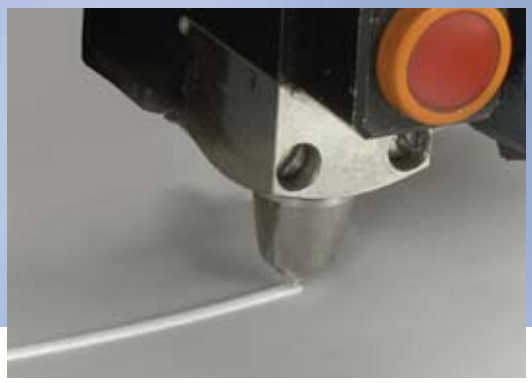
best practices
For Extrusion Seam Gumming

Extrusion seam gumming is one of the most sensitive of all gumming applications. Without proper setup and maintenance, it is easy to produce defective envelopes. The factors listed below are believed to be some of the key variables affecting quality and consistency in extrusion seam gumming.



1. Seam Gum Formulation

The appropriate gum formulation is critical to successful high speed extrusion seam gumming. Use a gum formulated specifically for use on high speed extrusion equipment. The proper formulation will typically be based on ethylene vinyl acetate (EVA) and be designed to produce minimal buildup and proper cut-off, even at high speeds. For most systems, a viscosity of 200–600 cps is desirable. Some envelope converters choose to use the same gum for extrusion seam and window gumming.

It should be noted that although this may simplify inventory and handling, it can compromise the quality of both applications, especially at very high speeds.

2. Nozzle Size

Choosing the right nozzle size is important to assure the appropriate application amount. If the orifice size is too large, an excessive amount of seam gum will be deposited, possibly resulting in squeeze-out after the envelopes are packed. With larger orifice nozzles, it is harder to achieve proper bead cut-off, especially at higher speeds. Using a smaller orifice nozzle typically results in cleaner cut-off and less tailing. However, smaller orifice nozzles are more prone to clogging during shutdown, especially with a fast-drying seam gum. A range of nozzle sizes from 0.30–0.45 mm (0.012"–0.018") is commonly used.

3. Setup

The distance between the nozzle tip and the paper is critical. Consult your equipment manufacturer for the recommended setup. There are two types of nozzles, those that are designed to contact the envelope (contact nozzles) and those that are not (non-contact). If the nozzle is too far away from the paper, the bead may not cut off cleanly, resulting in tailing. Non-contact nozzles are not designed to come in contact with the paper, as this creates a potential jam point and will result in buildup on the nozzle tips. A typical distance is 1/8"–3/16" from the paper. Most extrusion equipment has guides to hold the paper down while the seam gum is being extruded. If these are not set properly or are not used, the paper will tend to “bounce,” and the gum may splash. Proper paper control during adhesive application is critical.

4. Pressure

The proper fluid pressure setting should be used. The correct pressure depends on the desired bead width, nozzle size and extrusion equipment manufacturer and model. Consult your extrusion equipment manufacturer’s manual for the proper setting. In most cases, a minimum incoming plant pressure of 80 psi is desirable.

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5. Minimizing Buildup

Excessive buildup on the tip of the nozzle can lead to tailing. Nozzle tips should be wiped clean during machine shutdowns and when buildup becomes excessive. Paper guides should be used to control the paper during the extrusion process to avoid "bouncing" which can result in tip buildup caused by the seam gum bead or paper fibers hitting the nozzle. Rough papers have a tendency to generate more paper dust that will accumulate on the nozzle tip, creating buildup. Excessive pressure can cause the bead to splash off the paper back onto the tip of the nozzle. Faster setting seam gums have more of a tendency to build up because they are more likely to dry out on the nozzle tip.

6. Preventing Clogs

To prevent the nozzle from clogging if the machine is going to be down for 10-15 minutes or more, place a small amount of lithium grease on the tip. Also, avoid the use of very fast setting extrusion seam gums or very small nozzle sizes. Follow the equipment manufacturer's recommended preventive maintenance schedule for cleaning and replacing hoses, filters, valves and nozzles.

7. Filters

In-line filters should be cleaned or changed regularly. Consult your extrusion equipment manufacturer's manual for preventive maintenance information. A filter that is no finer than 50 mesh should be used. If too fine a filter is used, the filter will clog quickly and restrict the flow to the nozzle. It is not advisable to run without some type of filter since outside contaminants such as paper dust often find their way into the closed extrusion system. These contaminants will clog the nozzle tip if they are unfiltered.

8. Preventive Maintenance

In general, this can be the most critical factor in determining successful long-term performance. Follow recommended preventive maintenance procedures for replacing or cleaning hoses, springs, filters, valves and nozzle tips.

9. Back Flap Gumming

Some envelope converters attempt to minimize the impact of seam gum tailing by gumming the back flap instead of the side flaps. The result is that the trailing edge of the bead is at the bottom of the envelope instead of at the top. This method can reduce the chances of tacked flaps due to tailing, but it can lead to more splashing of the extruded bead when the envelope is compressed.

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