



# **Dubai Municipality Health and Safety Department**



## **Technical Guideline on Personal Protective Equipment – Eye and Face Protection**

**DM-PH&SD-GU59-PPEFP2**

 GOVERNMENT OF DUBAI	<b>Organization Unit:</b>	<b>Health &amp; Safety Department</b>	<b>الوحدة التنظيمية:</b>	 بلدية دبي DUBAI MUNICIPALITY
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## 1. INTRODUCTION

Workers are subjected to various hazards wherein eye and face injuries are potentially one of the most painful, debilitating and costly injuries that can occur in the workplace. Due to the harmful and severe injuries that may affect the worker's eye and face which can also result to forfeiture of earnings in worst cases of loss of sight, Dubai Municipality through Local Order 61/1991, Article 38.4 mandates all employers to *"Take every precaution necessary for the protection of the worker and ensure his safety from occupational illness or potential work accident"*.



This technical guideline aims to provide guidance to employers to safeguard their employees from foreseeable hazards that may cause eye and face injuries. Employers must put every effort to eliminate and minimize occupational hazards since eye and face protection equipment does not provide unlimited protection and should not be used as a substitute to engineering controls such as machine guarding or isolation but should be used in conjunction with other risk control measures and sound safe systems of work.

Proper selection of eye and face protection devices should be considered based on work type activity, risks at work and other factors as detailed in this guideline. Use of personal protective equipment is always the last resort in risk control measures and the employers must ensure that employees provided with necessary eye and face protection are diligent in wearing the appropriate personal protectors while on work or while hazards are present.

## 2. PURPOSE

This document provides guidance on proper selection, general requirements, use, training, care, maintenance and replacement of eye and face protectors to minimize the likelihood and severity or prevention of injuries from workplace hazards such as impact, non-ionizing radiation and liquid splash exposure from chemicals which includes but not limited to machinery operations, chemical handling, material welding and cutting and assembly operations.

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### 3. SCOPE

This technical guideline, shall apply to all commercial and industrial establishments, public or government institutions, including construction-related project sites in the emirate of Dubai.

This technical guideline does not cover certain hazardous exposures which include but not limited to blood-borne pathogens, high energy particulate radiation, lasers, masers, microwaves, radio frequency radiation, X-rays, sports and recreation.

### 4. DEFINITION

Unless the context otherwise requires, the following terms shall be deemed to mean the definitions hereby assigned to them.

#### **Chin protector**

Part of the faceshield that provides lower face, chin and neck protection to the wearer.

#### **Component**

Functional part of the eye and face protective device that was subjected to performance requirements of applicable conformance standards.

#### **Crown**

Part of the faceshield that provides forehead protection to the wearer.



#### **Faceshield**

A protector designed, when used over primary eye protection devices (spectacles or goggles), to shield the wearer's face, or portions thereof, in addition to the eyes, from certain hazards, depending on the faceshield type.

#### **Filter lens**

Type of lens that reduces the effects of specific wavelengths of infrared, visible, and/or ultraviolet radiation.

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### Fracture

A lens is considered to have fractured in the event that it sustained cracks through its entire thickness into at least two separate pieces or if any visible material is fully detached from the internal surface.

### Frame

Part of eyewear which is designed to hold the lens or lenses in the proper position.

### Full-facepiece respirator

Tight fitting respirator that covers the eyes, nose and mouth from approximately the hairline to beneath the chin.

### Goggle

A type of eye protector designed to fit the face surrounding the eyes from certain hazards, depending on the goggle type.

### Handshield

Hand held protective device used by welders

### Infrared radiation (IR)

As related to the conformance standards referenced in this technical guideline, electromagnetic energy with wavelengths ranging from 780-2000 nanometers.

### Lens

Translucent part of the protective device wherein the wearer sees.



### Photochromic lens

Type of lens which automatically darkens during exposure, and fades when removed from sunlight and/or ultraviolet radiation.

### Plano lens

Lens which is not provided with vision correction.

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### Prescription lens (Rx)

Lens which was made specifically to match the wearer's vision corrective prescription.

### Sideshield

A part of the spectacle which is permanent or detachable that provides side impact resistance.

### Spectacle

A protector designed to afford eye protection from certain hazards, depending on the type.

### Temple

Part of the spectacle's frame commonly attached to the front and passes on either side of the head to the ears.

### Ultraviolet radiation (UV)

A type of electromagnetic energy generated from the sun and other artificial sources with wavelengths ranging from 200-380 nanometers.

### Welding helmet

A faceshield type device designed to specifically provide protection to the eyes and face against optical radiation and weld spatter.



## 5. GUIDELINES

### A. Hazard Identification and Risk Assessment

The employer shall carry out occupational eye and face hazard identification to determine the risk of exposure to eye and face hazards, including those which may be encountered during emergency situations taking into account the adequacy of any existing controls.

Workers are exposed to various occupational hazards that may cause eye and face injuries and the employer should be aware of the possibility of multiple and simultaneous hazard exposures. The following

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list of hazards may be present in the workplace and may be considered in conducting Hazard Identification and Risk Assessment.

- Impact – blunt impact of flying or swinging objects such as chips, fragments, particles, dirt, sand, etc. from activities and operations like machining of metal, wood and plastic, grinding and chipping with power operated tools, use of hand held tools, masonry, riveting, handling of molten metals, etc.
- Dust – exposure to nuisance and fine dust from woodworking, buffing and general dusty conditions.
- Heat – exposure to intense heat from operations and activities such as pouring, casting and hot dipping of metals, furnace operations, welding or other similar operations.
- Chemical – exposure to hazardous substances due to liquid splash, vapors, fumes, droplets and mist from handling and use of chemicals from industrial processes, laboratories, etc.
- Optical radiation – exposure to infrared (IR), ultraviolet (UV), blue light, and glare from activities such as welding, brazing, torch cutting, laser, soldering work and other similar activities.
- Electrical – sparks and arc flashes as a result of working near or with the use of electricity.
- Environmental factors – such as humidity, temperature, etc. brought about by the working environment, climatic conditions and other environmental factors that may affect the use of personal protective equipment.
- Human factors – often describes the interaction of people or employees with each other, working environment, equipment and facilities. Human factors include the attitude of workers with regards safety measures, length of work, fit and comfort of personal protective equipment, compatibility with prescriptive eyewear, disabilities, worker comprehension to follow instructions, etc.

Having identified the hazards, completed the risk assessment and having taken account of existing controls, the organization should be able to determine whether existing controls are adequate or needs improvement, or if new controls are required.

If new or improved controls are required, selection should be determined by the principle of the hierarchy of hazard controls which includes elimination or minimization through engineering, administrative and personal protective equipment controls.

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Hazard identification shall be undertaken by individual(s) who have the necessary capability and competence in relevant hazard identification methodologies and techniques and have suitable knowledge of the work being conducted.

## B. Eye and Face Protection Selection Factors and Procedures


If the identified risks are still not eliminated or reduced to an acceptable level, eye and face protectors shall be considered and used in conjunction with other control measures such as machine guards, engineering and other control measures to reduce the risks. Employers shall develop procedures in the selection of appropriate eye and face protection that will afford the necessary level of protection and comfort to workers. The following factors shall be considered in the selection process.


### Anticipated potential hazards

Workplace potential eye and face injury hazards may come from different sources such as from flying fragments and objects such as large chips, sand and dirt, hot sparks, high temperature exposure, splash from chemicals and molten metal, irritating mist, glare, welding, torch brazing, etc. Employers should carefully consider appropriate type of eye and face protector since the worker has possibility to be exposed to multiple and simultaneous hazards wherein the chosen protector(s) should be able to protect against the highest level of each hazard.




### Type of Eye and Face Protection

There are many types of eye and face protection which provides different levels of protection depending on the identified risks (For guidance on the selection of eye and face protectors, refer to Annex A). The following are the types of eye and face protectors.

Type of Protector	Description
Safety spectacles 	Protective eyewear intended to shield the wearer's eyes from certain hazards and impact of flying fragments, chips, particles, dirt, etc. Spectacles are also available with prescriptive lenses for those persons who needs eye correction.

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<b>Safety goggles</b> 	A type of eye protector designed to fit the face surrounding the eyes from certain hazards, depending on the goggle type. Goggles depending on configuration (direct, indirect or no ventilation) can provide certain protection from different hazards such as impact, liquid splash, dust, infrared radiation, etc.
<b>Faceshields</b> 	A protector designed, when used over primary eye protection devices (spectacles or goggles), to shield the wearer's face, or portions thereof, in addition to the eyes, from certain hazards, depending on the faceshield type.
<b>Welding helmet</b> 	A faceshield type device designed to specifically provide protection to the eyes and face against optical radiation and weld spatter.

Note: Images shown represent the protective devices available at the time of the preparation of this technical guideline. Eye and face protection do not need to take the forms shown but must meet the requirements as specified in this document.

### Appropriate accessories provided

Ensure that the selected eye and face protection shall be compatible with other personal protective equipment such as head, ear and respiratory protective equipment.



Personal protection selected for the workplace should be suitable for the actual working environment and whenever possible, will not limit vision and hinder the work to be done. Manufacturer shall be consulted to ensure compatibility of selected personal protective equipment prior use in the work place.

### Fitness, Comfort and Durability

Safety eye wears are available in different styles and sizes. Ensure that eye protectors are fitted properly to every user. Many accidents involving foreign bodies in the eye are a direct result of a safety eyewear product not offering sufficient protection due to poor fitting.

Comfort should be considered in the selection of eye and face protection since users may wear these protective products in long periods of time. Comfort during prolonged wear is improved if the selected product provides good optical quality.

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Employers shall ensure to procure eye and face protection from manufacturers or suppliers of good quality. Protective products must be made from durable materials rendering it to be used for longer periods of time, withstand wear and tear and provide adequate protection from workplace hazards.

### Type of Optical Lenses

Selection on the type of optical lenses shall be based on the type of hazard, work environment and need of the wearer. Eyewear maybe provided with prescriptive lenses to provide eye correction.

Lenses can be clear, tinted, photochromic or polarized. Each type of lenses and shade provides different levels of protection against optical radiation hazards such as infrared radiation (IR), visible light (glare), ultraviolet radiation (UV), welding, oxyfuel cutting, torch brazing and soldering.



### C. Conformance with International/UAE Standards

Employers shall ensure to provide their personnel with eye and face protection equipment with good quality and conforming to applicable UAE and international standards to ensure intended level of protection is afforded if properly selected and used by employees. Employers should purchase personal protective equipment from manufacturers or traders which have a valid conformity certificate for personal protective equipment products from Emirates Authority for Standardization and Metrology (ESMA). This technical guideline also considers the succeeding conformity standards in the selection of suitable eye and face protection.

ANSI Z87.1:2015 is the current standard from American National Standard Institute (ANSI) for occupational and educational personal eye and face protection devices. All components of eye and face protection devices bearing the permanent marking of this standard shall meet all applicable requirements in its entirety to minimize the occurrence and severity or prevention of injuries from foreseeable hazards (e.g. impact, non-ionizing radiation and/or chemical exposures) in work related and educational activities which includes, but not limited to, machinery operations, welding and cutting activities, chemical handling, and assembly operations.

Eye and face protection devices under European Standard must meet the requirements of EN 166:2001 which is applicable to all types of personal eye-protectors used against various hazards in work places such

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as industries, laboratories, educational establishments, do it yourself (DIY) activities, etc. which are likely to injure the eye or impair vision.

ANSI Z87.1:2015 and EN 166:2001 standards does not include certain hazardous exposures which include but not restricted to blood-borne pathogens, high energy particulate radiation, lasers, masers, microwaves, radio frequency radiation, X-rays, sports and recreation.

Every effort should be made to eliminate eye and face occupational hazards. Users must be informed that personal protectors do not provide unlimited protection against hazards and are not substitutes for sound risk control measures but should be used in conjunction with machine guards, engineering controls, and sound safety practices. Selection of appropriate eye and face protection in accordance with the above standards will be based on hazard evaluation in the workplace.

#### D. Safe Systems of Work

Employers are required to implement safe systems of work in every work site which includes information, training, instruction and supervision. Safe systems of work must be properly communicated to all stakeholders detailing potential hazards, duties and responsibilities, procedures and guidelines. Ensure that workers are properly supervised in the proper and diligent use of eye and face protection equipment.



Safety management systems shall be properly reviewed and revised to assess effectiveness and suitability of existing control measures and use of eye and face protection.

#### E. Activities and Typical Hazards Requiring Eye and Face Protection

The following are the examples of activities and typical hazards which requires eye and face protection as given in schedules A and B. List serves as a guide and is not exhaustive.

*Schedule A (Processes which may injure the eyes from particles or fragments thrown off or splash of chemicals).*

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- Breaking, carving, dressing or cutting of stones, concrete, brick, slag or similar material by means of a hammer, chisel, pick or similar hand tool or by means of a power tool and by the grinding of surfaces of any such materials by means of a wheel or disc driven by mechanical power.
- Dividing into separate parts of bricks, concrete, stones, metal or similar material by means of high speed saw or abrasive cutting off wheel or disc driven by mechanical power.
- Turning of metal or articles
- Drilling by means of stationary or power tools
- Cutting and welding of metals by means of an electric, oxy-acetylene or similar process.
- Hot fettling of steel castings.
- Fettling metal castings which involves the stripping of metal including runners, gates and risers and the removal of any other material.
- Chipping of metal, knocking out or cutting out or cutting off cold rivets, bolts, collars, lugs, pins, nuts, etc. from any structure or plant, thru the use of a hammer, chisel, punch or similar hand tool or by means of a portable power tool.
- Cutting and scuffing of scale, slag, paint, rust or other corrosion from the surface of metal or other materials by means of hand or power tools.
- Breaking of scrap metal thru the use of a hammer or by any other similar mechanically driven tool.
- Routing of metal.
- Working with drop and power hammers.
- Working near the furnace where there is risk to the eyes from molten metal.
- Pouring or skimming molten metal.
- Work which involves the risk that the hot sand thrown off may hurt the eyes.
- Dressing or truing of an abrasive wheel.
- Handling or manipulation of strong acids or dangerous corrosive liquids/chemicals or materials in open vessels and the operation, maintenance or dismantling of plant or any other part of plant which contains or contained such substances.
- Any other process where there is a risk of injury to eyes from particles or fragments thrown off and splash of chemicals during the course of the process.

Schedule B (*Processes which may cause injury to the eyes by reason of excessive exposure to glare, infrared or ultraviolet radiations*).

- Cutting and welding of metals by means of an electrical, oxy-acetylene or similar process.

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- All work activities conducted on furnaces wherein there is risk of exposure to excessive infrared radiation or light.
- Processes such as casting, rolling or forging of metals wherein eye exposure to excessive light or infrared radiation is likely
- Any other process or activity in which there is a risk of injury to the eyes from exposure to excessive light or infrared (IR) or ultraviolet (UV) radiations.

#### F. Eye and Face Protection General Requirements

Employers must provide adequate, appropriate and approved eye and face protection equipment to employees involved in processes and activities or work areas wherein there is a reasonably foreseeable risk of injury to the eyes.

Identified areas with activities and processes that may cause injury to the eyes shall be provided with conspicuously displayed signage with a statement *“Eye Protection is Required”*.



Protectors are a personal item and should be issued for exclusive use by a particular individual. However, in circumstances where protectors are reissued, the protectors should be maintained in a sanitary and reliable condition.

Eye and face protection devices shall provide comfort and fit to users. Poorly fitted protectors will not afford the protection for which they were designed. Protectors should be fitted by qualified personnel.

Spectacles with impact resistant rated lenses shall be used.

Spectacles without sideshield protection are not acceptable. Spectacles must have sideshield to restrict the entry of flying particles from the side of the wearer.

Welding helmets or faceshields should be only used over primary eye protection (spectacles or goggles).

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All components of eye and face protectors shall comply with the applicable standards as specified in this technical guideline. Accessories provided by the manufacturer shall not cause the protective device to fail the requirements of the applicable standard wherein it should comply.

Non-compliant components shall not be used with ESMA, ANSI Z87.1-2015, or EN 166:2001 complaint components.

Protector lenses shall be free of scratches, bubbles, inclusions, dull spots, pitting, mould marks, scouring, scaling and other visible effects which would impair optical quality.

Eye and face protection devices shall be free from projections, sharp edges, or other defects which are likely to cause discomfort or injury during use.

Materials which are known to be likely to cause skin irritation or any adverse effect on health shall not be used for parts of the eye protector that come into contact with the skin of the wearer.

Protective lenses shall be robust and not fracture when subjected with an impact as specified in applicable standard test (e.g. drop ball impact test in accordance with ANSI 87.1-2015).



All metal components of protectors shall display smooth surfaces and be corrosion resistant to the degree that the function of the protector shall not be impaired by the corrosion.

Protector shall be resistant to ignition in accordance with applicable international testing standards.

Personnel whose eyesight requires the use of prescription (Rx) lenses must wear either protective devices designed to be worn over regular prescription (Rx) eyewear or protective devices fitted with prescription (Rx) lenses.

Contact lens maybe used only with medical report from Dubai Municipality recognized physician and must only be used in conjunction with appropriate eye and face protection devices in a hazardous environment. Contact lenses are not protection devices wherein dusty and/or chemical environments may represent an additional hazard.

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Protective lenses with low luminous transmittance specification should not be used indoors, except if required for protection from optical radiation. Care should be exercised in conjunction with wearing such lenses for driving vehicles with tinted windshields or driving during night. Protective lenses with polarized coating present viewing problems when reading liquid crystal displays which are commonly found in vehicle dashboards. Some tinted lenses due to its characteristic of absorbing certain wavelengths makes viewing or reading visual displays or signs difficult.

Filter lenses must meet the requirements for shade designations in accordance with the applicable standards specified in this technical guideline. Tinted and shaded lenses are not filter lenses unless marked or identified as such by the standards.

Protectors shall be designed and worn to provide the wearer adequate ventilation and well protected from splash entry.

Emergency eye wash and shower facilities shall be provided for areas where there is a risk of eye injuries due to chemicals handled. Ensure that the emergency equipment is available and accessible at all times wherein it could provide a controlled flow of flushing fluid for a minimum of 15 minutes until medical personnel arrive.


## G. Safety Instructions and Markings


Every eye and face protection equipment shall be provided with manufacturer's instructions indicating proper storage, use, maintenance, cleaning, disinfection, protection capabilities and limitations, etc.

Employer must ensure that every user must be informed of the instructions and that employees must adhere to the specified manufacturer's instructions on the use, fitting, care, maintenance and other guidelines for eye and face protection.

All protectors claiming to comply with the requirements of the standards indicated in this guideline shall bear clear and permanent markings. The marking shall be fully visible when the complete eye protector is assembled and shall not impede vision when worn.

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### Marking for ANSI Z87.1-2015 Standard

Sequence of markings for ANSI standard for eye and face protection can follow a top to bottom sequence or a left to right sequence. Below information is provided to demonstrate example of resulting product marking compliant with this standard.

Manufacturer's Mark or Logo	Standard Mark	Impact Mark	Lens Type	Use
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Marking Requirements				
Type of Mark	Lenses & Replacement Lenses		Frame <sup>1</sup>	Marking for Complete Device (no replaceable parts) <sup>2</sup>
	Spectacles	All Others		
Manufacturer's Mark of Logo	Yes	Yes	Yes	Yes
Standard Mark				
• Plano	(None)	Z87	Z87	Z87
• Prescription	(None)	Z87	Z87-2	Z87-2
Impact Mark				
• Impact Rated	+	+	+	+
• Non-Impact Rated	(None)	(None)	(None)	(None)
Coverage (small head sizes) <sup>3</sup>	H		H	
Lens Type	(None)			(None)
• Clear	W shade <sup>5</sup>			W shade <sup>5</sup>
• Welding	U scale number <sup>6</sup>			U scale number <sup>6</sup>
• UV Filter <sup>4</sup>	L scale number <sup>7</sup>			L scale number <sup>7</sup>
• Visible Light Filter	R scale number <sup>8</sup>			R scale number <sup>8</sup>
• IR Filter	V			V
• Variable Tint	S			S
• Special Purpose				
Use				
• Splash/Droplet			D3	D3
• Dust			D4	D4
• Fine Dust			D5	D5

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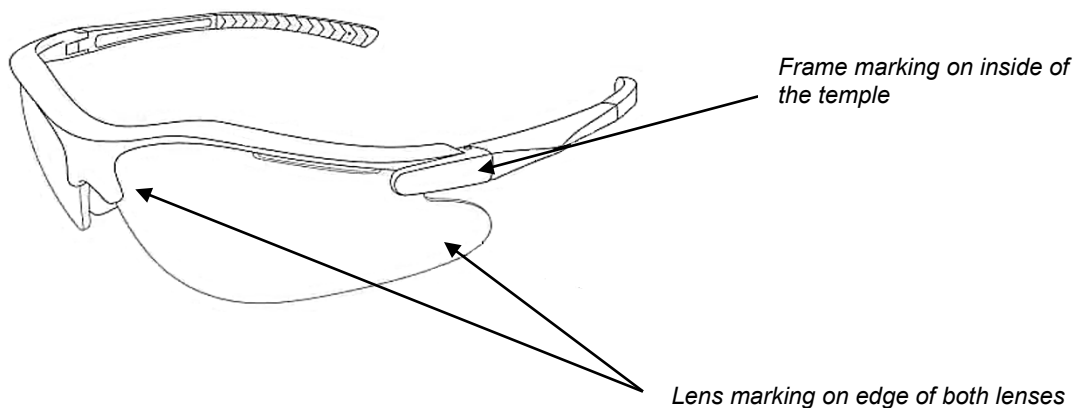



Note:

- Components of frames subject to marking that vary by type of protector.
  - Spectacles: Front and at least one temple. Both detachable sideshields are marked Z87+, if impact rated
  - Goggles: Frame and lens
  - Faceshields: Headgear/adaptor, crown and chin protector
  - Handshields and welding helmets: Headgear/adaptor, shell and lens housing or carrier
  - Respirators: None
  - Prescription frames: Size marking on front and temples in accordance with ANSI Z80.5-2004
- A complete device with no replaceable components shall be provided with at least one set of markings. The markings may be on the lens or the frames or both the lens and the frame.
- For spectacle safety eyewear, coverage marking "H" shall be located on the lens for rimless or semi rimless lens retention systems.
- "Filter" include: UV, Visible and IR Light Filters. For filters with multiple type compliance, designations shall be listed in the order given in this table: U, L, R.
- Welding shade numbers range from 1.3 to 14. Higher numbers denote darker lenses.
- UV filter scale numbers ranges from 2 to 6. Higher number denotes higher protection from far and near UV.
- Visible Light scale numbers ranges from 1.3 to 10. Lower numbers provides greater light transmittance.
- Infrared filter scale numbers ranges from 1.3 to 10. Lower numbers provide greater infrared transmittance.

#### Example of ANSI Z87.1-2015 marking standard

(For fictitious manufacturer: U)



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Example Device Specification	Resulting Mark
Impact rated, Welding (shade no. 3) Faceshield	UZ87+W3
Impact rated Goggle	UZ87+
Non-impact rated Goggle or Faceshield	UZ87
Impact rated Plano Spectacle	UZ87+
Impact rated Prescription Spectacle	UZ87-2+
Impact rated, Splash rated, Goggle or Faceshield	UZ87+D3
Impact rated, Goggle or Full Face Piece Respirator, splash, dust and fine dust rated	UZ87+D3D4D5
Non-impact rated, UV protective (scale no. 3), Goggle or Faceshield	UZ87U3

### Marking for EN 166:2001 Standard

Eye and face protection devices claiming to meet the requirements of EN 166:2001 shall carry the CE mark and contain the following order of technical information where relevant.

#### Lens Marking Identification

Scale Number (filters only)	Manufacturer Identification	Optical Class	Mechanical Strength	Fields of Use	Optional Requirements		
					Scratch Resistance	Fog Resistance	Radiant Heat

Where Applicable


#### Frame Marking Identification

Manufacturer Identification	EN Standard (EN 166)	Fields of Use	Mechanical Strength	Symbol to Fit Small Head	Highest scale number allowed
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Where Applicable

#### Meanings of the EN Marking

Scale Number		
(For eye protectors with filtering effect only. Consists of a <i>Code</i> and <i>Shade</i> separated by hyphen. Higher shade numbers have a stronger filtering effect)		
Type of Filter	Code Number	Shade Number
Welding Filters	No code Number	Between 1.2 to 16

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Ultraviolet (UV) Filters without color recognition	2	Between 1.2 to 5
Ultraviolet (UV) Filters with good color recognition	3	Between 1.2 to 5
Infrared (IR) Filters	4	Between 1.2 to 10
Sunglare Filter without infrared specification	5	Between 1.1 to 4.1
Sunglare Filter with infrared specification	6	Between 1.1 to 4.1

Optical Class	
Type	Description
1	Suitable for prolonged use
2	Suitable for sporadic use
3	Suitable for transient use

Mechanical Strength	
Symbol	Mechanical Strength Requirement
No symbol	Minimum robustness
S	Increased robustness (lenses only)
F (T)	High speed particles, Low Energy Impact (any type)
B (T)	High speed particles, Medium Energy Impact (goggles and faceshields only)
A (T)	High speed particles, High energy impact (faceshields only)

Note: Frames and lenses which meets the requirements of protection against impact at extreme temperatures (-5°/+55°C) shall be marked with one of the impact symbols followed by the letter T. i.e. FT, BT, or AT.

Fields of Use		
Symbol	Designation	Description of the field of use
No symbol	Basic Use	Unspecified mechanical hazards and hazards arising from UV, visible, IR and solar radiation
3	Liquids	Liquids (droplets or splashes)
4	Large dust particles	Dust with a particle size of > 5 µm
5	Gas and fine dust particles	Gas, vapors, sprays, smoke and dust with a particle size of < 5 µm
8	Short circuit electric circuit	Electric arc due to short circuit in electrical equipment
9	Molten metals and hot solids	Splashes of molten metals and preparation of hot solids

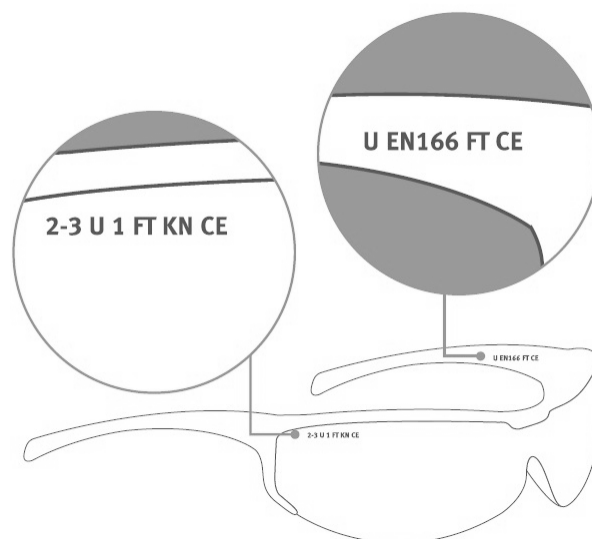
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Optional Requirements	
Symbol	Description
K	Resistance to surface abrasion by fine particles
N	Resistance to fogging of oculars
T	Protection against high speed particles at extreme temperatures
H	Frame suitable for small head
R	Enhanced reflectance

Example of EN 166:2001 marking standard  
(For fictitious manufacturer: U)

Lens Marking Identification					
2-3	U	1	FT	KN	CE
Scale Number	Manufacturer Identification	Optical Class	Mechanical Strength	Optional Requirement	



Frame Marking Identification			
U	EN 166	FT	CE
Manufacturer Identification	Standard	Mechanical Strength	



## H. Training

Employers are required to provide training for employees and even visitors. Records of any training including induction and tool box talks shall be properly kept for at least five (5) years and be made readily available to Dubai Municipality OHS inspectors and other regulatory agencies for review and demonstrate compliance with pertinent UAE and DM regulations.

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Scope of training may include risks of eye and face injuries in the workplace, preventive measures, legal obligations, when to use, proper use, fitting and care, safe practices, replacement, limitations etc.

Trainers must inform users that the use of personal protective equipment such as eye and face protectors are not to be relied upon in providing unlimited protection against hazards and are not substitutes for sound risk control measures but should be used in conjunction with machine guards, engineering controls, and sound safety practices.

## I. Safe Use Provisions

Users should visually inspect all eye and face protectors prior use. Protectors with broken parts, excessive scratches and distorted are unsuitable for use and shall not be worn. Defective protectors shall be handed over to a responsible person for discarding and replacement.

Lens or parts of eye protectors in contact with eyes shall be disinfected or cleaned prior use.

Persons shall properly and diligently use eye and face protectors while at work, during the presence of nearby foreseeable eye and face hazards or as directed by work supervisor/manager.



Employee shall report to the management the loss or damaged eye protection equipment prior commencement of work.

Employee shall report to the management if the issued eye and face protection is not properly fitting, uncomfortable or limits/hinders vision prior start of work.

Cautiousness shall be observed while using metal frame protective devices in electrical hazard areas.

Atmospheric conditions and the protectors' restricted ventilation can cause lenses to fog. Frequent cleaning may be required.

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## J. Care and Maintenance of Safety Eyewear

When not in use, eye and face protection equipment should be stored in areas which are cool, dry, clean and not exposed to direct sunlight. Presence of heat, oil, chemicals or other degrading elements shall be avoided in protective eyewear storage area(s) since it may adversely affect the quality of the product(s) to provide the necessary intended protection.

Protection equipment which is stored for extended period of time shall be visually inspected for defects wherein damaged products shall not be used, be discarded and replaced.

Regular cleaning shall be carried out to eye and face protectors to remove dirt, oils, and other contaminants in accordance with manufacturer's instructions. Protectors are generally cleaned using water and soap and left to dry in open air. Use of solvents for cleaning is not recommended as it may reduce the strength of the protective device.


There is no specified shelf or service life to eye and face protection equipment. However, protective eyewear subjected to impact, damage due to wear and tear, excessive scratches, inadvertent damage or change of wearer's prescription shall be removed from service and immediately replaced.

## 6. REFERENCES

European Standard – Personal eye protection specifications (EN 166:2001)











American National Standard Institute (ANSI) – For occupational and educational personal eye and face protection devices (ANSI/ISEA Z87.1:2015)


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## ANNEX A: EYE AND FACE PROTECTION SELECTION GUIDE


The succeeding selection guide is based from ANSI/ISEA Z87.1-2015 standard document and is not intended to be the only reference in selecting the proper eye and face protector. The below guide is intended to aid in identifying and selecting the available and compatible types of eye and face protectors based on the limitations of the listed hazards. Employers may also consult the manufacturer's guidelines for specific applications.

HAZARD	TYPE OF PROTECTORS	LIMITATIONS	
<b>IMPACT</b> - Chipping, grinding, machining, masonry work, riveting, & sanding activities			
Flying fragments, objects, large chips, particles, sand, dirt, etc.	<ul style="list-style-type: none"> <li>Spectacles with side protection (A)</li> <li>Goggles with direct or indirect ventilation (B, C)</li> <li>Faceshield over spectacles or goggles (E)</li> <li>Welding helmet over spectacles or goggles (F)</li> <li>Loose-fitting respirator over spectacles or goggles (G)</li> <li>Full-facepiece respirators (H)</li> </ul>	<p>Cautiousness shall be observed while using metal frame protective devices in electrical hazard areas. Metal frame eye and face protective equipment could likely cause electrical shock and burn through contact or thermal burns from exposure to electrical energy hazards which include radiation from accidental arcs.</p> <p>Ensure that goggles fit tightly to the face in order to provide adequate protection.</p> <p>Atmospheric conditions and the protectors' restricted ventilation can cause lenses to fog. Frequent cleaning may be required</p>	<p>A. Spectacles with side protection</p>  <p>B. Goggles with direct ventilation</p>  <p>C. Goggles with indirect ventilation</p>  <p>D. Goggles with no ventilation</p>  <p>E. Faceshield worn over spectacles or goggles</p>  <p>F. Welding helmet worn over spectacles or goggles</p>  <p>G. Loose fitting respirator worn over spectacles or goggles</p>  <p>H. Full facepiece respirator</p>  <p>I. Screen faceshield worn over spectacles or goggles</p>  <p>J. Reflective faceshield worn over spectacles or goggles</p> 
<b>HEAT</b> - Furnace operations - casting, hot dipping, pouring, gas cutting, & welding			
Hot sparks	<ul style="list-style-type: none"> <li>Spectacles with side protection (A)</li> <li>Goggles with direct or indirect ventilation (B, C)</li> <li>Faceshield over spectacles or goggles (E)</li> <li>Loose-fitting respirator over spectacles (G)</li> <li>Full-facepiece respirator (H)</li> </ul>	<p>Spectacles, cup and cover type goggles do not provide unlimited face protection.</p> <p>Operations involving heat may also involve optical radiation.</p> <p>Suitable level of protection shall be provided for both hazards.</p>	
Splash from molten metal	<ul style="list-style-type: none"> <li>Faceshield over goggles (E)</li> <li>Loose-fitting respirator over spectacles or goggles (G)</li> <li>Full-facepiece respirator (H)</li> </ul>		
High temperature exposure	<ul style="list-style-type: none"> <li>Screen faceshield over spectacles or goggles (I)</li> <li>Reflective faceshield over spectacles or goggles (J)</li> </ul>		
<p>* The images shown represent the protective devices available at the time of the preparation of this technical guideline. Eye and face protection devices do not need to take the forms shown but must meet the requirements as specified in this document.</p>			




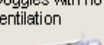
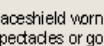

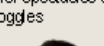


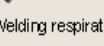
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HAZARD	TYPE OF PROTECTORS	LIMITATIONS	
<b>CHEMICAL</b> - Liquids, acid and chemical handling, degreasing, plating			
Splash, droplets and sprays	<ul style="list-style-type: none"> <li>Goggles with indirect ventilation (eyecup or cover type) (C)</li> <li>Faceshield over goggles (E)</li> <li>Loose-fitting respirator over spectacles or goggles (G)</li> <li>Full-facepiece respirator (H)</li> </ul>	<p>Lenses of protectors may fog due to atmospheric conditions and the restricted ventilation provided by the protector. Frequent cleaning may be required.</p> <p>Ensure goggles fit tightly to the face to provide adequate protection.</p>	<p>A. Spectacles with side protection</p> <p>B. Goggles with direct ventilation</p> <p>C. Goggles with indirect ventilation</p> <p>D. Goggles with no ventilation</p> <p>E. Faceshield worn over spectacles or goggles</p>
Irritating mist	<ul style="list-style-type: none"> <li>Goggle with no ventilation (cover type) (D)</li> <li>Faceshield over goggles (E)</li> <li>Loose-fitting respirator over spectacles or goggles (G)</li> <li>Full-facepiece respirator (H)</li> </ul>		
<b>DUST</b> - Woodworking, buffing, general dusty conditions			
Nuisance dust	<ul style="list-style-type: none"> <li>Goggles with direct or indirect ventilation (eyecup or cover type) (B, C)</li> <li>Full-facepiece respirator (H)</li> </ul>	<p>Lenses of protectors may fog due to atmospheric conditions and the restricted ventilation provided by the protector. Frequent cleaning may be required.</p>	F. Welding helmet worn over spectacles or goggles
Fine dust	<ul style="list-style-type: none"> <li>Goggles with indirect ventilation or no ventilation (C, D)</li> <li>Full-facepiece respirator (H)</li> </ul>	<p>Ensure goggles fit tightly to the face to provide adequate protection</p>	G. Loose fitting respirator worn over spectacles or goggles
<b>OPTICAL RADIATION</b>			
Infrared Radiation (IR)	<ul style="list-style-type: none"> <li>Spectacles with side protection (A)</li> <li>Goggles with direct or indirect ventilation (B, C)</li> <li>Faceshield over spectacles or goggles (E)</li> </ul>	<p>For proper fit of protector; there shall be no penetration of direct infrared spectra light or direct visible light or direct ultraviolet light in all non-lens areas.</p>	H. Full facepiece respirator
Visible light (Glare)	<ul style="list-style-type: none"> <li>Welding helmet over spectacles or goggles (F)</li> <li>Loose-fitting respirator over spectacles or goggles (G)</li> <li>Full-facepiece respirator (H)</li> </ul>	<p>Sideshields shall have equal to or greater than the filtering capability of the front lenses.</p>	I. Screen faceshield worn over spectacles or goggles
Ultraviolet Radiation (UV)			J. Reflective faceshield worn over spectacles or goggles
Lasers	Refer to ANSI Z136.1-2014 "Safe Use of Lasers", for guidance in choosing the correct protective eyewear when working with lasers.		

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HAZARD	TYPE OF PROTECTORS	LIMITATIONS	
<b>OPTICAL RADIATION</b>			
Arc welding	<ul style="list-style-type: none"> <li>Welding helmet over spectacles or goggles (F)</li> <li>Handshield over spectacles or goggles (G)</li> <li>Welding Respirator (H)</li> </ul> <p>Typical Filter Lens Shade: 10-14</p>	<p>Optical radiation protection is directly associated to the density of filter lens. Select the darkest shade that allows adequate task performance.</p> <p>For proper fit of protector; there shall be no penetration of direct visible light (glare) in all non-lens areas.</p>	<p>A. Spectacles with side protection</p>  <p>B. Goggles with direct ventilation</p>  <p>C. Goggles with indirect ventilation</p>  <p>D. Goggles with no ventilation</p>  <p>E. Faceshield worn over spectacles or goggles</p>  <p>F. Welding helmet worn over spectacles or goggles</p>  <p>G. Handshield over spectacles or goggles</p>  <p>H. Welding respirators</p>  <p>I. Welding goggles</p>  <p>J. Welding faceshield over spectacles or goggles</p> 
Oxyfuel gas welding	<ul style="list-style-type: none"> <li>Welding goggles (I)</li> <li>Welding helmet over spectacles or goggles (F)</li> <li>Welding faceshield over spectacles or goggles (J)</li> </ul> <p>Typical Filter Lens Shade:</p> <ul style="list-style-type: none"> <li>Oxyfuel gas welding: 6-8</li> </ul>	<p>Sideshields shall have filtering capability equal to or greater than the front lenses.</p> <p>Welding helmets purpose is to provide shield to the eyes and face from optical radiation, heat, and impact. Welding helmets should not be used as a stand-alone protective device and should be worn in conjunction with goggles or spectacles.</p>	
Oxyfuel or Oxygen cutting	<ul style="list-style-type: none"> <li>Oxyfuel or Oxygen cutting: 3-6</li> <li>Torch brazing: 3-4</li> </ul>	<p>Selection for the filter lens shade shall be made based on the welding process, arc current, electrode size and/or plate thickness. Use ANSI Z49.1:2012, Table 1, Guide for Shade Numbers, to select the proper filter lens shade for both protection and comfort (reduction in visible glare).</p>	
Torch brazing		<p><b>Note:</b> Filter lenses shall comply with the requirements as indicated in ANSI/ISEA Z87.1-2015, Table 6, Shade designations.</p>	
Torch soldering	<ul style="list-style-type: none"> <li>Spectacles (A)</li> <li>Welding faceshield over spectacles (J)</li> </ul> <p>Typical Filter Lens Shade: 2</p>	<p>Shade or special purpose lenses, as appropriate.</p> <p><b>Note:</b> Refer to ANSI/ISEA Z87.1-2015 for definition of special purpose lenses.</p>	
Glare	<ul style="list-style-type: none"> <li>Spectacles with or without side protection (A)</li> <li>Faceshield over spectacles or goggles (E)</li> </ul>		

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بلدية دبي  
DUBAI MUNICIPALITY

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