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Binocular Loupes

When you need a closer look

Surgical loupes help to alleviate eye strain by enlarging the image when you are working on tiny subjects or conducting precision operations. They are portable and easier to use than a surgical microscope. However, they are not created equal, and choosing the pair that's right for you is important to your satisfaction.

Choosing Loupes

Choosing the correct surgical loupes for your application involves several factors, including resolution, working distance, field of view, depth of field, magnification, weight and interpupillary distance. These terms are defined below.

Ideally, you want the lowest magnification that is suitable for your application. As a general rule, the lower the magnification, the greater the depth of field and field of vision. Likewise, the longer the working distance, the greater the field of view. The larger your field of view, the less you need to turn your head. This reduces eye strain and fatigue. It is also important to consider the weight and fit of your loupes. Lightweight loupes are more comfortable for longer periods of use, and they are less likely to slide down your nose as you work. WPI loupes have adjustable interpupillary distance for a correct fit every time.

Your Height	Working Distance (when sitting)	Working Distance (when standing)
< 170cm (5'7")	34cm (14 in.)	42cm (16 in.)
170-193cm (5'7"-6'4")	42cm (16 in.)	50cm (20 in.)
> 193cm (6'4")	50cm (20 in.)	55cm (22 in.)

Three styles of loupes are available today. The first is a single lens loupe for simple, low-magnification applications. A photographer or jeweler might use this style. The second style is the Galilean loupe designed by the 17th-century astronomer Galileo Galilei. **Galilean loupes** use multiple lenses and offer magnification between 2.0x and 3.0x. These are easy to use, lightweight and affordable. For greater magnification up to about 8.0x, **prismatic loupes** are available. Prismatic loupes use a series of lenses and prisms to magnify the subject, according to design principles of Johannes Kepler, a contemporary of Galileo. They offer greater magnification, sharp resolution and a greater depth of field.

Things to Consider

Resolution

Resolution determines the amount of fine details that can be distinguished. The type of glass used in the lenses and coatings applied to it can affect the resolution of your loupe. To test a set of loupes, look through them at a piece of graph paper. Notice color distortions or curvature of the lines. A high resolution loupe will have crisp, straight lines. The lines, seen through lower quality lenses, will be slightly blurred and curved.

Working Distance

The working distance is distance at which a loupe will focus. The working distance must be equal to the distance from the loupe lens to the top of your subject. Each loupe has a defined working distance, but the working distance you require will depend upon your height, posture and table height. It is best to determine your desired working distance, and then choose a set of loupes that will meet your criteria.

You can measure your actual working distance or use the table below to get a rough idea.To measure your working distance, sit or stand in a comfortable position with your back straight. Do not lean forward

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too much. Measure the distance from your eyes to the top of your subject. Usually, your working distance will be close to what is shown in the table below.

Field of View

The area that is in focus when viewed through the loupes is the field of view. The longer the working distance of a loupe, the greater its field of view will be. Likewise, the lower the magnification factor, the larger the field of view.This tradeoff must be considered carefully when choosing loupes. When using a Galilean loupe the center of the image is clear, but the outer rim of the image is blurred. The prism loupe image is sharp to the very edge of the field of view.

Depth of Field

Like the field of view, the depth of field is directly related to the working distance and magnification factor. The depth of field is the amount of depth that is in focus when viewing the subject through the loupe. Greater depth of field is preferred, because you can see deeper into the subject without repositioning. For greater depth of field, choose a loupe with a longer working distance or a lower magnification factor.

Magnification

The size of the image viewed through the loupe is determined by the amount of magnification, which is a personal preference. Higher magnification provides a larger image, but it also means a reduced field of view and depth of field. Generally speaking, for simple surgical cases or for beginners in training, 2.5x or 3.0x magnification is sufficient. When a more delicate or complicated procedure is required, choose a magnification factor of 3.5x to 4.5x. If you are working on a tiny area or are conducting a microsurgery, chose a magnification factor of 5.0x to 6.0x. Higher magnification loupes can be used in place of a surgical microscope, if desired.

Interpupillary Distance

The distance between the pupils of your two eyes is your interpupillary distance. For the sake of comfort when focusing, your loupes must fit your eyes. You optometrist can give you an exact measurement. WPI loupes are adjustable so that you can set your loupes to an inter-pupillary distance that suits you.

BINOCULAR LOUPES

PART NUMBER	STYLE	POWER	WORKING DISTANCE	PRICE	
504037	Clip-On	2.5x	34cm		
504039	TTL	2.5x	34cm		
504040	Flip-Up: For pre-scription lenses	3.0x	39cm		
504050	Prism	3.5x	34cm		
504051	Prism	3.5x	50cm		
504052	Prism	4.5x	50cm		
504053	Prism	4.5x	34cm		
504054	Prism	4.0x	50cm		
504055	Prism	4.0x	34cm		
504497	Prism	5.0x	50cm		
504038	Galilean*	2.5x	34cm		
504056	Galilean**	2.5x	50cm		
504057	Galilean	3.0x	34cm		
504058	Galilean	3.0x	50cm		
504059	Galilean	3.5x	34cm		
504060	Galilean	3.5x	50cm		
504496	Galilean	2.5x	34cm		

** Lenses are individually adjustable*
*** Both lenses are adjusted simultaneously*

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