da Vinci® Cleaning Test Results

SurgiSonic® Dual Cleaning Method
Cleans both ends of a da Vinci® instrument at the same time

The No. 3315 SurgiScrub™ suction chamber
Patent Pending

Test 1. Cleaning da Vinci® instrument jaw and hinge area.
Test 2. Cleaning da Vinci® instrument shaft and control box.

The SurgiSonic® Machine was filled with 5 gallons of water and 5 ounces of SurgiSoak® Enzyme Concentrate, and heated between 100° to 120°F. Both tests were run concurrently as pictured above. Tests were conducted by Geddis, Incorporated.

No. 1211X SurgiSonic® Machine
80 Watts per Gallon
Transducer Frequency 62 kHz
Cycle 60 Hz

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Tosi®-Lumcheck is a registered trademark of Healthmark Industries.
SurgiSonic® and SurgiSoak® are registered trademarks of Geddis, Inc.
Basic Set Up: for test 1. and test 2. The SurgiSonic® 1211 X surgical instrument cleaning machine was fitted with the No.3200 SurgiScrub™ adaptor kit. The adaptor kit comes with three SurgiScrub™ suction chambers for cleaning the distal, jaw/pulley, end of the da Vinci® instrument that is attached to the left side of the machine, and male to male luer slip connectors that attach the proximal, shaft/control box, end of the da Vinci® to the regular suction chambers located on the right side of the machine. Both types of suction chambers are fitted with #3212 medium hole rubber nipples. Both ends of three da Vinci® robotic instruments can be cleaned at the same time in the SurgiSonic® using this dual hookup method.

Test 1. Cleaning results for the distal end of a da Vinci® robotic instrument.
The distal, jaw/pulley/hinge area of the da Vinci® robotic instrument was injected with ketchup; ketchup was used as the test medium because it is thick, hard to clean, and the fiber content would be visibly trapped in the SurgiSonic® No. 3112 filters. The entire distal, jaw/pulley/hinge, area of the da Vinci® robotic instrument was then inserted into the No. 3212, latex free, rubber nipple all the way into the No. 3315 SurgiScrub™ suction chamber. The four holes on the underside of the SurgiScrub™ suction chamber create a concentrated flushing action on the jaw/pulley/hinge area of the instrument. The test was run for 15 minutes. All of the ketchup appeared to be removed from the instrument in both the normal and fast cleaning speeds. A second test was performed using tomato juice on the jaw area of the instrument and a Tosi® Lumcheck test strip. Both were inserted into the No. 3320 suction chamber together. Both appeared to be cleaned within two minutes.
**Test 2.** Cleaning results for the proximal end of a da Vinci® robotic instrument.

The number 1 hole on the back of the control box of the da Vinci® instrument is connected to an open ended tube that runs to the seal located behind the jaw area of the instrument. Ketchup was used as a medium and injected into the number 1 hole of the control box to fill the shaft of the da Vinci® instrument. A No. 3200 male to male luer slip connector was connected to the number 2 hole of the da Vinci® control box. The other end of the male to male luer slip connector was inserted into the No. 3212 medium hole, latex free, rubber nipple attached to the No. 3312 standard suction chamber. Cleaning solution was suctioned into the control box and shaft. The solidified ketchup fiber was extracted and then trapped in a 70 micron filter. The test was run at both the normal cleaning cycle and fast cleaning cycle. The results were the same in both tests.

![No. 3200 male to male luer slip connector in #2 hole of control box.](image)

![No. 3312 suction chamber, with No. 3212 Nipple, connected to luer slip connector.](image)

![No. 3112 SurgiSonic® filter after test.](image)
No. 1211X SurgiSonic® Cleaning Machine Cleaning da Vinci® Surgical Instruments

The daVinci® robotic instruments have a tight seal between the jaw/pulley area and the shaft/control box area. The SurgiScrub® adaptor kit individually attaches each end of the da Vinci® robotic instrument to the SurgiSonic® 1211X instrument cleaning machine by using two different types of suction chambers. One that maximizes the flushing action needed to clean the distal, jaw/pulley, end of the instrument while the other suction chamber maximizing the suction power needed to clean the proximal, shaft/control box, end of the instrument. Each end of the instrument has its own individually dedicated suction chamber/filter/pump/and fluid return tube; which assures maximum cleaning power is applied equally to both areas on each side of the seal.

NOTE: The SurgiSonic® ultrasonic cleaning machine was designed to clean all types of tubular surgical instruments. Our patented technology combines suction with ultrasonic action to individually clean up to six regular tubular surgical instruments at the same time, or three da Vinci® robotic instruments.