

# APPLICATION NOTE

1/2008



## CO-MICS 2, the new generation of coaxial microincision cataract surgery: dispose of all of your prejudices

As the technology leader in small incision cataract and vitreoretinal surgery, the engineers at Oertli Instruments are always on the look out for solutions beyond the well-known boundaries. The latest example is a new generation of phaco tips and sleeves, which make cataract surgery through a 1.6 mm incision a truly unique experience that is both advantageous for the patient and for the surgeon.

Technical prejudices usually hinder the development of new products, but we take them as a challenge to be overcome.

When looking for solutions for 1.6 mm cataract surgery, we needed to overcome four major prejudices:

### Prejudice No. 1:

The emulsification power of small incision cataract surgery is reduced

Wrong! You only have to find the good solution:

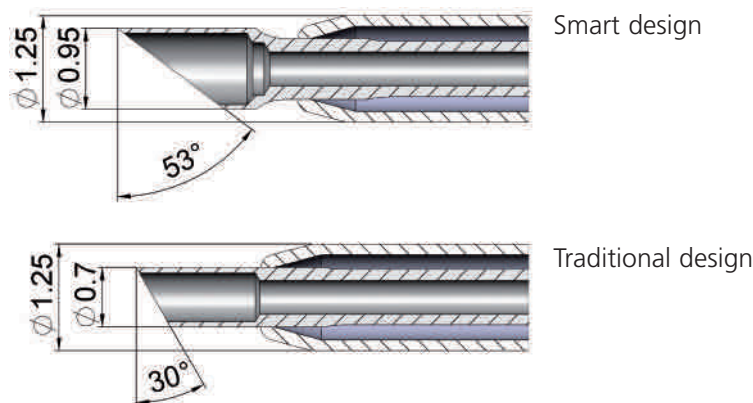


Fig. 1

In Fig. 1 two tip-sleeve combinations are shown which are both suitable for 1.6 mm surgeries. In both cases, the sleeve is the same, but two very important dimensions are considerably different: the outer diameter of the tip and the bevel angle. In the "traditional design", the interface between the sleeve and the tip is at the distal end. In the "smart design", the distal end of the phaco tip has a larger diameter. The interface to the sleeve is at a smaller diameter, just behind the distal end.

The emulsification efficiency can be calculated: all end faces perpendicular to the ultrasonic motion fragment the nuclear particles, the emulsification power therefore is proportional to the cross-sectional area defined by the outermost and the innermost diameter (see Fig. 2: area "A").

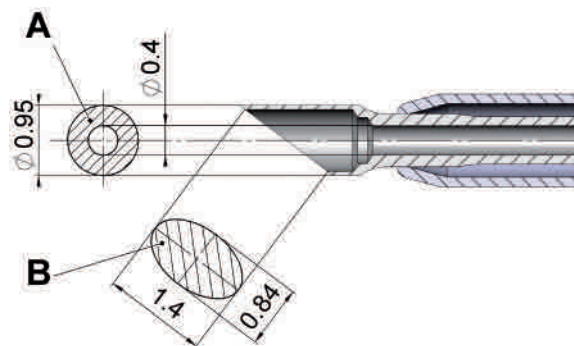


Fig. 2

Calculations as well as the experiences in the O.R. give astonishing results:

Phaco tip	Design	Incision Size	Emulsification power
19G	Traditional	2.8 mm	100%
20G	Traditional	2.2 mm	54%
CO-MICS	Traditional	1.6 mm	29%
CO-MICS 2	Smart	1.6 mm	146%

→ The emulsification power of a smart CO-MICS 2 system is better than you are accustomed to with 19G surgery!

#### Prejudice No. 2: The holdability of a small tip is not enough

Wrong!

The holdability is easy to calculate and is proportional to the area of the aspiration opening (Fig. 2, area "B"). Again the calculations and the experiences in the O.R. are in agreement:

Phaco tip	Design	Incision Size	Holdability
19G	Traditional	2.8 mm	100%
20G	Traditional	2.2 mm	59%
CO-MICS	Traditional	1.6 mm	34%
CO-MICS 2	Smart	1.6 mm	106%

→ The holdability of a smart CO-MICS 2 system is at least as good as that of a 19G tip.

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## Prejudice No. 3: The aspiration efficiency of a small tip is low

Wrong!

The flow of a phaco tip depends on the applied vacuum. However, the vacuum is not a fixed setting. When working with small tips, it should be increased. Fig. 3 shows the dependence between the vacuum and the flow rate for a traditional 19G- and the smart CO-MICS 2 tip. In order to obtain the same flow rate, the vacuum can be increased by 100-150 mmHg.

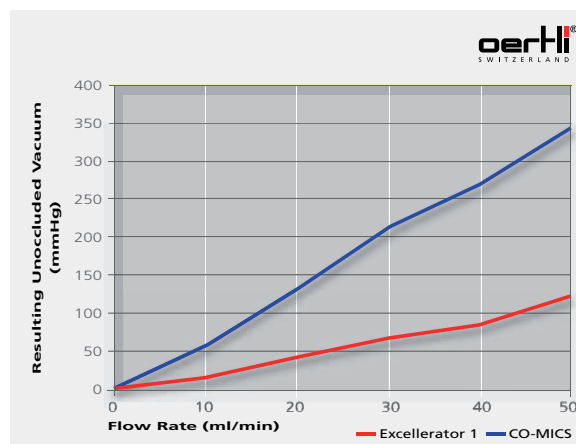


Fig. 3

→ The aspiration efficiency of a smart CO-MICS 2 system is the same as that of 19G surgery (the vacuum has to be raised by 100-150 mmHg).

This enhancement of the vacuum does not imply a decrease of chamber stability, because of:

## Prejudice No. 4: The chamber stability of a small tip is worse than for a larger tip

Wrong!

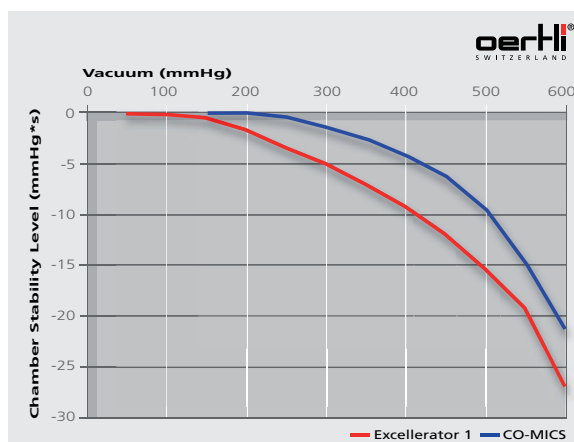


Fig. 4

For all vacuum settings, the CO-MICS 2 shows better chamber stability. An increase of the vacuum by 150 mmHg for the smart CO-MICS 2 system leads to the same chamber stability as for the 19G system. This curve shows that the increase of the aspiration vacuum, suggested in "Prejudice No. 3", is feasible and will result in the same chamber stability level as the 19G system.



## Conclusion

With a smart CO-MICS 2 system it is easy to achieve the same efficiency as that to which you are accustomed with 19G surgery – simply increase your vacuum level by 150 mmHg!

The emulsification efficiency and the fluidic properties are all at least as good as those

that you are familiar with in 19G surgery.

Apart from these technical aspects, the smart CO-MICS 2 system exhibits great advantages for the surgeon in his daily business. The advantages of smart CO-MICS 2 are presented in the following reports.

### Dr. Detlev R.H. Breyer

Breyer Augen Chirurgie, Düsseldorf, Germany

Astigmatism neutral MICS is the pivot of modern phacorefractive cataract surgery with toric, aspheric and multifocal IOL.

CO-MICS 1 was already a great improvement to bimanual MICS due to a lack of leakage problems and better fluidics.

With the CO-MICS 2 tip we now have a phacotip that is as efficient and fast as a conventional phacotip, but does fit through a 1,6 mm incision. A must have in advanced phacorefractive surgery.

### Prof. Rupert Menapace

Medical University of Vienna, Austria

By adjusting the design according to physical laws, Oertli has engineered a new CO-MICS tip which fully exploits the potentials: As a result, the smart tip design achieved an astonishing increase in holdability and energy transfer while at the same time providing tight and gentle sealing of the wound tunnel. Thus, phacoemulsification with the new CO-MICS 2 tip through a 1.6 mm incision is equally or even more efficient than with a traditional 19-gauge tip requiring a 2.8 mm incision. With traditional tips, the coaxial inflow tends to push fragments away from the tip. With the smart tip design, the irrigation is essentially confined to the side openings, avoiding anteriorly directed inflow. The key advantage, however, is the inherent reduction of surge upon occlusion break. As a result, very high vacuum settings may be applied which increases power coupling and thus energy transfer at the tip head.

In conclusion, the new CO-MICS 2 tip provides for astonishing phacoemulsification efficiency and chamber stability, and optimally preserves the integrity and self-sealing properties of the wound. Appropriately modified wound designs allow phacoemulsification through wound sizes as small as 1.4 mm, which is below the minimum incision size required for state-of-the-art MICS IOLs.

## How to put CO-MICS 2 into practice

CO-MICS 2 works with the standard Hexadisq® (VG800011) hand piece on any Oertli® OS3 or CataRhex® **SwissTech** machine. No modification of the machine or new

software is required. Just set the vacuum limit 150 mmHg higher than usual. Order the following single use sterile machine pack (10 procedures):

**VV621111C**

Phaco pack for **SwissTech** (tip, sleeve, key, test chamber, tubing set)

**VV630111C**

Phaco pack for OS3 (tip, sleeve, key, test chamber, cassette)

**VV630111CB**

Phaco pack for OS3 (tip, sleeve, key, test chamber, cassette, bimanual I/A instruments)