February 15, 2023

LightScalpel Inc
David Walters
Chief Operating Officer
11818 North Creek Parkway N
Suite 100
Bothell, Washington 98011

Re: K213669
Trade/Device Name: Lightscalpel Ls-4020
Regulation Number: 21 CFR 878.4810
Regulation Name: Laser Surgical Instrument For Use In General And Plastic Surgery And In Dermatology
Regulatory Class: Class II
Product Code: GEX
Dated: November 1, 2022
Received: November 18, 2022

Dear David Walters:

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. Although this letter refers to your product as a device, please be aware that some cleared products may instead be combination products. The 510(k) Premarket Notification Database located at https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm identifies combination product submissions. 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) for devices or postmarketing safety reporting (21 CFR 4, Subpart B) for combination products (see https://www.fda.gov/combination-products/guidance-regulatory-information/postmarketing-safety-reporting-combination-products); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820) for devices or current good manufacturing practices (21 CFR 4, Subpart A) for combination products; and, if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

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 https://www.fda.gov/medical-devices/medical-device-safety/medical-device-reporting-mdr-how-report-medical-device-problems.

For comprehensive regulatory information about medical devices and radiation-emitting products, including information about labeling regulations, please see Device Advice (https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance) and CDRH Learn (https://www.fda.gov/training-and-continuing-education/cdrh-learn). Additionally, you may contact the Division of Industry and Consumer Education (DICE) to ask a question about a specific regulatory topic. See the DICE website (https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance/contact-us-division-industry-and-consumer-education-dice) for more information or contact DICE by email (DICE@fda.hhs.gov) or phone (1-800-638-2041 or 301-796-7100).

Sincerely,

Jianting Wang -S

Jianting Wang
Acting Assistant Director
DHT4A: Division of General Surgery Devices
OHT4: Office of Surgical
and Infection Control Devices
Office of Product Evaluation and Quality
Center for Devices and Radiological Health

Enclosure

Indications for Use

Form Approved: OMB No. 0910-0120
Expiration Date: 06/30/2023
See PRA Statement below.

510(k) Number *(if known)*
K213669

Device Name
LightScalpel® LS-4020 CO2 Laser System_

Indications for Use *(Describe)*

The LightScalpel LS-4020 CO2 Laser Systems are intended for use in laser surgery procedures for incision, excision, vaporization, ablation, and/or coagulation of soft tissue in specialties such as: general surgery, dermatology, gynecology, dentistry and oral surgery, otorhinolaryngology, plastic and reconstructive surgery, orthopedic surgery, neurosurgery, podiatry, and urology.

Gynecology / Genitourinary:
Incision, excision, ablation, and/or vaporization of soft tissue for treatment of: Conization of the cervix, including cervical intraepithelial neoplasia and vulvar and vaginal intraepithelial neoplasia; Condyloma, including cervical, genital, vulvar, perineal, and Bowenoid papulosa; leukoplakia (vulvar dystrophies); incision and drainage of Bartholin's and nabothian cysts; herpes vaporization; urethral caruncle vaporization; cervical dysplasia; benign and malignant tumors; hemangiomas; benign and malignant lesions of external genitalia; condyloma; phimosis; erythroplasia.

Dermatology / Plastic Surgery:
Incision, Excision, Ablation, and Vaporization of soft tissue for performance of or treatment of: laser skin resurfacing; laser dermabrasion; laser burn debridement; wrinkles, rhytids, and furrows; keratosis, including actinic and seborrheic keratosis, seborrhoecae vulgares, seborrheci wart, and verruca seborrheica; vermillionectomy of the lip; cutaneous horns; solar/actinic elastosis; cheilitis, including actinic cheilitis; lentigines, including lentigo maligna or Hutchinson's malignant freckle; Uneven pigmentation/dyschromia; acne scars; surgical scars; keloids, including acne keloidalis nuchae; hemangiomas, including Buccal, port wine, and pyogenic granulomas/granuloma, pyogenicum/granuloma telagiectaticum; tattoos; telangiectasias; removal of small skin tumors, including periungual (Koenen) and subungual fibromas; superficial pigmented lesions; adenosebaceous hypertrophy or sebaceous hyperplasia; rhinophyma reduction; cutaneous papilloma (skin tags); milia; debridement of eczematous or infected skin; basal & squamous cell carcinoma, including keratoacanthomas, Bowen's disease (Erythroplasia of Queyrat), and Bowenoid Papulosis (BP) lesions; nevi, including spider, epidermal, and protruding; neurofibromas; laser de-epithelialization; tricoepitheliomas; xanthelasma palpebrarum; syringoma; complete or partial nail matrixectomy; benign/malignant vascular/avascular skin lesions; Mohs surgery; lipectomy; verrucae and seborrhoecae vulgares, including: paronychial, periungal, and subungual warts; blepharoplasty; and hair transplantation site preparation.

Dental Surgery:
Gingivectomy – Removal of hyperplasias; gingivoplasty; papillectomy; vestibuloplasty; epulis; sulcular debridement; removal of soft tissue, cysts, and fibroma (non-malignant tumor, mucosa, tongue); extraction site hemostasis; treatment of ulcerous lesions, including aphthous ulcers; a heat source to activate tooth bleaching materials; Laser Assisted New Attachment Procedure (cementum-mediated periodontal ligament new attachment to the root surface in the absence of long junctional epithelium).

Oral Surgery:
Frenum release/frenectomy; abscess (drainage); flap surgery; biopsy (incisional & excisional); aphthous ulcers (incision & excision); excision & ablation of lesions, benign & malignant lesions, oral cavity tumors, and hemangiomas; salivary gland pathologies; preprosthetic gum preparation, leukoplakia; partial glossectomy; periodontal gum resection; homeostasis; operculectomy; crown lengthening (soft tissue); incision of infection when used with antibiotic therapy; extraction site hemostasis.

General and Thoracic Surgery:
Incision, excision, and vaporization of soft tissue in general and thoracic surgery, including endoscopic and open procedures for: debridement of decubitus ulcers, stasis, diabetic, and other ulcers; mastectomy; debridement of burns; rectal and anal hemorrhoidectomy; breast biopsy, reduction mammoplasty; cytoreduction for metastatic disease, laparotomy and laparoscopic applications; mediastinal and thoracic lesions and abnormalities; skin tag vaporization; atheroma; cysts, including sebaceous and pilar cysts, and mucous cysts of the lips; pilonidal cyst removal and repair; abscesses; other soft tissue applications.

Gyn Laparoscopic Surgery:
Laser incision, excision, vaporization, and photocoagulation of soft tissue for treatment of: endometrial lesions, including ablation for endometriosis; excision/lysis of adhesions; salpingotomy; oophorectomy/ovariectomy; fimbrioplasty; metroplasty; uterine myomas and fibroids; ovarian fibromas and follicle cysts; uterosacral ligament ablation; hysterectomy.

Otorhinolaryngology / ENT:
Laser incision, excision, ablation, vaporization, and / or photocoagulation of soft tissue in otorhinolaryngology for treatment of: leukoplakia, including oral, larynx, uvula, palatal, and upper lateral pharyngeal tissue; adult and juvenile papillomatosis polyps; lymphangioma removal; removal of recurrent papillomas in the oral cavity, nasal cavity, larynx, pharynx, and trachea, including the uvula, palatal, upper lateral pharyngeal tissue, tongue, and vocal cords; stenosis, including subglottic stenosis; tonsillectomy (including tonsillar cryptolysis and neoplasma) and tonsil ablation / tonsillotomy; benign and malignant tumors and fibromas (oral); superficial lesions of the ear, including chondrodermatitis nondularis chronica helices / Winkler's disease; uvulopalatoplasty (LAUP, laser UPPP); turbinectomy and turbinate reduction / ablation; septal spur ablation/reduction and septoplasty; partial glossectomy; tumor resection of oral, subfacial, and neck tissues; rhinophyma; verrucae vulgares (warts); gingivoplasty / gingivectomy

Podiatry:
Laser excision, ablation, and /or vaporization of soft tissue in podiatry for the reduction, removal and/or treatment of: Verrucae vulgares / plantar warts, including paronychial, periungual, and subungual warts; fungal nail treatment; matrixectomy – partial and complete; porokeratoma ablation; neuromas/fibromas, including Morton's neuroma removal; ingrown toenail treatment; debridement of ulcers; treatment of other soft tissue lesions.

Orthopedic Surgery:
Laser incision / excision, ablation, and /or vaporization of soft tissue in orthopedic surgery. Applications include: meniscectomy; chondromalacia ablation; chondroplasty; ligament release (lateral and other); excision of plica; partial synovectomy; debridement of traumatic wounds; debridement of decubitus & diabetic ulcers; and PMMA removal.

Neurosurgery:
Laser incision / excision, ablation, and /or vaporization of soft tissue in neurosurgery for the treatment of: posterior fossa tumors; peripheral neurectomy; benign and malignant tumors and cysts (e.g. gliomas, meningiomas (including basal tumors), acoustic neuromas, lipomas, and large tumors); arteriovenous malformation; and pituitary gland tumors (transphenoidal approach).

Type of Use *(Select one or both, as applicable)*

☒ Prescription Use (Part 21 CFR 801 Subpart D) ☐ Over-The-Counter Use (21 CFR 801 Subpart C)

CONTINUE ON A SEPARATE PAGE IF NEEDED.

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LightScalpel® Inc
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PH: 425-368-1588 FAX: 425-368-1568

510(k) Summary

K213669

510(k) Summary Preparation Date: 23 January 2023

1. 510(K) Owner:
   LightScalpel® Inc.
   11818 North Creek Pkwy N Suite 100
   Bothell, WA 98011
   866-697-7548 / 425-368-1588 / 425-368-1568 (FAX)

2. 510(k) Contact:
   David Walters
   Chief Operating Officer
   11818 North Creek Pkwy N Suite 100
   Bothell, WA 98011
   866-697-7548 / 425-368-1588 / 425-368-1568 (FAX)
   dwalters@lightscalpel.com

3. Device Trade Name: LightScalpel® LS-4020

   Common Name: CO_2 Laser System

   Classification Name: Laser surgical instrument for use in general and plastic surgery and in dermatology (21 CFR 878.4810).

   "A carbon dioxide laser for use in general surgery and in dermatology is a laser device intended to cut, destroy, or remove tissue by light energy emitted by carbon dioxide."

   Classification: Class II

   Product Code: GEX

4. Predicate Device(s):

   4.1. LightScalpel LS-1005 / LS-2010 CO_2 Laser Systems; K141658

   4.2. Lumenis Ultrapulse™; K151331

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5. Device Description and Function

The LightScalpel LS-4020 laser system, similar to the previously released LS-1005 and LS-2010 laser systems are mobile platforms that utilizes a radio frequency (RF) excited carbon dioxide (CO_2) laser tube to produce an infrared beam at a nominal 10.6 µm wavelength at powers adjustable from 2 - 40 Watts Continuous Wave (CW) and 2 to 20 Watts SuperPulse (SP). The systems differ only in the laser tubes used and pre-programmed values in the controlling software, which allow higher laser tube outputs for the LS-2010 and LS-4020 systems.

The models of the LS family CO_2 Laser systems are based on the size and/or quantity of the laser tube installed. The original LS-1005 model cleared on K123037 and K132661 utilizes a shorter (thus lower output) laser tube. The LS-1005 and LS-2010 models cleared on K141568 utilize a standard length all aluminum laser tube. The new LS-4020 utilizes two standard length tubes.

Laser energy is conducted to the point of application by a flexible fiber waveguide and handpiece assembly. Laser system operation is controlled by operator input on a touchscreen display panel. The RF laser drive is modulated to provide additional pulsed and SuperPulse emission modes selected from the laser system control panel.

A “calibration port” on the side of the laser systems allows checking and setting the power emitted from the distal laser aperture to the internal power meter and serves as a check on fiber waveguide transmission efficiency. Laser system power, rates, and durations are adjustable as tabulated below:

The laser systems have safety features complying with requirements in 21 CFR 1040, Performance Standards for Light Emitting Products.

Primary safety features are as follows:
System On-Off Key switch, Emergency Stop Switch, Remote Interlock, Fiber Interlock, Beam Blocking Shutter, Internal Laser Power Detector, RF Power Monitor, and required Laser Safety Labels and Labeling.

Laser system physical characteristics are:
Delivery System: Flexible Fiber Waveguide; ~ 0.75mm ID.; Handpieces with internal focusing lens (“tipless”) and with disposable pre-sterilized ceramic tips.
Purge Gas: Internal air pump purge through the Fiber and Handpiece.
System Cooling: Air; two to four thermostatically controlled fans (depending on model) with over-temperature protection.
Mobility: 4 wheels and handgrip on console for convenient system positioning.

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6. Intended use(s) of the Device

The LightScalpel CO2 Laser Systems are intended for use in laser surgery procedures for incision, excision, vaporization, ablation, and/or coagulation of soft tissue in specialties such as: general surgery, dermatology, gynecology, dentistry and oral surgery, otorhinolaryngology, plastic and reconstructive surgery, orthopedic surgery, neurosurgery, podiatry, and urology.

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7. Technological Characteristics Comparison to Predicate Devices

The technological characteristics comparison to predicate devices is summarized in the following table.

Predicate 510(k)	**LS-4020 K213669**	**LS-1005 / LS-2010 K141658**	**Lumenis UltraPulse™ K151331**
Characteristic	--	--	--
Laser Medium	CO_2	CO_2	CO_2
Wavelength (µm)	10.6	10.6	10.6
Laser Drive Source	RF	RF	RF
Output Power (W)	2-40	2-10 / 2-20	1 - 60
Pulsed Power (W)	2-40	2-10 / 2-20	1 - 60
Gated PW (ms)	5-500	5-500	50 - 1000
Gated Rep. Rate (pps)	1 - 50	1 - 50	1 - 100
Superpulse (W)	2-20	2-5 / 2-10	1-20
Superpulse Peak (W)	100	50	240
Superpulse Pulse Duration	Up to 0.8 ms	Up to 0.8 ms	Up to 2 ms
Beam Delivery System	Flexible Fiber Waveguide	Flexible Fiber Waveguide	Articulated Arm or WG
System HxWxD (in)	40x15x15	40x15x15	57x14x20
System Weight (lb)	66	47	270
Mobility	4 Wheels & Handle	4 Wheels & Handle	4 Wheels & Handle
Intended Use	Incision, Excision, Vaporization, Ablation, and/or Coagulation of Soft Tissue	Incision, Excision, Vaporization, Ablation, and/or Coagulation of Soft Tissue	Incision, Excision, Vaporization, Ablation, and/or Coagulation of Soft Tissue
Line Voltage – Nom.	100-240 VAC	100-240 VAC	100-240 VAC

The LS4020 laser system is substantially equivalent to the predicate devices in emission wavelength, control parameters, relative output power, delivery accessories, and physical size.

8. Non-clinical performance data: Each LS-4020 laser system is tested for electrical safety and output characteristics. Representative data is presented in the Bench Testing section of this report.
9. Clinical performance data: None. Clinical testing was determined to be unnecessary, as the performance parameters are consistent with predicate CO_2 laser systems and technology.
10. In summary, the LightScalpel LS-4020 CO_2 laser systems are equivalent to the predicate laser systems for the indicated uses in the stated medical specialties.