

Common Problems and Solutions Part 2

Sealing on Horizontal Flow Wrappers

In this article we continue our discussion of common problems that occur on horizontal flow wrapping machinery, focusing this time on the crimpers and the sealing function.

It can be difficult to identify the true root cause of sealing problems, so it makes sense to ask a few questions and identify the *what*, *where* and *when* before proceeding.

What is the problem? Weak seals? Fracturing? Leakers? Etc.

Where does it occur? Leading or trailing seal? Every package? Every wrapper? Etc.

When did it first occur? *When* does it happen now? With all films? With all products? At all line speeds? Etc.

During initial set up we want to identify improper adjustments, machine problems, processing inconsistencies, crimper design deficiencies or any other issue that may be hindering or preventing the desired results. When the problem occurs after some period of running with no difficulties our objective is to find out what changed.

Every situation is unique, and there are many factors that serve to determine the best procedure, but we have attempted to present the following solutions in a practical sequence, beginning with the more likely possibilities. We also describe most solutions in broad strokes, since space does not permit a detailed description of every procedure and adjustment.

1) PROBLEM- There is fracturing in the fin fold area of the endseal on most packages.

The fin fold area, with its doubled film thickness (four layers of film vs. two on the rest of the endseal), is the most common location for seal problems. If film fracturing is going to occur, this is where you'll usually find it.

Check the crimper clearance. Excessive interference is probably the most significant cause of fracturing. Usually, this should be set so that the upper and lower jaws are just making contact.

Run a carbon or NCR (carbonless) paper impression. If you see evidence that the crimpers are misaligned or not mounted on the centerline of the shaft then deal with that before proceeding further.

Take a look at the spring pressure. Check that it's even on both ends. Make sure that the springs are not overly compressed and bottomed out. If they are, they may need to be replaced. If the springs look fine, then try backing off of the pressure. Make small adjustments and check the seal quality each time so that your attempt to solve one problem doesn't create another. Reduce pressure too much and you'll lose seal integrity.

Heat can also be a factor. You can experiment with lower heat settings to see if the fracturing problem improves without negatively impacting seal quality.

A different serration pattern may be required, and in some cases a fin seal relief on the crimpers is necessary. This is especially true with thicker film structures. A proper relief decreases the depth of the serrations (crown and root) in the area where the fin seal travels and is designed to accommodate variances in tracking of the fin. The depth of the relief is customized for the specific film.

2) PROBLEM- The packages look fine, but there are leaks in the fin fold area on the endseal.

As we mentioned above, the fin fold area, with its doubled film thickness (four layers of film vs. two on the rest of the endseal), is the most common location for seal problems.

Run a carbon or NCR (carbonless) paper impression. Check for proper crimper alignment and even spring pressure.

Check the crimper clearance. This should usually be set so that the upper and lower jaws are just making contact.

Try increasing spring pressure evenly. Make small adjustments and check the seal quality each time. Stop if the film fractures and back off to the last good setting. If the seal still leaks it may help to either replace old, worn springs or switch to springs that exert greater force.

If there is no improvement, or if the change is not significant enough, then take a look at the heat setting, especially if the problem is most evident at higher line speeds. Often the temperature setting must be raised in order to reach the required seal initiation temperature if line speed is significantly increased (and dwell time reduced). If

there is inadequate heat, the problem will often manifest itself in the fin seal area because of the thickness added by the extra layers of film. Adequate flow of the sealant layer is required in order to plug the gap that can be created at the fin seal fold. Increase the temperature setting in small increments. Too much heat can also cause problems, especially at slower line speeds,

As also mentioned above, a different serration design or fin seal relief may be required if none of the other solutions are effective. This is most often the case with thicker film structures. A proper relief decreases the depth of the serrations (crown and root) in the area where the fin seal falls and is designed to accommodate variances in tracking of the fin. The depth of the relief is customized for the specific film.

3) PROBLEM- The end seal is splitting or leaking, but only on some of the packages.

Check for backlash in the crimper head. You should not be able to move the upper shaft independently of the lower shaft. It only takes a little movement to cause a problem, especially if the crimpers have horizontal serrations (parallel to the knife slot). The backlash can usually be eliminated by adjusting a split gear.

If the fracturing is consistent (say, the leading seal on every other package), then check the crimper set-up. You may be able to hear or feel that one set of crimpers is hitting harder than the other. Make sure that the shafts were cleaned properly before the crimpers were mounted so that there is no dirt or build-up between the two. Check that the crimpers are mounted on the centerline of the shafts and that the serrations mesh properly.

Check clearance to make sure that the crimpers are just making contact, and run a carbon or NCR paper impression to check pressure settings. Make sure the pressure is even, and try slightly increasing or decreasing (depending on the problem). It may be that the settings are just on the edge of what works and what doesn't.

Also check the knife and anvil set-up. If they're hitting too hard you can usually hear them banging. At higher line speeds this can create a situation where the crimper faces, separated by a knife that's adjusted out too far, do not return fully to mesh before the crimpers rotate through.

Check the heat on all sealing faces with a pyrometer, making sure that all heaters are functioning properly.

4) Problem- A seal quality problem (film splitting, distortion, leaking seals, etc.) occurs on a wrapper that had been running fine up to that point.

If a problem appears, then something has changed, the trick is to find out what. Use carbon or NCR paper to check the set-up in order to get a better idea of what's happening.

Do a visual inspection. Look closely at the sealing faces on the crimpers to see if they've become worn. Check the sealing head and crimpers to make sure that nothing has come loose.

Check to see if the pressure and clearance settings have been adjusted recently. Perhaps a change made to eliminate a cutting problem, or with other good intent, is ultimately having a negative impact on the sealing function.

Use a pyrometer to check the heat on both sealing faces on all crimpers to make sure you have no bad heaters or thermocouples.

Has the line speed changed? Problems become more apparent at higher speeds, and the margin for error in set-up and adjustment is reduced.

Check the film. Even if you're running the "same" film you've been using, rolls from different batches can vary because of allowable manufacturing tolerances. The storage environment can also have an impact, as the rolls can be affected by heat or humidity.

If all else fails, back off on the clearance and pressure and redo a complete crimper set-up.

5) PROBLEM- One wrapper is a regular problem.....more difficult to set up and in regular need of readjustment in order to get good seals.

Let's assume that the film and crimpers are the same as you're using on your other wrappers on that line.

Check for backlash in the crimper head, and adjust the split gears if necessary. Backlash is a common cause of intermittent problems.

Check the springs. Are they the same resistance as the springs on the other machines? Does the pressure appear to be adjusted similarly to the other wrappers? Are the springs old and worn or bottomed out? Change them if necessary.

Check the phasing to make sure that the crimpers are properly positioned.

Check that the temperature settings are the same as the other wrappers, then check the temperature on each crimper face using a pyrometer. Make sure they're consistent and that the temperature matches the sealing faces on the other machines.

If possible, check to see if either shaft is bent.

Check the infeed to make sure that product is being presented the same as the other wrappers.

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