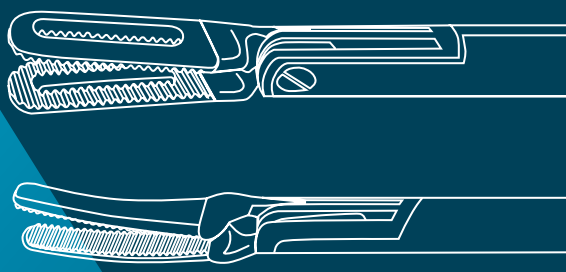
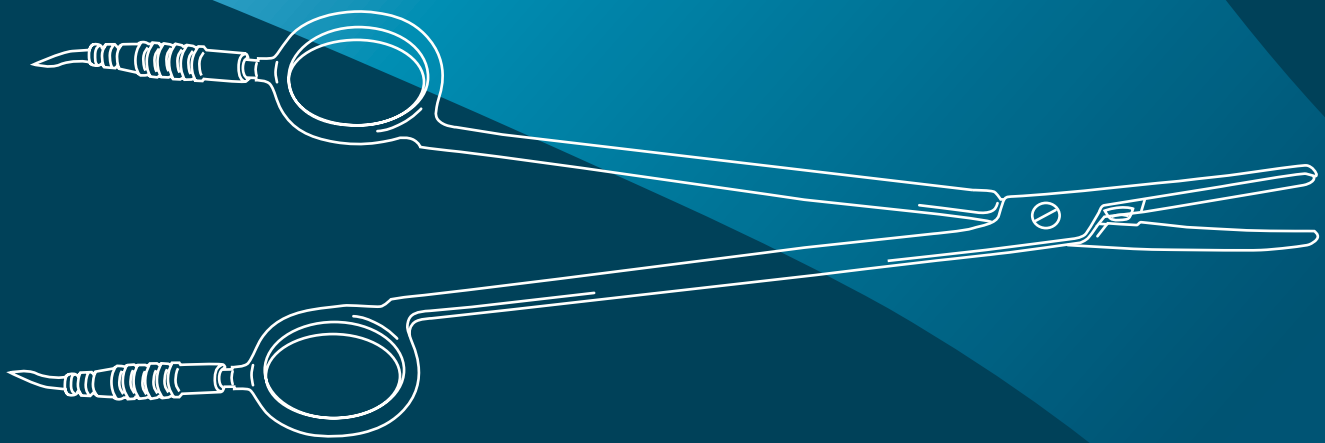
May 2015



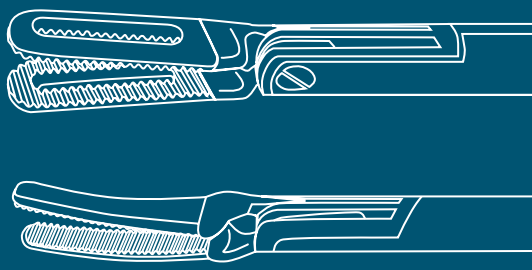


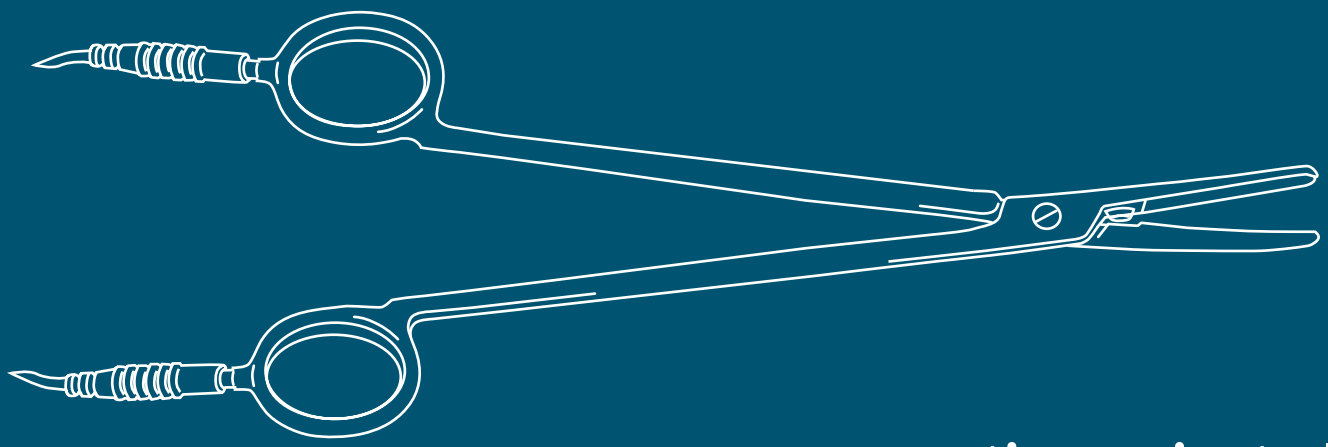
ThermoStapler®

Electrosurgical vessel sealing system

emed

confidence in performance





time oriented performance

The everyday practice of using the **ThermoStapler®** system in the operating room setting indicates that it allows to reduce the time of the performed procedures

time oriented performance

“Medicine usually requires the art of timing.”
Ovid

The **ThermoStapler®** vessel sealing system enables permanent sealing of large blood vessels and tissues during open and laparoscopic surgery. The **ThermoStapler®** system, designed by EMED, is an alternative to the traditional vessel sealing method using many ligatures and staplers. **ThermoStapler®** system is based on modern bipolar technique. It enables reliable vessel sealing and minimises the patient’s blood loss during the procedure.

As a result, less time for blood vessel sealing, less materials for surgical field drying and less blood units administered to the patient are required.

The everyday practice of using the **ThermoStapler®** system in the operating room setting indicates that it allows to reduce the time of the performed procedures.*

New generation of vessel sealing system **ThermoStapler® II** enables to achieve optimum sealing effect even faster.

* References:
„When using the **ThermoStapler®** system, 23 cm forceps for tissue and large vessel coagulation were used; in particular, long oncological procedures were shorter and less haemostatic pads were used.”
The references are from the Head of the Otolaryngology Department, Voivodship Specialist Hospital in Olsztyn, Bogdan Kibiłda, MD, Ph.D.

ThermoStapler® versus bipolar technique

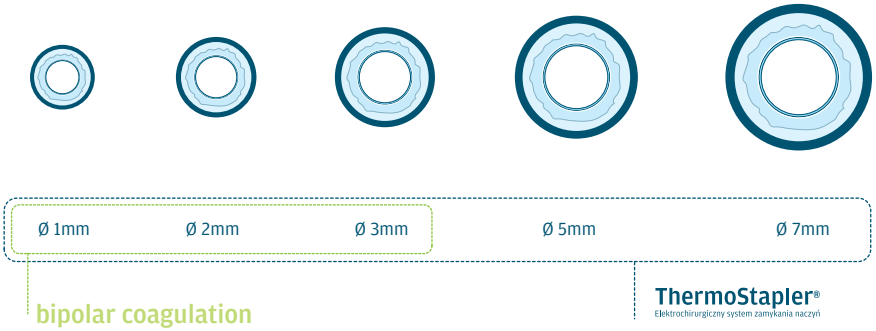
confidence through technology

Bipolar technique

While bipolar technique is being used, high frequency current flows between the two ends of the bipolar instrument and focuses solely on the small surface of tissue placed between them.

The risk of burns at sites distant from the surgical field is thus minimised. Therefore, bipolar techniques are considered safer than the monopolar modes.

Bipolar coagulation and ThermoStapler®—range of applications



ThermoStapler®

the idea behind

The combination of high temperature and mechanical pressure causes shrinkage of collagen tissue. Under the influence of high temperature, collagen changes its structure and becomes a very durable sealer. Vessels closed with the use of the **ThermoStapler®** system are capable of withholding significant blood pressure.

The efficiency of coagulation, and thus the safety of vessel sealing, is significantly affected by the condition of the used instrument. The sealing effect is proportional to tissue resistance. Any contamination or tissue residues on the surface of the active part of an instrument increase the resistance, and thus can significantly reduce the sealing effect with the same power setting. The best sealing effect is achieved when the instrument branches are cool and moist, and therefore it is recommended to wet the branches before use.

When using the ThermoStapler® system, the tissue heating area is smaller compared to standard bipolar coagulation. The risk of damage to the adjacent tissues is minimal. The tissue can be easily cut using surgical scissors. There is no risk of bleeding. The safety the closure using the ThermoStapler® system is comparable to the other mechanical methods.

The tissue parameters are continuously monitored during the sealing process. The system alerts the operator about achieving the optimal vessel occlusion or tissue sealing level, and automatically terminates the process. The vessel occlusion site is flexible. The ThermoStapler® system allows to close blood vessels with a diameter of up to 7 mm. However the oparator should assess the safety of the closure each time.

safety in **ThermoStapler®**

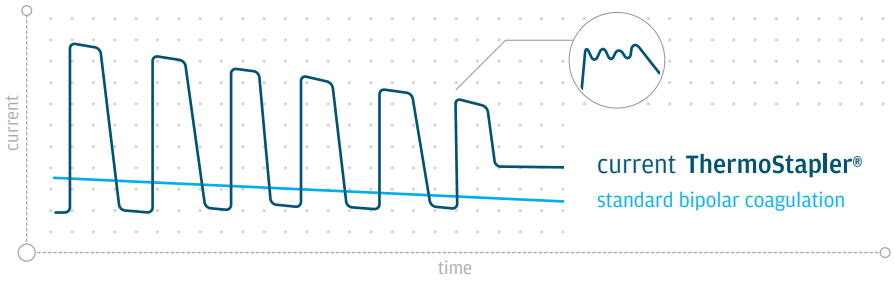
confidence through safety

Constant monitoring and the AutoStop function of the generator after sealing the vessel prevents tissue overheating, limits the damage to the tissue and significantly reduces the effect of tissue adhering to the tool.

To get through a successful operating procedure is always a matter of both—a medical team and instruments the surgeon can relay on. The rule is to pick out instruments in the same way as surgical team, by choosing those that ensure smooth running of any procedure and back-up in case of emergency.

One of the important elements of the vessel sealing procedure is controlling the tissue temperature. The electrical properties of the tissue are monitored by the generator on a constant basis. As a result of heat, water content in the tissue decreases and its conductivity capabilities are reduced. The tissue resistance increases.

The vessel sealing system is equipped with electrical circuits and an advanced microprocessor based on complex algorithms. This is why it is able to constantly monitor the administered current. The constant measurement of the tissue impedance causes the generator to administer current for as long as it is necessary to obtain a secure seal of the vessel. After that, the generator is automatically switched off.



The **ThermoStapler®** system operates based on especially modulated high frequency current which guarantees optimal sealing of the vessel with minimum destruction of the tissue.

A quick analysis of the nuances of current flow enables to assess the water level in the tissue.

*References:

„The use of the **ThermoStapler®** bipolar vessel sealing system in transvaginal hysterectomy", Malinowski Andrzej, Pawłowska Nela, Wojciechowski Michał, Ginekologia Polska, 2008 (12), p. 861.

features and advantages

setting performance goals

Time and cost reducing features of the **ThermoStapler®** system:

- integrated system: diathermy, argon coagulation and a vessel sealing module ensures cost reduction, there is no need to purchase any additional devices
- high reliability of the system ensures maximum safety of work
- time of operation is significantly reduced
- blood loss is significantly reduced, the system allows to economize on sutures and staplers
- natural sealing of vessels
- multiple-use device, no limits on the number of uses
- no foreign body remains in the patient's body
- no risk of adhesion or infection
- quick and safe operation
- regulating the intensity of the effect enables the surgeon to select the most appropriate type of operation

Basic advantages of the **ThermoStapler®** system:

- physical pressure onto the vessel with the use of a special bipolar instrument
- a generator administering high frequency and low voltage current which does not cause sparks during the sealing process
- constant monitoring of the tissue impedance during the process of sealing
- small area of thermal tissue lesions compared to standard monopolar and bipolar coagulation *
- microprocessor control ensuring the repeated coagulation effect
- automatic switch-off of the generator at the moment of achieving the optimal sealing of the vessel, confirmed with a sound signal
- the possibility to select the level of intensity of the effect lower intensity means higher precision and depth of the coagulation, higher intensity means quicker final effect
- the possibility to conect two different **ThermoStapler®** instruments or to combine the vessel sealing technique with a traditional bipolar technique

*References:

„Comparison of lateral thermal spread using monopolar and bipolar diathermy and the bipolar vessel sealing system ThermoStapler® during thyroidectomy" Jan Brzeziński, Karolina Kałużna-Markowska, Maciej Naze, Grzegorz Strużyk, Marek Dedecjus. Polski Przegląd Chirurgiczny 2011, 83, 7, 649-657

applications

areas of **ThermoStapler®** application

ThermoStapler® is widely used for resections (partial or total) of tumours and organs. It allows a quick and effective sealing of whole bundles of vessels, which are then cut with surgical scissors. Removing a tumour, an organ or a part of it, is quick and bears no risk of haemorrhage. The operated area remains dry almost throughout the entire procedure.

General Surgery	Tools for open surgery	Laparoscopic tools
Thyroid resection	•	
Parotid gland resection	•	
Stomach resection (partial or total)	•	
Small intestine resection	•	
Colon resection	•	
Gallbladder resection	•	•
Liver resection	•	
Spleen resection	•	
Appendix resection	•	•
Whipple procedure	•	
Hartmann procedure	•	
Treating haemorrhoids	•	

Gynaecology	Tools for open surgery	Laparoscopic tools
Abdominal hysterectomy	• angled	
Vaginal hysterectomy	• angled	
LAVH	•	•
Resection of an ovary or fallopian tube	•	•

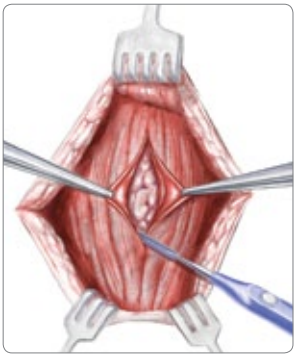
Urology		
Radical prostatectomy	•	•
Bladder resection	•	•
Kidney resection	•	•

Cardiosurgery		
Harvest of saphenous vein	•	

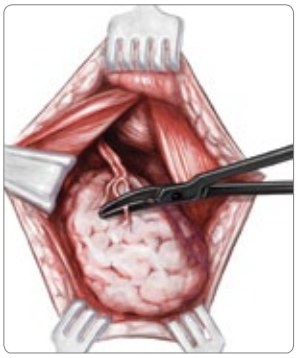
Thoracosurgery		
Resection of lung wedge	•	
Resection of lung segment	•	
Resection of lung lobe	•	

applications

strumectomy



Collar skin incision. Coagulation of subcutaneous blood vessels with the use of bipolar forceps. Separating the muscles in order to provide access to the thyroid gland. Application scope of the **ThermoStapler®** system for a strumectomy procedure.



Sealing thyroid vessels with the use of **ThermoStapler®**.

Cutting the vessels with the scissors.

Resection of the thyroid gland.

Application

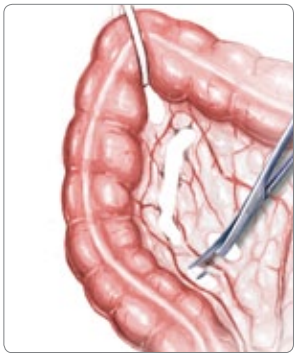
	605-039	Straight forceps, 160 mm, TIP C	Haemostasis of subcutaneous blood vessels	
	520-500	Standard blade, length 25 mm	Cutting muscles	
	801-116 801-16S	**ThermoStapler®** clamps, smooth, angled, length 16 cm	Sealing of blood vessels	

applications

procedures on the colon

Release of the ascending colon by closing and cutting blood vessels.

Closing the blood vessels using the **ThermoStapler®** instrument



While closing blood vessels, a distance of 2 cm from the colon membrane should be maintained.

Stomach resection.

Cutting sealed blood vessels with scissors.

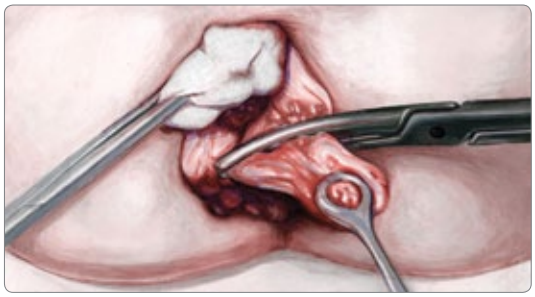
Application

	605-039	Straight forceps, 160 mm, TIP C	Haemostasis of subcutaneous blood vessels	
	520-500	Standard blade, length 25 mm	Cutting muscles	
	801-123 801-23S	**ThermoStapler®** clamps, smooth, angled, length 23 cm	Sealing of blood vessels	

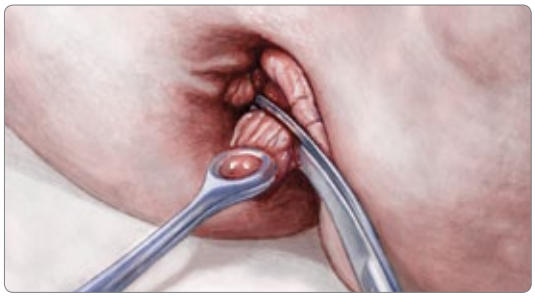
applications

haemorrhoidectomy

Grasping the haemorrhoid with the appropriate clamp.



Tighten the **ThermoStapler®** tool at the base of the haemorrhoid and activate the current flow.



After closing blood vessels, cut off the surplus mucus. In order to avoid damaging the rectum interior constrictor muscle, make sure not tocut off too large a piece of the mucous tissue.

Application

801-118
801-18S

ThermoStapler® clamps, smooth, angled, length 18 cm

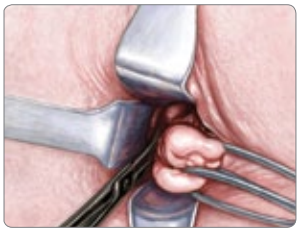
Sealing of blood vessels

applications

vaginal hysterectomy

The use of the **ThermoStapler®** bipolar vessel sealing system is an efficient and safe alternative to the classical trans-vaginal hysterectomy technique using surgical sutures.*

Incision of the vaginal mucosa.
Directing the uterus to the vagina
in order to expose the uterine ligaments.



Release of the uterine ligaments: subsequent tightening of the **ThermoStapler®** tool and closing tissue structures.
After ligating the vessels the closed area should be cut with surgical scissors.
The procedure should be repeated until the uterus is fully released.

Sewing up the uterus stump with a running suture.

The use of the **ThermoStapler®** bipolar vessel sealing system is an efficient and safe alternative to the classical trans-vaginal hysterectomy technique using surgical sutures.

*References:
„The use of the **ThermoStapler®** bipolar vessel sealing system in transvaginal hysterectomy", Malinowski Andrzej, Pawłowska Nela, Wojciechowski Michał, Ginekologia Polska, 2008 (12), p. 851-861.

Application

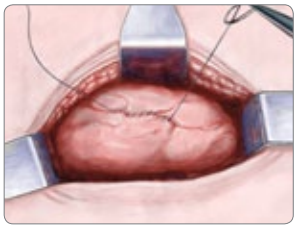
	605-039	Straight forceps, 160 mm, TIP C	Haemostasis of subcutaneous blood vessels	
	801-123 801-23S	**ThermoStapler®** clamps, smooth, angled, length 23 cm	Sealing of blood vessels	

applications

abdominal hysterectomy

Cutting the abdominal coat and exposing the uterus. Gradual release of the uterine ligament junctions: ligating tissue structures by subsequent clamping of the **ThermoStapler®** tool and application of current.

Cutting the ligated area with surgical scissors.



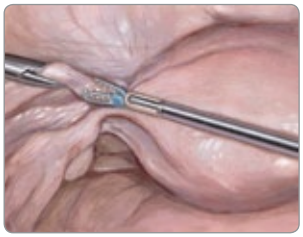
Removing tools, sewing up the vagina stump with a running suture.

Application

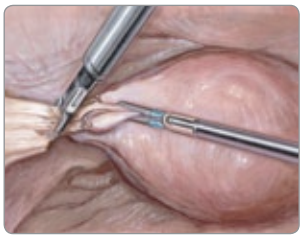
	605-039	Straight forceps, 160 mm, TIP C	Haemostasis of subcutaneous blood vessels	
	520-500	Standard blade, length 25 mm	Cutting muscles	
	801-123 801-23S	**ThermoStapler®** clamps, smooth, angled, length 23 cm	Sealing of blood vessels	

applications

laparoscopic hysterectomy



Sealing the round ligament, fallopian tube and ovarian ligament in purpose to dissect and separate the uterus.



Cutting the sealed area with electrosurgical scissors.

Application

	824-010	Laparoscopic insert, large grasping forceps, length 34 cm	Sealing of blood vessels	
	824-018	Laparoscopic insert, scissors curved, length 34 cm	Cutting the ligated area	

setting the stage

ThermoStapler® diathermies and instruments

100-620 Electrosurgical Unit atom

100-013 Electrosurgical Unit spectrum

100-008-T Electrosurgical Unit ES350
with argon and ThermoStapler®

ThermoStapler®

vessel sealing clmps, angled

	Ref. No.	length	CE max. 134°C STERILIZATION
	801-023	23 cm	ThermoStapler® - bipolar vessel sealing clamps, angled, with teeth
	801-116	16 cm	ThermoStapler® - bipolar vessel sealing clamps, angled, smooth
	801-118	18 cm	ThermoStapler® - bipolar vessel sealing clamps, angled, smooth
	801-123	23 cm	
	801-128	28 cm	

ThermoStapler®

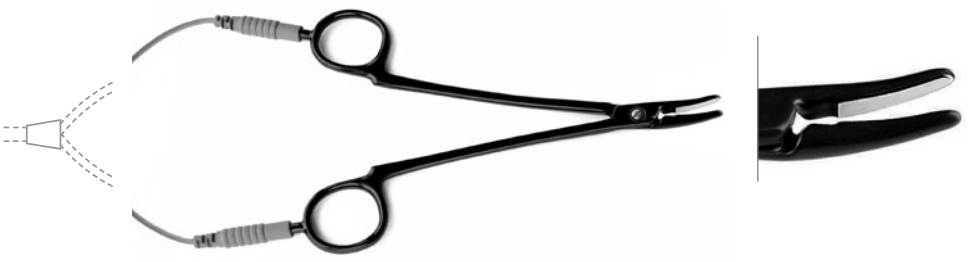
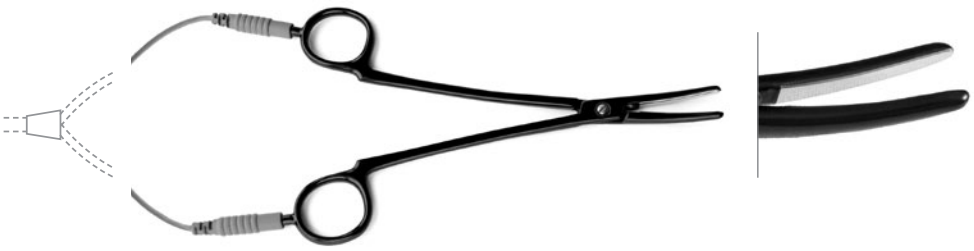
vessel sealing clmps, straight

	Ref. No.	length	CE max. 134°C STERILIZATION
	801-216	16 cm	ThermoStapler® - bipolar vessel sealing clamps, straight, smooth
	801-218	18 cm	ThermoStapler® - bipolar vessel sealing clamps, straight, smooth
	801-223	23 cm	
	801-228	28 cm	

	401-03S 401-05S	3 m 5 m	Bipolar cable 2x2,6mm, for ThermoStapler® clamps
			

ThermoStapler®

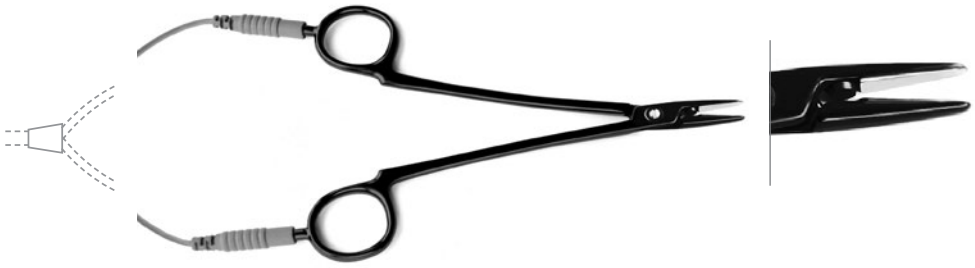
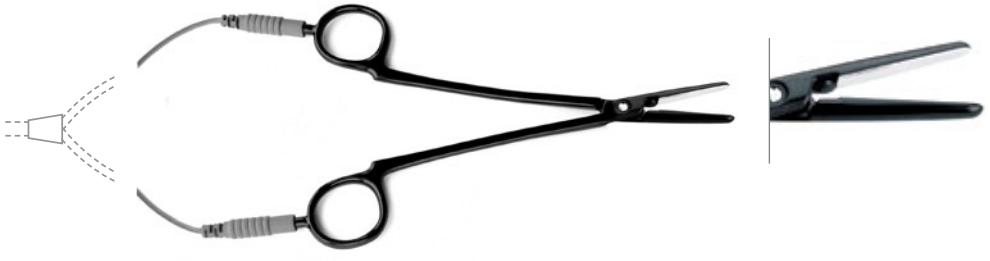
vessel sealing clmps, angled, SDS

SDS plug	Ref. No.	length	CE max. 134°C STERILIZATION
	801-16S	16 cm	ThermoStapler® - bipolar vessel sealing clamps, angled, smooth, with cable 3 m
			
	801-18S	18 cm	ThermoStapler® - bipolar vessel sealing clamps, angled, smooth, with cable 3 m
	801-23S	23 cm	ThermoStapler® - bipolar vessel sealing clamps, angled, smooth, with cable 3 m
	801-28S	28 cm	ThermoStapler® - bipolar vessel sealing clamps, angled, smooth, with cable 3 m
			

instruments with fixed cable

ThermoStapler®

vessel sealing clmps, straight, SDS

SDS plug	Ref. No.	length	CE max. 134°C STERILIZATION
	801-66S	16 cm	ThermoStapler® - bipolar vessel sealing clamps, straight, smooth, with cable 3 m
			
	801-68S	18 cm	ThermoStapler® - bipolar vessel sealing clamps, straight, smooth, with cable 3 m
	801-73S	23 cm	ThermoStapler® - bipolar vessel sealing clamps, straight, smooth, with cable 3 m
	801-78S	28 cm	ThermoStapler® - bipolar vessel sealing clamps, straight, smooth, with cable 3 m
			

instruments with fixed cable

ThermoStapler®

bipolar laparoscopic instruments

	Ref. No.	length	CE max. 134°C STERILIZATION
	824-13S		Handle for bipolar laparoscopic instrument, reusable, SDS plug, 3 m cable
	824-134	340 mm	Outer shaft, reusable, for bipolar laparoscopic instrument
	824-110	100 mm	
	824-519	100 mm	Insert: dissector Maryland, for bipolar laparoscopic instrument
	824-019	340 mm	

	Ref. No.	length	CE max. 134°C STERILIZATION
ThermoStapler® 	824-501	100 mm	Insert: grasping forceps, fenestrated, for bipolar laparoscopic instrument
	824-010	340 mm	Insert: grasping forceps, fenestrated, reusable, for bipolar laparoscopic instrument
ThermoStapler® 	824-030	340 mm	Insert: grasping forceps, toothed, large, reusable, for bipolar laparoscopic instrument
ThermoStapler® 	824-031	340 mm	Insert: dissector Maryland, wide, reusable, for bipolar laparoscopic instrument
	824-011	340 mm	Insert: forceps, delicate curved, reusable, for bipolar laparoscopic instrument
	824-014	340 mm	Insert: micro-grasper, fenestrated, reusable, for bipolar laparoscopic instrument
	824-015	340 mm	Insert: grasping forceps, fenestrated, curved, reusable, for bipolar laparoscopic instrument
	824-018	340 mm	Insert: scissors, curved, reusable, for bipolar laparoscopic instrument

Laparoscopic instruments for ThermoStapler®

Do not use bipolar scissors in bipolar cutting mode.

„ThermoStapler® bipolar vessel sealing system (EMED) proves to be a valuable alternative to traditional technique using surgical sutures, and an effective and safe method of achieving haemostasis during vaginal hysterectomy, resulting in significantly reduced need for pain medication during hospitalization."

The use of ThermoStapler® – bipolar vessel sealing system in vaginal hysterectomy

Malinowski Andrzej, Pawłowska Nela, Wojciechowski Michał
Klinika Ginekologii Operacyjnej i Endoskopowej Instytutu Centrum Zdrowia Matki Polki w Łodzi
Katedra Położnictwa i Ginekologii Operacyjnej Uniwersytetu Medycznego w Łodzi

„Ginekologia Polska" 2008, 79, 850-855

„The mean safe distance of the active tip of an electric device from important anatomic structures is 5 mm and depends on the device type and its power settings. Monopolar diathermy causes the strongest heating of surrounding tissues, and the ThermoStapler® bipolar vessel sealing system, despite producing the highest temperature during operation, causes relatively small thermal injury to the surrounding tissues."

Comparison of lateral thermal spread using monopolar and bipolar diathermy, and the bipolar vessel sealing system ThermoStapler® during thyroidectomy

Jan Brzeziński [1], Karolina Kałużna-Markowska [2], Maciej Naze [1], Grzegorz Stróżyk [1], Marek Dedecjusz [1]

[1] Department of General, Oncological and Endocrine Surgery Medical University in Łódź, Polish Mother Memorial Hospital - Research Institute

Kierownik: prof. dr hab. *J. Brzeziński*

[2] Laser Diagnostics and Therapy Centre of the Technical University in Łódź

Kierownik: dr n. med. *C. Peszyński-Drews*

„Polski Przegląd Chirurgiczny" 2011, 83, 7, 649-657

„The operative time was significantly shorter (average 18 minutes) in the second group of patients (operated with ThermoStapler®). We also recorded a statistically significant decrease in the incidence of complications in the group operated with ThermoStapler®. (...)

Use of bipolar vessel sealing system in a decisive manner shortens the duration of operation. Use of bipolar vessel sealing system also enables a radical reduction in the incidence of complications rate such as bleeding, recurrent laryngeal nerve paralysis, symptoms of hypoparathyroidism, and wound infection. In the future, similar studies should be performed to assess the real costs resulting from the use ThermoStapler®."

Usefulness of electrosurgical techniques in thyroid gland surgery.

Bartosz W. Kowalski [1, 2], *Jacek Bierca* [2], *Jan Zmora* [2], *Małgorzata Kołodziejczak* [2], *Anna Kosim* [2], *Mariusz Frączek* [1]

[1] Department of General and Gastroenterological Surgery, Voivodship Hospital of Traumatological Surgery in Warsaw

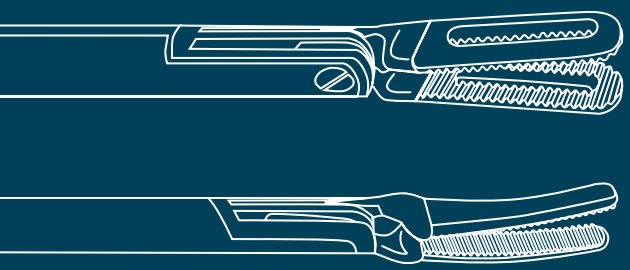
Kierownik: dr hab. med. *M. Frączek*

[2] Department of General and Proctological Surgery, Solec Hospital in Warsaw

Kierownik: dr n. med. *J. Bierca*

„Polski Przegląd Chirurgiczny" 2012, 84, 5, 225-229

www.emed.pl



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