



Attention! Read, follow and keep these instructions as a reference of use.

**This medical device requires specialized surgical procedure. It should only be performed by qualified surgeons with specific training, including diagnosis, preoperative planning and surgical protocol. The use of the product without knowledge of appropriate techniques and/or procedures and inadequate conditions, including the surgical environment, may harm the patient leading to unsatisfactory results.**

### INDICATIONS

Small and Large Fragments Osteosynthesis System NEOFIX is intended for small and large bone fracture fixation, arthrodesis and osteotomy fixation. Examples include: fractures of the clavicle, scapula, humerus, olecranon, radius, ulna, carpals, metacarpals, distal femur, proximal tibia, tibial pylon, fibula, calcaneus, tarsals and metatarsals; small fragments of the hand and wrist; pelvis and acetabulum fractures; periprosthetic fractures; metatarsal and phalangeal osteotomies; and carpal, metacarpal, wrist and ankle arthrodesis. This system is not indicated for use in the spine.

### TECHNICAL SPECIFICATIONS AND CHARACTERISTICS

The Small and Large Fragments System - NEOFIX is composed by Plates and Screws

The screws for Small and Large Fragments are made in Ti6Al-4V Alloy as per ASTM F136, with exception of the Screw Cap.

The plates are made of Commercially Pure Titanium Grade 2, Pure Titanium Grade 4 as per ASTM F67 Standard Specification for Unalloyed Titanium, for Surgical Implant Applications and Ti-6Al-4V Alloy as per ASTM F136 Standard Specification for Wrought Titanium-6Aluminum-4Vanadium ELI (Extra Low Interstitial) Alloy for Surgical Implant Applications.

### PRESENTATIONS

Small and Large Fragments Osteosynthesis System NEOFIX are available in envelopes (surgical grade paper and plastic film) containing one (01) unit. The packaging is properly sealed, labeled and includes a package insert with instructions.

Implants provided are NONSTERILE and must be sterilized before each use, as described in "Sterilization" section.

Small and Large Fragments Osteosynthesis System NEOFIX is intended for ONE USE ONLY and shall not be reused meaning that, once a unit comes in contact with body fluids or tissues, or it falls to the floor, it is contaminated and shall be immediately discarded. Only intact implants can be re-sterilized.

Small and Large Fragments Osteosynthesis System NEOFIX must be implanted using specific and exclusive tools. The necessary tools must be purchased separately and ARE NOT INCLUDED in the product as they are not part of the implants – tools are available in individual packages. NEOORTHO implants must only be handled with the help of NEOORTHO tools. The tools have separated registration.

### HANDLING

Please read, follow and keep these instructions as a reference of use.

Use the product only for the purpose it was intended.

The surgical techniques vary according to the surgeon's choice and it's his responsibility to choose the methodology, type, size, design and dimension of the products to be used, as well as the criteria for evaluating the results of surgery.

Sterilize the implants following the instructions of the "Sterilization" item.

Manipulate the implants only in appropriate environments with due care. Only trained professionals should handle and deploy the plates and screws.

The implants must be applied and adapted in accordance with the requirements and suitable surgical techniques.

Do not contour the 3.5 Reconstruction LS Plate without the use of the Cap Screws.

The implants must only be used with their NEOORTHO instrumental.

Before using the product, the surgeon should read carefully the recommendations, warnings and precautions.

We recommend that surgeons with their staff, before starting the surgical procedure, check the material to be used (correct quantity) and the complete presence of instrumental and auxiliary instruments. It is not indicated the beginning of the procedure without such care.

Before use, it is necessary to check the integrity of the implants and instruments. They must not have bruises.

The products must be correctly clean and sterilized.

Any complication or other effects that might happen because of wrong indications or techniques, inappropriate choice of material, lack of asepsis, etc., is the surgeon's responsibility and cannot be transferred to the manufacturer or supplier of the product.

NEOORTHO is not responsible for any adaptation of its material and not advise other indications of use or adaptations of use during the surgical procedure. NEOORTHO reminds the ethical and legal consequences that may result from such adjustments.

The lack of one of the components in the container, box or tray **CANNOT BE REPLACED BY ANY MATERIAL OTHER THAN THE RECOMMENDED**, which can cause great inconvenience to the patient and the surgeon, even causing the cancellation of the surgery.

The product selection must be in accordance with the techniques and the patient's needs, taking into consideration the kind of pathology and where the product will be used.

The characteristics of adequate bone support are related to the experience of the professional that, by opting for the use of the implants of the Small and Large Fragments Osteosynthesis System NEOFIX, should perform the analysis of the patient, observing the restrictions imposed in the "Contraindications" item in these Instructions for Use.

### IMPLANT TRACEABILITY

The manufacturer is responsible, together with distributors, suppliers and hospitals, for the traceability of the Small and Large Fragments Osteosynthesis System NEOFIX.

During the manufacturing, the implants are laser-engraved with the, for instance, manufacturer's logo, batch number, product reference number and product dimensions, so that one of the implants' traceability phases is completed.

In Small and Large Fragments Osteosynthesis System NEOFIX implants, traceability is ensured by engraving on the implant's body (inviolable marking) of the following information:

- Manufacturer's logo;
- Batch number.

Implants with insufficient space to accommodate all applicable information are engraved with all relevant information possible, in the following order: batch number, manufacturer's name or logo; material identification; product reference code and other optional pieces of information.

If product marking may affect its performance, the implant is too small or its physical properties do not allow a legible marking, the required information is to be provided on the label or instruction for use, in order to ensure the product's traceability.

In case of an adverse effect, related to the product, the PATIENT, who holds all information related to his/her respective implant, will visit the SURGEON (responsible for the procedure) for a clinical assessment. Once the problem is diagnosed and related to the product, the HOSPITAL, in charge of providing all data related to the product, surgery, materials and sterilization, will get in touch with the DISTRIBUTOR to report the occurrence. The DISTRIBUTOR will request a Cause Analysis from the MANUFACTURER.

### STERILIZATION

Small and Large Fragments Osteosynthesis System NEOFIX implants are NONSTERILE, are intended for ONE USE ONLY and shall be sterilized before use.

Product sterilization facilities must observe all hospital, technical and sterilization standard procedures and such standards shall be checked before the sterilization of Small and Large Fragments Osteosynthesis System NEOFIX (autoclave biological and physical tests).

#### WE ONLY RECOMMEND STEAM AUTOCLAVE TO STERILIZE IMPLANTS.

Please use a hospital autoclave according to standard procedure. The product must be removed from its packaging and placed in its appropriate container before undergoing the sterilization process. We recommend 2 layers of an FDA-cleared wrap and the following sterilization parameters:

**Sterilization temperature: 132°C**  
**Sterilization cycle: 4 minutes**  
**Drying time: 20 minutes**

The sterilized material shall not stay inside the autoclave. We recommend its immediate use, right after the sterilization process, since there is the imminent risk of recontamination when the material is exposed to hot and humid environment.

Do not allow contaminated products contact sterilized ones in order to avoid the risk of cross-infection.

**WE DO NOT RECOMMEND IMPLANT STERILIZATION USING ETHYLENE OXIDE, GAMMA OR DRY HEAT (STERILIZER).**

**IMPLANTS ARE NOT TO BE SUBMERGED IN GLUTARALDEHYDE (OR SIMILAR PRODUCTS).**

### CONTRAINDICATIONS

Contraindication: any health condition, related to a disease or to the sick individual, that serves as a reason to withhold a certain medical treatment (relative contraindication) or even not undertake such course of action (absolute contraindication). If such condition is not observed, the patient's health may be considerably affected by severe harmful effects.

Contraindications (relative or absolute) must be taken into consideration when the surgeon is deciding on best course of treatment. The selection of a certain device should include a general assessment of the patient's health. The circumstances below may reduce the changes of a successful procedure:

#### Relative contraindications:

- Insufficient amount or quality of bone that prevents the firm fixation of the device.
- Previous history of infection at the surgical site.
- Active local infection.
- Loss of soft tissue with bone exposure.
- Any neuromuscular change that imposes an abnormally heavy load on the device during the healing period.
- Senility, mental disease, alcoholism, or other mental impairment that may lead the patient to ignore precautions or limitations required for the use of the implant, and which may lead to implant breakage or to other complications.
- Morbid obesity.
- Inadequate coverage of soft tissues at the operation site.
- Pregnancy (evaluation at medical discretion).

#### Absolute contraindications:

- Active-acute infection at the site.
- Bone-to-bone fracture fixation. Areas with pulling forces and twisting muscle;
- Spine fixation.

The devices, at first, should not be used in pediatric cases.

### ADVERSE EFFECTS / COMPLICATIONS

Adverse effects are harmful, unintended and unwanted effects from those that are considered as the main effects. The installation procedure of the Small and Large Fragments Osteosynthesis System NEOFIX implants as well as all the other surgical procedures may cause discomfort and localized edema, including some complications:

- Incision scar, size compatible with surgical need (to implant the device).
- Delayed union or non-union.
- Fixation loss or unsuccessful fixation.
- Failure of reconstruction
- Migration or mobilization of the device.
- Illness and Death: in all surgical procedures there is an incidence of illness and death and the patient should be informed by the surgeon before undergoing surgery and be aware of this incidence.

Some complications may require additional surgical intervention.

### WARNINGS AND PRECAUTIONS

This medical device requires specialized surgical procedure. It should only be performed by qualified surgeons with specific training, including diagnosis, preoperative planning and surgical protocol. The use of the product without knowledge of appropriate techniques and/or procedures and inadequate conditions, including the surgical environment, may harm the patient leading to unsatisfactory results.

The use of this material should only be performed within the guidelines and parameters technically acceptable in the country

We recommend the issuing of an identification card for the patient informing that he/she has a metallic prosthesis.

Titanium used in the implants of the Small and Large Fragments Osteosynthesis System NEOFIX meets the chemical, mechanical and metallurgical specifications according to the standards ASTM F136 and ASTM F67. Titanium is a PARAMAGNETIC metal and, thus, allows the patient to undergo MRI, CT or X-rays, without risk of displacement of the implants.

The titanium used in the manufacture of implants is a biocompatible metal and up to now there is no history of cases of cytotoxicity, carcinogenicity, genotoxicity, toxicity or allergy in relation to that material.

Because other manufacturers employ different materials and have different tolerances and specifications for manufacturing, NEOORTHO warns that the Small and Large Fragments Osteosynthesis System NEOFIX implants cannot be used with components from any other manufacturer, avoiding the occurrence of galvanic corrosion (corrosive process resulting from the electrical contact between different materials placed in direct contact in the presence of an electrolyte medium).

During the plate conformation, it is necessary to observe if there is metal fatigue due to excessive conformation. If it occurs, the plate must be discarded and replaced.

For the torque application on the screws, bone quality and the skill and experience of the surgeon should be noted. If the thread is damaged because of bone quality and the torque that was applied, the screw must be replaced by the correspondent emergency screw.

Injuries and falls that might happen can hardly move or displace the implants.

In case of surgery to be performed during pregnancy, it is the medical staff responsibility to evaluate the patient conditions and the decision whether or not the surgical procedure.

We suggest radiological pre-operative control to verify the location of the desired segment, as well as trans-operative radiological control to assist in the correct positioning of implants and immediate postoperative control, documenting the placement and stability of the implant site.

It is the surgeon's choice the need for removing the implants after achieved the desired goal.

In case it is necessary to remove the implants, the surgical procedure of removal is the inverse of the procedure of implantation. The removed implant must be immediately discarded, observing the instructions of the item "Disposal of Materials".

**The implant removed must NEVER be reused.**

In case of infection, the necessity of removing the implant should be analyzed by the surgeon. It is known that in infections of low virulence, the implants of titanium do not interfere in the treatment and/or in the control of the process. When the removal of the implant is necessary in order to control the infection, it may be considered the possibility of a re-implantation at a later time, after the complete healing of the infection.

The NEOORTHO implants should be handled only by specialized personnel and nursing, in the phases of sterilization and implantation. This material, despite its ease of handling and placing, does not relieve the previous experience of the surgical team with this type of procedure.

### AFTER SURGERY CARE

Instruct the patient on the need for post-surgical professional monitoring, noting the importance of the patient's postoperative guidelines and restrictions.

Patients should be advised to follow a program of supportive therapy with the intent to assist the treatment.

The patient should be instructed regarding the appropriate and restricted activities.

The patient should also be instructed to report the physician of any unusual changes in the surgical site. The physician should monitor the patient if a change is detected at the site.

### STORAGE

The Implants of the Small and Large Fragments Osteosynthesis System NEOFIX must be kept, after sterilization, in their sterilization box (container, box, and tray) in a dry, cool place, without contact or presence of humidity and must be used immediately after the sterilization process to avoid the risk of their contamination.

The implant must be stored in such a way to keep its configuration and its finishing of surface and not causing any damage to its package.

It is recommended to store the implants separately from the instruments.

Store preferably in shelves of metal or glass frame, thus enabling the daily cleaning and hygiene that may assure that the storage environment is free of dust and weather conditions that may affect the perfect conservation of the stored product.

Do not store the implants in high shelves, next to lamps (so it does not resect the package or fade the label). They cannot be stored directly on the ground.

They cannot be stored in areas where contaminant substances, such as insecticides, pesticides or cleaning materials, are used.

All products must be handled carefully. The inadequate handling can damage and/or harm the adequate functioning of the product. The product may not suffer mechanical shock, such

as fall, hit, since it can induce internal tensions that will compromise the shelf-life of the implant.

### MATERIAL DISPOSAL

All materials used during surgery may pose serious health risks. Removed implants should be adequately disposed by the hospital. Before final disposal, into the environment, we recommend in-force guidelines and legislation are carefully followed.

Final disposal methods and procedures, for orthopedic implants, must ensure their complete de-characterization, so that they are not re-used. We recommend removed implants are cut, bended or shaped in such a way its re-use is simply not possible. Implant de-characterization is the hospital's responsibility, as well as used methods and procedures.

#### “NON-STERILE PRODUCT – IT CANNOT BE RE-USED”

-  Manufacturer  
*Fabricante*
-  Date of manufacture  
*Fecha de Fabricación*
-  Use by date  
*Plazo de Validad*
-  Batch Code  
*Código del Lote*
-  Catalogue number  
*Código del Producto*
-  Product Size  
*Tamaño del Product*
-  Do not use if package damaged  
*No utilizar si el embalaje está dañado*
-  Keep way from sunlight  
*Mantener alejada de la luz solar*
-  Keep dry  
*Mantener seco*
-  Do not re-use  
*No reutilizar*
-  Non-sterile  
*No estéril*
-  Consult instructions for use  
*Ver instrucciones del uso*  
**ifu.neoortho.com.br**
-  Caution: Attention while using thje product  
*Precaución: Atención al operar el producto*

#### Manufactured by:

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**Lot and Manufacturing Date:** See label.

For further information, please visit: [www.neoortho.com.br](http://www.neoortho.com.br)