Laser Stent – Graft Trimmer

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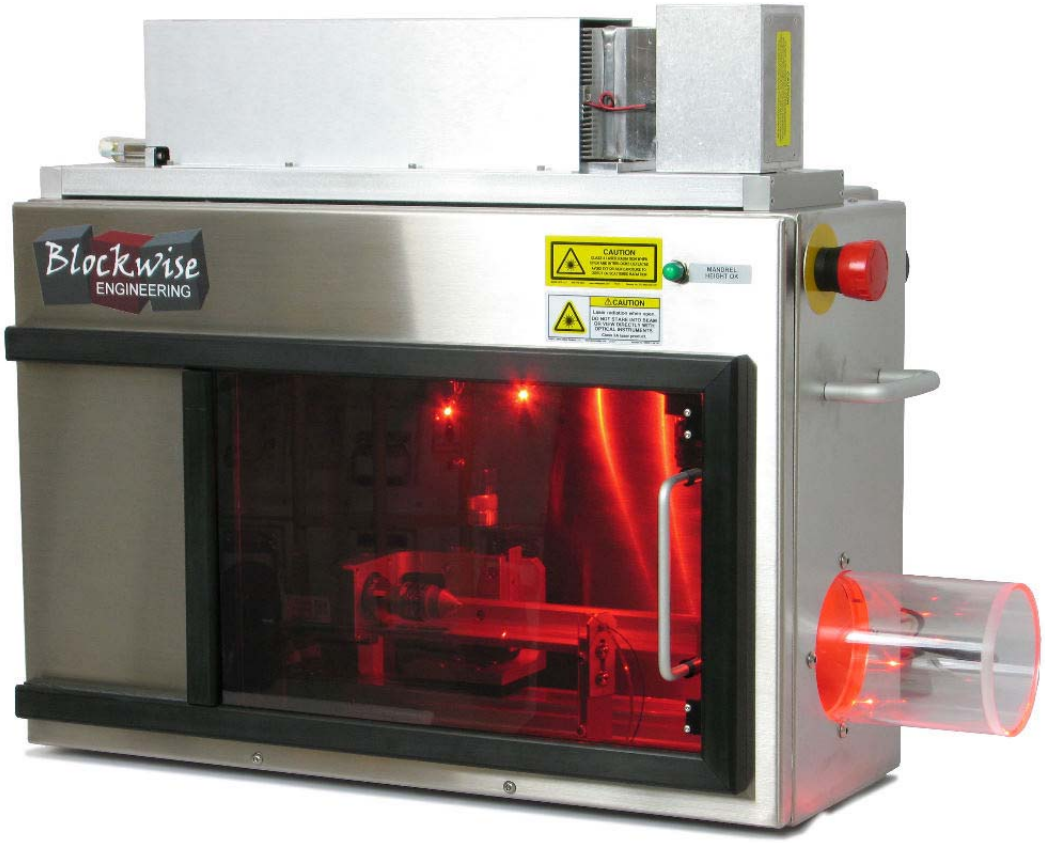
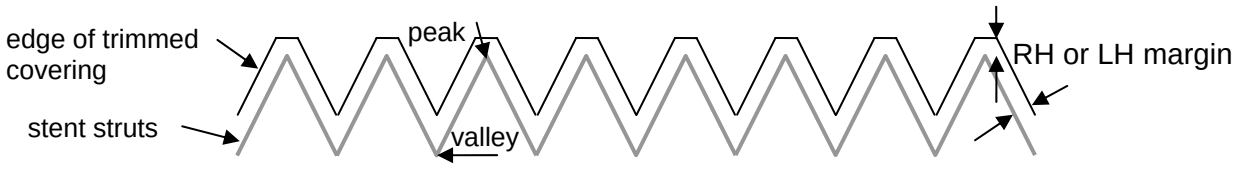
http://www.blockwise.com

The Blockwise Laser Trimmer is a vision-guided laser designed to trim polymer stent covering from covered stents. The vision system can located the peaks and valleys of the metal struts at the ends of a stent, and the ends can be trimmed with a straight circumferential cut or with a cut following the peaks and valleys. Circumferential slit cuts can also be made within the body of the stent.



This picture shows a flat, or unwrapped depiction of the end of a stent, showing how the margin parameter is used in “scallop” cut mode.



A few of the parameters contained in the parameter file are listed here:

- **no of peaks** This is the number of tips formed by the metal struts on the end of the stent (Not used in slitting modes.)
- **stent length (mm)** Length of the stent (metal tip to metal tip). This parameter is used to begin the search for the right tips of the stent.
- **diameter (mm)** This parameter is used to convert angular rotation to linear millimeters on the surface of the stent, to position the cuts with the correct margin, and is used in all modes to provide the correct cutting speed.

- **RH Peak/trough distance (mm)** Used to calculate the expected (search) position of the right-hand troughs relative to the right-hand tip search position.
- **LH Peak/trough distance (mm)** Used to calculate the expected (search) position of the left-hand troughs relative to the left-hand tip search position.
- **laser power (%)** Range is 0 to 100 % Controls the laser power by setting the duty cycle (on-time as a percentage of the period) of the PWM signal to the laser's "modulation" input. This parameter is used in all cut modes.
- **laser pulse density (pulse/mm)** Sets the number of laser pulses per linear mm along the cut. This parameter is used in all cut modes.
- **cut type** Set to "end trimming" or "circumferential slits to the control the type of cut to be performed.
- **cut speed (mm/sec)** Sets the linear speed of the stent under the laser during cutting. This parameter is used in all cut modes.
- **RH margin** This is the desired margin (mm) between the metal struts and the cut at the right end.
- **LH margin** This is the desired margin (mm) between the metal tips and the cut at the left end.
- **cut left side** Set to "straight" , "scalloped", or "none" This parameter specifies whether and how the left end of the stent is to be cut. (Not used in slitting modes.)
- **cut right side** Set to "straight", "scalloped", or "none". This parameter specifies whether and how the right end of the stent is to be cut. (Not used in slitting modes.)
- **RH exposure** An integer in the range 1 to 261, sets the exposure time of the camera for imaging the right end of the stent. For a given stent type, use the Test Display screen to find the setting that makes the area near the centerline of the stent pure white except for the struts, then enter the value into the parameter file for that stent type. (Used in all cutting modes.)
- **LH exposure** An integer in the range 1 to 261, sets the exposure time of the camera for imaging the left end of the stent. For a given stent type, use the Test Display screen to find the setting that makes the area near the centerline of the stent pure white except for the struts, then enter the value into the parameter file for that stent type. (Used in all cutting modes.)
- **log pictures** TRUE or FALSE If true, images of the stent prior to cutting are stored on the computer hard disk. (Used only in End Trimming modes.)

Specifications:

Maximum Stent Diameter:	44 mm
Maximum Stent Length:	145 mm
Laser type & power	CO2, powers up to 25W available
Camera-to-laser cutting accuracy	±0.2 mm
Linear Motion Accuracy	±0.1 mm
Rotary Motion Accuracy	±1°
Service Connections	120 VAC electric power, compressed air 5 to 7 bar, 2.5 inch ventilation hose
Laser Cabinet Dimensions	width 31", height 23", depth 19"
Software Language	National Instruments Labview