

APPLICATION NOTE



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The autoseal Pars Plana Microincision System from Oertli Instruments: "How you can get Swiss watchmaker technology into a trocar"

What makes a good autoseal trocar system?

Several autoseal trocar systems are already available on the market. Most vitreoretinal surgeons have tried them, but many have not been completely satisfied by the results. Together with our customers, the Oertli® engineers have collected the following wish list for a truly superior autoseal Pars Plana Microincision System (PMS):

- **Miniaturized solution:** an autoseal pilot tube should not be bigger than the non-sealing pilot tube. Any increase in diameter will unnecessarily obstruct the surgical field and decrease the surgeon's flexibility.
- **Reliable sealing:** the seal has to be very tight in order to guarantee a stable intraocular pressure, even during the most critical surgeries, such as combined cataract – vitreoretinal surgery. The perfect sealing properties have to be sustained throughout the duration of the surgery.
- **Low mechanical resistance:** When moving the instruments in and out of the pilot tube, the friction between the instrument and the seal has to be as low as possible, just as it is with non-sealed PMS.
- **Reliable fixation of the pilot tube in the sclerotomy:** When removing the instrument out of the pilot tube, the pilot tube has to remain firmly in the sclerotomy.
- **Easy insertion of the instruments:** the pilot tube must be designed in a way that allows the surgeon to locate the opening of the tube easily, just as with non-sealed PMS.
- **Position of the infusion line can be changed during surgery:** all pilot tubes should be identical so that the infusion line can be easily switched from one pilot tube to another.
- **No compromises concerning postoperative wound tightness:** all sclerotomies have to be tight at the end of the surgery. This remains the top priority of a surgeon when performing sutureless vitreoretinal surgeries.

How has Oertli® fulfilled this wish list?

The answer is easy: with a smart, high-precision solution originating from the Swiss genes of watchmakers! When the surgeon uses the Oertli® autoseal PMS for the first time, he and his staff will be confused: the pilot tubes look exactly the same! The secret is hidden inside the pilot tube (see Fig. 1): a multifunctional miniaturized silicone seal is already mounted inside the pilot tube.

tion line included in the PMS can be inserted into any of the pilot tubes (all pilot tubes are identical). By applying a small longitudinal force, the adaptor on the irrigation line clicks into the precise irrigation interface of the seal (see Fig. 2). And, of course, it will stay there as long as the surgeon wants it to. If during surgery the surgeon wants to connect the irrigation line to another pilot tube, this can be easily done (see Fig. 3). Naturally, the former pilot tube

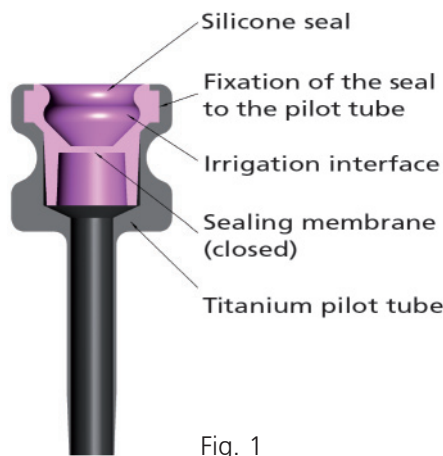


Fig. 1

There are three aspects of the seal in particular that make the surgeon's life easier: a) Geometry: the ring at the outer side of the seal perfectly fits to the precise geometry of the titanium pilot tube. Thus, the seal is reliably fixed to the pilot tube; no handling is necessary, neither for the surgeon, nor for the nurse. b) Irrigation interface: the irriga-

tion line can then be used to insert instruments. c) The seal: a very thin silicone membrane with a slit-shaped opening is the central part of the autoseal pilot tube. The membrane has been optimized for perfect sealing and, at the same time, for low-friction properties to enable smooth movement of the instruments.

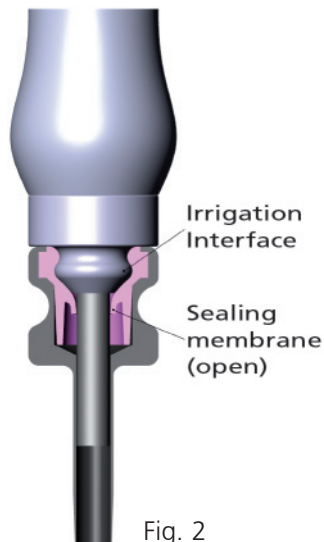


Fig. 2

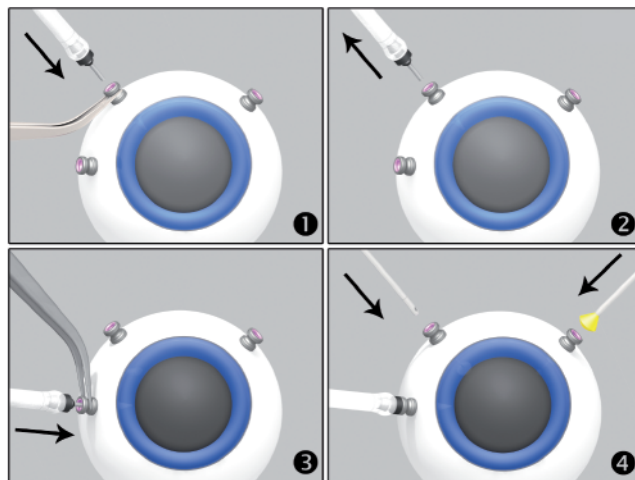


Fig. 3

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Which steps need special consideration?

As with all new products, there are a few points that the surgeon needs to be aware of:

- The autoseal PMS seals very well! This is especially important to know if one is injecting fluids or gases into the vitreous cavity or when indenting the globe. An overpressure can be avoided by either having the air pump controlling the pressure or by bypassing the seal of one of the pilot tubes by inserting a cannula of 23G or smaller.
- Don't cut when retracting the cutter from the pilot tube! Some surgeons remove the cutter out of the pilot tube while the instrument is still cutting. This should not be done with the autoseal PMS because the silicone membrane will be destroyed and there will be considerable leakage out of the pilot tube.
- Take care when inserting fragile or sharp instruments! It is not a problem to insert e.g. a diamond dusted membrane scraper. But the insertion should be done with care, otherwise the membrane scraper and / or the seal might be damaged. Similar care should be taken when inserting sharp instruments, such as needles.

What are the advantages of using the Oertli® autoseal PMS?

- **Miniaturized solution:** the globe is not obstructed by large-diameter seals.
- **Perfect sealing:** leakage is negligible. The best proof of this can be seen in combined cataract – vitreoretinal surgeries. Different surgeons have already performed combined surgeries, applying different techniques, and all of these surgeons were very pleased with the performance of the PMS.
- **Constant intraocular pressure:** low pressure situations are in the past. The sealed pilot tubes render all other pressure maintenance solutions obsolete, e.g. active irrigation or gas forced infusion. All you need is the most reliable physical phenomenon, i.e. gravity, to feed the irrigation line and the autoseal PMS. Extra tubing / handling and software control of the pressure are not necessary.
- **Time saving:** we estimate that 1-2 minutes per surgery can be saved by not having to deal with the plugs. In a clinic that is performing 700 vitreoretinal surgeries per year, this is a potential saving of 12-24 hours or up to four days in the O.R. This is certainly a major improvement in efficiency.
- **Easier process with the staff:** no more handling and communication concerning the plugs. The surgeon and the nurse can concentrate on more important tasks.
- **Less BSS consumption:** BSS outflow due to non-sealing PMS might be the biggest part of the overall BSS consumption.

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Conclusion

The autoseal PMS from Oertli Instruments is another product that surgeons will love from the first time they use it. It makes surgeries easier and more reliable. Both the patient and the surgeons have sustainable

benefits when using this product. There is only one way to show all of the advantages of the autoseal PMS: see proof of its superiority by simply doing a demonstration in the O.R.

Mr. R. Ted Burton

MD, Norfolk and Norwich University Hospital, UK

I have used the autoseal PMS system for 4 cases and found it to be a major advance in 23G vitrectomy. There was no resistance to the movement of the instruments. When the instruments were removed the trocars stayed in place and they sealed well. It was a joy not to have to use plugs. There are situations where it will be very helpful to be able to move the infusion to any of the ports.

To insert a diamond dusted silicone scraper it was necessary to observe the trocar under the microscope. The use of heavy liquid may be difficult as there is no leakage of vitreous fluid around the instruments and it may require the development of a dual barreled 23G heavy liquid cannula.

Prof. Christian Prünte

Medical University of Vienna, Austria

The autoseal Pars Plana Microincision System obviously adds safety and comfort to 23G vitrectomy. This amazing "invisible" innovation effectively blocks outflow during the procedure. Stable IOP can be easily set by bottle height avoiding dangerous IOP fluctuations and intraocular turbulences.

Furthermore it avoids the need for time-consuming and tricky manipulations of plugs.

However, the system does not limit the use of any instrumentation.

Even silicon-tipped instruments can be easily introduced. The introduction of this selfsealing trocar system really is a major step forward in the development of 23G vitrectomy.

How to put autoseal™ PMS into practice

Autoseal™ PMS is available as single use sterile pack (10 procedures):

- VV123110** PMS set 23G, includes 4 terminals, infusion line, incision blade and incision template
- VV630113A** Vitrectomy pack 23G for OS3 / NovitreX3000, includes PMS set, 3000 cuts SPS cutter, endo illuminator, air feeder line, two way stop cock, TwinVac cassette
- VV630113AP** same as VV630113A, with panorama light in place of the standard illuminator