

## Evaluating cleaning agents for use with STS™ Dry Vacuum Systems based on extent of foam generated in use

<b>Test Performed</b>	Generally available vacuum line cleaners were tested to determine the extent of foam generated in use, which may then be carried past the float valve in an 8-gallon CAS tank and enter the STS vacuum pump.
<b>Materials</b>	Various vacuum line cleaners (Pages 2–3 contain list and observations) STS-3 Dry Vacuum System 8-gallon CAS Tank
<b>Test Procedure</b>	
<b>Test Dates</b>	October 06, 18 and 22, 2010
<b>Conditions</b>	Room Temperature and Pressure
<b>Method</b>	Vacuum line cleaners were tested using two methods: <ol style="list-style-type: none"> <li>1. <b>Shake Test:</b> Approximately 12 fluid oz. of vacuum line cleaner was mixed in a 16 oz. jar following the manufacturer’s recommended concentration and shaken to observe extent of foaming and time taken for foam to dissipate. Cleaners were rated on a scale of 1 to 10 on extent of foaming, 1 indicating negligible to no foam generated and 10 indicating extensive foaming.</li> <li>2. <b>Actual Use Test:</b> The following test was performed with those cleaners that had a rating of 5 and/or higher from the shake test. With 4 gallons of water in the 8-gallon CAS tank, the equivalent of 8 HVE manufacturer-recommended volume of vacuum line cleaner was introduced into the vacuum system. Observations of foam carried past the float valve in the CAS tank and entering the STS vacuum pump were recorded.</li> </ol>
<b>Findings</b>	The following cleaners are likely to extensively foam, get carried past the float valve in an 8-gallon CAS tank, and eventually enter the STS vacuum pump: <ul style="list-style-type: none"> <li>• Purevac Hg (Sultan Healthcare, Inc.)</li> <li>• Or-Evac Evacuation Cleaner 32oz/Bt (Henry Schein, Inc.)</li> <li>• Clean &amp; Clear Gallon Ea (Southland Distributors)</li> </ul>
<b>Observations</b>	See Sheet 2 & 3. Results are color-coded as follows: <ul style="list-style-type: none"> <li>• <b>Green</b> — Favorable cleaners that may not damage vacuum pump;</li> <li>• <b>Yellow</b> — Cleaners that were rated higher than 5 on the shake test, but did not produce extensive foam that entered the vacuum pump; and,</li> <li>• <b>Dark red</b> — Cleaners that were rated higher than 5 in the shake test and produced extensive foam that entered the vacuum pump.</li> </ul>
<b>Air Techniques, Inc. Recommendation for ensuring longevity and performance of your dry vacuum system</b>	
<p>Many variables have an effect on the longevity and performance of a dry vacuum system. The use of a foaming cleaner is detrimental not only due to the possibility of plaque-like deposits in a vacuum line over time, but also due to cases where foam enters the vacuum pump resulting in residual buildup and its eventual failure.</p> <p><b>We recommend using cleaners with the following characteristics:</b> non-foaming, neutral pH discharge, and completely biodegradable. <b>CleanStream™ has these characteristics.</b></p> <p>Cleaners from other manufacturers that are highlighted in green on pages 2–3 have shown to produce an insignificant extent of foam and may be safe to use with your dry vacuum system.</p>	

Product/Chemical	Manufacturer	Remarks
Purevac Hg Evacuation Cleaner 32oz/Bt	Sultan Healthcare, Inc.	<b>Shake Test:</b> 9 <b>Actual Use Test:</b> Foam got past the float valve in the tank after 4 HVEs load <sup>1</sup> of water/cleaner solutions were drawn in to CAS tank.
OR-EVAC EVACUATION CLEANER 32OZ/BT	Henry Schein, Inc.	<b>Shake Test:</b> 10 <b>Actual Use Test:</b> Foam got past the float valve in the tank after 7 HVEs load of water/cleaner solutions were drawn in to CAS tank.
CLEAN & CLEAR GALLON EA	Southland Distributors	<b>Shake Test:</b> 7 <b>Actual Use Test:</b> Foam got past the float valve in the tank. After 7 HVEs load of water/cleaner solutions were drawn in to CAS tank. Foam carried over was a slow stream that started at 6 HVE loads (1.5 gallons) and increased to a larger volume as more water/cleaner mixture was introduced.
Shock & Clean Evacuation System Maint Kit Ea (Shock)	Palmero Sales Co Inc	<b>Shake Test:</b> 9 <b>Actual Use Test:</b> Pending upon receipt of a large enough sample.
Purevac Evacuation Cleaner 32oz/Bt	Sultan Healthcare, Inc.	<b>Shake Test:</b> 7 <b>Actual Use Test:</b> No foam got past the float valve in the tank. After 8 HVEs load of water/cleaner solution were drawn in, water was drawn in till float valve closed. No foam or water got past float valve.
Vac Attak Evacuation Cleaner 800gm/Jr	Premier Dental	<b>Shake Test:</b> 7 <b>Actual Use Test:</b> No foam got past the float valve in the tank. After 8 HVEs load of water/cleaner solution were drawn in, water was drawn in till float valve closed. No foam or water got past float valve.
Precision Cleanse Plus Matrix Ea	Midmark Corporation	<b>Shake Test:</b> 6 <b>Actual Use Test:</b> The volume of this cleaner is significantly less than most other cleaners. Precision Cleanse Plus Matrix only introduces 120 ml of water/cleaner mixture per HVE or SE; most other cleaners recommend 1 liter or 1 quart per HVE or SE. After 8 HVE load of water/cleaner solution were drawn in, water was drawn in till float valve closed. No foam or water got past float valve.
MAXI-EVAC EVACUATION SYSTEM CLEANER 2LB	Henry Schein, Inc.	<b>Shake Test:</b> 5 <b>Actual Use Test:</b> No foam got past the float valve in the tank. After 8 HVEs load of water/cleaner solution were drawn in, water was drawn in till float valve closed. No foam or water got past float valve.
Vacuum Clean Tablets 45/Bt (Clean)	Palmero Sales Co, Inc.	<b>Shake Test:</b> 5 <b>Actual Use Test:</b> No foam got past the float valve in the tank. After 8 HVEs load of water/cleaner solution were drawn in, water was drawn in till float valve closed. No foam or water got past float valve.
CleanStream	Air Techniques, Inc.	<b>Shake Test:</b> 5 <b>Actual Use Test:</b> No foam got past the float valve in the tank. After 8 HVEs load of water/cleaner solution were drawn in, water was drawn in till float valve closed. No foam or water got past float valve.
E-VAC Concentrate Solution 1gal/Bt	L&R Mfg Co	<b>Shake Test:</b> 3
Evac Cleaner Fresh-Vac 32 Oz	Ecolab Professional Prod	<b>Shake Test:</b> 3
VACUSOL ULTRA 32OZ BOTTLE	Biotrol Intl	<b>Shake Test:</b> 3

<sup>1</sup> One HVE-load is equivalent to the manufacturer-recommended mixture of water/cleaner.

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<b>Product/Chemical</b>	<b>Manufacturer</b>	<b>Remarks</b>
SANI-TREET GREEN UNI DOSE 50	Enzyme Industries, Inc.	<b>Shake Test: 3</b>
Citrizyme 300 Gram Canister	Pascal Company, Inc.	<b>Shake Test: 3</b>
Slugbuster Powder 40/Bx	Ramvac	<b>Shake Test: 2</b>
Evacuation System Cleaner Liquid 32oz New	Patterson Dental Supply	<b>Shake Test: 2</b>
Turbo Vac Line Flush	Pinnacle Dental Products	<b>Shake Test: 2</b>
VACUKLEEN E2 INTRO PK/60	Heraeus Kulzer Incorporate	<b>Shake Test: 2</b>
SRG Evacuation System Cleaner Gal/Bt	Mydent International	<b>Shake Test: 1</b>
ProE-Vac 1gal/Ea	Certol International	<b>Shake Test: 1</b>
Sani-Treet + Mint Scent Gal	Enzyme Industries, Inc.	<b>Shake Test: 1</b>
Vacuum Sys Cleaner Pwd 2#	Patterson Dental Supply	<b>Shake Test: 1</b>