



Troubleshooting Foam in the Starch Adhesive

As our technical support team travels the country, one of the problems they are asked to help troubleshoot is “foaming issues” of the corrugator adhesive. They have found that many plants never encounter a foaming problem in the adhesive, but others fight this daily. Other plants may face the problem sporadically. Our team approaches this issue, trying to identify the root cause, whether sporadic or ongoing; once identified, a corrective action can be taken. This article intends to provide a brief overview of some of the findings over the years. Defoamers and Antifoam products will solve foaming issues, but if you can solve the root cause without adding additional cost, that is a win-win.

The most common cause of foaming in the adhesive is excess agitation or the introduction of air into the adhesive. This is a really big category and has many root causes. This can originate in the mixer, as it is being pumped through the starch loop, in the day tanks, or even in the starch pans at the machine. The type of agitation designed by your mixer manufacturer is fixed, but the amount of mix time and when it occurs is controlled by the starch formulator. Too much mix time can result in foaming in the mixer. Agitation in the starch loop can originate from the pump speed or pressure, air leaks in pump diaphragms, restricted starch lines, too many turns (or 90 deg. turns) in the loop, etc. Foaming in the Day Tanks (Run Tanks, Dosers, etc...) located between the starch storage tanks and the machine usually originate from excess agitation in the tanks, pump overspeed in the feed and return lines, aggressive agitators or circulation inside the tank, and leaks in the air pump diaphragms. Foam originating from the starch pan at the machine is typically caused by Glue roll Cell configuration (an 18 quad roll will create more agitation than a 25 quad) due to roughness of the surface, the level of starch in the pan, proper setting of the starch diffusers, and Glue roll to Paper Speed ratios being too high. A final item is low adhesive viscosity; even when everything else is okay, thin starch will circulate much faster through the pumps and loops and more prone to generate foam.

The second group of causes of Foaming is the water used in the adhesive. Plants using reclaimed wastewater for making their starch formulas have another variable to deal with. Some plants do an excellent job of filtering and treating the water before use in the adhesive. Variables that affect the foaming are the pH of the water being used and whether there are soaps from converting equipment washups contained in that water. Adjusting for pH and solids and possibly bacteria alone do not always solve the foaming issues if soap is involved. High pH water tends to foam more than lower pH. If the root cause is the soap for washup water, a defoamer or antifoam may be needed. We have also encountered plants where the city water has two sources, and the issues may be slightly different from time to time depending on which source they are pulling from that week.



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The adhesive formulation can play a part in foam issues as well. As we mentioned above, low viscosity can result in an increased likelihood of foam. We also mentioned the amount of mix time at each step in the starch formulation. The components of the starch formula and the ratio at which they are added can change the cohesiveness of the formula and make the starch more or less likely to foam as well.

In summary, I suggest that you discuss your foaming issue with your team and your starch formulation representative. Begin by observing the starch at the end of the batch (a small amount of foam is normal), then observe the storage tanks, Day Tanks, and pans. See if the visual inspection gives you a clue where to start your search for the root cause. From our experience, you will likely find your pumps are running too fast, have leaks in the diaphragms of the air pumps, or the starch loop requires a good cleaning.

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