



## The Problem Diagnosis Process

Problems happen. That's an unfortunate reality, and packaging lines are certainly no exception. In previous white papers we have dealt with specific problem identification and solution options for many common issues on horizontal flow wrappers and vertical baggers. In this paper we take a step back and examine the problem diagnosis process itself. We explore steps that will help to uncover relevant information, identify goals, avoid inaccurate conclusions and, ultimately, choose the proper corrective action.

If you do a Google search for “problem diagnosis” you’ll find that many of the results deal with medical conditions. Makes sense. For a doctor and a patient, diagnosis must occur before treatment. The true nature of the problem must be understood before any attempt can be made to solve it. Physicians have access to many sophisticated diagnostic tests to gather information for their analysis, but before they can even decide which tests to run they must first gather information by performing a physical examination and asking a series of analytical questions.

The investigation of package quality and packaging line productivity problems should go through a similar process. Reaching an incorrect diagnostic conclusion may not have the same potential life-or death consequences, but it could certainly contribute to poor seals, lousy production numbers, rejected packages and an increase in customer complaints. In our field there are certainly tests that can be run on packages, materials and machinery, but we too must learn as much as we can by thoroughly examining the situation and asking the right questions.

This is a simple but important process. Each situation is unique, and it’s essential to eliminate assumptions and get into the details. Following is a series of questions that we often ask to help us better understand a situation and help customers decide on the best way forward.

### **1) What’s happening?**

What are the symptoms you’re experiencing? For example, maybe you have leaking seals, or poor hot tack. Maybe a wrapper setting seems to require frequent readjustment. Or maybe there are frequent crimper or knife set-up problems on one line.

Can you see the problem? Feel it? Hear it? Maybe it shows up in a seal integrity test or in a productivity report. Whatever the case may be, we want to define the problem by identifying what you see occurring that’s different from the condition you desire. This helps to make sure that everyone involved is clear about the nature of the issue and, as we work through possible solutions, it provides some criteria to measure change.

### **2) Why is it a problem?**

This might seem obvious, but it helps to understand the true impact of the problem. What are the negative consequences? Maybe customers are complaining. Maybe downtime is up and productivity is down. Or maybe marketing is upset about the cosmetics of a package. Is a line shut down, or can production continue temporarily without a solution? The information gathered helps to shape the approach and define the goals.

### **3) Where does it happen?**

Is the issue limited to a specific wrapper or bagger? A specific line? A certain product? A specific film? Does it occur on a certain place on the package (leading side, trailing side, on the fin fold, at the gussets, etc.)?

#### **4) When does it happen?**

Is it a constant or an intermittent problem? If it's intermittent, what's the frequency? Can you recognize any triggering event or condition?

#### **5) How long has this been going on?**

Is this something that just happened or just started happening, or has it been occurring for some time?

#### **6) What has changed? or What's different?**

This is the big one. It's a step that's often overlooked, but it's where many of the important discoveries are made on the way to the ultimate solution. If at some point in time, a problem does not exist and then, at a later point in time it does, then something changed in the interim. Figure out what's different to help understand the root cause of the problem.

Sounds easy, but it's not always. There are frequently many things that have changed, and the cause can't always be narrowed down to a single factor. It may be that a combination of changes has led to the problem.

Here are a few possible scenarios with examples of some things that could have changed. These are certainly not all inclusive, but serve only to provide a demonstration of the diagnostic process.

A. Packages coming off of a flow wrapper or a bagger have weak seals.

- Has the line speed been increased?
- Has there been any change to the clearance or pressure settings?
- Are all of the heaters functioning? (Ignore the readout on your heat controls; check the sealing jaws or crimpers with a pyrometer.)
- Has the film roll been changed? (Is the roll from a different batch, or has it been stored differently than the previous roll?)
- Has the knife or anvil been changed recently?
- Have there been personnel changes on the line in question?

B. Packages coming off a flow wrapper show intermittent fracturing of the end seal.

- Does the line speed vary?
- Has anyone changed the clearance, pressure or heat settings?
- Does the product size vary?
- Have the knives or anvils been changed recently?
- Are the crimper serrations worn?
- Has there been a film change?
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#### **7) What (if anything) has been tried already?**

Knowledge can be gained from failures. What attempts have been made to solve the problem, and what were the results?

## 8) What's the goal?

It's not as simple as just saying that we want to solve the problem. Is it realistic to fully eliminate the problem, or will a reduction of intensity or frequency to a certain level be satisfactory? Is the objective to manage the issue by dealing primarily with the symptom(s) or is the goal to discover and cure the root cause?

Constraints such as time or budget may dictate the faster or less expensive approach even if it doesn't truly eliminate the cause of the problem. For example, a change in sealing crimper serration pattern may eliminate a fracturing problem that was actually the result of a film, machinery or processing issue. Focusing on the root cause may be an appropriate second step after dealing with the symptoms.

Preventative measures should also be considered to eliminate the possibility of the same problem occurring on similar lines and to avert a reoccurrence at a future point in time.

In the end, the key is *information before action*. Develop an effective solution by asking and then finding the answers to the right questions. Gathering this knowledge before moving forward greatly increases the possibility of achieving a positive and lasting result.

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