

Stening[®] Devices' Presentation

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Bronchology

Bronchology

Stents

Stening® Tracheal Stent (ST)

The Stening® Tracheal stent is the classical and straight stent for tracheal affections. It has a tubular structure, with flat surface anchoring studs on its outer wall to prevent stent migration.

It is used in:

- Primary or secondary tracheal neoplasm
- Tracheoesophageal fistula
- Tracheal rupture
- After laser resection, cryotherapy or electrocautery, to maintain the airway opened.
- Extrinsic compression or compromise of the submucosa
- Post intubation stenosis
- Post-traumatic stenosis
- Post infectious stenosis (endobronchial tuberculosis, histoplasmosis mediastinal fibrosis, herpes virus, diphtheria)
- Focal trachea-broncho-malacia: following tracheostomy or radiation therapy
- Diffuse trachea-broncho-malacia: idiopathic, polychondritis or Mounier-Kuhn syndrome
- Tracheal tumours
- Amyloidosis
- Excessive dynamic compression of the airway

Miscellaneous:

- Extrinsic compression caused by an aortic aneurysm
- Tracheal distortion caused by kyphoscoliosis
- Tracheal obstruction caused by an oesophageal stent
- In combination with an oesophageal stent



Stening® Bronchial Stent (ST)

Stening® Bronchial stent follows the Stening® Tracheal stent general design, with some changes on its walls' thickness and its dimensions. It is introduced in a wide range of diameters and lengths, sharing a lot of indications described for the tracheal version.

It is used in:

- Bronchial neoplasms
- Neoplasms that invade the tracheal carina or its slopes
- Imminent atelectasis
- After laser resection, cryotherapy or electrocautery, to maintain the airway opened
- Bronchial stenosis
- Post infectious stenosis (endobronchial tuberculosis, histoplasmosis mediastinal fibrosis, herpes virus, diphtheria)
- Post-traumatic stenosis
- Post-surgical term-terminal bronchial anastomosis stenosis
- Bronchial rupture
- Extrinsic compression
- Broncho-malacia
- Amyloidosis
- Excessive dynamic compression of the airway
- Bronchus invasion caused by an oesophageal carcinoma
- After endoscopic resection of bronchial metastasis



Tracheal Stenosis Stent (SET)

It is a tracheal stent of easy implant and removal. It is especially suitable for the benign stenosis treatment.

With a 14, 15 and 16 mm diameter on its edges and a 12, 13 and 14 mm diameter respectively on its central portion, constitutes a profile that increase the difficulty of its spontaneous displacement after being introduced. The stents for tracheal stenosis (SET) have a 5 mm longer version: "L".

These variants are how Stening® responds to the needs on treatment for special clinical situations.

It is used in:

- Simple tracheal stenosis
- Complex and long tracheal stenosis
- Stenosis combined with malacia or compression
- After laser resection, cryotherapy or electrocautery, to maintain the airway opened
- Post infectious stenosis (endobronchial tuberculosis, histoplasmosis mediastinal fibrosis, herpes virus, diphtheria)
- Post anastomosis surgical tracheal stenosis
- Architecture modifications, deformity, bending (senile trachea)
- Extrinsic compression

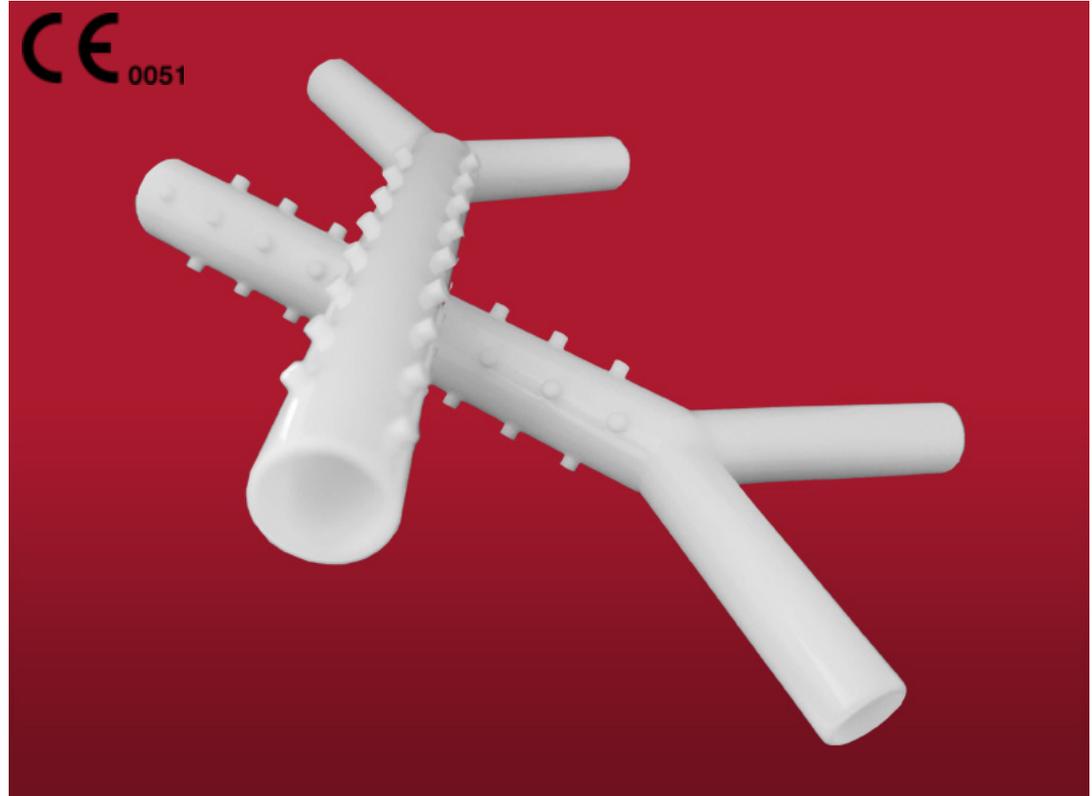


Stening® “Y” Stent (SY)

Flexible tracheo-carino-bronchial prosthesis for supporting tracheal bifurcation and carinal angle, able to maintain ventilation through the main bronchi in very advanced obstructive conditions.

It is used in:

- Tracheal neoplasms
- Long tracheobronchial neoplasm, with or without a compromise for the carina and/or its slopes
- Neoplasms that affect both sources
- Oesophageal carcinoma with an airway invasion
- Tracheoesophageal or tracheocutaneous fistula
- After laser resection, cryotherapy or electrocautery, to maintain the airway opened
- Extrinsic compression or compromise of the submucosa
- Tracheal stenosis
- Tracheobronchial stenosis
- Tracheo-broncho-malacia
- Amyloidosis
- Excessive dynamic compression of the airway



Bronchology

Special Prostheses

Stening® Class Stent (CLASS)

The Stening® Class Stent is a device designed to maintain the clearance of the airway in sufficient conditions for ventilation. It has a conical elastic tubular structure, with non-slip spurs arranged in several rows and distributed symmetrically along its surface.

Special features:

Gradual resistance:

To accompany the functionality of the bronchus and its physiology, the strength of its wall is progressively reduced distally at a rate of 3% per each centimeter of the length of the stent.

Increase in fixing capacity:

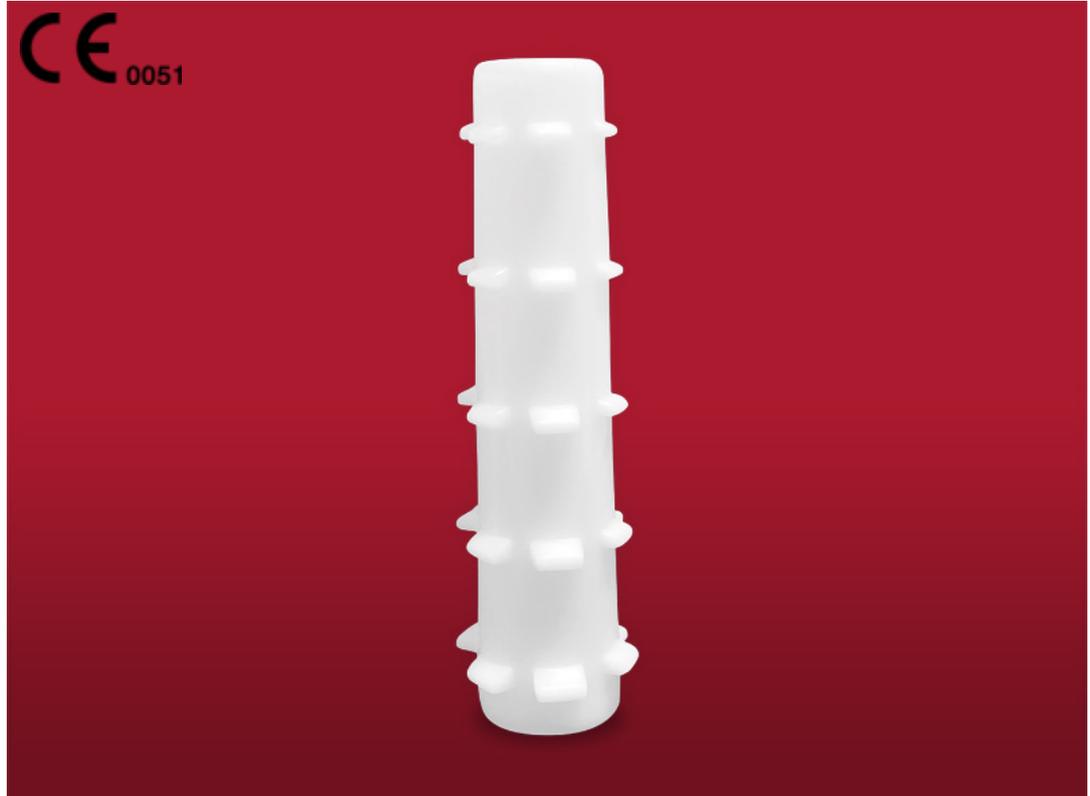
Although the increase in the fixing capacity of the Stening® Class Stent can not be precisely determined with regard to its counterpart, this property is benefited by the existence of fixations aligned against the direction of possible unwanted displacement. Their number duplicates the existing ones in the straight stent model.

It is used in:

- Bronchial neoplasms.
- Neoplasms that invade tracheal carina or its slopes.
- Impending atelectasis.
- Following laser photorecorder, cryotherapy or electrocautery, to maintain the opening of the airway.
- Bronchial stenosis.
- Postinfectious stenosis (tuberculosis, histoplasmosis with mediastinal fibrosis, herpes virus, diphtheria).
- Post-traumatic stenosis.
- Post-terminal surgical bronchial anastomosis stenosis.
- Bronchial rupture.
- Extrinsic compression.
- Bronchomalacia.
- Bronchial Amyloidosis.
- Excessive dynamic compression of the airway.
- Invasion of bronchial sources by esophageal carcinoma.
- After endoscopic resection of bronchial metastases.

Warnings:

- They are specified for the following device



Stening® Class LSD Stent (CLASS LSD)

The Stening® Class LSD Stent is a device designed to maintain the clearance of the airway in sufficient conditions for ventilation. It has a side hole that allows ventilation of the right upper lobe.

It has a conical elastic tubular structure, with non-slip spurs arranged in several rows and distributed symmetrically along its surface.

Special features:

Gradual resistance:

To accompany the functionality of the bronchus and its physiology, the strength of its wall is progressively reduced distally at a rate of 3% per each centimeter of the length of the stent.

Increase in fixing capacity:

Although the increase in the fixing capacity of the Stening® Class LSD Stent can not be precisely determined with regard to its counterpart, this property is benefited by the existence of fixations aligned against the direction of possible unwanted displacement. Their number duplicates the existing ones in the straight stent model.

It is used in:

- Same ones specified for the Stening® Class Stent

Warnings:

- Remember that the stent should always be inserted into the bronchoscope with the larger diameter end in a proximal position, and the narrowest end in distal one.
- If it is necessary to shorten the stent, it is preferable to make the cut close to its distal end. In other words, near the end of the smaller diameter.
- As the name implies, LSD models are only useful in the right hemi-tree. In Class LSD models, when loading the stent into the introducer or the bronchoscope, remember to orient the lateral hole of the stent towards the entrance of the right upper lobe bronchus, which is usually at 3 o'clock. Check this location previously during the Bronchoscopic examination and once again after the implant.
- The device should not be reused.



Stening® Roll (Roll)

The Stening® Roll is the Stening response to the clinical need on carrying out diseases treatments for small bronchi, but that are still capable of providing ventilation to its distal segments. This can be seen in the neoplastic infiltrations in the lower lobar bronchi both right and left ones.

In this way, the interventionist and therapeutic bronchoscopy extends its scopes and Stening accompanies it with the development of devices that can be applicable in minor bronchi. As well as in peripheral ones and those with low resistance on their thin walls. These force the experts' skills to increase the scopes of the intravenous surgical treatments of the airway.

The Stening® Roll 911 is a special stent for common trunk of the basal segments of the lower lobes (left and right).

Due to this, the stent possesses smaller anchors and a larger distribution that provide a smooth support and with more distribution points of its loads. So that, its short dimensions make possible its fitting inside the bronchus that is going to be treated. Its anatomic shape copies the bronchus' conical shape, avoiding the distortion produced by the classical stents with a cylindrical shape.

The measure of preference is detailed on the Roll 911, with a distal external diameter of 9mm and a proximal one of 11mm. The length is 20mm.

For the individual anatomic variations we have two more types: the Roll 810, with a length of 20mm and the Roll 1012, with a length of 25mm. The last one is a special one for the intermediate bronchus. It permits the air flux without occluding the apical entrance of the lower one, when this segment is unscathed. In this way, it is possible to effectuate treatments on the intermediate bronchus without interfering with the ventilation of other segments.

The Stening® Rolls can be cut on their margins to fit the length of the bronchus where they are implanted. Effectuate the section on its proximal margin, because this one does not confront any bronchial spur during the respiratory dynamic.

A stent implant inside the common trunk of the lower lobar can end in an occlusion on the entrance of the apical segment. The doctor must evaluate the benefits of restoring the ventilation of the basal ones in spite of the loss of the apical from the lower one. This must be done when this last one would not be affected by the neoplastic disease.

It is used in:

- A complete or partial obstruction of the lower lobar bronchus with unscathed basal ones
- A complete or partial obstruction of the common trunk of the basal ones in the lower lobe (right or left)
- A complete or partial obstruction of the intermediate bronchus
- A combination of the ones above

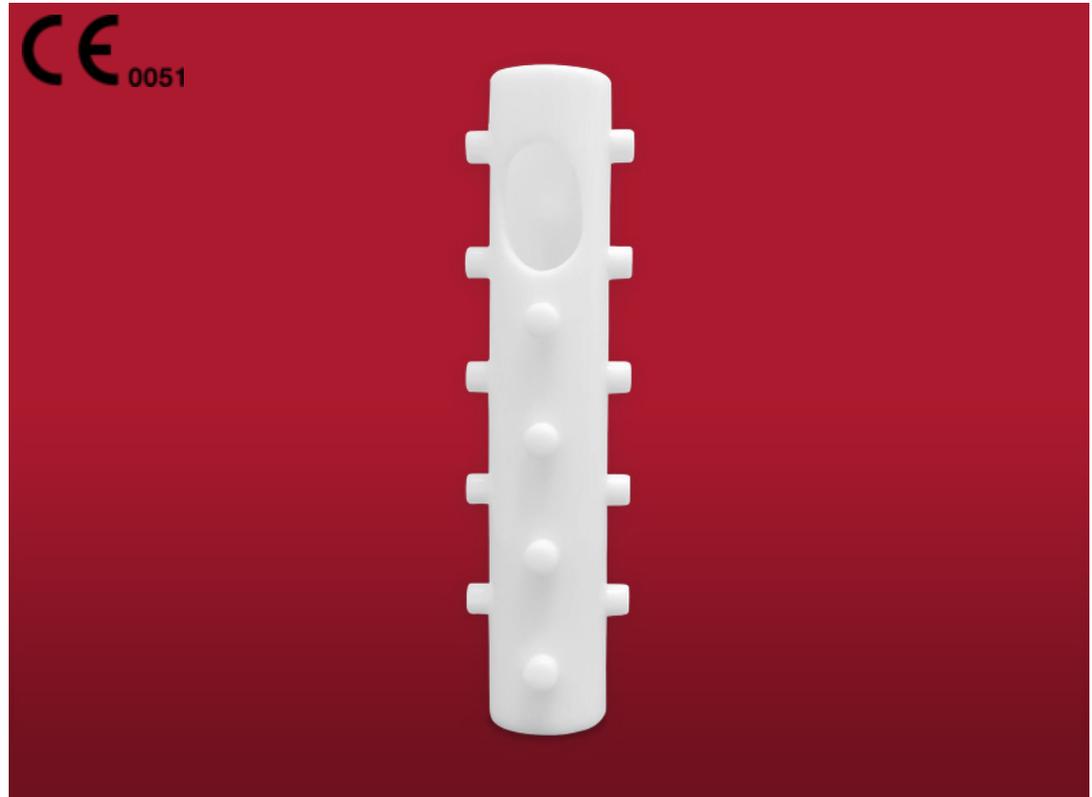


Stening® Bronchial LSD Stent (ST LSD)

The LSD from Stening®, with a lateral hole, is useful for diseases in the main right bronchus or the intermediate one when you want to preserve the ventilation of the upper lobe through the lateral hole of the stent. The hole must be orientated to this lobar.

It is used in:

- Neoplasms in the main right bronchus or intermediate one that do not affect the upper lobar
- Extrinsic compression under equal conditions



Stening® Solid Stent MS10 (MS10)

Stening® Solid Stent made out of silicone and intended for bronchial occlusion in the treatment of different bronchopleural pulmonary affections such as the bronchopleural fistula and persistent air loss in pneumothorax cases that cannot be treated with conventional surgery.

It is radiopaque (white or pale yellow).

Presentation: the Stening® Solid Stent, MS10, is supplied in a container that has two units of 5mm of greater diameter, four of 6mm, two of 7mm and two of 8mm.

It is used in:

- Bronchopleural fistula
- Suture failure in a stump after lobar pulmonary resection
- Occluded bronchial treatment



Stening® Solid Stent MS03 (MS03)

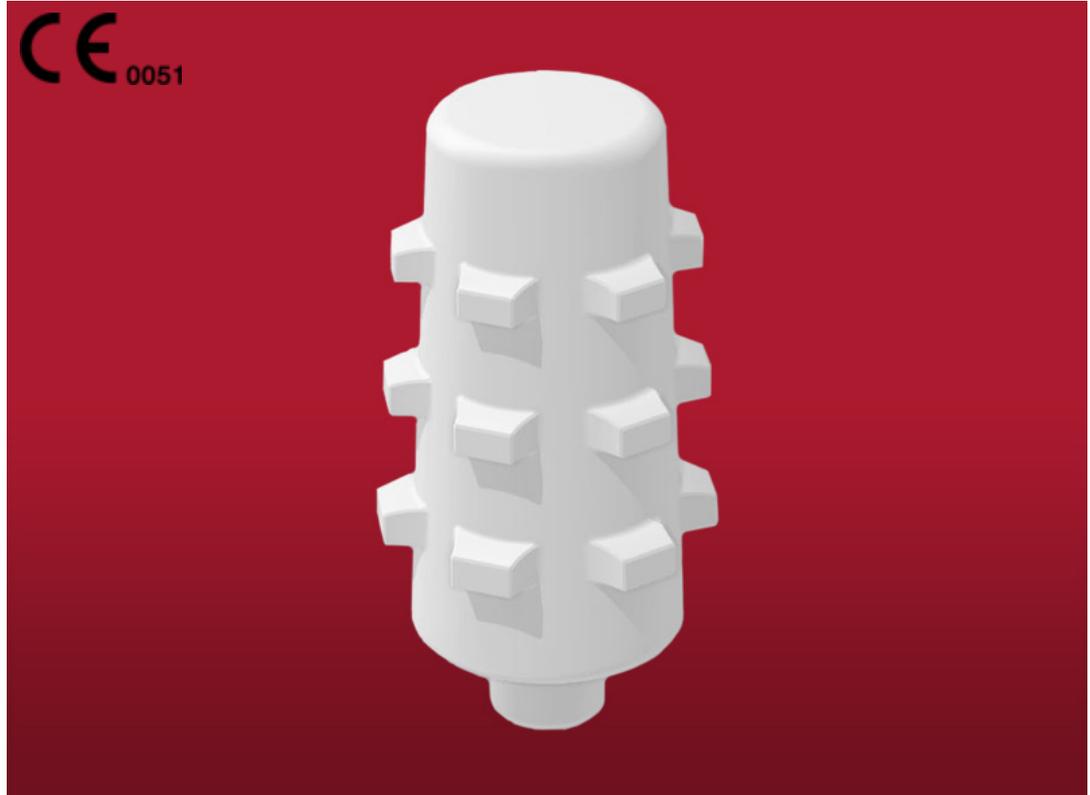
Stening® Solid Stent made out of silicone and intended for bronchial occlusion in the treatment of different bronchopleural pulmonary affections such as the bronchopleural fistula and persistent air loss in pneumothorax cases that cannot be treated with conventional surgery.

The Solid Stent is presented in three different sizes: MS810, MS911 and MS1012.

It is radiopaque (white or pale yellow).

It is used in:

- Bronchopleural fistula.
- Suture failure in a stump after lobar pulmonary resection.
- Occluded bronchial treatment.



Subglottal Stent (SG)

It presents an 8 mm section on its proximal edge where its wall's thickness is reduced. Throughout this section, its normal wall, of 1.5 mm, reduces its thickness gradually until it ends.

This wall's thickness decreasing achieves, on that edge, a surface of low resistance on the stent. It is meant to occupy the subglottic region, close to the vocal chords. This design allows the stent deformation during the laryngeal movements and the glottal dynamic during swallowing and phonation.

The stent fixation on the trachea will be carried out by the remaining walls of the prosthesis, of a standard shape and width.

It can also be used in other locations such as the middle or lower trachea or even in the source bronchi, replacing a classical stent.

As it can be understood, when this stent is implanted in the source bronchus, the transition from the bronchial mucosa to the stent inside will be very smooth, without the "step" that accompanies the classical stent. That could help to reduce the turbulence of the air flow and the secretions impaction.

It is used in:

- Tracheal stenosis close to the subglottis
- All indications from every tracheal and bronchial stent



Stening® High Pressure Stent (SAP)

With a more robust wall, this model is very resistant to max compression.

When any stent is put under a strength test that compresses it with loads that increase gradually, the stent's paulatine deformation takes place until it reaches the cession point. Here, the prosthesis suffers a higher deformation, with a notorious reduction of its radial resistance to flattening. This is called the break point, which is about 900 g/cm² in a classical stent.

In the Stening® High Pressure Stent the tolerance to compression increases surpassing the 2000 g/cm².

Its wall's thickness increase is accompanied by an inevitable reduction in the area available for air flow.

It is used in:

- Tracheal neoplasms with a solid extrinsic compression
- A severe tracheal compression that occurs again after the dilatation
- In replacement of a classical stent that collapse by extrinsic compression



Stening® Thin Wall Tracheal Stent (HE)

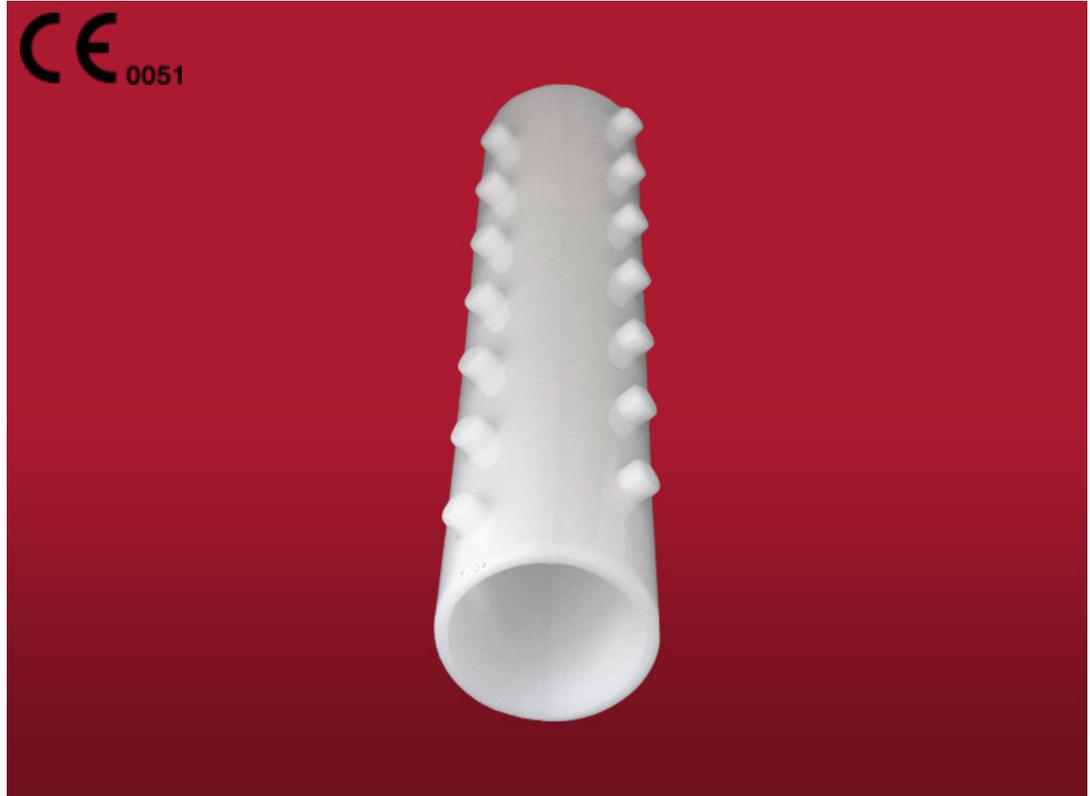
It consists on a straight tracheal stent with a thinner wall. This docility makes its implant and removal easier. It has a special utility after the neoplastic and endotracheal tissue's resection, when the affection lacks of a compressive component.

A thinner wall of the prosthesis significances an increase in the stent cross section surface destined for ventilation. The relation between the surface that occupies the wall and the clearance available for ventilation is modified favourably.

The wall's thickness decrease makes easier the introduction of the prosthesis inside the ejector or the bronchoscope. As well as the implant and removal manoeuvres.

It is used in:

- Primary or secondary tracheal neoplasm
- Tracheoesophageal fistula
- Tracheal rupture
- After laser resection, cryotherapy or electrocautery, to maintain the airway opened
- Tracheomalacia



Stening® Ocludded “Y” Stent (SYO)

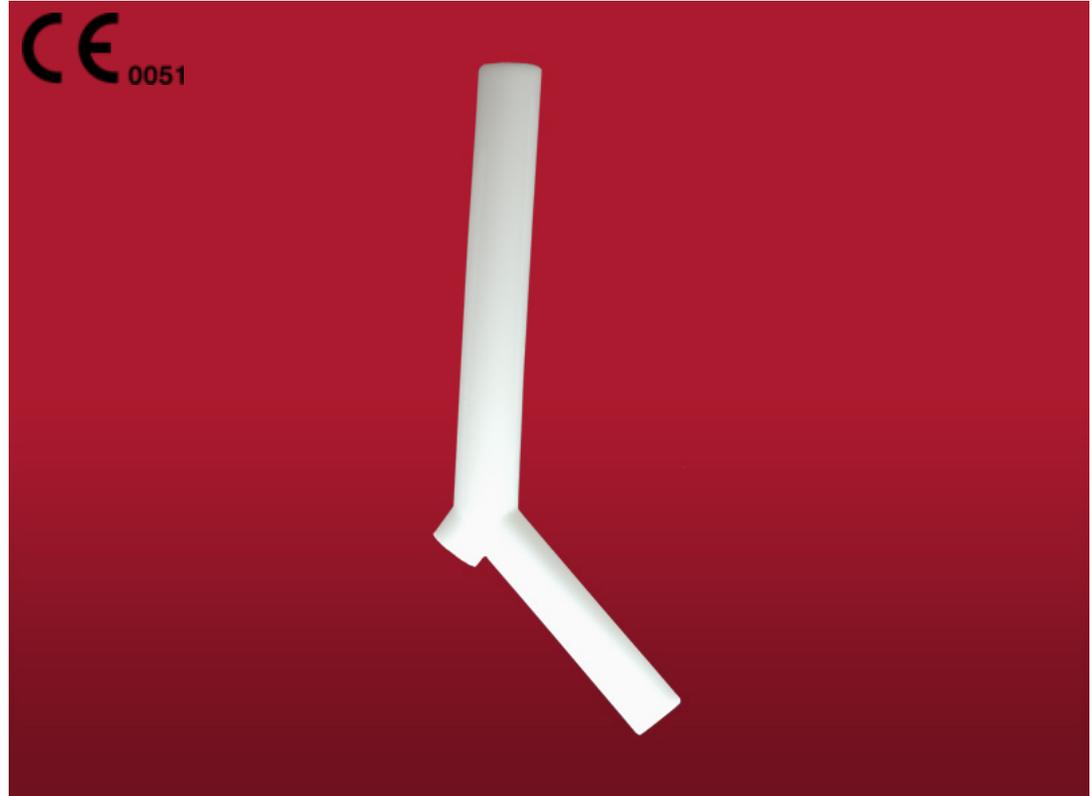
It consists on a tracheo-carino-bronchial “Y” stent that has one of its bronchial branches completely occluded on its origin.

Thereby, the stent satisfies a special function, allowing the ventilation from the healthy lung on patients with a postsurgical bronchopleural fistula or from other aetiologies and that require mechanical respiratory assistance.

The occluded branch impedes the air flow loss through the vast communication with the pleural cavity.

It is used in:

- A right or left bronchopleural fistula, from any aetiology, with or without the MRA (Mechanical Respiratory Assistance) need
- A bronchopleural fistula accompanied by empyema on patients with a tube drainage or buleau



Laryngology and Tracheostomy

Laryngology and Tracheostomy

T-Tubes

Tracheal T-Tube (TM)

The Tracheal T-Tube makes possible the maintenance of an adequate calibre in the airway. It can act as a support for the tracheal wall in the stenosis treatment.

The external branch of the Tracheal T-Tubes prevents displacement and permits the aspiration of bronchial secretions. Both internal branches must be suctioned.

The external branch must remain permanently closed, with the lid provided for that purpose.

It is used in:

- Tracheal stenosis.
- Subglottal stenosis.
- Laryngotracheal stenosis.
- After a tracheal resection and a termino-terminal anastomosis.
- Tracheal reconstruction.
- Larynx or trachea trauma.
- Conventional tracheal cannula substitution.

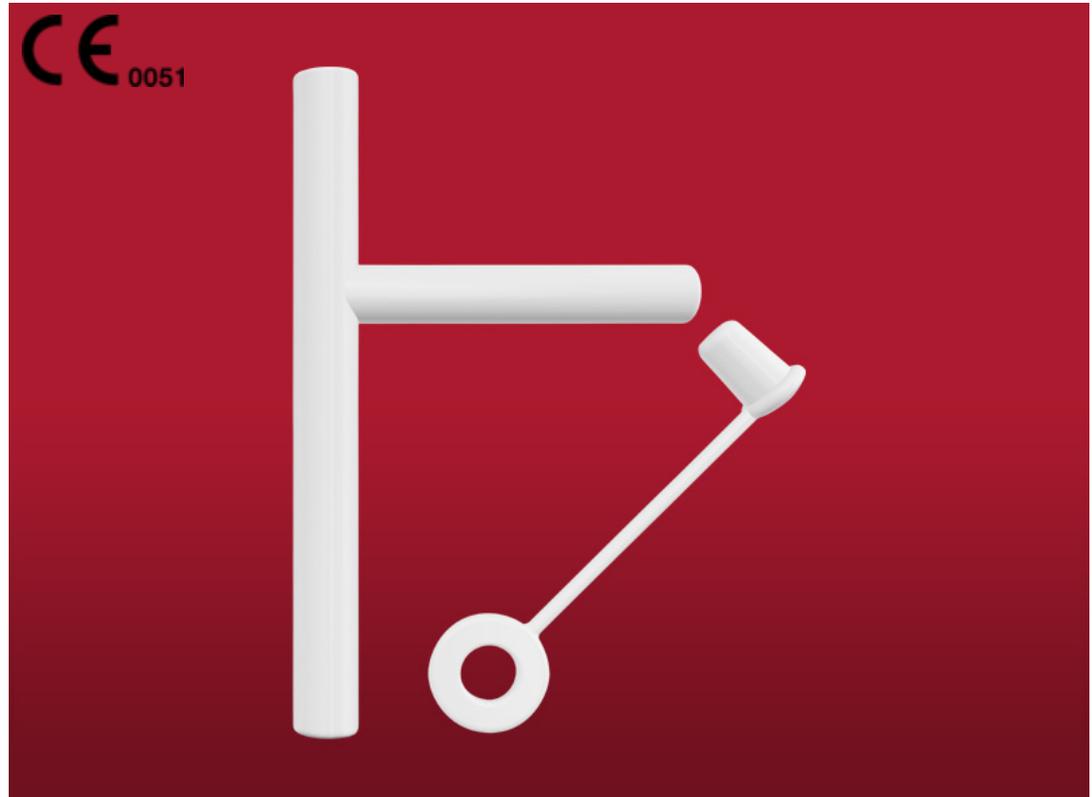


Long Tracheal T-Tube (TML)

The large t-tube has a distal branch of greater length. This variant makes it possible to treat localized conditions in the intrathoracic portion of the trachea.

It is used in:

- Distal, precarinal and tracheal injuries.
- Tracheal stenosis.
- Subglottal stenosis.
- Laryngotracheal stenosis.
- After a tracheal resection and a termino-terminal anastomosis.
- Tracheal reconstruction.
- Larynx or trachea trauma.
- Conventional tracheal cannula substitution.



Angular Paediatric Tracheal T-Tube (TMPA)

The paediatric tracheal tube has an external branch at an angle of 70 ° and fixation ring.

It is used in:

- Tracheal stenosis.
- Laryngeal stenosis.
- Laryngotracheal injury.
- Segmental tracheal resection.
- Support in tracheal reconstruction.



Laryngology and Tracheostomy

Cannulas

Tracheostomy Tutor (TU)

The Tracheostomy Tutor allows a secondary access to the airway.

It replaces the conventional tracheal cannula providing comfort, reducing the production of secretions and facilitating phonation.

Maintains the tracheostomy orifice permeable until its definitive closure is decided.

The tutor is fixed in the osteoma of the anterior tracheal wall and in the planes of the neck. Its introduction into the tracheal clearance is minimal.

The ring of the outer branch keeps it in the desired position.

Its external branch must be included permanently, so that the entrance of warm and humid air by the upper airway is possible.

It is used in:

- After removing a cannula or a t-tube, to avoid a definitive closure of the osteoma.
- Preserve the tracheostomy hole.



Laryngology and Tracheostomy

Others

Pharyngeal Tube (TF)

It is made out of flexible silicone and is useful in a wide range of situations.

Its apical end is progressively enlarged, in this way the anterior edge maintains contact with the base of the tongue, while the posterior one rests on the pharyngeal wall. In that way, the saliva is stored in the oropharynx leading to oesophagus, preventing the maceration of the tissues and avoiding the aspiration of the saliva towards the airway.

It is used in:

- Secondary fistulas to laryngectomy, radiotherapy, neoplastic conditions, caustic ingestion
- Orcutaneous or pharyngocutaneous, traumatic fistula
- Head and neck oncological surgery
- Oesophageal stenosis
- Oesophagus carcinoma



Laryngeal Stent (LP-LM-LG)

The Laryngeal stent is a silicone prosthesis that copies the reliefs of the endolarynx.

This flexible mould is an alternative to support the laryngeal skeleton in situations of organ trauma or after the reconstruction surgery. It has a very smooth surface and blunt edges that reduce traumatism on the mucosa. Its flexibility favours the tolerance and the solid conformation prevents its collapse and deformation.

The Stening® Laryngeal Stent is radiopaque and it is accompanied by two curved silicone discs that help on its external fixation.

It is used in:

- Laryngeal stenosis.
- Surgical reconstruction.
- Partial laryngectomies.
- Severe burns.



Thank you for your attention

For more information visit:

www.stening.es