to install & adjust to accommodate different head sizes
8	Headband /Nape Strap	-----
9	Sweatband	-----
10	Chin Strap	-----



11	Brim	-----
12	Color	-----
13	Ambient Temperature Rating	-----
14	Logo Requirement	-----
15	Certification Requirement	-----
16	Marking Requirement	-----
17	Additional Requirements	Low temperature [LT] to (-30°C) and the High Visibility tests for Chromaticity and Luminescence for added visibility

7.1.2 Cap Helmet with Staz-On suspension,

SN	Attribute	Values
1	Design Standard/Spec	ANSI/ISEA Z89.1-2014
2	Design Type	
3	Design Class	Class B (Electrical) proof tested at 20,000 volts and Third Party certified by SEI.
4	Application/Protection Type	-----
5	Style	Non-vented, vented
6	Material	Polyethylene
7	Harness/Suspension	Adjustable with swing & ratchet. Easy to install & adjust to accommodate different head sizes
8	Headband /Nape Strap	YES
9	Sweatband	YES
10	Chin Strap	-----
11	Brim	-----
12	Color	-----
13	Ambient Temperature Rating	-----
14	Logo Requirement	-----



15	Certification Requirement	-----
16	Marking Requirement	-----
17	Additional Requirements	Low temperature [LT] to (-30°c) and the High Visibility tests for Chromaticity and Luminescence for added visibility

7.1.3 vented Cap Helmet with 4-point Fas-Trac suspension III,

SN	Attribute	Values
1	Design Standard/Spec	ANSI/ISEA Z89.1-2014
2	Design Type	
3	Design Class	Class B (Electrical) proof tested at 20,000 volts and Third Party certified by SEI.
4	Application/Protection Type	-----
5	Style	size (6½"-8") vented
6	Material	Polyethylene
7	Harness/Suspension	Adjustable with swing & ratchet. Easy to install & adjust to accommodate different head sizes
8	Headband /Nape Strap	-----
9	Sweatband	-----
10	Chin Strap	-----
11	Brim	-----
12	Color	-----
13	Ambient Temperature Rating	-----
14	Logo Requirement	-----
15	Certification Requirement	-----
16	Marking Requirement	-----
17	Additional Requirements	meets voluntary standard for hi-visibility as prescribed by ANSI/ISEA Z89.1-2014

7.1.4 Hat Non-Slotted Full Brim with Fas-Trac suspension III,

SN	Attribute	Values
1	Design Standard/Spec	ANSI/ISEA Z89.1-2014
2	Design Type	
3	Design Class	Class B (Electrical) proof tested at 20,000 volts and Third Party certified by SEI.
4	Application/Protection Type	-----
5	Style	Non-vented
6	Material	Polyethylene
7	Harness/Suspension	Adjustable with swing & ratchet. Easy to install & adjust to accommodate different head sizes
8	Headband /Nape Strap	-----
9	Sweatband	-----
10	Chin Strap	-----
11	Brim	full
12	Color	-----
13	Ambient Temperature Rating	-----
14	Logo Requirement	-----
15	Certification Requirement	-----
16	Marking Requirement	-----
17	Additional Requirements	meet the 2009 additions voluntary standard to ANSI/ISEA Z89.1-2014 for Reverse Donning of Helmet Test, low temperature [LT] to(-30°C) and the High Visibility tests for Chromaticity and Luminescence for added visibility.



7.1.5 Hat Non-Slotted Full Brim with Staz-On suspension,

SN	Attribute	Values
1	Design Standard/Spec	ANSI/ISEA Z89.1-2014
2	Design Type	
3	Design Class	Class B (Electrical) proof tested at 20,000 volts and Third Party certified by SEI.
4	Application/Protection Type	-----
5	Style	Non-vented
6	Material	Polyethylene
7	Harness/Suspension	Adjustable with swing & ratchet. Easy to install & adjust to accommodate different head sizes
8	Headband /Nape Strap	YES
9	Sweatband	YES
10	Chin Strap	-----
11	Brim	Full
12	Color	-----
13	Ambient Temperature Rating	-----
14	Logo Requirement	-----
15	Certification Requirement	-----
16	Marking Requirement	-----
17	Additional Requirements	Low temperature [LT] to (-30°C) and the High Visibility tests for Chromaticity and Luminescence for added visibility

OTHER STANDARDS RELEVANT TO HEAD PROTECTION

Occupational equipment is unlikely to be marked with these Standard numbers, but they may contain useful information on equipment performance or test methods.

EN 960:1995	Head forms for use in testing of protective helmets
EN 13087-1:2000	Protective helmets - Test methods - Part 1: Conditions and conditioning
EN 13087-2:2000	Protective helmets - Test methods - Part 2: Shock absorption
EN 13087-3:2000	Protective helmets - Test methods - Part 3: Resistance to penetration
EN 13087-4:2000	Protective helmets - Test methods - Part 4: Retention system effectiveness
EN 13087-5:2000	Protective helmets - Test methods - Part 5: Retention system strength
EN 13087-6:2000	Protective helmets - Test methods - Part 6: Field of vision
EN 13087-7:2000	Protective helmets - Test methods - Part 7: Flame resistance
EN 13087-8:2000	Protective helmets - Test methods - Part 8: Electrical properties
EN 13087-10:2000	Protective helmets - Test methods - Part 10: Resistance to radiant heat

7.2 Foot protection:

Feet and legs are at risk from hazards such as falling objects, electricity, excessive heat, metal and chemical splashes, work in flammable atmosphere. The use of foot protection such as safety boots with steel or composite toecaps, rubber boots or anti-static footwear can help protect against these hazards.

- a) Safety shoes or safety boots with built in steel toe protection shall meet the requirements of EN ISO 20345:2011 or ANSI M I/75 C/75 standards or equivalent (with a minimum 3/8" heel and where necessary appropriate ankle protection).
- b) PVC chemical resistant with built in steel toe protection shall meet the requirements of BS EN 943 or EN 13832-3 standards or equivalent.
- c) Safety shoes or safety boots shall be worn in field locations when personnel are outside of vehicle, in specifically designated areas or where any type of foot injury hazard exists, as required by local policy or management.
- d) It's a general requirement that safety footwear shall also be worn at all times by all personnel working in or visiting any operational facility.
- e) Safety footwear shall be maintained in good condition.
- f) Safety footwear should be regularly inspected for any form of damage or deterioration.
- g) Laces shall be checked and replaced if necessary.
- h) The soles of the boot should be anti-slip for wet or oily surfaces.

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- i) Rubber safety boots with built in steel toe protection shall be used for wet jobs or specialist tasks involving contact with chemicals.
 - j) The use of tennis or canvas type shoes or sandals shall be prohibited in working areas.
 - k) It is recommended that they be renewed after a period of 3 years continuous use.
 - l) The choice of safety footwear should be made on the basis of compatibility with the work, degree of protection afforded, and the requirements of the user.
 - m) Safety footwear should be flexible, wet-resistant, have oil resistant soles and absorb perspiration.
 - n) Boots are required where ankles need protection.
 - o) The ability of the safety footwear to resist corrosion, abrasion and industrial wear and tear should also be considered.
 - p) The manufacturer's instructions and markings for appropriate use and level of protection should always be followed.
 - q) Soles should be heat and oil resistant and slip resistant. They may be shock resistant, anti-static or conductive.
 - r) Protective Toecaps can be either made of steel or composite material. They shall be capable of resisting a heavy sharp object falling from a considerable height.
 - s) Heat Resistance Leather or other heat resistant materials can be used in safety footwear to offer protection against heat, sparks and molten metal.

- t) Rubber and PVC are suitable waterproofing materials for footwear because they are not permeable.
- u) There are 'breathable materials' which are water resistant, but which also allow air to get through and perspiration to get out and may therefore be more comfortable and more hygienic.
- v) Footwear with exposed metal on the soles is strictly prohibited in any facility.

Types of Foot Protection:

- a) Safety Boots or Shoes are the most common type of safety footwear. These may have steel or composite toecaps. They may also have other safety features including slip resistant soles, steel midsoles, oil-resistant and insulation against extremes of temperature.
- b) Rubber Boots protect against water and wet conditions and can be useful in jobs where the footwear needs to be washed. They are usually made from rubber but are available in polyurethane and Polyvinyl Chloride (PVC), which have greater chemical resistance. Rubber boots can be obtained with corrosion resistant steel toecaps, rot-proof insoles, steel midsoles, anklebone padding and cotton linings.
- c) Anti-Static Footwear prevents the build-up of static electricity on the wearer. It reduces the danger of igniting a flammable atmosphere and gives some protection against electric shock.

- d) Conductive Footwear also prevents the build-up of static electricity. It is particularly suitable for handling sensitive components or substances. It gives no protection against electric shock. IT SHALL NOT BE WORN WHERE THERE IS A DANGER OF ELECTRIC SHOCK.



Various types of foot protection

Examples of hazards which may require foot protection

- a) Objects falling on and crushing the foot/toes – this will include jobs requiring manual handling, such as construction workers or removal people.
- b) Treading on pointed or sharp objects (e.g., nails) on the ground piercing the shoe, injuring the sole of the foot and resulting in cuts and wounds.

- c) Slips, trips and falls resulting in injuries such as sprained ankles. Although there is no such thing as nonslip footwear there are slip resistant 'ant slip' soles which can reduce the likelihood of slipping on certain floors.
- d) Working in cold or hot conditions. Working in the cold requires footwear with thermal insulation. Work in hot conditions requires footwear with heat resistant and insulating soles. For protection against molten metal splash, footwear must have quick release fastenings.
- e) Electrical hazards.
- f) Working in potentially explosive atmospheres or for the handling of sensitive materials (e.g., detonators). Footwear must be antistatic.
- g) Working with and handling hazardous chemicals. Footwear should be resistant to that chemical.
- h) Wet work, for example using water sprays when cleaning. Water resistant or waterproof material should be used.
- i) Work in flammable atmospheres.

Key points to note about protective footwear are:

- a) Consider the comfort factors for the wearer. Generally, footwear should be flexible, wet resistant and absorb perspiration. Cushioned soles make standing more comfortable.
- b) Inspect for wear and tear and loose seams before use. Replace broken laces and remove materials lodged in the tread of the sole.

SPECIFICATIONS FOR FOOT AND LEG PROTECTION

The most important things common to all types of shoes are:

1. The shoe is manufactured and tested and has an EC Type Examination certificate according to the European standard No.: EN ISO 20345 :2011 and according to the protection group S3
2. The shoe must be examined and conform to the SRC skating test and consist of:
 - A- SRA -A is resistant to ceramic skating.
 - B- SRB -B is resistant to skiing on stainless steel.
3. The face of the shoe should be made of smooth natural leather and not grainy and not less than 2 mm thick (to increase the skin's resistance to tearing).
4. The face of the shoe should be water-resistant Upper (WRU)
5. The leather of the shoe is lined with foam insulation, which prevents the face of the shoe from breathing, which leads to sweating of the foot.
6. The sole is made of high-quality Polyurethane (preferably by direct injection) resistant to oils, grease, cracking and tearing and withstands a temperature of up to 150 degrees, the sole is made of polyurethane to maintain the comfort of the worker.
7. The steel front should withstand shock 200J, the pressure is more than 15 N.
8. The shoe has a stainless-steel plate that is resistant to rust and corrosion (not iron) to protect the foot from sharp objects and resists about 1100 Neotn.
9. The shoe has the property of antistatic electricity:

A- Isolates the electric current up to 250 volts.

B- Discharges static electrical charges.

10. The inner brushes of the shoe are highly breathable (for sweating the foot) and against bacteria and fungi and resistant to tear and comfortable and shock absorber and discharge static electricity charges.

11. The heel of the shoe has a shock-absorbing property.

12. Special inner lining to absorb sweat and increase ventilation.

13. Adopting a universal Mondo Point size system to ensure accurate measurement, which provides great comfort while wearing shoes

14. The shoe must be newly produced.

Specifications of foot protection:

7.2.1 PVC Chemical Resistant Steel-toe Boots S5

SN	Attribute	Values
1	Design Standard/Spec	EN 13832-3 & EN 943
2	Application/Protection Type	<ul style="list-style-type: none"> ▪ Water-Resistant, Acid/Alkali/Oil/Fat-Resistant ▪ Anti-Static ▪ Resistant to solvents and acetone ▪ Resistant to concentrated Sulfuric acid ▪ Anti-Slip
3	Permeation	Excellent Permeation Rate
4	Style	High Shank - Knee Height 38-40 Cm
5	Gender	UNISEX (Male & Female)
6	Material	PVC & Nitrile rubber
7	Material Weight	Light Weight
8	Material, Toe Cap	Integral steel toe cap 200J Protection
9	Color	black
10	Size	38-50 (Europe)
11	Certification Requirement	Conformance certificate
12	Marking Requirement	Embossed or tagged with details such as date of manufacture, brand name, standards compliance, country of origin
13	Additional Requirements	Polymeric footwear with antistatic properties

7.2.2 BOOT, SAFETY, (EH), 6 INCHES

SN	Attribute	Values
1	Design Standard/Spec	ASTM F2413-18, M/I/C_EH
2	Style/Type	High Ankle Lace-Up
3	Height, Shaft/Upper	6 Inches
4	Gender	Men & Women
5	Application/Protection Type	Oil Resistant Impact Resistant Penetration Resistant



		Slip Resistant Abrasion Resistant Electrical Hazard Protection 100% Water Resistant Shock Absorbent Anti-Bacterial Anti-Static
6	Safety Rating	Category: S3
7	Material, Upper	<ul style="list-style-type: none"> ■ Waterproof Aircell Leather ■ Buff Leather Crazy Hors ■ Or Full Grain Leather
8	Material, Insole	Double Density Pu/Rubber (Direct Injection) puncture resistance
9	Material, Lining	<ul style="list-style-type: none"> ■ Black 3d Mesh Lining (Polyester). ■ Antistatic + Anti-Bacterial Foam Eva + Nylon Lining
10	Material, Midsole/Shank	Apt (Anti-perforation Textile)
11	Material, Outsole	Double Density Pu/Rubber (Direct Injection)
12	Material, Toe Cap	Composite Toe Cap – 200J resistant toe cap according to EN 12568:2010 Or Steel Toe
13	Material Outer Toecap	Waterproof Aircell Leather
14	Material, Heel	Double Density Pu/Rubber (Direct Injection)
15	Color	Black/Brown
16	Weight	Light Weight (750g In Size 42 - One Shoe)
17	Size	38 TO 50 (Europe)
18	Certification	Certificate Of Conformance
19	Marking Requirement	Embossed or tagged with details such as Date Of Manufacture, Brand Name, Standards Compliance, Country Of Origin
20	Additional Requirements	<ul style="list-style-type: none"> ■ 100% Metal Free (Recommended) ■ Good Design, Comfortable, Anti-slip, Light & Flexible. ■ HRO Certification (Resistant Up To 300° C Per Contact)



7.2.3 STANDARD (OR ALTERNATIVE): BOOT, SAFETY, (EH), PULL ON, 11 INCHES

SN	Attribute	Values
1	Design Standard/Spec	ASTM F2413-18, M/I/C, EH PR ASTM F3445-21 (SLIP RESISTANCE)
2	Style/Type	High Ankle Lace-Up
3	Height, Shaft/Upper	11 Inches
4	Gender	Men & Women
5	Application/Protection Type	Oil Resistant Impact Resistant Penetration Resistant Slip Resistant Abrasion Resistant Electrical Hazard Protection 100% Water Resistant Shock Absorbent Anti-Bacterial Anti-Static
6	Safety Rating	Category: S3
7	Material, Upper	<ul style="list-style-type: none"> ▪ Waterproof Aircell Leather ▪ Buff Leather Crazy Hors ▪ Or Full Grain Leather
8	Material, Insole	Double Density Pu/Rubber (Direct Injection) puncture resistance
9	Material, Lining	<ul style="list-style-type: none"> ▪ Black 3d Mesh Lining (Polyester). ▪ Antistatic + Anti-Bacterial Foam Eva + Nylon Lining
10	Material, Midsole/Shank	Apt (Anti-perforation Textile)
11	Material, Outsole	Double Density Pu/Rubber (Direct Injection)
12	Material, Toe Cap	Composite Toe Cap – 200J resistant toe cap according to EN 12568:2010 Or Steel Toe
13	Material Outer Toecap	Waterproof Aircell Leather
14	Material, Heel	Double Density Pu/Rubber (Direct Injection)



15	Color	Black/Brown
16	Weight	Light Weight (750g In Size 42 - One Shoe)
17	Size	38 TO 50 (Europe)
18	Certification	Certificate Of Conformance
19	Marking Requirement	Embossed or tagged with details such as Date Of Manufacture, Brand Name, Standards Compliance, Country Of Origin
20	Additional Requirements	<ul style="list-style-type: none"> ▪ 100% Metal Free (Recommended) ▪ Good Design, Comfortable, Anti-slip, Light & Flexible. ▪ HRO Certification (Resistant Up To 300° C Per Contact)

7.2.4 BOOT, SAFETY, (SD), 6 INCHES

SN	Attribute	Values
1	Design Standard/Spec	EN ISO 20345: 2011 S3 ASTM F2413-18, M/I/C, SD
2	Style/Type	High Ankle Lace-Up
3	Height, Shaft/Upper	6 Inches
4	Gender	Men & Women
5	Application/Protection Type	Oil Resistant Impact Resistant Penetration Resistant Slip Resistant Abrasion Resistant Electrical Hazard Protection 100% Water Resistant Shock Absorbent Anti-Bacterial Anti-Static
6	Safety Rating	Category: S3
7	Material, Upper	<ul style="list-style-type: none"> ▪ Waterproof Aircell Leather ▪ Buff Leather Crazy Hors ▪ Or Full Grain Leather
8	Material, Insole	Double Density Pu/Rubber (Direct Injection) puncture resistance

9	Material, Lining	<ul style="list-style-type: none"> ▪ Black 3d Mesh Lining (Polyester). ▪ Antistatic + Anti-Bacterial Foam Eva + Nylon Lining
10	Material, Midsole/Shank	Apt (Anti-perforation Textile)
11	Material, Outsole	Double Density Pu/Rubber (Direct Injection)
12	Material, Toe Cap	Composite Toe Cap – 200J resistant toe cap according to EN 12568:2010 Or Steel Toe
13	Material Outer Toecap	Waterproof Aircell Leather
14	Material, Heel	Double Density Pu/Rubber (Direct Injection)
15	Color	Black/Brown
16	Weight	Light Weight (750g In Size 42 - One Shoe)
17	Size	38 TO 50 (Europe)
18	Certification	Certificate Of Conformance
19	Marking Requirement	Embossed or tagged with details such as Date Of Manufacture, Brand Name, Standards Compliance, Country Of Origin
20	Additional Requirements	<ul style="list-style-type: none"> ▪ 100% Metal Free (Recommended) ▪ Good Design, Comfortable, Anti-slip, Light & Flexible. ▪ HRO Certification (Resistant Up To 300° C Per Contact)

OTHER STANDARDS RELEVANT TO FOOTWEAR AND LEG PROTECTION

Occupational equipment is unlikely to be marked with these Standard numbers, but they may contain useful information on equipment performance or test methods.

BS 7971-5:2004	Protection for use in violent situations and training: footwear
EN 13287:2004	Test method for slip resistance
EN ISO 18690:2000 due Oct'05	Guidance for the selection use and maintenance of safety, protective and occupational footwear

EN 20344:2004	Requirements and test methods for safety, protective and occupational footwear for professional use
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7.3 Eye / face protection:

Eye protection is needed to protect against the hazards of impact (e.g., in work with power driven tools where chippings may fly off), splashes or liquid droplets during the handling of hazardous chemicals, dust, gases (especially where gases or vapors are used under pressure), welding (where intense light or other optical radiation is emitted at dangerous levels), non-ionizing radiation and the light from lasers. Where any such risks have been identified, each company shall provide personnel with appropriate eye protection, and give instruction and training on selection, use and maintenance.

- a) Eye protection shall meet the requirements of BS EN 1661F standard or ANSI Z87.1/CSA Z84.3 or equivalent.
- b) In all cases eye protection shall include side shield to give lateral protection to the eyes.
- c) All jobs are entitled to 2 (transparent & Dark) safety glass & replaced when damaged without approvals.
- d) Eye protection shall be worn in designated areas or where any type of eye injury hazard exists for both of employees or visitors who may come into contact with the process and be at risk from the hazards.

- e) Eye protectors shall be provided both for persons directly involved in the work and also for others not directly involved or employed but who may come into contact with the process and be at risk from the hazards.
- f) Local policy or operating location management may extend this requirement to all jobs.
- g) Make sure the eye/face protection fits the user and does not fall off easily.
- h) It should be issued on a personal basis and used only by the person they are issued to.
- i) Personnel who do not require corrective lenses shall wear plain spectacle type safety glasses or goggles.
- j) Personnel who normally wear corrective glasses shall be required to obtain prescription safety glasses in accordance with the operating location's established program.
- k) It is important to ensure that the protective eyewear does not disturb the proper positioning of the prescription spectacles so that the wearer's vision will not be inhibited or limited.
- l) The use of contact lenses shall be discouraged in work situations where personnel are exposed to severe dust, chemicals and/or spray conditions where particles may enter eyes.
- m) Personnel who wear contact lenses shall also wear safety glasses or goggles as required by the task being undertaken and agreed PPE evaluations.
- n) Eye-shields are heavier than most safety glasses and consist of a frameless one-piece molded lens. These are sometimes worn as safety glasses or are

issued for wearing over non-safety prescription glasses. Eye-shields shall conform to BS EN 1661F standard or equivalent.

- o) Face-shields are heavier and bulkier than other types of eye protection. They provide whole face protection for certain types of hazards such as chemical splashes, abrasive dusts and flying particles. They do not protect against gases, dusts, mists or vapors.
- p) In certain circumstances the eye-shield lens and the glasses worn underneath could reflect light differently. This could cause distortion of the wearer's vision. For these reasons it is recommended that they are worn only on a short-term basis.
- q) For prolonged, regular wear, specific safety eyewear should be provided.
- r) For operations including grinding, scraping, chipping etc., or the handling of chemicals and solvents, sample taking etc. safety goggles are required.
- s) Goggles and face-shields shall conform to BS EN 166 and suffixed with a suitable classification. An assessment should also be made of the impact rating required and the final part of the suffix relates to mechanical strength.
- t) The lenses of eye protectors shall be kept clean as dirty lenses restrict vision, which can cause eye fatigue and lead to accidents.
- u) Eye protectors shall be protected by being placed in suitable cases when not in use.
- v) Eye protector headbands shall be replaced when worn out or damaged.
- w) Lenses that are scratched or pitted shall be replaced, as they may impair vision and their resistance to impact may be impaired.

- x) Transparent face shields shall be replaced when warped, scratched or have become brittle with age.

Types of Eye & Face Protection

There are several types of eye protection, some of which provide protection for the wearer's face as well. Some typical examples are:

- a) Safety spectacles are similar in appearance to prescription spectacles but may incorporate optional side shields, Compatible with prescription glasses, General use including sun protection
- b) Safety goggles are heavier and less convenient to use than spectacles or eye shields. They are made with a flexible plastic frame and one-piece lens and have an elastic headband.

Double-glazed goggles or those treated with an anti-mist coating may be more effective where misting is a problem.

'direct ventilation goggles' Where strenuous work is done in hot conditions, direct ventilation direct ventilation goggles may be more suitable. However, these are unsuitable for protection against chemicals, gases and dust.

'Indirect ventilation' goggles are not perforated but are fitted with baffled ventilators to prevent liquids and dust from entering.

Indirect ventilation goggles will not protect against gas or vapor.

- c) Chemical goggles used for Handling chemicals, works producing flying objects, dust, vapor.
- d) Welding goggles used for Assisting/supervising welding activities; any works emitting light.

- e) Face-shields such as full face-shields, visors or balaclavas, Face shields are heavier and bulkier than other types of eye protector but are comfortable if fitted with an adjustable head harness, Face shields protect the face but do not fully enclose the eyes and therefore do not protect against dusts, mist or gases, Visors on brow guards or helmets are replaceable, They may be worn over standard prescription spectacles and are generally not prone to misting, Face shields with reflective metal screens permit good visibility while effectively deflecting heat.
- f) Chemical face shield used for Handling chemical producing splashing.
- g) Welding face shield used for Welding activities (for welder).

Examples of hazards which may require eye and face protection

The main hazards are:

- (a) Liquid or chemical splash as a result of handling or coming into contact with dangerous liquids or chemical substances.
- (b) Working with power driven tools, where chippings or debris are likely to fly into the face, or abrasive materials may be projected.
- (c) Dust, gas or liquid mist from machines, high pressure cleaning, or using gas or vapor under pressure.
- (d) Radiant heat, molten metal, hot solids, sparks or hot liquid splash from working in hot conditions, for example welding, ovens, furnaces etc.
- (e) Intense light or other optical radiation emitted at levels liable to cause risk of injury, for example welding, lasers etc.

Hazards to the eye and sources of hazards encountered in occupational environments

Classification	Hazard (examples)	Source (examples)
Mechanical	Flying metal particles	Metal machinery, weld chipping, riveting, wire cutting, grinding
	Flying stone/mineral particles	Abrasive blasting, stone dressing, sculpting, grinding, rock drilling
	Flying wood/fibrous particles	Wood turning, tree felling, scrub clearance
	Coarse airborne dusts	Cement mixing, stone dressing, wood sawing, orbital sanding, grain storing, flour milling, coal mining/processing
	Molten metal splash	Metal pouring, metal skimming, die casting, metal flame cutting, soldering
	High pressure water	Water jet blasting
	Short circuit electric arc	Electrical installations and equipment



Chemical	Chemical splashes	Bleaching, battery filling, electrolytic plating, degreasing, paint stripping, chlorination processing, cement mixing
	Liquid aerosols	Crop spraying, paint/lacquer spraying, fumigating
	Steam jets	Leaking pipework, pressure vessel venting
	Fine dusts and powders	Cement mixing, wall sanding, lime spreading, powder coating
	Fumes, vapors and gases	Varnishing, adhesive bonding, exhaust gas analysis, welding/soldering, fumigation
	Biological agents/viruses	Veterinary work, dental surgery, first aid, medical research, waste management
Radiation	IR	Furnace work, metal pouring/smelting, metal casting, gas welding/brazing, flame

		cutting
	Visible glare	High temperature furnaces, high intensity artificial light, strong sunlight
	Ultra-violet	Electric arc welding, high energy discharge lamps, short circuit electric arcs dental curing lamps, strong sunlight, lacquer curing plant
	Laser	Laser measurement equipment laser cutting, stray beams from laser systems laser systems manufacture/repair

Maintenance of occupational eye-protectors

General

Occupational eye-protectors are subjected to many harsh environments and also need to with stand regular cleaning. Consequently, they are prone to damage and wear and any such degradation can affect their performance. It is important, therefore to constantly inspect eye-protectors and maintain them in a condition which ensures continuing conformance to original specification. This clause details a number of

procedures to help provide the correct information to users.

NOTE It is necessary to supply all eye-protectors with user instructions compiled by the manufacturer. Such instruction should be rigorously adhered to and take precedence over any contrary recommendations contained in this section.

Use and handling

Information on the following should be given to all users of eye-protectors.

- a) Eye-protectors should be used and handled with care. They should not be misused or allowed to become damaged, worn or contaminated with dirt, grease or other foreign matter. Eye-protectors should be replaced if they have been subjected to significant impact, molten metal splash, etc. even if there is no obvious visible damage.
- b) Spectacles should never be placed on a workbench or surface with the oculars facing downwards.
- c) Stickers or labels should not be attached to eye-protectors, and users should not mark or scratch them with identifying marks.
- d) When not in use eye-protectors should be stored in a protected manner
- e) User instructions should be examined for any special procedures relating to use and handling.

Inspection

- a) Eye-protectors should be inspected prior to every period of use to confirm that they will provide the specified level of protection. There should be documented procedures, supported by training programs, to ensure that the inspection is properly conducted.
- b) The inspection criteria are subjective, but if during inspection, any doubts are raised concerning the integrity of an eye-protector it should be immediately discarded and replaced. Inspection criteria contained in user instructions should be rigorously applied.
- c) During inspection, particular attention should be paid to the following: -
 - 1- **Oculars.** Any significant scratches, abrasions, clouding or discoloration should result in the oculars being replaced. Check also for any looseness in the frame;
 - 2- **Spectacle frames.** These should be undistorted and undamaged and capable of being adjusted to give optimum fit. Adjustable sidearm should remain easily adjustable and without undue slackness. Sidearm should open and close freely but without excessive slackness in the hinge mechanism. Side shields, if fitted, should be secure and undamaged.
 - 3- **Headbands.** All headbands should provide a secure optimum fit and be easily adjustable. Elastic headbands should retain adequate extensibility. There should be no slippage in headband assemblies when they are tightened.
 - 4- **Housings and frames.** Goggle frames should not be damaged or

distorted. Any ventilators or ventilation openings should be unclogged and secure in the frame.

5- **Face shields.** Welding shield windows should hold the filters securely, flip down holders should close without allowing entry of stray light. Mesh screens should not be torn or distorted. There should be no signs of scratching, abrasion, fine stress cracking or heat damage.

Cleaning

Eye-protectors should be cleaned, as necessary prior to storage, following the procedures contained in the user instructions. Generally, the eye-protector should be cleaned with a non-abrasive mild detergent, warm water and a soft lint-free cloth; followed by rinsing and drying.

Manufacturers' cleaning solutions may be used but any "general purpose" cleaning solution should be treated with suspicion. Solvents or industrial cleaners should not be used.

The employer should make facilities and materials readily available for the cleaning operation and should introduce the necessary procedures and controls to ensure it is undertaken effectively.

Repair and replacement of parts

No repairs should be undertaken to eye-protectors other than under the written authority of the manufacturer. Unauthorized repairs may

compromise the specification, invalidate certification/approval and negate a manufacturer's warranty.

Replacement of parts should be conducted strictly in accordance with manufacturer's instructions which should identify those parts which may be replaced.

Any repair or replacement of parts should be carried out by a suitably trained person and clearly documented.

Storage

Procedures in user instructions on storage conditions should be rigorously adhered to.

Any necessary cleaning should be performed prior to storage.

Eye-protectors should be provided with individual storage facilities to protect from dirt, oil, grease, excessive temperatures, strong sunlight, strong artificial light, moisture and high voltage equipment.

It should be checked that the eye-protector is not distorted during storage. If pliable spectacle cases are provided these should not be placed in any pocket which will cause the spectacle to be compressed.

SPECIFICATIONS FOR EYE AND FACE PROTECTION

7.3.1 Safety Glasses:

7.3.1.1 Clear Over Spectacles:

SN	Attribute	Values
1	Design Standard/Spec	ANSI/ISEA (Z87.1-2015) / 2020
2	Application/Protection Type	<ul style="list-style-type: none"> ▪ Polycarbonate lenses absorbs 99.9% of harmful UV A, B and C, 180-380NM. ▪ Anti-glare ▪ Anti-fog ▪ Anti-scratch ▪ Anti-impact
3	Gender	Unisex style
4	Glasses Shape/Style	Easily fits over most medium sized prescription eyewear of up to 144 mm.
5	Temple Style	Adjustable length Drop Temples “Hook’ behind the ears prevents slipping during work activity for added protection
6	Material, Temple Arm	Polycarbonate
7	Material, Temple Inlay	-
8	Padding, Bridge & Temple	Polycarbonate
9	Material, Lens	Polycarbonate
10	Optical Class	Class 1
11	Lens Colour	Clear Lens
12	Lens Coating	<ul style="list-style-type: none"> ▪ Polycarbonate Lenses Absorbs 99.9% Of Harmful UV A, B and C, 180-380nm. ▪ Anti-glare ▪ Anti-fog ▪ Anti-scratch ▪ Anti-impact
13	Attachment/Suspension	Supplied With Safety Glass Cords
14	Weight	Lightweight
15	Testing Requirements	Complying to EN Testing & Standard
16	Marking Requirement	Embossed with details such as Brand Name, Article Number & Standard Compliance

17	Certification Requirement	Certificate Of Compliance
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- Temple’s regulation in length and inclination
- Soft terminal tips to eliminate local pressure
- TUFF STUF
- Optimal comfort and fit to the soft adjustable nose pad

7.3.1.2 Dark Safety Glasses:

SN	Attribute	Values
1	Design Standard/Spec	ANSI/ISEA (Z87.1-2015) / 2020
2	Application/Protection Type	
3	Gender	
4	Glasses Shape/Style	5X9.N0.00.99
5	Temple Style	Temples regulations in length and inclination
6	Material, Temple Arm	Quick-Slick motion
7	Material, Temple Inlay	-
8	Padding, Bridge & Temple	Adjustable Temples and SoftPad technology
9	Material, Lens	Polycarbonate
10	Optical Class	
11	Lens Colour	Dark
12	Lens Coating	<ul style="list-style-type: none"> • Anti-fog • Anti-scratch treated • UV Protection
13	Side Shields	Integrated Side Shields with Ventilation System
14	Attachment/Suspension	-
15	Weight	Lightweight
16	Testing Requirements	U EN166 FT CE
17	Size	-
18	Marking Requirement	5X9.N0.00.99
19	Certification	U EN166 FT CE

- Temples regulation in length and inclination
- Soft terminal tips to eliminate local pressure
- Optimal comfort and fit to the soft adjustable nose pad
- TUFF STUF

7.3.1.3 Clear Safety Glasses:

SN	Attribute	Values
1	Design Standard/Spec	ANSI/ISEA (Z87.1-2015) / 2020
2	Application/Protection Type	
3	Gender	
4	Glasses Shape/Style	5X9.N0.00.99
5	Temple Style	Temples regulations in length and inclination
6	Material, Temple Arm	Quick-Slick motion
7	Material, Temple Inlay	-
8	Padding, Bridge & Temple	Adjustable Temples and SoftPad technology
9	Material, Lens	Polycarbonate
10	Optical Class	
11	Lens Colour	Clear
12	Lens Coating	<ul style="list-style-type: none"> • Anti-fog • Anti-scratch treated • UV Protection
13	Side Shields	Integrated Side Shields with Ventilation System
14	Attachment/Suspension	-
15	Weight	Lightweight
16	Testing Requirements	U EN166 FT CE
17	Size	-
18	Marking Requirement	5X9.N0.00.99
19	Certification	U EN166 FT CE

- Temples regulation in length and inclination

- Soft terminal tips to eliminate local pressure
- TUFF STUF

7.3.2 Safety Goggle:

7.3.2.1 Clear Safety Goggle:

- Clear Polycarbonate Lens
- Projects against impacts and UV radiations
- Anti-fog
- Anti-scratch treated
- Tuff STUF
- UV Protection
- Can be used for prolonged periods as it does not create distortion or fatigue
- Mirrored version (FM) gives protection from glare
- Mechanical work in good visibility conditions
- Liquids (droplets or splashes)
- Large dust particles and chemical
- Gas and fine dust particles
- Molten metals and hot solids
- *According to ANSI/ISEA (Z87.1-2015) / 2020

7.3.2.2 Dark Safety Goggle:

- Dark Polycarbonate Lens
- Projects against impacts and UV radiations

-
- Anti-fog
 - Anti-scratch treated
 - Tuff STUF
 - UV Protection
 - Can be used for prolonged periods as it does not create distortion or fatigue
 - Mirrored version (FM) gives protection from glare
 - Mechanical work in good visibility conditions
 - Liquids (droplets or splashes)
 - Large dust particles and chemical
 - Gas and fine dust particles
 - Molten metals and hot solids
 - *According to ANSI/ISEA (Z87.1-2015) / 2020

7.3.2.3 Safety Glasses of Welding ANSI ISEA-ZS7.1-2020

7.3.2.4 Face welder shield

- Light weight, made of excellent material for long life.
- Strong resistance to impact, heat, welding spatter.
- Spare shaded and clear anti-spatter lenses.
- Meets the BS 7028 / BS EN 166-167-168 grade 2 impact.
- Meets ANSI Z87.1.
- Heat resistant
- Welding spatter resistant

7.3.2.5 Welding goggles

- Soft comfortable frame provides good ventilation.
- Shade 5 welding lenses.
- Anti-fog coated lens.
- Spare inner lenses, welding lenses.
- According to ANSI Z87.1-2003

Tensile blindness

Tensile blindness. complete	Grades Of Cream
Welding is diaphragmatic shielded by the kernal arc (in which the welding material with inert bitumen) welding skewer is 4 mm.	10
Welding is covered with a curious arc (the soldering material is obscured by the inert laurel) welding alveolar from 4.8 mm to 6.8 mm	12
The Necessity of Sexual Abuse Welding Sink 6.4mldr	14
Ahamat Toos Kahri-Nali Abolfazi (Non-Spiritual)	11
Male Male Adult Male	12
Rainwater Pipeline	12
Sharp with the arch of the drion	10-14
Aham percent	2
Welding felt bulb	3 or 4

Cut up to 25 mm	3 or 4
Medium cut 25 to 150 salt	4 or 5
Heavy cut 150 mm	5 or 6
Gas welding (Khafeef) up to 3.2	4 or 5
Adult populations (average) 3.2 to 12.7	5 or 6
Laurel ahad (Taqil) is more harmful than 12.7	6 or 8

7.3.3 Visors for helmets

SN	Attribute	Values
1	Standard	ANSI/ISEA Z87.1-2010; EN 166 (2C-2.5 MSA 1BT3R [clear] and 2-4 MSA 1BT3R [green tint]); CSA Z94.3 and AS/NZS 1337
2	Classification	Radiant heat/elevated temperature
3	Material	Polycarbonate
4	Color(s)	Clear, reflective-coated, Green tint, reflective-coated
5	Available Styles	Molded
6	Size	9.5" (24.1 cm) x 17.75" (45.09 cm) x .07" (1.8 mm)
7	Features	Reflects >60% Infrared (IR) radiation (EN166 "R" mark) in the 780nm to 2000nm wavelengths Impact-rated (Z87+)
8	Certification	Third-party by Intertek, INSPEC International Ltd., CSA International and SAI Global Ltd
9	lenses	Clear/dark
10	Lenses coating	Reflective coating reflects IR and helps dissipate heat

- Thick visor helps prevent warping, cracking or crazing under tough conditions
- Extended length for greater coverage of face and neck; DO NOT use for welding

7.3.4 Metal Frames for Helmet

SN	Attribute	Values
1	Standards	ANSI/ISEA Z87.1-2021
2	frame	Heavy duty anodized aluminum frame for tough work environments ANSI/ISEA Z87.1-2010 Third-party by Intertek
3	Classification	General purpose
4	Color(s)	Silver
5	Available Styles	Universal (spring coil)
6	Material	Anodized aluminum
7	Applications	Machine operation, maintenance, millwright, extrusion, drilling, blasting, casting/conveying
8	Markets	Manufacturing; construction; steel/smelting operations
9	Features	<ul style="list-style-type: none"> • Works with V-Gard Visors • Spring coil for fast loading of frame to helmet • Three visor resting positions Locking device holds visor securely in the down position
10	Certification	third party by Intertek

7.3.5 Eye wash should comply with ANSI Z358.12014

SN	Attribute	Values
1	Capacity	60liter (16 US gallons)
2	mounted	60liter wall-mounted or table top portable emergency eye/face wash station. Provided with bottle of water preservative (Bacteriostatic Additive)
3	Flow rate	3liter /minute (0.8gpm)
4	features	Enables quick inspection, cleaning and filling
5	Material	High Density Polyethylene
6	Spray Heads Material	Engineering Grade Thermoplastic

Other Standards relevant to eye protectors

Occupational equipment is unlikely to be marked with these Standard numbers, but they may contain useful information on equipment performance or test methods.

EN 165:1996	Eye protection - vocabulary
EN 167:2002	Personal eye protection - optical test methods
EN 168:2002	Personal eye protection - non-optical test methods
EN 170:2002	Specification for UV filters
EN 171:2002	Specification for IR filters
EN 172:1995	Specification for sun glare filters for industrial use (amended 2002)
EN 1836:1997	Sunglasses and sun glare filters for general use
EN 1938:1999	Goggles for motorcycle and moped riders
EN 13178:2000	Eye protective equipment - Eye protectors for snowmobile drivers
BS 4110:1999	Specification for visors for vehicle users
BS 7028:1999	Eye protection for industrial and other uses. Guidance on selection, use and maintenance
EN 12254:1999	Screens for laser working places - Safety requirements and testing

7.4 Hearing protection:

1- Hearing protective devices shall conform to BS EN 352 or ANSI S3.14 standards (BS EN 352- 1 for ear muffs and BS EN 352-2 for ear plugs) or equivalent.

2- Personnel required to work in these areas shall wear hearing protection. Any area where two individuals standing 2-3 feet apart must raise their voice above normal level should be considered high noise unless measured to be less than 85 dB(A).

3- Working in an area of high noise levels can cause both temporary and permanent hearing loss.

4- Signs shall be posted at entrances to areas where continuous noise levels reach 85 dB(A) or higher.

5- Hearing loss can occur with no physical pain or other obvious warning.

6- Unusual operating conditions, such as gas plant blow down or use of air guns can sometimes cause high noise levels.

7- For exposure over a full working day (8 hours), the daily personal noise exposure has one action level as of 85 dB(A) is the defined action level that requires hearing protection; and the area designated as a Hearing Protection Required Zone with appropriate signs.

8- Consideration should be given to double hearing protection (earmuffs and plugs) for noise levels above 100 dB(A).

9- Ear plugs or muffs must be capable of reducing noise levels to below the second action level as designated on the current operational site, i.e. 100 dB(A) and preferably to the first action level of 85 dB(A).

- Determining the need to provide hearing protection for employees can be challenging. Employee exposure to excessive noise depends upon a number of factors, including:

- The loudness of the noise as measured in decibels (dB).
- The duration of each employee's exposure to the noise.
- Whether employees move between work areas with different noise levels.
- Whether noise is generated from one or multiple sources.
- Generally, the louder the noise, the shorter the exposure time before hearing protection is required. For instance, employees may be exposed to a noise level of 90 dB for 8 hours per day (unless they experience a Standard Threshold Shift) before hearing protection is required. On the other hand, if the noise level reaches 115 dB hearing protection is required if the anticipated exposure exceeds 15 minutes.
- Table, below, shows the permissible noise exposures that require hearing protection for employees exposed to occupational noise at specific decibel levels for specific time periods. Noises are considered continuous if the interval between occurrences of the maximum noise level is one second or less. Noises not meeting this definition are considered impact or impulse noises (loud momentary explosions of sound) and exposures to this type of noise must not



exceed 140 db. Examples of situations or tools that may result in impact or impulse noises are powder-actuated nail guns, a punch press or drop hammers.

Table Permissible Noise Exposures Duration per day,

Duration per day, in hours	Sound level in dB*
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25	115

When measured on the A scale of a standard sound level meter at slow response.

Source: 29 CFR 1910.95, Table G-16.

If engineering and work practice controls do not lower employee exposure to workplace noise to acceptable levels, employees must wear appropriate hearing protection. It is important to understand that hearing protectors reduce only the amount of noise that gets through to the ears. The amount of this reduction is referred to as attenuation, which differs according to the type of hearing protection used and how well it fits. Hearing protectors worn by employees must reduce an employee's noise exposure to within the acceptable limits noted in Table 5. Refer to Appendix B of 29 CFR 1910.95, Occupational Noise Exposure, for

detailed information on methods to estimate the attenuation effectiveness of hearing protectors based on the device's noise reduction rating (NRR). Manufacturers of hearing protection devices must display the device's NRR on the product packaging. If employees are exposed to occupational noise at or above 85 dB averaged over an eight-hour period, the employer is required to institute a hearing conservation program that includes regular testing of employees' hearing by qualified professionals. Refer to 29 CFR 1910.95(c) for a description of the requirements for a hearing conservation program.

Types of Hearing Protection:

- a)** Earplugs which fit into the ear canal (Roll into small cylinder, then insert in the ear canal (follow manufacturer instructions for lifetime)). An ear-plug is a device that is inserted into an individual's ear canal to protect them from exposure to loud noises. Ear-plugs come in wide variety of forms, mostly manufactured from soft plastic, PVC, silicone and Polyurethane. They provide good sound attenuation when fitted correctly. The type of ear-plug chosen will depend on each individual's needs and personal preference. The most effective type of ear plugs is Round Disposable Foam Ear Plugs (round, non-corded or round, corded).

- b)** Semi-inserts or canal caps which cover over the entrance to the ear canal.

Canal caps have rounded heads that cover the entrance to the ear canal, while semi-insert plugs generally have conical tips that are pushed into the ear canal. Both types are convenient for situations where the hearing protection has to be taken on and off frequently. Firm pressure from the head band is required to maintain an effective seal, which can be uncomfortable over longer use. These are normally recommended for use in areas of intermittent noise.

- c)** Earmuffs which completely cover the ear.

Ear-muffs, also known as ear defenders, are hard plastic cups that fit over and surround the individual's ears and are sealed to the head by cushion seals. These are usually manufactured from plastic materials with a metal or plastic head band and foam or liquid ear cushion. Depending on the material used, the ear-muffs can irritate skin around the ears, particularly in warm weather.



Various types of hearing protection

SPECIFICATIONS OF HEARING PROTECTION:

7.4.1 Round Disposable Foam Ear Plugs (NRR 31) round,

SN	Attribute	Values
1	Design Standard/Spec	ANSI S3.19-1974 and CSA
2	Style/Type	Single Use (Disposable) Uncorded
3	Gender	Unisex (Male & Female)
4	Application/Protection Type	<ul style="list-style-type: none"> ▪ Plant Patrolling ▪ Construction Work ▪ Drilling/Grinding/Blasting/ ▪ Maintenance Activities ▪ Carpentry Work
5	Safety Rating - NRR/SNR	31 NRR
6	Material	Polyurethane Foam
7	Color	Orange
8	Size	One Size Fits All
9	Shape	12 mm at base, 27 mm long. Tapered shape (bell type)
10	Testing Requirements	Complying to EN Testing & Standard
11	Certification Requirement	ANSI S3.19-1974 and CSA
12	Marking Requirement	Not applicable on the earplug itself Marking, Standard & Instruction only on the box packing
13	class	Class A
14	Additional Requirements	Packaging: 200 Pairs Per Dispenser Box, 10 Boxes/Carton

7.4.2 Round Disposable Foam Ear Plugs (NRR 31) round,

SN	Attribute	Values
1	Design Standard/Spec	ANSI S3.19-1974 and CSA
2	Style/Type	Single Use (Disposable) corded
3	Gender	Unisex (Male & Female)
4	Application/Protection Type	<ul style="list-style-type: none"> ▪ Plant Patrolling ▪ Construction Work ▪ Drilling/Grinding/Blasting/ ▪ Maintenance Activities ▪ Carpentry Work
5	Safety Rating - NRR/SNR	31 NRR
6	Material	Polyurethane Foam
7	Color	Orange
8	Size	One Size Fits All
9	Shape	12 mm at base, 27 mm long. Tapered shape (bell type)
10	Testing Requirements	Complying to EN Testing & Standard
11	Certification Requirement	ANSI S3.19-1974 and CSA
12	Marking Requirement	Not applicable on the earplug itself Marking, Standard & Instruction only on the box packing
13	class	Class A
14	Additional Requirements	Packaging: 200 Pairs Per Dispenser Box, 10 Boxes/Carton

7.4.3 Reusable Silicone Ear Plugs

SN	Attribute	Values
1	Design Standard/Spec	ANSI S3.19-1974.
2	Style/Type	Bullet type ear plug made of soft polyurethane foam multicolored. Disposable with Cord
3	Gender	Unisex
4	Application/ Protection Type	SNR 33 Any other noise generating activities above 85 decibels
5	Safety Rating - NRR/SNR	33 SNR
6	Material	made of soft, comfortable silicone
7	Color	Yellow & White
8	Size	Regular (one size fits all)
9	Shape	Bullet type
10	Testing Requirements	In accordance with EC directive 89/686/EEC
11	Certification Requirement	Conforms to EN 352-2/EN 13819-1 EC examination certificate no 941057
12	Marking Requirement	EN 352-2:2002/EN 13819-1
14	Additional Requirements	<ul style="list-style-type: none"> • Packaging: 100 Pairs Per Dispenser Box • Tri-Seal plugs are available in corded and uncorded • 25dB Ruggedly designed versions

7.4.4 Helmet Mounted Hearing Protection, Medium,

SN	Attribute	Values
1	Design Standard/Spec	EN 352-3 - Hearing Protectors - Ear Muffs attached to a Safety Helmet
2	Style/Type	Helmet Mounted
3	Gender	Unisex
4	Application/Protection Type	Plant patrolling, construction work, drilling/grinding/blasting/ maintenance activities, carpentry work, any other noise generating activities above 85 decibels
5	Safety Rating	SNR 32 dB, NRR 27
6	Material	Thermoplastic
7	Color	Black
8	Weight	Less than 250 GRAMS



9	Size	One Size
10	Testing Requirements	NA
10	Certification Requirement	Comply with : <ul style="list-style-type: none"> ■ ANSI/ASA S12.6-2016 : methods for measuring the real-ear attenuation of hearing protectors ■ ANSI S3.19-1974 hearing protectors and physical attenuation of earmuffs ■ EN ISO 4869 :1995, Acoustics - Hearing Protectors
11	Marking Requirement	CE

7.4.5 Helmet Mounted Hearing Protection, High

SN	Attribute	Values
1	Design Standard/Spec	EN 352-3 - Hearing Protectors - Ear Muffs attached to a Safety Helmet
2	Style/Type	Helmet Mounted
3	Gender	Unisex
4	Application/Protection Type	Plant patrolling, construction work, drilling/grinding/blasting/maintenance activities, carpentry work, any other noise generating activities above 85 decibels
5	Safety Rating	SNR 36 dB, NRR 31
6	Material	Thermoplastic
7	Color	Black
8	Weight	Less than 250 GRAMS
9	Size	One Size
10	Testing Requirements	NA
10	Certification Requirement	Comply with : <ul style="list-style-type: none"> ■ ANSI/ASA S12.6-2016 : methods for measuring the real-ear attenuation of hearing protectors ■ ANSI S3.19-1974 hearing protectors and physical attenuation of earmuffs ■ EN ISO 4869 :1995, Acoustics - Hearing Protectors
11	Marking Requirement	CE

7.4.6 Earmuffs Headband Model, NRR 21 dB,

SN	Attribute	Values
1	Design Standard/Spec	Conforms to EN352-3
2	Style/Type	Headband
3	Gender	Unisex
4	Application/Protection Type	Plant patrolling, construction work, drilling/grinding/blasting/ maintenance activities, carpentry work, any other noise generating activities above 85 decibels
5	Safety Rating	NRR 21 dB: Standard noise reduction
6	Material	Thermoplastic
7	Color	White
8	Weight	Less than 250 grams
9	Size	computer designed to fit each ear
10	Testing Requirements	Third Part Tested to ANSI S3.19-1974 CSA Class A and EN352-3
10	Certification Requirement	Comply with : <ul style="list-style-type: none"> ■ ANSI/ASA S12.6-2016 : Methods For measuring The Real-Ear Attenuation of Hearing Protectors, ■ ANSI S3.19-1974 Hearing Protectors and Physical Attenuation of Earmuffs ■ EN ISO 4869 :1995, Acoustics - Hearing Protectors
11	Marking Requirement	CE
12	Additional Requirements	Comply: Soft Ear Cup material, replaceable ear cushions and foam liners designed to avoid echo noise problems in resting position <ul style="list-style-type: none"> • individually adjusted to angle of ear for long comfort wearing and independently raise and lower muffs

7.4.7 Earmuffs Headband Model, NRR 25 dB,

SN	Attribute	Values
1	Design Standard/Spec	Conforms to EN352-3
2	Style/Type	Headband
3	Gender	Unisex
4	Application/Protection Type	Plant patrolling, construction work, drilling/grinding/blasting/ maintenance activities, carpentry work, any other noise generating activities above 85 decibels
5	Safety Rating	NRR 25 dB: Standard noise reduction
6	Material	Thermoplastic



7	Color	Blue
8	Weight	Less than 250 grams
9	Size	computer designed to fit each ear
10	Testing Requirements	Third Part Tested to ANSI S3.19-1974 CSA Class A and EN352-3
10	Certification Requirement	Comply with : <ul style="list-style-type: none"> ■ ANSI/ASA S12.6-2016 : Methods For measuring The Real-Ear Attenuation of Hearing Protectors, ■ ANSI S3.19-1974 Hearing Protectors and Physical Attenuation of Earmuffs ■ EN ISO 4869 :1995, Acoustics - Hearing Protectors
11	Marking Requirement	CE
12	Additional Requirements	Comply: Soft Ear Cup material, replaceable ear cushions and foam liners designed to avoid echo noise problems in resting position <ul style="list-style-type: none"> • individually adjusted to angle of ear for long comfort wearing and independently raise and lower muffs

7.4.8 Earmuffs Headband Model, NRR 28 dB, Hi-Viz

SN	Attribute	Values
1	Design Standard/Spec	Conforms to EN352-3
2	Style/Type	Headband
3	Gender	Unisex
4	Application/Protection Type	Plant patrolling, construction work, drilling/grinding/blasting/ maintenance activities, carpentry work, any other noise generating activities above 85 decibels
5	Safety Rating	NRR 28 dB: Standard noise reduction
6	Material	Thermoplastic
7	Color	Yellow
8	Weight	Less than 250 grams
9	Size	computer designed to fit each ear
10	Testing Requirements	Third Part Tested to ANSI S3.19-1974 CSA Class A and EN352-3
10	Certification Requirement	Comply with : <ul style="list-style-type: none"> ■ ANSI/ASA S12.6-2016 : Methods For measuring The Real-Ear Attenuation of Hearing Protectors, ■ ANSI S3.19-1974 Hearing Protectors and Physical Attenuation of Earmuffs ■ EN ISO 4869 :1995, Acoustics - Hearing Protectors
11	Marking Requirement	CE



12	Additional Requirements	Comply: Soft Ear Cup material, replaceable ear cushions and foam liners designed to avoid echo noise problems in resting position <ul style="list-style-type: none"> individually adjusted to angle of ear for long comfort wearing and independently raise and lower muffs
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7.4.9 Multi-Position Earmuff, Headband Model, NRR 24 dB over the head,

SN	Attribute	Values
1	Design Standard/Spec	Conforms to EN352-3
2	Style/Type	Headband
3	Gender	Unisex
4	Application/Protection Type	Plant patrolling, construction work, drilling/grinding/blasting/ maintenance activities, carpentry work, any other noise generating activities above 85 decibels
5	Safety Rating	NRR 24 dB, behind the head and under the chin
6	Material	Thermoplastic
7	Color	Yellow
8	Weight	Less than 250 grams
9	Size	computer designed to fit each ear
10	Testing Requirements	Third Part Tested to ANSI S3.19-1974 CSA Class A and EN352-3
10	Certification Requirement	Comply with : <ul style="list-style-type: none"> ANSI/ASA S12.6-2016 : Methods For measuring The Real-Ear Attenuation of Hearing Protectors, ANSI S3.19-1974 Hearing Protectors and Physical Attenuation of Earmuffs EN ISO 4869 :1995, Acoustics - Hearing Protectors
11	Marking Requirement	CE
12	Additional Requirements	Comply: Soft Ear Cup material, replaceable ear cushions and foam liners designed to avoid echo noise problems in resting position <ul style="list-style-type: none"> individually adjusted to angle of ear for long comfort wearing and independently raise and lower muffs

7.5 Hand protection:

If a workplace hazard assessment reveals that employees face potential injury to hands and arms that cannot be eliminated through engineering and work practice controls, employers must ensure that employees wear appropriate protection. Potential hazards include skin absorption of harmful substances, chemical or thermal burns, electrical dangers, bruises, abrasions, cuts, punctures, fractures and amputations. Protective equipment includes gloves, finger guards and arm coverings or elbow-length gloves. Employers should explore all possible engineering and work practice controls to eliminate hazards and use PPE to provide additional protection against hazards that cannot be completely eliminated through other means. For example, machine guards may eliminate a hazard. Installing a barrier to prevent workers from placing their hands at the point of contact between a table saw blade and the item being cut is another method.

- a) Hands are at risk of injury in many of the activities carried out in the industrial oil and gas sector. Cuts, abrasions or even amputations can occur in manual handling and construction work, while hands and skin are at risk of burns or skin disease where chemicals are handled.
- b) Where hand protection is required, personnel shall be provided with an appropriate type of safety glove, and given instruction on the selection, use and maintenance of the gloves. They shall also be trained to always wash hands after work. In addition, barrier creams may be used. These should be

applied after washing the hands and prior to work. However, the creams are not a substitute for carefully selected gloves.

- c) Gloves provide protection against general workplace hazards , and should be worn whenever possible whilst personnel are in PPE designated areas, e.g. outside of accommodation on offshore installations or out on plant on onshore sites.
- d) Gloves or other hand protection shall be capable of giving protection from hazards, be comfortable and fit the wearer well.
- e) The choice shall be made on the basis of compatibility with the work, suitability for protection and the requirements of the user.
- f) The manufacturer's instructions and markings for appropriate use and level of protection shall always be followed.
- g) Wearing of gloves during the operation of rotating machinery is strictly prohibited. There is a potential danger to the operator from the possibility of a glove becoming entangled with the machinery, than the degree of protection offered by gloves being used in such service.

There are four types of hand and arm protection:

- (a) Gloves – hand only.
- (b) Gloves with a cuff – hand and wrist.
- (c) Gauntlets/sleeves/long gloves – hand, wrist and part of forearm.
- (d) Sleeving /arm protection – part or whole of forearm and/or upper arm

Examples of hazards which may require hand/arm protection

Some examples where hand and arm protection may be required are:

- (a) Protection from cuts and abrasions, for example when handling sharp or pointed objects.
- (b) To keep hands warm and supple in cold weather, for example when working on a building site, as manual dexterity is lost when the hands are cold.
- (c) To keep hands warm in cold weather when operating machines that cause vibration, such as pneumatic drills and chainsaws. Vibration white finger occurs more often and more severely when the hands and fingers are cold as the blood supply to the fingers is reduced by the body in an attempt to conserve heat.
- (d) Danger from electrical hazards – see paragraph 85(c) for further information.
- (e) Handling or coming into contact with chemicals, for example maintenance of machinery, cleaning up chemical spillages and mixing and dispensing pesticide formulations.
- (f) Handling radioactive materials.
- (g) Handling hot or cold materials and work involving accidental contact with naked flames such as welding, ovens etc.

Key points

The key points to note for hand and arm protection are:

(a) Make sure that users are not allergic to or sensitized by the material, for example latex gloves are made of rubber and the proteins present in the rubber are skin and respiratory sensitizers. If you have to use latex gloves, use a powder free type containing a minimum amount of free proteins. It may be better to select an alternative material, if practicable.

(b) Ensure they fit the wearer properly and are worn correctly for the job being done. For example, there should be no gap between the glove and the wearer's sleeve when handling dangerous chemicals.

(c) Ensure users can handle and remove the gloves carefully to avoid contamination of the hands and the inside of the glove. Contaminants that get inside the glove and sit permanently against the skin may cause greater exposure than if a glove had not been worn at all. Many wearers are not instructed on how to correctly put on and take off gloves, which means that the insides of the gloves become contaminated when worn for the second time or more. This contamination can cause damage to the skin.

(d) Ensure users clean their hands thoroughly when they change gloves and moisturize their hands at least once a day.

(e) Check gloves regularly and throw them away if they are worn or have deteriorated. They should be free of holes or cuts and debris and their shape should not be distorted.

(f) **Do not** wear a glove for extended periods as this can lead to the development of excessive moisture (sweat) on the skin which in itself will act as an irritant.

(g) **Do not** use pre-work creams, sometimes sold as barrier creams, as a replacement for carefully selected gloves.

They are not PPE because:

- (i) they do not provide protection against hazards;
- (ii) workers may not apply them properly, leaving part of their skin uncovered
- (iii) there is no information available on the rate of penetration of substances through prework creams
- (iv) protection may be removed while working without workers noticing.

(h) Select carefully for chemical resistance and protection, especially against mixtures, and do not use for longer than the recommended breakthrough times.

Manufacturers will advise on breakthrough times for their products

The following are examples of some factors that may influence the selection of protective gloves for a workplace.

- Type of chemicals handled.
- Nature of contact (total immersion, splash, etc.).
- Duration of contact.
- Area requiring protection (hand only, forearm, arm).
- Grip requirements (dry, wet, oily).
- Thermal protection.
- Size and comfort.

- Abrasion/resistance requirements. Gloves made from a wide variety of materials are designed for many types of workplace hazards. In general, gloves fall into four groups:
- Gloves made of leather, canvas or metal mesh;
- Fabric and coated fabric gloves;
- Chemical- and liquid-resistant gloves;
- Insulating rubber gloves (29 CFR 1910.137 and the following section on electrical protective equipment for detailed requirements on the selection, use and care of insulating rubber gloves).

Types of gloves:

- (i) Chemical gloves
- (ii) Impact and compression
- (iii) Vibration
- (iv) Cuts and abrasions.
- (v) Extremes of temperature.
- (vi) Skin irritation and dermatitis.
- (vii) Contact with corrosive or toxic liquids.
- (viii) Electrical hazards.



Impact gloves



Electrical gloves



Chemical-resistant
gloves



Radiation-resistant
gloves

various types of gloves

1. Chemical- and Liquid-Resistant Gloves

Chemical-resistant gloves are made with different kinds of rubber: natural, butyl, neoprene, nitrile and fluorocarbon (viton); or various kinds of plastic: polyvinyl chloride (PVC), polyvinyl alcohol and polyethylene. These materials can be blended or laminated for better performance. As a general rule, the thicker the glove material, the greater the chemical resistance but thick gloves may impair grip and dexterity, having a negative impact on safety.

Some examples of chemical-resistant gloves include:

- **Butyl gloves** are made of a synthetic rubber and protect against a wide variety of chemicals, such as peroxide, rocket fuels, highly corrosive acids (nitric acid, sulfuric acid, hydrofluoric acid and red-fuming nitric acid), strong bases, alcohols, aldehydes, ketones, esters and nitro compounds. Butyl gloves also resist oxidation, ozone corrosion and abrasion, and remain flexible at low temperatures. Butyl rubber does not perform well with aliphatic and aromatic hydrocarbons and halogenated solvents.
- **Natural (latex) rubber gloves** are comfortable to wear, which makes them a popular general-purpose glove. They feature outstanding tensile strength, elasticity and temperature resistance. In addition to resisting abrasions caused by grinding and polishing, these gloves protect workers' hands from most water solutions of acids, alkalis, salts and ketones. Latex gloves have caused allergic reactions in some individuals and may not

be appropriate for all employees. Hypoallergenic gloves, glove liners and powderless gloves are possible alternatives for workers who are allergic to latex gloves.

- **Neoprene gloves** are made of synthetic rubber and offer good pliability, finger dexterity, high density and tear resistance. They protect against hydraulic fluids, gasoline, alcohols, organic acids and alkalis. They generally have chemical and wear resistance properties superior to those made of natural rubber.
- **Nitrile gloves** are made of a copolymer and provide protection from chlorinated solvents such as trichloroethylene and perchloroethylene. Although intended for jobs requiring dexterity and sensitivity, nitrile gloves stand up to heavy use even after prolonged exposure to substances that cause other gloves to deteriorate. They offer protection when working with oils, greases, acids, caustics and alcohols but are generally not recommended for use with strong oxidizing agents, aromatic solvents, ketones and acetates.
- **The below Table summarizes the types of protective gloves and their corresponding usage.**

Glove Type	Purpose	Uses
Cotton or Canvas	Protects from abrasion. Provides warmth and cleanliness	Light work such as handling small loads with fiber/cotton ropes, small hand tools, and materials with abrasive surfaces



Leather or Leather reinforced	Protects from abrasion, lacerations, puncture and blasting	Handling of rough, rigid or abrasive materials during activities such as wire rope handling, grinding and abrasion equipment.
Leather insulated Heat or Cold resistant	Protects from thermal (cold or hot) burns	Welding, Operating or maintaining cryogenic equipment around engines, boilers and steam lines
Electrical Insulated	Protects from electrical burns and electrical shock	Work on live electrical equipment, and it must be rated for the live electrical equipment Voltage.
Chemical Resistant	Protects from chemical burns, chemical contact and skin absorption and/or irritation	Handling chemicals such as acids, caustics, soda ash and most hydrocarbons.
Latex	Protects from blood borne pathogens and mild detergents	First aid, emergency response, cleaning and glove lining.

The following table from the U.S. Department of Energy (Occupational Safety and Health Technical Reference Manual) rates various gloves as being protective against specific chemicals and will help you select the most appropriate gloves to protect your employees. The ratings are abbreviated as follows: VG: Very Good; G: Good; F: Fair; P: Poor (not recommended). Chemicals marked with an asterisk (*) are for limited service.



Table 4 : Chemical Resistance Selection Chart for Protective Gloves

Chemical	Neoprene	Latex/Rubber	Butyl	Nitrile
Acetaldehyde*	VG	G	VG	G
Acetic acid	VG	VG	VG	VG
Acetone*	G	VG	VG	P
Ammonium hydroxide	VG	VG	VG	VG
Amy acetate*	F	P	F	P
Aniline	G	F	F	P
Benzaldehyde*	F	F	G	G
Benzene*	P	P	P	F
Butyl acetate	G	F	F	P
Butyl alcohol	VG	VG	VG	VG
Carbon disulfide	F	F	F	F
Carbon tetrachloride*	F	P	P	G
Castor oil	F	P	F	VG
Chlorobenzene*	F	P	F	P
Chloroform*	G	P	P	F
Chloronaphthalene	F	P	F	F
Chromic acid (50%)	F	P	F	F
Citric acid (10%)	VG	VG	VG	VG
Cyclohexanol	G	F	G	VG
Dibutyl phthalate*	G	P	G	G
Diesel fuel	G	P	P	VG
Diisobutyl ketone	P	F	G	P
Dimethylformamide	F	F	G	G
Diocetyl phthalate	G	P	F	VG
Dioxane	VG	G	G	G
Epoxy resins, dry	VG	VG	VG	VG
Ethyl acetate*	G	F	G	F
Ethyl alcohol	VG	VG	VG	VG
Ethyl ether*	VG	G	VG	G
Ethylene dichloride*	F	P	F	P
Ethylene glycol	VG	VG	VG	VG



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Formaldehyde	VG	VG	VG	VG
Formic acid	VG	VG	VG	VG
Freon 11	G	P	F	G
Freon 12	G	P	F	G
Freon 21	G	P	F	G
Freon 22	G	P	F	G
Furfural*	G	G	G	G
Gasoline, leaded	G	P	F	VG
Gasoline, unleaded	G	P	F	VG
Glycerin	VG	VG	VG	VG
Hexane	F	P	P	G
Hydrazine (65%)	F	G	G	G
Hydrochloric acid	VG	G	G	G
Hydrofluoric acid (48%)	VG	G	G	G
Hydrogen peroxide (30%)	G	G	G	G
Hydroquinone	G	G	G	F
Isooctane	F	P	P	VG
Kerosene	VG	F	F	VG
Ketones	G	VG	VG	P
Lacquer thinners	G	F	F	P
Lactic acid (85%)	VG	VG	VG	VG
Lauric acid (36%)	VG	F	VG	VG
Lineolic acid	VG	P	F	G
Linseed oil	VG	P	F	VG
Maleic acid	VG	VG	VG	VG
Methyl alcohol	VG	VG	VG	VG
Methylamine	F	F	G	G
Methyl bromide	G	F	G	F
Methyl chloride*	P	P	P	P
Methyl ethyl ketone*	G	G	VG	P
Methyl isobutyl ketone*	F	F	VG	P
Methyl methacrylate	G	G	VG	F
Monoethanolamine	VG	G	VG	VG
Morpholine	VG	VG	VG	G
Naphthalene	G	F	F	G
Napthas, aliphatic	VG	F	F	VG



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Napthas, aromatic	G	P	P	G
Nitric acid*	G	F	F	F
Nitric acid, red and white Fuming	P	P	P	P
Nitromethane (95.5%)*	F	P	F	F
Nitropropane (95.5%)	F	P	F	F
Octyl alcohol	VG	VG	VG	VG
Oleic acid	VG	F	G	VG
Oxalic acid	VG	VG	VG	VG
Palmitic acid	VG	VG	VG	VG
Perchloric acid (60%)	VG	F	G	G
Perchloroethylene	F	P	P	G
Petroleum distillates (naphtha)	G	P	P	VG
Phenol	VG	F	G	F
Phosphoric acid	VG	G	VG	VG
Potassium hydroxide	VG	VG	VG	VG
Propyl acetate	G	F	G	F
Propyl alcohol	VG	VG	VG	VG
Propyl alcohol (iso)	VG	VG	VG	VG
Sodium hydroxide	VG	VG	VG	VG
Styrene	P	P	P	F
Styrene (100%)	P	P	P	F
Sulfuric acid	G	G	G	G
Tannic acid (65)	VG	VG	VG	VG
Tetrahydrofuran	P	F	F	F
Toluene*	F	P	P	F
Toluene diisocyanate (TDI)	F	G	G	F
Trichloroethylene*	F	F	P	G
Triethanolamine (85%)	VG	G	G	VG
Tung oil	VG	P	F	VG
Turpentine	G	F	F	VG
Xylene*	P	P	P	F

Note: When selecting chemical-resistant gloves be sure to consult the manufacturer's recommendations, especially if the gloved hand(s) will be immersed in the chemical.

Care of Protective Gloves

Protective gloves should be inspected before each use to ensure that they are not torn, punctured or made ineffective in any way. A visual inspection will help detect cuts or tears but a more thorough inspection by filling the gloves with water and tightly rolling the cuff towards the fingers will help reveal any pinhole leaks. Gloves that are discolored or stiff may also indicate deficiencies caused by excessive use or degradation from chemical exposure.

Any gloves with impaired protective ability should be discarded and replaced. Reuse of chemical-resistant gloves should be evaluated carefully, taking into consideration the absorptive qualities of the gloves. A decision to reuse chemically-exposed gloves should take into consideration the toxicity of the chemicals involved and factors such as duration of exposure, storage and temperature.

SPECIFICATIONS FOR GLOVES:
7.5.1 (Oil/Diesel/Chemical)Gloves:

SN	Attribute	Values
1	Design Standard/Spec	EN420:2003+A1:2009 General requirements
2	Application/Protection Type	<ul style="list-style-type: none"> ■ Chemicals Resistant ■ Puncture And Abrasion Resistant ■ tear Resistance
3	Style	Exceptionally flexible, easy to manipulate and extremely comfortable that increases productivity for the user
4	Leak Penetration Rating	Passed The Air & Water Leak Penetration Test
5	Chemical Permeation Resistance	Excellent Permeation Rate
6	Material	NITRILE
7	Material, Inner Lining	Double nitrile coating on polyamide lining. Third rough foam nitrile coating on palm and fingertips
8	Finish/Grip	Diamond Palm Texture
9	Cuff Details	Gauntlet With Foldable Cuff Gutter To Prevent Dripping On Arm
10	Color	Blue, Yellow
11	Size	08, 09, 10, 11
12	Length	Length: 35 cm. Thickness: 1.15 mm on cuff - 1.30 mm on palm.
13	Logo Requirement	Not Applicable
14	Testing Requirements	Complying To EN Testing
15	Certification Requirement	As per CE European Directives & Standard
16	Marking Requirement	Complies with EN 420 - CE Marking, STD Number and Performance Level Pictogram are stamped on top of the gloves and polybag.
17	Additional Requirements	Powder-free

- Dexterity (from 1 to 5) : 5
- Resistance to abrasion (from 1 to 4): 4
- Resistance to cutting (from 1 to 5) :1
- Resistance to tear (from 1 to 4) : 2

- Resistance to puncture (1 to 4) : 1
- Resistance to cutting by sharp objects (TDM EN ISO 13997) (from A to F) : X

7.5.2 Electrical Gloves

7.5.2.1 ELECTRICAL INSULATING GLOVES CLASS 0 ,AC

SN	Attribute	Values
1	Design Standard/Spec	Arc flash certified as per IEC 614821-2:2014 and ATSM F2675:2021 standards. Class 0
2	Application/Protection Type	Electrical Protection. For electrical work with a maximum voltage of 1000 volts. To be used with leather protectors for mechanical protection
3	Utilization	Oilfield, General Industrial Utility, Workshop
4	Electrical Insulating Class	Class 0 - Maximum Working Voltage 1,000V
5	Style	Reduced hand fatigue, for improved usability, with mechanical protection against cut & abrasion and Puncture according to EN388: 3121A
6	Material	Natural rubber latex formulation: Great flexibility and durability
7	Outer Protector	To be used with leather protectors for mechanical protection (ILP3S or ILP10A).
8	Finish/Grip	Smooth
9	Cuff Details	Cut Edge/Straight
10	Color	As per relevant Standard
11	Weight	Lightweight
12	Size	7 to 11
13	Length	360mm/14inch
14	Logo Requirement	-----
15	Testing Requirements	Tested to the following standards: <ul style="list-style-type: none"> ▪ EN 60903:2003 ▪ Technical reports:



		<ul style="list-style-type: none"> SATRA; SPC0217112/1332/4, SPC0217241 /1333/2, SPC0229884/1446 APA VE: 0620269-R01-Rev1, 0622806R01-Rev1, 0621655-R01-Rev1,
16	Certification Requirement	Certified , EC Certification Number 7005
17	Marking Requirement	Tagging 2091907 XX EN 60903-2003 CEI 903-2002
18	Additional Requirements	Shelf life minimum 12 months from date of delivery

7.5.2.2 ELECTRICAL INSULATING GLOVES CLASS 1, AC

SN	Attribute	Values
1	Design Standard/Spec	Arc flash certified as per IEC 614821-2:2014 and ATSM F2675:2021 standards
2	Application/Protection Type	Electrical Protection. For electrical work with a maximum voltage of 1000 volts. To be used with leather protectors for mechanical protection
3	Utilization	Oilfield, General Industrial Utility, Workshop
4	Electrical Insulating Class	Class 1 - maximum of 7500 V (DC maximum 11250)
5	Style	Reduced hand fatigue, for improved usability with mechanical protection against cut & abrasion and puncture according to EN388: 3122B
6	Material	Natural rubber latex formulation: Great flexibility and durability
7	Outer Protector	To be used with leather protectors for mechanical protection (ILP3S or ILP10A).
8	Finish/Grip	Smooth
9	Cuff Details	Cut Edge/Straight
10	Color	As per relevant Standard
11	Weight	Lightweight
12	Size	7 to 11
13	Length	400mm at least
14	Logo Requirement	-----



15	Testing Requirements	<p>Tested to the following standards:</p> <ul style="list-style-type: none"> ▪ EN 60903:2003 ▪ Technical reports: ▪ SATRA; SPC0217112/1332/4, SPC0217241 /1333/2, SPC0229884/1446 APA VE: 0620269-R01-Rev1, 0622806R01-Rev1, 0621655-R01-Rev1,
16	Certification Requirement	Certified , EC Certification Number 7005
17	Marking Requirement	<p>Tagging</p> <p>2091907 XX</p> <p>EN 60903-2003</p> <p>CEI 903-2002</p>
18	Additional Requirements	Shelf life minimum 12 months from date of delivery

7.5.3 Multi/General purpose Gloves

SN	Attribute Values	
1	Design Standard/Spec	<ul style="list-style-type: none"> ▪ EN ISO 21420:2020 General requirements ▪ EN388:2016+A1:2018 Protective gloves against mechanical Risks
2	Application/ Protection Type	<ul style="list-style-type: none"> ▪ Multitasks, Impact Protection on top of hand and full length of fingers pinch, ▪ Anti-Slip, ▪ Oil Resistant ▪ Oil Base Mud Resistant, ▪ Added abrasion resistance and durability, rough KEVLAR palm TEFLOC grip for maximum grip in oily or wet conditions
3	Utilization	Oilfield, General Industrial Utility, Logistics, Cargo Handling, Rigging
4	Style	<ul style="list-style-type: none"> ▪ High visibility for increased safety ▪ KEVLAR Stitched Palm ▪ TPR Impact Protection on top of hand and full length of fingers ▪ TEFLOC Grip System On Palm Resists Oil And Enhances Grip ▪ Extended Airprene Wrist Closure with TPR PULL TAB ▪ Force Flex Multi-Task Style, ▪ Full Finger Type, Mesh Material. Injection Molded TPR padding covering finger ribs ▪ Cage on back of hand.

		<ul style="list-style-type: none"> ▪ Washable
5	Material	100% polyamide. Full nitrile coating of the hand. Second foam nitrile coating on palm and fingertips
6	Color	HI VIS, Red Palm
7	Weight	Light Weight
8	Size	07, 08, 09, 10
9	Certification Requirement	<ul style="list-style-type: none"> ▪ Certificate of conformance with the following as a minimum specs ▪ EN420 Mechanical Hazards, EN-388 (4232XP) and ▪ ANSI/ISEA 105-2016 Level A2
10	Marking Requirement	<ul style="list-style-type: none"> ▪ CE Marking, STD Number, Performance Level Pictogram

- Resistance to abrasion (from 1 to 4) : 3
- Resistance to cutting (from 1 to 5) : 1
- Resistance to tear (from 1 to 4) : 2
- Resistance to puncture (1 to 4) : 1
- Resistance to cutting by sharp objects (TDM EN ISO 13997) (from A to F): X

7.5.4 Cut resistant gloves

SN	Attribute	Values
1	Design Standard/Spec	<ul style="list-style-type: none"> ■ ANSI-ISEA 105:2016 Hand protection ■ EN ISO 21420:2020 General requirements ■ EN388:2016+A1:2018 Protective gloves against mechanical Risks
2	Application/ Protection Type	<ul style="list-style-type: none"> ■ Flexible reinforcements for better protection against impact and pinching. ■ Double nitrile coating to work in oil environments ■ Protection against impact in metacarpal area. ■ Very good resistance to abrasion and cutting ■ Kevlar® thread for a longer durability of the glove
3	Utilization	<ul style="list-style-type: none"> ■ Heavy Equipment & Vehicle Maintenance/Production Services/Drilling Extraction/Infrastructure/Shop Work & Fixture Set-Up/Transport & Logistics
4	Style	<ul style="list-style-type: none"> ■ Construction: Knitted/Cuff Style: Knitwrist Kevlar® Thread ■ Neoprene reinforcement on back and fingertips. Smooth nitrile coating/foam nitrile on palm and fingertips
5	Material	<p>SOFT nocut high performance fiber.</p> <p>Foam nitrile coating on palm and fingertips. Reinforcement between the thumb and index finger.</p> <p>10 cm cuff. Gauge 15.</p> <p>Support: SOFTnocut high performance fibers. Coating: nitrile foam.</p> <p>Reinforcement: nitrile.</p>
6	Color	Orange
7	Weight	Lightweight
8	Size	07, 08, 09, 10, 11
9	Logo Requirement	No
10	Testing Requirements	EN388:2016- 4 X 4 3 D P
11	Certification Requirement	Certificate of Conformance to EN388:2016- 4 X 4 3 D P
12	Marking Requirement	CE Marking, Std Number, Performance Level Pictogram – Marking available in the label

- Resistance to abrasion (from 1 to 4) : 4
- Resistance to cutting (from 1 to 5) : 1
- Resistance to tear (from 1 to 4) : 4
- Resistance to puncture (1 to 4) : 3
- Resistance to cutting by sharp objects (TDM EN ISO 13997) (from A to F) : C
- Resistance to cutting by sharp objects (from A1 to A9) : A3

7.5.5 Impact resistant

SN	Attribute	Values
1	Design Standard/Spec	<ul style="list-style-type: none"> ▪ EN ISO 21420:2020 General requirements ▪ EN388:2016+A1:2018 Protective gloves against mechanical Risks ▪ EN13594:2002 4.1.3/6.8.2. Impact energy attenuation ▪ ANSI-ISEA 138:2019 Performance and Classification for Impact-Resistant Gloves
2	Application/ Protection Type	<ul style="list-style-type: none"> ▪ Multitasks, Impact Protection on top of hand and full length of fingers pinch, ▪ Anti-Slip, ▪ Oil Resistant ▪ Oil Base Mud Resistant, ▪ Added abrasion resistance and durability, rough KEVLAR palm TEFLOC grip for maximum grip in oily or wet conditions
3	Utilization	Oilfield, General Industrial Utility, Logistics, Cargo Handling, Rigging
4	Style	<ul style="list-style-type: none"> ▪ Flexible reinforcements ▪ Reinforcement between the thumb and index finger and on the palm ▪ Protection against impact in the metacarpal area. After an energy impact of 5J, the force transmitted to the back of the hand cannot exceed 4 kN ▪ Very good abrasion and cut resistance ▪ Kevlar® thread stitching ▪ 8 cm cuff with Velcro closure ▪ Double nitrile coating for oily work

5	Material	<ul style="list-style-type: none"> ▪ High performance polyethylene support. ▪ Thermoplastic (TPR) reinforcement on back and fingertips. ▪ Smooth nitrile coating/foam nitrile on palm and fingertips. ▪ Embossed inside reinforcement on palm. ▪ Kevlar® thread on all the seams. ▪ Support: High performance polyethylene fibers. ▪ Coating: nitrile. ▪ Back reinforcement: TPR. ▪ Reinforcement on thumb/forefinger: PVC.
6	Color	HI VIS, Red Palm
7	Weight	Light Weight
8	Size	08, 09, 10, 11
9	Certification Requirement	<ul style="list-style-type: none"> ▪ Certificate of conformance with the following as a minimum specs ▪ EN420 Mechanical Hazards, EN-388 (4232XP) and ▪ ANSI/ISEA 105-2016 Level A2
10	Marking Requirement	<ul style="list-style-type: none"> ▪ CE Marking, STD Number, Performance Level Pictogram

- Resistance to abrasion (from 1 to 4) : 4
- Resistance to cutting (from 1 to 5) : 1
- Resistance to tear (from 1 to 4) : 4
- Resistance to puncture (1 to 4) : 2
- Resistance to cutting by sharp objects (TDM EN ISO 13997) (from A to F) : D
- Resistance to cutting by sharp objects (from A1 to A9) : A4
- Impact resistance (from 1 to 3) : 1

7.5.6 Welding gloves

SN	Attribute	Values
1	Design Standard/Spec	Conforms to EN388 (3X4XC) EN407 (X1XXXX)
2	Application/Protection Type	<ul style="list-style-type: none"> ▪ 5 finger glove for a better grip of hot objects as well as dexterity ▪ Handling of Warm/Hot parts and removing mould of warm parts ▪ Mechanical Protection
3	Style	5 finger glove with black liner
4	Mechanical Protection Level Rating	EN388 (3X4XC)
5	Material	<ul style="list-style-type: none"> ● high-quality split cowhide leather and feature welted seams, ● reinforced with Kevlar thread to guard against heat, flames, sparks and punctures ● three-dimensional thumb design that optimizes flexibility, ensuring better overall control
6	Temperature Protection Range	Up to 100°C
7	Material, Lining	cotton
8	Finish/Grip	Three-dimensional thumb design: Enhanced dexterity and control
9	Cuff Details	long-cuff gloves provide EN 12477 Type A protection up to the forearms, making them ideal for stick and MIG welding, as well as torch cutting and grinding
10	Color	Brown Black
11	Weight	900 GSM
12	Size	09, 10, 11
13	Length	300mm (11.8 Inch)
14	Logo Requirement	
15	Testing Requirements	In accordance with EN 388 /EN 407
16	Certification Requirement	Certified. Certificate N 0075/797/162/07/18/1314 Issued by CTC
17	Marking Requirement	EN388, EN407, EN407

7.5.7 LEATHER WELDING HAND SLEEVES

- Cow Split Leather Sleeve.
- Protects from Metals Splashes, Flames and Sparks.
- **Width:** 7" | **Height:** 23"
- **Standards:** EN 388

7.5.8 Leather and textile protective gloves against mechanical risks

- Five-finger palm-type protective glove.
- Made of raw, split cowhide leather on the palm side (except for the part of the cuff that is not covered by the vasco protector), thumb and forefinger on the back and the nail protector on the other fingers. The rest of the back of the hand and the back of the cuff are made of woven textile. The gloves adjusted by an elastic band sewn on the inside of the back of the hand between the cuff and the femur. The palm area and the forefinger are reinforced with an extra layer of leather to provide a protective function The cuff is stiffened (laminated) and hemmed. The palm area and the palm side of the fingers are lined with brushed soft fabric

7.5.9 Trico Dotted Gloves:

- Trico Dotted Gloves
- Granular material polyvinyl chloride
- *Standard: EN388*

7.5.10 Cotton Dotted Gloves:

- Weight: 10 G of pair
- Cotton with PVC dots
- Knitted wrist seals out dirt and debris
- PVC polka dots provides superior grip in dry conditions
- For safe and secure handling comfort

OTHER STANDARDS RELEVANT TO HAND AND ARM PROTECTION

EN374-2:2003	Protective gloves against chemicals and microorganisms: part 2 - Determination of resistance to penetration
EN374-3:2003	Protective gloves against chemicals and microorganisms: Part 3 - Resistance to permeation by chemicals
EN10823:2000	Gloves impact cut test for fabric, leather and other materials
ENISO 10819:1997	Hand-arm vibration: Method for the measurement of the vibrationtransmissibility of gloves at the palm of the hand
BS 6526:1998	Domestic oven gloves - Requirements and test methods

<p>BS 7971</p>	<p>Protective clothing and equipment for use in violent situations and in training. Part 4 – Limb protectors Part 6 - Gloves against mechanical thermal and chemical hazards Part 7 – Slash resistant gloves</p>
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Occupational equipment is unlikely to be marked with these Standard numbers, but they may contain useful information on equipment performance or test methods.

7.6 Falls from a height protection:

Life lines / safety harness (Personal protective equipment for the prevention of falls from a height Low stretch kern-mantel ropes)

Introduction

All work at height shall be assessed. Employees and contractors are required to use fall protection equipment or systems when an assessment of the hazard indicates that a person could fall 1.8 or more meters (6 or more feet). A pre-job risk assessment shall be conducted on site prior to any work at any elevation that could expose a worker to a fall hazard. This analysis shall address specific fall hazards, control measures, open spaces, or hazardous protrusions, which cannot be guarded. Fall into open excavations, trenches, or floor openings at the worksite must also be taken in consideration. Provisions for the rescue of an employee who has fallen and is incapable of self-rescue shall be addressed. Work planning, engineering controls and the

use of primary fall protection such as adequate guardrails and work platforms are the fundamental processes that shall be used when considering fall protection. Personal fall protection equipment should only be considered to prevent or minimize the consequences of a fall when collective preventive measures, e.g. guarding of floor and wall openings, are not practical. Personal fall protection and fall arrest systems are considered secondary protection. The Personal Fall Protection equipment selected to prevent or minimize the consequences of a fall shall meet the standard relevant to its intended use (e.g. BS EN 361 or ANSI) for both full body harness, and shock absorbing lanyard system (a tie off and attachment system capable of safely arresting a fall without injuring the employee). Fall protection must be registered and must be subject to regular inspections in the store area. Ropes for use in rope access, rescue and in speleology are used in similar ways and therefore require the same characteristics. They are used in combination with ascending, descending and safety devices for work positioning in rope access; lowering or raising casualties in rescue; as a means of ascent, descent and horizontal motion in speleology. The characteristics required are low extension during normal working procedure but with the capacity to withstand forces generated by a fall. Some energy absorption of these impact forces is also desirable, the amount usually a compromise with the acceptable extension during normal working practice

Types of systems

Personal fall protection systems comprise an assembly of components for protection against falls from height at work, including at least a body holding device connected to a reliable anchor. Such systems include work restraint systems, work positioning systems, rope access systems, rescue systems and fall arrest systems.

The equipment and components used may sometimes be the same within any of these systems – it is the manner in which they are used which determines the type of system:

(a) Work restraint systems prevent the user from reaching zones where the risk of a fall exists. Such systems are sometimes incorrectly called ‘fall restraint’.

(b) Work positioning systems support the user in tension or suspension while a task is being undertaken in such a way that a fall is prevented or restricted. Such systems allow the user to have both hands free for working. However, work positioning systems must always incorporate a backup system (typically a fall arrest system) des

(c) Rope access systems use two separately secured subsystems, one as the means of support and the other as a safety backup for (specifically) getting to and from the place of work. Such systems become work positioning systems when the user is at the place of work. It is important to note that in such a system both ropes are static (i.e. stationary) while the user moves up and

down the rope. If the rope supporting the user moves with the user (i.e. as in a bosun's chair arrangement) the system is a work positioning system not a rope access system.

(d) Rescue systems are personal protective systems by which a person can rescue themselves or others by pulling, lifting or lowering.

(e) Fall arrest systems are personal protective systems where the fall is arrested to prevent the user colliding with the ground or structure. Such systems have energy absorbance capacity built into the system and are designed to limit the forces on the human body to no greater than 6 kN. Examples are energy absorbing lanyards, inertia reel devices (when used correctly, ie anchored vertically above the user) or lead climbing using dynamic rope.

Key points

Key points to note about personal fall protection:

(a) Consider all elements when selecting suitable equipment – the maximum descent height and load; safe and secure anchorage points; the length, type and number of ropes and lanyards; the specification of ascender/descender devices; a system for recovery after a fall.

(b) Inspect equipment at regular intervals. Regulation 9 of LOLER requires lifting equipment for lifting people to be examined every six months by a

competent person if it is exposed to conditions causing deterioration which is liable to result in dangerous situations.

(c) Special care needs to be taken when inspecting components made from webbing and rope because of the deterioration that can take place in these materials. Guidance on this topic and the recommended inspection frequency can be found in INDG367 Inspecting fall arrest equipment .

SYSTEM COMPONENTS SPECIFICATIONS:

Fall Protection

7.6.1 Derrick Harness

Back, Chest & Hip D-Rings, Tongue Buckle Leg Straps, Shoulder Padding

- **CAPACITY ANSI Z359.11:** 130–310 lbs. (59–140 kg) **OSHA / CSA Z259.10:** 400 lbs. (180 kg)
- **SIZES** Extra Small, Standard, Extra Large, Super Extra Large
- **D-RING LOCATIONS** Dorsal (back), hips (optional), shoulders (optional), chest (optional)
- **LEG STRAP BUCKLE OPTIONS** Quick connect, tongue buckle
- **PADDING LOCATIONS** Shoulder, waist (construction), legs (optional)
- **RFID EQUIPPED** Yes (inside label pack)
- **THREAD / STITCHING** Polyester
- **WEB** Polyester, nano-technology treated

- **WEB KEEPER** Polyester, hook and loop closure
- **LEG BUCKLES** Anodized forged aluminum, stainless steel tabs and adjuster
- **CHEST BUCKLE** Anodized forged aluminum, stainless steel tabs and adjuster
- **D-RING** Anodized forged aluminum
- **PFL ADAPTER** Integrated polymer dedicated PFL attachment point
- **PADDING** Breathable spacer mesh and foam
- **PRODUCT WEIGHT** 3.53 lbs. – Standard back D-ring with quick connect leg straps
- **SHIPPING DIMENSIONS** 6" x 25" x 22"
- **PRODUCT STYLES** Racing style
- **STANDARDS** ANSI Z359.11, CSA Z259.10, OSHA

7.6.2 Derrick Safety Harness:

Full body harness including 5 fall arrest attachment points (1 front, 1 back central, 2 sides and 1 for sit harness). Back and front central attachment by metallic D-ring double bar Work positioning belt with two equivalent and lateral attachment points by metallic D-ring double bar and sit harness with one ventral attachment point by metallic D-ring, maximum rated load 100kg. On one shoulder and belt attachment by metallic male/female buckles. Chest harness linked to the sit harness by

connector, including a slide, with automatic locking gate device by swivel ring on front. Loops for carrying tools.

- **Webbings:** Polyamide / Polyester 45 mm.
- **Buckles:** Automatic, Aluminum.
- **Threads:** Polyester.
- **Meets Standard EN361, EN358, EN813.**

7.6.3 Gravity Suspension Harness,

V Shape, Polyester, Back D-Ring, 2 Side D-Ring, Front D-Ring, Ventral D-Ring, Waist Pad, Leg Pad, Shoulder Pad, Medium, Black, Aluminum Hardware

SPECS:

- **Ventral** attachment point positioned at the waist. Fall arrest rated
- dorsal and front D-Rings;
- Waist pad manufactured from fully breathable material and
- designed with multi-layered padding which dissipates pressure
- from the webbing to reduce fatigue when working for long periods of time;
- Shoulder padding to protect the neck from chafing;
- Aluminum or steel D-Rings options;
- Side D-Rings that fold forward when needed and away when not needed;
- **Ergonomic** design allows for easy adjusting on buckles;

- Aluminum bayonet buckles on the leg straps;
- Gravity Suspension Light harness comes standard with steel hardware;
- Triple locking carabineer for security and peace of mind;
- A total of 3 rigid tool loops for easy attachment are on the waist belt and 1 tool loop on each leg pad;
- Adjustable fully padded leg loops with quick release buckles;
- RFID enabled for easy tracking;
- Meets standards: EN 361, EN 358, EN 813.

7.6.4 Body Harness, Back/Chest/Shoulder D-Ring, Bayonet Buckles, STD

- **CAPACITY:** 140 Kg
- **D-RING LOCATIONS:** Dorsal (back), hips, shoulders, chest (depends on version)
- **BUCKLE CONNECTION:** Chest: Bayonet, Leg: Qwik-Fit, Bayonet (depends on version), Belt: Qwik-Fit
- **PADDING LOCATIONS:** Waist (version with waist belt)
- **THREAD/STITCHING:** Polyester
- **WEB:** Polyester
- **WEB KEEPER:** Polyester, hook and loop closure
- **LEG BUCKLES:** Steel
- **CHEST BUCKLE:** Steel
- **D-RING:** Steel (dorsal D-Ring bent for easy connection)

1,06 Kg (back D-Ring Qwick-Fit leg buckles)

1,15 Kg (back, front D-Rings, Qwick-Fit leg buckles)

- **PRODUCT STYLES:** Racing style
- **FALL INDICATOR:** Dual, at the backside
- **OPERATING TEMPERATURE:** 40C +50°C
- **MAXIMUM LIFESPAN:** 10 years from date of first use
- **STANDARDS:** EN 361:2002, EN 358:2018 (version with waist belt), EN 1497:2007 (version with shoulder loops)

7.6.5 Full Body Harness Vest style harness

Full body harness is made of pieces of polyamide webbing which are sewn and connected by metal buckles. This configuration guarantees full safety and comfort work.

With back attaching buckle - for attaching fall arrest system, front attaching loops for attaching fall arrest system, connecting and adjusting buckles for comfort wearing and using of harness.

Complies to EN361:2002.

Technical specification

- **Weight:**730 g
- **Tapes Material:** polyester
- **Width:**45 mm
- **Threads Material:** polyester
- **Connecting and adjusting buckles Material:** galvanized steel

7.6.6 Body Harness BACK D-RING, 3 ADJUSTERS, QWIK-FIT BUCKLES, MED/LG, EN

- **Material Webbing:** Polyester, minimum tensile strength: 25 kN
- **D-ring:** Alloy steel, Minimum breaking strength: 25 kN
- **Back plate:** LDPE
- **Quick fit buckles:** Alloy steel
- **Bayonet buckles:** Steel
- **Keepers:** LDPE or elastic
- **Size:** Small, Medium/Large, Extra Large
- **Fall indicator:** Dual, at the backside
- **Load capacity:** 140 kg
- **operating temperature:** -30 °C ... +50 °C
- **Maximum lifespan:** 10 years from date of manufacture
- **Approvals:** EN 361:2002, EN 1497:2007 (harnesses with shoulder loops)

7.6.7 Harness, Back D-Ring, Qwik-Fit Leg Buckles, STD.

- **CAPACITY:** 140 Kg
- **SIZES:** Standard
- **D-RING LOCATIONS:** Dorsal back
- **BUCKLE CONNECTION:** Chest: Leg: Qwik-Fit
- **THREAD/STITCHING:** Polyester
- **WEB:** Polyester

- **WEB KEEPER:** Polyester, hook and loop closure
- **LEG BUCKLES:** Steel
- **CHEST BUCKLE:** Steel
- **D-RING:** Steel (dorsal D-Ring bent for easy connection)
- **PRODUCT WEIGHT:** 1,06 Kg (back D-Ring, Qwick-Fit leg buckles)
- **PRODUCT STYLES:** Racing style
- **FALL INDICATOR:** Dual, at the backside
- **OPERATING TEMPERATURE:** -40°C. +50°C
- **MAXIMUM LIFESPAN:** 10 years from date of first use
- **STANDARDS EN 361:2002.**

7.6.8 Twin Standard Lanyards

- **CAPACITY:** ANSI Z 359.13: 130 lb.–310 lb. (59–140 kg) CSA Z259.11: 150 lb. – 310 lb. (68–140 kg) CSA Z259.11 Light Weight: 110 lb.–230 lb. (50–105 kg)
- **SUB BRAND/MODEL NAME:** V-Series Standard Shock Absorbing Lanyard
- **THREAD/STITCHING:** Polyester
- **SNAPHOOK MATERIAL:** Steel.
- **PRODUCT WEIGHT :**2.35–5.73 lb.
- **SHIPPING WEIGHT:** 2.35–5.73 lb.
- **SHIPPING DIMENSIONS:** 5"x1"– 6"x1"
- **PRODUCT STYLES:** Twin,

- **STANDARDS:** ANSI Z359.13, CSA Z259.11 –17, OSHA

7.6.9 Double Rope Two (Anchor connector) +One (termination connector).

The lanyard is made of \varnothing 12mm polyamide kernmantle rope. The ends of the lanyard are sewn making the connecting loops equipped with thimbles. The lanyard connected with a certified energy absorber. It can be used as a basic personal protective system against falls from a height.

Meets Standards EN 355 EN 354, EN362.

Connector (termination connector) with eyelet, **Steel** with automatic locking gate by safety catch, opening 20 mm.

Meets Standard EN362 Class T.

Connector (Anchor connector) with eyelet, In Galvanized steel with automatic locking gate by safety catch, opening 50 mm.

Meets Standard EN362 Class A.

7.6.10 Personnel Tripod, 50' Rescuer, 65' Winch, Stainless Steel Cable, (2) Pulleys, (2) Carabiners.

- **Approvals / Standards:** ANSI Z359.14/ OSHA

7.6.10.1 TRIPOD

- A tripod must perform reliably within harsh conditions, and the Tripod does. Built for durability, the unit features:
- Skid-resistant feet with built-in leg base support strap that improves stability and strengthens entire system.

- Cut-resistant pin retention chains to enable extended service life
- Internal leg-locking mechanism prevents accidental disengagement during use and reduces possibility of damage to mechanism during use or while in storage.

7.6.10.2 Winch

- **Maximum workload of 400 lb.** (181 kg) for personnel, 620 lb. (281 kg) for materials
- Patent-pending bracket attachment for easy installation
- Ergonomic carry grip
- Foldable crank handle
- Includes integral RFID technology
- Includes self-locking swivel 36C snaphook
- ANSI Z359.1-compliant

7.6.10.3 Rescuer

- User capacity up to 400 lb. for personnel
- Stainless steel 316
- (5 mm) wire rope
- Integral mounting bracket
- Color-coded switch for retrieval mechanism activation
- Ergonomic, stainless steel carrying handle can also be used as anchorage connection point
- Built-in shock absorber
- Robust aluminum housing with thermoplastic bumpers

- Self-locking swivel snap hook with load indicator
- Stow-able, foldable crank handle
- RFID-enabled
- Meets OSHA regulations and ANSI Z359.14

7.6.11 Personnel Safety Tripod

Powder coated galvanized steel head with a guiding pulley for the installation of the rope.

4 attachment points: 1 central attachment point on the pulley, 3 lateral attachment points (openings) located in the head's walls.

Legs made of aluminum profiles with rounded edges. They consist of two sections. The telescopic construction of the legs allows the user to adjust their length. To adjust the legs' length locking pins are used. The legs of the tripod are equipped with self-aligning steel feet with rubber pads. The feet have anti-slip "teeth" used when positioning the tripod on a slippery (e.g. icy) surface.

Tripod legs can be secured with textile webbing or steel chain.

leg locking pin

- **Working load limit:** 500 kg
- **Working height:** - legs extended: 229 cm
- **Weight:** 17 kg
- **Leg spacing:** 119-182 cm
- **Opening diameter under tripod:** 140 - 213 cm

- **Meets Standard EN795/B:2012 Class B.**

7.6.12 25m Winch Rescue

The rescue lifting device is component of rescue system. the rescuer can lift the other person from a lower to higher place or lower him over a distance limited to 2m.

a winch equipped with clamp for mounting on tripod leg.

Crank arm can be disassembled for easier transport.

- **Winch Weight:** 15 KG
- **Cable diameter:** 6.3mm
- **Cable Length:** 25meters
- **Cable type:** 6x19 + NFC
- **Mechanism Ratio:** 1:5
- **Force required for pulling load with weight 200kg:** 7.41kg
- **Max Work Load:** 140 kg.
- **Meets Standard EN1496/B.**

7.6.13 Material Safety Tripod

The head is made of powder coated galvanized steel and has two wheels for guiding the work rope of rescue devices. Cotter above wheels prevent the rope from slipping during work.

The tripod legs are made of strengthened aluminum profiles with 9-step adjustment, locked with cotter. Two legs "A" are equipped with a wheel

(for guiding the work rope) and anchor point (bore) for mounting winches, the third leg “B” has no wheel or anchor point.

Aluminum steps are mounted with cotters and provide easier access to the tripod head when extending the legs to their maximum height.

Steel feet have rubber pads for flat surfaces and spiked edges for slippery surfaces.

The tripod’s legs can be secured with textile webbing or steel chain leg locking pin

- **Working load limit:** 1000 kg
- **Working height:** 179 - 289
- **legs extended:** 229 cm
- **Weight:** 17 kg
- **Leg spacing:** 147-232 cm
- **Opening diameter under tripod:** 173 - 271 cm
- **Meets Standard EN795/B:2012 Class B.**

7.6.14 SRL (Self Retracting Lanyard)

- The internal energy absorber ensures the forces passed to the user and anchorage are reduced to below 6 kN
- All internal components are manufactured from materials with inherently high corrosion resistant
- Retraction dampening device restricting ultimate lifeline retraction velocity if released whilst extracted

- The toughened case is designed to resist impact damage and protect internal components
- **Material Case:** Polycarbonate (Aluminum for 30m lengths)
- **Pawls:** Hardened stainless steel
- **Chassis:** Stainless steel
- **Fasteners:** Stainless steel
- **Retraction spring:** Stainless steel spring (Carbon Steel spring for 30m lengths)
- **Drum module:** PC-ABS (Polycarbonate / ABS blend) with aluminum threaded plate (Aluminum for 30m lengths)
- **Cable lifeline:** Galvanized or stainless steel
- **Locking mechanism:** Stainless steel & Manganese bronze core
- **Snap hook:** Forged zinc-plated steel / stainless steel with load indicator
- **Length:** 6m (20 ft.), 10m (30 ft.), 15m (50 ft.) or 30m (100 ft.)
- **Lanyard type:** 5mm galvanised or stainless steel cable (7x19)
- **Weight range:** 60 - 140 kg (including tools)
- **Temperature range:** -40 °C to 54 °C
- **Static strength:** 15 kN
- **Maximum arrest distance :**2 m
- **Maximum arresting force:** 6 kN
- **Approvals:** EN 360:2002, CNB/P/11.062

7.6.15 Fall arrestor

- Retractable Fall Arrestor Device is designed for works which require large dislocation from the anchorage point.
Retractable fall arrestor is a component of personal protective Equipment against fall from the height. Connecting Handle.
- Identify **Label includes:**(Product model, Serial Number, Date of manufacture and Cable length) .
- **Case:** Cable retractor with brake and energy absorber mechanism inside Steel Casing with fall indicator.
- **Cable: Galvanized Steel, Ø 4 mm**
- **Length:** 10 meters.
- **User weight:** 140KG.
- **Mechanism:** Stainless Steel
- **Snap Hook:** Aluminum, Comes with snap hook of the working cable with swivel function.
- Meets Standard EN 360:2002.

7.6.16 PFL retractable mini retractable lanyard:

The most compact and light weight self-retracting lanyard ever developed using multiple spring radial energy absorbing technology. This is new design eliminates the need for an external energy absorber outside of the housing making it the smallest retractable lanyard on the market.

-Most compact self-retracting lifeline ever developed.

- -6 ft (1.8 m) length.
- -360 degree fully rotating attachment point for enhanced user mobility.
- -Available in twin-leg and tieback options.
- -400lbs worker capacity.
- -Tie off acceptable 2 ft below D-Ring.
- 6' (1.8 m), 36 C snaphook, steel carabiner (top)
- Approvals: ANSI Z35914 (Class B)

CSA Z59.2.2

OSHA

EN360:2002

7.7 Respiratory:

Introduction

1- European Standards for personal protective equipment (PPE) have been developed as the preferred means of demonstrating equipment conformity with the basic health and safety requirements (BHSRs) of the EC Personal Protective Equipment Directive. Only equipment which meets these BHSRs is entitled to carry the CE mark, and be sold for use in the EC. The alternative route to obtaining the CE mark relies on the manufacturer producing a 'technical file' for the equipment which also demonstrates that it satisfies the BHSRs. In such cases, the equipment

will carry the CE mark but no Standard number. The manufacturer's information will contain the performance specification

2- The Standards contain design, performance and marking requirements for the different types of equipment. This document lists the Standards, and gives a brief explanation of the markings which they define.

3- Respiratory Protective Equipment (RPE)

3.1 Air Purifying Respirators

Air purifying respirators are respirators with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element. Air purifying respirators shall meet the requirements of BSEN 141/143/371/372 as applicable", or be approved jointly by Mines Safety and Health Administration and the National Institute for Occupational Safety and Health (MSHA/NIOSH). Air purifying respirators shall not be used for protection in areas where H₂S is present in the atmosphere.

3.2 Air Supplied Respirators

Air Supplied Respirators are respirators that supply the user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units. SCBA or SAR shall be provided where:

- Airborne contaminants exceed levels safe for filter masks.
- There is an atmosphere deficient of oxygen.
- The atmosphere is immediately dangerous to life or health.

3.3 Self-contained breathing apparatus shall:

Conform to BS EN 137:1993 "Specification for Respiratory Protective Devices: Self-Contained Open Circuit Compressed Air Breathing Apparatus", or

- Approved jointly by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health (MSHA/ NIOSH).

Air-line Respirators Air-line respirators shall:

- conform to BSEN 138:1994/BSEN 139:1995/BSEN 269:1995/BSEN 270:1995 as applicable, or

Any modifications or adaptations shall be constructed so as not to void the original equipment manufacturer's approvals.

4- Emergency Escape Breathing Apparatus (Escape Set)

An Escape set is defined as a breathing apparatus that has a portable air supply of compressed air and is designed for the sole purpose of enabling a person to escape from a hazardous atmosphere. Emergency Escape Breathing Apparatus is never to be used to provide protection in normal work situations. Immediately upon activation of the device, the wearer is to leave the area of hazardous atmosphere.

The breathing apparatus shall be selected such that the time required to allow the wearer to escape shall be within the capacity of the apparatus.

Emergency Escape Breathing Apparatus (Escape Set) shall:

- conform to BSEN 1146:1997 “Respiratory protective devices for self-rescue, Self-contained Open-circuit Compressed Air Breathing Apparatus Incorporating a Hood (compressed air escape apparatus with a hood)”, or
- be approved jointly by the Mine Safety and Health Administration and the National Institute for Personal Protective Equipment Procedures” Occupational Safety and Health (MSHA/ NIOSH)
- Qualifications of Maintenance Personnel Personnel designated as Respiratory Protective Equipment (RPE) maintenance personnel shall be trained and certified in the maintenance and servicing of the equipment that they are expected to maintain by the manufacturer or the manufacturer’s appointed agent. No attempt should be made to replace components, make adjustments or make repairs beyond the manufacturer's recommendations.
- Air Purity (Quality) The employer shall ensure that compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration accords with the following specifications:
 - **Oxygen content (v/v):** 19.5 – 23.5% • Carbon Monoxide: 5 parts per million maximum
 - Carbon Dioxide: 500 parts per million maximum
 - **Oil Mist:** 0.5 mg/m³
 - **Odour:** Lack of noticeable odour



- Fitness of SCBA or Air-line Users From a health perspective and to assure safety, it is important that the wearer is capable of using

Self-Contained Breathing Apparatus (SCBA)/Supplied Air Breathing Apparatus (SABA) properly, which requires:

- A good fit of the face mask to the face. The standard of fit shall be demonstrated by qualitative or quantitative test procedures. Difficulty is sometimes encountered in fitting masks to workers with small faces, those who wear dentures or have skin conditions that may interfere with the mask to face seal
- Hair on the face and/or head that is in contact with the seal of RPE will impair the efficiency of the seal and thus constitute an avoidable hazard to the safety of the wearer Personnel who may be required to wear RPE shall therefore maintain the area of the seal free from hair.
- Medical fitness of SCBA/SABA users shall be determined by a physician using the standards in the Fire Fighter's Routine Medical Examination, CAA Airport Firemen's Medical or equivalent medical fitness standard acceptable to BA.

Examples of such duties include but are not limited to:

- Working in H₂S Classified Zones
- Confined Space Work Activities;
- Breaking the seals on vessels;
- Pigging Operations;

- Specific maintenance activities where potential exposure to toxic/harmful atmospheres is present; □ Chemical handling;
- Emergency Intervention Activities (e.g. rescues, firefighting, valve isolations).

Types of RPE

Respiratory protective equipment is generally of two types:

(a) Respirators that rely on filtering contaminants from workplace air. These include simple filtering face pieces and respirators and power assisted respirators.

(b) Breathing apparatus, which gives an independent supply of breathable air, for example fresh air hose, compressed airline and self-contained breathing apparatus. You will need to use breathing apparatus in a confined space or if there is a chance of an oxygen deficiency in the work area.

Requirements

1- Design

The apparatus shall be of simple and reliable construction and as compact as possible. The apparatus shall be so designed that there are no protruding parts or sharp edges likely to be caught on projections in narrow passages or that may hurt the wearer.

The apparatus shall be designed to ensure its full function in any orientation. The ready-for-use state of the apparatus, i.e. the pressure

of the cylinder(s) shall be identifiable at any time. In the ready-for-use state the face piece shall be securely attached to the apparatus.

The cylinder has to be opened either, e.g. by a quick-opening valve or an equivalent to this, and in the case of a permanent installation of the apparatus shall be opened automatically upon removal from the container or be locked in the open position against inadvertent shutting. The apparatus shall not be fitted with a supplementary air supply control device which may reduce the duration of the apparatus. If a breathing apparatus for working, e.g. "airline equipment" is used in connection with an escape apparatus, the escape apparatus design shall be such as to prevent air loss from the escape apparatus in the event of malfunction or disconnection of the breathing apparatus for working.

2- Materials

The carrying container and the locking device, where present, shall be adequately protected against corrosion. The materials used shall be able to withstand temperatures and mechanical stress expected whilst being carried on the man as well as on machines and vehicles. Exposed parts, i.e. those which may be subjected to impact during use of the apparatus, shall not be made of aluminium, magnesium, titanium or alloys containing such proportions of these metals as will, on impact, give rise to frictional sparks capable of igniting flammable gas mixtures. Any container making use of such material shall be adequately protected so that when tested according to national regulations for impact and scraping no metal shall be exposed. To prevent electrostatic

charges on non-metal carrying containers, the surface resistance shall not exceed 10⁹ Ω. Where the apparatus is required to be antistatic during escape, materials used shall be antistatic as far as it is practicable. Materials which come into direct contact with the wearer's skin and the breathable gas shall not be known to be likely to cause irritation or any other adverse effect to health.

3- Cleaning and disinfection

All parts requiring cleaning and disinfecting shall be able to withstand cleaning and disinfecting agents and procedures as recommended by the manufacturer.

4- Mass

The mass of the complete apparatus including carrying container shall not exceed 5 kg when designed to be carried on the man for a complete shift.

5-Connections

Any means for sealing used shall be retained in position when the connection(s) is (are) disconnected during normal maintenance.

6- Harness

The apparatus shall have a harness. Any harness shall be designed to allow quick, easy and correct donning of the apparatus without assistance.

7- Handling

The apparatus shall be capable of being donned and put into operation simply and without undue exertion under difficult conditions, i.e. in the dark and in confined spaces. If the apparatus is fitted with a special lock; the design shall be such that it cannot be opened inadvertently. If the apparatus has been opened, a clear indication of this shall be given on the outside of the apparatus.

8- Leak tightness

The ready for use apparatus shall be leak tight so that the pressure change does not exceed 0,3 mbar in 1 min.

9- Facepiece

The facepiece shall be a mouthpiece assembly or a full face mask and shall be attached securely to the apparatus. Normally the facepiece should be a mouthpiece assembly with two teeth bites and a permanently attached nose clip. The mouthpiece shall facilitate reliable

sealing and it shall not be possible to block inadvertently the breathing circuit when the apparatus is in operation. The mouthpiece assembly shall be fitted with an adjustable or self-adjusting head harness if it is likely that an undue load is exerted on the wearer's mouth. The nose clip shall provide an airtight seal of the nose. It shall be flexibly attached to the mouthpiece assembly such that when fitting the mouthpiece the wearer's attention is automatically drawn to the nose clip. If a full face mask with a standard thread EN 148-1 is used then it shall meet the requirements of EN 136. If any other full face mask is used as a facepiece the following requirements shall be met. The full face mask shall be provided with an adjustable or self-adjusting head harness. The requirements of 4.11.1 and 4.11.3 of EN 136 shall be met. The lens of the full face mask shall meet the requirements for eyepieces and visors in EN 136 except the requirement for the field of vision.

10- Goggles

If the device shall be used with goggles, then the lenses of the goggles shall be protected against fogging. The head straps of the goggles shall be flexible and easily adjustable or self-adjusting. The goggles shall be attached to the apparatus to prevent loss. The goggles shall not interfere with the donning of the apparatus.

11- Inhalation and exhalation valves

Valve assemblies shall be such that they can be readily maintained and correctly replaced. It shall not be possible to fit an exhalation valve assembly into the inspiratory circuit or an inhalation valve assembly into the exhalation circuit:

11.1 Inhalation valve(s) Inhalation valve(s) shall function correctly in all orientations.

11.2 Exhalation valve(s)

11.2.1 Exhalation valve(s) shall function correctly in all orientations.

11.2.2 Exhalation valve(s) shall be protected against dirt and mechanical damage and shall be shrouded or shall include any other device that may be necessary to comply with 4.7 of EN 136.

11.2.3 The exhalation valve(s) shall continue to operate correctly after:
a) a continuous exhalation flow of 300 l/min; and b) a negative pressure (static) in the mask of 80 mbar; (30 s for each test).

11.2.4 When the exhalation valve housing is attached to the face blank it shall withstand axially a tensile force of 150 N applied for 10 s. The test is repeated 10 times in 10 s intervals.

12 Resistance to temperature

12.1 Storage

After conditioning in accordance with 6.4.1 and return to (20 ± 3) °C, the connectors between apparatus and facepiece shall be examined. For standardized threads a thread gauge shall be used to check dimensions.

12.2 Temperature performance

The apparatus shall operate trouble-free over the temperature range – 30 °C to 60 °C. Apparatus specifically designed for temperatures beyond these limits shall be tested and marked accordingly

12.2.1 Low temperatures for breathing apparatus without positive pressure, the inhalation resistance shall not exceed 10 mbar. For breathing apparatus with positive pressure, a positive pressure shall be maintained in the cavity of the mask adjacent to the face seal. The exhalation resistance of all types of apparatus shall not exceed 10 mbar.

12.2.2 High temperature

12.2.2.1 Apparatus without positive pressure for breathing apparatus without positive pressure, the inhalation resistance shall not exceed 7 mbar. The exhalation resistance shall not exceed 3 mbar

12.2.2.2 Apparatus with positive pressure For breathing apparatus with positive pressure, a positive pressure shall be maintained in the cavity of the mask adjacent to the face seal. The exhalation resistance shall not exceed 10 mbar.

12.3 Flammability

When tested in accordance with 6.4.3, the breathing tube(s) (leading to facepiece), medium pressure tube(s) and lung governed demand valve shall prove to be “self-extinguishing”, i.e. the material shall not be of highly flammable nature and when tested the parts shall not continue to burn for more than 5 s after removal from the flame.

13 Protection against particulate matter

The component parts of the apparatus supplying compressed air shall be reliably protected against the penetration of particulate matter that may be contained in the compressed air.

14 High pressure parts

Metallic high pressure tubes, valves and couplings shall be tested to prove that they are capable of withstanding a pressure of 50 % above the maximum filling pressure of the air container. EN 402:1993 6 © BSI 12-1999 Non-metallic parts shall be tested to prove that they are

capable of withstanding a pressure twice the maximum filling pressure of the air container.

15 High and low pressure connections

It shall not be possible to fit a low pressure hose directly to a high pressure part of the circuit.

16 Compressed air container(s)

Compressed air containers shall comply with national regulations. The container shall be approved with respect to the appropriate filling pressure. NOTE Only containers of equal maximum filling pressure shall be connected to an apparatus with more than one container.

17 Compressed air container seal

There shall be only one seal or other technical provisions to open the total air stored. The seal or its equivalent shall be opened easily by hand or automatically when starting the apparatus. Where a conventional valve is used it shall be so designed that the valve spindle cannot be completely unscrewed from the assembly during normal operation of the valve. The opening device shall be designed so that it cannot be closed inadvertently by contact with a surface.

18 Pressure reducer

If the apparatus is designed with a pressure reducer, any adjustable medium pressure stage shall be reliably secured against accidental alteration and adequately sealed so that any unauthorized adjustment can be detected.

19 Pressure safety valve

A pressure safety valve shall be provided if the downstream parts of the apparatus cannot take full container pressure.

19.1 Apparatus with a pressure safety valve The pressure safety valve shall be designed to pass an air flow of 400 l/min at a medium pressure not exceeding 30 bar. with the pressure safety valve operational, the inhalation and exhalation breathing resistance shall not exceed 25 mbar.

19.2 Where a pressure safety valve is not provided, the breathing resistance requirements of 5.19.1 shall be met.

20 Pressure indicator

The apparatus shall be equipped with a reliable pressure indicator which will indicate the maximum filling pressure in the container(s). The pressure indicator shall function independently of the action of the container seal at all times. A pressure indicator incorporating a suitable blow-out release shall be provided such that, in the event of an

explosion or fracture of the pressure elements of the indicator, the explosion will be away from the front of the wearer. If the window is incorporated in the pressure indicator, it shall be of non-splintering clear material. A restrictor shall be provided so that, if the indicator is damaged, the outflow of air at 200 bar pressure shall not exceed a rate of 30 l/min. (If the nominal pressure is less the requirement shall be met at the nominal pressure.)

Testing

If no special measuring devices or measuring methods are specified, commonly used methods and devices shall be applied.

1- Visual inspection The visual inspection shall be carried out, where appropriate, by the test station prior to laboratory or practical performance tests. The visual inspection includes marking and instructions for use.

2- Practical performance tests Practical performance tests shall be performed with two apparatus and four test subjects. The execution of further tests is at the discretion of the testing authorities.

2.1 Test subjects The apparatus shall be worn by test subjects practising regularly with breathing apparatus and their medical fitness shall be known to be satisfactory. They shall be medically examined and certified fit to undertake the test procedures.

2.2 Apparatus to be tested For practical performance tests, only apparatus which have passed the laboratory tests shall be used. The apparatus shall be checked and found to be suitable prior to use. EN 402:1993 8 © BSI 12-1999

2.3 Preparation of apparatus to be tested Before starting each test the apparatus shall be checked for leaktightness and opening pressure of the demand valve. The container pressure at the start of the test shall correspond to the prescribed filling pressure.

STANDARDS FOR RESPIRATORY PROTECTIVE EQUIPMENT

7.7.1 Self-contained breathing apparatus

SCBA shall be approved according to

- EN 137:2006, type 2 Fire requirements (incl. flame engulfment test).
- ATEX APPROVED

FACE PIECE

- **Approvals: EN 136: 1998**

- **properties:**

- 1- Made of Hycar rubber with polycarbonate coated lens (medium and large).
- 2- Removable inhalation check valve preventing exhaled air from entering and contaminating regulator
- 3- Exhalation valve that is to be serviceable without special tools.
- 4- Rubber head harness
- 5- Silicone nose cup

- 6- Push to connect lung governed demand valve
- 7- Rubber neck strap
- 8- Made of Hiker rubber with polycarbonate coated lens (medium and large).
- 9- Removable inhalation check valve preventing exhaled air from entering and contaminating regulator
- 10- Exhalation valve that is to be serviceable without special tools.
- 11- Rubber head harness
- 12- Silicone nose cup
- 13- Push to connect lung governed demand valve
- 14- Rubber neck strap

Backplate

- Backplate shall fixed
- Glass fiber reinforced
- polyamide, flame retardant and conducting surface
- Optional: rubber bumper on bottom of backplate for additional robustness

Harness

-
- SCBA shall be equipped with a Basic (non padded) harness
 - Polyamid webbing coated with CR rubber, flame retardant, tear resistant and conducting surface
 - Shoulder straps should be S-shaped to ensure unobstructed arm movements
 - Hip straps shall be adjustable
 - Hip strap shall be adjustable by pulling to the side front
 - Basic: Polyimide webbing coated with CR rubber, flame retardant, tear resistant and conducting surface

Hip Belt

Basic : Aramid textile

Cylinder Strap

- Strap of a mixed flame retardant fabric with quick-release buckle for tightening – can accommodate 1 cylinder

- Brand: Aramid textile

Buckles

- Plastic: Glass fiber reinforced polyimide, flame retardant

Accessories can be added in the future

- Chest strap : MAC (Modacrylic) – blended fabric with aramid
- Hose holder : Polyimide webbing coated with CR rubber, flame retardant, tear resistant and conducting surface
- Rescue handle : Aramid textile
- Bumper : TPE (thermoplastic elastomer)

Classic Pneumatics

- Pressure reducer
- primary low pressure warning device
- Mechanical gauge

Demand Valve (regulator)

- Fixed lung governed demand valve

Air cylinders

- SCBA shall equipped with composite compressed air cylinder.
- Shall be available in 6.8 liter /300 bar
- Has pressure gauge to detect pressure of cylinder if put on rack on un attached SCBA

- Supplier has to be authorized service center to be sure of spare parts and warranty
- Availability of Yearly test Air flow test as it's a mandatory for warranty
- SCBA Must be Upgradable and easy to clean

7.7.2 TROLLEY Specs.

- SCBA shall be approved according to Comply with EN 14593-1
- A trolley for cylinder holder suitable for placing two cylinders with a capacity of 50 liters having a maximum operating pressure of 300 bar or 200 bar, high pressure hoses, pressure reducer and two coils with hoses for the remote supply of breathable air
- (Standard length: 40 meters each)
- trolley system allows the use of two cylinders with a capacity of 50 liters and with an
- operating pressure of 300 bar or of 200 bar
- considering an average consumption of 40 l/minute, the autonomy of maximum process is equivalent to 375 minutes for two operators (with two cylinders of 50 liters at 300 bar).

7.7.3 FACE PIECE

- Approvals: EN 136: 1998
- properties:
 - 1- Made of Hycar rubber with polycarbonate coated lens (medium and large).

- 2- Removable inhalation check valve preventing exhaled air from entering and contaminating regulator
- 3- Exhalation valve that is to be serviceable without special tools.
- 4- Rubber head harness
- 5- Silicone nose cup
- 6- Push to connect lung governed demand valve
- 7- Rubber neck strap
- 8- Made of Hiker rubber with polycarbonate coated lens (medium and large).
- 9- Removable inhalation check valve preventing exhaled air from entering and contaminating regulator
- 10- Exhalation valve that is to be serviceable without special tools.
- 11- Rubber head harness
- 12- Silicone nose cup
- 13- Push to connect lung governed demand valve
- 14- Rubber neck strap

7.7.3 Emergency Escape Breathing Device (EEBD)

The S-Cap-Air is supplied in a fluorescent protective carrying bag ensuring high visibility and protection from the environment. It consists of a 3 liter 200 bar compressed air cylinder with automatic air supply valve and pressure indicator, a high visibility hood with Oro-nasal facemask, large visor and elastic neck seal, and a well

visible pneumatic end-of-service time indicator turning red before the cylinder pressure is exhausted.

Approvals

- SCBA shall be approved according to EN 1146

Features and benefits

- Meets new SOLAS requirements
- Light and compact
- Simple to use, easy training
- Fast automatic starting
- 15 minutes air supply
- High visibility outer bag and hood for added safety
- End-of-service time indicator in field of vision
- Integrated oro-nasal mask and neck seal for increased tightness
- Exhalation valve minimises visor misting and CO₂ accumulation
- Cylinder pressure indicator for simple visual checks
- Simple to check, simple to refurbish

Approvals

- Size: Diameter approx. 250 mm, width approx. 550 mm
- Weight: not exceed 4.7 K composite cylinder
- Service Time: 15 minutes

- Air supply: Continuous, approx. 35 litres/minute
- Warranty: 2 years
- Maintenance: Visual inspections only, simple refurbishments after use

Other standards relevant to RPE

Occupational equipment is unlikely to be marked with these Standard numbers, but they may contain useful information on equipment performance or test methods.

EN 132:1999	Glossary of RPE terms
EN 133:2001	Classification of RPE
EN 134:1998	Nomenclature of RPE components
EN 135:1999	List if equivalent terms in English, French and German
EN 142:2002	Mouthpieces for RPE
EN 144-1:2000	Gas cylinder valve insert connector thread specification
EN 144-2:1999	Gas cylinder valves - outlet connectors
EN 144-3:2003	Gas cylinder valves – Diving gases Nitrox and Oxygen
EN 148-	Facepiece standard thread connector specification

1:1999	
EN 148-2:1999	Facepiece centre thread specification
EN 148-3:1999	Facepiece M 45x3 thread specification
BS 4275:1997	Guide to implementing an effective respiratory protective device programme – Now superseded by:
EN 529:2005	Respiratory protective devices – Recommendations for selection, use, care and maintenance – Guidance document
BSEN 12021:1999	Compressed air for breathing apparatus

Respiratory protective devices — Gas filters and combined filters — Requirements, testing, marking

Introduction

A given respiratory protective device can only be approved when the individual components satisfy the requirements of the test specification which may be a complete standard or part of a standard, and practical performance tests have been carried out on complete apparatus where specified in the appropriate standard. If for any reason a complete apparatus is not tested then simulation of the apparatus is permitted provided the respiratory

characteristics and weight distribution are similar to those of the complete apparatus.

1- Object and field of application

This European Standard refers to gas filters and combined filters for use as components in unassisted respiratory protective devices with the exception of escape apparatus and filtering face pieces. Laboratory tests are included for the assessment of compliance with the requirements. Some filters complying with this standard may also be suitable for use with other types of respiratory protective devices and if so shall be tested and marked according to the appropriate European Standard.

2- References

EN 143, Respiratory protective devices; Particle Filters; Requirements, testing, marking. EN 148-1, Respiratory protective devices; Threads for face pieces; Standard thread connection.

3-Definition and description

Gas filters remove specified gases and vapours. Combined filters remove dispersed solid and/or liquid particles, and specified gases and vapours.

4- Classification

According to their application and protection capacity gas and combined filters are classified in types and classes.

4.1 Types of filters

Gas filters are contained in one of the following types or combinations of them. If a filter is a combination of types, it shall meet the requirements of each type separately.

4.1.1 Types A, B, E and K

Type A: For use against certain organic gases and vapours with a boiling point higher than 65 °C as specified by the manufacturer. NOTE The requirements for filters for use against organic low boiling compounds will be given in a separate standard.

Type B: For use against certain inorganic gases and vapours as specified by the manufacturer (excluding carbon monoxide)

Type E: For use against sulphur dioxide and other acidic gases and vapours as specified by the manufacturer.

Type K: For use against ammonia and organic ammonia derivatives as specified by the manufacturer.

4.1.2 Special filters. These filters shall always incorporate a P3 filter.

Type NO-P3: For use against nitrogen oxides, e.g. NO, NO₂, NO_x.

Type Hg-P3: For use against mercury

4.2 Classes of filters

Gas filters of types A, B, E and K are classified in terms of capacity as follows;

class 1 Low capacity filters class

Class 2 Medium capacity filters

Class 3 High capacity filters

The protection provided by a class 2 or class 3 filter includes that provided by the corresponding filter of lower class or classes. Special filters are not classified.

5. Requirements

5.1 General If the gas filter is combined with a particle filter, the combined filter shall meet the filtration efficiency requirement for the particle filter as described in EN 143 in addition to the requirements described below.

The connection between filter(s) and facepiece shall be robust and leaktight. The connection between filter and facepiece may be achieved by a permanent or special type of connection or by a screw thread connection (including threads other than standard threads). If a standard thread is used it shall be in accordance with the European Standard EN 148-1. If the filter is a twin filter designated to be used with a twin filter facepiece, it shall not be possible to connect it to the standard thread connector

The filter shall be readily replaceable without use of special tools and shall be designed or marked to prevent incorrect assembly. The particle filter of combined filters shall be on the influent side of the gas filter. The maximum

weight of filter(s) designated to be used directly connected to a half mask is 300 g. The maximum weight of filter(s) designated to be used directly connected to a full face mask is 500 g.

5.2 Materials The filter shall be made of suitable material to withstand normal usage and exposures to those temperatures, humidity and corrosive environments that are likely to be encountered. Internally it shall withstand corrosion by the filtering media. Material from the filter media released by the air flow through the filter shall not constitute a hazard or nuisance for the wearer.

5.3 Mechanical strength Before testing for breathing resistance and protection capacity the filters shall be subjected to a test in accordance with 6.2 simulating rough usage of the filter. After this treatment the filters shall show no mechanical defects and shall meet the requirements for breathing resistance and protection capacity.

5.4 Breathing resistance The resistance imposed by filter(s) to the flow of air .

6 Testing

6.1 General All performance tests shall be conducted so that the test gas or air will pass through the filter horizontally. Each test shall be conducted with 3 specimens conditioned only by the test described in

6.2. Each of the three test specimens shall comply with the appropriate requirement. If the gas filter is combined with a particle filter, the combined

filter shall be submitted to filtration efficiency testing for the particle filter as described in EN 143 in addition to the tests described in this standard.

When a single filter of a twin filter is tested separately the air flow specified for a test may be halved. If, however, it is possible that the single filter may be used alone, then the full air flow shall be used for testing.

Respiratory protective devices — Gas filters and combined filters specifications:

1. Half face mask, medium size twin cartridges, special thermoplastic rubber to give both comfort and stability. Comes with AnthroCurve™ sealing surface unmatched fit. NIOSH certified to 42 CFR, Part 84.
2. Organic Vapor/Acid Gas (GMC adv.) Bayonet-Style Respirator Cartridges protects against organic vapor and acid gases including Chlorine, Sulfur Dioxide, Hydrogen Chloride and Hydrogen Sulfide and provides lightweight, low-profile performance. According to NIOSH-certified (to 42 CFR, Part 84)
3. Multigas (GME adv.) Bayonet-Style Respirator Cartridges protects against organic vapor, acid gases, ammonia, methylamine, formaldehyde and hydrogen fluoride. According to NIOSH-certified (to 42 CFR, Part 84) and provides lightweight, low-profile performance.



4. Low-Profile P100 adv. Particulate Filter (99.97% filter efficiency level) effective against all particulate aerosols.
5. Half face mask, twin cartridges (not included) Soft Feel Hycar rubber MSA Exclusive formulation face piece material that improve pliability and softness to provide unique facepiece computer designed, Medium Size, NIOSH certified to 42 CFR, Part 84.
6. Organic Vapor/Acid Gas (GMC) Threaded Respirator Cartridges protects against organic vapor and acid gases including Chlorine, Sulfur Dioxide, Hydrogen Chloride and Hydrogen Sulfide. NIOSH certified to 42 CFR, Part 84
7. Multigas (GME) Threaded Respirator Cartridges protects against organic vapor, acid gases, ammonia, methylamine, formaldehyde and hydrogen fluoride. According to NIOSH-certified (to 42 CFR, Part 84).
8. Full face mask medium size, made of a skin-compatible and largely age-resistant natural rubber formulation, with scratch-resistant and almost unbreakable acrylic lens, Good voice transmission, certified and approved to EN 136, Class 2 standards
9. GAS FILTER K2 against Ammonia and organic ammonia derivatives 5000 ml/m³ (0.5 vol.-%). Certified and approved to EN 148-1 standards. According to EN 14387:2000/A1:2006

10. Gas Filter 90 AB according to DIN/EN A2B2 protects against Organic gases and vapors, and Inorganic gases and vapors up to 5000 ml/m³ (0.5 Vol.-%). According to EN 14387:2000/A1:2006.

11. Gas Filter 90 ABEK2 protects against Organic gases and vapors, Inorganic gases and vapors, Sulfur dioxide and acidic gases and vapors, Ammonia and Organic ammonia derivatives up to 5000 ml/m³ (0.5 Vol.-%). According to EN 14387:2000/A1:2006.

12. Gas Filter A2B2E2K2 P2 protects against Organic gases and vapors, Inorganic gases and vapors, Sulfur dioxide and acidic gases and vapors, Ammonia and Organic ammonia derivatives up to 5000 ml/m³ (0.5 Vol.-%). With particles with maximum filter penetration 6% certified and approved to EN standards, for above mask

13. Twin Port full face mask with bayonet connection, medium size, with advantage harness with silicon strap. According to EN 136, class 2

14. Twin Port full face mask with bayonet connection, large size, with advantage harness with silicon strap. According to EN 136, class 2 (carton of 22 pcs).

15. Advantage Filter A2B2E1K1, approved according to EN 14387 and EN 143. Package of 2



16. Organic Vapor/Acid Gas (GMC-P100) Threaded Respirator Cartridges protects against organic vapor and acid gases including Chlorine, Sulfur Dioxide, Hydrogen Chloride and Hydrogen Sulfide. NIOSH certified to 42 CFR, Part 84 Particulate Filter (99.97% filter efficiency level) effective against all particulate aerosols.(BOX Of 6)

7.8 Protective clothing

Introduction

The Standards contain design, performance and marking requirements for the different types of equipment. This document lists the Standards, and gives a brief explanation of the markings which they define.

Types of protection

Types of body protection include:

- overalls, aprons and coveralls (protection against hazardous substances)
- clothing for cold, heat and bad weather
- clothing to protect against machinery, e.g. chainsaws
- high visibility clothing (e.g. jackets, vests)
- harnesses
- back supports
- life jackets.

Examples of hazards which may require protective clothing

The main hazards are:

(a) Working with chemicals – handling small quantities of low risk chemicals may only require aprons protecting against accidental splashes. Larger

quantities of chemical or risks of contact with sprays or jets of chemical are likely to require protective coats/trousers or coveralls. Potential exposures to large quantities of chemical or very hazardous materials will often require the use of gas or liquid tight suits and appropriate RPE.

(b) Cuts and hazards working with knives, machinery etc – use clothing made of thick or padded material or multilayer reinforced fabric, aramid fibers (eg body armour material).

(c) Electrical hazards – use electrical insulating clothing when working on or near live parts of low voltage installations at nominal voltages up to 500 V ac or 750 V dc. The clothing needs to be used with other electrical insulating PPE, such as boots and gloves. It prevents electrocution when there is a risk of unintentional contact with live parts.

(d) Electrostatic hazards – where clothing is to be used in potentially explosive atmospheres, select clothing made from materials which have been shown to resist the buildup of static electricity.

(e) Cold from working outside or in a cold/freezer area – use clothing made of thick or padded material or multilayer leather or fabric or thermal insulating fabrics. Minus 25 and Minus 50 suits are available which are designed to protect at these subzero temperatures.

(f) Wet when working outside in the rain or using water sprays for cleaning etc – use rubbers, plastics, waterrepellent coatings, waterproof and breathable fabrics. (g) Radiant heat and flame from welding, metalworking, foundries – use suitable flame-retardant, insulating and

heat resistant fabrics.

Key points

The key points to note about protective clothing are:

- (a) Store used/contaminated clothing separately from clean clothing.
- (b) Select protective clothing carefully for chemical resistance and protection, especially against mixtures, and do not use for longer than the recommended breakthrough times. Manufacturers will advise on breakthrough times for their products.
- (c) Clean clothing according to the manufacturer's instructions. For chemical suits hygienic cleaning may be possible but industry guidance is that this clothing cannot be effectively decontaminated.
- (d) Inspect for wear and tear, loose seams and surface damage before use.
- (e) Do not wear loose protective clothing near moving machinery in case it gets caught.
- (f) A full-sleeve and full leg coverall of fire retarding material 'NOMEX Delta C' is the standard. The single-piece coverall must be fitted with florescent stripes on body and legs portions
- (g) Employees must not wear loose clothing or don't loose accessories such as neck-tie and jewelry around rotating machinery. All clothing and accessories must be secured while working near such machines.
- (h) Clothing should be kept clean at all times and should be removed immediately if they become soaked with hydrocarbons or chemicals.

If contaminated, avoid the vicinity of heat or flames. The use of compressed air for cleaning hydrocarbon-soaked clothes and body is prohibited.

- (i) Review the appropriate **Material Safety Data Sheet (MSDS)** and follow recommendations, or immediately wash the exposed skin area with soap and water to prevent skin irritation (or dermatitis), and change hydrocarbon-soaked clothes as soon as possible.

SPECIFICATIONS FOR PROTECTIVE CLOTHING

7.8.1 High visibility clothing

Most high visibility clothing has a fluorescent yellow or orange background, made from materials impregnated with fluorescent pigments, with bands of shiny retroflected material. It is designed to make the wearer easy to see under any light conditions in the day and under illumination, for example by vehicle headlights in the dark.

Types of high visibility clothing

There are three classes of high visibility clothing. Each has minimum areas for the background and retroflective bands:

- (a) Class 1 – the least conspicuous (waistcoats and most trousers).
- (b) Class 2 – more conspicuous than Class 1 (waistcoats, jackets and some trousers).
- (c) Class 3 – the most conspicuous (jackets and coveralls) aero planes.

Key points

The key points to note for high visibility clothing are:

- (a) Select high visibility clothing suitable for the task. Clothing that protects from other hazards such as cold weather is often available with a high visibility option. Outdoor workers may need different clothing at different times of the year.
- (b) Inspect before use for wear and tear, or loose seams.
- (c) Ensure only correct cleaning materials are used. Lack of cleanliness is a significant factor in loss of visibility.

7.8.2 Fire Retardant Coveralls

SN	Attribute	Values
1	Design standard/spec	<ul style="list-style-type: none"> ▪ NFPA 2112 ▪ EN ISO 11612 <ul style="list-style-type: none"> ▪ EN-1149 or NFPA 70E
2	Application/protection type	<ul style="list-style-type: none"> ▪ Long-term durability High comfort, soft feel ▪ Not tight-fitting ▪ Permanently anti-static in accordance with EN-1149 or NFPA 70E ▪ Ease of cleaning and longevity of flame-resistant fabric
3	Style	Single Piece Work Coverall
4	Gender	--
5	Type, sleeve length	Long sleeves
6	Stitch pattern	<ul style="list-style-type: none"> ▪ One-piece garment fully double stitched with DuPont Nomex Inherent flame-resistant sewing thread ▪ All stress points are bar tacked with DuPont Nomex Inherent flame-resistant sewing thread ▪ Permanent sewn crease line (pleat)
7	Material	<ul style="list-style-type: none"> ▪ Nomex III-A Inherent Flame-Resistant Fabric ▪ Or 98% Guardian Lifetime Flame-Resistant/2% Antistatic



9	Material weight	230 gram per square meter (gsm)
10	Color	--
11	Collar details	High Collar and fixed hood that rolled inside the collar
12	Waist details	<ul style="list-style-type: none"> ■ As per approved size chart ■ Concealed elastic side waist
13	Closure/fastening details	■ zippers will be of a heavy duty standard and fire retardant to ensure continuous use Coveralls
14	Cuff details	double stitched with snap fasteners to ensure
15	Pocket details	<ul style="list-style-type: none"> ■ sufficient side, back and chest pockets Stitching
16	Visibility features	<p>yellow, green or grey fire retardant reflected stripes as follows:</p> <p>One on each leg, lower portion, two inches wide and four inches apart. One on each arm, lower portion, one-inch-wide and two inches apart.</p> <p>One reflective strip around the waist area logo will be stitched directly to each coverall,</p> <p>upper left chest</p>
17	Size	-----
18	logo	-----
19	Certification requirement	EN ISO 11612 A1+A2 B1 NFPA 2112 - EN 1149-5 ISO 17493:2000 IEC 61482 Class 1 EN ISO 11612, EN 1149
20	Marking requirement	Written documentation received with garments (e.g. instructions, warranties, technical data)
21	Additional requirements	Permanent protection against heat and flame protection Inherent flame-resistant fabric with strong overall thermal protective performance

7.8.3 Winter Coverall (With Lining)

SN	Attribute	Values
1	Design Standard/Spec	ASTM F2302, NFPA 70E
2	Application/Protection Type	<ul style="list-style-type: none"> •Standard leg length to fit 33" inside leg •Thermal resistance not less than class 2 •Air permeability not less than 2 •Garment class 3 •reflective material class 2 •Thermal resistance not less than class 2 •Air permeability not less than 2 •Thermal insulation not less than 150 M². K/W
3	Style	•Single Piece Work Coverall
4	Gender	--
5	Type, Sleeve Length	•Full Sleeves
6	Stitch Pattern	<ul style="list-style-type: none"> ▪ Double stitched with heavy duty 100% cotton sewing thread ▪ Fully double stitched and all stress points are fully bar-tacked ▪ Permanent sewn crease line (pleat)
7	Material	• 70% cotton and 30% polyester
8	Material Treatment	•Winter Poly/ Cotton Insulated Coveralls
9	Material Weight	170-220 Gsm
10	Color	-----
11	Collar Details	High Collar and fixed hood that rolled inside the collar
12	Waist Details	<ul style="list-style-type: none"> ▪ As per approved size chart ▪ Concealed elastic side waist
13	Closure/Fastening Details	• Concealed two ways brass zips
14	Cuff Details	Adjustable cuffs with concealed snap/press buttons



15	Pocket Details	<ul style="list-style-type: none">• Two chest pockets• Two side pocket with cotton lining• Two back pocket• Tool pocket right hand side leg• Pen pocket left hand side sleeve• All patch pocket with double fabric layer in bottom
16	Visibility Features	<ul style="list-style-type: none">• local reflective stripes (3 cm width) on arms and legs
17	Size	--
18	Logo Requirement	----
19	Certification Requirement	As per CE European Directives for ergonomics & garments stability or ISO EN13688
20	Marking Requirement	With necessary markings in the garments as per international standard which contains fabric/product information, article number, size and washing/garment user instructions
21	Additional Requirements	<ul style="list-style-type: none">• Radio/Gas detector loop on right hand side chest• Concealed buttons• Action back for freedom of movement

7.8.4 COVERALL, WINTER, FR, ANTISTATIC, THERMAL INSULATED, WITH HOOD

SN	Attribute	Values
1	Design Standard/Spec	<ul style="list-style-type: none"> •EN ISO 11612 A1+A2, B1, C1, E2, F1  , (Flame Retardant Garments) •EN ISO 11611 Class 2 A1+A2  (Arc Flash) •EN 1149 -5: 2008  (Electrostatic Dissipative Protective Clothing) •EN 342 0.318 (M². K/W) (Worming) •NFPA 70e (PPE Requirements For Arc Flash And Electrical Safety Clothing) •ASTM F2302 (Standard Performance Specification For Labeling Protective Clothing As Heat And Flame Resistant)
2	Application/Protection Type	<ul style="list-style-type: none"> •Thermal Resistance Not Less Than Class 2 •Air Permeability Not Less Than 2 •Garment Class 3 •Reflective Material Class 2 •Thermal Insulation Not Less Than 150 M2. K/W •Maximum Total Shrinkage (< 3% After Five Wash Cycle)
3	Style	<ul style="list-style-type: none"> •Single Piece Work Coverall with hood
4	Gender	--
5	Type, Sleeve Length	<ul style="list-style-type: none"> •Full Sleeves
6	Stitch Pattern	<ul style="list-style-type: none"> ▪ Triple - Stitched Seams For Extra Durability <ul style="list-style-type: none"> ▪ Sew On Flame Resistant Reflective Industrial Wash Tape ▪
7	Material	<ul style="list-style-type: none"> • 100% Modacrylic \Polyster Flame Resistant •100% Cotton Flame Resistant Lining
8	Material Treatment	<ul style="list-style-type: none"> •Winter Poly/ Cotton Insulated Coveralls



9	Material Weight	170-220 Gsm
10	Color	-----
11	Collar Details	High Collar and fixed hood that rolled inside the collar
12	Waist Details	<ul style="list-style-type: none"> ▪ Comfortable, Elastic Waistband 2 Sides Only (Not All Waist)
13	Closure/Fastening Details	<ul style="list-style-type: none"> • Two Way Zipper Non-Metallic Or Copper With Studs (Non-Sparking) By Zipper •Zipper Location: Center-Front Full Length With Hook And Loop - Closure And Storm Flap •Puller Type: (Cord \ Fabric \ Rubber \ Leather) •Storm Flap: Concealed Buttons \ Hook-And-Loop •With Hook-And-Loop Closure And Drawcord Adjustable With •Spring Cord Lock End Stopper Fastener Slider Toggles Clip
14	Cuff Details	<ul style="list-style-type: none"> •Adjustable By Concealed Bottom Or Hook And Loop Closure For A Secure Fit
15	Pocket Details	<ul style="list-style-type: none"> • All Patch Pockets With Double Fabric Layers In Bottom •2 Chest Pockets With Concealed Zip Closure •2 Side-Front With Trouser Access Pockets With Cotton Lining •2 Back Pockets With Flap
16	Visibility Features	<ul style="list-style-type: none"> •Reflective Striping Placed On Shoulders, Sleeves And Legs (50 Mm (Fr) Reflective Striping (Silver))
17	Size	--
18	Logo Requirement	-----
19	Certification Requirement	As per CE European Directives for ergonomics & garments stability or ISO EN13688
20	Marking Requirement	With necessary markings in the garments as per international standard which contains fabric/product information, article number, size and washing/garment user instructions

21	Additional Requirements	<ul style="list-style-type: none"> •1 Pen Pocket Left Hand Side Sleeve •1 Tool \ Rule Pocket Right Hand Side Leg •2 Radio And Gas Loop Detector •Rain And Cold Insulated, Fitted, Removable (Detachable Hood) • Action Back For Extra Freedom Of Movement
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7.8.5 SPECS COVERALL, WINTER, FR, ANTISTATIC, WITHOUT INSULATION

SN	Attribute	Values
1	Design Standard/Spec	<ul style="list-style-type: none"> •EN ISO 11612 A1+A2, B1, C1, E2, F1  , (Flame Retardant Garments) •EN ISO 11611 Class 2 A1+A2  (Arc Flash) •EN 1149 -5: 2008  (Electrostatic Dissipative Protective Clothing) •EN 342 0.318 (M². K/W) (Worming) •NFPA 70e (PPE Requirements For Arc Flash And Electrical Safety Clothing) •ASTM F2302 (Standard Performance Specification For Labeling Protective Clothing As Heat And Flame Resistant)
2	Application/Protection Type	<ul style="list-style-type: none"> •Thermal Resistance Not Less Than Class 2 •Air Permeability Not Less Than 2 •Garment Class 3 •Reflective Material Class 2 •Thermal Insulation Not Less Than 150 M2. K/W



		<ul style="list-style-type: none"> •Maximum Total Shrinkage (< 3% After Five Wash Cycle)
3	Style	<ul style="list-style-type: none"> •Single Piece Work Coverall with hood
4	Gender	--
5	Type, Sleeve Length	<ul style="list-style-type: none"> •Full Sleeves
6	Stitch Pattern	<ul style="list-style-type: none"> •Triple - Stitched Seams For Extra Durability •Sew On Flame Resistant Reflective Industrial Wash Tape
7	Material	<ul style="list-style-type: none"> • 100% Modacrylic \ Polyester Flame Resistant
8	Material Treatment	<ul style="list-style-type: none"> •Winter Poly/ Cotton Insulated Coveralls
9	Material Weight	170-220 Gsm
10	Color	-----
11	Collar Details	High Collar and fixed hood that rolled inside the collar
12	Waist Details	<ul style="list-style-type: none"> ▪ Comfortable, Elastic Waistband 2 Sides Only (Not All Waist)
13	Closure/Fastening Details	<ul style="list-style-type: none"> • Two Way Zipper Non-Metallic Or Copper With Studs (Non-Sparking) By Zipper •Zipper Location: Center-Front Full Length With Hook And Loop - Closure And Storm Flap •Puller Type: (Cord \ Fabric \ Rubber \ Leather) •Storm Flap: Concealed Buttons \ Hook-And-Loop •With Hook-And-Loop Closure And Drawcord Adjustable With •Spring Cord Lock End Stopper Fastener Slider Toggles Clip
14	Cuff Details	<ul style="list-style-type: none"> •Adjustable By Concealed Bottom Or Hook And Loop Closure For A Secure Fit

15	Pocket Details	<ul style="list-style-type: none"> • All Patch Pockets With Double Fabric Layers In Bottom •2 Chest Pockets With Concealed Zip Closure •2 Side-Front With Trouser Access Pockets With Cotton Lining •2 Back Pockets With Flap
16	Visibility Features	<ul style="list-style-type: none"> •Reflective Striping Placed On Shoulders, Sleeves And Legs (50 Mm (Fr) Reflective Striping (Silver))
17	Size	--
18	Logo Requirement	----
19	Certification Requirement	As per CE European Directives for ergonomics & garments stability or ISO EN13688
20	Marking Requirement	With necessary markings in the garments as per international standard which contains fabric/product information, article number, size and washing/garment user instructions
21	Additional Requirements	<ul style="list-style-type: none"> •1 Pen Pocket Left Hand Side Sleeve •1 Tool \ Rule Pocket Right Hand Side Leg •2 Radio And Gas Loop Detector •Rain And Cold Insulated, Fitted, Removable (Detachable Hood) • Action Back For Extra Freedom Of Movement

7.8.6 Overall, Summer, Fr, Antistatic, Without Insulated

SN	Attribute	Values
1	Design Standard/Spec	<ul style="list-style-type: none"> •EN ISO 11612 A1+A2, B1, C1, E2, F1  , (Flame Retardant Garments) •EN ISO 11611 Class 2 A1+A2  (Arc Flash) •EN 1149 -5: 2008  (Electrostatic Dissipative Protective Clothing)



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		<ul style="list-style-type: none"> •EN 342 0.318 (M². K/W) (Worming) •NFPA 70e (PPE Requirements For Arc Flash And Electrical Safety Clothing) •ASTM F2302 (Standard Performance Specification For Labeling Protective Clothing As Heat And Flame Resistant)
2	Application/Protection Type	<ul style="list-style-type: none"> •Thermal Resistance Not Less Than Class 2 •Air Permeability Not Less Than 2 •Garment Class 3 •Reflective Material Class 2 •Thermal Insulation Not Less Than 150 M2. K/W •Maximum Total Shrinkage (< 3% After Five Wash Cycle)
3	Style	<ul style="list-style-type: none"> •Single Piece Work Coverall with hood
4	Gender	--
5	Type, Sleeve Length	<ul style="list-style-type: none"> •Full Sleeves
6	Stitch Pattern	<ul style="list-style-type: none"> ▪ Triple - Stitched Seams For Extra Durability <ul style="list-style-type: none"> ▪ Sew On Flame Resistant Reflective Industrial Wash Tape
7	Material	<ul style="list-style-type: none"> • 100% Modacrylic \Polyster Flame Resistant
8	Material Treatment	<ul style="list-style-type: none"> •Winter Poly/ Cotton Insulated Coveralls
9	Material Weight	170-220 Gsm
10	Color	-----
11	Collar Details	High Collar and fixed hood that rolled inside the collar
12	Waist Details	<ul style="list-style-type: none"> ▪ Comfortable, Elastic Waistband 2 Sides Only (Not All Waist)
13	Closure/Fastening Details	<ul style="list-style-type: none"> • Two Way Zipper Non-Metallic Or Copper With Studs (Non-Sparking) By Zipper •Zipper Location: Center-Front Full Length With Hook And Loop - Closure And Storm Flap •Puller Type: (Cord \ Fabric \ Rubber \ Leather) •Storm Flap: Concealed Buttons \ Hook-And-Loop



		<ul style="list-style-type: none"> •With Hook-And-Loop Closure And Drawcord Adjustable With •Spring Cord Lock End Stopper Fastener Slider Toggles Clip
14	Cuff Details	<ul style="list-style-type: none"> •Adjustable By Concealed Bottom Or Hook And Loop Closure For A Secure Fit
15	Pocket Details	<ul style="list-style-type: none"> • All Patch Pockets With Double Fabric Layers In Bottom •2 Chest Pockets With Concealed Zip Closure •2 Side-Front With Trouser Access Pockets With Cotton Lining •2 Back Pockets With Flap
16	Visibility Features	<ul style="list-style-type: none"> •Reflective Striping Placed On Shoulders, Sleeves And Legs (50 Mm (Fr) Reflective Striping (Silver))
17	Size	--
18	Logo Requirement	--
19	Certification Requirement	As per CE European Directives for ergonomics & garments stability or ISO EN13688
20	Marking Requirement	With necessary markings in the garments as per international standard which contains fabric/product information, article number, size and washing/garment user instructions
21	Additional Requirements	<ul style="list-style-type: none"> •1 Pen Pocket Left Hand Side Sleeve •1 Tool \ Rule Pocket Right Hand Side Leg •2 Radio And Gas Loop Detector •Action Back For Extra Freedom Of Movement

7.8.7 Fire Retardant Winter Jackets

Fire retardant and anti-static meet the following standard EN 14605:2005, EN13980-1 or EN ISO 14116:2008, EN 1149-5:2008

Stitching and zippers will be of a heavy duty standard to ensure continuous use, and will have an overlapping flap over the zipper. The weight of the fabric and fill will be sufficient for temperatures of -10 Deg C.

Cuffs will have snap fasteners. Jackets will be Navy Blue in color Jackets will have yellow, green or grey FR reflective stripes Highly breath able Fixed flame retardant cotton lining Foot Protection Water repellent outer fabric High tear resistance Supple and comfortable.

7.8.7.1 JACKET WATER AND WIND PROTECTIVE, INSULATED, FR, ANTISTATIC, WITH REMOVABLE HOODS

SN	Attribute	Values
1	Design Standard/Spec	<ul style="list-style-type: none"> •EN 1149-5:2015  (Electrostatic Dissipative Protective Clothing) •EN ISO 11612:2015 (A1 B1 C1)  , (Flame Retardant Garments) •EN ISO 13688:2013, EN 340-2003 (General Performance Requirements For Ergonomics, Innocuousness, Size Designation, Ageing, Compatibility And Marking Of Protective Clothing)

		<ul style="list-style-type: none"> •EN ISO 14116:2015  (Protection Against Heat & Flame, Limited Flame Spread) •EN 343:2004+A1:2008  (Protection Against Rain)
2	Application/Protection Type	<p>Features: Inherently flame-resistant – Inherent flame-resistant properties built in and durable Comfortable to wear - Soft & breathable. Roomy sizing patterns for appropriate fit Exceptional durability – Outstanding laundered appearance - Fabric retains its new look and maintains permanent pressed appearance Excellent Value – Long life cycle & great durability with AntiStatic Properties</p>
3	Style	<p>Multi-layer winter jacket construction Comfortable to wear - Soft & breathable. Roomy sizing patterns for appropriate fit. Hip Length design with elastic side waist for better fitting</p>
4	Gender	--
5	Type, Sleeve Length	Full Sleeve with adjustable
6	Material	Breathable Fabric, Water, Oil, Grease And Dirt Repellent Finish Shell Fabric Feature: Fr & Antistatic
7	Material Treatment	---
8	Material Weight	Multi-Layer Construction Weight: 200 to 270 GSM (Total Weight) Middle Layer - Wind Breaker/Padding/Quilted
9	Material, Inner Lining	FR Quilted or Cotton Lining
10	Color	--
11	Collar Details	High Collar and fixed hood that rolled inside the collar
12	Closure/Fastening Details	<ul style="list-style-type: none"> •Two Way And Non-Metallic Or Copper With Studs By Zipper •Puller Type: (Cord \ Fabric \ Rubber \ Leather) •Zipper Location: Center-Front Full Length With Hook-And-Loop \ Bottom Closure And Storm Flap •Rain And Cold Insulated, Fitted, Removable (Detachable Hood) •With Hook-And-Loop Closure And Drawcord Adjustable With Spring Cord Lock End Stopper Fastener Slider Toggles Clip



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		<ul style="list-style-type: none">•With Hook-And-Loop Closure And Drawcord Adjustable With Spring Cord Lock End Stopper Fastener Slider Toggles Clip
13	Cuff Details	<ul style="list-style-type: none">•Adjustable By Concealed Bottom Or Hook And Loop Closure For A Secure Fit
14	Pocket Details	<ul style="list-style-type: none">•2 Side-Front Lower Pockets With Hook-And-Loop \ Zipper By Puller And Safety Flap•2 Radio And Gas Loop Detector•1 Internal Pocket On Left Hand Side•1 Google Pocket Behind Storm Flap•1 Napoleon Pocket
15	Visibility Features	<ul style="list-style-type: none">•Reflective Tape Size: 50 Mm Fr Reflective Striping (Silver) Sew On Flame Resistant Industrial Wash Tape•Reflective Distribution Design: Reflective Striping Placed On Shoulders And Sleeves
16	Size	--
17	Certification Requirement	EN 11612 & NFPA 2112 (UL) certified.
18	Marking Requirement	With necessary markings in the garments as per international standard and FT-FR label management system which contains fabric/product information, article number, garment qualifying standards, size and washing/garment user instructions.
19	Logo Requirement	--
20	Additional Requirements	

7.8.8 Coat for Cold & Rain

- From water proof material padded with company logo with local reflective stripes on arms, chest and back and has head cover inside
- Water penetration level 3
- Breathability not less than level 1
- Thermal resistance not less than class 2
- Air permeability not less than 2
- Thermal insulation not less than 150 M2. K/W
- Garment class 3
- reflective material class 2

7.8.9 PVC APRON

- PVC apron made from PVC fabric, Protection from acids, bases, punctures, and abrasion , Vinyl construction: For flexible, yet durable, personal protection ,
- MATERIAL Vinyl (PVC) ,
- AVAILABLE SIZES : 33 inch x 44 inch ,
- THICKNESS 18 mil ,length 44-inch . Sealed grommets with adjustable 48-inch ties ,
- Tested according to EN 14603-2005. +A 1:2009. TYPE PB4

7.8.10 Welding apron

- Durable, light weight.
- Resistance to heat.
- Resistance to abrasion.
- Neck and waist adjustable straps.
- Complied with standards ASTM F2302, NFPA 70E

7.8.11 LEATHER WELDING JACKET

- The jacket has an inside pocket, lined collar, adjustable press stud wrist closure, full press stud front closure and side adjusters.
- All seams are sewn with heat resistant.
- Lightweight and extremely durable
- Press stud adjustable cuffs, Press stud side adjusters for snug fit
- Riveted reinforced wear areas
- Standards: EN 388

7.8.12 LEATHER WELDING LEG

- GUARD / SHOES GUARD
- Durable welding leg guard / shoes guard for superior heat and abrasion protection.
- All seams are sewn with heat resistant.
- Made from premium side split cowhide with riveted stress points for increased durability.
- Lightweight and extremely durable

- Offers superior protection against heat & abrasion.
- Length: Width: 23" - Height: 33"
- Standards: EN 388

7.8.13 Chemical suit

- Chemical-protective suit guards against various inorganic chemicals* (including acids and bases), while remaining durable, lightweight and flexible. Medium duty chemical barrier,
- Type 3/4 protection chemical, High visibility, for enhanced workplace safety,
- PRODUCT MATERIAL Polyethylene on bicomponent Polypropylene/Polyethylene non-woven, suit must include a thumb loop, respirator fit hood and secure zip flap with self-adhesive tape closure
- Standard : CE Category III Type 3/4/5 protection.

7.8.14 Non encapsulating chemical suit Type 1

- Non encapsulating chemical suit Type 1 / Level B protection
PRODUCT MATERIAL :Outer: Butyl rubber and a top layer of Viton rubber coated on polyamide fabric Inner: Butyl rubber ,SEAM TYPE :Stitched and sealed with a glued-on tape on both inside and outside ,Non-encapsulating

design: Ideal for work in enclosed spaces , Comfortable, flexible, durable chemical barrier, SHELF LIFE 10 years , attached with gloves and boots

- STANDARDS OVERVIEW
- EN 943-1:2015 + A1:2019
- EN 943-2:2019
- EN 1073-2:2002 (radioactive particle protection)
- EN 14126:2003 (infective agent protection)
- EN 1149-5:2008 (antistatic suit material)
- Approved for use in ATEX zones 0, 1, 2/20, 21, 22 and chemical group IIA, IIB, IIC SOLAS

7.8.15 Disposable Chemical Overall

- Compliance ANSI 103 (Proposed standard for PPE)
- Made from polymeric material. Supported with hood.
- One piece, hooded suits.
- Must have good tearing, cracking, and abrasion resistance as well as chemical hold out.
- PVC coated nylon or cotton.

7.8.16 Disposal suit type 3 & type 4

- Chemical-protective suit guards against various inorganic chemicals* (including acids and bases), while remaining durable, lightweight and flexible Medium duty chemical barrier,

- Type 3/4 protection chemical ,Bright yellow color: High visibility, for enhanced workplace safety ,
- PRODUCT MATERIAL Polyethylene on bicomponent Polypropylene/Polyethylene non-woven , suit must include a thumb loop, respirator fit hood and secure zip flap with self-adhesive tape closure
- Standard : CE Category III Type ¾ protection

7.8.17 Disposal suit type 5 & TYPE 6

- Disposal protective suit is made from SMS material, protecting wearers against liquid spray and particulates*, filtering 99.9% of particulates over 3 microns ,STANDARDS OVERVIEW CE CATEGORY III (Type 5, Type 6) ,Heightened breathability: Air and water vapor permeability help this protective outer garment minimize the risk of excessive heat stress and maximize wearer comfort ,Its optimized fit ensures comfort, with additional features including a two-way zipper with resealable storm flap, finger loops and an elasticated waist, wrist and ankles
- Standard : CE Category III Type 5/6 protection

7.8.18 Specification of Fire Protection Suit

First: General requirements

I) The garment must comply with EN 469 “Protective clothing for firefighters – performance requirements for protective clothing for firefighting, level 2”.

1- The following insulation values should be achieved:

X2:

Testing before pre-treatment

$HTI_{24} \geq 17s$ and $HTI_{24}-HTI_{12} \geq 5s$

$RHTI_{24} \geq 18s$ and $RHTI_{24}-RHTI_{12} \geq 6s$

Contact heat threshold $\geq 13s$

Testing after pre-treatment

$HTI_{24} \geq 18s$ and $HTI_{24}-HTI_{12} \geq 5s$

$RHTI_{24} \geq 24s$ and $RHTI_{24}-RHTI_{12} \geq 8s$

Contact heat threshold $\geq 12s$

2- The following resistance to water penetration should be achieved:

Y2: ≥ 100 kPa

3- The following water vapour resistance should be achieved:

Z2: Ret: ≤ 16 m²Pa/W

- II) The garment must comply with EN 1149-5 “Protective clothing – Electrostatic properties - Part 5: Material performance and design requirements” in combination with EN 1149-3 “Protective clothing – Electrostatic properties – Part 3: Test methods for measurement of charge decay”.

Second: Material requirements

III) Material ensemble:

The weight of the material composition shall not exceed 560 g/m². Construction in Liner-System, direct laminates are not allowed. The membrane is facing the outer shell.

IV) Outershell:

- 1- Composition: 89% meta-aramid, 9% para-aramid and 2% P140 antistatic fibre.
- 2- Construction: ripstop weave with a thermo-reactive para-aramid grid on the back of the fabric.
- 3- Surface treatment: a water, oil and soil-repellent long-term special impregnation with a minimum durability of 40 washes without re-impregnation must be proved. A spray rate of ≥ 5 according to EN 24920 must be reached.
- 4- Weight of approx. 220 g/m² \pm 5 g.
- 5- Tensile strength lengthwise and crosswise ≥ 1200 N \pm 5%.

6- Abrasion resistance against scuffing $\geq 40,000$ rubs.

I) Insulation, membrane, seam sealing, suction barriers:

1. Combination of moisture barrier and thermal protection.
2. Microporous bicomponent EPTFE membrane, laminated on 85% m-aramid / 15% p-aramid nonwoven fabric, 140 g/m² substance $\pm 5\%$.
3. The following properties are to be supported by the test certificates of an accredited testing institute:

A- Testing the water-proofness

- a. Water-proofness after 25 washes at 60°C according to ISO 6330, method 6M/E, and 10 dry cleanings according to ISO 3175-2; for laminate and cross seams, water pressure according to EN 20811 at 1 bar;
- b. Heat resistance following EN 469:2005 for 5 minutes at 260°C, then the waterproofness of laminate and cross seams is tested according to EN 20811 at 1 bar;
- c. Contact heat resistance according to EN 702 at 220°C and 7 sec contact time, then the waterproofness of laminate and cross seams is tested according to EN 20811 at 1 bar;

B- Testing the viral impermeability:

Test of the resistance against penetration of blood and body fluids (blood pathogens) – test method with Phi-X174 bacterium according to ISO 16604, Method C, pressure of 20 KPa. New condition: no visible

penetration and no lees on surface and cross seams. After pretreatments, 5 cycles (one cycle = 5 washes + 1 drying) according to EN ISO 6330, 6N, F (50°C). Then an oven test (185°C ± 5°C) for 5 min. according to EN ISO 17493. No visible penetration and no lees on surface and cross seams.

1. The seam welding is done with an appropriate PTFE-based ribbon that meets the above-mentioned properties of the laminate also for cross seams.
2. Breathable suction barriers on the tunic seam, cuffs and front zip made from 3-layer laminate (ePTFE with a 100% aramid textile base), Ret according to EN 31092 < 15 m2Pa/W

C- Flam test Manikin:

The suit must be passed successfully the test accordance with ISO 13506, ASTM F1930 or any equivalent standard.

II) Lining

1. Composition: 93% meta-aramid, 5% para-aramid and 2% P140 antistatic fibre with hydrophilic finish, piece-dyed.
2. Construction: 3D ripstop double face, weight: 200 g/m² ± 5%,

III) Knitted cuffs:

Aramid, 93% meta-aramid, 5% para-aramid, 2% carbon fibre, black-blue, spun-dyed,

IV) Pull Tabs:

1. Silicone rubber FR, according to ISO 15025 and ISO 17493 no ignition, no melting, no afterburning.
2. Dimensions: 70x27 and 40x27mm.

V) Velcro fastener:

1. Cleaning, washing and flame resistant, or equivalent material
2. Permanent fitting and as far as possible covered manufacture is required.
3. The fabric weight is 350 g/m² (hook) and 370 g/m² (pile) ±5%
4. The following characteristic values represent minimum requirements:
5. Table 1: (Adhesion strength N/cm band)
6. After opening and closing 1 time ≥ 2.10 N/cm²
7. After 10,000 times ≥ 0.95 N/cm²
8. Table 2: (Adhesion strength N/cm surface)
9. After opening and closing 1 time ≥ 12 N/cm²
10. After 10,000 times ≥ 6.0 N/cm²
11. Fastness to washing in acc. with EN ISO 105 C06 grade 4–5
12. Rubbing fastness (wet & dry) in acc. with EN ISO 105 X12 grade 4–5
13. Light fastness in acc. with EN ISO 105 B02 grade 4–5.

VI) Abrasion protection with pads:

1. Silicone-carbon-coated, flame-retardant, wear and scuff resistant black Aramid material, weight approx. $390 \text{ g/m}^2 \pm 5\%$. Underneath cushioning material, weight approx. 500 g/m^2 .
2. The following characteristic values represent the requirements of silicone carbon material:
 - A) Abrasion resistance according to EN 530 (12 kPa) 16.000 rubs
 - B) Cut resistance according to EN 388 Level 3.

VII) Cushioning material:

1. Permanently flame-resistant, light, non-humidity absorbing cushioning material made from soft durable elastic and vulcanised cellular rubber, or equivalent material.
2. For this, the following technical specific values must be obtained:
3. Density [kg/m^3] according to EN ISO 845 170 ± 30
4. 25% deformation pressure [kPa] according to ASTM D-1056 $\geq 25 \leq 45$
5. 50% residual pressure deformation [%] according to ASTM D-1056 ≥ 25
6. A test certificate on the selected tests according to EN 469 is to be submitted that shows the suitability for use in firefighter protective clothing:
 - A) Limited flame spread according to EN ISO 15025: no afterflame, no afterglow, no hole formation, no melting drip-off
 - B) Thermal resistance against shrinking according to ISO 17493 $\geq 2\%$

- C) Dimensional change according to EN 25077 lengthwise and crosswise
 $\geq 1.7\%$

VIII) Reflective finish:

1. Combination reflective material yellow/silver/yellow
2. The surface of the retro-reflective material must be completely covered with glass beads where the silver center part must consist of retro-reflective, glass beads which are integrated in such a way into the fluorescent, yellow polymeric layer to create a homogenous and seamless product surface. The polymeric layer and optical system are applied to a hot melt adhesive that can be applied at 150°-185° Celsius, dependent on the substrate. The product must show a total band width of 50.8 mm with a 19 mm wide, centrally arranged silver retro-reflective band. Or a total band width of 76.2 mm with a 25 mm wide, centrally arranged silver retro-reflective band. The product must consist of disconnected single segments.
3. The reflective material must comply with the requirements of EN ISO 20471:2013, Table 4 for separate performance retroreflective materials and clearly exceed the required minimum coefficients of retro-reflection. Apart from that, the performance specifications of EN 469:2005 + A1:2006 + AC:2006 (D) , Section 6.14 or Annex B, must be complied with.
4. Thermal resistance: According to the test exposure at 180°C for 5 minutes, the material may neither drip off, ignite, melt nor shrink by more than 5%. In addition, the requirements of ISO 20471 Chapter 6.2 (retroreflective coefficient after the test), have to be complied. The test must be performed after 30 washing cycles according to EN ISO 6330,

6N at 60°C. In like manner, the requirements of EN ISO 20471:2013, Chapter 6.2, after exposure to radiant heat according to EN ISO 6942, Method A at 10kw/m² for 3 min. and after an oven test at 260°C for 5 minutes must be complied with.

5. Flame spread: The material has to be tested according to ISO 15025 (Method A) and reach Index 3 of limited flame spread according to EN ISO 14116. This applies to the condition as new as well as after 30 cycles according to ISO 6330 (Method 6N).

6. Requirements on wash-ability:

A) In its combination of background material, polymeric and glass bead layer, the reflective material must be suitable at least to a limited extent for commercial washing.

B) For this, the following criteria have to be fulfilled:

- a. 60°C according to ISO 6330 (Method 6N) up to 30 cycles according to EN ISO 20471:2013
- b. Household tumble dryer (max. 90°C exhaust air temperature, max. 120° to 140°C inlet temperature)

IX) Sewing yarn

100% Aramid or equivalent material

Third: Requirements for the garment design

X) Cut/Patterning:

The jacket is to be designed in such a way as to offer unrestricted freedom of movement. For this, gussets shall be inserted throughout

all layers in the underarm zone. The elbows are pre-shaped to allow for optimal mobility. The width comprises both enough air entrapment to maintain insulation as well as an elimination of bulk to restrict garment weight

I) Membrane:

The membrane, inserted between the lining and outer fabric, is sewn together with the wicking- barrier construction. All seams of the membrane are permanently waterproof-welded.

II) Inspection opening:

Between the lining, membrane and outer fabric, there are two inspection openings that are closed with a zipper. Access to both membrane sides for purposes of maintenance is ensured. The long zips allow the entire garment to be turned inside out through the openings. The protective effect of the garment may not be negatively affected by this.

III) Front closure:

1. The jacket is provided with a top-release panic zip that ends up in the collar seam. The zip is inserted in such a way that it can be easily exchanged. On the left-hand front part, a storm flap is sewn on next to the centre front opening. It covers the complete front length. A thermal and moisture-proof membrane is inserted. The flap is equipped with a two 2-ply, flame-retardant laminate in such a way that no wetness can be soaked to the inside of the jacket.

2. On the right-hand front part, there is a cut-on flap underneath the centre front zipper
3. The storm flap is closed with hook and loop strip. This loop strip is on the inside of the cover panel, starting from the lower edge of the collar until 10 cm above the hem edge.
4. The diametrically opposed hook strip is interrupted in the centre of the zip, and by about 5 cm at the end of the zip. In addition, the cover panel is closed 3 cm above the hem edge with a press stud.

IV) Collar:

The outside collar is made of outer fabric. The inside collar is made of one layer of lining material and one layer of outer fabric. The membrane in between is waterproof-sealed with the torso part of the membrane. In the collar seam of the membrane, there are waterproof-sealed connecting pieces to fix all the fabric plies. On the outside collar, a 16 cm long and 6 cm wide throat tab is sewn in to close the collar. The outside collar width is adjustable.

V) Shoulder pocket:

At the jackets left-hand side is a shoulder pocket, about 16cm long and 10cm wide, to fit a small radio unit or a knife. The pocket flap does have an opening for the antenna and there is an antenna and microphone fixture above the pocket.

VI) Front part and pockets:

1. Both front parts are divided by a yoke and waist cross seam.

2. On both front parts are radio pockets made of outer fabric. The pockets are open at the top and bottom, and are closed with a hook and loop strip.
3. Both side radio pockets do have an additional torch fixture inside.
4. An antenna and microphone fixture, about 13 cm long and 2.5 cm wide, is attached on both front parts in chest-height. On top of this, a loop strip is attached for fastening the name tag and/or collar. A 1.5 cm deep side pocket is sewn on both in the left and right-hand front part under the cross seam of the waist. The pocket mouths are about 19 cm wide and the pocket bag is 20 cm deep. The side pockets are inserted 1 cm below the dividing seam.
5. The pocket flaps have slanted edges and are inserted in the cross seams of the waist.
6. In each lower edge of the pocket flaps, a 2.5 cm x 2.5 cm tab is inserted. Under the flaps of the side pockets, there is an adjustable loop with press stud, on the left with a snap hook.
7. All pocket bags are made of outer fabric.

VII) Back part and shoulder pads:

1. The back part has a cross yoke seam. On the shoulders, there are topstitched shoulder pads, covered with silicone-coated Aramid, reinforced with closed cell flame retardant Neoprene.
2. The back part is made 5 cm longer in the lower area. This prolongation runs out towards the side seam.

VIII) Sleeves:

1. The sleeves are ergonomically pre-shaped with inserted underarm gussets to prevent the jacket from lifting when doing overhead work.
2. At the height of the elbow, an approx. 20 cm long and 15 cm wide reinforcement made of coated Aramid material is applied to protect the elbows and upper fabric.
3. An individual width adjustment of the cuff is possible with a hook and loop strap that has a hook and loop strip. A 2-ply, flame-retardant laminate is inserted as a wicking- barrier and prevents moisture from soaking into the inside of the sleeve.
4. Double knitted cuffs with an integrated thumb tag are attached to the wicking-barrier. The thumb opening is trimmed with bias tape made of upper fabric. The opening can be individually adjusted by the wearer.
5. To protect the wicking-barrier and upper fabric, a flame-retardant, wear and scuff resistant Aramid fabric is inserted to the inside of the cuff and to the out

IX) Preparation for rescue loop:

1. Below the front yoke seam, openings turned over with outer fabric are inserted on both sides in the joining seam of the trimming as connecting pieces to the casing at the back for the rescue loop. The vertical opening of the connecting pieces has a length of about 14 cm and is closed with an approx. 3 x 2 cm hook strip and an approx. 3 x 2.5 cm frieze strip. The connecting pieces, which are slanted at

the hemline, are about 19 cm long towards the side seam and have an opening to pull in the approx.

2. 9.5 cm long rescue loop as well as the approx. 5 cm long hook and frieze strips for fastening the rescue loop.
3. Following from there, an approx. 9.5 cm wide casing made of lining material is attached on the inside to the outer fabric. On the back part, this casing runs horizontally and, from the side seam, it slants upwards.
4. The lower topstitch seam of the casing has two interruptions of approx. 15 cm long each in the back part to pull in the rescue loop.

OTHER STANDARDS RELEVANT TO CLOTHING

Occupational equipment is unlikely to be marked with these Standard numbers, but they may contain useful information on equipment performance or test methods.

EN 348:1992	Protective clothing - Determination of behaviour of materials on impact of small splashes of molten metal
EN ISO 6942:2002	Protective clothing - Protection against heat and fire: Method of test: Evaluation of materials and material assemblies when exposed to a source of radiant heat
EN 367:1992	Protective clothing - Protection against heat and flames: Test method. Determination of heat transmission on exposure to flame

EN 348:1992	Protective clothing - Determination of behaviour of materials on impact of small splashes of molten metal
EN 373:1993	Protective clothing - Assessment of resistance of materials to molten metal splash
EN 381-1:1993	Protective clothing for users of hand-held chainsaws: Test rig for testing resistance to cutting by a chainsaw
BS 1547	Specification for flame retardant industrial clothing.
BS 2653	Specification for protective clothing for welders.
BS 3314	Specification for protective aprons for wet work.
BS 3783	Specification for X-ray lead-rubber protective aprons.
BS 3791	Specification for clothing for protection against heat for short periods.
BS 7182	Specification for air-permeable chemical protective clothing

EN 463:1994	Protective clothing - Protection against liquid chemicals: Test method. Determination of resistance to penetration by a jet of liquid (jet test)
EN 464:1994	Protective clothing against liquid and gaseous chemicals, including aerosols and solid particles: Test method. Determination of leak tightness of gas-tight suits (internal pressure test)
EN 468:1995	Protective clothing against liquid chemicals. Test method. Determination of resistance to penetration by spray (spray test)
EN 530:1995	Abrasion resistance of protective clothing material. Test methods
EN 702:1995	Protective clothing - Protective clothing against heat and flame. Test method. Determination of the contact heat transmission through protective clothing or its materials
EN 863:1996	Protective clothing - Mechanical properties. Test method: puncture resistance
EN 1149-2:1997	Protective clothing - Electrostatic properties. Test method for measurement of the electrical resistance through a material (vertical resistance)
EN 1149-3:2004	Protective clothing. Electrostatic properties. Test methods for measurement of charge decay



EN ISO 6942:2002	Protective clothing – Evaluation of materials and material assemblies when exposed to a source of radiant heat
BS 7184:2001	Selection, use and maintenance of chemical protective clothing. Guidance
TR 14560:2003	Guidelines for selection, use, care and maintenance of protective clothing against heat and flame
EN ISO 15025:2002	Protective clothing. Protection against heat and flame. Method of test for limited flame spread
ISO 22608:2004	Protective clothing against liquid chemicals. Measurement of repellency, retention, and penetration of liquid pesticide formulations through protective clothing materials



EGPC PPEs GUIDELINES

Main Department	Sector	Footwear type					Overall		Shirt & Trousers		Jacket	Fleece	Vest	EarMuff	EarPlugs	Eye-Glasses	Face Shield		Hard Hat		Baro Head	Gloves										Mask						
		EH boot	SD boot	EH shoes	Pull-on	GM Shoes	NON FR	FR	Uniform	Lined	Rain Coat	FR	Hi-Vis	Helmet Mounted	Over Head	NRR 12 db	Clear	Sun	Welding	Clear	Full Brim	Half Brim	FR	Dut Resistant	Impact Resistant	Chemical Resistant indoor	Chemical Resistant outdoor	Welding Gloves	General Purpose	Low Voltage	Vibration Resistant	Latex Gloves	Half Face Mask					
Administration	Carpenter	☑					☑		☑	☑	☑		☑		☑	☑					☑	☑															☑	
Administration	Plumber	☑					☑		☑	☑	☑				☑	☑					☑	☑																
Administration	Garden	☑					☑		☑	☑	☑				☑	☑					☑	☑																
Administration	Admin employees			☑			☑		☑		☑				☑	☑					☑	☑															☑	
Administration	Mess supervisor			☑			☑		☑		☑				☑	☑					☑	☑															☑	
Administration	Transportation			☑			☑		☑	☑	☑				☑	☑					☑	☑															☑	
Administration	Administrator (secretary for Technical Dept's)			☑			☑		☑		☑				☑	☑					☑	☑															☑	
Administration	Airport ground services		☑				☑		☑	☑	☑				☑	☑					☑	☑															☑	
Comission	All		☑				☑		☑		☑				☑	☑					☑	☑																
Departments GM	Key persons					☑			☑	☑	☑				☑	☑					☑	☑															☑	
Drilling	All		☑				☑		☑	☑	☑				☑	☑					☑	☑																
Engineering	Engineer / technician		☑				☑		☑	☑	☑				☑	☑					☑	☑																☑
Exploration	All		☑				☑		☑	☑	☑				☑	☑					☑	☑																☑
HSE	All	☑					☑		☑	☑	☑			☑	☑						☑	☑																
Laboratory	Chemist / technician		☑				☑		☑		☑				☑	☑					☑	☑				☑												☑
Laboratory	Sample Cather						☑		☑	☑	☑				☑	☑					☑	☑					☑											☑
Maintenance	Electric /amp electric Engineer / technician	☑					☑		☑	☑	☑				☑	☑					☑	☑																
Maintenance	Instrument Engineer / technician	☑					☑		☑	☑	☑				☑	☑					☑	☑																☑
Maintenance	Turbine Engineer / technician	☑					☑		☑	☑	☑				☑	☑					☑	☑																☑
Maintenance	Re-winding motors /air condition Engineer / technicians	☑					☑		☑	☑	☑				☑	☑					☑	☑																☑
Maintenance	Auto Engineer		☑				☑		☑	☑	☑				☑	☑					☑	☑																☑
Maintenance	Mechanical Engineer		☑				☑		☑	☑	☑				☑	☑					☑	☑																☑
Maintenance	Diesel Generator Engineer		☑				☑		☑	☑	☑				☑	☑					☑	☑																☑
Maintenance	Mechanical Technician		☑				☑		☑	☑	☑				☑	☑					☑	☑																☑
Maintenance	Auto Technician			☑			☑		☑	☑	☑				☑	☑					☑	☑					☑											
Maintenance	Welding Technician			☑			☑		☑	☑	☑				☑	☑					☑	☑																☑
Maintenance	Diesel Generator Technician			☑			☑		☑	☑	☑				☑	☑					☑	☑					☑											☑
Maintenance	Planning	☑					☑		☑	☑	☑				☑	☑					☑	☑																☑
Material	Administrator			☑			☑		☑		☑				☑	☑					☑	☑																☑
Material	Warehouse Employees			☑			☑		☑		☑				☑	☑					☑	☑																☑
Material	Yard employees	☑					☑		☑	☑	☑				☑	☑					☑	☑																☑
Material	Diesel / Gasoline station employees		☑				☑		☑	☑	☑				☑	☑					☑	☑					☑											☑
Medical	Doctors / Nurse			☑			☑		☑	☑	☑				☑	☑					☑	☑																☑
Process	Engineer / technician		☑				☑		☑	☑	☑				☑	☑					☑	☑					☑											☑
Production	ESP Engineer / technician			☑			☑		☑	☑	☑				☑	☑					☑	☑					☑											☑
Production	Sulfer Rod Engineer / technician			☑			☑		☑	☑	☑				☑	☑					☑	☑					☑											☑
Production	Welfare Engineer / technician			☑			☑		☑	☑	☑				☑	☑					☑	☑					☑											☑
Production	Facilities/Production Engineer / technician			☑			☑		☑	☑	☑				☑	☑					☑	☑					☑											☑
Project	Civil /Electric / Instrument	☑					☑		☑	☑	☑				☑	☑					☑	☑					☑											☑
Project	Mechanical		☑				☑		☑	☑	☑				☑	☑					☑	☑					☑											☑
Project	Material supervisor	☑					☑		☑	☑	☑				☑	☑					☑	☑																☑
Security		☑					☑		☑	☑	☑				☑	☑					☑	☑																☑
Telecom	Engineer / technician	☑					☑		☑	☑	☑				☑	☑					☑	☑																☑
IT	Engineer / technician			☑			☑		☑	☑	☑				☑	☑					☑	☑																☑



ANNEX1