

A Short guide to Dental Loupes

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Loupes consist of a lens or series of lenses which allow for optical enlargement (magnification) of objects, providing the operator better vision to enhance the quality of their dental work. In addition, they improve posture and therefore prevent back and neck pains.

What to look for when purchasing loupes

1-Magnification: The degree of enlargement. This ranges from 2.5 – 6 x. First time users are generally recommended to start with 2.5 – 3 x and increase magnification as they get used to operating with loupes. However, this recommendation varies depending on the type of work carried out, as shown in table 1.

Table 1. Recommended loupes magnification for different dental specialities.

Speciality	Recommended Magnification
General dentistry, Implantology, Dental Hygiene/Therapy	2.5 – 3.0 x
Endodontics, Crown and Bridge	2.5 – 4.0 x
Laboratory work or other Technician	3.0 – 6.0 x

2-Field of view/width of field: How much of the working site can be visualised i.e. how many teeth can you see. Operators find a larger FOV easier to adapt to and instruments can be brought into field easier. However, as magnification increases, FOV decreases, so try and find the balance between detail and FOV. You can assess FOV by looking at a ruler and measuring the diameter of the image you see.

3-(a) Depth of field: Distance head can move whilst keeping the image in focus. A larger DOF is preferred.

3-(b) Working distance: Length between operator's head and patient's mouth in good posture. Working distance corresponds directly to size of DOF, longer working distance will have larger DOF, and vice versa.

Types of loupes

1-Through the lens (TTL): TTLs have telescopes fixed within the lens at a set distance. They are custom made to match the operators interpupillary distance (ID) (distance between centres of pupils of eye). When a sales rep says, "we'll measure you up", this is what they're referring to.

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2-Flip-up: These are fully adjustable in their ID. An advantage over TTLs is that you can flip up the telescopes when not needed and continue using the loupes as a regular pair of safety goggles.

TTLs are generally better, don't require adjustment for ID and give larger FOV.

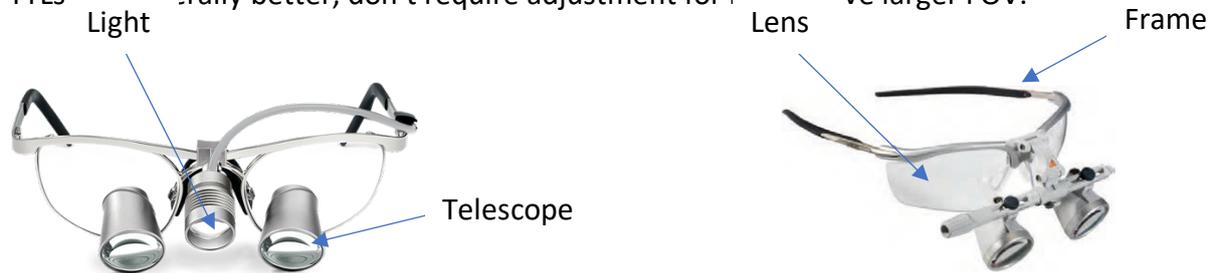


Figure 1: TTL and flip-up loupes.

Illumination (light)

The light is arguably the unsung hero of loupes, a must buy if you ask me. They improve vision, prevent shadows and overhead light adjustment. When purchasing do consider: battery life (ideally should last at least one clinical session), charging time, battery type e.g. Lithium and weight.

Image quality

When assessing the image quality look for the following:

- (a) **Resolution:** How well can you distinguish fine detail.
- (b) **Chromatic aberration:** Separation of colour.
- (c) **Spherical aberration:** Separation of lines, seen as line distortion.

TIP: To assess these, look at a flat ruler through the loupes – check how well you can distinguish colour, lines and check the lines appear straight.

Other considerations

Weight: Heavy loupes may lead to discomfort and headaches, so try find a model you feel comfortable with before purchasing.

Frame: Choose a frame that is comfortable, lightweight, stable, durable and adjustable, not on the basis of looks...

Loupes are a worthy investment into your career and health. I think they should be an essential part of the toolkit for a practising dentist, so purchase yours wisely.

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