



The Prediction of IOL Power in Oil Filled Eyes

Calculating IOL Power with OKULIX

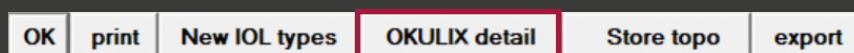
Silicone oil is used in complex cases of retinal detachment or tear. The "heavy" silicone oil is generally used to effect pressure on the posterior pole or inferior retina and can often be a long-term replacement of vitreous. Gas and light silicone oil will float in the vitreous and are the more common choice when the detachment is superior. Gas endotamponade is generally temporary and biometry should not be attempted in a gas filled eye. Oil filled eyes tend to develop cataract because of the vitreous replacement surgery^{1,2}.



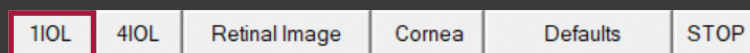
Best practice would dictate that regular biometry should be performed prior to vitrectomy. If this is impractical then the following steps should be taken.

- 1 Measure the eye with the **Cataract App** as per instruction (user guide section 12.4) and select the **Calculation** tab  to open **OKULIX** via .

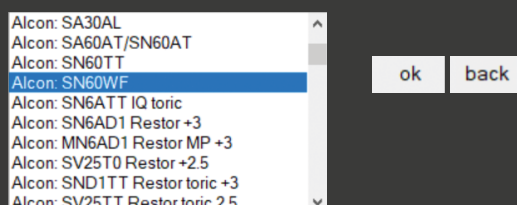
- 2 Select **OKULIX detail**.



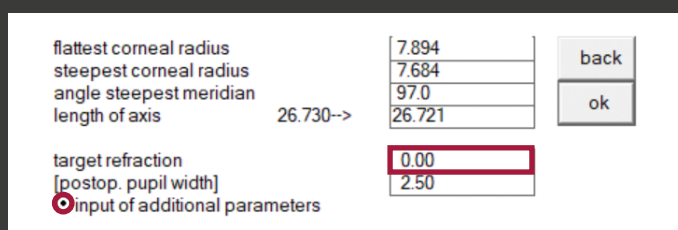
- 3 Select **1IOL**.



- 4 Select the desired IOL and press **OK**.



- 5 Enter the target refraction and select input of additional parameters then select **OK**.



1 STANISLAO RIZZO et al.: *Heavy Oils in Vitreoretinal Surgery*. Retinal Physician, 2018

2 YING CHEN et al.: *Silicone oil in vitreoretinal surgery: indications, complications, new developments and alternative long-term tamponade agents*. Acta Ophthalmologica, 2020. Wiley Online Library.

- 6 Enter the refractive index of the vitreous replacement oil and then select **OK**.

[refractive index vitreous]	1.4	back ok
[flattest posterior corneal radius]	6.70	
[steepest posterior corneal radius]	6.42	
[angle steepest posterior radius]	107.00	
	measured	
[praeop. ACD]	2.81	
[cryst. lens thickness]	4.44	
[weight factor axial eye length]	0.50	

i See below for list of common silicon oil and their refractive indices.

- 7 Confirm postop ACD (note this is optional and most will not change) then select **OK**.

[postop. ACD (instead of 4.230)]	4.634	back ok
<input type="radio"/> calculate scaling of retinal image size		

- 8 The IOL power is predicted based on the data provided and considers the refractive index of the oil used.

target refr. 0.00D, r= 7.79mm, ACD=4.63mm, a=26.72mm, Alcon: SN60WF

(parax.) best focus
2.5mm Pup.

16.00 -> [0.71]	0.64 (1.17/-1.06/ 5)
16.50 -> [0.37]	0.29 (0.82/-1.06/ 5)
17.00 -> [0.02]	-0.05 (0.48/-1.06/ 5)
17.50 -> [-0.32]	-0.39 (0.14/-1.06/ 5)

Standard ☒ Printer ☐ Selectable

ok print export back


An alternative procedure is favored by some surgeons and has been shown to produce good visual outcomes and allow for the removal of the oil. The crystalline lens is replaced during the same procedure as the vitrectomy surgery and a standard IOL is implanted along with a "piggyback" IOL in the sulcus to account for the oil filled posterior chamber. When the oil is exchanged, the sulcus fixed IOL is removed, and the patient can be returned to emmetropia. The IOL calculation can be used to predict a standard IOL power and also to calculate the sulcus lens (e.g. Rayner Sulcoflex) addition that considers the oil filled vitreous cavity^{3,4}.

i For further information please refer to the OKULIX user guide (Section 3.4).

3 M. AMON: *A journey through supplementary IOLs and 12 years of clinical history*. rayner.com

4 OKULIX User Manual, Version 09.27, 2023.

Commonly Used Silicone Oil

Manufacturers	Product	Refractive Index	Link
Bausch & Lomb	Oxane	1.40	
Geuder/Labtician	Several	1.39–1.404	