Recommending the best binoculars

Our cut-out-and-keep series to assist retailers with product knowledge

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With the exception of spectacles, binoculars are the most used optical instruments in the world. As such they should be one of the leading profit generating lines in any sport and outdoor shop. To sell them effectively, and to entrench yourself as one of the binocular experts in your area, you need to understand the technical jargon and be aware of the factors that should be considered by the potential user.

Magnification

Binoculars are normally described by two numbers – 7x32, 8x42, etc. The first of these numbers refers to the magnification of the binocular. When looking through the binoculars, the object will appear 7 times, or 8 times, larger than the naked eye will perceive it. Or put differently, it will appear 7 times, or 8 times, nearer than what it actually is.

Most consumers will have the mindset that the more magnification, the better. Unfortunately, this is not necessarily true, as more magnification will also enlarge the effect of handshake, or the movement of a boat or car.

Greater magnification also reduces the field of view and the depth of field. The most popular binoculars ranges from 7x to 10x, but most people will be better off choosing the lower end of this range.

Size of objective lens

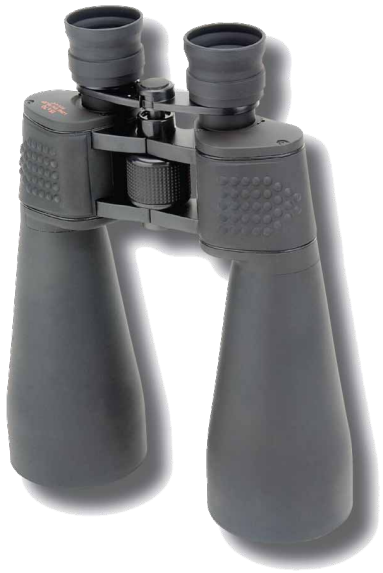
The second of the two numbers that normally describe binoculars refers to the diameter, in millimetres, of the objective lens. The objective lenses are the larger lenses at the front of binoculars, closest to the objective being viewed, not the ones to which you put your eyes.

The larger these lenses are the brighter an object will appear.

Field of view

This is a measurement of the width of the image seen through the binocular and is expressed either as degrees of arc9, e.g. 6° or 7°, or as meters at 1 000 meters, e.g. 130 meters at 1 000 meters, or as feet at 1 000 yards. This is sometime also inscribed on the body of the binocular.

A wider field of view is necessary to pick up faster moving objects, such as birds in flight. It is also useful to scan a certain area quickly.



Binoculars with lower magnification generally offer a wider field of view.

Depth of field

Unless a binocular is focussed on an object at infinity, there is usually an area in front of the object and another area behind the object that is out of focus, with an area between them that is in focus. This in focus area is referred to as the depth of field.

A deeper depth of field helps to locate an object easier and will also mitigate the need to make small focus adjustments every time an object moves a little closer or further away.

Binoculars with lower magnification offer a greater depth of field.

Type of binocular

There are two types of binocular on the market – porro prism and roof prism.

Porro prism is the traditional design where the objective lens (front) and the ocular lens (back) are offset, which makes them wider bodied. They have fewer internal elements and are generally brighter and less expensive.

Roof prism became popular since the sixties and the lenses are in alignment, contributing to being longer and sleeker in design. They are more rugged and many people find them easier to hold steady for extended periods. Manufacturers of good quality roof prism binoculars apply a phase correcting material, with the result that they offer the same sharp image contrast as porro prism binoculars.

What will the binocular be used for?

- Hunters normally need rugged, durable binoculars that perform well in low light conditions of dawn and dusk.
- Yachtsmen will put a high price on water resistance and, because they're using binoculars on a moving platform, a big exit pupil.
- Backpackers want binoculars that are compact, light and very portable.
- Birders should consider fast focusing and close focusing binoculars with a very good depth of field and good field of view. In addition, they should offer good water resistance and be portable.

Focusing

Although some older military or marine binoculars were designed with individual eyepiece focusing, most modern users prefer centre focusing systems. These are characterised by a wheel positioned between the two barrels, which, when turned, move both ocular lenses backwards or forwards at the same time.

Most users prefer fast focusing binoculars to enable them to quickly change focus when the object they are looking at moves forward or backward. The distance the focusing wheel needs to be turned from close focus to infinity determines the speed of focusing.

A mechanism is provided to enable users to compensate for differences in their left and right eye sight; this mechanism can take the form of an adjustment on one of the ocular lenses, or on the centre focus wheel. This adjustment needs to be done only once for a particular user, but if more than one person will be using the binocular, it needs to be done every time a user changes. The consumer should be made aware of this hassle factor and encouraged to buy each user his, or her, own binoculars.

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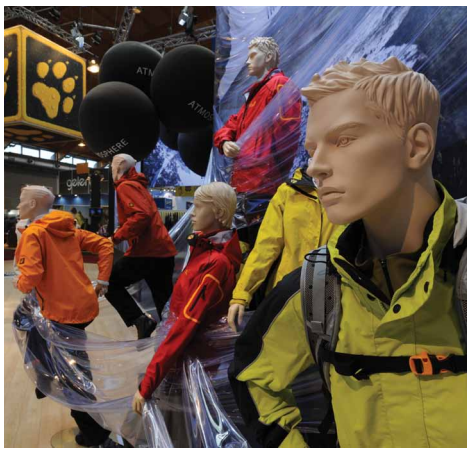
The OutDoor Europe show again breaking records



THE MEETING place for the world's outdoor industry — the OutDoor Europe trade fair in Friedrichshafen — will again have a record number of exhibitors (890) from 38 countries, representing more than 1 000 brands from all major outdoor players, 80% of them international.

Apart from the exhibition stretching across 12 halls and filling 8 500 m^2, the four fair days, from Thursday 14 July to Sunday 17 July, will also be packed with conferences (this year focusing on outdoor technical clothing), fashion shows, activities like climbing, slacklining and trail running, outdoor movie shows and the famous OutDoor Party.

The OutDoor Trade show, held annually at Lake Constance in Friedrichshafen, has opened their online shop for advance ticket sales. OutDoor tickets bought on the online shop are up to 33% cheaper than at the show, reports Messe Friedrichshafen. The OutDoor Industry Award established itself as an industry seal of quality that helps guide both retailers and consumers. The award ceremony will be held on July 14 at 17h30 in Hall 2. For more information go to www.outdoor-show.com.

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Some models offer permanently focused or non-focusing binoculars. These binoculars cannot focus as closely as adjustable ones can and, as any defect in the user's eye will be magnified by the binocular, require good eyesight to perform well. This might be acceptable if the user has good eyes and will never view objects that are closer than about 20 metres away.

Lens coatings

Every time light strikes a highly polished glass like a lens or prism, about 5% of it is lost due to reflection. In most binoculars there are 10-16 glass surfaces and it is therefore not too difficult to calculate that the cumulative effect of this light loss will equal, or exceed, 50%. However, during World War II it was discovered that a coating of reflection reducing material applied on the polished surface of the lens or prism could reduce the loss caused by reflection from 5% to 1%. Later it was further discovered that multiple coatings will even reduce the 1% to a fraction of 1%.

When manufacturers state that their binoculars are *fully coated* or *fully multi-coated* it means that all surfaces inside and outside have been coated. Lens coating is quite an expensive process and one therefore finds that *fully coated* or *fully multi-coated* claims are made by the more expensive brands.

Exit pupil

Binoculars concentrate the light gathered by the objective into a beam, which is called the exit pupil. The diameter of the exit pupil is the diameter of the objective lens, divided by the power of magnification. When this equals the diameter of the user's pupil, the binocular is used at its maximum effective light gathering.

A narrow exit pupil necessitates the binocular to be very precisely placed in front of the eye while a binocular with a wider exit pupil can be placed easier and quicker.

It should also be borne in mind that the pupil of the human eye dilates from about 2mm in daylight to about 7mm at night time. People that will be using their binoculars mainly at dawn or dusk will require instruments with larger exit pupils.

Interpupillary adjustment

Binoculars are adjustable via a hinged construction that enables the distance between the two telescope halves to be adjusted to accommodate viewers with different eye separation. Most are designed for the average interpupillary distance of adults. People with abnormally wide or narrow faces, or children, should make sure that the binocular can be adjusted to their eyes.

Other factors to consider

Eye relief: This refers to the distance between the ocular lens and the human eye. This is an important consideration for wearers of spectacles who do not want to remove their spectacles when using binoculars. Their eyes are normally 10-15mm behind the glass of their spectacles and they therefore need to use binoculars that offer a minimum of 15mm of eye relief.

Water resistance or proof: Binoculars are normally used outside and therefore need protection against the elements. Most binoculars claim some degree of water resistance and a few, mainly in the more expensive category, can claim to be waterproof.

Weight: The larger a binocular, the heavier it is. The wider the objective lenses, the more it weighs. Higher quality glass is denser and therefore heavier. To reduce the weight, quality binocular bodies are cast out of a lightweight alloy like magnesium or aluminium or a modern synthetic, such as polycarbonate.

Protective armouring: Many modern binoculars are manufactured with an absorbing outer shell made of rubber or polyurethane. This serves to protect the sensitive internal elements against shock.