EN166, EN169, EN170 and EN172 Workwear Safety Standards

EN 471 & ISO EN 20471 are European standards for personal eye protection.

Both the Frame and Lens are tested so both must include the CE symbol and the manufacturers logo. The CE marking certifies that a product has met EU consumer safety, health or environmental requirements.
The frame will usually be marked on the inside of both arms. All safety frames must pass the European EN166 standard. This is a higher standard that the US or Asian equivalent and is considered the baseline for safety eyewear. If EN166 is not stamped on the frame then look elsewhere. Counterfeit products exist so play safe and be sure. As with anything that concerns safety – buy from a trusted source and request this information if you are not sure or if you feel that the product supplied is sub-standard. You may be saving someone else's sight or livelihood. Next will be numbers and/or letters which indicate to what degree the frames passed the EN166 Test within various categories.

Frame marking:

3 - Protection against liquid droplets and splashes. This is usually only found on Goggles where a full seal is made around the eyes.
4 - Protection against large dust particle over 5 microns in size.
5 - Protection against dust and fine dust particles smaller than 5 microns.

Strength of the frame (and Lens – S not applicable to the lens):

S - Withstands impacts against small objects travelling up to 12 meters per second.
F - Withstands impacts against small objects travelling up to 45 meters per second.
B - Withstands impacts against small objects travelling up to 120 meters per second.
A - Withstands impacts against small objects travelling up to 190 meters per second.
T - Withstands impacts at extreme temperatures.
A frame can have a combination of these markings

Lens Marking

Unlike the frame, lenses can meet various safety standards including EN166, 169, 170 & 172. If every standard on the lens were printed then you may just as well wear a blindfold. The standards are printed as simply as possible to the degree to which they meet the standard.Remember, the CE mark is mandatory. In addition there will be a degree of solar or UV radiation protection, the optical quality and then the mechanical strength.

Radiation Protection

2 - UV Protection (EN170). The number 2 indicates the filter may effect colour recognition
2C or 3 - UV Protection (EN170). The number 2C (previously 3) indicates the filter allows good colour recognition.
4 - Infrared Protection (EN171). i.e. protection from heat
5 - Solar Protection (EN172). i.e. 100% UV sun glare protection with no infrared (IR) protection.
6 - Solar Protection (EN172). i.e. 100% UV sun glare protection with infrared (IR) protection.

Safety Glasses Lens Types

All safety eyewear sold by Granite Workwear Ltd include high quality, optical quality 1 lenses. Most of the glasses are however available in different lens types, each of which is especially designed for different light conditions.

Clear Lenses

The clear lens is the most popular as it filters out 10% or less of the visible spectrum providing as near to natural vision as possible. They also filter out 100% of harmful UV light.

Smoke Lens

The smoked lens is much the same as you will find in traditional sunglasses but with the added strength of EN166 certified impact resistance. They will block out up to 87% of visible light which may sounds a lot but is required when working in normal bright outdoor conditions.

Contrast Lenses

The contrast lenses have a gradient of tint from dark at the top to clear at the bottom.

Yellow

Yellow or Light Enhancing / low light lenses. Technically it does not actually enhance the light but provides additional contrast and reduces glare, making it appear easier to see in low light circumstances. Ideal for when working on surfaces of a similar hue such as snow or on cloudy and overcast days. During low light many surfaces can appear flat and the term ‘flat light’ is often used to describe this situation. This can often happen in the middle of an overcast day which makes the yellow lens highly popular in the UK.

This lens also has a few other important enhancements such as a partial Flash coating for reflection of Infrared / heat and also a 30% blue light filtration. Blue light is part of the visible spectrum but has been proven to cause partial and total blindness over time. Although this lens does provide 100% UV protection, they do improve visible light which means they are not ideal for use in bright sunlight which could force you to squint, resulting in a headache.

ESP Lenses

Extra Sensory Perception (ESP) is the name given to a type of lens that filters out the harmful blue end of the spectrum. Blue light has a smaller wave length than the other visible colours and is closest to invisible UV light than any other. It carries more energy that others colours also which makes it damaging to our eyes in the long run.

Blue light radiates between 380nm ± 480nm and these lenses remove this wavelength, allowing rest of the visible spectrum through. Safety glasses using these lenses are regarded as an excellent choice for people moving in and outdoors on a regular basis.

Polarised Lens

When light reflects off a surface at a low angle it reverberates. As this light enters the eye it disperses causes glare. The polarising filter minimises this reverberated light enabling better vision and reduces the need to squint through glare.

The lenses contain specially aligned crystals which block horizontally polarized light. Acting just like a window blind to allow light through at one angle but not another. These properties make them ideal for working on water, and other reflective surfaces.

Polarised lenses maintain a 100% UV filter and also block 90% of reflected directional light in additional to 22% of Infrared radiation.

Flash Lenses

These can be distinguished by their reflective appearance and as such have been very popular regardless of their special properties. Flash lenses are similar to smoked lens in that they filter out roughly 90% of visible light making them excellent for bright outdoor conditions. However, the special properties of this lens also filter out up to 60% of Infrared radiation. Over time the heat carried by IR light can cause damage to the Cornea and since IR light is invisible, your eyes it will not adjust to increased exposure. Flash lenses are therefore an excellent choice for working in direct sunlight or an industrial process giving off high temperatures.