BINOCULARS INFO TEXT

Characteristics binoculars

People long ago had the desire to be close to things far away. That's why the first binoculars were built more than 400 years ago. But what exactly is a pair of binoculars? And what do the mysterious numbers on them mean?

Binoculars are optical devices that allow you to see things that are very far away. With your eyes alone, you would not be able to see them at all or only with difficulty. Most binoculars look very similar from the outside. But when you look through them, you quickly realise that the same subject can look very different through two different pairs of binoculars. This is because they differ in certain characteristics. You can see this directly from the numbers printed on the binoculars. Curious? Then you can find out more here.

Magnification

An important value in binoculars is the magnification. Some have a magnification of 2x, others of 6x, 8x, 10x or rarely 12x. This means that you can get 12 times closer than with your eyes. For example, a bird 1200 m away looks as big as if it were only 100 m away. However, the higher the magnification, the harder it is to keep the image steady. Another advantage of lower magnification is that the field of view is larger, so you have a better overview with binoculars. This is especially important with moving subjects such as animals or footballers helpful in the stadium.

At a higher magnification, more details can be seen. By the way: The magnification is always the first number on the binoculars. This model (8x42) has an 8x magnification built in.

Lens diameter

But what does the second number stand for? Quite simple: it tells you the size of the lens diameter in millimetres. This refers to the width of each lens at the front of your binoculars. The larger the diameter, the more light comes through the lens to your eye and the brighter your image will be. In these binoculars, the diameter is 42 mm. This is why the binoculars are called 8x42.

Exit pupil

The so-called exit pupil is the bright spot you can see when you look into your binoculars from above. The larger it is, the brighter the image appears in your eye. You can calculate the exit pupil by dividing the lens diameter by the magnification:
Lens diameter/magnification = 42/8 = 5.253

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Pupil distance

The pupil distance is the distance between the two exit pupils. This distance must be adjusted individually for each observer. To adjust your binoculars to your eyes, you have to bend your binoculars in the middle. And how can you tell if the distance is set correctly? It's simple: you should only see the image through the binoculars in a single circle.

Twilight factor

Do you still want to see something with your binoculars at dusk, i.e. just before it gets dark? Then the twilight number can give you a good indication. The higher this number, the better you can see with your binoculars even in difficult light conditions. With a little mathematical practice you can calculate it yourself. To do this, multiply the magnification by the lens diameter and take the square root of the result.

Square root (magnification x lens diameter) = square root (8 x 42) = 18.33

Light intensity

In addition to the twilight factor, the luminous intensity can also help you to determine the theoretical brightness of your binoculars. You can calculate this by dividing the lens diameter by the magnification and squaring the result.
(Lens diameter/magnification)^2 = (42/8)^2 = 27.56

Interpupillary distance

The interpupillary distance describes how far your eye is from the eyepiece when looking through the binoculars. If you wear glasses, for example, your eye is further away than without. To ensure that the distance fits perfectly even with glasses and that you can see everything, our binoculars are all equipped with adjustable eyecups. You can either fold them down or turn them out.

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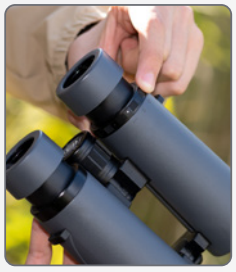
Field of view

The field of view tells you how many metres wide you can see at a distance of 1000 metres. With a field of view of 101 m/1000 m, this means that at a distance of 1000 m you can see an area that is 101 m wide. Sometimes this value is given as a number of degrees instead of metres.
Then you can easily calculate the metre value. You only need to know that 1° corresponds to 17.5 metres. So multiply the number of degrees by 17.5 to get the number of metres. Here is an example for a field of view of 6°: Degree x 17.5 = 6 x 17.5 = 105 metres on 1000 metres



Dioptric compensation

With many binoculars, especially the expensive ones, you can rotate the right eyepiece. If your eyes have different powers of vision, you can easily compensate for this.

For advanced users

Glass material

There are many different glass materials for the lenses of binoculars, such as Bk-7 or BaK-4. We are especially careful with models for children and use plastic lenses for them, so that you can safely explore your environment with them.

Coating

When light falls into binoculars, so-called stray light can occur. This would significantly reduce the contrast in your image. To prevent this from happening, the lenses are coated. This so-called coating ensures that more light falls into the binoculars and reflections are reduced.

Uncoated lenses let only 50 to 60 % of the light through, fully coated lenses already 70 to 75 % and fully multi-coated lenses even up to 95 %.

The different coating levels are:

a) Partial coating
With this type of coating, the outer objective and eyepiece lenses are already coated.

b) Full coating
In the case of full coating, all glass surfaces facing the light (in the course of the beam path) have been vapour-deposited once.

c) Multi-coating
Here, all glass surfaces facing the light are coated (as with full coating), but with an additional layer on each of the outer objective and eyepiece lenses.

d) Full multi-coating
With this qualitatively best type of coating, all glass surfaces of the prisms and lenses facing the light are coated at least 3 times.

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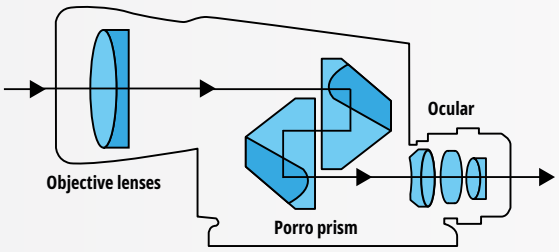
Binocular types

Porro prism binoculars

Wide design, observable objects look more vivid, but very unwieldy.



Roof prism binoculars

Narrow design, are much easier to handle and more compact.