

## TECHNICAL BULLETIN

May 21, 2012

Re: **Cockling of Paper Release Liners**

Dear Valued Customer,

The summer is upon us and with it come thoughts of the beach, barbeques, and baseball. For manufacturers and users of pressure-sensitive tapes, it also brings thoughts of cockling liners. You know the old saying, it's not the heat, it's the humidity? In our business, this is a very accurate statement. While we cannot stop the forces of nature, we can offer the rationale behind cockling and potential ways to deal with it.

### ***What is cockling?***

To anyone who has manufactured or used pressure-sensitive tapes with a silicone-coated, Densified Kraft release liner, cockling is a familiar sight, even if you were unaware of the technical term we use to describe it. Paper, by its very nature, is an absorptive medium. In high humidity, as typically experienced in the summer months, paper will absorb moisture from the atmosphere. As a result, the paper swells; it grows in all three dimensions creating a waviness which we call cockling. This photograph illustrates this phenomenon.



### ***What can cockle?***

All paper-based products will cockle to some degree; some visibly, others more discreetly. Densified Kraft will cockle quite visibly, as the picture illustrates. There are several paper coatings which are employed to alleviate this. Poly-coated liners have a layer of polyolefin (plastic) coated on both sides of the base paper. This plastic layer helps to encapsulate the paper and protect it from drawing in the moisture which causes cockling. The higher the basis weight, along with the poly-coating layer, the more resistant it will be. This type of liner has better moisture resistance than Densified Kraft, but does not eliminate cockling all together.

### ***Why is cockling a problem to me?***

Because the paper is growing in all dimensions and the pressure-sensitive tape is not, there is the potential for creasing and wrinkling during the lamination process resulting in scrap. To avoid this potential, an end-user may choose to unwind a couple wraps of tape to reveal non-cockled product. We understand that no one likes to waste material! Mounting surfaces which are pre-laminated with tape can cockle prior to the secondary laminating process. Again, this cockling can lead to creases or wrinkles in the secondary laminating process.

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### *How do I deal with cockling?*

As a partner in your process, Adchem continuously seeks ways to offer solutions to the issues you encounter. Having worked through the various ways that cockling can affect your operations, we offer the following as a means to assist you in minimizing losses and help you to avoid creasing and wrinkling. Cockling can be thought of as an outer surface phenomenon. In truth, the paper wound tightly within a roll is picking up moisture and changing dimensionally, but not to the point at which it becomes cockled. If we keep this in mind when handling the tape in the summer months, or in environments with high humidity, we can employ very simple procedures to deal with it.

- Rolls of tape with paper liners should be stored in a cool dry environment.
- They should be protected from dirt, extreme temperatures and humidity, and damage.
- Plastic wrap around each roll, including both ends, will help to keep the moisture from getting to the paper.
- When a laminating job is complete, the remaining roll should be wrapped in plastic, even if it is still up on the machine.
- Any product already threaded through the laminator will be unprotected and may need to be discarded if it develops severe cockling prior to the next job.
- Pre-laminated parts (foam sheets, pre-coated graphic arts mounting boards, etc.) should be protected from humidity by storing them in a controlled environment or by wrapping them in plastic.

In some cases, even a small degree of cockling is unacceptable for a given application. In these situations it is incumbent on the user to seek other means of dealing with it by choosing an alternate liner.

- As mentioned poly-coated liners offer a degree of protection from cockling.
- Board is another option. Although 12-pt board is a paper based liner, its heavy basis weight and a layer of poly-coating on both sides virtually eliminates cockling.
- In some cases a film liner may be an answer. Plastics are not as absorptive as paper and therefore, not susceptible to cockling.

We at Adchem are providing this information to you, valued customer, so you better understand the nature of the phenomenon and the simple ways to remedy it. We encourage you to share this information with your operations personnel, so they know the options that can be taken. We further encourage you to share this information with your sales force and end customers.

Remember, in the summer, it's not the heat, it's the humidity.

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