

Stick Packaging for Powdered and Granular Products: Typical Opening Challenges and Solutions

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Single-portion stickpacks containing drink mixes, instant coffee, baby formula or other powdered or granular products make the perfect on-the-go package for today's busy lifestyles.

The only problem with many of the stickpacks on the market is their opening technology. The tear-notch systems widely used for stick packages can lead to missing or misplaced notches, making opening difficult and/or leading to damaged or leaky packages. The result is a frustrated consumer and a bad rap for your brand.

The purpose of this white paper is two-fold:

1. To help companies using tear-notch technology troubleshoot problems before their products get into the consumers' hands.
2. To offer alternatives to tear-notch technology that eliminate typical performance challenges.

In both cases, our goal is to help companies that utilize stick packaging improve customer satisfaction with their products in order to strengthen their brands.

The Skinny on Stickpacks

Before we get into the specifics of opening technologies, let's define stickpacks themselves.

Size

Stickpacks used for powdered or granular products are cylindrical in shape with a single back seal, which can be either a fin or lap seal (see fig. 1 and 2). While packagers can make stickpacks in a variety of sizes by changing the tooling, the typical stickpack:

- Has a layflat measurement of 23mm x 120mm
- Holds approximately 5-6 grams of product

Material

It's especially important for the material used in stick packaging to tear easily, once the tear is initiated, to allow easy opening. The structure used for fin-sealed stickpacks is generally a reverse-printed oriented polyethylene terephthalate (OPET) on the outer layer with foil in the middle and a polyethylene sealant layer on the inside.

- **Reverse-printed PET** provides a crisp, glossy print surface for superior brand identity, and has good directional tear properties.
- **Foil** provides the moisture barrier needed to prevent product clumping and has virtually no tear resistance.
- **PE sealant** ensures a hermetic seal to prevent product leakage, and is specially formulated to have minimal tear resistance in the cross or transverse direction.

Stickpacks with a lap seal often have heat-sealable polypropylene on the outer layer (versus PET) because both sides of the film need to be sealable.

Economics/Source Reduction

Stickpacks use about 30% less material compared to 4-side seal pouches containing the same amount of product, making them relatively economical to produce and presenting significant source reduction opportunities. Typical production speeds of 700 to 800 packages per minute (depending on equipment) also contribute to their favorable economics.

The Trouble with Tear Notches: Troubleshooting Guide

Tear notches are typically machine-applied in the upper left corner of stickpacks to accommodate right-handed consumers, who tear from left to right. First the area to be notched is heat-sealed, then the notch is made in the heat-sealed area to prevent product leakage or a compromised barrier.

To follow are four types of problems often seen with tear-notched stickpacks, along with what causes them and how processors can address them.

1. Packages that Won't Open

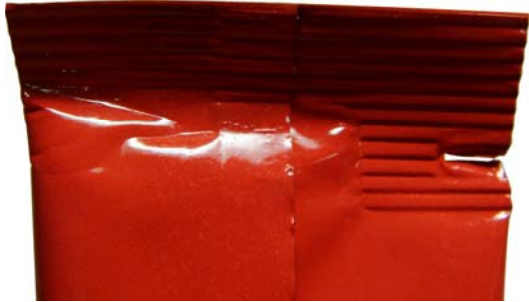


Possible problem	Tear notches are defective or missing.
Probable cause	Worn punch die that partially punches the notch but doesn't cut through.
What to look for	<ul style="list-style-type: none">▪ Frayed notches▪ Ruptured packages
Likely solution	Sharpen or replace the punch die assembly.

2. Packages that Open Erratically



Possible problem A	Misaligned notches.
Probable cause	Notch system isn't installed properly or set properly, or the film isn't lined up properly at the unwind.
What to look for	Tear notches don't line up with graphics.
Likely solution	Reset punch system or shift unwind roll.



Possible problem B	Edge of the fin isn't notched properly (for packages with the fin facing toward the tear initiation), causing the tear to stop at the seal or to follow the seal (the path of least resistance).
Probable cause	Misaligned seal.
What to look for	Notch falls short of seal.
Likely solution	Realign seal unit or film.

3. Packaging that Only Opens Part Way

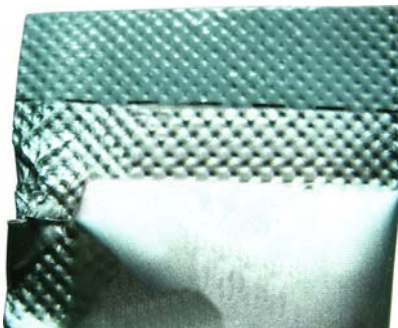


Possible problem A	Defective heat seal.
Probable cause	Poor heat seal contact due to seal die contour.
What to look for	Must try opening package to ascertain.
Likely solution	Adjust heat or pressure.
Important note	Because the tear notch has to go around half the package to nick the fin seal, even correctly placed and heat-sealed notches may still only allow a 25% opening, making even small granules difficult to dispense.



Possible problem B	Notch doesn't nick the seal properly (for lap seal packages or packages with the fin facing away from the tear initiation), causing the opening to stop at the seal.
Probable cause	Misaligned seal.
What to look for	Notch falls short of seal.
Likely solution	Realign seal unit or film.

4. Product that Leaks or Is Clumped and Won't Dispense



Possible problem	Misaligned notches or a defective heat seal, which are either allowing product to leak out or allowing moisture in.
Probable cause, what to look for and likely solution	Same as shown in #2 and #3 for these problems.

Packager Frustrations

In addition to the quality headaches associated with tear notching, this added step can have a fairly serious impact on productivity, including:

- Slower production speeds required to achieve quality heat seal and notch.
- Worn punch dies are costly to replace and time-consuming to change out, resulting in lost production time.
- Defective packages (that either won't open or leak) lead to reject rates that are often in excess of 5%. Without the notch, the reject rate on stick packaging would be virtually zero.

Alternative Technologies: The Cure for the Tear Notch Headache

Films used for stick packaging can be treated during the conversion process to incorporate opening technology, thereby eliminating the need for tear notches. A prime example is Fancy Cut® technology, which is described below.

Fancy Cut® Technology



What it is	A proprietary, microscopic treatment that allows easy tearing. The feature is invisible to the naked eye so it doesn't impact graphics.
How it's applied	Applied as a continuous treatment in the machine direction.
How it works	Allows tear initiation anywhere along the side of the package; the tear itself will be fairly linear across the package, though there is no guiding system to keep the tear straight. Fancy Cut technology allows the package top to be completely removed.
How it's identified	Identified with a small tear notch and/or printed "tear here" indicator. Consumers are trained to look for tear notches, so these become an easy visual cue. Even a small notch requires heat sealing around it to prevent leakage, though, which leaves about an 80% opening for dispensing product.

The Future of Stick Packaging

With our increasingly on-the-go lifestyles, there's no end in sight for the growth of portable, convenient stickpacks. The only thing that may impede growth is tear notch opening technology that falls short of consumer expectations. However, either properly executed tear notches or advanced opening technologies can eliminate both consumer and packager frustrations to help fuel growth.

Contact Curwood at 800-544-4672 for assistance developing stick packaging that performs on every level.



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