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**Rx only**

## Instructions for Use Implants

MAR-01305, Vers. 3

### For U.S. Distribution Only

For further information please refer to the U.S. section of our website:

[www.ifu-us.linkorthopaedics.com](http://www.ifu-us.linkorthopaedics.com)



## Legend of label symbols and descriptions



Manufacturer



U.S. Distributor



Caution



Consult instructions for use



Do not re-use



Number of units in the package



Keep away from sunlight



Article number



Serial number



Batch number



Order number

**Rx only**

Caution: Federal law restricts this device to sale by or on the order of a physician



Date of manufacture/sterilisation (YYYY-MM or YYYY-MM-DD)



Use by date (YYYY-MM-DD)



Fragile, handle with care



Keep dry



Do not use if package is damaged and consult instructions for use



Sterilized using Ethylene Oxide



Sterilized using irradiation



Non-sterile



Medical Device



UDI Number



Material Number



Contains hazardous substances

Further information on the symbols glossary can be found on our website.



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## 1. Brief description

The non-active, surgically-invasive implant systems by Waldemar Link GmbH & Co. KG are intended for the partial or complete long-term replacement of a diseased joint or a diseased bone region in the human body. They consist of defined components that can be combined with each other in accordance with their approved uses. The products may only be used and operated in an aseptic medical environment by persons who have the appropriate training, knowledge or experience in the orthopedic and surgical field.

The package inserts provided with the devices do not contain all of the information necessary for the selection and application of the devices. For proper handling, refer to other product-related instructions, such as those on the surgical technique associated with the relevant system, as well as special handling recommendations and device labels, where applicable. For definitive identification information on the product such as system compatibility, article number, material and shelf life, refer to the identification on the implant and/or the packaging. You should also take advantage of the training courses and printed materials provided for your information.

To learn more, please contact the Waldemar Link GmbH & Co. KG sales office or your field representative.

## 2. Handling

The components are supplied sterile (gamma sterilization, at least 25 kGy) as single-use devices in individual packages.

The packaging may contain protective components for the implants. These components are not intended for implantation.

Implants should always be stored in their unopened protective packaging. Examine the packaging for damage before using the implant. Damaged packaging can have an adverse effect on both the sterility of the device as well as the proper performance of the implant, such that the device may no longer be used. Check the use by date on the implants. Implants with expired use by dates are no longer permitted to be used for implantation!

Observe the pertinent standards for the aseptic handling of devices during and after removal of the implant from the packaging. When removing the packaging, make a record of the batch or serial numbers on the label, since this information is decisive for batch tracing. Self-adhesive labels with this information are enclosed with every package for your convenience.

### Please note!

- Implants must be handled with great care and should not be modified or changed, even the smallest scratches and damages can considerably impair their stability or performance. Damaged implants are not permitted to be used.
- Manipulations, such as vigorous bending, kinking or bending backward are not permitted to be performed on implants that have fastening elements (e.g. straps) for intraoperative adjustment.
- Surfaces provided for the connection of modular prosthetic components (cone, pins, screws) must not be damaged and may need to be cleaned with sterile liquid and dried before being joined together, so that neither blood nor any other coating impairs any of the connections, which could compromise the reliability of the connection.
- Ceramic implants may only be used in combination with brand new, unused implants.
- In the case of broken ceramic components, the ceramic particles must be removed completely, since otherwise increased abrasion can be expected.
- Packaging and implants to be discarded must be handled in compliance with national and local regulations for hospital disposal.

## 3. Storage

Sterile-packaged implants must be stored in the undamaged original packaging in buildings with adequate protection against damage due to impacts, frost, humidity, excessive heat, and direct sunlight.

Improper storage due to excessive heat (> 122 °F / 50°C) over an extended period (> 100 days) can lead to visible packaging residue on the implant.

Further information is available from the manufacturer upon request.

## 4. Materials, implant selection, permissible combinations

Titanium and titanium alloys, implant steel, cobalt-chromium-molybdenum alloys, ultra high molecular weight polyethylene and aluminum oxide ceramics as well as aluminum composite ceramics are used as basic materials.

- Cobalt-based alloy (CoCrMo) according to ISO 5832-4/ASTM F-75 and ISO 5832-12/ASTM F-1537
- Titanium-aluminum alloy (TiAl6V4) according to ISO 5832-3/ASTM F-136 and ASTM F-1108
- Titanium (Ti) according to ISO 5832-2/ASTM F-67
- Implantable stainless steel according to ISO 5832-1/ASTM F-138/ASTM F-139
- Cobalt-based alloy (CoCrNiMoFe) according to ISO 5832-7/ASTM F-1058
- “BILOX forte” aluminum oxide (Al<sub>2</sub>O<sub>3</sub>) ceramics according to ISO 6474-1 and “BILOX delta” aluminum oxide composite (ISO 6474-2) ceramics by CeramTec AG
- Ultra-high molecular weight polyethylene (UHMWPE) according to ISO 5834-2/ASTM F-648
- Calcium phosphate coating (HX) according to ASTM F-1609
- Commercially pure titanium coating (CpTi) – Titanium plasma spray coating according to ASTM F-1580
- Double coating of titanium and calcium phosphate (TiCaP) according to ASTM F-1580 and ASTM F-1609
- Titanium nitride coatings (TiN: titanium nitride, TiNbN (LINK PorEx): titanium niobium nitride, TiNbON: titanium-niobium-oxynitride, TiNb: titanium-niobium)

Further information on the material compositions is available from the manufacturer upon request. Please refer to the relevant surgical technique associated with the system and the identification on the packaging for further information on implant selection, permissible combination options and implant materials. Also refer to the relevant surgical technique for information on allocating and handling the instruments to be used for the implantation. Combinations with implants from other manufacturers and/or combinations with LINK implants that deviate from the surgical technique specifications have not been tested and are not permitted.

### 4.1 Permissible materials for tribological pairings:

- CoCrMo alloy/UHMWPE
- TiN and TiNbN-coated metals from the standard series ISO 5832ff/UHMWPE E
- Al<sub>2</sub>O<sub>3</sub>/UHMWPE
- Al<sub>2</sub>O<sub>3</sub>/composite ceramics
- Composite ceramics/UHMWPE

“Ceramic on metal” and “metal on metal” pairings are prohibited within the area of the bearing surface. The same applies for the pairing of BILOX delta or BILOX forte with a ceramic component by another manufacturer.

## 4.2 Range of motion of the hip implants:

The range of motion rises as the head diameter of the prosthesis increases. To reduce the risk of dislocation in patients with an increased tendency to luxation, Waldemar Link GmbH & Co. KG offers components that inhibit luxation (shouldered, anti-dislocation, inclined).

These include, for example, XL 28-size prosthesis head made of CoCrMo, acetabular cups and cup inserts with shoulders (raising the cup edge). There is less range of motion than with a standard combination because the neck of the head and the cup shoulder reduce the range of motion. Acetabular cup components with an inside diameter of less than 28 mm (e.g. an inside diameter of 22 mm) have less range of motion than standard combinations.

## 4.3 Cones:

The male and female cones of modular stem connections, such as a hip prosthesis stem with a hip prosthesis head, must match. Correct taper coupling must be ensured. The cones have been optimally matched to each another and are not permitted to be combined with devices by other manufacturers.

## 4.4 Diameters:

The diameters of articulating bearing surface components must match; e.g. the diameter of the femoral head used must fit the inside diameter of the articulating opposite bearing surface (e.g. of the acetabular cup).

## 4.5 Anchoring the implants:

Implant components are labelled as to whether they are to be cemented or not.

## 5. Indications and contraindications

Refer to the surgical technique of the relevant implant system for indications and contraindications.

## 6. Preoperative planning

Preoperative planning provides important information to identify the appropriate implant system and select the components of a system. Make sure that all components required for the operation are laid out and ready in the operating room. Test prostheses to verify proper fit (where applicable) and additional implants should be kept at the ready, in case other sizes are needed or the intended implant cannot be used. All LINK instruments necessary for the implantation must be on-hand and intact. If prosthesis implantation is indicated, then it must be taken into consideration, along with the overall circumstances of the patient:

- that all non-surgical and surgical treatment alternatives for the joint disease have been considered
- that artificial joint replacement performance is categorically inferior to natural joint performance, and an indication-related improvement in the preoperative condition is the only aim here
- that an artificial joint may loosen due to stress, wear and tear, and infection, or luxation or dislocation may occur
- that revision surgery, which under certain circumstances may exclude the possibility of restoring joint function, may be necessary due to loosening of the implant
- that if the use of bone cement or the selection of cementless implants is indicated, the biological age of the patient, among other things, must be considered
- that the patient consents to undergo the operation and accepts the risks involved
- that if load-transferring bone cement and/or bone structures are damaged, then the loosening of the components, bone and implant fractures, as well as other serious complications cannot be ruled out

- that if the patient is suspected of having allergies and tests positive on the applicable tests, then the patient's foreign body sensitivities (material tolerances) must be examined
- that acute and chronic infections, local and systemic, may compromise the successful implantation, so pre-operative microbiological analysis is recommended

Generally, the mechanical failure or fracture of an implant is a rare exception. However, this cannot be excluded with absolute certainty despite the sound structure of the implant.

This may be due to stress on the implant and prosthesis as the result of a fall or accident, among other things.

If the bone area where the implant is anchored is altered in such a way that the prosthesis is no longer able to withstand normal stress and an area of the prosthesis becomes subject to a stress imbalance, then a mechanical failure of the implant system may result. Such stress imbalances may also occur if the anchoring elements of the implants are required to form a bridge over larger bone deficiencies without optimal reinforcement of the bone. It is recommended that the implant with the largest possible anchoring elements be used. Proper preparation for surgical procedures also includes the functional testing of implants and instruments prior to use.

## 7. Possible risks and side effects

Surgery-related risks and side effects:

- Blood loss, allogeneic/autologous blood transfusions
- Swelling/hematomas
- Thrombosis/embolism/heart attack
- Impaired wound healing
- Infections
- Muscle and nerve damage
- Damage to blood vessels
- Postoperative pain
- Complications associated with the anesthesia applied
- Postoperative calcification

Implant-related risks and side effects:

- Intraoperative fractures
- Periprosthetic infection
- Allergic reactions to implant components and/or abraded particles
- Drop in blood pressure following application of bone cement
- Implant fractures/ceramic material fractures
- Implant loosening or subsidence
- Implant malpositioning/misalignment
- Reduced range of motion
- Luxation of joint components
- Discrepancies in the lengths of the extremities
- Premature wear and tear – reoperation
- Postoperative pain, e.g. thigh pain
- Implant protrusion/erosion (e. g. in the case of the acetabular components)

## 8. Reprocessing

The implants are supplied as sterile single-use devices. Implants that had already been implanted are not permitted to be reprocessed.

Instruments must be disinfected and sterilized prior to use. Please observe our separate sterilization instructions for instruments.

## 9. Resterilization

Our Implants are designed for single-use only. Resterilization by the user is not permitted.

Implants, as well as their materials are not suitable to be resterilized. Unpredictable degradations may occur in these implants during resterilization.

## 10. Circumstances that can interfere with the success of an operation

- Severe osteoporosis
- Severe deformities
- Local bone tumors
- Systemic diseases
- Metabolic disorders
- Case history of infections and falls
- Drug dependency or abuse, including excessive alcohol and nicotine consumption
- Obesity
- Mental disorders or neuromuscular diseases
- Heavy physical activities associated with strong vibrations
- Hypersensitivities

## 11. Postoperative phase

In addition to movement and muscle training, special attention must be paid to carefully instructing the patient during the postoperative phase. Physician-supervised postoperative monitoring of healing progress is recommended. Where applicable, patients should also be advised on how to avoid overstraining themselves.

## 12. MRI Information

The Waldemar Link GmbH & Co. KG implant systems have not been evaluated for safety and compatibility in the MR environment. They have not been tested for heating, migration, or image artifact in the MR environment. The safety of these implants in the MR environment is unknown.

Scanning a patient who has this device may result in patient injury.

## 13. Important notes!

- If the implantation of a LINK implant system is considered to be the best solution for the patient and one of the circumstances described in section 10 is applicable to the patient, it is necessary to advise the patient with regard to the anticipated effects that these circumstances could have on the success of the operation. It is further recommended that the patient be informed about measures that he or she can take to reduce the effects of such complications. All information provided to the patient should be documented in writing by the operating surgeon.
- The patients should be instructed in detail about the limitations of the implants, especially about the effects of excessive stress caused by body weight and physical activity, among other things. They should be encouraged to adjust their activities accordingly.
- Proper selection, placement and fixation of the devices are decisive factors, which will determine the life of the implant.
- Please refer to the relevant system-related surgical procedure for instructions on handling BILOX forte and BILOX delta ceramic components during the operation.
- Enquiries of any kind should be directed to Waldemar Link GmbH & Co. KG (see contact information on the cover sheet). The same applies for requests for further information on the devices.

## 14. Instruments

Please refer to the description in the reprocessing instructions US-H50 for the:

- initial use
- performance test
- maintenance
- manual cleaning
- reprocessing
- sterilization
- servicing
- transport

## 15. Complaints about our products

Complaints of whatever kind must be filed with Waldemar Link at: [complaint@linkhh.de](mailto:complaint@linkhh.de).

When filing a complaint, always quote the name or REF number of the relevant component along with the LOT and SN number, your name and your contact address.

## 16. Servicing

Medical devices and instruments that are sent in for servicing must be processed beforehand in such a way that they cannot constitute a hazard to third parties. We will be pleased to provide you with further information about special instrument sets, their applications, disassembly, cleaning, and care.

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