

# Amico Yasna Pars

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Enjoy  
the moments  
that matter  
the Most





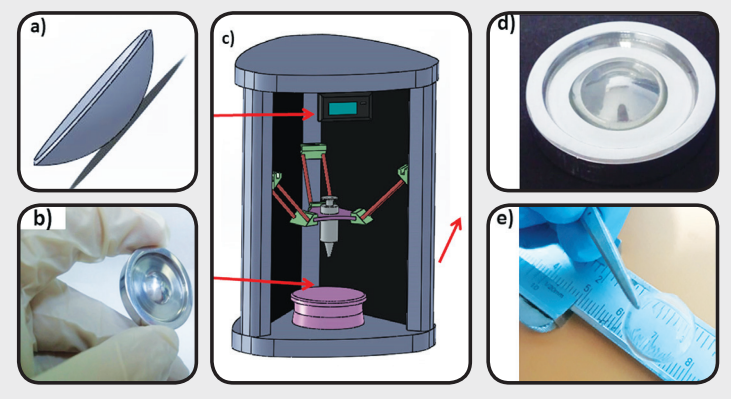
# 3D printed artificial cornea for corneal stromal transplantation

Songul Ulag, Elif Ilhan, Ali Sahin, Betul Karademir Yilmaz, Deepak M. Kalaskar, Nazmi Ekren, Osman Kilic, Faik Nuzhet Oktar, Oguzhan Gunduz

Corneal blindness is a significant global problem that results from both inflammatory and infectious causes. Some of the more important global etiologies for corneal blindness include trachoma, corneal ulceration and ocular trauma. In the pediatric age group, xerophthalmia and ophthalmia neonatorum both contribute to corneal blindness. While corneal transplantation techniques have advanced dramatically over the past decade, the availability of technological advances has been dampened by the limited availability or complete lack of donor corneal tissues for large segments of the global population. Even in regions where corneal donor tissue is readily available for transplantation purposes, it may not be the best option when etiologies such as severe alkali burns, aniridia with stem cell deficiency, multiple previous graft failures, prominent corneal neovascularization and surface keratinization with dry ocular surface may all lead to a poor postoperative result. Therefore there is an urgent need to find alternative solutions to replace the damaged cornea with an artificial cornea. With this purpose, the researcher combined chitosan and PVA to form a biocompatible, elastic, permeable-to-oxygen composite material for the corneas. Then they drafted up an aluminum mold in SolidWorks and machined it before any 3D printing took place. The mold was used to perfect the cornea shape as 3D printing with FFF technology alone wouldn't give them the dimensional precision they needed. Then, with varying proportions of chitosan in the mix, a set of sample cornea constructs were fabricated.

The 0.4mm thick constructs were subjected to scanning electron microscopy and UV spectrophotometry to determine their optical properties, with further biocompatibility tests with human stem cells determining clinical feasibility.

The printing steps for production of corneal construct, solid model (a), Aluminium mold (b), 3D device (c), after printing process (d), printed corneal stroma construct (e).



The results showed that the PVA corneas had the correct size and shape for precise light refraction, and light transmittance values were found to decrease with additional chitosan content. Tensile strength also decreased with chitosan content but the constructs could all comfortably support the typical intraocular pressure. The real potential of the study comes from the biocompatibility test, however, as the printed structures were compatible with the stem cells even after 30 days of degradation. With the appropriate nurturing, the stem cells could differentiate into a usable stroma layer, supporting the natural healing process of the body post-transplantation. The researcher team concluded that their work, with further developments, could lead to a more safe and sustainable method of corneal blindness treatment.

# WHITESTAR SIGNATURE PRO

System is a stable and efficient solution whether you use peristaltic, venturi or a bit of both.



## TAKE COMFORT IN STABILITY

With automatic occlusion sensing, the **WHITESTAR SIGNATURE® PRO** System proactively adjusts to maintain intraocular pressure (IOP), freeing you to concentrate on the details of each procedure.

## PROTECTS THE PATIENT'S EYE BY WORKING BEHIND THE SCENES TO MAINTAIN IOP THROUGHOUT THE PROCEDURE:

- Continuously monitors vacuum levels
- Anticipates pressure changes
- Fast, proactive response to occlusion breaks



## POST-OCCLUSION SURGE IN PERISTALTIC MODE†

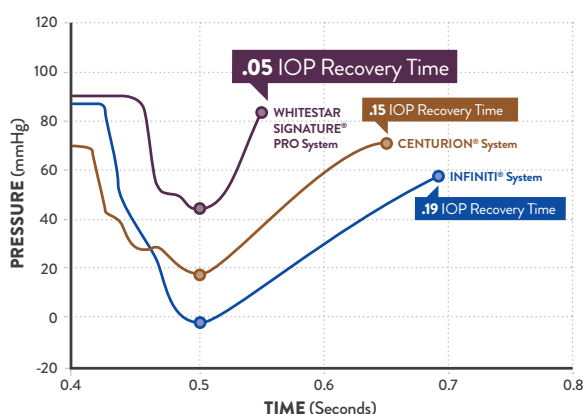
**51%** LESS CHANGE IN IOP than the INFINITI® Vision System\*

**74%** FASTER IOP RECOVERY than the INFINITI® Vision System\*\*

**12%** LESS CHANGE IN IOP than the CENTURION® System\*

**67%** FASTER IOP RECOVERY than the CENTURION® System\*\*

*Results from non-clinical study.*



**WHITESTAR SIGNATURE® PRO** System: Aspiration 30 ccm, Vacuum 400 mmHg, Pump Ramp 100%, Bottle Height 90 cm, CASE Vacuum 200 mmHg, OPO73.

**CENTURION®** System: Active FMS, Aspiration 30 ccm, Vacuum 400 mmHg, IOP Target 65 mmHg.

**INFINITI®** System: INTREPID® Plus Fluidics Management System, Aspiration 30 ccm, Vacuum 400 mmHg, Bottle Height 90 cm.

\*Change in pressure from steady state to post-occlusion surge trough

\*\*Change in time from post-occlusion surge trough back to steady state

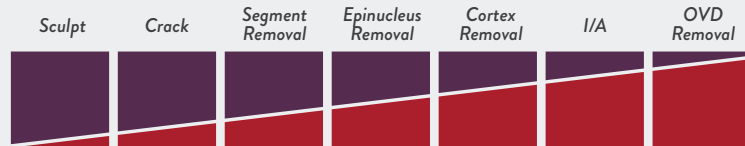


## HAVE IT YOUR WAY

Choose the flow that fits each step, case, preference and patient. With on-demand fluidics, you have freedom of choice throughout the procedure — whatever your technique may be.

- Peristaltic for holdability and intraoperative control
- Venturi for followability and improved efficiency
- Switch between pumps as you choose, at the press of the footpedal

### PERISTALTIC PUMP



### VENTURI PUMP

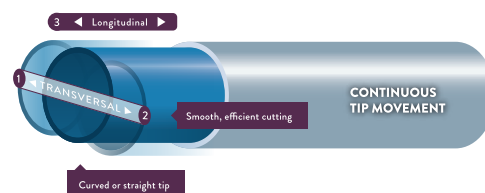
Peristaltic can be optimal for sculpt, crack and segment control while venturi is well suited for I/A.



## FOSTER EFFICIENCY THROUGH CONTROL

Work the way you want. The **ELLIPS® FX** Handpiece smoothly and efficiently cuts while protecting the eye and giving you total control.

- Continuous, elliptical ultrasound for both power and followability
- Reduced heat generated at the incision
- Less corneal edema
- Lower endothelial cell loss



In both blocked and unblocked conditions, elliptical energy management maintains significantly cooler temperatures than the competitor handpiece.

# Defining the future of monofocals

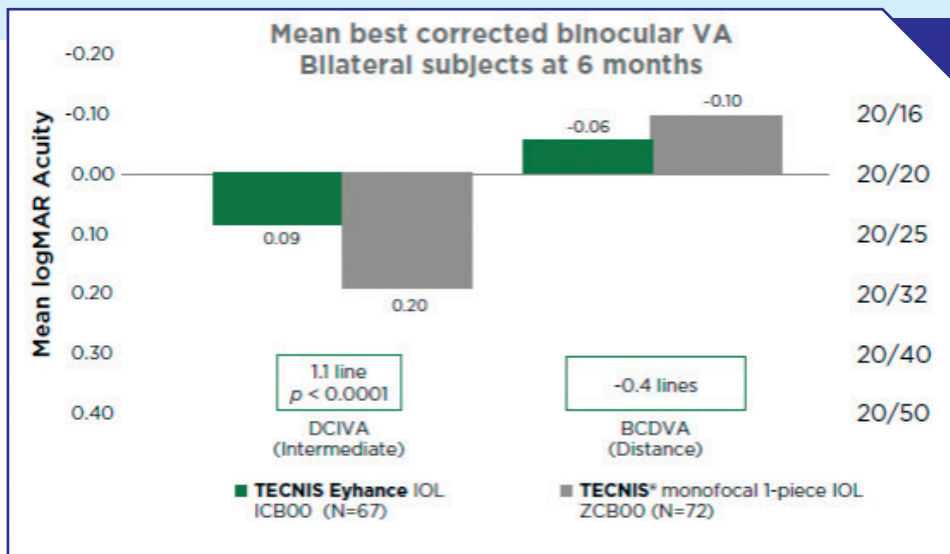
## Part I: The technology

The Tecnis Eyhance IOL (Johnson & Johnson Vision), model ICB00, is a next-generation monofocal IOL that extends the depth of focus, improving vision for intermediate tasks while providing similar distance vision to that of a standard aspheric monofocal IOL. Data show a low incidence of halo, glare or starburst comparable to that reported with the Tecnis 1-piece IOL. Nevertheless, the new lens is distinguished by a critical difference in design – namely, a continuous change in power from the periphery to the center of the lens, creating a unique anterior surface that improves intermediate vision, maintains distance image quality comparable to aspheric monofocal IOLs, delivers a profile of photic phenomena similar to ZCB00 and keeps on reducing spherical aberration to near zero. A comparison of power maps spotlights the unique structure of the new lens and emphasizes that ~85 percent of the surface of the TECNIS Eyhance IOL and TECNIS Monofocal lenses have exactly the same features; the difference between them lies only in the central area. The consequence of this novel design is a very favorable contrast profile: data indicate an equivalent contrast to other approved aspheric monofocal. Note that the TECNIS Eyhance IOL, unlike other monofocal lenses, is not based on a spherical-aberration (SA) based or zonal design, but the continuous power profile is created with a higher order asphere. Furthermore, in large pupil eyes the TECNIS Eyhance IOL provides significantly better contrast than other monofocal IOLs.

## Part II. The clinical trial

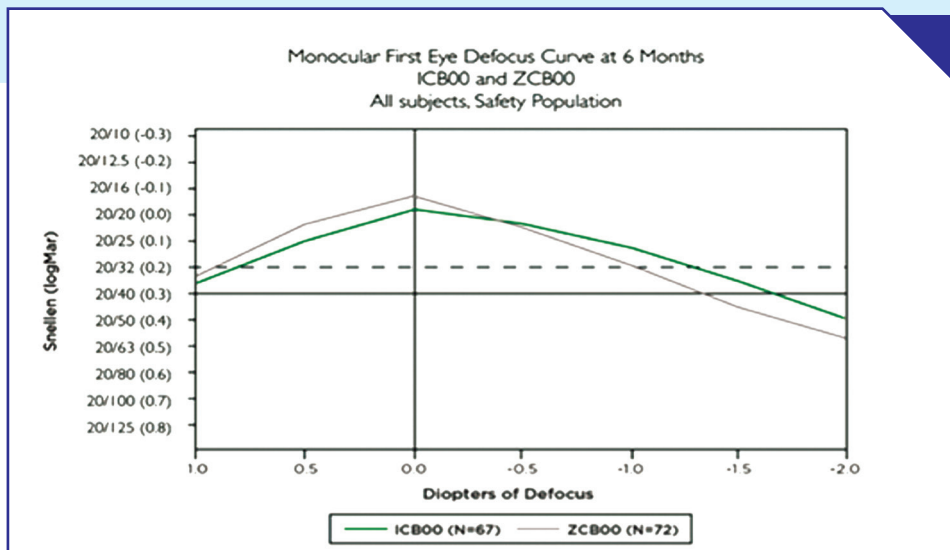
The prospective, multi-center, randomized clinical study compared the clinical performance of the TECNIS Eyhance IOL with that of the TECNIS Monofocal IOL ZCB00. Both the evaluator and the subject were masked. The primary endpoint for the study was distance-corrected intermediate visual acuity (DCIVA); secondary endpoints were best corrected distance visual acuity (BCDVA) and uncorrected intermediate visual acuity (UCIVA). From a total of 68 subjects bilaterally implanted with the TECNIS Eyhance IOL, and 72 controls bilaterally implanted with TECNIS Monofocal, 68 and 72 individuals respectively were followed up at six months. The results were striking – a monofocal IOL has been shown in a clinical trial to deliver significant improvements to intermediate vision. Eyes implanted with the TECNIS Eyhance IOL had significantly better monocular intermediate vision at 66 cm than the controls (mean TECNIS Eyhance IOL DCIVA value was better than the mean DCIVA for TECNIS Monofocal:  $p < 0.0001$ ), and better results were obtained for UCIVA outcomes, too. Similar results were observed for binocular intermediate vision: eyes implanted with the TECNIS Eyhance IOL had mean DCIVA and UCIVA values superior to those of eyes implanted with the TECNIS Monofocal.

Figure1. TECNIS Eyhance IOL provides statistically significant improvement in binocular intermediate vision at 66 cm



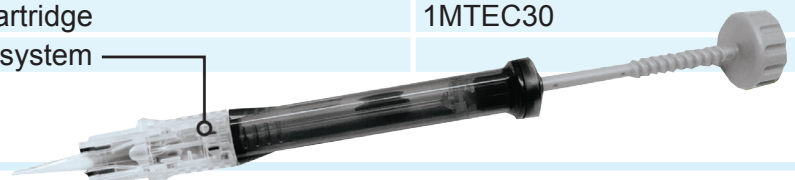
The TECNIS Eyhance IOL also provides excellent (20/20) distance vision: monocular and binocular distance vision is comparable to that provided by the TECNIS Monofocal IOL. Thus, the TECNIS Eyhance IOL is very similar, and not inferior, to the TECNIS Monofocal IOL in terms of binocular distance vision. In addition, reported rates of photic phenomena (halo, glare, starbursts) were similar for both lenses. Regarding defocus, measurements indicate that the TECNIS Eyhance IOL has a larger 'landing zone' than the TECNIS Monofocal IOL.

Figure2. TECNIS Eyhance IOL delivers a bigger landing zone than the TECNIS 1-piece IOL



Finally, The new TECNIS Eyhance monofocal IOL (ICB00) redefines the concept of the monofocal lens that it will become the monofocal IOL of choice for many ophthalmic surgeons.

| RECOMMENDED INSERTION INSTRUMENTS                    |  | MODEL   |
|------------------------------------------------------|--|---------|
| The UNFOLDER® Platinum 1 Series Screw-Style Inserted |  | DK7796  |
| The UNFOLDER® Platinum 1 Series Cartridge            |  | 1MTEC30 |
| Preloaded TECNIS Simplicity® delivery system         |  |         |





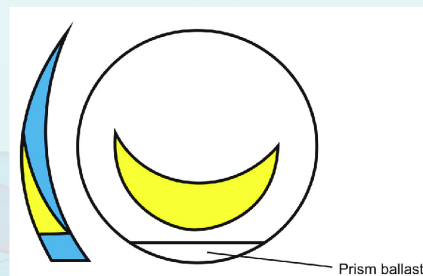
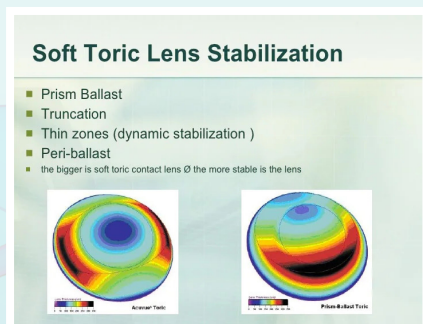
# AIR OPTIX for ASTIGMATISM

بیماران در فیت لنزهای تماسی مخصوص آستیگماتیسم گهگاه از عدم دید مطلوب و چرخش لنز در هنگام پلک زدن شکایت می کنند. لنزهای Airoptix for Astigmatism با استفاده از تکنولوژی به کار رفته در تهیه آنها این مشکلات را مرتفع کرده اند.

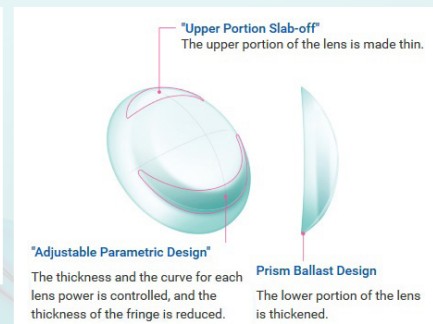


## استفاده از تکنولوژی Prism Ballast

- ایجاد منطقه سنگین در قسمت پایینی لنز برای قرار گرفتن مناسب و دقت بیشتر بینایی
- قرار گرفتن نقاط سنگین لنز در ساعت ۴ و ۸ که باعث پایداری بیشتر لنز گردیده و از چرخش لنز در چشم می کاهد.
- این نقاط در سایر لنزها در ساعت ۵ و ۷ قرار می گیرد که پایداری کمتری را ایجاد می نماید.
- این طراحی باعث بهترین فیت در بیمارانی که مشکل آستیگماتیسم دارند می گردد.
- ایجاد منطقه بینایی گسترده و کاهش قطر منطقه سنگین لنز (Prism ballast) و دریافت حداکثر جذب اکسیژن توسط قرنیه
- طراحی لبه پایدار برای ایجاد راحتی استفاده از لنز
- وجود سه نشانگر در ساعت های ۳، ۶ و ۹ که معاینه کننده با استفاده از آنها و بررسی لنز موجود در چشم توسط اسلیت لمپ از قرار گرفتن درست آن مطلع می گردد.
- این لنز به دلیل محتوای آب کم و جذب کمتر آب از لایه اشکی چشم برای مصرف کنندگانی که دچار خشکی چشم هستند بسیار مناسب است.
- لنز Airoptix for Astigmatism با پوشش دهی نمره ها، سیلندرها و محورهای مختلف و با بیش از ۱۵ سال حضور در بازار ایران یکی از مطرح ترین و بهترین برندهای قابل دسترس برای معاینه کنندگان و مصرف کنندگان است.



**Alcon®**  
Vision Care



# Advanced Refraction Table HRT-7000



دنیای امروزی بر مبنای دقت و سرعت است. طبیعتاً معاینه کنندگان نیز به دلیل حجم زیاد مراجعه کنندگان نیاز به سرعت معاینه بالاتر و دقت بیشتر در کارشان دارند. یونیت های معاینه چشم پزشکی و بینایی سنجی که از طرف کمپانی های معروف سازنده عرضه گشته اند این نیاز را تامین می کنند. یونیت معاینه HRT-7000 از جمله این محصولات هست که چند برابر سرعت معاینه را افزایش می دهد. این وسیله جابجایی بیمار بین میزهای معاینه مختلف را از بین می برد. در این روش بیمار در صندلی تعبیه شده برای خود یونیت نشسته و کلیه معاینات لازم در یک مکان انجام گردیده و سپس خارج می گردد.

این وسیله قابلیت قرار گرفتن ۴ دستگاه معاینه بصورت یک جا را به روی خود دارد:

۱. اتورفرکتور اتومتر ۲. اسلیت لمپ ۳. فوراپتر ۴. چارت پروژکتور

طبعاً اگر این چهار دستگاه از برند Huvitz باشند قابلیت اتصال به یکدیگر و انجام سریع تر معاینه را خواهند داشت. مثلاً بعد از انجام رفرکشن بیمار، اطلاعات توسط دستگاه اتورفرکتور اتومتر به کامپیوتر مرکزی تعبیه شده در یونیت انتقال داده شده و سپس به دستگاه فوراپتر ارسال می گردد. در این مرحله عدسی لازم بصورت خودکار جابجا گردیده و نمره لازم جلوی دید بیمار قرار خواهد گرفت.

مزایای دیگر این دستگاه:

الف. عدم نیاز به جابجایی افراد کهنسال، کودکان و کسانی که قابلیت حرکتی کمتری دارند.

ب. راحتی و عدم قرار گرفتن تریال فریم به روی بینی بیمارانی که هر گونه عمل زیبایی به روی صورت خود انجام داده اند.

ج. عدم قرار گرفتن تریال فریم به روی گوش بانوان و جابجایی حجاب آنها.

د. اشغال فضای کمتر و عدم نیاز به فضای گسترده و زیاد

ر. زیبایی و جذابیت بیشتر برای معاینه شوندگان

ف. سیستم برق کشی داخلی به صورت جداگانه برای برق رسانی به هر دستگاه، جهت حفظ زیبایی و جلوگیری از شلوغ شدن قسمت معاینه

م. دارای بازوی فوروپتر و پایه چارت پروژکتور

ی. سنسور نگهدارنده برای جلوگیری از بالا آمدن بیش از حد صندلی و آسیب رساندن آن به صفحه یونیت

نیاز مصرف کنندگان باعث ایجاد تولیدات جدید و به روز تر در بازار خواهد گشت. در نهایت یونیت های معاینه به آهستگی جای خود را در مطب ها باز خواهند کرد و به زودی استفاده از آنها مانند سایر دستگاه چشم پزشکی، یکی از نیازهای روزمره معاینه کنندگان خواهد بود.

**Huvitz**  
Pacing Progress Toward People

## NANOEDGE SINGLE-USE VACUUM TREPHINES

- Non-slip finger grips
- Cutting depth control: 0,0625 mm blade progression per quarter turn and 0.25 mm per full 360° rotation for precise cuts in various corneal layers
- Seamless blades for precise trephination
- Wide range of different sizes in small diameter increments for nearly all corneal applications
- Cross hairs for accurate alignment with the visual axis

### NANOEDGE SINGLE-USE VACUUM TREPHINES radial

|                              |                              |                              |
|------------------------------|------------------------------|------------------------------|
| <b>G-570600</b> .....6.00 mm | <b>G-570750</b> .....7.50 mm | <b>G-570850</b> .....8.50 mm |
| <b>G-570650</b> .....6.50 mm | <b>G-570775</b> .....7.75 mm | <b>G-570875</b> .....8.75 mm |
| <b>G-570700</b> .....7.00 mm | <b>G-570800</b> .....8.00 mm | <b>G-570900</b> .....9.00 mm |
| <b>G-570725</b> .....7.25 mm | <b>G-570825</b> .....8.25 mm |                              |



## NANOEDGE SINGLE-USE CORNEAL PUNCHES

- Guide posts support precise tissue cuts without slipping or tilting
- Maximum contrast between graft and white cutting block minimizes the need for recoloring
- Non-slip positioning of the graft through seating ring and application of vacuum (with G-560xxx)
- Seamless blade for precise punches

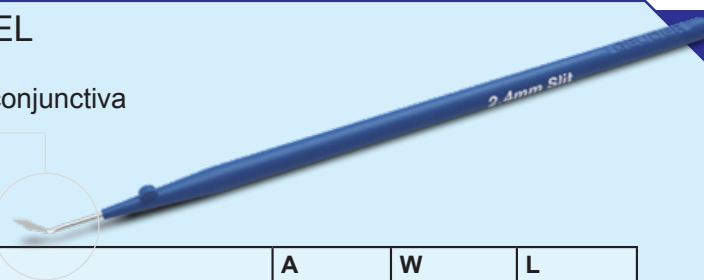
### NANOEDGE SINGLE-USE CORNEAL PUNCHES

|                              |                              |                              |
|------------------------------|------------------------------|------------------------------|
| <b>G-540600</b> .....6.00 mm | <b>G-540725</b> .....7.25 mm | <b>G-540850</b> .....8.50 mm |
| <b>G-540625</b> .....6.25 mm | <b>G-540750</b> .....7.50 mm | <b>G-540875</b> .....8.75 mm |
| <b>G-540650</b> .....6.50 mm | <b>G-540775</b> .....7.75 mm | <b>G-540900</b> .....9.00 mm |
| <b>G-540675</b> .....6.75 mm | <b>G-540800</b> .....8.00 mm | <b>G-540925</b> .....9.25 mm |
| <b>G-540700</b> .....7.00 mm | <b>G-540825</b> .....8.25 mm | <b>G-540950</b> .....9.50 mm |



## PHACO SLIT KNIVES – DOUBLE-BEVEL

- Create square incisions
- Straight incisions are less prone to intersect the conjunctiva



| Item no.       | Description                                                                                                                             | A<br>Angle | W<br>Width | L<br>Length |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------|------------|-------------|
| <b>G-34055</b> | NanoEdge Phaco Slit Knife db angled 2.85 mm                                                                                             | 42°        | 2.85 mm    | 14.5 mm     |
| <b>G-34062</b> | NanoEdge Phaco Slit Knife protect db angled 2.85 mm  | 42°        | 2.85 mm    | 11 mm       |
| <b>G-34056</b> | NanoEdge Phaco Slit Knife db angled 3.0 mm                                                                                              | 42°        | 3.0 mm     | 14.5 mm     |
| <b>G-34057</b> | NanoEdge Phaco Slit Knife db angled 3.2 mm                                                                                              | 42°        | 3.2 mm     | 14.5 mm     |

