1. SurgiTel ErgoVision Telescopes
   GSC
2. Orascoptic Dimension-3, HiRes, and EyeMax Telescopes
   Orascoptic/sds
If there is one item you can buy to improve your dentistry virtually overnight, it is a pair of high quality loupes. Even routine procedures such as examinations and simple restorations can be improved by doing them under magnification. It’s just common sense - if you can see better, you’ll work better. The advanced magnification systems available today have brought dentistry into a new world. They allow you to achieve a degree of perfection that is impossible with the unaided eye. And the ability to see what you are doing more clearly makes clinical practice less stressful and more enjoyable.
The amount of magnification will vary, based on personal preference. Some clinicians are very comfortable at only 2x (this usually means the image through the magnification lenses is twice as large compared to unaided vision), while other practitioners extol the virtues of the higher ranges. The 2x lenses are a good place to start if you are not currently using any form of magnification. They normally give you a relatively wide field of vision and require less break-in time than the higher powers.

Be aware that, as the power of magnification increases, the field and depth of vision typically decreases. This means you will see a fewer number of teeth through the higher power lenses and small movements of your head will interfere with focusing as compared to lower power ones. It may take you some time to get used to this smaller field of vision. You may find yourself bumping into noses, cheeks, lips, etc. until you get oriented to the smaller vision field. This problem can be largely overcome by using an expanded field prism loupe.

The higher powers, starting at 3.5x, take you to another level that is hard to believe until you experience it. Even though we feel 2x-2.5x is helpful, the real benefits of magnification start to become evident at 3.5x. This doesn’t mean you will be wasting your money purchasing a lower power system - it can be used by an assistant or hygienist assuming you have non-customized flip-ups. These staff members also need vision enhancement for their clinical procedures. Hygienists will marvel at how well they can see during root smoothing procedures while assistants will be able to precisely refine the margins of provisionals under magnification.

**Advantages**

- See margins better, both at the preparation and finishing stages, with incredible clarity. When finishing margins of restorations, magnification permits you to clearly distinguish restorative material from tooth structure.

- Gives you the feeling that you are on the leading edge of dentistry and gently prods you to practice at a higher level. This concept raises your self-esteem and gives you more confidence to expand your practice by trying new procedures.

- Makes you feel like you are watching someone else doing the procedure, especially at the higher ranges of power. This is due to the fact that you only see several teeth, the head of the handpiece, and your fingertips in your field of vision. You could be watching a closed circuit video of the procedure, only you are doing it.

- Gives your patients the feeling that you are doing everything you can to provide them with the highest level of care. They are truly amazed at the lengths you are willing to go to achieve excellence.

- Better ergonomics. When properly fitted, magnification should help with musculoskeletal problems.

**Disadvantages**

- Weight. There is no doubt all the loupes are heavier than regular corrective or plain safety glasses. This problem is usually experienced by new users and typically is not an issue once you start to benefit from the vision enhancement these products provide. And eyeglass straps also help in overcoming the weight problem.

- Disorientation. When you start wearing magnification, things definitely look different. You can lose your perspective and feel somewhat out of control, even dizzy. However, this problem also dissipates very quickly. But this is one reason it’s a good idea start with a lower power loupe and then progress up to a higher power if you prefer to see even more detail.

- Difficulty talking to patient. This is mainly with the TTL models that do not allow you to flip the loupes up and out of the way.

**Note**

It is sometimes difficult to tell if loupes with the same power designation actually have the same level of magnification. Two factors that can interfere with apples-to-apples comparisons are field of view (how many teeth can you see when looking through the loupes) and working distance. Therefore, 2.5x from one company may not appear to be equivalent to 2.5x from another. Therefore, use the magnification designation only as a guide. Indeed, Orascoptic has even stopped assigning a specific magnification code to its loupes and now uses a classification system based on ranges of power (Class II = 2.0-2.9, Class III = 3.0-3.9, etc.).
Types of Loupes

Through-The-Lens (TTL)
The actual telescopes are mounted through holes drilled into the lenses of the eyeglasses hosting them. These are available in standard field (usually called Galilean) or wide field (usually called Prisms).

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<th>ADVANTAGES</th>
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+ No possibility of getting out of adjustment since they are custom designed for the individual clinician concerning working distance, interpupillary distance, etc. However, a bent frame can distort even this type.
+ Usually lighter in weight than flip-ups.
+ Optics are closer to the eye, typically resulting in larger field of view.

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<th>DISADVANTAGES</th>
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– Cannot be shared with other staff members since they are custom-made for one person.
– Must be removed when you talk to patients during consults, for example, since the telescopes get in the way of eye-to-eye communication. If you wear corrective lenses, that means you must have two pairs of glasses with you at all times so you can switch back and forth.
– Due to the location of the telescopes, it is difficult to take clinical photographs while wearing them. This means that, if you are documenting a procedure step-by-step through photography, you must be constantly removing the telescopes to shoot the image. This changing of lenses during a procedure becomes very cumbersome, is a nuisance, and challenges even the most devout practitioners of asepsis.
– More difficult to clean, compared to flip-ups.
– Must return to manufacturer if your eyeglass prescription changes.
– Prescription changes for corrective lenses are more expensive.
– Declination angle is limited, which may force you to bend your neck more than what is comfortable.
– May not meet ANSI’s safety requirements.

Flip-Ups
Telescopes are mounted on a bracket attached to the bridge of the frame of the eyeglasses. This bracket, which may be a simple hinge or a hinge with a vertical adjustment, allows the telescopes to be flipped up when they’re not needed. Can be regular field (Galilean) or wide field (Prisms).

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+ Can be worn at all times during the day since they do flip up out of the field of vision and don’t interfere with communication with patients.
+ Will be less likely to interfere with photography when they are flipped up and out of the way.
+ Easier to clean than TTLs.
+ Can sometimes be shared with other staff members if eyeglass lenses are not corrective.
+ Prescription changes for corrective lenses can be done at any optician.
+ Declination angle may be more adjustable for proper ergonomics.

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– Tend to be heavier and not as comfortable as regular corrective lenses or through-the-lens loupes. This extra weight becomes even more evident when they are flipped up because all the weight is now concentrated on the top of the lenses.
– Since they are adjustable, they can get out of adjustment if one of their tightening screws becomes loose. This means you are constantly readjusting them. The flip-up mechanism can also become loose and cause the telescopes to fall down over your glasses at inopportune times.

Working Distance
Measured from your eyes to the patient at the position where you are most comfortable working. This is one reason that it is better to be measured in your own office rather than in a convention booth at a dental meeting.

Field of View
How many teeth you can see when looking through the loupes. Usually, a wider field of view is better.

Depth of Field
How far you can move before the teeth get out of focus, similar to focusing a camera when taking clinical photos at a fixed magnification.
Declination Viewing and Viewing Angle
Determines how much you have to bend your neck and/or back to see the teeth through the loupes. A steep declination angle usually allows you to keep your neck relatively straight as you look downward toward the patient, but if it is too steep, you won’t be able to see through the loupes. This factor is one of the most important ones in preventing or minimizing musculoskeletal problems.

Cleaning and Disinfection
As mentioned above, flip-ups are much easier to clean. But all of these products require special care. None of the magnification systems should be immersed in cold sterilization solutions. Consult with each company on their specific recommendations for disinfection.

Staff
You may choose to buy one system for yourself and another one to be shared by your staff. But don’t be surprised if you end up purchasing several loupes for your staff, since enlightened auxiliaries also get excited about magnification’s virtues.

Choosing the System for You
The final decision as to which design will best suit you is a personal one. No system is perfect and you should list your objectives prior to buying. If you don’t plan on sharing your telescopes with other staff members, don’t mind having to remove your lenses for patient communication, and want the lightest in weight option (for prisms), then the through-the-lens will be your better purchase. However, if you want increased flexibility, much easier cleaning, and possibly more options in declination/viewing angles, then you should buy the flip-ups.

Since all of the products are available via a free trial period in your office, we advise all dentists and auxiliaries to take advantage of this valuable opportunity. Try one or more and pick the one which “feels right” for you. These companies are very accommodating and have received high marks from our evaluators for their excellent customer service.

Weight Measurements
The weight measurements were done on a digital scale without the retainer straps. These weights may vary based on the type of frame you select. However, you can use them for comparison.
SurgiTel ErgoVision Telescopes
GSC
(4.5) www.surgitel.com

Flip-ups
Cost: $745.00-$1,195.00 (Galilean)
Cost: $1,650.00-$1,895.00 (Prisms)

TTL
Cost: $745.00-$1,195.00 (Galilean)
Cost: $1,650.00-$1,895.00 (Prisms)

Includes:
• Telescopes w/protection caps
• Frame w/double nose pads
• Hard plastic carrying case
• Side shields
• Retainer strap
• Flip-up paddles (Flip-ups only)
• Screwdriver and cleaning cloth (Flip-ups only)
• Plain or single prescription lenses

Options:
• Pair of Opti-Caps: $25.00 (Galilean)
• Pair of Curing Light protection filter caps: $40.00
• Pair of Clip-on Laser Filters: $225.00–$395.00
• Set of Polarizing Filter Caps: $150.00
  (2 for telescopes and 1 for light)
• Refurbishment: $89.00

Free trial: 45 days

Warranty: Limited lifetime
**RAVES & RANTS**

- Adjustments with flip-ups minimize neck strain
- Double nosepiece most comfortable
- Prisms are most expensive
- Compacts have smaller diameter

**WHAT'S NEW?**

Compact prisms

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### Flip-Ups

<table>
<thead>
<tr>
<th>Power</th>
<th>Type</th>
<th>Weight</th>
<th>Working Distances</th>
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</thead>
<tbody>
<tr>
<td>2.0x</td>
<td>Galilean</td>
<td>2.4oz/68.0g</td>
<td>9.5-29.5in/24.1-74.9cm</td>
</tr>
<tr>
<td>2.5x</td>
<td>Galilean</td>
<td>2.4oz/68.0g</td>
<td>9.5-29.5in/24.1-74.9cm</td>
</tr>
<tr>
<td>3.0x</td>
<td>Galilean</td>
<td>2.7oz/76.5g</td>
<td>9.5-29.5in/24.1-74.9cm</td>
</tr>
<tr>
<td>4.0x</td>
<td>Prisms</td>
<td>3.7oz/104.9g</td>
<td>9.0-30.0in/22.8-76.2cm</td>
</tr>
<tr>
<td>5.0x</td>
<td>Prisms</td>
<td>3.8oz/107.7g</td>
<td>9.0-30.0in/22.8-76.2cm</td>
</tr>
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</table>

### TTL

<table>
<thead>
<tr>
<th>Power</th>
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<th>Weight</th>
<th>Working Distances</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0x</td>
<td>Galilean</td>
<td>1.9oz/53.9g</td>
<td>9.8-21.8in/24.9-55.4cm</td>
</tr>
<tr>
<td>2.5x</td>
<td>Galilean</td>
<td>1.9oz/53.9g</td>
<td>9.8-21.8in/24.9-55.4cm</td>
</tr>
<tr>
<td>3.0x</td>
<td>Galilean</td>
<td>2.2oz/62.4g</td>
<td>9.8-21.8in/24.9-55.4cm</td>
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<tr>
<td>3.5x</td>
<td>Compact Prisms</td>
<td>3.1oz/87.9g</td>
<td>9.0-30.0in/22.8-76.2cm</td>
</tr>
<tr>
<td>4.0x</td>
<td>Prisms</td>
<td>3.3oz/93.6g</td>
<td>9.0-30.0in/22.8-76.2cm</td>
</tr>
<tr>
<td>4.5x</td>
<td>Compact Prisms</td>
<td>3.3oz/93.6g</td>
<td>9.0-30.0in/22.8-76.2cm</td>
</tr>
<tr>
<td>5.0x</td>
<td>Prisms</td>
<td>3.4oz/96.4g</td>
<td>9.0-30.0in/22.8-76.2cm</td>
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<tr>
<td>5.5x</td>
<td>Compact Prisms</td>
<td>3.6oz/102.1g</td>
<td>9.0-30.0in/22.8-76.2cm</td>
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**Frames**

Contemporary black metal titanium frame, available in three sizes, has a matte finish to reduce glare and reflection. The unique double flexible nose pads help stabilize the frames and distribute the weight more evenly. There are even several different nose pad mounting positions for different nose shapes. The frames were rated very comfortable. The retainer strap is the type that slips over the ends of frame. It can be tightened to help hold the telescopes in position or loosened to allow them to hang around the neck.

**Adjustments**

For the flip-ups, the patented adjustment fixture holding the loupes to the frames allows you to customize the viewing/declination angle to minimize neck strain. Most of the other adjustments for the telescopes are made in the factory and are permanently fixed. About the only other adjustment you need to do is the interpupillary distance, which is done by turning the large, easily accessible knob on the top of the bar connecting the telescopes.

**Packaging**

Black plastic case lined with foam rubber. Your name is imprinted on the front of the case for easy identification. The case has a secure, suitcase-like lock and a removable shoulder strap. This case secures the loupes very well. One evaluator reported dropping the case several times with the loupes inside and not sustaining any damage.

**Directions**

User’s guide is easy to understand and informs you of all the adjustments that are possible with this product, although the neon pink paper makes reading them rather difficult. And, General Scientific’s customer service rated highly, as they solved several of our problems very efficiently.
Frames

Standard gold, but also available in designer colors such as black, blue, slate, wine, and silver titanium. Available in four sizes. All frames have spring-loaded temples that automatically adjust to each individual. The nosepiece is soft silicone and adjustable for different facial structures and the adjustable headstrap helps to balance the weight distribution. The retainer strap is the type that slips over the ends of frame. Made from cloth, it can be tightened to help hold the telescopes in position or loosened to allow them to hang around the neck. Name is engraved on temple arm on standard frames.

Adjustments

TTL With EyeMax, you can adjust the working distance by rotating each telescope (there is a serrated area for better gripping). Flip-Ups With EyeMax, you can also adjust the working distance, same as with the TTLs. Interpupillary distance can also be adjusted on Dimension-3 by turning the large, easily accessible knob on the top of the bar connecting the telescopes, while on EyeMax, you rotate the thumbwheel below the interpupillary hinge. You can also make just about any other adjustment by loosening the various retaining screws using the supplied screwdriver. Once adjusted, they can be locked into position. Convergence angles are set and locked into position.
**Packaging**
Black, foam-lined wood case with engraved nameplate. HiRes come in a very stylish silver-like plastic with foam inside to secure the loupes. However, there is no handle.

**Directions**
Small booklet, very detailed, easy to understand, good photos.

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**SurgiTel ErgoVision Telescopes** have an extra comfort level afforded by the flip-ups, which have two different adjustments to customize the viewing/declination angle. These adjustments tend to reduce strain on your neck and are not possible with any of the TTL loupes. However, the ErgoVision frames help even the TTL design by increasing the declination angle so the strain on your neck is lessened somewhat. The unique double nose pad also helps with comfort. In addition, the ErgoVision prisms rate a step above due to their diameter, which is 20.0mm, compared to 12.1mm for the Orascoptic EyeMax. This larger dimension seems to create a brighter viewing area by allowing more light through the telescope.

In addition, the new **Compact** prisms give you most of the benefits of the conventional ones but at less weight and less length. For example, from the top of the telescope, we measured a conventional 4.0x prism and a 5.5x compact version. While the conventional prism extended 6.3cm out from the eyeglass lens, the compact version reduced that distance to 4.9cm. Although this is not a quantum reduction, shorter is always better. Two evaluators also commented that the compact version has an enhanced depth of field compared to other models, while two others felt EyeMax offered a better depth of field. A wider field of view was also mentioned as an advantage of the compact version over other models. Even with the 5.5x, a full quadrant can be viewed, while another evaluator reported a 3.0in/7.6cm view with 3.5x. And the interchangeable end caps can quickly increase or decrease your working distance by 2.0in/5.1cm.

However, the diameter of the compact version with its end cap in place is only 12.4mm, significantly smaller than the conventional ones. And the side shields were considered to be flimsy, easy to break, hard to clean, and easily scratched.

The **Orascoptic** line-up, which includes **Dimension-3**, **EyeMax**, and the new **HiRes Telescopes** comprise a full line-up of choices, while **EyeMax** are the only TTL prisms that you can change the working distance for a specific procedure, although accomplishing this maneuver is rather cumbersome, requiring you to unglove. **Dimension-3**, the original Galilean models, also garnered many accolades. In addition, you also have the most choices in frames, from basic to designer. However, the entry level cost for **Dimension-3** is somewhat pricey.

The new **HiRes** offer either round or elliptical version. Excellent optics, very good resolution, and the lightest weight of all loupes. If you want magnification with very little learning curve, extremely wide field of vision, and barely more weight than your regular corrective lenses, HiRes fills the bill. However, they are not available at higher levels of magnification and their tariff is quite stiff.