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A man with a beard and short hair is wearing dark safety glasses. He is looking directly at the camera with a neutral expression. He is wearing a dark-colored t-shirt with a white collar. The background is black.

safety
eyewear
guide

protecting people

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uvex Safety Eyewear Guide
Everything you need to know
about eye protection



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Definition of eye protection

Safety eyewear protects the eyes against harmful influences such as intense light, UV radiation, liquid splash, dust, splinters or weather effects. Eye protection typically takes the form of single-or twin-lensed glasses which are held in place by side arms that go over the ears or goggles that provide additional protection against high energy impacts, liquid splash or dust due to the all round seal. These are held in place by an adjustable headband.

Please note that selecting and using appropriate eye protection requires a detailed risk analysis of the workplace and the hazards present. Legal regulations and provisions must be also be observed.

Legal note

uvex cannot be held liable for any damage resulting from the advice given in this booklet. This booklet must not be considered a substitute for either a risk assessment or purchase advice.

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Types of workplace hazards

When identifying hazards it is important to take into account and distinguish between the type of hazard, the scope, duration, probability and the severity of the incident on the individual.

Potential hazards include mechanical, optical, liquid splash, thermal, biological and electrical hazards. In many cases, several hazards may be present at any one time.

Welding, for example, involves optical, mechanical and thermal hazards. Applications in which liquids or gases can escape under high pressure involve mechanical as well as chemical or thermal hazards.



Mechanical hazards: Foreign objects such as dust and solids (chips or grains) that can get into the eye.

Optical hazards: Ultraviolet, visible and infrared radiation in the form of ultraviolet glare, flash burns or thermal hazards.

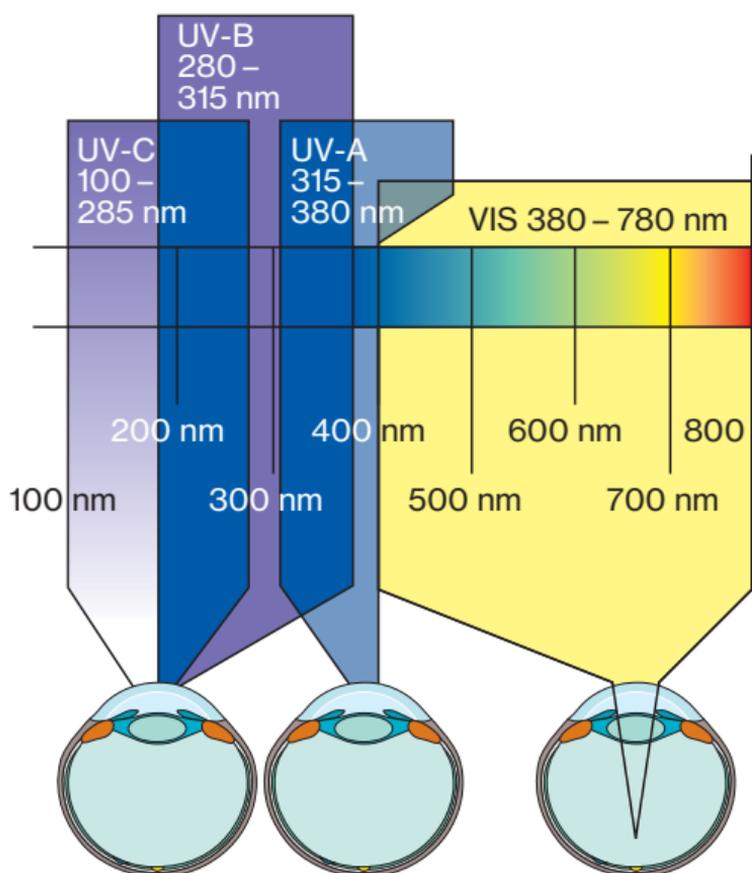
Chemical hazards: Solid, liquid or gaseous substances such as vapour, mist and smoke as well as acids or lyes.

Thermal hazards: Heat that is transferred through solids or liquids via gases or infrared radiation as well as extreme cold.

Biological hazards: Bacteria, viruses and spores that can enter the body through the eyes can cause infections.

Electrical hazards: Electric arcs caused by short-circuits when working in electrical power distribution plants, for example.

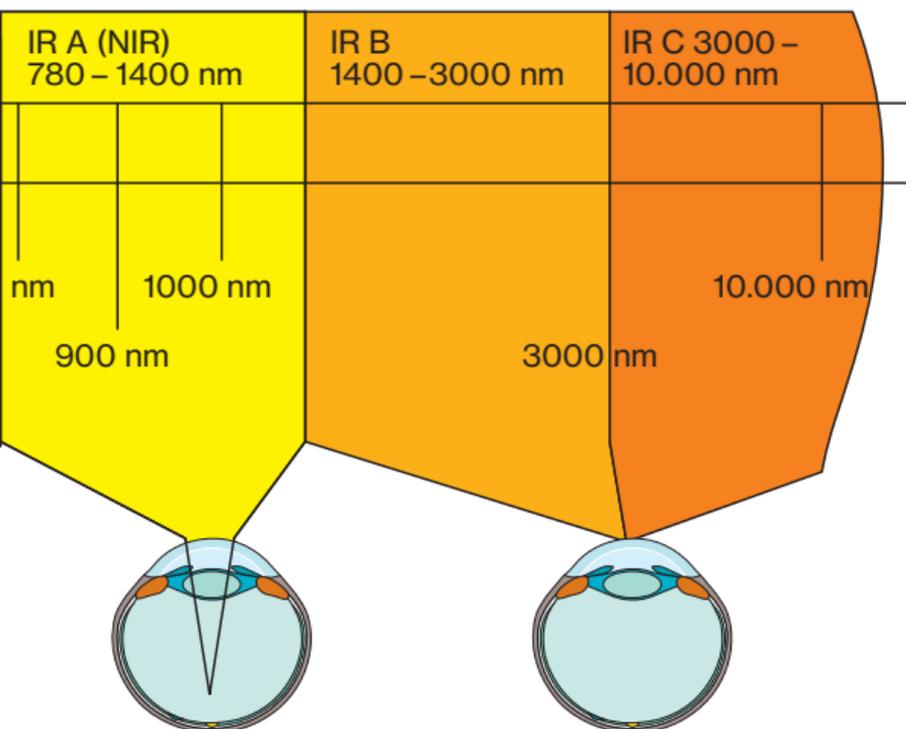




Optical radiation is divided into three areas:

- UV radiation 100 nm – 380 nm (UV = ultraviolet, short-wave, invisible and high-energy)
 - Solarium
 - Sun
 - Fluorescence
- VIS radiation 380 nm – 780 nm (VIS = visible)
 - Prismatic colours
- IR radiation 780 nm – 1 mm (IR = infrared, long-wave, invisible)
 - Thermal radiation
 - Heat lamps
 - Welding

Optical radiation



Standards

DIN EN 166:2001 Personal eye protection – Specifications

DIN EN 167:2001 Personal eye protection – Optical test methods

DIN EN 168:2001 Personal eye protection – Non-optical test methods

DIN EN 169:2002 Personal eye protection – Filters for welding and related techniques – Transmittance requirements and recommended use

DIN EN 170:2002 Personal eye protection – Ultraviolet filters – Transmittance requirements and recommended use

DIN EN 171:2002 Personal eye protection – Infrared filters – Transmittance requirements and recommended use

DIN EN 172:1994+2000+2001 Personal eye protection – Sunglare filters for industrial use

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Professional Use

MADE IN GERMANY

CE

EN 19

Eye protection markings according to EN 166

Frame markings



Identification of the manufacturer

Number of the EN standard

Fields of use

Designation	Description of the fields of use
None General use	Protection against non-specific mechanical risks
3 Liquids	Protection against liquids (droplets and splashes)
4 Coarse dust particles	Protection against dust with a grain size of $> 5 \mu\text{m}$
5 Gas and fine dust particles	Protection against gas, vapour, mist, smoke and dust with a grain size of $< 5 \mu\text{m}$
8 Electric arcs	Protection against electric arcs caused by short-circuits in electrical systems
9 Molten metal and hot solids	Protection against metal splashes and penetration of hot solids



Certification mark

Symbol for resistance to high-speed particles

Mechanical strength	
None	Minimal strength (filters only)
S	Increased strength (filters only)
F	Low-energy impact (45 m/s)
B	Medium-energy impact (120 m/s)
A	High-energy impact (190 m/s)
T	Tested under extreme temperatures (-5° C +55° C)

Lens markings



Scale number (filters only)

Identification of the manufacturer

Optical class

Symbol for mechanical strength

Mechanical strength	
None	Minimal strength (filters only)
S	Increased strength (filters only)
F	Low-energy impact (45 m/s)
B	Medium-energy impact (120 m/s)
A	High-energy impact (190 m/s)
T	Tested under extreme temperatures (-5° C +55° C)

W**1****9****K****N****CE**

Symbol for non-adherence of molten metal and resistance to penetration of hot solids

Symbol for resistance to surface damage by fine particles

Symbol for resistance to fogging

Certification mark

Optical clarity and useful life

Optical quality is key to selecting the right protective eyewear. EN 166 distinguishes between three classes, these being:

Requirements

EN166	
Optical properties	$\pm 0,06$ dpt. Class 1 $\pm 0,12$ dpt. Class 2 $\pm 0,25$ dpt. Class 3

Simplified illustration

Optical class 1 lenses are particularly suitable when a high level of visual performance is required while protecting the human eye against damage in the form of defective vision, even when worn for prolonged periods of time.

All uvex eyewear conforms to optical class 1.

When stored correctly and without use, the maximum lifetime of a safety eyewear product is 6 years. Depending on the intensity of use and wear caused by external influences, the maximum life of a product is 2 years. If protective eyewear has been scratched or otherwise damaged it must be replaced.



Cleaning

Cleaning recommendations for protective eyewear

- Rinse off coarse dirt under flowing water, when possible
- Clean the lenses using uvex cleaning spray and tissues, or uvex lens cleaning towelettes
- Commercially available disinfectants can be used by spraying or wiping; **do not immerse eyewear in disinfectant**
- Store eyewear in a case when not in use



Rinse under flowing water



Clean using a uvex cleaning station

Clean using uvex cleaning towelettes



Store in a case or pouch

Types of protective eyewear

Safety spectacles

Classic style safety glasses usually come in the form of single- or twin-lensed glasses. Well fitting spectacles will ensure a secure and comfortable fit and protect against common hazards.



Overspecs

Protective eyewear that can be worn over prescription glasses and are often worn by site visitors. Ideal for short-term use.



Goggles

Protective eyewear with an allround seal and headband for protection against increased mechanical and liquid splash hazards. Depending on the shape, some can be worn over prescription glasses.



Visor

Covers the entire face, specially designed to protect against mechanical and liquid splash hazards. Some designs allow goggles to be worn under a visor which can increase the protection against liquid splash.



Prescription safety spectacles

Safety spectacles with customised lenses to suit the user's vision.



uvex UV protection

Polycarbonate which is used to manufacture uvex safety lenses absorb 100% of UV radiation up to 400 nm. All uvex lenses offer 100% UVA, UVB and UVC protection.



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uvex lens coating technology

Fogged up and scratched lenses are often the main reasons that safety eyewear is taken off or not worn. High quality, effective and durable lens coatings raise the value and 'wearability' of eyewear for the wearer.

uvex has developed specially formulated scratch-resistant and anti-fog coatings that are permanent for the lifetime of the product. No matter how many times the product gets cleaned, the eyewear will remain fog free.

The unique uvex lens coating process enables different coatings to be applied to the inside and outside of the lens. Unlike conventional dip coating processes used by other manufacturers (applying one coating to both sides), the uvex process allows each coating to perform independently and therefore delivers a more effective and visibly noticeable result.



Different workplaces require different lens coatings depending on the level of dirt, heat and humidity. uvex has developed a range of coatings with these variables in mind. For example, a very humid environment such as a foundry will require an anti-fog coating on both sides of the lens to ensure clear vision.

uvex's most popular lens coating, uvex supravision excellence is ideal for those that require anti-fog on the inside of the lens due to body heat, and a scratch resistant coating on the outside to help with external factors that may damage the lens. A scratch resistant coating helps prolong the life of the product.

	Coating	Scratch-resistant (K)	Anti-fogging (N)	Chemical-resistant	Auto-clavable
Core coatings	uvex supravision excellence	Outside	Inside	Outside	
	uvex supravision sapphire	Both sides		Both sides	
	uvex supravision plus	Both sides	Both sides		
Special coatings	uvex supravision extreme	Outside	Inside	Outside	
	uvex supravision variomatic	Outside	Inside	Outside	
	uvex supravision clean	Outside	Inside	Outside	Both sides
	uvex infradur	Both sides		Both sides	
	uvex infradur plus	Outside	Inside	Outside	

Chemical resistance

Personal eye protection is resistant to all chemicals.

Chemical resistance refers only to the behaviour of the respective coating when it comes into contact with the chemical in question.

+ Resistant

0 Limited resistance (no visual impairment, but loss of function)

- Not resistant (swelling/peeling)



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Chemical resistance

	uvex supravision excellence uvex infradur plus uvex supravision clean		uvex supravision sapphire uvex infradur	
	Outside	Inside	Outside/Inside	
Solvent etc.				
Methanol	+	+	+	
Ethanol	+	+	+	
Isopropanol	+	+	+	
n-butanol	+	+	+	
Methoxypropanol	+	+	+	
Acetone	+	+	+	
Acetonitrile	+	+	+	
Diethyl ether	+	+	+	
Petroleum ether	+	+	+	
Butyl acetate	+	+	+	
Xylene	+	+	+	
Cyclohexanol	+	+	+	
Gasoline - Super	+	+	+	
Diesel	+	+	+	
Chlorinated hydrocarbons				
Dichlormethane (methylene chloride)	+	+	+	
1,1,2-trichloroethene (trichlorethylene) C ₂ HCl ₃	+	+	+	
Acids/lyes				
Formic acid (30%)	+	+	+	
Acetic acid, concentrated	+	+	+	
Hydrofluoric acid (20%)	+	+	+	
Hydrochloric acid (20%)	+	+	+	
Sulphuric acid (50%)	+	+	+	
Caustic potash (30%)	+	+	+	
Ammonia solution (10%)	+	+	+	
Other				
Silver nitrate solution (1%)	+	+	+	

uvex supravisjon ETC	uvex supravisjon plus	uvex supravisjon extreme		Celluloseacetat	
		Outside/Inside	Outside	Inside	AF
	+	+	+	+	+
	+	+	+	+	+
	+	+	+	+	+
	+	+	+	+	-
	-	+	-	+	-
	-	+	-	+	0
	+	+	+	+	+
	+	+	+	+	+
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	-	+	-	+	+
	+	+	+	-	-
	-	+	+	+	-
	+	+	+	-	+
	+	+	+	-	+
	-	+	0	-	+
	0	+	+	-	+
	+	+	+	+	+
	+	+	+	+	+

Areas of application

	Area of application	Eyewear type	Lens material
Mechanical hazard	Precision engineering	Safety spectacles Goggles	PC
	Light assembly work	Safety spectacles	PC
	Grinding	Safety spectacles Goggles	PC
	Angle grinding	Goggles	PC
	Turning and milling	Safety spectacles	PC
	Dusty environments	Goggles	PC
	Foundry cleaning	Goggles	PC
	Forestry and agriculture	Safety spectacles	PC
Chemical hazard	Laboratory work	Safety spectacles Goggles	PC CA
	Working with acids and galvanic media	Goggles	PC CA
Optical hazard	Spot welding Soldering Oxyacetylene welding Flame cutting Welder's assistant Foundries Furnaces	Safety spectacles Goggles	PC
	Working outdoors (sun glare/driver)	Safety spectacles	PC
	Offshore/maritime	Safety spectacles	PC
	Strong lighting Glare	Safety spectacles	PC
	Mixed lighting	Safety spectacles	PC
	Sterile working environment	Safety spectacles Overspecs	PC
	Oil & Gas	Safety spectacles Overspecs Goggles	PC
	Site visitor	Safety spectacles Overspecs	PC

Choosing the right glasses

As well as the protection level offered, design (both shape and style) coupled with comfort all play an important role when choosing the right eye protection. Not all safety eyewear is the same and no two people are the same as people's faces vary considerably and is why the size and shape is important to ensuring the best fit and level of protection. Different models are offered which take into account different head and facial features. Trying on different styles of safety eyewear to ensure a close comfortable fit that meet the identified protection level for the workplace risk is paramount.

It is important to consider prescription wearers when selecting safety eyewear. For example, uvex offers overspecs that can be worn over prescription glasses for short periods. Alternatively, uvex offers customised protective eyewear, our prescription safety spectacles which offer considerably higher levels of comfort.



For more information about eye protection,
visit our website:

www.uvex-safety.com/en/products/safety-glasses/



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