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PROPPER'S **VAPOR LINE®** STEAM STERILIZATION INTEGRATOR
A Performance Comparison Study

Frank E. Platko, Ph.D.
Director, Product Development
Propper Manufacturing Company, Inc.
Long Island City, New York 11101, U.S.A.

Propper's Vapor Line® Steam Sterilization Integrator

Product Description

The Vapor Line® Integrator is a physicochemical steam sterilization monitor which relies on the migration of a dark colored chemical melt along a paper wick to signal sterilizing (green for pass) or non-sterilizing (red for fail) exposure conditions. The extent to which the chemical melt travels along the wick (length of run) is quite reproducible and depends on: 1) the presence of saturated steam, 2) the exposure temperature and 3) the time of exposure. These are the three critical variables of steam sterilization. The Vapor Line® Integrator will accurately monitor all variables and integrate the effects of each into a stable, easy-to-read, dark color bar display. Vapor Line® will literally PASS or FAIL the steam-processed load ... no color interpretation of the bar is required.

Performance Testing

Objective: A series of steam sterilizer cycle tests was conducted in order to demonstrate the performance reproducibility of the Vapor Line Integrator® by itself and in conjunction with SteriGage® , a similar commercial integrator. Repetitive cycle testing was performed for several exposure times at 250°F gravity displacement and 272°F pre-vacuum sterilizer conditions. After processing, the length of run for each indicator color bar was measured and the integrating ranges were determined for all test conditions, The Vapor Line® and SteriGage® performances were then compared.

Test Protocol: Sixty Vapor Line® and sixty SteriGage® Integrators were taken randomly from single lots of commercial product. Individual test packs were constructed from twelve huckaback towels, each folded in quarters. Several Vapor Line® and SteriGage® Integrators were centrally positioned in each pack between the folded towels. The resulting test packs were loosely taped to yield a 9 in. x 12 in. x 3 in. configuration.

All cycle testing was conducted in a 79 liter steam autoclave with capabilities for pre-vacuum (pulsed) and gravity displacement modes. Chamber heat-up times ranged from 45 to 60 seconds for the pre-vacuum and 2 to 2.5 minutes for gravity displacement cycles. A total of ten Vapor Line® and ten SteriGage® Integrators were tested at each exposure condition.

Test Results: A millimeter scale was used to measure the length of run for each integrator color bar from the center of the foil pocket to the leading edge of the bar. A run of 16.5mm or more constitutes a PASS/ ACCEPT reading for the Vapor Line® and SteriGage® Integrators, respectively. The integration ranges, average length of run values, and total number of PASS/ ACCEPT indications are tabulated below for each exposure condition.

Length of Run (mm)

	Vapor Line®			Sterigage®		
	Int. Range	**Average**	**Total Pass**	**Int. Range**	**Average**	**Total Accept**
272°Exposure						
1 Min.	10.0 - 12.0	10.7	0	10.0 - 12.5	11.4	0
1.5 Min.	11.5 - 13.5	12.2	0	12.5 - 15.0	14.2	0
2.5 Min.	18.0 - 20.0	19.0	10	18.5 - 21.5	20.2	10
250 °Exposure						
10 Min.	3.5 - 7.0	5.3	0	4.5 - 9.0	7.1	0
15 Min.	11.0 - 14.0	12.8	0	11.5 - 13.0	12.5	0
20 Min.	20.0 - 23.0	21.3	10	19.0 - 21.5	20.4	10

Conclusions

The results of the study presented above clearly illustrate a high degree of reproducibility for both the Vapor Line® and SteriGage® Integrators. This is striking when one considers normal pack to pack and cycle to cycle variations. Furthermore, it is equally clear that both integrators are essentially equivalent in respect to sensitivity over the entire range of steam autoclave application. In fact, no significant performance differences were noted.