# SUMMARY OF SAFETY AND CLINICAL PERFORMANCE of Sterile Semi-Resorbable Parietal Reinforcement Implants

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# ABBREVIATIONS

| | |
|---|---|
| CER | Clinical Evaluation Report |
| CMR | Carcinogenic Mutagenic or toxic to Reproduction |
| EU | European Community |
| Eudamed | European database on medical devices |
| FSCA | Field Safety Corrective Action |
| FSN | Field Safety Notice |
| IFU | Instructions For Use |
| MDCG | Medical Device Coordination Group |
| MDR | Medical Device Regulation |
| NB | Notified Body |
| PLLA | Poly-L-lactic acid |
| PMCF | Post-Market Clinical Follow-up |
| PMS | Post-Market Surveillance |
| PP | Polypropylène |
| PSUR | Periodic Safety Update Report |
| QOL | Quality Of Life |
| SOTA | State Of The Art |
| SRN | Single Registration Number |
| SSCP | Summary of Safety and Clinical Performances |
| UDI-DI | Unique Device Identification - Device Identifier |
| URL | Uniform Resource Locator |

*This Summary of Safety and Clinical Performance (SSCP) is intended to provide public access to an updated summary of the main aspects of the safety and clinical performance of the device.*
*The SSCP is not intended to replace the Instructions For Use as the main document to ensure the safe use of the device, nor is it intended to provide diagnostic or therapeutic suggestions to intended users or patients.*
*The following information is intended for users/healthcare professionals.*

# SSCP REGULATORY CONTEXT

The current SSCP document pertains to *Sterile Semi-Resorbable Parietal Reinforcement Implants* (**4DDOME® / PROMESH® SURG DOME, 4DMESH® / PROMESH® SURG ABSO, 4DVENTRAL® / PROMESH® SURG ABSO VENT and 4DFIX®)** that are implantable class III medical devices according to the classification in the Annex VIII of the Medical device Regulation (MDR).

This Summary of Safety and Clinical Performance (SSCP) is produced in alignment with the requirements of COUSIN BIOTECH's Clinical Evaluation Plan and REGULATION (EU) 2017/745 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, referencing the MDCG 2019 – 9 - Summary of safety and clinical performance: A guide for manufacturers and notified bodies.

This SSCP is intended to provide public access to an updated summary of the main aspects of the safety and clinical performance of the device. The SSCP is not intended to replace the Instructions For Use (IFU) as the main document to ensure the safe use of the device, nor is it intended to provide diagnostic or therapeutic suggestions to intended users or patients.

This SSCP is an important source of information for intended users – both healthcare professionals and if relevant for patients. It is one of several means intended to fulfil the objectives of the Medical Device Regulation (MDR) to enhance transparency and provide adequate access to information. The SSCP for *Sterile Semi-Resorbable Parietal Reinforcement Implants* (**4DDOME® / PROMESH® SURG DOME, 4DMESH® / PROMESH® SURG ABSO, 4DVENTRAL® / PROMESH® SURG ABSO VENT and 4DFIX®)** includes both information intended for healthcare professionals (Section A) as well as for the patient (Section B).

The SSCP for *Sterile Semi-Resorbable Parietal Reinforcement Implants* (**4DDOME® / PROMESH® SURG DOME, 4DMESH® / PROMESH® SURG ABSO, 4DVENTRAL® / PROMESH® SURG ABSO VENT and 4DFIX®)** is based on the following documentation:

- Clinical Evaluation Report (CER)
- Post-Marketing Surveillance (PMS) plan and regular reports
- Post-Marketing Clinical Follow-up (PMCF) plan and regular reports
- Design verification/validation reports
- Risk management report
- IFU

The SSCP shall be reviewed on an annual basis and updated if needed to ensure that any clinical and/or safety information in the SSCP remains correct and complete after implementation of the PMCF reports and of the Periodic Safety Update Report (PSUR). Any pertinent modification in the documentation pertaining to *Sterile Semi-Resorbable Parietal Reinforcement Implants* shall be implemented in all sections of the SSCP if needed.

For the sake of objectivity and impartiality to the patients, information in the SSCP shall adequately summarize both favourable and unfavourable data.

The IFU shall provide all relevant information needed to directly access the SSCP in Eudamed. The IFU shall be updated regularly on this database. The following applies to the IFU:

- It shall state that the SSCP is available in the European database on medical devices (Eudamed), where it is linked to the Basic UDI-DI.
- It should provide the URL to the Eudamed public website: https://ec.europa.eu/tools/eudamed
- It should state the value of the Basic UDI-DI. Alternatively, another metadata can be stated provided it can be used to unambiguously search and find the intended SSCP in Eudamed.

The MDR requires that the SSCP shall be written in a way that is clear to the intended user and, if relevant, to the patient. The SSCP should therefore be translated into the languages accepted in the Member States where the device is sold/envisaged to be sold. By analogy, this is also a requirement for an IFU.

Manufacturer’s references number for SSCP: TF07_SSCP_4D

# SECTION A: SUMMARY OF SAFETY AND CLINICAL PERFORMANCE FOR THE HEALTHCARE PROFESSIONALS

## 1. IDENTIFICATION OF THE DEVICE AND GENERAL INFORMATION

### 1.1. DEVICE TRADE NAME(S)

The EC Family identified and concerned by the SSCP are the *Sterile Semi-Resorbable Parietal Reinforcement Implants* including:

- **4DDOME® / PROMESH® SURG DOME**
- **4DMESH® / PROMESH® SURG ABSO**
- **4DVENTRAL® / PROMESH® SURG ABSO VENT**
- **4DFIX®**

*The **4DDOME®**, **4DMESH®** and **4DVENTRAL®** references correspond to the products developed and manufactured by COUSIN BIOTECH.*

*The **PROMESH® SURG** references correspond to the products developed and manufactured by COUSIN BIOTECH and distributed by Peters Surgical. **PROMESH® SURG** references distributed by Peters Surgical, are identical to COUSIN BIOTECH references except for the name of the device on the Box, IFUs and labels.*

### 1.2. MANUFACTURER'S NAME AND ADDRESS

The manufacturer of the *Sterile Semi-Resorbable Parietal Reinforcement Implants* (**4DDOME® / PROMESH® SURG DOME**, **4DMESH® / PROMESH® SURG ABSO**, **4DVENTRAL® / PROMESH® SURG ABSO VENT** and **4DFIX®**) is:

COUSIN BIOTECH
ALLEE DES ROSES
59117 WERVICQ SUD
FRANCE

### 1.3. MANUFACTURER'S SRN

The single registration number of the manufacturer is FR-MF-000001179.

### 1.4. BASIC UDI-DI

The BASIC UDI-DI for *Sterile Semi-Resorbable Parietal Reinforcement Implants* (**4DDOME® / PROMESH® SURG DOME**, **4DMESH® / PROMESH® SURG ABSO**, **4DVENTRAL® / PROMESH® SURG ABSO VENT** and **4DFIX®**) are the following:

3750185574DDOM3M (**4DDOME®**)
3750185574DMESH4L (**4DMESH® / 4DFIX®**)
3750185574DVENT6U (**4DVENTRAL®**)

## 1.5. MEDICAL DEVICE NOMENCLATURE DESCRIPTION / TEXT

The GMDN and EMDN code for *Sterile Semi-Resorbable Parietal Reinforcement Implants* (**4DDOME® / PROMESH® SURG DOME**, **4DMESH® / PROMESH® SURG ABSO**, **4DVENTRAL® / PROMESH® SURG ABSO VENT** and **4DFIX®**) are the following:

| Brand Name | GMDN code | EMDN code |
|---|---|---|
| **4DDOME® PROMESH® SURG DOME** | 44756 Abdominal hernia surgical mesh, composite-polymer | P900204 SURGICAL MESHES, MORE THAN ONE COMPONENT |
| **4DMESH® PROMESH® SURG ABSO** | | |
| **4DFIX®** | | |
| **4DVENTRAL® PROMESH® SURG ABSO VENT** | | |

## 1.6. CLASS OF DEVICE

The principal characteristics of *Sterile Semi-Resorbable Parietal Reinforcement Implants* (**4DDOME® / PROMESH® SURG DOME**, **4DMESH® / PROMESH® SURG ABSO**, **4DVENTRAL® / PROMESH® SURG ABSO VENT** and **4DFIX®**) are listed below in the table below:

| CATEGORY | CLASSIFICATION |
|---|---|
| **Duration** | Permanent/ Long-term |
| **Invasive device** | Yes |
| **Body contact** | Implant in contact with tissues (muscles, peritoneum) |
| **Biological effect** | No |
| **Usage** | Single use |
| **Sterile** | The devices are sterile (ethylene oxide sterilization) * |
| **Active medical device** | No |
| **Software** | No |
| **Medicinal substance** | No medicinal products are incorporated in the devices |
| **Biological material** | No material derived from animal tissue or human blood is incorporated in the devices** |
| **Radioactive device** | The devices are not radioactive |

* The implants are designed for long-term implantation. They are sterilized by ethylene oxide and designed for single-use.
** The implanted materials of *Sterile Semi-Resorbable Parietal Reinforcement Implants* consisting of polypropylene (PP), poly-L-lactic acid (PLLA) and blue dye: [phthalocyaninato(2-)] copper. No material of human or animal origin is in contact with the patient.

The medical device is a class III implantable medical device as pertained by the rule Annex VIII, Chapter III, Rule 8, Dashes 3 and 7 of the Annex VIII of the MDR.

### 1.7. YEAR WHEN THE FIRST CERTIFICATE WAS ISSUED COVERING THE DEVICE

**4DDOME®** is CE marked since July 2004 (according to Directive 93/42/EEC).
**4DMESH®** is CE marked since January 2005 and April 2015.
**4DVENTRAL®** is CE marked since April 2016 (according to Directive 93/42/EEC).
**PROMESH® SURG DOME**, **PROMESH® SURG ABSO**, **PROMESH® SURG ABSO ANAT** and **PROMESH® SURG ABSO VENT** are CE marked since March 2020 (according to Directive 93/42/EEC).
**4DFIX®** is a new product and is undergoing initial CE marking.

### 1.8. AUTHORISED REPRESENTATIVE IF APPLICABLE, NAME AND THE SRN

The authorized representative of this company is Cousin BIOTECH. The Single Registration Number (SRN) of this authorized representative is N° FR-MF-000001179.

### 1.9. NOTIFIED BODY'S NAME AND SRN

The Notified Body (NB) for *Sterile Semi-Resorbable Parietal Reinforcement Implants* (**4DDOME® / PROMESH® SURG DOME**, **4DMESH® / PROMESH® SURG ABSO**, **4DVENTRAL® / PROMESH® SURG ABSO VENT** and **4DFIX®**) and the validation of this SSCP is DQS Medizinprodukte GmbH.
Its single identification number is CE 0297.

## 2. INTENDED USE OF THE DEVICE

### 2.1. INTENDED PURPOSE

**4DDOME® / PROMESH® SURG DOME**, **4DMESH® / PROMESH® SURG ABSO**, **4DVENTRAL® / PROMESH® SURG ABSO VENT** and **4DFIX®** are intended to be used as parietal reinforcement implants.

### 2.2. INDICATION(S) AND INTENDED PATIENT GROUP(S)

**4DDOME® / PROMESH® SURG DOME**, **4DMESH® / PROMESH® SURG ABSO** and **4DFIX®** are indicated for use in repair and parietal reinforcement for inguinal and femoral hernias.
**4DVENTRAL® / PROMESH® SURG ABSO VENT** is indicated for use in repair and reinforcement of ventral hernia necessitating a surgical repair with a method that includes an extraperitoneal implantation.

The intended patient population is:

- Adult male or female suffering from groin hernias with an indication of surgical repair with extraperitoneal implantation. These include:
  - Inguinal hernias
  - Femoral hernias
- Adult male or female suffering from a symptomatic ventral hernia necessitating a surgical repair with a method that includes an extraperitoneal implantation.

### 2.3. CONTRAINDICATIONS

The contraindications for **4DDOME® / PROMESH® SURG DOME**, **4DMESH® / PROMESH® SURG ABSO**, **4DVENTRAL® / PROMESH® SURG ABSO VENT** and **4DFIX®** are the following:

- Allergy to any of the components
- Infected site
- Pregnancy
- Growing children

## 3. DEVICE DESCRIPTION

### 3.1. DESCRIPTION OF THE DEVICE

#### 3.1.1. General description

The devices under consideration in this SSCP belong to the EC family *Sterile Semi-Resorbable Parietal Reinforcement Implants*. This EC family is composed of 4 sub-families of devices:

- **4DDOME® / PROMESH® SURG DOME**

**4DDOME® / PROMESH® SURG DOME** are synthetic semi-resorbable reinforcement parietal implants for repair and surgical reinforcement of inguinal and femoral hernias. They are composed of two prostheses:

- One semi-resorbable dome (consisting of 11% non-resorbable light propylene (PP) and 89% resorbable poly-L-lactic acid (PLLA)),
- One semi-resorbable (onlay) mesh (consisting of 25% non-resorbable light propylene (PP) and 75% resorbable poly-L-lactic acid (PLLA))

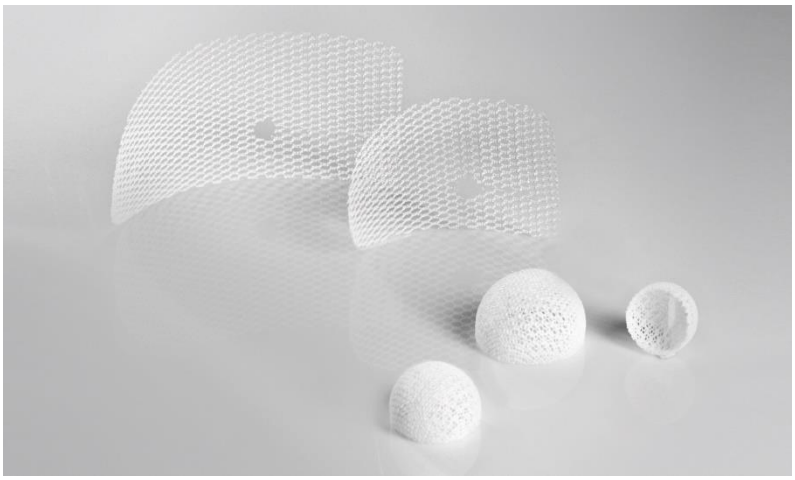


*Figure 1 : Picture of 4DDOME® implants: three sizes of dome + two sizes of meshes*

- **4DMESH® / PROMESH® SURG ABSO** and **4DFIX®**

**4DMESH® / PROMESH® SURG ABSO** and **4DFIX®** meshes are semi-resorbable parietal reinforcement implants consisting of 25% non-resorbable light propylene (PP) and 75% resorbable poly-L-lactic acid (PLLA)) and 35% non-resorbable light propylene (PP) and 65% resorbable poly-L-lactic acid (PLLA)) respectively. They are designed for the repair and reinforcement of inguinal and femoral hernias. A blue monofilament orientation marker is sewn on four **4DMESH®** product codes (4DMESH1015, 4DMESH1215 /

PSAB1215RS, 4DMESH1317, 4DMESH1216) and on four **4DFIX®** product codes (VCBFX1215U, VCBFX1317U, VCBFXLAPRU, VCBFXLAPLU) to facilitate the placement of the mesh by the surgeon.

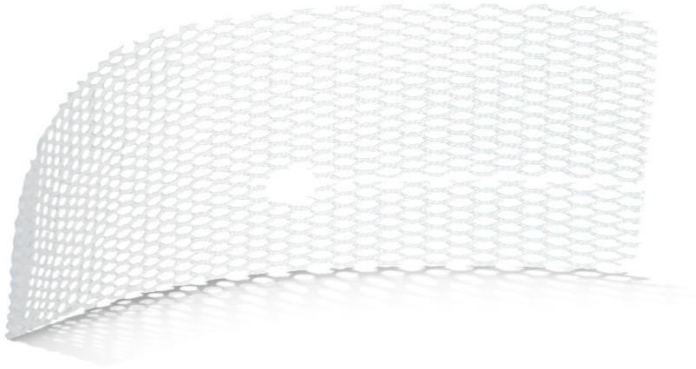


*Figure 2 : Picture of 4DMESH®*

The **4DMESH® / PROMESH® SURG ABSO** & **4DFIX®** meshes may be pre-shaped to facilitate the surgery (4DMESHPRSR / PSABANATSR, 4DMESHPRSL / PSABANATSL, 4DMESHPRLR / PSABANATMR, 4DMESHPRLL / PSABANATML, 4DMESHPRXR / PSABANATLR and 4DMESHPRXL / PSABANATLL, VCBFXPRSRU, VCBFXPRSLU, VCBFXPRMRU, VCBFXPRMLU, VCBFXPRLRU and VCBFXPRLLU). These preformed products have a 3D shape. The 3Dshape is expected to facilitate placement and avoid early displacement of the mesh. Due to its anatomical form, these **4DMESH®** & **4DFIX®** are available in left and right orientations. Moreover, these **4DMESH®** & **4DFIX®** have also a mono-filament orientation marker.

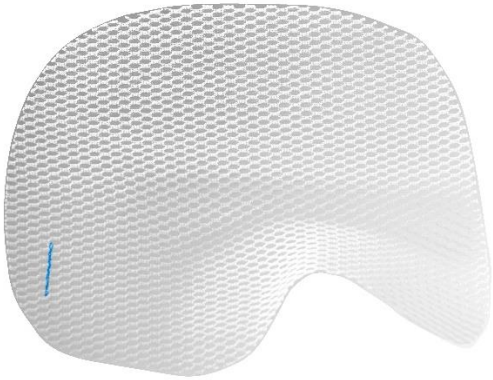


*Figure 3 : Picture of 4DMESH® Pre-Shaped*

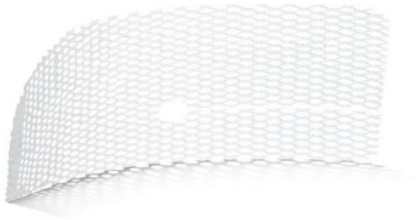
- **4DVENTRAL® / PROMESH® SURG ABSO VENT**

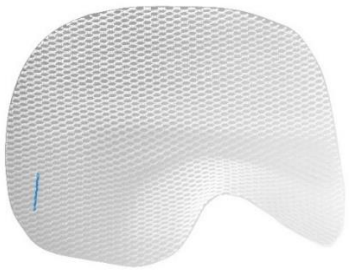
The **4DVENTRAL® / PROMESH® SURG ABSO VENT** implant is designed for the repair of ventral hernia that require the addition of an extra-peritoneal reinforcing or bridging material to obtain the desired surgical result. The **4DVENTRAL®** device is a semi-resorbable reinforcement parietal implant. The knit which forms the mesh is made of 60% Poly-L-Lactic Acid (PLLA) and 40% Polypropylene (PP).

*Figure 4 : Picture of 4DVENTRAL®*

### 3.1.2. List of references (Model and sizes)

A listing of references regarding the *Sterile Semi-Resorbable Parietal Reinforcement Implants* is detailed in the table below:

| Brand Name | Cousin Biotech Product Codes | Description and size | Picture |
|---|---|---|---|
| **4DDOME®**<br>**PROMESH® SURG DOME** | 4DDOM24GSR<br>PSABDO2PCL | dome Ø 24 mm<br>+ precut mesh 60 x 135 mm |  <br>*4DDOME®* |
| | 4DDOM30GSR<br>PSABDO3PCL | dome Ø 30 mm<br>+ precut mesh 60 x 135 mm | |
| | 4DDOM38GSR<br>PSABDO4PCL | dome Ø 38 mm<br>+ precut mesh 60 x 135 mm | |
| | 4DDOME24SR<br>PSABDO2PCS | dome Ø 24 mm<br>+ precut mesh 90 x 52 mm | |
| | 4DDOME30SR<br>PSABDO3PCS | dome Ø 30 mm<br>+ precut mesh 90 x 52 mm | |
| | 4DDOME38SR<br>PSABDO4PCS | dome Ø 38 mm<br>+ precut mesh 90 x 52 mm | |
| **4DMESH® (BIOMESH SR)** | FBIOSRF128 | mesh with flap 120 x 80 mm, Ø 8 mm |  <br>*4DMESH®* |
| | FBIOSRF952 | mesh with slit 90 x 52, Ø 8 mm | |
| **4DMESH® flat**<br>**PROMESH® SURG ABSO** | 4DMESH1515 | mesh 150 x 150 mm | |
| | 4DMESH0715 | mesh 70 x 150 mm | |
| | 4DMESH0510 | mesh 50 x 100 mm | |
| | 4DMESH1015 | oval mesh 100 x 150 mm (+orientation mark) | |
| | 4DMESH1215<br>PSAB1215RS | oval mesh 120 x 150 mm (+orientation mark) | |
| | 4DMESH1317 | oval mesh 130 x 170 mm (+orientation mark) | |
| | 4DMESH1216 | precut mesh 120 x 165 mm (+orientation mark) | |
| | 4DMESHRABA | precut mesh with flap 110 x 140 mm | |

| Brand Name | Cousin Biotech Product Codes | Description and size | Picture |
|---|---|---|---|
| | 4DMESHM613<br>PSAB0613PC | precut mesh with slit 60 x 135 mm, Ø 8 mm | |
| | 4DMESHF812<br>PSAB0812SH | precut mesh 85 x 125 mm | |
| | 4DMESHMBES | precut mesh with slit 50 x 120 mm, Ø 6 mm | |
| | 4DMESHMBEL | precut mesh with slit 70 x 130 mm, Ø 7 mm | |
| | 4DMESH1717<br>PSAB1717SQ | mesh 170 x 170 mm | |
| **4DMESH® pre-shaped**<br><br>**PROMESH® SURG ABSO ANAT** | 4DMESHPRXR<br>PSABANATLR | right pre-shaped mesh 120 x 170 mm (+orientation mark) |  <br>*4DMESH® pre-shaped* |
| | 4DMESHPRXL<br>PSABANATLL | left pre-shaped mesh 120 x 170 mm (+orientation mark) | |
| | 4DMESHPRLR<br>PSABANATMR | right pre-shaped mesh 120 x 150 mm (+orientation mark) | |
| | 4DMESHPRLL<br>PSABANATML | left pre-shaped mesh 120 x 150 mm (+orientation mark) | |
| | 4DMESHPRSR<br>PSABANATSR | right pre-shaped mesh 105 x 140 mm (+orientation mark) | |
| | 4DMESHPRSL<br>PSABANATSL | left pre-shaped mesh 105 x 140 mm (+orientation mark) | |
| **4DVENTRAL®**<br><br>**PROMESH® SURG ABSO VENT** | 4DVENT05RO | mesh Ø 50mm | <br>*4DVENTRAL®* |
| | 4DVENT07RO | mesh Ø 70mm | |
| | 4DVENT09RO | mesh Ø 90mm | |
| | 4DVENT12RO<br>PSABVT12DI | mesh Ø 120mm | |
| | 4DVENT0715 | rectangular mesh 70 x 150 mm | |
| | 4DVENT1015 | rectangular mesh 100 x 150 mm | |
| | 4DVENT1515<br>PSABVT1515 | square mesh 150 x 150 mm | |
| | 4DVENT1520 | rectangular mesh 150 x 200 mm | |
| | 4DVENT1530<br>PSABVT1530 | rectangular mesh 150 x 300 mm | |
| | 4DVENT2020 | square mesh 200 x 200 mm | |
| | 4DVENT2025<br>PSABVT2025 | rectangular mesh 200 x 250 mm | |
| | 4DVENT2535 | rectangular mesh 250 x 350 mm | |
| | 4DVENT3030<br>PSABVT3030 | square mesh 300 x 300 mm | |
| | 4DVENT3040 | rectangular mesh 300 x 400 mm | |
| **4DFIX® flat** | VCBFX1717U | mesh 170 x 170 mm | |
| | VCBFX613RU | right precut mesh with slit 60 x 135 mm, Ø 8 mm | |
| | VCBFX613LU | left precut mesh with slit 60 x 135 mm, Ø 8 mm | |
| | VCBFX0812U | precut mesh 80 x 120 mm | |

| Brand Name | Cousin Biotech Product Codes | Description and size | Picture |
|---|---|---|---|
| | VCBFX812FU | mesh with flap 120 x 80 mm, Ø 8 mm |  *4DFIX® flat* |
| | VCBFX1215U | Oval mesh 120 x 150 mm (+orientation mark) | |
| | VCBFX1317U | Oval mesh 130 x 170 mm (+orientation mark) | |
| | VCBFXLAPRU | Right precut mesh 120 x 165 mm (+orientation mark) | |
| | VCBFXLAPLU | Left precut mesh 120 x 165 mm (+orientation mark) | |
| | VCBFXRABAU | Precut mesh with flap 110 x 140 mm | |
| **4DFIX® pre-shaped** | VCBFXPRSRU | Right pre-shaped mesh 105 x 140 mm (+orientation mark) |  *4DFIX® pre-shaped* |
| | VCBFXPRSLU | Left pre-shaped mesh 105 x 140 mm (+orientation mark) | |
| | VCBFXPRMRU | Right pre-shaped mesh 120 x 150 mm (+orientation mark) | |
| | VCBFXPRMLU | Left pre-shaped mesh 120 x 150 mm (+orientation mark) | |
| | VCBFXPRLRU | Right pre-shaped mesh 120 x 170 mm (+orientation mark) | |
| | VCBFXPRLLU | Left pre-shaped mesh 120 x 170 mm (+orientation mark) | |

*Table 1: Listing of the variants*

### 3.1.3. Materials and contained substances

**Contained substances**

*Sterile Semi-Resorbable Parietal Reinforcement Implants* are made of:

- Polypropylene (PP)
- Poly-L-Lactic Acid (PLLA)
- Blue dye: [phthalocyaninato(2-)] copper (only for certain references **4DMESH® / PROMESH® SURG ABSO** and **4DFIX®**). See §3.1.1

**Materials or substances in contact with the patient tissues.**

*Sterile Semi-Resorbable Parietal Reinforcement Implants* are in direct contact with tissues as muscles and peritoneum. These medical devices are for long term implantation as permanent implant (> 30 days).

**Medicinal substance / CMR and sensitizing products**

| | |
|---|---|
| Incorporation of medicinal substances, tissues or blood products ? | No |
| Incorporation of blood components ? | No |
| Incorporation of latex ? | No |
| Incorporation of phthalates classified as carcinogen, mutagen or toxic for the reproduction ? | No |

### 3.1.4. Clinically relevant characteristics

| | |
|---|---|
| Is sterile ? | Yes |
| Single use / reusable ? | Single use |
| Invasive | Yes |
| Implantable | Yes |
| Radioactivity | No |

### 3.1.5. Operating principle and mode of action

**Hernia repair**

These meshes have been designed for extraperitoneal “open” surgery or laparoscopic approach (“keyhole” surgery) such as Transabdominal preperitoneal approach (TAPP) and Total extraperitoneal approach (TEP).

Prostheses are used as hernia defect coverings/patches that stop visceral contents (bowels) from passing through the hernia orifice towards the abdominal wall.
When meshes are entirely non-resorbable, the inflammatory responses might persist for a longer time, leading to pain and/or discomfort. Semi-resorbable meshes are proposed as a potential solution to combine the advantages of an absorbable mesh to reduce inflammation and non-absorbable mesh to provide strength. As shown in the below picture, the PLLA resorption will be replaced by local fibrosis intended to take over the reinforcement function of the prosthesis after several months of implantation and to guarantee mechanical resistance of the mesh.

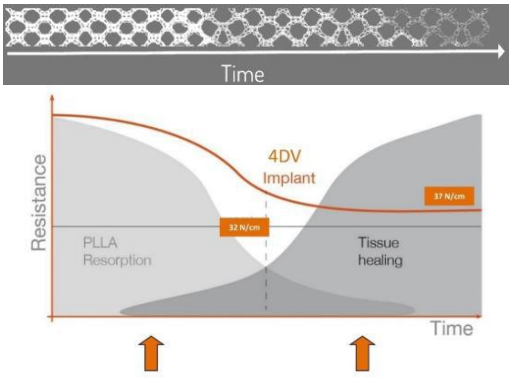



*Figure 5 : Expected PLLA resorption and tissue healing (fibrosis)*

The concept of 4DDOME® lies on the shape evolution of the dome. Its initial ovoïd shape ensures maximal resistance to intra-abdominal pressure. With time, the dome becomes flat and merges with the Transversalis fascia, which leaves the patient with a strengthened and pain-free groin.

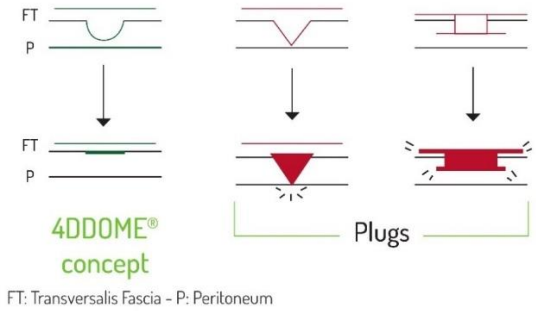



*Figure 6 : « Plug » principle*

**Fixation of meshes**

Fixation method remains a surgeon's choice or preference. If necessary, the surgeon has the possibility of adding additional points of fixing, according to his/her appreciation.

### 3.2. A REFERENCE TO PREVIOUS GENERATIONS OR VARIANTS IF SUCH EXIST AND A DESCRIPTION OF THE DIFFERENCES

A new sub-family (**4DFIX®**) that presents minor differences with **4DMESH®** is undergoing initial CE marking.

Compared to **4DMESH®, 4DFIX®** features additional small PLLA loops (resorbable) on one side.
The presence of the hydrophilic PLLA on the **4DMESH®** and **4DFIX®** ensures a better contact with soft tissue. **4DFIX®** references have been designed to emphasize use of PLLA hydrophilic material on one side (loop side) to enhance the soft tissue interaction

### 3.3. DESCRIPTION OF ANY ACCESSORIES WHICH ARE INTENDED TO BE USED IN COMBINATION WITH THE DEVICE

There are no accessories included with the *Sterile Semi-Resorbable Parietal Reinforcement Implants*.

### 3.4. DESCRIPTION OF ANY OTHER DEVICES AND PRODUCTS WHICH ARE INTENDED TO BE USED IN COMBINATION WITH THE DEVICE

There are no other devices and products included with the *Sterile Semi-Resorbable Parietal Reinforcement Implants.*

## 4. RISKS AND WARNINGS

### 4.1. RESIDUAL RISKS AND UNDESIRABLE EFFECTS

Risk related to the **4DDOME® / PROMESH® SURG DOME**, **4DMESH® / PROMESH® SURG ABSO**, **4DVENTRAL® / PROMESH® SURG ABSO VENT** and **4DFIX®** devices and mentioned in the IFU are the following:

- Discomfort/Pain
- Recurrence
- Adhesions
- Obstruction

- Erosions/Extrusion
- Irritation nearby organ
- Infection
- Inflammation
- Fistula
- Seroma/Lymphocele
- Mesh deformation
- Hematoma
- Mesh migration
- Allergic reaction
- Foreign body reaction
- Male infertility (only for **4DMESH® / PROMESH® SURG ABSO**, **4DFIX®** and **4DDOME® / PROMESH® SURG DOME**)

Based on the last update of the literature searches performed during the last clinical evaluation, the reported risks associated with the use of the *Sterile Semi-Resorbable Parietal Reinforcement Implants* are Infection, Relapse of hernia, Seroma / Local accumulation of fluid, Post-operative Hematoma, Discomfort, Persistent Pain, Allergy / Irritation, Bowel adhesion, Local numbness, Erosion / Mesh migration and Perioperative complications

Based on the continuous post-market surveillance, since 2005 the main risks associated with the use of *Sterile Semi-Resorbable Parietal Reinforcement Implants* are infection, allergy, change in the device aspect/feeling and discomfort/pain (see table below for details). No serious problem nor declaration to competent authority was reported.
Since 2005, other complaints were about delivery, packaging, documentary issues, contamination and misuse.

| Data source | Undesirable side effects | Frequency in the target population |
|---|---|---|
| **SOTA** | Infection | 1% if not infected at surgery<br>Frequent if preexisting infection or emergency situation (not precisely quantified) |
| | Relapse hernia | 1-10% (6.5%) |
| | Seroma, local accumulation of fluid | Frequent as initial complication, persistent < 5% |
| | Post-operative hematoma | Frequent as initial complication (not precisely quantified) |
| | Discomfort | 10-15% |
| | Persistent pain | 10-15% |

| Data source | Undesirable side effects | Frequency in the target population | |
|---|---|---|---|
| | Allergy / irritation | Rare | |
| | Bowel adhesion | Symptomatic infrequent<br>Occlusion due to bowel adhesion rare | |
| | Local numbness | No Data, frequent on incision | |
| | Erosion and mesh migration | Rare | |
| | Perioperative complications | Rare | |
| **PMS/PSUR (between 2005 and 2023)** | Infection | 3 | |
| | Allergy | 2 | |
| | Change in the device aspect/feeling | 2 | |
| | Discomfort/pain | 2 | |
| | Recurrence | 1 | |
| | Lymphocele | 1 | |
| **IFU** | - Discomfort/Pain<br>- Recurrence<br>- Adhesions<br>- Obstruction<br>- Erosions/Extrusion<br>- Irritation nearby organ<br>- Infection<br>- Inflammation<br>- Fistula<br>- Seroma/Lymphocele<br>- Mesh deformation<br>- Hematoma<br>- Mesh migration<br>- Allergic reaction<br>- Foreign body reaction<br>- Male infertility | Not available | |
| **Clinical studies on Sterile Semi-Resorbable Parietal Reinforcement Implants** | Recurrence | 0% | (Mutter et al., 2012)<br>(Leroy et al., 2006)<br>E.4DMESH_PMCF 2016-2017<br>RAP_4DMESH_2023<br>4DVentral_2023 |
| | | 0.5% | (Mutter et al., 2010) |
| | | 0.7% | (Simone, 2016)<br>(Agca et al., 2019) |
| | | 1.4% | 4DDOME_2023 |

| Data source | Undesirable side effects | Frequency in the target population | |
|---|---|---|---|
| | Discomfort | 4,3% | 4DDOME_2023 |
| | | 11% | RAP_4DMESH_2023 |
| | | 12% | 4DVentral_2023 |
| | | 8.0% | E.4DMESH_PMCF 2016-2017 |
| | | 14% | (Agca et al., 2019) |
| | Persistent pain | 0.4% | (Simone, 2016) E.4DMESH_PMCF 2016-2017 |
| | | 7.3% | RAP_4DMESH_2023 |
| | | 22.3% | 4DVentral_2023 |
| | | 1.4% | 4DDOME_2023 |
| | | 8.0% | (Mutter et al., 2010) |
| | Swelling / seroma | 2.0% | E.4DMESH_PMCF 2016-2017 |
| | | 2.1% | (Mutter et al., 2012) |
| | | 2.7% | RAP_4DMESH_211015_V1-0 2021 |
| | | 5.0% | (Leroy et al., 2006) |
| | | 5.1% | (Mutter et al., 2010) |
| | | 7.2% | (Simone, 2016) |
| | | 10% | (Agca et al., 2019) |
| | | 2.1% | RAP_4DMESH_2023 |
| | | 3% | 4DVentral_2023 |
| | Post-operative pain | 70.0% | (Simone, 2016) |
| | | 13.4% | RAP_4DMESH_2023 |
| | | 18% | 4DVentral_2023 |
| | Hematoma | 0.5% | (Mutter et al., 2010) |
| | | 1.7% | (Simone, 2016) |
| | | 2.5% | (Leroy et al., 2006) |
| | | 0.3% | RAP_4DMESH_2023 |
| | | 4.2% | 4DVentral_2023 |
| | | 2.9% | 4DDOME_2023 |
| | Infection | 0% | (Simone, 2016) (Mutter et al., 2010) E.4DMESH_PMCF 2016-2017 4DDOME_2023 |
| | | 0.6% | RAP_4DMESH_2023 |
| | | 0.5% | 4DVentral_2023 |
| **Vigilance from 2005 and 2022** | No vigilance | 0 case | |

*Table 2 Summary of undesirable effects and their frequency according to available documentation.*

Regarding safety, there are several adverse events following implantation of the device which have been identified and previously described. These events are all expected, and their frequency are within or below what is described in current literature:

| Undesirable side effects | Frequency reported in the literature | Frequency observed in the clinical studies carried by the manufacturer on Sterile Semi-Resorbable Parietal Reinforcements Implants |
|---|---|---|
| Infection | Rare < 1% | Rare none described in studies |
| Recurrence of hernia | Around 6% (up to 12% for patients at risk / long term/ ventral hernia) | < 1% in the clinical datasets |
| Seroma, inflammation, scar swelling | Frequent post-op, persistent symptomatic 2-5% | 0-1% persistent<br>Up to 7% if systematically detected immediately post op |
| Discomfort<br>Pain | Mild 10%<br>severe 2-4% | Mild to moderate pain/discomfort around 8% (up to 14%)<br><1% severe persistent<br>Sensation of foreign body up to 10% |
| Hematoma | Up to 3% | Up to 3% |
| Allergy, irritation | Rare < 1% | Isolated cases<br>None in studies |
| Bowel adhesion, Obstruction | Rare | None identified |
| Erosion and mesh migration | Rare | None identified |
| male infertility after bilateral groin hernia repair | 1-2% of bilateral hernias in younger patients | None identified but patients in the study are in their 60's |

*Table 3: Frequency of undesirable side effects reported in the literature vs frequency observed in the clinical studies reported by COUSIN BIOTECH.*

## 4.2. WARNINGS AND PRECAUTIONS

The **warnings** of the *Sterile Semi-Resorbable Parietal Reinforcement Implants*, including warning concerning surgical technique, are described below:

- Prostheses are delivered sterile (sterilisation by ethylene oxide gas).
- To be stored in a dry place away from light and at room temperature in its original packaging.
- Before any use, inspect the integrity of packaging and device (of which blister / peelable pouches). Do not use in the event of deterioration of the device and/or the packaging.
- Do not use if the device is out of date.
- Semi resorbable parietal reinforcement implants are for single use only. It cannot be re-used and/or resterilized (potential risks would be and are not limited to: loss of the product's sterility, risk of infection, loss of the product's efficiency, recurrence)
- COUSIN BIOTECH does not offer any guarantee or recommendation as far as the use of a particular type of means of fixation is concerned.
- This device must be implanted by a qualified surgeon (familiar with the relevant anatomy and experienced in visceral surgery).
- This device must always be separated from abdominal cavity by peritoneum.
- EXPLANTATION AND ELIMINATION OF DEVICES

  Explantation and handling should be done following recommendations of ISO 12891-1:2015 « Implants for surgery – Retrieval and analysis of surgical implants » Part 1: « Retrieval and Handling». Any explanted device must be sent back, for analysis, following the current protocol. This protocol is available on demand to COUSIN BIOTECH. It is important to note that any implant that should not have been cleaned and disinfected before expedition must be contained in a sealed package.

The elimination of explanted medical device must be conducted in accordance with standards in the country for the disposal of infectious hazards waste. The elimination of a non-implanted device is not the subject of specific recommendations.

| Family | Additional Warning |
|---|---|
| **4DDOME® / PROMESH® SURG DOME** | The prosthesis should always be installed with an anterior reinforcement<br>The dome should not be cut or trimmed |
| **4DMESH® / PROMESH® SURG ABSO**<br><br>**4DFIX®** | The rough side with loops should be placed facing the inguinal floor (only for **4DFIX®**)<br><br>Meshes for laparoscopic surgery have a blue landmark that should be positioned towards the medial side of the patient |
| **4DVENTRAL® / PROMESH® SURG ABSO VENT** | The 4D Ventral® implant is designed for extraperitoneal implantation only.<br>Mesh fixation points should be at least 1cm from the edge of the mesh with 1cm spacing between fixation points. |

*Table 4 : Additional specific warning*

### 4.3. OTHER ASPECTS OF SAFETY INCLUDING A SUMMARY OF ANY FIELD SAFETY CORRECTIVE ACTION IF APPLICABLE

**4DDOME® / PROMESH® SURG DOME**, **4DMESH® / PROMESH® SURG ABSO**, **4DVENTRAL® / PROMESH® SURG ABSO VENT** and **4DFIX®** were not subject to Field Safety Corrective Action.

## 5. SUMMARY OF CLINICAL EVALUATION AND INFORMATION ON POST-MARKET CLINICAL FOLLOW-UP

### 5.1. SUMMARY OF OTHER CLINICAL DATA RELATED TO EQUIVALENT DEVICE, IF APPLICABLE

Not applicable.

### 5.2. SUMMARY OF CLINICAL DATA FROM CONDUCTED INVESTIGATIONS OF THE DEVICE BEFORE THE CE-MARKING, IF APPLICABLE

Not applicable.

### 5.3. SUMMARY OF CLINICAL DATA FROM OTHER SOURCES AND MAIN FINDINGS ON THE DEVICE

The update of the literature search performed in the last clinical evaluation report allowed the identification of clinical evidence pertaining to the evaluated device.
The reference and summary of these clinical evidence retrieved from literature and from manufacturer documentation are presented in this section. The detailed reference of these clinical articles is specified in the section Bibliography.

| Reference Systematic review (Author, year) | Medical device / category | Type of study | Number of patients | Comparison group | Clinical outcome | Follow-up | Quantification performance outcome | Quantification safety outcome |
|---|---|---|---|---|---|---|---|---|
| (Simone, 2016) | 4DDOME | Retrospective large series | 710 | No | General success of the prosthesis, short to medium term<br><br>effect on pain<br><br>repair of hernia<br><br>uneventful surgery, quick discharge from hospital<br><br>low complication rates and recurrences | 1 year | low rate or recurrence of only 0.70%.<br><br>no chronic pain at 1 year, except in 0.42% of cases | There were a subcutaneous hematoma and a seroma in one case. Fifty (7.2%) patients presented with incisional scar swelling. There were no wound infections. These minor complications resolved within 1 month. |
| (Mutter et al., 2012) | 4DDOME | Randomized controlled study vs Plugfix | 47 | PerFixTM plug | General success of the prosthesis, short to medium term<br><br>reinforcement of hernia<br><br>low complication rates and recurrences | 1 year | Recurrence: 0% | Seroma: 2.1% |

| Reference Systematic review (Author, year) | Medical device / category | Type of study | Number of patients | Comparison group | Clinical outcome | Follow-up | Quantification performance outcome | Quantification safety outcome |
|---|---|---|---|---|---|---|---|---|
| (Mutter et al., 2010) | 4DDOME | Prospective cohort Study | 196 | No | General performance of the prosthesis, short to medium term<br><br>effect on pain, discomfort<br><br>reinforcement of hernia<br><br>low complication rates and recurrences | 18 months | Recurrence: 0.5%<br><br>Persistent pain: 8.0% | Seroma: 5.1%<br><br>Hematoma: 0.5%<br><br>Wound infection: 0% |
| (Leroy et al., 2006) | 4DDOME | Cohort follow-up, prospective, monocentric study | 40 | No | General performance of the prosthesis, short to medium term<br><br>effect on pain, discomfort<br><br>reinforcement of hernia<br><br>low complication rates and recurrences | 14 months | At 12 months of follow-up, no recurrence was reported.<br><br>Moreover, pain evaluated by the VAS score (0 – 10) was a median of 0 (range 0 – 2). | Three (7.5%) minor postoperative complications were reported at 1 month:<br>-2 seromas (5%),<br>-1 sub-cutaneous hematoma (2.5%).<br><br>No infection was reported. |

| Reference Systematic review (Author, year) | Medical device / category | Type of study | Number of patients | Comparison group | Clinical outcome | Follow-up | Quantification performance outcome | Quantification safety outcome |
|---|---|---|---|---|---|---|---|---|
| (Agca et al., 2019) | 4DMESH | Retrospective large series | 258 | PP patch (unspecified) | General success of the prosthesis, short to medium term<br><br>Repair of hernia<br><br>Expected complications rates / comparator<br>Specific : pain, seroma, discomfort (sensation of foreign body)<br><br>Low rates of Recurrence | 18 months | Recurrence: 0.77%<br><br>Discomfort: 14% | Seroma: 2.3% |

| Reference Systematic review (Author, year) | Medical device / category | Type of study | Number of patients | Comparison group | Clinical outcome | Follow-up | Quantification performance outcome | Quantification safety outcome |
|---|---|---|---|---|---|---|---|---|
| E.4DMESH_PMCF 2016-2017 | 4DMESH | Prospective registry, retrospective inclusions | 378 | No | General success of the prosthesis, medium term<br><br>repair of the hernia (medium term)<br><br>effect on pain and discomfort (non-comparative)<br><br>ease of use for surgeon<br><br>low complication rates<br>very low recurrence rates | 2 years | Recurrence: 0%<br><br>Persistent pain: 0.4% | Swelling / seroma : 2.0% |

| Reference Systematic review (Author, year) | Medical device / category | Type of study | Number of patients | Comparison group | Clinical outcome | Follow-up | Quantification performance outcome | Quantification safety outcome |
|---|---|---|---|---|---|---|---|---|
| **RAP_4DMESH_2023** | 4DMESH Flat 281<br>4DMESH preshaped 49 | Prospective registry, retrospective inclusions | 332 | No | General success of the prosthesis, medium term<br><br>repair of the hernia (medium term)<br><br>effect on pain and discomfort (non-comparative)<br><br>ease of use for surgeon<br><br>low complication rates<br>very low recurrence rates | 2 years | No recurrence<br><br>The rate of painful patients goes from 91.6% preoperatively to 13.2% at D30. | Seroma / swelling: 2,1%<br><br>Post op pain: 13.4%<br><br>Hematoma:0.3 %<br><br>Infection:0.6%<br><br>Persistent pain: 7.3%<br><br>Discomfort:11 % |

| Reference Systematic review (Author, year) | Medical device / category | Type of study | Number of patients | Comparison group | Clinical outcome | Follow-up | Quantification performance outcome | Quantification safety outcome |
|---|---|---|---|---|---|---|---|---|
| **4DVentral_INTERIM-REPORT _2023** | 4DVENTRAL | Prospective registry, retrospective inclusions | 190 | No | General success of the prosthesis, short to medium term<br><br>Pain short term<br><br>Recurrence and symptoms (PROM)<br><br>QoL (PROM)<br><br>Low complication rates and low recurrence rates | 6m – 4y | Recurrence: 1,4%<br><br>The rate of painful patients goes from 58.6% preoperatively to 17.9% at D30. | Seroma / swelling: 3%<br><br>Post op pain: 18%<br><br>Hematoma:4.2 %<br><br>Infection:0.5%<br><br>Persistent pain:22.3%<br><br>Discomfort:12 % |

| Reference Systematic review (Author, year) | Medical device / category | Type of study | Number of patients | Comparison group | Clinical outcome | Follow-up | Quantification performance outcome | Quantification safety outcome |
|---|---|---|---|---|---|---|---|---|
| **4DDOME_ INTERIM-REPORT_2023** | 4DDOME | Prospective registry, retrospective inclusions | 69 | No | General success of the prosthesis, medium term (1.9y, up to 5.1y)<br><br>General safety : low complication rates and low recurrence rates<br><br>Success of treatment Effect on symptoms. PROM : Patient satisfaction | The follow-up is done at 2 years and at 5 years. | Recurrence: 1,4%<br><br>The rate of painful patients goes from 90.8% preoperatively to 4.8% at D30. | Hematoma:2.9 %<br><br>Infection:0%<br><br>Persistent pain:1.4%<br><br>Discomfort:4.3 % |

*Table 5: Summary of clinical data pertaining to the evaluated device based on the literature*

The trend analysis performed in the PMS report regarding the likelihood of undesirable side-effects and frequency of incidents did not reveal any significant change in these parameters that could lead to a revision of the initial evaluation of the benefits-risk ratio. Indeed, the complaint rate is very low when comparing to sales volume.

## 5.4. AN OVERALL SUMMARY OF THE CLINICAL PERFORMANCE AND SAFETY

Based on the clinical data analysed in the last edition of the clinical evaluation report, the following performances claimed on *Sterile Semi-Resorbable Parietal Reinforcement Implants* as intended by COUSIN BIOTECH.

| Claimed performance | Evaluation of the benefit: Clinical outcome | Quantification of the clinical outcome | Data source |
|---|---|---|---|
| **Groin hernia (Inguinal and femoral)** | | | |
| **Intended use : treatment of hernia** | **Success of surgery** | Low rate <10% /No recurrence of hernia | *4DDOME(PROMESH® SURG DOME)*<br>(Simone, 2016)<br>(Mutter et al., 2012)<br>(Mutter et al., 2010)<br>(Leroy et al., 2006)<br>4DDOME Survey 2020<br>4DDOME_2023<br>*4DMESH/4DFIX(PROMESH® SURG ABSO)*<br>(Agca et al., 2019)<br>E.4DMESH_PMCF 2016-2017<br>RAP_4DMESH_2023 |
| | **Reduction of symptoms** | Significant | *4DDOME(PROMESH® SURG DOME)*<br>(Simone, 2016)<br>(Mutter et al., 2012)<br>(Mutter et al., 2010)<br>(Leroy et al., 2006)<br>4DDOME_2023<br>*4DMESH/4DFIX(PROMESH® SURG ABSO)*<br>(Agca et al., 2019)<br>E.4DMESH_PMCF 2016-2017<br>RAP_4DMESH_2023 |
| | **Improved QOL** | Significant | *4DDOME(PROMESH® SURG DOME)*<br>(Mutter et al., 2012)<br>4DDOME Survey 2020 |

| Claimed performance | Evaluation of the benefit: Clinical outcome | Quantification of the clinical outcome | Data source |
|---|---|---|---|
| **Parietal repair and reinforcement** | **Success of surgery**<br>**Low rate of recurrence** | Low rate <10% /No recurrence of hernia | *4DDOME(PROMESH® SURG DOME)*<br>(Simone, 2016)<br>(Mutter et al., 2012)<br>(Mutter et al., 2010)<br>(Leroy et al., 2006)<br>4DDOME Survey 2020<br>4DDOME_2023<br><br>*4DMESH/4DFIX(PROMESH® SURG ABSO)*<br>(Agca et al., 2019)<br>E.4DMESH_PMCF 2016-2017<br>RAP_4DMESH_2023 |
| **Ventral hernia** | | | |
| **Intended use: treatment of hernia** | **Success of surgery** | Low rate <12% /No recurrence of hernia | *4DVENTRAL(PROMESH® SURG ABSO VENT)*<br>4DVentral_2023 |
| | **Reduction of symptoms** | Significant | *4DVENTRAL(PROMESH® SURG ABSO VENT)*<br>4DVentral_2023 |
| | **Improved QOL** | Significant | *4DVENTRAL(PROMESH® SURG ABSO VENT)*<br>4DVentral_2023 through PROM patient satisfaction |
| **Parietal reinforcement** | **Success of surgery**<br>**Low rate of recurrence** | Low rate <10% /No recurrence of hernia | *4DVENTRAL(PROMESH® SURG ABSO VENT)*<br>4DVentral_2023 |

*Table 6: Summary of available clinical evidence pertaining to the claimed performances of the Sterile Semi-Resorbable Parietal Reinforcement Implants.*

As presented in the table above, the medical device allows treatment of inguinal, femoral and ventral hernias by parietal repair and reinforcement.
See section above (§4.1) for undesirable side-effects.
When compared to the evaluation of the clinical risks collected on the medical device itself, the benefits to the patient outweight the clinical risks. Thus, the benefit-risk ratio is deemed as acceptable.

## 5.5. ONGOING POST MARKET CLINICAL FOLLOW-UP

A post-marketing surveillance plan has been established regarding the Sterile Semi-Resorbable Parietal Reinforcement Implants. This plan describes the activities implemented by COUSIN BIOTECH to continually update the data presented in the Clinical Evaluation Report (CER) and in particular:

- The acceptability of the risk benefit ratio compared to the state of the art and current clinical knowledge, and therapeutic alternatives.
- The adequacy of the information provided with the device compared to expectations in terms of instructions and risk management measures.
- The suitability of the device (including the information of the IFU) in relation to the clinical needs of the target users and the usability of the products.

- Consistency of performances and benefits claimed by the COUSIN BIOTECH for the device based on available clinical data.

No unanswered question has been identified.

The following minor limitations / uncertainties have been identified:
- Minor limitation on femoral hernia for **4DMESH®, 4DFIX®** and **4DDOME®**
- Minor limitation related to equivalence data for **4DFIX®**
- Minor limitation on duration of follow-up in study provided for **4DVENTRAL®**

These uncertainties are all acceptable for CE marking but should be addressed in the PMCF Plan through general and specific PMCF activities as appropriate.

Given the information exposed, the following specific activities are planned as specific PMCF activities on the PMCF Plan:
- Continuous follow-up for patients with 4DVENTRAL®, 4DMESH® and 4DDOME® included on Club Hernia registry
- Inclusion of 4DFIX® and 4DDOME® on Club Hernia registry follow-up
- Follow-up of all the femoral indication with 4DMESH® and 4DDOME® on Club Hernia registry
- Follow-up of patients with 4DFIX on the database on Club Hernia registry (Interim report when the first 30 patients have reached a follow-up of 1 month. Then follow-up at 1 year, 2 years and 5 years)
- Completion of the 5-year follow-up for patients with 4DMESH® included on Club Hernia registry between 2013 and 2015
- Interventional PMCF clinical investigation PMCF for 4DFIX (Last inclusion: July 2024 / Last patient last follow-up visit: August 2029 / End of study: September 2029

# 6. POSSIBLE DIAGNOSTIC OR THERAPEUTIC ALTERNATIVES

## 6.1. DIAGNOSTIC

A hernia is an outpouching of the parietal peritoneum. If the hernia extends beyond the abdominal cavity and is thus visible on the surface of the body, it is defined as an external hernia. Hernias occur in various, locations, although femoral and inguinal hernias are both located in the groin area (Hernia Institute of Florida, 2015; Miller, 2018; Schumpelick et al., 1990). Ventral hernia comprises all hernia resulting from a weakness of the abdominal wall, congenital or acquired (Hernández-Granados, 2021; Henriksen, 2020a; Henriksen, 2020b; Muysoms, 2015; EHS, 2018). They are diagnosed through a physical exam although given the configuration of the femoral ring itself, femoral hernias are difficult to diagnose and carry a high risk of strangulation (risk multiplied by 10) and visceral pain (Fitzgibbons and Forse, 2015; Köckerling, 2019).

## 6.2. THERAPEUTIC ALTERNATIVES

The natural course of a hernia is a progressive aggravation with no spontaneous reduction. The usual consequences are pain, when lifting heavy objects, or coughing, of after prolonged sitting or standing. Acute complications can occur when part of the bowel gets impacted in the hernia orifice with a potential bowel occlusion. For these reasons, the treatment of symptomatic hernias is considered surgical in all cases.
However, for asymptomatic or minimally symptomatic inguinal hernias, patients can be advised that watchful waiting is a safe and reasonable option. The issue of observation versus surgical intervention in this asymptomatic or minimally symptomatic population was reassessed in a recent metanalysis (Gong and Li,

2018) which found that there were no significant differences in hernia related symptoms after long-term follow-up and that watchful waiting did not increase the complication rate and is safe in patients with asymptomatic or minimally symptomatic inguinal hernias. They concluded that patients have relative less pain in the surgical group, compared with watchful waiting. However, this strategy would merely delay rather than avoid surgical repair of hernias in most of inguinal hernia patients. This has been confirmed recently by another metanalysis (Reistrup et al., 2021).
The use of a truss (hernia belt) for groin hernia in men is controversial. Data to determine whether their use prevents hernia complications are lacking (FDA, 2019; HerniaSurge Group, 2018).
Femoral hernia carry a high risk of strangulation (risk multiplied by 10) and visceral pain. Postoperative morbidity and mortality after intervention in an emergency situation surpasses 10%. Therefore, watchful waiting is not indicated in women and a diagnosed femoral hernia should therefore always be operated (except if discovered during pregnancy).
As previously mentioned, therapeutic alternatives only delay rather than avoid surgical intervention. In contrast, the main performance outcomes identified in the literature regarding the use of mesh for hernia repair are the following: reduction of pain, quality of life, recurrence of the hernia and rate of complications (Fitzgibbons and Forse, 2015).

## 7. SUGGESTED PROFILE AND TRAINING FOR USERS

According to the IFU provided by the manufacturer:
This device must be implanted by a qualified surgeon (familiar with the relevant anatomy and experienced in visceral surgery).
This is confirmed in the literature. As the treatment of symptomatic hernias is considered surgical in all cases, surgeons are the only users of mesh devices for hernia repair. Numerous studies have shown that the most important factor influencing the outcome of laparoscopic herniorrhaphy is the experience of the surgeon (compiled in Fitzgibbons and Forse 2015).

## 8. REFERENCE TO ANY HARMONISED STANDARDS AND COMMON SPECIFICATIONS APPLIED

The general standards claimed for the *Sterile Semi-Resorbable Parietal Reinforcement Implants* are listed in the table below. The harmonized standards following Regulation (EU) 2017/745 are in italics and bold.

Note 1: Regarding the biological evaluation, some tests are done according to ISO 10993-3 (2003). A gap analysis between ISO 10993-3 (2003) and ISO 10993-3 (2014) is available in Annex 6.1 Biological risk Assessment. It shows that it is not necessary to redo the tests and that the results are considered valid according to ISO 10993-3 (2014).

| Standard Title | Date |
|---|---|
| ***EN ISO 13485: Medical devices - Quality management systems - Requirements for regulatory purposes*** | ***March 2016 A11:September 2021*** |
| EN ISO 14630: Non-active surgical implants - General Requirements | December 2012 |
| EN 556-1: Sterilization of medical devices - Requirements for medical devices to be designated "STERILE" - Part 1: Requirements for terminally sterilized medical devices | July 2024 |
| ***EN ISO 11135: Sterilization of health-care products - Ethylene oxide - Requirements for the development, validation and routine control of a sterilization process for medical devices*** | ***July 2014 A1: November 2019*** |

| Standard Title | Date |
|---|---|
| ***EN ISO 11737-1: Sterilization of health care products — Microbiological methods —Part 1: Determination of a population of microorganisms on products*** | ***January 2018 A1:June 2021*** |
| ***EN ISO 11737-2: Sterilization of health care products — Microbiological methods — Part 2: Tests of sterility performed in the definition, validation and maintenance of a sterilization process*** | ***May 2020*** |
| EN ISO 14937: Sterilization of health care products — General requirements for characterization of a sterilizing agent and the development, validation and routine control of a sterilization process for medical devices | October 2009 |
| ISO 19227: Implants for surgery - Cleanliness of orthopedic implants - General Requirements | August 2018 |
| ***EN ISO 11607- 1: Packaging for terminally sterilized medical devices – Part 1: Requirements for materials, sterile barrier systems and packaging systems*** | ***January 2020 A1 October 2023*** |
| ***EN ISO 11607-2: Packaging for terminally sterilized medical devices – Part 2: Validation requirements for forming, sealing and assembly processes*** | ***January 2020 A1 October 2023*** |
| EN 868-5: Packaging for terminally sterilized medical devices - Part 5:Sealable pouches and reels of porous materials and plastic film construction - Requirements and test methods | December 2018 |
| EN ISO 14155: Clinical investigation of medical devices for human subjects - Good clinical practice | August 2020 |
| ISO/TR 20416: Medical devices - Post-market surveillance for manufacturers | July 2020 |
| EN ISO 10993-1: Biological evaluation of medical devices. Part 1: Evaluation and testing within a risk management process | December 2020 |
| ISO 10993-3: Biological evaluation of medical devices. Part 3: Tests for genotoxicity, carcinogenicity and reproductive toxicity **Note 1** | October 2003 |
| ISO 10993-3: Biological evaluation of medical devices. Part 3: Tests for genotoxicity, carcinogenicity and reproductive toxicity **Note 1** | October 2014 |
| EN ISO 10993-5: Biological evaluation of medical devices. Part 5: Tests for in vitro cytotoxicity | June 2009 |
| ISO 10993-6: Biological evaluation of medical devices. Part 6: Tests for local effects after implantation | July 1994 |
| EN ISO 10993-7: Biological evaluation of medical devices. Part 7: Ethylene oxide serilization residuals | October 2008 |
| EN ISO 10993-7 / A1 Biological evaluation of medical devices - Part 7 : Ethylene oxide sterilization residuals | January 2022 |
| ***EN ISO 10993-10: Biological evaluation of medical devices. Part 10: Tests for irritation and skin sensitization*** | ***February 2023*** |
| EN ISO 10993-11: Biological evaluation of medical devices. Part 11: Tests for systemic toxicity | May 2018 |
| ***EN ISO 10993-12: Biological evaluation of medical devices. Part 12: Sample preparation and reference materials*** | ***June 2021*** |

| Standard Title | Date |
|---|---|
| ***EN ISO 10993-17: Biological evaluation of medical devices. Part 17: Establishment of allowable limits for leachable substances*** | ***November 2023*** |
| ***EN ISO 10993-18: Biological evaluation of medical devices. Part 18: Chemical characterization of materials*** | ***May 2020 A1 July 2023*** |
| ISO/TS 10993-19: Biological evaluation of medical devices. Part 19: Physico-chemical, morphological and topographical characterization of materials | March 2020 |
| ***EN ISO 10993-23: Biological evaluation of medical devices - Part 23: Tests for irritation*** | ***March 2021*** |
| ***EN ISO 10993-9: Biological evaluation of medical devices - Part 9: Framework for identification and quantification of potential degradation products*** | ***September 2021*** |
| EN ISO 10993-13: Biological evaluation of medical devices - Part 13: Identification and quantification of degradation products from polymeric medical devices | June 2010 |
| ***EN ISO 15223-1: Medical devices – Symbols to be used with information to be supplied by the manufacturer - Part 1: General requirements*** | ***September 2021*** |
| EN ISO 20417: Medical Devices - Information to be supplied by the manufacturer | May 2021 |
| ***EN ISO 14971: Medical devices - Application of risk management to medical devices*** | ***December 2019 A11: December 2021*** |
| IEC 62366-1: Medical Devices - Application of usability engineering to medical devices | February 2015 A1: July 2020 |
| ISO/TR 24971: Medical Devices: Recommendations for the application of ISO 14971 | June 2020 |
| ISO 2859-1: Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection | November 1999 A1 : June 2011 |
| ISO 12891-1: Retrieval and analysis of surgical implants - Part 1: Retrieval and handling | July 2015 |
| EN ISO 19011: Guidelines for auditing management systems | July 2018 |
| EN ISO 14644-1: Cleanrooms and associated controlled environments. Part 1: classification of air cleanliness | December 2015 |
| EN ISO 14644-2: Cleanrooms and associated controlled environments. Part 2: monitoring to provide evidence of cleanroom performance related to air cleanliness by particle concentration | December 2015 |
| EN ISO 14644-3: Cleanrooms and associated controlled environments. Part 3: test methods | October 2019 |
| EN 17141 - Cleanrooms and associated controlled environments - Biocontamination control | August 2020 |
| EN 13392: Textiles. Monofilaments. Determination of linear density | March 2001 |
| EN 13895: Textiles. Monofilaments. Determination of tensile properties | March 2003 |
| EN ISO 13937-2: Textiles - Tear properties of fabrics - Part 2: Determination of tear force of trouser-shaped test specimens (Single tear method) | April 2000 |
| EN ISO 13934-1: Textiles - Tensile properties of fabrics - Part 1: Determination of maximum force and elongation at maximum force using the strip method | April 2013 |
| EN ISO 9073-7: Textiles - test methods for nonwovens - Part 7: Determination of bending length | July 1998 |

| Standard Title | Date |
|---|---|
| ISO 3801: Textiles - Woven Fabrics - Determination of Mass per Unit Length and Mass per Unit Area | September 1977 |
| EN 12127: Textiles - Fabrics - Determination of mass per unit area using small samples | October 1997 |
| NF S94-167-5: Implants for surgery. Artificial ligaments.<br>Part 5 : characterization of cleanness.<br>Verification of extractable residues. | December 1998 |
| EN 13844: Textiles - Monofilaments - Determination of thermal shrinkage | December 2002 |
| ISO 14949: Implants for surgery — Two-part addition cure silicone elastomers | October 2001 |
| NF S94-801: Vaginal reinforcement implant for stress urinary incontinence and/or pelvic organ prolapse repair surgery through vaginal approach - Pre-clinical and clinical tests | December 2007 |
| ASTM D1388: Standard Test Method for Stiffness of Fabrics | July 2018 |
| ASTM D3787: Standard Test Method for Bursting Strength of Textiles - Constant-Rate-of-Traverse (CRT) Ball Burst Test | January 2016 (R2020) |
| ASTM D4169: Performance testing is shipping containers and systems Program 13 for air (intercity) and motor freight (local) for single package up to 61.8 kg | June 2016 |
| ASTM D4332: Standard Practice for Conditioning Containers, Packages, or Packaging Components for Testing | June 2022 |
| ASTM D5276: Standard Test Method for Drop Test of Loaded Containers by Free Fall | October 2023 |
| ASTM D642: Standard Test Method for Determining Compressive Resistance of Shipping Containers, Components, and Unit Loads | October 2020 |
| ASTM F1929: Standard test Method for Detecting Seal Leaks in Porous Medical Packaging by Dye Penetration | December 2023 |
| ASTM F1980: Standard Guide for Accelerated Ageing of Sterile Barrier Systems for Medical Devices | December 2021 |
| ASTM F1886: Standard Test Method for Determining Integrity of Seals for Medical Packaging by Visual Inspection | December 2016 |
| ASTM F2503: Standard Practice for Marking Medical Devices and Other Items for Safety in the Magnetic Resonance Environment | March 2020 |
| American pharmacopoeia USP (39) Chapter 85 and 161 Bacterial Endotoxins Test | February 2017 |
| European pharmacopoeia 10th Edition - 2.6.14 (Bacterial endotoxins) | July 2019 |
| ASTM D999: Standard Test Methods for Vibration Testing of Shipping Containers | December 2023 |
| ASTM D6653: Standard Test Methods for Determining the Effects of High Altitude on Packaging Systems by Vacuum Method | November 2021 |
| ASTM D4728: Standard Test Method for Random Vibration Testing of Shipping Containers | May 2022 |
| ANSI/AAMI ST72 Bacterial endotoxins – Test methods, routine monitoring, and alternatives to batch testing | 2019 |
| Regulation 2017/745: REGULATION (EU) 2017/745 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 April 2017 on medical devices, | May 2017 |

| Standard Title | Date |
|---|---|
| amending Directive 2001/83/EC, Regulation (EC) No 178/2002 and Regulation (EC) No 1223/2009 and repealing Council Directives 90/385/EEC and 93/42/EEC | |
| Regulation (EU) 2023/607 of the European Parliament and of the Council of 15 March 2023 amending Regulations (EU) 2017/745 and (EU) 2017/746 as regards the transitional provisions for certain medical devices and in vitro diagnostic medical devices (Text with EEA relevance) | March 2023 |
| COMMISSION IMPLEMENTING REGULATION (EU) 2021/2226 of 14 December 2021 laying down rules for the application of Regulation (EU) 2017/745 of the European Parliament and of the Council as regards electronic instructions for use of medical devices | December 2021 |
| Décret n° 2016-1537 du 16 novembre 2016 relatif aux recherches impliquant la personne humaine | November 2016 |
| Arrêté du 15 mars 2010 paru au JORF du 16 mars 2010, fixant les conditions de mise en oeuvre des exigences essentielles applicables aux dispositifs médicaux, pris en application de l'article R.5211-24 du CSP | March 2010 |
| Arrêté du 15 mars 2010 paru au JORF du 16 mars 2010, fixant les modalités d'application des procédures de certification de la conformité définies aux articles R.5211-39 à R.5211-52, pris en application de l'article R.5211-53 du CSP | March 2010 |
| Arrêté du 20 décembre 2011 relatif aux déclarations et à la communication de dispositifs médicaux pris en application de l'article R. 5211-65-1 du code de la santé publique - Version consolidée au 25 septembre 2019 | December 2011 |
| MDSAP Audit Approach | August 2024 |
| Corrigendum to Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices, amending Directive 2001/83/EC, Regulation (EC) No 178/2002 and Regulation (EC) No 1223/2009 and repealing Council Directives 90/385/EEC and 93/42/EEC | December 2019 |
| MEDDEV 2.7.1 Rev 4: Clinical Evaluation : A guide for manufacturers and notified bodies | June 2016 |
| MEDDEV 2.12.1 Rev.8: Guidelines on a Medical Devices Vigilance System | January 2013 |
| Additional Guidance Regarding the Vigilance System as outlined in MEDDEV 2.12-1 rev. 8 | July 2019 |
| NBOG's Best Practice Guide 2014-3: Guidance for manufacturers and Notified Bodies on reporting of Design Changes and Changes of the Quality System | 2014 |
| MDCG 2018-1 Rev.4: Guidance on basic UDI-DI and changes to UDI-DI | April 2021 |
| MDCG 2019-1: MDCG guiding principles for issuing entities rules on basic UDI-DI | January 2019 |
| MDCG 2019-4: Timeline for registration of device data elements in EUDAMED | April 2019 |
| MDCG 2019-5: Registration of legacy devices in EUDAMED | April 2019 |
| MDCG 2019-7 Guidance on article 15 of the medical device regulation (MDR) and in vitro diagnostic device regulation (IVDR) on a person responsible for regulatory compliance | December 2023 |
| MDCG 2019-8: Guidance document implant card on the application of Article 18 Regulation (EU) 2017/745 on medical devices | March 2020 |
| MDCG 2019-9: Summary of Safety and Clinical Performance<br>A guide for manufacturers and notified body | March 2022 |

| Standard Title | Date |
|---|---|
| MDCG 2020-3: Guidance on significant changes regarding the transitional provision under Article 120 of the MDR with regard to devices covered by certificates according to MDD or AIMDD | September 2023 |
| MDCG 2020-5 Clinical Evaluation - Equivalence<br>A guide for manufacturers and notified bodies | April 2020 |
| MDCG 2020-6: Guidance on sufficient clinical evidence for legacy devices | April 2020 |
| MDCG 2020-7: Guidance on PMCF Plan Template | April 2020 |
| MDCG 2020-8: Guidance on PMCF Evaluation Report Template | April 2020 |
| MDCG 2020-10/1: Safety reporting in clinical investigations of medical devices under the Regulation (EU) 2017/745 | October 2022 |
| MDCG 2020-10/2: Clinical Investigation Summary Safety Report Form v1.0 | October 2022 |
| MDCG 2020-13: Clinical Evaluation Assessment Report Template | July 2020 |
| MDCG 2020-15: MDCG Position Paper on the use of the EUDAMED actor registration module and of the Single Registration Number (SRN) in the Member States | August 2020 |
| MDCG 2021-1 Rev.1: Guidance on harmonised administrative practices and alternative technical solutions until EUDAMED is fully functional | May 2021 |
| MDCG 2021-5 Guidance on standardisation for medical devices | July 2024 |
| MDCG 2021-6 Regulation (EU) 2017/745 – Questions & Answers regarding clinical investigation | December 2023 |
| MDCG 2021-8 Clinical investigation application/notification documents | May 2021 |
| MDCG 2021-10 The status of Appendixes E-I of IMDRF N48 under the EU regulatory framework for medical devices | June 2021 |
| MDCG 2021-11: Guidance on Implant Card – Device types | May 2021 |
| MDCG 2021-12: FAQ on the European Medical Device Nomenclature (EMDN) | June 2021 |
| MDCG 2021-19: Guidance note integration of the UDI within an organisation's quality management system | July 2021 |
| MDCG 2021-20 Instructions for generating CIV-ID for MDR Clinical Investigations | July 2021 |
| MDCG 2021-24 Guidance on classification of medical devices | October 2021 |
| MDCG 2021-25: Regulation (EU) 2017/745 - application of MDR requirements to 'legacy devices' and to devices placed on the market prior to 26 May 2021 in accordance with Directives 90/385/EEC or 93/42/EEC | October 2024 |
| MDCG 2021-28 Substantial modification of clinical investigation under Medical Device Regulation | December 2021 |
| MDCG 2022-4 Guidance on appropriate surveillance regarding the transitional provisions under Article 120 of the MDR with regard to devices covered by certificates according to the MDD or the AIMDD | May 2024 |
| MDCG 2022-7 – Questions and Answers on the Unique Device Identification system under Regulation (EU) 2017/745 and Regulation (EU) 2017/746 | May 2022 |
| MDCG 2022-14 MDCG Position Paper Transition to the MDR and IVDR Notified body capacity and availability of medical devices and IVDs | August 2022 |
| MDCG 2022-11 MDCG Position Paper Notice to manufacturers to ensure timely compliance with MDR requirements | November 2023 |
| MDCG 2022-21 Guidance on Periodic Safety Update Report (PSUR) according to Regulation (EU) 2017/745 | December 2022 |

| Standard Title | Date |
|---|---|
| MDCG 2023-3 Questions and Answers on vigilance terms and concepts as outlined in the Regulation (EU) 2017/745 on medical devices | November 2024 |
| IMDRF MDCE WG/N56FINAL:2019 Clinical Evaluation | October 2019 |
| Q&A on practical aspects related to the implementation of Regulation (EU) 2023/607 - Extension of the MDR transitional period and removal of the "sell off" periods | July 2024 |
| MDR/IVDR Language requirements<br>Overview of language requirements for manufacturers of medical devices for the information and instructions that accompany a device in a specific country | January 2024 |
| The EMDN – The nomenclature of use in EUDAMED | January 2020 |
| The CND nomenclature – Background and general principles | January 2020 |

*Table 7: General standards claimed for Sterile Semi-resorbable Parietal Reinforcement Implants*

No common specifications have been identified for the moment.

## 9. REVISION HISTORY

| SSCP revision number | Date issued | Change description | Revision validated by the Notified Body |
|---|---|---|---|
| **1** | 19/12/2022 | Creation | Submission to DQS in December 2022 |
| **2** | 22/04/2024 | Update according to the review of DQS (under MDR) Changes are un blue | Submission to DQS in April 2024 |
| **3** | 26/11/2024 | Update of the list of standards. No need to submit the SSCP to lay person for validation. No change of the technical content (except for the list of standards) | Submission to DQS in November 2024 |
| **4** | 03/12/2024 | Update the intended use in the patient section. It is not necessary to submit the change to lay people for validation. It is simply a correction to the wording. | Submission to DQS in December 2024 |

# SUMMARY OF SAFETY AND CLINICAL PERFORMANCE FOR PATIENTS

*This Summary of Safety and Clinical Performance (SSCP) is intended to provide public access to an updated summary of the main aspects of the safety and clinical performance of the device. The information presented below is intended for patients or lay persons. A more extensive summary of its safety and clinical performance prepared for healthcare professionals is found in the first part of this document.*

*The SSCP is not intended to give general advice on the treatment of a medical condition. Please contact your healthcare professional in case you have questions about your medical condition or about the use of the device in your situation. This SSCP is not intended to replace an Implant card or the Instructions For Use (IFU) to provide information on the safe use of the device.*

## 1. DEVICE IDENTIFICATION AND GENERAL INFORMATION

### 1.1. DEVICE TRADE NAME(S)

The CE Family identified and concerned by this Summary of Safety and Clinical Performance are the *Sterile Semi-Resorbable Parietal Reinforcement Implants* including 4 sub-families:

- **4DDOME® / PROMESH® SURG DOME**
- **4DMESH® / PROMESH® SURG ABSO**
- **4DVENTRAL® / PROMESH® SURG ABSO VENT**
- **4DFIX®**

*The **4DDOME®, 4DMESH®** and **4DVENTRAL®** and **4DFIX®** devices correspond to the products developed and manufactured by COUSIN BIOTECH.*

*The **PROMESH® SURG DOME, PROMESH® SURG ABSO** and **PROMESH® SURG ABSO VENT** correspond to the products developed and manufactured by COUSIN BIOTECH and distributed by Peters Surgical. These products are strictly identical respectively to **4DDOME®, 4DMESH®** and **4DVENTRAL®**. The intended purpose and performances, materials, manufacturing processes, and sterilization method are unchanged. They only differ in the labels, brand name, external design of the cardboard box and they have their own instruction for use. The content of the instruction for use is strictly identical, only the first page is different (customer name, brand name and document reference).*

### 1.2. MANUFACTURER'S NAME AND ADDRESS

The manufacturer of the *Sterile Semi-Resorbable Parietal Reinforcement Implants* is:

**COUSIN BIOTECH**
ALLEE DES ROSES
59117 WERVICQ SUD
FRANCE

### 1.3. BASIC UDI-DI

The Basic UDI-DI is a unique identifier introduced by the European Regulation 2017/745 for the devices to identify a model or family of devices.

For *Sterile Semi-Resorbable Parietal Reinforcement Implants,* there are three Basic UDI-DI as follows:

3750185574DDOM3M (**4DDOME® / *PROMESH® SURG DOME***)
3750185574DMESH4L (**4DMESH®** / ***PROMESH® SURG ABSO*** *and* **4DFIX®**)
3750185574DVENT6U (**4DVENTRAL® / *PROMESH® SURG ABSO VENT***)

### 1.4. YEAR WHEN THE FIRST CERTIFICATE (CE) WAS ISSUED COVERING THE DEVICE

*Sterile semi-resorbable parietal reinforcement implants* were already CE-marked and available on the European market:

- **4DDOME®** since July 2004
- **4DMESH®** since January 2005 and April 2015
- **4DVENTRAL®** since April 2016
- **PROMESH® SURG DOME**, **PROMESH® SURG ABSO** and **PROMESH® SURG ABSO VENT** since March 2020

However, 4DFIX® is a new product equivalent to 4DMESH®. CE certification for this product is currently being obtained.

## 2. INTENDED USE OF THE DEVICE

### 2.1. INTENDED PURPOSE

*Sterile Semi-Resorbable Parietal Reinforcement Implants* are intended to be used as parietal reinforcement implant (It means a reinforcement of the abdominal wall for hernias).

**Focus on the hernia treatment**

Abdominal wall hernia treatment is one of the most current surgical act. Hernia is a protrusion of visceral or abdominal fat tissues through an unnatural hole. Fat tissue is a collection of tightly packed cells (adipocytes) that store fat.
Hernias can occur at any age or sex, from newborns to athletes. A protuberance is visible on the abdominal wall. In first intention, this protuberance can be reduced by push back the organs in the abdominal cavity. If the hernia bag can't be push back, complications can appeared, as pain or necrosis. Nowadays to avoid those critical complications, hernia is systematically treated surgically and mostly with mesh, in order to mechanically reinforce the abdominal wall at the hernia area. Four types of hernia can be named:

- Umbilical zone
- Ventral zone
- Femoral zone
- Inguinal zone

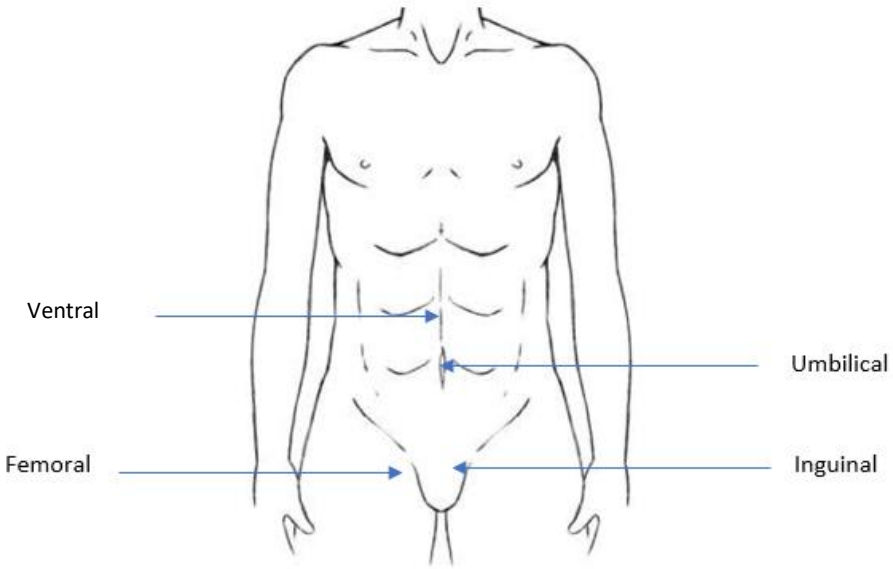



*Figure 7 Main locations of abdominal wall hernias*

## 2.2. INDICATION(S) AND INTENDED PATIENT GROUP(S)

**4DDOME® / PROMESH® SURG DOME**, **4DMESH® / PROMESH® SURG ABSO** and **4DFIX®** are indicated to repair and reinforce the abdominal wall in case of groin and femoral hernias.

**4DVENTRAL® / PROMESH® SURG ABSO VENT** is indicated to repair and reinforce the abdominal wall in case of ventral hernia.

The intended patient population is:

- Adult male or female suffering from groin and femoral hernias necessitating a surgical repair by implantation outside the peritoneum (continuous membrane which lines the abdominal cavity and covers the abdominal organs).
- Adult male or female suffering from a symptomatic ventral hernia necessitating a surgical repair by implantation outside the peritoneum.

## 2.3. CONTRAINDICATIONS

Please, be sure to discuss with your surgeon the potential physical and psychological restrictions and the contraindications.

The contraindications for *Sterile Semi-Resorbable Parietal Reinforcement Implants* are the following:

- Allergy to any of the components
- Infected site
- Pregnancy
- Growing children

# 3. DEVICE DESCRIPTION

## 3.1. DESCRIPTION OF THE DEVICE

### 3.1.1. General description

The devices under consideration in this Summary of Safety and Clinical Performance belong to the EC family *Sterile Semi-Resorbable Parietal Reinforcement Implants*. This family is composed of 4 sub-families of devices.

The fourth sub-families of devices are knit consisting of polypropylene (PP) filaments and poly-L-lactic acid (PLLA) filaments. Once implanted, the PLLA filaments will degrade progressively until disappear. The polypropylene filaments are not intended to degrade in the body. That is why they are named as semi-resorbable implants.

- **4DDOME® / PROMESH® SURG DOME**

**4DDOME® / PROMESH® SURG DOME** are synthetic semi-resorbable meshes for repair and surgical reinforcement of groin and femoral hernias. They are composed of two prostheses:

- One semi-resorbable dome
- One semi-resorbable flat mesh

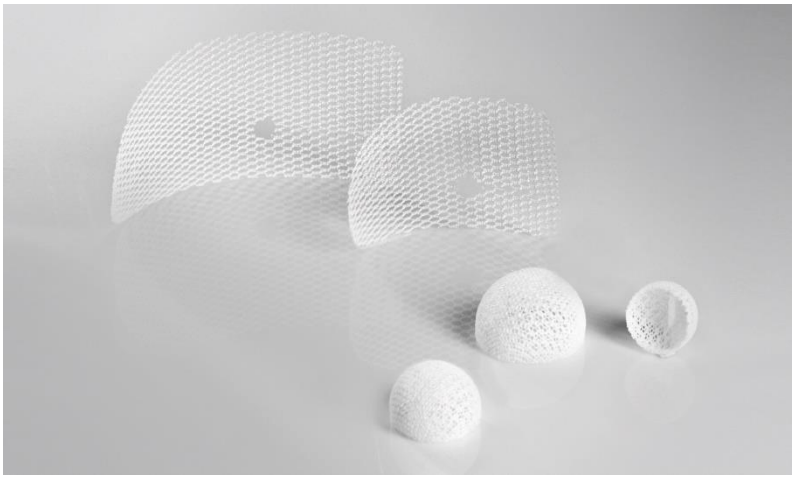


*Figure 1 : Picture of 4DDOME® implants: three sizes of dome + two sizes of meshes*

- **4DMESH® / PROMESH® SURG ABSO** and **4DFIX®**

**4DMESH® / PROMESH® SURG ABSO** and **4DFIX®** are synthetic semi-resorbable meshes for the repair and reinforcement of groin and femoral hernias.
Some references shall be implanted with a particular orientation. That is why a blue orientation marker is sewn on some **4DMESH® / PROMESH® SURG ABSO** and **4DFIX®** references to facilitate the placement of the mesh by the surgeon.

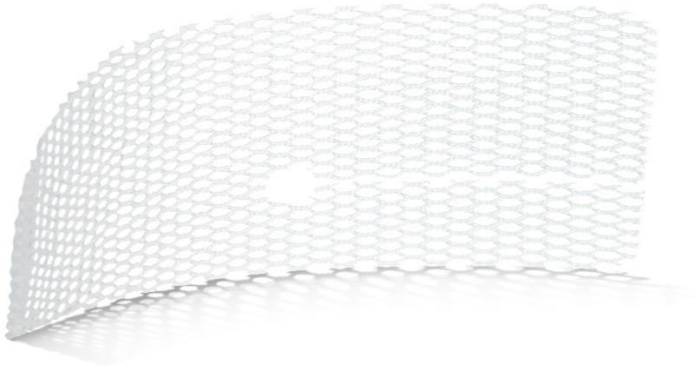


*Figure 2 : Picture of 4DMESH®*

In addition, some **4DMESH® / PROMESH® SURG ABSO** and **4DFIX®** references may have a 3D shape to facilitate the surgery. The 3Dshape is expected to facilitate placement and avoid early displacement of the mesh.

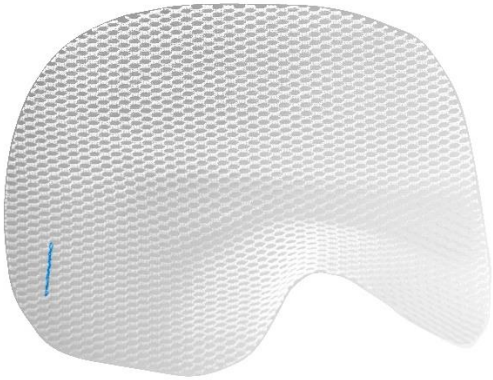


*Figure 3 : Picture of 4DMESH® Pre-Shaped*

- **4DVENTRAL® / PROMESH® SURG ABSO VENT**

The **4DVENTRAL® / PROMESH® SURG ABSO VENT** are synthetic semi-resorbable meshes for the repair of ventral hernia that require the addition of an extra-peritoneal reinforcing or bridging material to obtain the desired surgical result.



*Figure 4 : Picture of 4DVENTRAL®*

### 3.1.2. Materials or substances in contact with the patient tissues.

**Duration of use or contact with the body**

*Sterile Semi-Resorbable Parietal Reinforcement Implants* are in direct contact with tissues as muscles and peritoneum. Peritoneum is a continuous membrane which lines the abdominal cavity and covers the abdominal organs.
These medical devices are for long term implantation as permanent implant (> 30 days).

**Materials or substances in contact with the patient tissues**

| BRAND NAME | PART OF THE DEVICE | RAW MATERIAL (Commercial name) |
|---|---|---|
| 4DDOME®<br>PROMESH® SURG DOME | Dome and mesh | Polypropylene<br>Poly-L-Lactic Acid (PLLA) |
| 4DMESH®<br>4DFIX®<br>PROMESH® SURG ABSO | Mesh | Polypropylene<br>Poly-L-Lactic Acid (PLLA) |
| | Blueorientation maker (depending on references) | Polypropylene (PP)<br>Blue colorant ([phthalocyaninato(2-)] copper) |
| 4DDOME®<br>PROMESH® SURG DOME | Mesh | Polypropylene<br>Poly-L-Lactic Acid (PLLA) |

**Other substances**

| | |
|---|---|
| A medicinal substance (including a human blood or plasma derivative) | **NO** |
| Tissue(s) or cells of human or animal origin, or their derivatives | **NO** |
| Substances or combinations of substances that are absorbed by or locally dispersed in the human body | **/NO** |
| Materials incorporated into the device that contain or consist of CMR (carcinogenic, mutagenic or toxic to reproduction) substances or endocrine-disrupting substances | **NO** |
| Materials that could result in sensitisation or an allergic reaction by the patient or user | **NO** |

## 3.2. INFORMATION ABOUT MEDICINAL SUBSTANCES IN THE DEVICE, IF ANY

*Sterile Semi-Resorbable Parietal Reinforcement Implants* do not contain any medicinal substances.

## 3.3. DESCRIPTION OF HOW THE DEVICE ACHIEVING ITS INTENDED MODE OF ACTION

These meshes have been designed for:

- Open surgery: anterior incision of abdominal wall to implant the mesh (no mini-invasive surgical technique)
- Laparoscopic approach: this is a posterior surgical technique that allows access to the posterior abdominal wall through small incisions.

Prostheses are used as patches covering the defect in the abdominal wall (which is at the origin of the hernia) and thus they mechanically reinforce the abdominal wall at the location of the defect and stop visceral contents (bowels) from passing through the defect towards the abdominal wall.
When meshes are entirely non-resorbable (such as meshes made of 100% polypropylene (PP) filaments), the inflammatory response might persist for a longer time, leading to pain and/or discomfort. Conversely, when meshes are fully resorbable, the long-term mechanical resistance might be impaired.
Semi-resorbable meshes are proposed as a potential solution intended to address the drawbacks of non-resorbable meshes (they intend to reduce chronic inflammation) and those of fully resorbable meshes (they intend to provide long-term strength).

Fixation method of the mesh remains a surgeon's choice or preference. If necessary, the surgeon has the possibility of adding additional points of fixing, according to his/her appreciation.

### 3.4. DESCRIPTION OF ACCESSORIES, IF ANY

There are no accessories included with the *Sterile Semi-Resorbable Parietal Reinforcement Implants*.

## 4. RISKS AND WARNINGS

*Contact your healthcare professional if you believe that you are experiencing side effects related to the device or its use or if you are concerned about risks. This document is not intended to replace a consultation with your healthcare professional if needed.*

### 4.1. HOW POTENTIAL RISKS HAVE BEEN CONTROLLED OR MANAGED

To control and manage potential risks, the manufacturer complies with applicable regulations, standards and directives. The manufacturer applies risk management, clinical evaluation, post-market surveillance and vigilance processes. This includes continuous review of clinical data and feedback on device use.

### 4.2. REMAINING RISKS AND UNDESIRABLE EFFECTS

Like any implantable medical device, the devices are susceptible to generate possible undesirable side effects which include but are not limited to:

- Discomfort/Pain
- Recurrence
- Adhesions
- Obstruction
- Erosions/extrusion
- Irritation nearby organ
- Infection
- Inflammation
- Fistula (A fistula is an abnormal connection between two organs or between an organ and the skin)
- Seroma (Non-cancerous (benign) mass or swelling (edema) caused by an accumulation of serum (the clear portion of any body fluid) in a tissue or organ)
- Lymphocele (Lymph effusion or accumulation)
- Mesh deformation
- Hematoma
- Mesh migration
- Allergic reaction

- Foreign body reaction
- Male infertility (only for **4DMESH® / PROMESH® SURG ABSO**, **4DFIX®** and **4DDOME® / PROMESH® SURG DOME**)

### 4.3. WARNINGS AND PRECAUTIONS

Please, be sure to discuss with your surgeon the potential physical and psychological restrictions, the consequences of implanting the device and the surgical risks and possible side effects.
If you have symptoms that appear abnormal, return for further consultation with your surgeon.

Any serious incident that has occurred in relation to the device should be reported to the manufacturer and the competent authority of the Member State in which the user and/or patient is established.

*Sterile Semi-Resorbable Parietal Reinforcement Implants* must be implanted by a qualified surgeon (familiar with the relevant anatomy and experienced in visceral surgery). The prescription of the device is decided on by the surgeon, the only person qualified to do so.

An implant card for the patient is provided by the healthcare professional at the clinic. This implant card provides information, for the patient, to identify the device and traceability elements as well as the name, address and website of the manufacturer. Please, scan the implant card immediately upon receipt to keep track of it in case of loss.

The summary of the safety and performance characteristics of the device and the instructions for use can be found on the COUSIN BIOTECH website.

The instruction for use is in electronic format and can be downloaded from the COUSIN BIOTECH website (www.cousin-biotech.com/ifu).

### 4.4. SUMMARY OF FIELD SAFETY CORRECTIVE ACTIONS (IF APPLICABLE)

Problems with a device may require the manufacturer to implement a Field Safety Corrective Action (FSCA) to prevent or reduce the risk of a serious incident related to a device made available on the market.

A 'field safety notice' (FSN) is an important communication about the safety of a medical device that is sent by a device manufacturer, or their representative. FSNs tell you what you need to do to reduce the specified risks of using the medical device.

*Sterile Semi-Resorbable Parietal Reinforcement Implants* was not subject of any FSCA or FSN.

## 5. SUMMARY OF CLINICAL EVALUATION AND POST-MARKET CLINICAL FOLLOW-UP

### 5.1. CLINICAL BACKGROUND OF THE DEVICE

*Sterile semi-resorbable parietal reinforcement implants* were already CE-marked and available on the European market:

- **4DDOME®** since July 2004
- **4DMESH®** since January 2005 and April 2015
- **4DVENTRAL®** since April 2016

- **PROMESH® SURG DOME**, **PROMESH® SURG ABSO** and **PROMESH® SURG ABSO VENT** since March 2020

However, 4DFIX® is a new product equivalent to 4DMESH®. CE certification for this product is currently being obtained.

As part of the new Medical Device Regulation certification of the products, no novel feature has been introduced. The specifications of the final product remain unchanged. No change regarding the clinical performances and benefits.

## 5.2. CLINICAL EVIDENCE FOR THE CE-MARKING

To demonstrate the clinical safety and performance, the clinical evidence is based on the following sources:

**SCIENTIFIC LITERATURE**

Clinical studies have been published in the scientific literature. They include clinical results from retrieved literature (publications):

- On 933 patients who received 4DDOME®
- On 258 patients who received 4DMESH®

**CLINICAL STUDIES**

COUSIN BIOTECH has been performed fourth post-market clinical studies:

- A study for 4DMESH® to assess the effectiveness and the safety of the device at one years and the performances and the security of the device figuring post-surgery complications.
  216 patients treated with 4DMESH® have been included in the study for which an assessment of incidence and the severity of chronic postoperative pain at 1 and 12 months after surgery have been registered.
  Performance of the 4DMESH has been proven. Over 216 included patients, there was no hernia recurrence. 9,79% of patients experiment moderate pain and 0,43% experiment important pain at 1 year after surgery. Very few complications happened during the follow-up, no serious adverse event occurred.

- A study for 4DMESH® to assess the effectiveness and the safety of the device at 2 years.
  378 patients treated with 4DMESH® have been included in the study for which measurement of the chronic pain rate from 1 to 24 months after surgery have been registered.
  Chronic postoperative pain for patients who has a 4DMESH® implant, greatly decreases between preoperative and 3 months postoperative. 7.65% of patients had a moderate or important pain at 24 months. These percentages are compliant with the literature data.
  Regarding these results, at 24 months postoperative, the effectiveness of the semi-resorbable parietal reinforcement implant is proven.
  Over 430 surgeries, only one hernia recurrence was increased.
  Very few complications happened during the follow-up, no serious adverse event occurred.

- A study for 4DMESH® and another for 4DVENTRAL® to assess the efficacy and safety of the devices, based on intraoperative and post-operative complications (at 1 year, 2 years and 5 years after surgery) and number of reinterventions. Another objective is to assess the performance of the device

and ensure that it is maintained over time, based on improvement in the patient's quality of life (pain, discomfort, impact on daily quality of life), no recurrence (at 1 year, 2 years and 5 years after surgery). These two studies are ongoing:

- The end of the study is planned in 2026 for 4DMESH® after the 5-year follow-up of the last patient included in the registry (last patient included in December 2020).
- The end of the study is planned in 2027 for 4DVENTRAL® after the 5-year follow-up of the last patient included in the registry (last patient included in October 2022).

To date, with existing data from ongoing registries, results of the medical devices studied are consistent with published results for ventral and inguinal hernia cures, with a very low recurrence rate and a surgical outcome, evaluated by the patients themselves objectively excellent.

**The results of scientific literature and clinical studies demonstrate the clinical performance and benefits of *Sterile Semi-Resorbable Parietal Reinforcement Implants* and the acceptability of the benefits risk-ratio.**

### 5.3. SAFETY

Clinical risks are in line with expected rates for this type of surgery. State-of-the-art adverse effects are considered and mentioned in the instructions for use. Their ratio is lower than the state of the art (based on the literature). In addition,
the manufacturer continuously collects clinical data and evaluates the safety and clinical performance of its devices through :

- Continuous analysis of scientific literature
- Post-market surveillance of the device
- Clinical studies on the devices

This confirms the acceptability of the device's benefit/risk profile, based on current knowledge in this medical field and available medical alternatives.

## 6. POSSIBLE DIAGNOSTIC OR THERAPEUTIC ALTERNATIVES

*When considering alternative treatments, it is recommended to contact your healthcare professional who can take into account your individual situation.*

The natural course of a hernia is a progressive aggravation with no spontaneous reduction. The usual consequences are pain, when lifting heavy objects, or coughing, of after prolonged sitting or standing. Acute complications can occur when part of the bowel gets impacted in the hernia orifice with a potential bowel occlusion. For these reasons, the treatment of symptomatic hernias is considered surgical in all cases.

However, for asymptomatic or minimally symptomatic inguinal hernias, patients can be advised that watchful waiting is a safe and reasonable option. It is important to note that this strategy would merely delay rather than avoid surgical repair of hernias in the majority of inguinal hernia patients.

Sometimes, the use of a hernia belt for groin hernia in men may help relieve symptoms, but it is controversial, as there is a lack of evidence on their prevention of hernia complications.

As previously mentioned, therapeutic alternatives only delay rather than avoid surgical intervention. In contrast, the main performance outcomes identified in the literature regarding the use of mesh for hernia repair are the following: reduction of pain, quality of life, recurrence of the hernia and rate of complications.

# 7. REVISION HISTORY

| SSCP revision number | Date issued | Change description | Revision validated by the Notified Body |
|---|---|---|---|
| **1** | 19/12/2022 | Creation | Submission to DQS in December 2022 |
| **2** | 22/04/2024 | Update according to the review of DQS (under MDR). Changes are un blue | Submission to DQS in April 2024 |
| 3 | 26/11/2024 | Update of the list of standards. No need to submit the SSCP to lay person for validation. No change of the technical content (except for the list of standards). | Submission to DQS in November 2024 |
| **4** | 03/12/2024 | Update the intended use in the patient section. It is not necessary to submit the change to lay people for validation. It is simply a correction to the wording. | Submission to DQS in December 2024 |

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