

Performance Study for Proven Cleaning Efficacy and Efficiency of Endoscopes

DuoSwift™ Combination Squeegee Brush

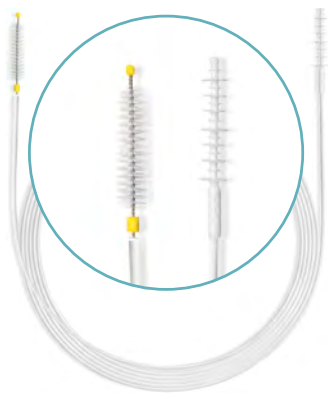


Background

Cleaning brushes are intended to be used during manual cleaning in the reprocessing and care of endoscopes. Following a procedure, it is necessary to remove biomaterial present in endoscope channels and on accessories prior to high-level disinfection or sterilization.

According to the SGNA Endoscope Reprocessing Protocol, manual cleaning is the most important step in removing the microbial burden from an endoscope.¹

According to ANSI/AAMI ST98:2022, the benchmark of $<6.4 \mu\text{g}/\text{cm}^2$ of protein should be achieved by routine manual cleaning of flexible endoscopes.²



Available Technologies

There are several manufacturers of endoscope cleaning brushes, but fundamentally most incorporate a nylon bristle to perform the cleaning action. **DuoSwift Combination Squeegee Brush from STERIS is a next-generation technology in manual cleaning** that utilizes both a bristle technology to loosen and squeegee to remove the biomaterial from the endoscope channel and is compatible with working channels from 2.8 to 7.0mm.

Study Objectives and Design

The objective of this study is to evaluate this next-generation technology offered in DuoSwift Combination Squeegee Brush against the available market-leading alternatives. This study is designed to follow endoscope manufacturer reprocessing instructions to simulate real-world conditions and practices in the most common endoscope working channel diameters. The following comparison products were evaluated in the study:

- Olympus® Channel Cleaning Brush (BW-412T)
- Pentax® Tri-Bristled Cleaning Brush (CS6021T)
- Boston Scientific® HedgeHog™ Dual-end Channel/Valve Brush (SBD-289-50)

Test Method

Testing was conducted using two (2) most common PTFE endoscope channel diameters, each soiled with a predefined amount of Artificial Test Soil (ATS2015) prepared with defibrinated sheep blood:

- Channel 1: 3.7mm diameter
- Channel 2: 4.2mm diameter

As defined by the manufacturer reprocessing instructions, the required number of passes through the channel were performed, followed by visual inspection of the brush and quantification of total residual protein ($\mu\text{g}/\text{cm}^2$). Three (3) replicates of each comparison product were tested to gather a statistically relevant sample size for analysis.

Positive controls were soiled with a specific amount of ATS, inspected visually, and quantified.

Negative controls were also conducted to measure the background levels of protein on the channels.

Test Results

Residual protein was compared to published industry benchmarks used to determine cleaning efficacy³.

According to ANSI/AAMI ST98:2022, the benchmark of <6.4 µg/cm² of protein should be achieved by routine manual cleaning of flexible endoscopes.²

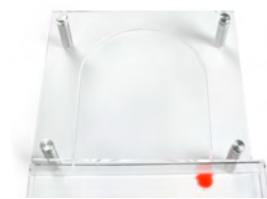
According to SGNA, manual cleaning is deemed complete when there is no longer debris visible on the brush.¹

Cleaning Brush	# of passes*	Visual	Residual protein (µg/cm ²)**	Residual protein (µg/cm ²)**	Brushing efficiency (% soil removal)
			3.7mm channel	4.2mm channel	
STERIS: DuoSwift Combination Squeegee Brush	1	Clean	1.4	0.5	99.79%
Olympus®: Combination Cleaning Brush	4	Soiled	60.3	451.3	46.79%
Pentax®: Tri-Bristled	4	Clean	4.8	1.9	98.85%
Boston Scientific®: Dual-End Channel	4	Soiled	245	237.2	72.05%

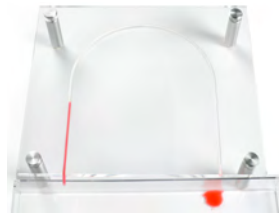
*Based on a specific number of brushing passes

**Industry benchmark for residual protein is <6.4 µg/cm²

- This study reports the STERIS DuoSwift Combination Squeegee Brush as having **superior brushing efficacy**, compared to the other brushes under evaluation, removing 99.79% of soil and consistently achieving the ANSI/AAMI ST98:2022 benchmark of 6.4 µg/cm².
- This study reports the STERIS DuoSwift Combination Squeegee Brush as having **superior brushing efficiency**, compared to the other brushes under evaluation, by achieving the ANSI/AAMI ST98:2022 benchmark of 6.4 µg/cm² in a single pass.
- Below is a visual representation of a typical result with STERIS DuoSwift Combination Squeegee Brush compared to the market-leading alternate:



STERIS DuoSwift Combination Squeegee Brush: Soil visibly removed from 3.7mm simulated channel after one (1) pass



Competitor Brush: Visible soil remains in 3.7mm simulated channel after one (1) pass

Conclusion

This study reports the **STERIS DuoSwift Combination Squeegee Brush as having superior brushing efficacy and superior brushing efficiency over the other technologies evaluated.** By achieving the ANSI/AAMI ST98:2022 threshold in a single pass, customers may consider this data as supporting evidence to adjust and streamline manual cleaning practices and policies. By contrast, using other brushing technologies there is less reliability to ensure the endoscope is clean even when following manufacturer's reprocessing instructions.

For more information about DuoSwift Combination Squeegee Brush, VISIT [STERIS.COM](https://www.steris.com) OR CONTACT YOUR LOCAL STERIS REPRESENTATIVE.

REFERENCES

¹SGNA Practice Committee. "Standards of Infection Control in Reprocessing of Flexible Gastrointestinal Endoscopes." Society of Gastroenterology Nurses and Associates(SGNA), 2016

²Association for the Advancement of Medical Instrumentation (AAMI). "ANSI/AAMI ST91:2015 Flexible and Semi-Rigid Endoscope Processing in Health Care Facilities." 2015

³STERIS Laboratory. Brushing Efficacy of Cleaning Brushes. October 2022