

AUG 22 2012

**510(k) Summary of Safety and Effectiveness**

**Company** Ethicon Endo-Surgery, LLC  
475 Calle C  
Guaynabo, PR 00969

**Contact** Marcia Arentz  
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**Date Prepared:** May 24, 2012

**Device Name:**

Trade Name: HARMONIC ACE® Shears + Adaptive Tissue Technology  
Common Name: Instrument, Ultrasonic Surgical

**Classification Name:**

Instrument, Ultrasonic Surgical (Unassigned, Product Code LFL)

**Predicate Devices:**

K120729: HARMONIC ACE® Shears + Adaptive Tissue Technology  
K050885: SonoSurg Short Curved Scissors 5 mm O.D., HF Series, Pistol and Inline Grip submitted as part of the Olympus Ultrasonic Surgical System SonoSurg  
K060245: HARMONIC Scalpel 5 mm Instruments by Ethicon Endo-Surgery

**Device Description:**

The Ethicon Endo-Surgery HARMONIC ACE® Shears + Adaptive Tissue Technology are used for coagulation and mechanical transection of soft tissue during laparoscopic and open procedures. The devices allow the surgeon to grasp, coagulate, and transect soft tissue with a single instrument. The devices are hand-actuated with a shaft and tissue effector that can be rotated. The energy delivery can be activated with hand activation or with an optional generator foot switch.

**Indications for Use Statement:**

The HARMONIC ACE® Shears + Adaptive Tissue Technology are indicated for soft tissue incisions when bleeding control and minimal thermal injury are desired. The instruments can be used as an adjunct to or substitute for electrosurgery, lasers and steel scalpels in general, plastic, pediatric, gynecologic, urologic, thoracic, exposure to orthopedic structures (such as spine and joint space) and other open and endoscopic procedures.

**Technological Characteristics:** Both the Ethicon Endo-Surgery HARMONIC ACE® Shears + Adaptive Tissue Technology and the predicate devices operate using ultrasonic technology to cut and coagulate soft tissues. The Ethicon Endo-Surgery HARMONIC ACE® Shears + Adaptive Tissue Technology incorporate an ergonomic handle and tapered blade geometry. The instruments have a coated ultrasonic blade and an EEPROM memory chip that stores device identification, usage tracking, and operating parameters for use by the Generator G11 that provides power for the HARMONIC ACE® Shears + Adaptive Tissue Technology.

Adaptive Tissue Technology refers to the power output algorithm that is utilized by the devices. During use the Adaptive Tissue Technology algorithm parameters stored on the device EEPROM are read by the generator and used to reduce the power (current) to the instrument and provide a secondary, higher pitched generator activation tone when there is little or no tissue between the instrument blade and tissue pads. To do this the generator monitors the frequency of the instrument blade and determines when there is a change in the thermal condition of the blade during device activation. This thermal condition of the blade is compared to the values stored on the EEPROM to determine when this minimal tissue condition is present and the Adaptive Tissue Technology features are activated.

**Technological Comparison:**

Device Characteristic	HARMONIC ACE Shears + Adaptive Tissue Technology (subject devices)	SonoSurg Short Curved Scissors 5 mm O.D., (predicate K050885)	Ethicon Endo-surgery HARMONIC Scalpel 5 mm Instruments (predicate K060245)
Technology	Ultrasonic	Ultrasonic	Ultrasonic
Procedures	Open and laparoscopic	Open and laparoscopic	Open and laparoscopic
Patient Use	Single Use	Reusable	Single Use
Sterilization Method	Ethylene Oxide sterilized (provided sterile to customer)	Steam (autoclave by end user)	Ethylene Oxide sterilized (provided sterile to customer)
SAL	10 <sup>-6</sup>	n/a	10 <sup>-6</sup>
Shaft Diameter	5.5 mm	5.5 mm	5.5 mm
Shaft Length	23 & 36 cm	19 cm	32 cm
Blade Frequency	55.5 kHz	47 kHz	55.5 kHz
Maximum Blade Amplitude (MAX Power Level)	91.2 microns (HAR36) 85.9 microns (HAR23)	81 microns	100 microns
Blade Shape	Curved	Curved	Curved
Energy Activation Method	Foot or Hand Switch	Footswitch	Foot or Hand Switch
Seals vessels up to diameter of	5 mm	5 mm	3 mm

**Performance Data:** Bench testing and laboratory evaluations of thoracic procedures in an animal model including acute and 30-day chronic survival studies were conducted to demonstrate that the HARMONIC ACE® Shears + Adaptive Tissue Technology perform as intended.

**Conclusion:** The results of the bench top and animal model testing demonstrate that the HARMONIC ACE® Shears + Adaptive Tissue Technology are as safe and as effective as the predicate device in cutting and coagulating soft tissue and sealing vessels up to 5 mm in diameter, as measured in situ, in thoracic surgical procedures. This testing supports the substantial equivalence of the HARMONIC ACE® Shears + Adaptive Tissue Technology to the legally marketed predicate device.



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration  
10903 New Hampshire Avenue  
Document Control Room - W066-G609  
Silver Spring, MD 20993-0002

Ethicon Endo-Surgery, LLC  
% Ethicon Endo-Surgery, Incorporated  
Ms. Marcia Arentz  
Regulatory Affairs Portfolio Leader  
4545 Creek Road  
Cincinnati, Ohio 45242

AUG 22 2012

Re: K121550

Trade/Device Name: HARMONIC ACE<sup>®</sup> Shears + Adaptive Technology

Regulatory Class: Unclassified

Product Code: LFL

Dated: July 18, 2012

Received: July 19, 2012

Dear Ms. Arentz:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

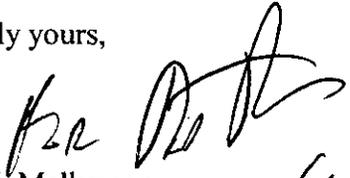
Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Part 801); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); good manufacturing practice requirements as set

device-related adverse events) (21 CFR 803); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801), please go to <http://www.fda.gov/AboutFDA/CentersOffices/CDRH/CDRHOffices/ucm115809.htm> for the Center for Devices and Radiological Health's (CDRH's) Office of Compliance. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to <http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm> for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address <http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm>.

Sincerely yours,

  
Mark N. Melkerson  
Director  
Division of Surgical, Orthopedic  
and Restorative Devices  
Office of Device Evaluation  
Center for Devices and  
Radiological Health

Enclosure

**Indications for Use**

510(k) Number (if known): K121550

Device Name: HARMONIC ACE® Shears + Adaptive Tissue Technology

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Prescription Use  X   
(Part 21 CFR 801 Subpart D)

AND/OR

Over-The-Counter Use \_\_\_\_\_  
(21 CFR 801 Subpart C)

(PLEASE DO NOT WRITE BELOW THIS LINE - CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of CDRH, Office of Device Evaluation (ODE)

Neil R. P. Ogden  
(Division Sign-Off)  
Division of Surgical, Orthopedic,  
and Restorative Devices

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