

## Adhesive System Q & A

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<u>Question</u>	<u>Answer</u>
1. How often should the adhesive filter element be examined and cleaned?	It is best to establish a schedule for checking/cleaning adhesive filters. Weekly is best, even if the filter element seems perfectly fine each time it is checked.
2. What is an indication of waiting too long between filter element cleaning?	<p>Cleaning schedules should be established that result in a relatively small amount of observed debris in the screen. Debris is captured inside the screen. The filtering process has failed if debris is observed on the outside of the screen.</p> <p>Cleaning schedules that result in debris migrating to the outside surface of the screen enhance the risk of contamination traveling to the applicators and plugging the nozzles. In this case, the filters need to be checked and cleaned or replaced more frequently.</p> <p>VERY IMPORTANT: Filter assemblies that do not have a ball inside the element, acting as a check valve, should always be installed with the filter cap <u>oriented down</u>, towards the ground. This assures any trapped debris is removed from the housing when the cap is removed.</p>
3. When should the filter element be replaced?	It is important that the pores (spaces) of the filter screen remain clean. Resins will begin to plug these pores over time, even when cleaning the screen on a regular basis. The filter element should be blown dry and inspected both for damage, such as splits in the screen and the pores should be carefully inspected for plugging. Any damage to the screen or plugging of 1/3 or more of the screen pores is cause to replace the screen.

4. Can a dirty filter element be cleaned?	Elements that have loose debris in them can be cleaned with a brush under running water. Elements that have a build-up of resins plugging the pores should be replaced.
5. How often should the entire adhesive system be flushed?	System flushing should be performed on a regular basis. Circumstances may vary, but once per month is a reasonable interval for most systems.
6. Is filter maintenance conducted prior to or after flushing the system?	<p>It depends upon how the fluid delivery system is designed and how long it has been since the system was last flushed. Regardless of the instructions below, the filter element should be replaced prior to any flushing if it is significantly dirty due to lack of frequent maintenance.</p> <p>Assuming regular maintenance is in place, you should flush the pump, filter and fluid regulator prior to cleaning the filter. The remainder of the system is then flushed after filter cleaning has occurred.</p> <p>This approach is not possible with many fluid delivery systems. In this case, perform an initial flush of the entire system, all the way through the applicators. Perform the filter maintenance. Flush the entire system again using clean water. It is beneficial to again check/clean the filter screen prior to charging the system with adhesive.</p>
7. Should the filter element be installed while flushing the system?	Yes, see (6), above.
8. Does the filter housing need to be cleaned?	The filter housing should be opened after completing the system flush. Remove, inspect and clean the filter screen, one final time. Also, take a flashlight and thoroughly inspect inside the filter housing for any contaminants adhering to the inner surfaces. These surfaces must be cleaned and the system once again quickly flushed if contaminants are found.

9. What should be used to clean/flush the adhesive system?	Clean, <u>hot</u> water is the only recommended means for flushing the adhesive system.
10. How much hot water should be flushed through the system?	Use at least 10 gallons of clean, hot water through the system when flushing.
11. Are the nozzles removed prior to system flush? How about the needle, seat and spring?	<p>There should be as little obstruction in the water's flow path as is possible when flushing the system. Therefore, the nozzles, needles, seats and springs should be removed prior to flushing. This may require flushing through only one applicator at a time.</p> <p>10 to 15PSI of fluid pressure is all that is required once the viscosity changes from adhesive to water. Find a means of reducing the fluid pressure to avoid "racing" the pump and also splashing adhesive/water all over the machine.</p> <p><u>The removed needle and seat should be kept as a matched set.</u> It is best to place these in a cup of water. Thoroughly clean these items, along with the spring and nozzle, under running water.</p>
12. Should the inside of the adhesive applicator body be inspected during the system cleaning process?	The inside of each applicator body should be thoroughly inspected using a flashlight after flushing and prior to reassembling the applicator. Any debris adhered to the surfaces or inside the fluid passageways must be removed and the system briefly flushed once again.
13. Does the adhesive applicator possess an internal filter?	Some applicators are designed with an internal filter, though many plant personnel are not aware they exist, therefore the filter is never cleaned or changed. Consult the equipment manual or manufacturer to understand the equipment design. These filters need to be checked, cleaned and/or replaced each time the system is flushed.
14. Are there any other parts of the adhesive applicator that need to be cleaned?	The fluid connection fitting should be periodically removed. Both the fitting and

	<p>internal thread area of the applicator should be carefully inspected for solids/resin build-up.</p> <p>The Stroke Adjustment Assembly, on applicators designed with an adjustable needle stroke, should also be periodically disassembled, inspected, cleaned and lubricated.</p> <p>NOTES:</p> <p>Cleaning of these parts of the applicator should be done after system flushing is complete. An additional, quick system flush may be required after re-assembly.</p> <p>Both the fluid fitting and Stroke Adjustment Assembly employ O-rings or seal rings to prevent fluid leakage. It is best to change these O-rings or seal rings prior to re-assembly.</p> <p>Inspection/cleaning of these items should be done every 6 months.</p>
<p>15. What determines when applicator wear items (needle, seat, nozzle and spring) are replaced?</p>	<p>The ball at the end of the needle should be inspected each time the applicator is disassembled and cleaned. Signs of wear are surface pitting or a significant “halo” pattern of wear caused by the ball impacting the seat. A telltale sign of wear during operation is seepage of adhesive from the nozzle while the applicator is sitting idle. This assumes the fluid delivery system, needle and seat have been properly cleaned to assure the seepage is not the result of debris lodged between the ball and seat.</p> <p>Non-contact nozzles that are separate from the seat should incur very minimal wear over time. These nozzles are most prone to being damaged when the tip impacts other parts of the machine, collapsing the nozzle orifice.</p> <p>Contact nozzles wear due to the abrasive nature of the paper. You will observe a horseshoe-shaped recess in the contact face</p>

	<p>of this nozzle. Replacement is required when the surrounding surface wear minimizes the depth of the recessed surface.</p> <p>Needles/seats should have a wear life in the 100's of millions cycles. Something is wrong if they are being changed more frequently.</p> <p>Springs should be replaced every month.</p>
16. Is there a supervisory "gate keeper" that approves replacement of applicator wear items or of the complete adhesive applicator?	<p>If not, there should be. It is much easier to simply replace parts rather than assure they are kept clean. It is also much more expensive! <u>Someone in a position of responsibility should decide when parts need to be changed</u> and this person needs to have enough knowledge to make an informed decision.</p>
17. What should be done with the wear items when they are replaced?	<p>Parts should be thrown away if they are truly worn, not thrown into a tool box or parts crib. Suspect parts should be cleaned and returned back to operation on the machine for evaluation as soon as possible.</p>
18. How often does the complete adhesive applicator need to be replaced?	<p>Very infrequently. The only wear part in the applicator body is the coil, which should last for many years. The only items that should need replacement, under normal operating conditions, are the needle, seat, nozzle and spring.</p>
19. What should be done with an adhesive applicator that has been replaced?	<p>See (17) &amp; (18), above.</p>
20. Is the adhesive system maintenance schedule actually being performed?	<p>Supervisors should be familiar with the requirements of the maintenance process and assure it is being properly accomplished. As the saying goes "trust, but verify".</p>
21. How do the people performing the maintenance activities know what is to be done and how to properly perform the required tasks?	<p>Those responsible for system maintenance tasks must be properly trained by a competent instructor. Too often they are misinformed as to what and how tasks are performed.</p>

<p>22. What is the cause of significant adhesive build-up on the nozzle tips and parent machine?</p>	<p>Proper system maintenance is always the first consideration, however another oft overlooked cause of dirty operation is adhesive pressure settings; either too low or too high.</p> <p>Test the Minimum Pressure setting by using its value during the purge function. A pressure slightly above that needed for the adhesive to consistently exit the nozzle cleanly should work well.</p> <p>Set the initial Maximum pressure about 30% <u>above</u> the determined Minimum Pressure as a starting point for 1:1 or 2:1 fluid delivery systems (10% for 5:1 systems), then evaluate and adjust accordingly based upon observations of results at production speeds. Be careful of raising the pressure too high because this could result in partial atomization of the adhesive stream, causing build-up issues.</p> <p>Another cause of adhesive build-up could be the adhesive you are using. Purchase adhesive designed for high-speed, side seam extrusion systems.</p> <p>Another cause of adhesive build-up is improper nozzle height adjustment. See (23), below.</p>
<p>23. What is a proper nozzle height adjustment?</p>	<p>First, and foremost, <u>never</u> adjust a non-contact nozzle so its orifice is below the bottom surface of the product guide. This allows the envelope side flap to contact the nozzle tip, prematurely wearing the nozzle and causing the adhesive on the envelope to be transferred back onto the nozzle.</p> <p>Non-contact nozzles are typically adjusted to a height of 5 to 7mm above the machine bed plate. Shorter distances may prove beneficial, however close attention to should be paid to evaluate the results.</p> <p>Contact nozzles, such as are available for the</p>

	<p>ITW Dynatec DynaCold applicator, are adjusted 5 paper thicknesses above the machine bed plate. Proper adhesive pressure becomes very important when using contact nozzles, as build-up will occur very quickly if pressures are set too high.</p>
<p>24. Is the adhesive drying in the nozzle tips when the machine down?</p>	<p>Nozzle tips should be sealed from the air with grease or by some other means when the machine will be down for 10 or more minutes.</p> <p>Problems with the adhesive drying in the tips, even after very short intervals, could be an environmental or chemistry issue. Check to see if there is a lot of air movement or elevated temperatures near the nozzles and try to remedy this situation. That failing, discuss this with your adhesive supplier. They may be able to offer a different product to overcome this issue.</p>
<p>25. What is the cause of glue pattern tailing and seal flap tabbing?</p>	<p>Adhesive system cleanliness should always be the first consideration to solving this issue. Nozzle “bearding”, especially if the build-up is dragging across the envelope side flap/seal flap, could result in tailing.</p> <p>Needle/seat wear or resin build-up that lodges between the needle and seat could be another cause. Felt nozzle tip cleaners work well to clean the nozzle’s inner surfaces and seat. A #8 or #9 guitar string is particularly useful to clean the nozzle orifice.</p> <p>Adhesive chemistry plays a significant role in both tailing and tabbing. The side seam gum being used needs to be of sufficient quality that the glue stream breaks cleanly when the applicator shuts off at pattern’s end.</p>
<p>26. Is there a system in place to minimize chances for accidental use of the wrong adhesive?</p>	<p>Accidental use of patch, latex or other inappropriate adhesives in the side seam extrusion system can cause significant problems. A system for correctly identifying adhesives’ intended function should be implemented. This could be color-coding,</p>

	alphanumeric or graphic symbols. It needs to be simple and understood by all members of the team.
27. What is a good procedure when changing the product used in the adhesive system?	<p>Caution needs to be taken when changing to a different adhesive product. Questions about chemical compatibility need to be asked of your adhesive supplier, if both the old and new adhesive is from the same vendor.</p> <p>That failing, take a cup of each adhesive and thoroughly mix them in a jar with a sealed lid. Allow the jar to sit for about a week at room temperature, and then inspect for any clumping or other signs of incompatibility.</p> <p>It is always best to completely flush the system with about <u>10 gallons</u> of clean, hot water when switching between <u>compatible</u> adhesives. Flush with <u>30 to 40 gallons</u> of clean, hot water when switching between <u>incompatible</u> adhesives.</p>