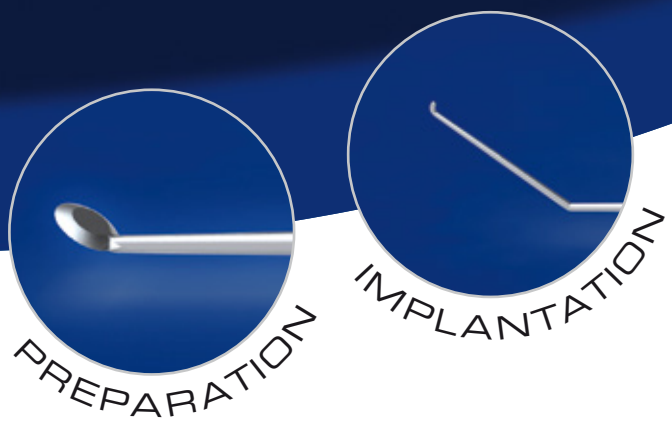
INNOVATION
MADE BY GEUDER®

DMEK

Descemet Membrane Endothelial Keratoplasty



THE INNOVATIVE SYSTEM
FOR TREATING ENDOTHELIAL
CORNEAL DISEASES

Geuder®
Precision made in Germany

THE NEW DMEK INSTRUMENT LINE

NOW WITH EVEN SMALLER CLEAR CORNEA INCISION

THE REVOLUTIONARY SYSTEM FOR TREATING ENDOTHELIAL CORNEAL DISEASES

Professor Dr. med.
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Knappschaftskrankenhaus
Sulzbach, Germany

Corneal grafts are the most common tissue transplants. Perforating keratoplasty has meanwhile become clinical routine in many centers.

Transplantation techniques have evolved in recent years and are moving away from perforation towards lamellar keratoplasty.

Endothelial corneal diseases comprise after all 40% of all keratoplasty indications. In many cases, perforating keratoplasty is excessive since the simple transplantation of vital endothelial cells would often suffice. This is why posterior lamellar techniques, especially DMEK, have been able to establish themselves in recent years as an alternative, widely atraumatic, solution for endothelial corneal diseases.

DMEK (Descemet Membrane Endothelial Keratoplasty) is limited to the isolated Descemet membrane and endothelial cells without stroma, with a thickness of only approx. 15µm.

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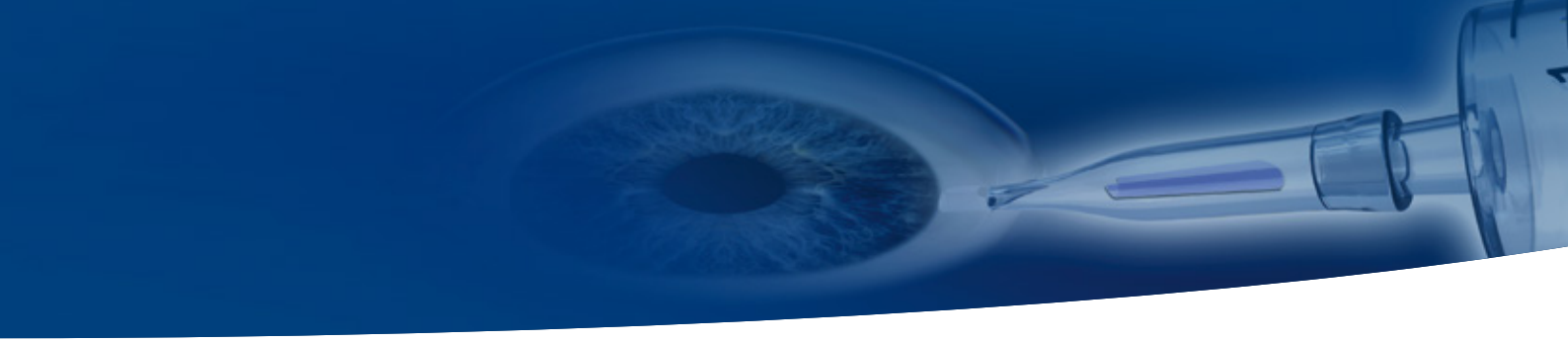


CLINICAL ADVANTAGES OF DMEK

Transplanting extremely thin lamella promotes considerably faster visual recovery than other lamellar keratoplasty techniques. DMEK prevents interface problems, causes neither postoperative astigmatism nor myopia and substitutes more endothelial cells (up to 9.5 mm graft size). As a result, visual acuity improves in many cases by 0.8 or better after only one week. Due to these very good results, DMEK might become the gold standard in the therapy of endothelial corneal diseases.

INSTRUMENTS FOR STANDARDIZATION OF DMEK

The success of this elegant technique is largely dependent on the number of vital endothelial cells and quality of the fragile graft and the gentle manipulation thereof. It is important that the fragile endothelial cells are not touched or stressed mechanically during preparation or implantation. In order to achieve reproducible results a standardized technique and specific instruments, which ensure a touch-free surgical procedure, are necessary. The new Liquid Bubble technique, which was developed in Sulzbach, Germany, uses a liquid in order to gently separate the Descemet membrane from the stroma beneath. It is another step towards the standardisation of DMEK.

On the following pages we introduce a new surgical set which will give experienced surgeons the opportunity to perform DMEK in the clinical routine. This set allows a touch-free preparation of a Descemet lamella and its subsequent transplantation.

Prof. Dr. med. Peter Szurman, MD

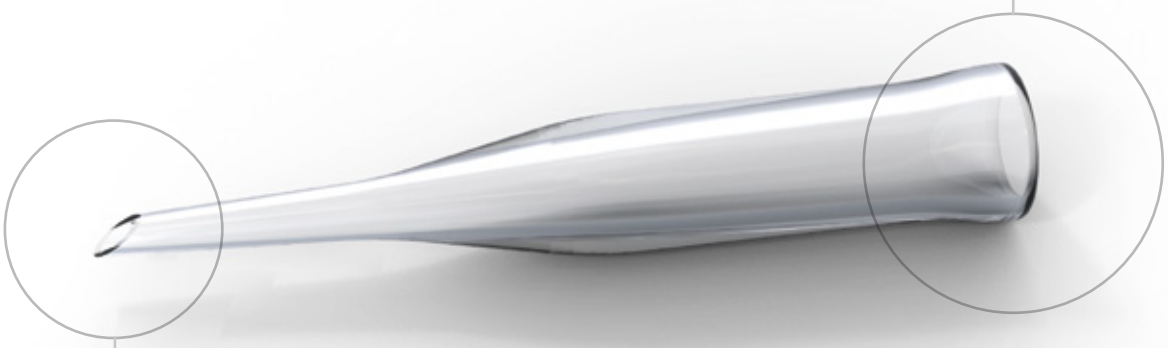
Literature:

1. Melles GR, Ong TS, Ververs B, van der Wees J (2006) Descemet membrane endothelial keratoplasty (DMEK). Cornea 2006; 25: 987-90
2. Cursiefen C, Kruse FE (2009) Descemet's stripping automated endothelial keratoplasty (DSAEK). Ophthalmologe. 106: 939-952
3. Szurman P, Yörük E (2010) DMEK-Step by Step. ESCRS, Paris
4. Yörük E, Szurman P (2010) DMEK Keratoplastik. Augenspiegel 11/2010
5. Yörük E, Szurman P (2011) Autologous Descemet´s Membrane Endothelial Keratoplasty. Cornea; in press

BRILLIANTLY SIMPLE:
THE IMPLANTATION CARTRIDGE

SIMPLIFICATION AND STANDARDIZATION OF DMEK SURGERY WITH TOUCH-FREE AND GENTLE HANDLING OF DESCEMET LAMELLA

- Safe and easy intake of the graft due to a large rounded opening of the cartridge



- Gentle and atraumatic injection into the anterior chamber
- Available in two sizes for incisions of 2.4 to 2.75 or 3.0 mm

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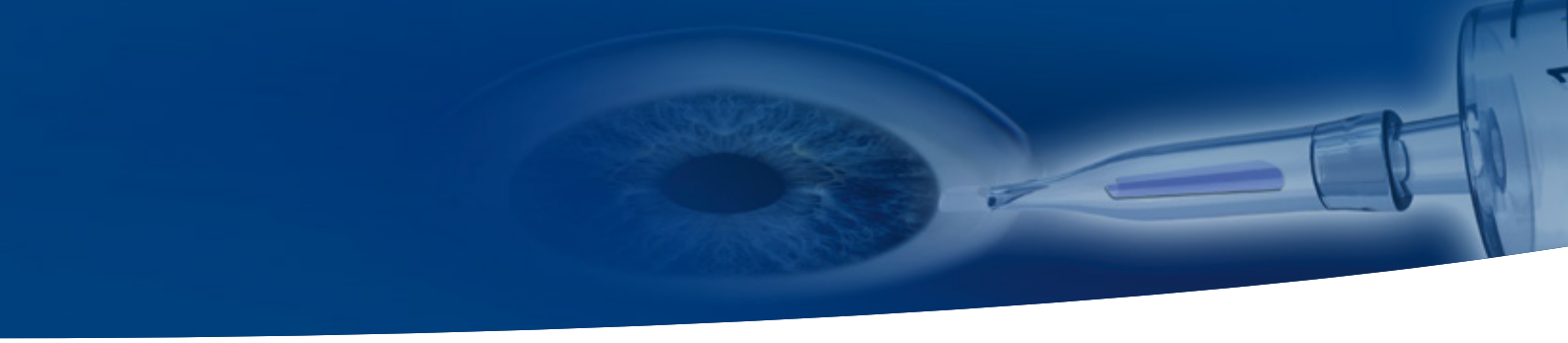
Precision made in Germany



INTELLIGENT DESIGN – TOUCH-FREE TECHNIQUE

- Atraumatic handling of the sensitive endothelium through smooth aspiration into the cartridge. Implantation into the anterior chamber without direct manipulation of endothelium and Descemet membrane
- Reduced loss of endothelial cells and reliable preservation of the functionality of the endothelial cells

ELEGANT FUNCTIONALITY – CRYSTAL CLEAR & SMOOTH

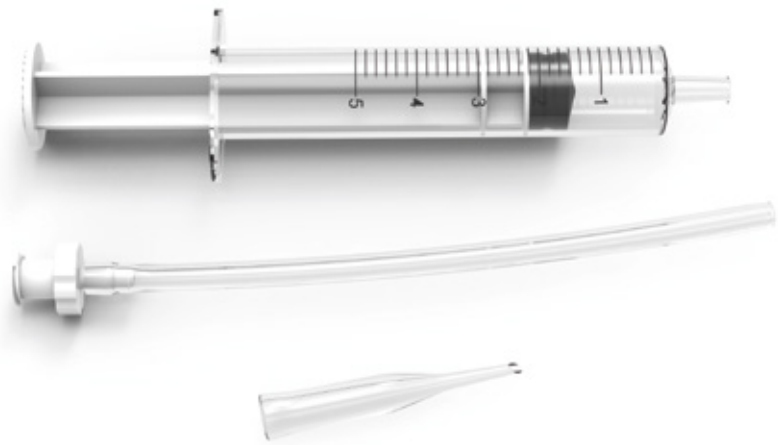
- Maximum safety for endothelial cells through streamlined design and smooth surface of the transparent cartridge
- Implantation of lamella under visual control prevents complications caused by wrong alignment of the graft within the eye
- Reduced surface friction saves endothelial cells and preserves high quality of the graft

NO SUTURE – NO ADVERSE EFFECTS

- Minimum incision size of 2.4 to 2.8 or 3.0 mm for fast visual recovery and satisfied patients
- Minimization of surgically induced astigmatism and other unwanted adverse effects

WELL CONCEIVED: THE ACCESSORIES

- Low additional costs through compatible standard accessories:
  - Standard single-use syringe
  - Heidelberg extension tubing
  - Swab



PREPARING THE DONOR EYE
PREPARATION TECHNIQUES

1 PREPARING THE DONOR CORNEA

In order to prepare the valuable Descemet membrane, fixate the donor cornea securely.

G-38620
SZURMAN
DMEK GRAFT RETAINER
for preparation of DMEK graft

G-38623
REMKY
DMEK KERATOPLASTY FORCEPS
modified by Szurman
to hold graft during
preparation

2a CLASSIC PREPARATION

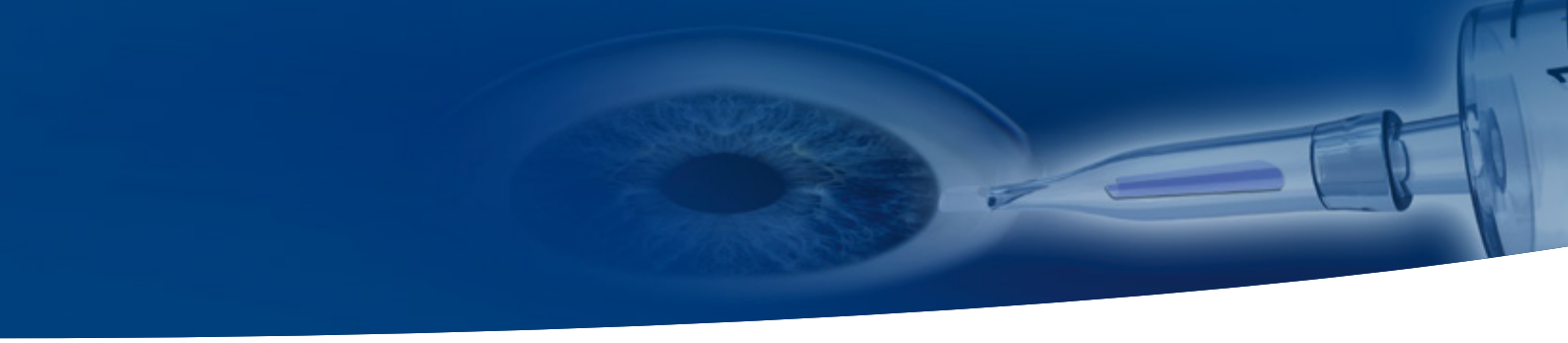
In order to prepare the Descemet lamella, scrape the membrane gently 360° starting at the periphery.

G-38621
SZURMAN
DMEK PREPARATION SCRAPER
for removal of Descemet
membrane from graft

G-38622
SZURMAN
DMEK PREPARATION SPATULA
for removal of Descemet
membrane from graft

G-38624
SZURMAN
DMEK PREPARATION FORCEPS
for removal of Descemet lamella

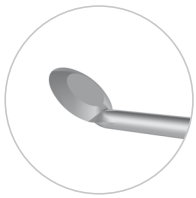
G-38628
YÖRÜK
DMEK TRANSPLANT FORCEPS
for grasping and removal of
Descemet membrane
grasping area 6 mm



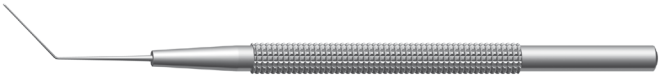
2b PREPARATION – THE LIQUID BUBBLE TECHNIQUE BY SZURMAN

At an appropriate location within the trabecular meshwork of the donor cornea prepare a small tunnel in order to overcome the zone of strongest adherence within the stroma. A suitable dye (e.g. trypan blue) injected under the Descemet membrane detaches the membrane fom the stroma. At the same time it stains the membrane selectively without damaging sensitive endothelial cells.

G-34191
NANOEDGE MVR STILETTO
angled
20 gauge / 0.9 mm
6 pcs. per box, **sterile**



G-38622
SZURMAN
DMEK PREPARATION SPATULA
for removal of Descemet membrane from graft



G-16189
SPATULA
angled, 45°
0.5 wide x 0.25 mm thick

G-32167
SAUTTER
HYDRODISSECTION CANNULA
rotation of 90°
27 gauge / 0.4 mm

G-15134
MICRO COLIBRI FORCEPS
with tying platform
extremely delicate
for corneal graft

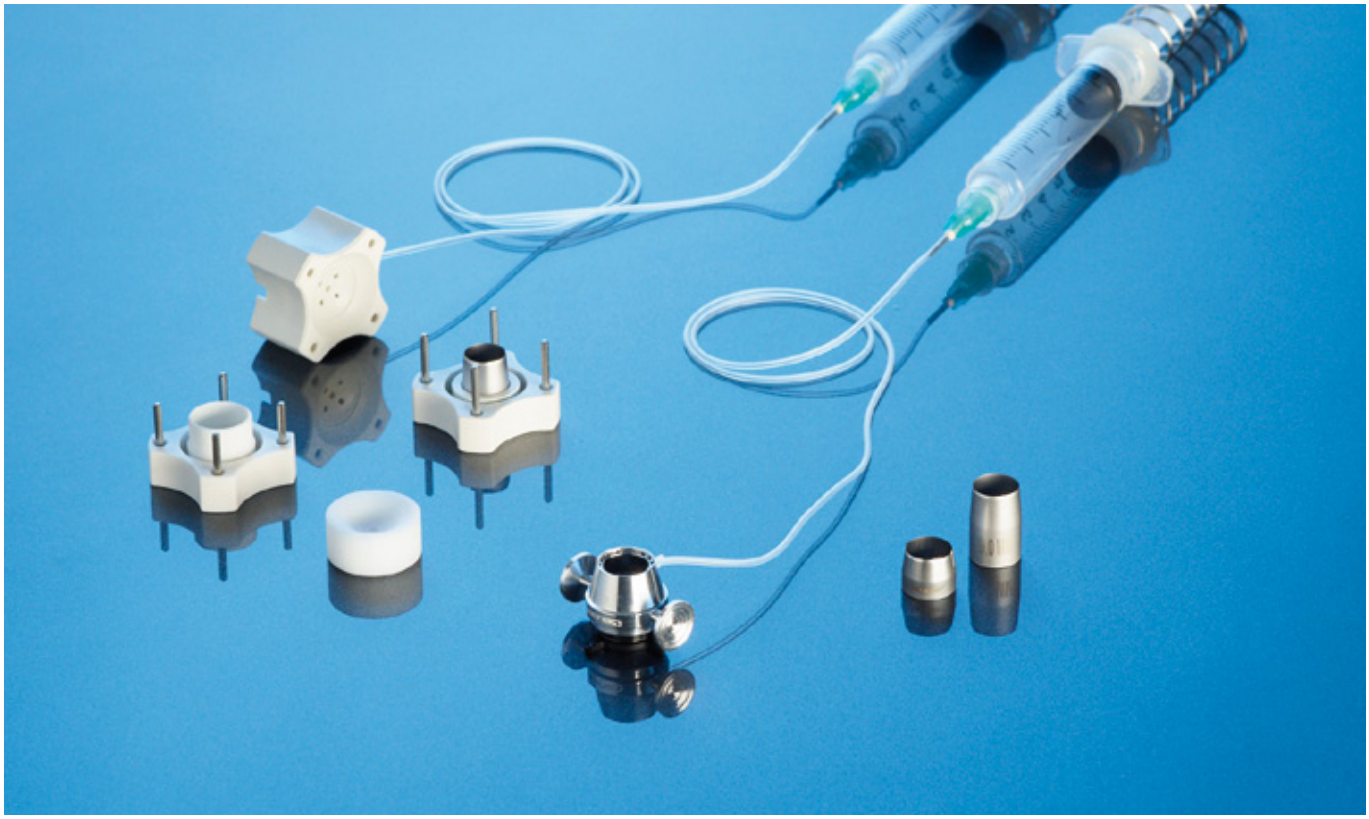
3 PUNCHING OUT THE DONOR CORNEA

The last step of preparation involves punching out the desired size of the lamella of the donor cornea. After storing the graft in liquid peel off the lamella from the stroma with a preparation spatula.

G-32671
ÖRK LINZ MODEL
SILICONE BLOCK FOR DMEK
for donor cornea, white-colored

GEUDER offers NanoEdge trephines and corneal punches in a wide range of different sizes in small diameter increments for nearly all corneal applications.

Learn more from our sales representatives or website
http://www.GEUDER.de/en/products/instruments



1 MAIN INCISION, PARACENTESIS AND IRIDECTOMY

Due to the slender design of the DMEK cartridge only a sutureless 2.4 to 2.75 mm clear cornea incision is necessary. The HATTENBACH 25 gauge hybrid scissors are optimal for the pressure compensating iridecomy.

NANOEDGE
PHACO SLIT KNIFE
angled, double bevel,
6 pcs. per box, **sterile**

G-34094	2.40 mm
G-34096	2.50 mm
G-34098	2.85 mm

G-34192
NANOEDGE MVR STILETTO
straight, incision width 0.8 mm
for instruments 23 gauge / 0.6 mm
6 pcs. per box, **sterile**

G-34191
NANOEDGE MVR STILETTO
angled, incision width 1.2 mm
for instruments 20 gauge / 0.9 mm
6 pcs. per box, **sterile**

G-32948
HATTENBACH
HYBRID SCISSORS
for the anterior chamber
25 gauge / 0.5 mm

G-31491
CLEAR CORNEA INCISION
FIXATION RING
inside diameter 13 mm
9 atraumatic teeth

2 PREPARING THE ANTERIOR CHAMBER

GEUDER's tried and tested hydrodissection cannulas offer free movement during DMEK.
Prepare the anterior chamber with BSS or air.

G-32167
SAUTTER
HYDRODISSECTION CANNULA
rotation of 90°
27 gauge / 0.4 mm

G-34245
SAUTTER
SINGLE-USE HYDRODISSECTION CANNULA
27 gauge / 0.4 x 22 mm
10 pcs. per box, **sterile**

3 DESCEMETORHEXIS

Incision hooks, the Descemet scraper and rhexis forceps enable a safe circular incision,
a complete rhexis of the recipient membrane and a subsequent polish.

G-38607
DESCEMET INCISION HOOK
diameter of hook: 0.2 mm
overall length: 103 mm

G-38608
DESCEMET SCRAPER
for peripheral scraping
of recipient bed
overall length: 103 mm

G-38601
ALTHAUS / CARTSBURG
IRRIGATION DESCEMET HOOK
diameter of hook: 0.25 mm
rhombic irrigation tube
overall length 98 mm

G-38602
TH. NEUHANN
IRRIGATION DESCEMET SCRAPER
0.7 mm wide scraper tip
rhombic 0.9 x 0.6 mm irrigation tube
overall length: 94 mm

G-38634
GERTEN
DSAEK/DMEK RHEXIS FORCEPS
for Descemetorhexis
reversed triangular tips to score and remove DM from host cornea
23 gauge / 0.6 mm

4 IMPLANTATION OF THE GRAFT

The last and crucial step of the surgery is to insert the graft into the recipient's eye. For better visualization, stain the Descemet lamella with a suitable dye, e.g. Trypan Blue, before loading the DMEK cartridge. Loading the cartridge through its large posterior opening is widely atraumatic for the Descemet lamella.
The accompanying tube enables a touch-free and gentle aspiration of the lamella.

The transparent glass cartridge allows a controlled injection of the graft into the anterior chamber. A double irrigation set enables touch-free unfolding and positioning of the Descemet lamella. An air or gas bubble (e.g. SF6) below the graft helps to attach the Descemet membrane to the cornea.

SZURMAN
SINGLE-USE DMEK-CARTRIDGE
for Descemet membrane endothelial keratoplasty,
incl. tube connection for loading the cartridge

G-38630 incision 3 mm
14 gauge / 2.0 mm, sterile

G-38635 incision 2.4 to 2.75 mm
16 gauge / 1.6 mm, sterile

G-38631
SZURMAN
DMEK IRRIGATION HANDPIECE
curved, closed tip
side port 0.3 mm
tube 23 gauge / 0.6 mm

G-38632
SZURMAN
DMEK IRRIGATION HANDPIECE
curved, front opening
tube 23 gauge / 0.6 mm

GEUDER AG reserves the right to make changes to technical details in response to recent developments. GEUDER does not assume liability for the accuracy of each individual statement.

Illustrations not drawn to scale (some illustrations are reduced to 80%).

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Precision made in Germany

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