PASSIVE MIDDLE EAR IMPLANTS

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For more than 30 years now, KURZ Medizintechnik has stood for ground-breaking developments in the middle ear prosthetics with its implants, instruments and tympanostomy tubes.

HIGH-TECH FOR THE MIDDLE EAR
When the company founder Heinz Kurz started with a small golden tympanostomy tube in 1974, no one could foresee that KURZ implants would one day set the standards for middle ear prostheses and instruments worldwide. Today KURZ products are highly innovative, high-tech works of art, designed to comply with the smallest tolerances and material thicknesses.

From the beginning, the proximity to local universities was an important locational advantage for our company, as well as the density of highly specialized companies in southwest Germany. To this day, KURZ prostheses are manufactured exclusively at our locally owned and operated manufacturing facility with support from competent partners.

WORLDWIDE REPRESENTATION
We supply surgeons and clinics worldwide via a broad network of distribution partners and have an American based subsidiary Kurz Medical Inc., out of Atlanta, GA. Attention to detail is important in the care and handling of our products and therefore we believe in supporting the market place with the highest level of sophistication and professional ethics. KURZ hosts several clinical and academic training seminars globally conducted by leading specialists in middle ear surgery.

ENTHUSIASM FOR TECHNOLOGY
In our developmental efforts, we work closely with leading national and international scientists, surgeons and engineers. Our collective know-how, tireless creativity and inquisitive minds, focus on the realization of implant designs that are comparable to functional anatomy in hopes of providing our patients with the best possible hearing results whom our products are made for.
KURZ Middle Ear Prostheses

WELL-ESTABLISHED KNOWLEDGE OF THE MIDDLE EAR

The aim of reconstructing the ossicular chain is to create the natural function as closely as possible and conduct the incoming acoustic signal to the inner ear with minimal loss. The complex mechanics of acoustic sound transmission places high demands on the development of implants and calls for well-established knowledge of the middle ear. Furthermore, prostheses must have properties that facilitate implantation for the surgeon and help to minimize risks.

SOLUTIONS FOR EVERY SITUATION

KURZ covers the entire range of implants required for tympanoplasty and stapedioplasty. In addition, the product line is rounded off by precision otological instruments and ventilation tubes.

INNOVATIVE DESIGNS AND MATERIALS

Innovative KURZ product designs and materials have set new standards in middle ear prosthetics throughout the world. For example, length adjustable prostheses can be shortened to a Functional Length of 0.75 mm. CliP prostheses standardize coupling to the incus or stapes. New types of ball-joint designs counterbalance the natural movements of the tympanic membrane and anatomically adapted bells create a secure connection to the stapes head. Furthermore, finely balanced weight distribution provides the prostheses with intraoperative stability.

These developments are based not only on well-established anatomical understanding but also on the latest results of scientific research and extensive test series. KURZ prostheses are available in numerous types and offer ideal solutions also in challenging anatomical situations.

MR information is available on www.kurzmed.com

IMPLANT MATERIALS AND PROCESSING

UTMOST CARE AND HIGHEST PRECISION

In order to achieve best possible results, the elegant design of the KURZ prostheses often probes the limits of feasibility. The manufacturing process of these prostheses requires highest precision and utmost care. Stringent inspections furthermore ensure compliance with highest quality standards.

INTENSIVE CLEANING PROCESS

All KURZ prostheses undergo an intensive cleaning process. The result is an extremely pure surface. This contributes to avoiding irritation-free contact with the sensitive mucosa and helps to prevent infections and granulomas which can develop as a result of residues or dirt particles.

HIGH DEMANDS TO BE MET BY MATERIALS

For the production of their prostheses, KURZ uses only high-quality, clinically tested materials. Due to its excellent biocompatibility titanium has since decades proven its worth as implant material. In addition, KURZ employs innovative nitinol variants which offer numerous clinically unique benefits.

TITANIUM

KURZ uses only high-quality (ASTM F67, medical grade), pure titanium for their prostheses. The properties of this material grade are ideally suited due to its rigidity, weight and technical manufacturing possibilities. The biocompatibility of this metal is also suitable for long-term applications.

Thanks to its low mass, titanium is particularly suitable for the use in middle-ear prostheses. Compared to other materials, it minimizes losses in connection with the transmission of sound energy. Moreover, the material is extremely resistant to deformation, while at the same time it can, if required, be adapted to individual anatomical situations by bending.

References:

NITINOL

Nitinol was discovered in 1958 by the Naval Ordnance Laboratory (USA). The alloy is made up of nickel and titanium in roughly equal proportions. It is distinguished by good mechanical properties as well as high resistance to corrosion.

Nitinol can assume different properties: As a shape memory alloy, the material is malleable and returns to its pre-programmed state when heated. The KURZ NiTiBOND Stapes Prosthesis makes use of this closing effect. Nitinol can also be produced in a superelastic configuration. These properties have been utilized in the design of the NiTiFLEX Stapes Prosthesis. The CliP attachment exhibits extreme spring elasticity and gently couples to the long process of the incus.

MRI SAFETY TESTS

MRI safety tests also cover the compatibility of KURZ prostheses, as long-term implants, with potential future Tesla strengths (up to 7.0 T). For further MRI-related information, see www.kurzmed.com

PURE TITANIUM (ASTM F67): CHEMICAL COMPOSITION

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Minimum cut-off grades in % (m/m)

KURZ implants are often placed in the middle ear. Vent inflammations and granulomas which can develop as a result of residues or dirt particles.

INNOVATIVE DESIGNS AND MATERIALS

KURZ employs innovative nitinol variants which offer numerous clinically unique benefits.

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KURZ employs innovative nitinol variants which offer numerous clinically unique benefits.

References:
ELEGANT DESIGNS WITH INNOVATIVE FEATURES
KURZ implant systems and prostheses for tympanoplasty are elegantly designed made from pure titanium. Well-established understanding of middle ear mechanics, in conjunction with the latest clinical research, represents the basis of our innovative developments. KURZ products are subject to extensive measurement and simulation testing. Furthermore, there are numerous publications by independent surgeons reporting the positive experiences with KURZ products.

SHORTEST FUNCTIONAL LENGTHS
KURZ designs all our devices considering pre-tension and stability such that the acoustic signal is transferred most optimal across the hearing frequencies. Consequently, a broad length availability becomes focal and in particular short length prostheses.

All KURZ partial prostheses achieve a functional length of 0.75 mm including our adjustable TTP-VARIO and TTP-VARIAC systems. Engineering was able to eliminate size limiting fixation columns from underneath the headplate by introducing a unique locking mechanism inside the headplate itself bringing greater utility and eliminate the need for additional shelf stock*.

OPTIMIZED INTRAOPERATIVE HANDLING
During surgery the finely balanced weight distribution of KURZ prostheses, and partially roughened surfaces, provide additional stability in handling. Fine structures and large, fenestrated head plates help to achieve better intraoperative visibility.

KURZ designs are also engineered to compensate for negative side effects of the healing process as found in the FlexiBAL partial prosthesis with its micro ball joint in the head plate. This flexibility mimics the fine movements of the tympanic membrane especially during the healing phase which has a favorable impact on implant stability.

BELLS, CLIPS, AND ADHESION FORCES
KURZ has developed many different solutions to ensure optimal, standardized coupling to the stapes head and footplate:

The conically shaped bell of the partial prostheses optimally adapts to the stapes head encouraging acoustic transfer function in the direction of the oval window. Recessed slots allow adequate space for the stapedius tendon and are easily augmented in the presence of superstructure anomaly.

Each KURZ total prosthesis is designed with a cannulated distal footing developed to give the prosthesis an excellent degree of stability. Additional stability and function is accessed when the hollow stem of the Total Prosthesis is cupped over the OMEGA sphere, transforming a typically static coupling to a much more dynamic union. In this way a flexible ball joint connection is created which can follow the postoperative movements of the tympanic membrane in the healing phase.


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**MAXIMUM VARIABILITY**

The tension-sensitive annular ligament of the stapes footplate plays a key role in reconstruction of the ossicular chain. If unforeseen precession develops here, it can have a critical effect on postoperative hearing outcome. Short prosthetic solutions as short as 0.75 mm Functional Length are available to counteract against unintentional tension.

**HIGH-PRECISION PATENTED SYSTEM**

The TTP-VARIAC System provides variability that is unique throughout the world: It is comprised of two variable-length titanium prostheses (one Partial, one Total) and the multifunctional AC-Sizer Disk. With the aid of different sizes of Sizer attached to the latter the surgeon can determine the required length of prosthesis with precision. On account of the potent clamping mechanism directly within the head plate the implant can be shortened to a Functional Length of up to 0.75 mm and the head plate can be fixed to the shim securely.

**PROVEN BENEFITS OF KURZ TYMPANOPLASTY PROSTHESES**

Like all KURZ prostheses, the TTP-VARIAC System has proven benefits: The elegant design and a fenestrated head plate provide maximum intraoperative visibility. The partially roughened surface improves stability.

**TWO PROSTHESES FOR ALL LENGTHS**

The high flexibility of the TTP-VARIAC System ensures not only the most appropriate length in each case. It also makes a major contribution to the optimization of inventory levels. One ideal addition to the total prostheses model is the OMEGA CONNECTOR (see page 18-19).

Developed in close collaboration with Tuebingen University ENT Clinic, Germany.


Like all KURZ prostheses, the TTP-VARIAC System has proven benefits: The elegant design and a fenestrated head plate provide maximum intraoperative visibility. The partially roughened surface improves stability.

**SIZER-DISK FOR PARTIAL PROSTHESES**

With integrated BELL Expander for expanding the boil.

**SIZER-DISK FOR TOTAL PROSTHESES**

**Length of determination:** Sizer Total is placed on the stapes footplate to intraoperatively determine the optimal length of the titanium prosthesis to be implanted later. By means of adhesion the Sizer remains stable during measurement.

**Removal of stem:** The projecting stem is removed with Cutting Forceps (REF 8000 171). It can thus be severed easily and with high precision.

**Cutting off the Sizer:** With the fine Micro Scissors (REF 8000 170) the Sizer can be removed from the Sizer Disk in the direct vicinity of the stem.

**Transport of the Sizer:** The Sizer can be transported with a fine aspiration device that suffices the head. Due to the plastic the Sizer is extremely light and therefore easy to handle.

**Minimum size of graft:** On the back of the Sizer Disk there are recessed templates that indicate the minimum sizes of graft which is placed between the prosthesis head plate and the tympanic membrane. In addition there is a millimeter scale.

Minimum size of graft:

**Transport of the Prosthesis along with the head plate:** The prosthesis along with the head plate is placed in the recess of the Sizer Disk that corresponds to the determined length. With the aid of Micro Closing Forceps (REF 8000 170) the head plate is firmly clamped.

**Finished prosthesis:** The finished TTP-VARIAC prosthesis is now ready for implantation.
**TTP®-VARIO SYSTEM**

**Adjustable Length Prostheses**

**PRECISION LENGTH ADJUSTMENT**

TTP-VARIO Titanium Prostheses provide the unique benefits of a length adjustable prosthesis system. The patented clamping mechanism within the head plate securely fastens the head plate to the stem. It provides a flexible design enabling prostheses to be sized as short as 0.75 mm (FL). Precise length adjustments are made with the aid of the TTP-VARIO instrument set (REF 8000 133).

**FOR OPTIMIZED INVENTORY LEVELS**

The adjustable length system satisfies all lengths within two types of prostheses: one for partial reconstructions and one for total reconstructions. Such flexible use makes a significant contribution to optimizing inventory levels.

**CONVINCING BENEFITS**

VARIO’s elegant design highlights intraoperative visibility and handling. Furthermore, a partially roughened head plate surface causes friction to the smooth cartilage improving contact liability.

**TTP-VARIO**

BELL Partial Prosthesis
Material: Pure Titanium (ASTM F67 Medical Grade)
Shaft Diameter: 0.2 mm

**TTP-VARIO**

AERIAL Total Prosthesis
Adjustable Length
3.0 - 7.0 mm
(0.25 mm increments)
Functional Length (FL) 0.75 - 3.50 mm

**TTP-VARIO**

Intrument Set (REF 8000 133)

**LIGHTWEIGHT AND FINELY BALANCED**

The TTP-Tuebingen Titanium Prosthesis has a lightweight design which enables the surgeon to adapt the implant to the patient’s individual anatomical situation by bending. Furthermore, finely balanced weight distribution ensures secure intraoperative and postoperative fit of the prosthesis.

**INTRAOPERATIVE VISIBILITY**

An open head plate in conjunction with a slim prosthesis stem further facilitates the handling. As a result the surgeon has maximum intraoperative visibility.

**PROVEN IN THE LONG TERM**

The TTP-Tuebingen has already been used successfully in tympanoplasty for several decades. As a result, KURZ is not only a hallmark of innovation but also of well-established long-term experience.

**TTP®-TUEBINGEN TYPE PROSTHESSES**

**LENGTH**

L (mm) | FL (mm) | REF
--- | --- | ---
1.75 | 0.75 | 1002 223
2.00 | 1.00 | 1002 224
2.25 | 1.25 | 1002 225
2.50 | 1.50 | 1002 226
2.75 | 1.75 | 1002 227
3.00 | 2.00 | 1002 228
3.25 | 2.25 | 1002 229
3.50 | 2.50 | 1002 230

**FL: Functional Length**

The TTP-Tuebingen Type Total Prosthesis is compatible with the OMEGA CONNECTOR (REF 1004 930).

**TTP-Tuebingen Type**

BELL Partial Prosthesis
Material: Pure Titanium (ASTM F67 Medical Grade)
Shaft Diameter: 0.2 mm

**TTP-Tuebingen Type**

AERIAL Total Prosthesis
Adjustable Length
3.0 - 7.0 mm
(0.25 mm increments)

**FOR OPTIMIZED INVENTORY LEVELS**

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**TTP-Tuebingen Type**

BELL Partial Prosthesis
Material: Pure Titanium (ASTM F67 Medical Grade)
Shaft Diameter: 0.2 mm

**TTP-Tuebingen Type**

AERIAL Total Prosthesis
Material: Pure Titanium (ASTM F67 Medical Grade)
Shaft Diameter: 0.2 mm

The TTP-Tuebingen Type Total Prosthesis is compatible with the OMEGA CONNECTOR (REF 1004 930).
**DUESSELDORF TYPE PROSTHESES**

**LONG-TERM EXPERIENCE**
With the Duesseldorf Titanium Prosthesis, KURZ demonstrates its well-established long-term experience. This implant has been successfully used for reconstructing the ossicle chain in middle ear reconstruction for over 20 years.

**SECURE INTRAOPERATIVE POSITIONING**
The features of the implant have set standards for a large number of other generations of prostheses. The cleverly engineered weight distribution of KURZ implants helps the surgeon to achieve secure intraoperative positioning of the prosthesis. The stem of the AERIAL Total Prosthesis and the bell of the BELL Partial Prosthesis have proven reliable throughout the world.

**CLINICALLY AND SCIENTIFICALLY EVALUATED**
Not only in clinical use are KURZ prostheses evaluated, but the individual benefits are also documented in numerous independent studies and scientific papers.

---

**MUNICH-LMU TYPE PROSTHESES**

**CHARACTERISTIC DESIGN**
The Munich-LMU is a prosthesis with a very characteristic head plate design. It is shaped like an umbrella with an extended rounded edge that creates a wide, atraumatic contact zone to the tympanic membrane. Large fenestrations provide good visual overview during implantation.

**STABILITY WHEN COUPLING**
Optimal coupling is provided by the particular prosthesis foot: The stem of the AERIAL Total Prosthesis has a cannulated distal footing to increase the fluid adhesion force to the stapes foot plate. The concave surface of the BELL Partial Prosthesis makes direct contact with a broad range of anatomical superstructures.

**PROSTHESES IN NUMEROUS LENGTHS**
In situ the well-balanced weight distribution provides the prosthesis with the best possible stability and simplified handling. The Munich Style Prosthesis is a fixed length prosthesis family available in 0.25 mm increments.

Developed in close collaboration with the ENT Clinic at LMU Munich University (Germany) Prof. Dr. A. Berghaus, Prof. Dr. J. Müller.

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**FL: Functional Length**

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<th>LENGTH L (mm)</th>
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**DUESSELDORF TYPE PROSTHESES**

**MUNICH-LMU TYPE PROSTHESES**

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**NOT AVAILABLE FOR COMMERCIAL SALE in the U.S. yet.**
MNP MALLEUS NOTCH PROSTHESES

FOR COUPLING TO THE MALLEUS
In ossicle reconstruction the malleus often still exists. Many surgeons want to preserve it and thus ensure stable coupling to the prosthesis.

REDUCED RISK OF DISLOCATION AND MIGRATION
Since the area around the malleus handle usually has the largest tympanic membrane deflection, simultaneous implant/drum contact is beneficial here. MNP’s concave recess facilitates this contact when placed under the malleus handle providing implant stability. Because of this recess the head plate of the MNP is relatively smaller.

MAXIMUM INTRAOPERATIVE VISIBILITY
The slimmer profiled, fenestrated head plate increases placement visibility.

MNP MALLEUS NOTCH PROSTHESES

MNP Partial Prosthesis
Material: Pure Titanium (ASTM F67 Medical Grade)
Shaft Diameter: 0.2 mm

MNP Total Prosthesis
Material: Pure Titanium (ASTM F67 Medical Grade)
Shaft Diameter: 0.2 mm

The MNP Total Prosthesis is compatible with the OMEGA CONNECTOR (REF 1004 930).

Length (L mm)  FL (mm)  REF
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MNP MALLEUS REPLACEMENT PROSTHESIS

STABILITY FOR A LONG-LASTING OUTCOME
Postoperative movements of the tympanic membrane can have a negative effect on the optimal position of a middle ear prosthesis. Invasive disease and anteriorly positioned malleus add to the degree of difficulty to reconstruction.

One of the aims of ossicular chain reconstruction is consequently to create a stable reconstruction minimizing the risk of tilting of the prosthesis.

SIMULATES AN ABSENT MANUBRIUM OF MALLEUS
The Malleus Replacement Prosthesis delivers an innovative concept which may considerably improve reconstruction instability of prostheses by creating an accessible lateral platform for implants to couple to. The adjustable Y link can be optimally positioned to the bony rim of the auditory canal.

WIDE RANGE OF APPLICATIONS
The MRP stabilizes and secures a partial or total reconstruction and counteracts dislocation, especially during the initial healing phase. It can be used in conjunction with a large number of KURZ prostheses. Ideally it is suited to interface with the Malleus Notch Prosthesis or the Cavity Bending Pliers (see page 54). The latter can easily be used on various KURZ prosthesis head plates.

Developed in close collaboration with Dr. Robert Vincent, Béziers (Causse Ear Clinic), France.

NOT AVAILABLE FOR COMMERCIAL SALE in the U.S. yet.
MODULAR SYSTEM FOR KURZ TOTAL PROSTHESES

The OMEGA CONNECTOR is compatible with all KURZ total prostheses that have a hollow stem with a diameter of 0.8 mm at the end of the shaft:

- TTP-VARIAC® System Total
- TTP-VARIO AERIAL Total
- TTP-Tuebingen Type AERIAL Total
- Duesseldorf Type AERIAL Total
- MNP Malleus Notch Total Prosthesis
- MunichLMU Type Total Prosthesis

QUICK DETERMINATION OF AVAILABLE SPACE

With the aid of the specially developed OMEGA CONNECTOR Sizer (see page 53) the surgeon can intraoperatively determine whether adequate space prevails for the OMEGA CONNECTOR between the stapes crura remnants. The measuring tip of the OMEGA CONNECTOR Sizer precisely corresponds to the dimensions of the OMEGA CONNECTOR.

OPTIMIZED FIT

In total ossicular reconstruction, movements of the tympanic membrane can alter the implant position on the stapes footplate. This risk may be reduced by using the OMEGA CONNECTOR together with a total prosthesis. The OMEGA CONNECTOR is designed to compensate for tympanic membrane movements and provide additional stability.

FLEXIBLE JOINT CONNECTION

With sufficient footplate access, the OMEGA CONNECTOR increases the medial surface contact of a total prosthesis. The micro ball joint connects with the cannulated stem of the KURZ total prosthesis. In this way it accommodates drum to headplate angles without prosthesis manipulations.

STABLE CONNECTION

An aspiration tip is ideally used to place the OMEGA CONNECTOR first into the middle ear. The cupped medial end of the total prosthesis is assembled with the OMEGA in situ. A snug and stable fit between the two prostheses makes fixation with adhesive unnecessary. The undersurface of the shoe has a longitudinally milled recess to compensate for footplate irregularity.

Developed in close collaboration with Dr. med. G. Schmid, Reutlingen, Germany.

OMEGA CONNECTOR

Can be used with KURZ Total Prostheses with a circular hollow stem.

Material: Pure Titanium (ASTM F67 Medical Grade)

Additional information

Image courtesy of R. Mlynski, Rostock, Germany
**CLIP® PARTIAL PROSTHESIS DRESDEN TYPE**

**STANDARDIZED COUPLING FOR MORE SAFETY**

The special feature of the CLIP Partial Prosthesis Dresden is its spring-loaded fastening mechanism. The CLIP standardizes coupling to the stapes head and thus enhances safety for a good postoperative outcome.

**SECURE FIT**

The elastic CLIP ensures a secure fit on the stapes head. Especially in the case of extensive eardrum reconstructions this stability is a major advantage.

**EXTREMELY ELEGANT**

KURZ implants are designed in such a way that they largely simulate the fine biological structures of the auditory ossicle chain. KURZ addresses this challenge with prosthesis geometries that are extremely fine and push back the limits of feasibility. Their manufacturing process requires the utmost care and precision.

**THE ORIGINAL**

Over a decade of clinical use including numerous scientific studies confirm the unique benefits of the CLIP Partial Prosthesis Dresden – the original among the clip prostheses.

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**CLIP PARTIAL FLEXIBAL® PROSTHESIS**

**UNDERSTANDING THE FUNCTION**

During the healing process, the tympanic membrane migrates to its ultimate position. After reconstruction of the auditory ossicular chain the implant can be susceptible to the environmental changes including dislocation which results in the loss of the incoming acoustical signal across all frequencies.

**INTEGRATED MICRO BALL JOINT**

A Micro Ball Joint is integrated into the head plate of the FlexiBAL. Consequently, the prosthesis can follow the macro movements of the tympanic membrane and continually align itself managing some of the dislocation effects. In addition, the movable head plate counteracts tension, especially at the annual ligament of the stapes footplate.

**STABLE AND CUSTOMIZED**

The unique CLIP Design provides the prosthesis with stability and standardizes coupling to the stapes head. Both of these benefits ensure a adequate fit of the FlexiBAL. In addition, the integrated Micro Ball Joint allows the surgeon to align the head plate with the tympanic membrane.

Developed in close cooperation with the ENT clinics of the university hospitals in Cologne and Dresden, Germany.

**Literature:**


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**LENGTH FL REF**

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FL: Functional Length

Special sizes upon request.
**ANGULAR CLIP® PROSTHESIS**

**PRESERVING THE ORIGINAL STRUCTURES**

One of the challenges of middle ear surgery is to preserve as much of the original structures as possible. When recommunicating the incus and stapes from discontinuity, preserving the native ossicles from progressive atrophy in a neutral position are important design configurations. The Angular CLIP bridges the incudostapedial joint with the aid of two mechanisms.

**CLIPPING AND CRIMPING**

Standardized coupling to the stapes head is provided by the CLIP. Its spring loaded foils produce a secure atraumatic fit while two titanium bands are crimped to the remaining incus long process.

**SOLID TITANIUM BRIDGE**

This type of reconstruction creates a bridge for the incoming acoustic signal. Its design pays particular attention to ligamental stress with its neutral fit.

Cartilage may be draped on the prosthesis laterally to protect the tympanic membrane.

Developed in close collaboration with Prof. Dr. med. K. B. Hüttenbrink, University of Cologne, Germany.

**ANGULAR PROSTHESIS PLESTER**

**STANDARDIZED CONNECTION**

Like the Angular CLIP the Angular Plester Prosthesis creates a secure, standardized connection between the stapes head and the long process of the incus when discontinuity is present. The Plester features a bell that is placed on the superstructure and two titanium bands which are crimped to the remnant incus.

**GOOD TOLERANCE IN LONG-TERM USE**

The Angular Prosthesis is made of pure titanium which demonstrates excellent tolerance long-term. In addition, the mechanical coupling has proven to be relatively stable.

**EVEN IF THE INCUS IS CONSIDERABLY SHORTENED**

Even if the distal end of the incus is considerably eroded, the Angular Prosthesis is a reliable, neutrally placed solution. Cartilage may be draped laterally on the prosthesis to protect the tympanic membrane.

**OVAL STEM FOR LARGER AREA OF CONTACT**

An enlarged oval stem end is the trademark of the Regensburg Type Total Prosthesis. It increases the area of contact with the stapes footplate, and together with a lower center of gravity ensures good balance and facilitates intraoperative handling.

**ADVANTAGEOUS FEATURES**

Small recesses in the head plate indicate the position of the stem. Below the head plate the shaft has a diameter of only 0.2 mm. Consequently, it can be easily articulated to match the tympanic membrane angle.

Developed in close collaboration with Regensburg University ENT Clinic, Germany and its middle ear research laboratory.

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**Additional Information**

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**Regensburg Type Total Prosthesis**

Material: Pure Titanium (ASTM F67 Medical Grade)

Shaft Diameter: 0.2 mm
One critical step in stapedioplasty is the coupling of the prosthesis to the long process of the incus. KURZ meets this requirement with solutions for various needs and schools.

**CRIMPING – EXTREMELY GENTLE MODELING**
Wide, perforated or exceptionally elegant loops in KURZ Crimp Prostheses facilitate modeling around the long process of the incus. This gentle but stable coupling supports good transmission of the incoming acoustical signal as well as protects the sensitive mucosa.

**CLIPPING – SUPERELASTIC BANDS**
A standardized form of coupling is provided by KURZ CliP Prostheses. Initial practical experience has shown that the superelastic nitinol band of the NiTiFLEX reduces the application force required when placed on to the incus. The contact-free zones are also designed to ensure that vascular nutrition of the surrounding structures is undisturbed.

**HEATING – SHAPE MEMORY EFFECT**
KURZ only uses pure titanium or titanium-nitinol combinations. Nitinol can have various characteristics: In addition to the superelastic properties, KURZ also uses the more traditional shape memory version of nitinol in their NiTiBOND prosthesis. When heated with the aid of a laser, the NiTiBOND loop closes in its pre-defined shape. The result is a moreatraumatic, standardized coupling.

**BUCKETS – EXTRA DEEP WELL**
KURZ Bucket Prostheses have extra deep wells to ensure more consistent coupling with the lenticular process. The elbow on the bail wire provides additional safety in intraoperative handling. The KURZ Bucket Prosthesis is constructed of pure titanium which is an extremely lightweight material, as well as having proven biocompatibility and MRI conditionality.

**OPTIMAL SOLUTIONS FOR REVISION SURGERY**
KURZ also offers solutions for revision surgery. The MVP with its micro ball joint and extra long malleus CliP creates a direct, adaptable and standardized connection between the malleus and stapes footplate. The Angular Piston stabilizes coupling between a shortened incus and the inner ear when bone resorption has occurred.

**MRI SAFETY**
MRI safety tests for future potential Tesla levels (e.g. 7.0 T) are performed on the KURZ prostheses, making them long-term implants. To protect the surrounding tissue and prevent the risk of adhesions, the stem of KURZ Stapes Prostheses are rounded. In addition, all KURZ implants are available in standard sizes making shortening redundant.

[Image of various prostheses]
HIGHLY COMPLEX STRUCTURES

The latest studies* concerning the incus show that especially the cross-section, geometry, and size of the auditory ossicle can vary enormously from person to person and be highly complex. KURZ has addressed this challenge by developing stapes prostheses with a perforated loop band.

EASIER MODELING

Longitudinal perforations in the band ensure that the loop is extremely malleable and easy to model around the long process of the incus. Consequently, the coupling is simplified significantly and more uniform. The additional material surface of the MatrIX band provides greater stability during the crimping process.

MINIMAL LOSS OF SOUND CONDUCTION

From an acoustomechanical viewpoint there should be as little play as possible in the coupling area between the prosthesis and the incus. A more consistent crimp along with increased surface area helps to ensure that the incoming acoustic signal is conductcd to the inner ear with minimal loss. To counteract a potential necrosis risk to the sensitive mucosa the coupling should not be too firm either.

Developed in close collaboration with Jack Kartush, MD, Michigan Ear Institute, Bloomfield, MI, USA.


K-PISTON STAPES PROSTHESIS

USED MOST OFTEN WORLDWIDE

One of the most commonly used KURZ Stapes Prosthesis in the world is the K-Piston. Its tested design has set standards for the development of many other generations of stapes prostheses. Numerous scientific studies support, inter alia, the excellent long-term suitability of this prosthesis.

REDUCED NECROSIS RISK

The wide band of the K-Piston, which, due to elaborate processes, is soft and flexible, helps to reduce the risk of necrosis. The loop is spiral-shaped as well preventing the loop tip and the loop attachment to touch during crimping. Consequently, the K-Piston is also suitable for small incus diameters. In addition, a low material pretension in the titanium loop ensures a dimensional firmness after crimping.

ATRAUMATIC DESIGN

The K-Piston made of pure titanium with its atraumatic rounded piston end is available in fixed lengths and diameters. The segment between the piston and the loop area is smooth and round minimizing an attachment surface for vibration-damping scar formation.

Developed in close collaboration with the ENT Clinic of Essen University, Germany.

K-PISTON STAPES PROSTHESIS

LENGTH (mm) REF
3.50 1006-103
3.75 1006-104
4.00 1006-105
4.25 1006-106
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9.00 1006-115
10.00 1006-116

Material: Pure Titanium (ASTM F67 Medical Grade)
Diameter: 0.4 mm
Band loop width: 0.3 mm

K-Piston STAPES PROSTHESIS

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Material: Pure Titanium (ASTM F67 Medical Grade)
Diameter: 0.6 mm
Band loop width: 0.3 mm
**SKARZYNSKI PISTON STAPES PROSTHESIS**

**LIGHTWEIGHT AND SLENDER**
The Skarzynski Piston is an extremely lightweight and slender prosthesis. It allows the surgeon to have a clear intraoperative overview and is particularly suitable in situations with a narrow oval niche.

**INDIVIDUAL AND PRECISE COUPLING**
The narrow offset band facilitates an easy manual crimp. The offset loop fits around the incus without its end meeting the loop attachment of the prosthesis, thereby enabling customized, precise coupling.

**FOR NUMEROUS ANATOMICAL CHALLENGES**
KURZ has developed and improved the Skarzynski Piston on the basis of traditional crimp prostheses. As a result, the Skarzynski Piston is suited to meet the numerous anatomical challenges.

Developed in close collaboration with Prof. Dr. Skarzynski, Poland.

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**ANGULAR PISTON STAPES PROSTHESIS**

**SECURE COUPLING IN SPITE OF EROSION**
In otosclerotic cases with advanced erosion of the long process of the incus, coupling of a conventional stapes prosthesis is often not possible. This can be observed in particular in connection with revision surgery, after stapedectomy or stapedotomy.

**TWO TITANIUM BANDS AS CLAMP**
In such cases, the Angular Piston provides a simple form of coupling: Its two titanium bands are crimped around the shortened process of the incus, fixing the implant in place while the shaft of the prosthesis is inserted into the vestibule in the customary way.

**TRIED AND TESTED IN ALL FREQUENCY RANGES**
The Angular Piston provides excellent sound transmission due to its design and the material properties of titanium. Low mass and high rigidity are particularly beneficial also in the high frequencies.

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Developed in close collaboration with Prof. Dr. Skarzynski, Poland.

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The Angular Piston provides excellent sound transmission due to its design and the material properties of titanium. Low mass and high rigidity are particularly beneficial also in the high frequencies.
**EVALUATION OF THE CLIP STAPES PROSTHESIS**

One important milestone in the evolution of stapes prosthesis is the development of the NiTiFLEX. Its proven CliP technology standardizes coupling of the prosthesis to the long process of the incus, increasing the likelihood of a good postoperative outcome.

**SUPERELASTIC NITINOL**

As opposed to conventional CliP prostheses, the NiTiFLEX has a loop made of superelastic nitinol which considerably reduces the attachment force. Extensive simulation and test series during the development process aimed to further enhance the transmission properties of the prosthesis.

**REDUCED PRESSURE TOWARD INNER EAR**

The prosthesis does not completely surround the incus. Laterally and medially there are prosthetic contact zones for a reliable acoustic sound transmission in the direction of force _FSound_. The attachment direction minimizes the risk of adding pressure in the direction of the inner ear. In addition, contact-free zones ensure continuous vascular nutrition of the mucosa. A wide, flat CliP band minimizes pressure peaks and may reduce the risk of necrosis.

The NiTiFLEX is available in all standard lengths.

Easy insertion with the aid of the Soft CliP Hook (REF 8000 127).

Developed in close collaboration with Tuebingen University ENT Clinic and the Institute of Engineering and Computational Mechanics at the University of Stuttgart (ITM), Germany.

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**SOFT CLIP® STAPES PROSTHESIS**

**STANDARDIZED COUPLING WITHOUT CRIMPING**

KURZ Clip Prostheses for stapedioplasty provide standardized coupling to the long process of the incus without crimping. The flexible band clip gently attaches with minimal application force. Its spring type mechanism conforms to multitude incus variations ensuring standardized and secure coupling.

**CONTINUOUS BLOOD SUPPLY TO THE MUCOSA**

The Soft Clip is made of pure, high quality titanium. This material possesses impressive long-term biocompatibility benefits. The wide band distributes surface tension to reduce risk of pressure necrosis. Contact free zones also prevent strangulation of the mucosa and contribute to continuous vascular supply. The contact zones run laterally and medially in the direction of the acoustic signal (_FSound_) to optimize the acoustic transmission.

**SOFT CLIP HOOK FOR EASY INSERTION**

A specially designed Soft Clip Hook (see page 57) helps the surgeon to attach the prosthesis onto the incus with reduced force. As a result, movement toward the inner ear is also reduced.

Developed in close collaboration with Dr. med. Schimanski, Luenen, and Dr. Ing. Eiber, ITM, Stuttgart, Germany.

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**NiTiFLEX Stapes Prosthesis**

- **Material:**
  - Superelastic Nitinol
  - Pure Titanium (ASTM F67 Medical Grade)
- **Diameter:** 0.4/0.6 mm
- **Band loop width:** 0.25 mm

**SOFT CLIP® Stapes Prosthesis**

- **Material:**
  - Pure Titanium (ASTM F67 Medical Grade)
- **Diameter:** 0.4/0.6 mm
- **Band loop width:** 0.25 mm

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</tr>
<tr>
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</tr>
</tbody>
</table>

**LENGTH**

<table>
<thead>
<tr>
<th>L (mm)</th>
<th>REF</th>
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<tbody>
<tr>
<td>Ø 0.6 mm</td>
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<td>1006 259</td>
</tr>
<tr>
<td>5.50</td>
<td>1006 261</td>
</tr>
</tbody>
</table>
PIONEER AMONG THE CLIP STAPES PROSTHESSES

As the classic model incorporating CLIP technology for stapes prostheses, the CLIP Piston ÀWengen standardizes the insertion procedure: Exerting slight pressure the CLIP is attached to the long process of the incus. Medial movements toward the inner ear are avoided.

STABLE ACOUSTIC SIGNAL TRANSMISSION

The prosthesis is laterally and medially coupled according to the acoustic signal direction, resulting in an optimized signal transmission. Contact free zones preserve vascular supply and reduce inadvertent point necrosis.

GOOD ACOUSTIC TRANSMISSION THANKS TO PURE TITANIUM

Even at high frequencies, titanium is an advantageous prosthetic material due to its low mass, exceptional acoustic transmission properties and biocompatibility.

**CLIP® PISTON ÀWENGEN STAPES PROSTHESIS**

**Material:**
- Pure Titanium (ASTM F67 Medical Grade)
- Diameter: Ø 0.4/0.6 mm
- Band loop width: Ø 0.25 mm

---

**CLIP® PISTON MVP STAPES PROSTHESIS FOR MALLEOVESTIBULOPEXY**

**CLIP TECHNOLOGY PROVEN IN THE LONG TERM**

The CLIP Piston MVP is designed for malleus to footplate revision stapes surgery. Long term usage show that the CLIP easily standardizes consistent coupling to the neck of the malleus.

**BALL JOINT PROSTHESIS FOR MALLEOVESTIBULOPEXY**

The extra long dimensions with an integrated ball joint simplify the complicated off axis positioning of traditional malleus to footplate implants. The ball joint additionally allows for the piston to be centered in the fenestration reducing tangential friction.

**POSTOPERATIVE STABILITY**

After adaptation of the implant the ball joint remains stable. The risk of postoperative dislocation is accordingly reduced.

Developed in close collaboration with Prof. Dr. Häusler, Bern University Canton Hospital, Switzerland.

---

**CLIP® PISTON MVP STAPES PROSTHESIS FOR MALLEOVESTIBULOPEXY**

**Material:**
- Pure Titanium (ASTM F67 Medical Grade)
- Diameter: Ø 0.4/0.6 mm
- Band loop width: Ø 0.25 mm

---

**Additional information**
BUCKET TYPE STAPES PROSTHESIS

COMPLETES THE PORTFOLIO OF COUPLING OPTIONS

With the characteristic Bucket Type Stapes Prosthesis, KURZ rounds off its stapes portfolio offering four separate coupling mechanisms to stapes surgery.

GENTLE AND SECURE

The KURZ bucket has a comparatively deep well in two diameters to manage the variety of lenticles. It facilitates surface contact on the medial side of the incus. A bail wire is configured for better management in events of dislocation.

EXCELLENT SOUND TRANSMISSION PROPERTIES

Due to its material, pure titanium, the Bucket Type Stapes Prosthesis combines the advantages of excellent biocompatibility with reduced weight. As a result, the prosthesis features excellent sound transmission properties.

Developed in close collaboration with Joseph Roberson MD, Palo Alto, USA.

**Material:**
Pure Titanium (ASTM F67 Medical Grade)
CRIMP-FREE COUPLING

The NiTiBOND Stapes Prosthesis combines the proven properties of CliP Stapes Prostheses with the benefits of shape memory nitinol. The result is an optimized mucosal sparing custom coupling.

FOR ALL INCUS SIZES

Extensive experience in the development of stapes prostheses, connected with sound knowledge of the middle ear, created the basis for the geometry of the unique nitinol loop. Due to its design it is suitable for almost all incus sizes.

The nitinol loop has four integrated contact zones that interface with the surface of the mucosa, conforming to the asymmetrical dimensions of the incus. Additionally, the loop also features three independent activation zones which keep thermal transfer from the mucosa surface during laser activation. These activation zones can be sequentially closed producing a custom coupling to the individualized incus.

The elasticity of the respective zones ensures that pressure is applied as uniformly as possible. A flat wide band reduces the risk of pressure points. To complement the nitinol loop the prosthesis stem is made of pure titanium.

REDUCED RISK IN LASER SETUP

The laser settings are determined outside the middle ear with the aid of the Thermo-Dummy. The dummy is delivered together with the NiTiBOND in the KURZ triangular box.

Developed in close collaboration with the O.RL Clinic of the University Hospital Zuerich and the Institute of Engineering and Computational Mechanics at the University of Stuttgart, Germany.

NITIBOND® STAPES PROSTHESIS

Material:
- Nitinol
- Pure Titanium (ASTM F67 Medical Grade)
Diameter: 0.4/0.6 mm
Band loop width: 0.25 mm

ContactFree Zone
Reduces risk of strangulation

Contact Zone
Safer coupling

Flat and Broad Band loop
Incorporates safety while projecting heat to the prosthesis; minimizes the risk of pressure points

ThermoActive Zone
Well-defined areas for heat application

ThermoBlock Zone
Minimizes the risk of overheating the mucosa

Elastic Zone
Provides potential even pressure

KURZ triangular box:
The NiTiBOND Stapes Prosthesis and the Thermo-Dummy are delivered in the KURZ triangular box.

Thermo-Dummy: With a fine instrument (hook) the Thermo-Dummy is lifted out of its anchorage and moved into a vertical position.

Application of the laser: To determine the correct settings the surgical laser is tested on the Thermo-Dummy and adjusted accordingly.

Secure closure of the NiTiBOND: After setting the laser it can be used for closing the NiTiBOND securely.

1. ThermoActive zone:
First step, the first ThermoActive zone of the prosthesis loop must be engaged by the evaluated settings for the laser.

2. ThermoActive zone:
The second shot to the ThermoActive zone in the center position.

3. ThermoActive zone:
The nitinol loop closes with a laser shot at the third ThermoActive zone.

NiTiBOND Stapes Prosthesis Material:
- Nitinol
- Pure Titanium (ASTM F67 Medical Grade)
Diameter: 0.4/0.6 mm
Band loop width: 0.25 mm

LENGTH
L (mm)
Ø 0.4 mm
ø 0.6 mm
1.50 1007 103
1.25 1007 104
1.00 1007 105
0.75 1007 106
0.50 1007 107
0.25 1007 108
0.00 1007 111

REFERENCE NUMBERS
VENTILATION TUBES: ESTABLISHED DESIGNS FOR SHORT- AND LONG-TERM VENTILATION

KURZ Ventilation Tubes are excellent solutions for aeration of the middle ear. A complement of geometrical designs has been created for short, mid and long term ventilation. Focus on biocompatible materials provide excellent tissue tolerance.

LARGE INNER LUMEN
Easy secretion discharge and optimal ventilation are ensured by comparatively larger inner lumens while maintaining dimensionally smaller overall tubes.

Tube lengths between flanges and smooth surfaces are also a key design feature which more efficiently facilitate suction and drainage.

FUNCTIONAL FEATURES
Unique to KURZ, the Tuebingen Type Tube features medial eyelet flanges and therefore is ideally suited for longer term ventilation. The Beveled Type Tube is more notably suited for narrow canals. Ventilation tubes that can be inserted without prior paracentesis simplify handling. The trocar on which the matching Trocar Ventilation Tube is mounted perforates the tympanic membrane, inserting the ventilation tube. The Minimal Type Ventilation Tube has an integrated trocar such that the tube is placed simultaneously with the paracentesis.
TUEBINGEN TYPE VENTILATION TUBES

THE CLASSIC DESIGN
Tuebingen Tubes are classic "collar button" ventilation tubes for aeration of the middle ear. KURZ manufactures this design in gold-platinum, gilded silver, and pure titanium. Titanium has excellent tissue tolerance.

COMPARATIVELY LARGE INNER DIAMETER
A particularly smooth surface and large inner lumen facilitates secretion discharge and drainage while the outer diameter is comparatively small. This tube comes in three different diameters providing flexibility in ventilation time, suction access and canal dimension without changing insertion technique.

OPTIMAL FIT DUE TO SHORT LENGTH
The Tuebingen tube has a relatively short length which, combined with wide flanges, ensures a more consistent fit into the tympanostomy. If required, a tube with retention wire can make the insertion easier.

BEVELED TYPE VENTILATION TUBES

VERY SMALL SIZES
This Beveled Ventilation Tube comes in three progressive sizes designed to overcome smaller canals to effusion volume challenges. The paediatric version (size 0) has a 0.75 mm inner diameter and a length of 0.70 mm ideally suited for a narrow outer ear canal.

EASY TO INSERT
The ventilation tube is made of a gold-platinum composition. Its funnel shaped outer flange facilitates insertion and suction of pervasive effusion.

Tuebingen Type Ventilation Tubes
Material: Gold-Platinum, Gilded Silver, Pure Titanium (ASTM F67 Medical Grade)

Beveled Type Ventilation Tubes
Material: Gold-Platinum

Packing unit 10 pieces/box
TVT TROCAR VENTILATION TUBES

ADEQUATE FIT WITHOUT PARACENTESIS
The Trocar Ventilation Tube is easy to insert without prior paracentesis. The tympanic membrane is pierced with the trocar tip upon which the ventilation tube is mounted. Once the trocar has been extracted, the ideal size between the incision and ventilation tube ensures that the ventilation tube is optimally fitted in the tympanic membrane. Insertion can be conducted easily and quickly under local anesthesia.

LARGE LUMEN FOR GOOD VENTILATION
The comparatively large inner lumen of the ventilation tube is an advantage allowing aspiration of secretion directly after insertion. The ventilation tube is therefore also suited for long-term ventilation and drainage of the middle ear and facilitates secretion discharge.

PURE TITANIUM
The Trocar Ventilation Tubes made of pure titanium have excellent tissue tolerance. The Trocar Ventilation Tube is delivered readily mounted on a single use trocar tip. This tip is connected to the fitted reusable stainless steel hand piece, Trocar Handle.

VENTILATION TUBE WITH EYELETS

EYELETS FOR LONG TERM VENTILATION
The Eyelet tube, based on the Tuebingen Ventilation Tube, is designed for long term ventilation and is manufactured with either one or two eyeleted medial flanges. The lateral flange displays orientation indentation to easily locate medial side flange placement.

GOOD VENTILATION
The eyelet tube is made of gold-platinum composition. The wider 1.50 mm inner diameter should offer additional dimensional benefit from occlusion along with a smoother lumen surface for efficient drainage.

<table>
<thead>
<tr>
<th>MATERIAL: GILDED SILVER</th>
<th>ID mm</th>
<th>OD mm</th>
<th>LENGTH mm</th>
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<tbody>
<tr>
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<table>
<thead>
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<th>OD mm</th>
<th>LENGTH mm</th>
<th>REF</th>
</tr>
</thead>
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<tr>
<td>Trocar Ventilation Tube</td>
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<td>2.80</td>
<td>2.50</td>
<td>1015 075</td>
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VENTILATION TUBE WITH EYELETS

<table>
<thead>
<tr>
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<th>ID mm</th>
<th>OD1 mm</th>
<th>OD2 mm</th>
<th>LENGTH mm</th>
<th>REF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventilation Tube (1 Eyelet)</td>
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<td>2.80</td>
<td>2.80</td>
<td>1.60</td>
<td>1015 064</td>
</tr>
<tr>
<td>Ventilation Tube (2 Eyelets)</td>
<td>1.50</td>
<td>2.80</td>
<td>2.80</td>
<td>1.60</td>
<td>1015 065</td>
</tr>
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</table>

Packing unit 10 pieces/box.

<table>
<thead>
<tr>
<th>REQUIRED ACCESSORY INSTRUMENT</th>
<th>REF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trocar Handle stainless steel, resterilizable</td>
<td>8000</td>
</tr>
</tbody>
</table>

| Diameter with Eyelets | 1 Eyelet (OD1): 3.90 mm
| 2 Eyelets (OD2): 4.80 mm |

Packing unit 10 pieces/box.
MINIMAL TYPE VENTILATION TUBE

FOR TEMPORARY VENTILATION

The Minimal Type Ventilation Tube is particularly suitable for temporary ventilation of the middle ear in adults with acute tubal occlusion.

NO PARACENTESIS THANKS TO SHARPLY GROUND CANNULA

Thanks to its sharp medial end the Minimal Type can pierce the tympanic membrane directly. Typically, these tubes are placed under local anesthesia in clinic setting and no prior paracentesis is required. The Minimal Type Ventilation Tube remains in the tympanic membrane for periods ranging from a few days to several weeks. To avoid injuries the tube must be clinically removed.

GOLD COATED STAINLESS STEEL

KURZ manufactures the Minimal Type Ventilation Tubes from gold coated stainless steel.

| MATERIAL: GOLD COATED STAINLESS STEEL (Not MRI conditional) |
|---|---|---|---|
| ID mm | OD mm | LENGTH mm | REF |
| Minimal Type Ventilation Tube | 0.60 | 0.90 | 6.00 | 1015 072 |

Packing unit 10 pieces/box

KURZ - Middle Ear Intelligence
INSTRUMENTS AND ACCESSORIES

KURZ INSTRUMENTS FACILITATE IMPORTANT MANIPULATIONS

To facilitate the insertion of prostheses, ventilation tubes, or important manipulations, the surgeon can dispose over numerous resourceful KURZ solutions. These include the KURZ Cartilage Cutter which enables precise cartilage slices cut with thicknesses ranging from 0.1 to 0.7 mm and the KURZ Meter for precise length determination of a stapes prosthesis.

STANDARDIZATION OF IMPORTANT SURGICAL STEPS

KURZ instruments are straightforward to handle. They standardize important surgical steps, such as coupling of a Clip Stapes Prosthesis, or measuring the correct prosthesis length, aiming to shorten operating time and achieve optimized operation result. While the precision instruments are ideal in combination with KURZ implants, they can also be universally employed in ENT surgery.

HIGH PRECISION IN THE MANUFACTURING PROCESS

Stainless steel or titanium form the basis for KURZ instruments. Their production requires high precision and technical know-how.
TTP-VARIAC® SYSTEM ACCESSORIES

ACCESSORY SET IN A PRACTICAL TRAY

TTP-VARIAC adjustable prostheses do require the use of VARIAC accessory instruments for proper execution of the assembly steps.

TITANIUM TWEEZERS FOR GENTLE PROSTHESIS HANDLING

The KURZ Titanium Tweezers are used for gentle removal and gentle handling of the prosthesis. They consist of pure material composition.

EXTREMELY ELEGANT MICRO SCISSORS

TTP-VARIAC Sizers, which are attached to the practical AC™ disk, determine the appropriate length of prosthesis (see page 10-11). With the aid of the Micro Scissors the surgeon can cleanly remove the sizer providing most optimal handling for length determination.

MICRO CLOSING FORCEPS FOR SECURE FIXATION OF VARIABLE-LENGTH PROSTHESSES

The head plate of the adjustable length TTP-VARIAC Prosthesis must be securely fixed to the stem with the aid of the titanium Micro Closing Forceps. These forceps are custom engineered to precisely close the headplate onto the corresponding stem. The use of the specially developed instrument is compulsory for this step.

SPECIALY DEVELOPED CUTTING FORCEPS

Use of the Cutting Forceps is also compulsory for the last step of the procedure. The tool trims the redundant stem from the lateral surface of the head plate. When the prosthesis has been inserted, fresh graft material such as cartilage or fascia will be placed between the implant and the tympanic membrane.

SPECIALLY DEVELOPED CUTTING FORCEPS

Use of the Cutting Forceps is also compulsory for the last step of the procedure. The tool trims the redundant stem from the lateral surface of the head plate. When the prosthesis has been inserted, fresh graft material such as cartilage or fascia will be placed between the implant and the tympanic membrane.

TTP-VARIAC System see page 10–11

<table>
<thead>
<tr>
<th>ITEM</th>
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<tbody>
<tr>
<td>Titanium Tweezers</td>
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<tr>
<td>Titanium Micro Closing Forceps</td>
<td>8000 137</td>
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<tr>
<td>Cutting Forceps, stainless steel</td>
<td>8000 171</td>
</tr>
<tr>
<td>Micro Scissors, stainless steel</td>
<td>8000 172</td>
</tr>
<tr>
<td>Tray TTP-VARIAC (without instruments)</td>
<td>8000 173</td>
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</table>

Material:
- Titanium, resterilizable
- Sterilizable instrument quality
- Stainless steel

AC SIZER SYSTEM SINGLE-USE SIZERS

APPROPRIATE PROSTHESIS LENGTH

Consistent and accurate sizing of a prosthesis is critical for postoperative hearing results. A prosthesis that is too short involves the risk of implant dislocation or migration. A prosthesis that is too long, can cause undesirable strain to the sensitive annular ligament of the stapes footplate.

TWO VERSIONS OF SIZING DISK

KURZ has developed a precision measuring system specially for determining the length of TTP-VARIAC Prostheses. With the aid of various sizers, which are attached to a practical disk, the surgeon can quickly and reliably determine the length of the prosthesis.

Two versions of sizing disks are available:
- 6 sizers for total prosthesis
- 6 sizers for partial prosthesis

FEATURES FOR SIMPLIFIED INTRAOPERATIVE HANDLING

Simple intraoperative handling of sizers is ensured by their light weight and ideal balance. In addition, elegant design provides optimal visibility.

On the back of the disk there are templates to determine the minimum size of transplants - e.g. cartilage or fascia - for the placement between the tympanic membrane and the prosthesis. The disk for partial prostheses also features a device for expanding the bells of BELL Prostheses.

Each disk is packed singly in sterile packaging. Each practical dispenser box contains 10 sizer disks.

<table>
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<tr>
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<tr>
<td>AC Sizer Partial</td>
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<tr>
<td>AC Sizer Disk Partial</td>
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</table>

Dispenser Box (Unit 10 pieces/box)

Important note: The AC Sizer System is made of polypropylene and is only for temporary use during middle ear surgery.

<table>
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<tr>
<th>ITEM</th>
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<tbody>
<tr>
<td>AC Sizer System Partial sterile, Unit 10 pieces/box</td>
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</tr>
<tr>
<td>AC Sizer System Total sterile, Unit 10 pieces/box</td>
<td>8000 550</td>
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</tbody>
</table>

Important note: The AC Sizer System is made of polypropylene and is only for temporary use during middle ear surgery.
**KURZ® PRECISE CARTILAGE KNIFE**

**FOR CUTTING CONSISTENTLY THIN CARTILAGE SLICES**

The KURZ Precise Cartilage Knife facilitates the cutting of consistently thin cartilage slices, as required for occluding tympanic membrane defects, covering tympanoplasty prostheses, or for reconstruction of the posterior auditory canal wall. It is equally suitable for cutting tragal and conchal cartilage conserving specimen material.

**CARTILAGE SLICES AS FINE AS 0.1 MM**

The cutting block, blade holder, and blade of the KURZ Precise Cartilage Knife make up a functional unit with which 0.7 mm cartilage slices can be made easily, quickly and in a standardized fashion. Distance plates (0.1/0.2/0.3 mm) make it possible to produce cartilage slices in thicknesses ranging from 0.1 mm to 0.7 mm.

The surgeon achieves best possible results with KURZ blades. Each blade is individually packed sterile in boxes of 10 each. They are particularly sturdy and contain one oval and one circular template imprinted on each blade face. The latter indicates the minimum size of graft for covering a KURZ tympanoplasty prosthesis.

**Material:**
Sterilizable instrument quality stainless steel

<table>
<thead>
<tr>
<th>ITEM</th>
<th>REF</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>KURZ Precise Cartilage Knife Set (blade holder, cutting block, distance plates, blades incl. Instrument Tray)</td>
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<tr>
<td>Distance Plate for Precise 1 mm (for compression of fascia)</td>
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<td>Supplies</td>
<td>REF</td>
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</tr>
<tr>
<td>Blades sterile single-packed, 10 pieces</td>
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**Replacement Parts:**

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<th>ITEM</th>
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<th>COST</th>
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</thead>
<tbody>
<tr>
<td>1 Set of Distance Plates (0.1/0.2/0.3 mm)</td>
<td>8000 102</td>
<td>102</td>
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<tr>
<td>KURZ Precise Blade Holder incl. Knurled Screw M3, Sr. 1.4305</td>
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<td>103</td>
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<tr>
<td>Instrument Tray KURZ Precise</td>
<td>8000 177</td>
<td>177</td>
</tr>
<tr>
<td>Knurled Screw M3, Sr. 1.4305</td>
<td>8000 190</td>
<td>190</td>
</tr>
<tr>
<td>Set Precise Cutting Block M6</td>
<td>8000 191</td>
<td>191</td>
</tr>
<tr>
<td>KURZ Precise Cutting Block incl. Nut Precise Cutting Block M6</td>
<td>8000 110</td>
<td>110</td>
</tr>
<tr>
<td>Instrument Tray KURZ Precise incl. Plate POM/Trey stainless steel</td>
<td>8000 144</td>
<td>144</td>
</tr>
</tbody>
</table>

**CARTILAGE FORCEPS SCHIMANSKI DESIGN**

**FOR DIFFERENT SIZES OF CARTILAGE SLICES**

Different sizes and thicknesses of cartilage slices can be required for the management of minor tympanic membrane defects (myringoplasty), covering a tympanoplasty prosthesis, reconstruction of the auditory canal wall, or mastoidectomy. These can be made efficient and fast with the Cartilage Forceps.

**FLEXIBLE HANDLING**

The two rectangular jaws of the forceps hold the cartilage enabling reliable and precise cutting with the aid of a blade. Additional thinning can be achieved by repeating the primary technique. Consequently, the Cartilage Forceps facilitate conserving specimen material.

**EFFICIENT AND STANDARDIZED METHOD**

The Schimanski design cartilage forceps are an easy, efficient tool which simplifies the technique of trimming cartilage to functional specimen.

**Material:**
Sterilizable instrument quality stainless steel

<table>
<thead>
<tr>
<th>ITEM</th>
<th>REF</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartilage Forceps Schimanski Design</td>
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<td>192</td>
</tr>
</tbody>
</table>

**ITEM | REF | COST |**
**CARTILAGE PUNCH**

**ADDITIONAL STABILITY AND OPTIMIZED FIT**

With the aid of a stabilizing shoe made of cartilage a total prosthesis can be positioned centrally and retained on the stapes footplate. In this way the surgeon counters a potential postoperative dislocation.

**SINGLE-STEP PROCEDURE**

KURZ developed the Cartilage Punch in an effort to reproduce a more consistent option for stabilizing of total prostheses. The instrument enables the surgeon to make small oval cartilage slices intraoperatively, swiftly, and in a single step. The center perforation is intended for the stem of KURZ Total Prostheses.

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<table>
<thead>
<tr>
<th>ITEM</th>
<th>REF.</th>
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</thead>
<tbody>
<tr>
<td>Cartilage Punch incl. Instrument Tray</td>
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<tr>
<td>REPLACEMENT PARTS</td>
<td></td>
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<tr>
<td>Instrument Tray incl. Inlay</td>
<td>8000 176</td>
</tr>
<tr>
<td>Spring</td>
<td>8000 198</td>
</tr>
<tr>
<td>Plastic Base POM (black)</td>
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</tr>
</tbody>
</table>

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**SIZER OMEGA CONNECTOR**

**SECURE CONNECTION WITH THE STAPES FOOTPLATE**

The OMEGA CONNECTOR (see page 18-19) creates an optimized connection with the stapes footplate for KURZ Total Prostheses (with the exception of the Regensburg Total Prosthesis). To obtain a secure fit on the stapes footplate appropriate spatial conditions must be considered.

**PRECISION REFERENCE MEASUREMENT**

The Sizer OMEGA CONNECTOR was developed for managing the spatial limitations. Length and width of its measuring tip are equivalent to the dimensions of the KURZ OMEGA CONNECTOR.

**EASY TO USE**

The instrument is placed onto the footplate to determine ample footplate space for the OMEGA prosthesis. It is made of stainless instrument steel and can be resterilized.

---

<table>
<thead>
<tr>
<th>ITEM</th>
<th>REF.</th>
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</thead>
<tbody>
<tr>
<td>Sizer OMEGA CONNECTOR</td>
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---

Material: Sterile instrument quality stainless steel
MALLEUS HANDLE CAVITY TO COUNTERACT PROSTHESIS DISLOCATION
For easy intraoperative handling and a good postoperative hearing outcome, implant stability and implant balance are two of the most important criteria.

In this context it can be advantageous to make a malleus handle cavity like the one found in the KURZ Malleus Notch implant. It ensures good prosthesis fit and thus counteracts the risk of dislocation.

FOR A LARGE NUMBER OF TYMPANOPLASTY PROSTHESSES
With the aid of the Malleus Handle Cavity Bending Pliers a surgeon using KURZ tympanoplasty prostheses (TTP-Tuebingen Type, Duesseldorf Type, TTP-VARIO or TTP-VARIAC) can make an optional malleus handle cavity to the existing head plate. The pliers standardize and speed up this procedure.

GENTLE CONSISTENT PRESSURE
A special holder at the tip of the pliers holds the implant securely during the bending process. The concavity can thus be created with gentle, consistent pressure.

ITEM REF
MALLEUS HANDLE CAVITY BENDING PLIERS 8000 109
Material:
Sterilizable instrument quality stainless steel

BELL EXPANDER
INDIVIDUAL ALIGNMENT AND EXPANSION OF THE PROSTHESIS
Elegant designs make it possible to adapt KURZ middle ear prostheses to unique anatomical conditions by bending. Stems are easily angulated and bells can be modified to a more open position in the presence of enlarged capitulums adding to a more consistent predictable sizing.

ADAPTATION TO THE STAPES HEAD
For individual expansion of the bell on partial prostheses, KURZ offers a special BELL Expander. This tool uniformly expands any KURZ BELL implant to fit unique dimension of stapes heads while preserving the integrity of the materials. Consequently, the implanted prosthesis is fitted securely and the anatomically shaped bell can transmit incoming sound directly to the articular surface of the stapes.

THUMBSCREW RESTRICTS EXPANSION
The degree of expansion is adjusted by using a thumbscrew on the head of the BELL Expander. The prosthesis stem is positioned into the special slot, whereby the bell is pointing upward. A tapered pin exerts uniform pressure on the bell and expands it gently.

ITEM REF
BELL Expander 8000 107
Material:
Sterilizable instrument quality stainless steel
**KURZ® METER**

**PRECISION STAPES PROSTHESIS LENGTH DETERMINATION**

The KURZ Meter is a precision instrument for determining the length of stapes prostheses intraoperatively. Due to its easy handling it simplifies and standardizes the measuring procedure during stapes surgery.

**MORE SAFETY**

A scale on both sides allows easy use for right- and left-handed users. The stop hook of the KURZ Meter is applied medially to the long process of the incus. With the aid of a scale the surgeon advances the measuring tip up to the footplate with precision. Prosthesis length is calculated by adding the measured distance between the process of the incus (medial side) and the surface of the stapes footplate to the depth of prosthesis insertion into the inner ear. The latter is determined by the surgeon.

**SAFE CLEANING AND STERILIZATION**

The KURZ Meter can be disassembled into its individual parts for safe cleaning. This facilitates sterilization.

![Image of KURZ Meter](image1)

**Material:** Sterilizable instrument quality stainless steel

**KURZ® METER**

**SOFT CLIP® HOOK**

**EASY INSERTION OF CLIP STAPES PROSTHESES**

KURZ developed the Soft CliP Hook specially for standardized insertion of NiTiFLEX and Soft CliP Stapes Prostheses. While the prosthesis shaft is positioned in the open footplate the CliP prosthesis is gently pushed onto the long process of the incus with the aid of the Soft CliP Hook. This reduces the risk of movement toward the direction of the inner ear and undesirable rotation of the prosthesis.

**REDUCED FORCE REQUIRED**

The Hook securely holds in place the special recess of the loop while pushing. It permits gentle attachment of the CliP prosthesis with reduced force. The application force is transferred to the axis of the long process of the incus.

Developed in close collaboration with Dr. John W. House, House Ear Institute, Los Angeles, USA.

![Image of Soft CliP Hook](image2)

**Material:** Sterilizable instrument quality stainless steel

**KURZ® METER**

![Image of Measuring Prosthesis Length](image3)

**Measuring distance is read off the scale reliably**

**KURZ Meter in an Instrument Tray**

**Soft CliP Hook**

![Image of Positioning onto the Incus](image4)

**Positioning onto the incus with the first wide opening**

**Prosthesis is pushed into place with one movement**

Image courtesy of G. Schimanski

**KURZ® METER**

**SOFT CLIP® HOOK**

**POSITIONING HOOK**

![Image of Positioning Hook](image5)

**Material:** Sterilizable instrument quality stainless steel

**KURZ® METER**

**PRE-CALCULATION OF STAPES LENGTH**

![Image of Pre-Calculation of Stapes Length](image6)

**KURZ® METER**

**SOFT CLIP® HOOK**

**INSERTION HOOK**

![Image of Insertion Hook](image7)

**KURZ® METER**

**PRE-CALCULATION OF STAPES LENGTH**

![Image of Pre-Calculation of Stapes Length](image8)

**KURZ® METER**

**SOFT CLIP® HOOK**

**INSERTION HOOK**

![Image of Insertion Hook](image9)

**KURZ® METER**

**PRE-CALCULATION OF STAPES LENGTH**

![Image of Pre-Calculation of Stapes Length](image10)

**KURZ® METER**

**SOFT CLIP® HOOK**

**INSERTION HOOK**

![Image of Insertion Hook](image11)
VENTILATION TUBE INSERTION FORCEPS

FOR RETENTION COLLAR VENTILATION TUBES
KURZ has developed a special instrument for inserting ventilation tubes with a retention collar: the Ventilation Tube Insertion Forceps. It particularly facilitates the handling ofTuebingen Type Ventilation Tubes, Ventilation Tubes with Eyelets, and Beveled Type Ventilation Tubes.

TRANSPORT AS SAFE AS POSSIBLE
The holding mechanism of the insertion instrument immobilizes the tube during transport and thus facilitates insertion of the ventilation tube in the tympanic membrane. The tube remains on the shaft of the Insertion Forceps until it is finally released. The instrument is made of stainless, resterilizable instrument steel.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>REF</th>
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<tr>
<td>Ventilation Tube Insertion Forceps</td>
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Material
Sterilizable instrument quality stainless steel

Prescription Devices
Caution: United States Federal Law restricts devices identified herein to sale by or on the order of a physician. This brochure does not replace nor does it set forth the complete contents of the "Instructions for Use" for the products in this brochure, and is not a substitute for reviewing and understanding that important information. Therefore, before using any products included in this brochure, please review the entire contents of the respective "Instructions for Use" information.

Because of registration the products are currently not available in all countries.