



When Are Tapes Too Old for Processing? Why Viable Shelf-Life Matters

By Dave Shuey, Avery Dennison Performance Tapes

One of the questions we get from gasket converters is whether tapes that are no longer covered by warranty can still be used. Answering that question requires understanding the difference between the specific manufacturer's warranty and the viable shelf life of a particular tape product.

Avery Dennison Performance Tapes standard limited warranty covers defects in materials and workmanship for a period of one year from the date of shipment, although Avery Dennison Core Series™ products have a two-year warranty period.

Many tape products are consumed during the applicable warranty period, but there may be cases where only a portion of a roll is used to meet the requirements of a specific order. The remainder is then often stored until the customer reorders the part for which the tape was acquired. If the reorder comes after the manufacturer warranty has expired, can the roll still be used?

This is where the concept of viable shelf life comes into play. The adhesives used in tapes for gasket lamination have been carefully engineered for compatibility between the adhesive and the liner as well as to help prevent oxidation and changes in performance as the tape ages. While it typically isn't possible to put a hard number on the viable shelf life of a specific product, for tapes using rubber or acrylic adhesives it may be significantly longer than the warranty period.

Using Out-of-Warranty Rolls

There are several items converters should be aware of when using rolls that have been in storage beyond the warranty period. The first is the potential impact of age on the release qualities of the tape.

It isn't common with tapes that have been engineered for compatibility between the adhesive and the liner but there is the potential for unwind and liner release to increase with age and then stabilize.

Increased unwind release is less of an issue with double-coated tapes, as that construction requires minimal differential between the liner release and the unwind release. Transfer tapes require a higher adhesive differential and there may be a tendency with tapes stored improperly for the liner to stay with the tape during unwinding. This may require extra care in unwinding, but if the tape can be unwound it can potentially be processed and may be able to perform as expected. If there is a question about liner release with a particular substrate, application testing is recommended.

Another consideration that can affect how tape ages is the type of adhesive used. Silicone adhesives are more sensitive to aging than rubber and acrylic adhesives. Tapes using silicone adhesives should generally be used within the manufacturer warranty period to help ensure proper performance.

Recognizing Potential Tape Problems

The biggest factor that affects tape aging is the environmental conditions in which the roll is stored. Excessive heat or humidity can introduce issues that require extra care in processing. Most of these issues can be identified by visually inspecting the roll.

- **High temperature:** Manufacturer warranties may require that tape rolls are stored in accordance with certain standards. At Avery Dennison, we recommend that tape products are stored at 72° F and 50% relative humidity. Precise environmental control isn't always possible but extremes in temperature, such as those that occur when tapes are stored in a trailer during the summer, should be

avoided. Excessive temperatures can cause the adhesive to flow, and the pressure created by the weight of the roll can force the adhesive to ooze, which will be visible when inspecting the roll. The short-term solution is to cut off the end where oozing has occurred (lathe slitting if possible) and/or freezing or cooling the roll before processing. Longer term, if storage conditions can't be better controlled, it may make sense to order smaller rolls to reduce the effect of gravity on the adhesive or move to horizontal packaging.

- **Low temperature:** In sub-freezing temperatures, the adhesive can freeze and become glassy, limiting its ability to bond. If this occurs, simply allow the roll to warm to ambient temperatures before processing.
- **High humidity:** Excessive humidity can be a problem when paper-based liners are used, as they will absorb the moisture in the air and crinkle. This can even occur in processing if the roll is left idle on the machine for too long. It may be possible to cut off the area where crinkling has occurred

and process the remainder of the roll. But if crinkling is a persistent problem, consider switching to a moisture-stable liner such as polyolefin, polycoated kraft, or polyethylene terephthalate PET / polyester).

- **UV exposure:** Rolls with rubber or modified/tackified acrylic adhesives that are exposed to UV light can discolor, turning yellow or brown. These tapes will come off the roll fine but may not bond to the substrate as aggressively as they should. It may be possible to heat the roll to reenergize the adhesive, but it's usually best to replace rolls that show signs of discoloration.

The viable shelf life of the tapes used in gasket lamination doesn't have to be limited by the manufacturer warranty. A well-engineered tape, supported by a manufacturer that collaborates with converters to help ensure tape performance matches application requirements, may deliver reliable performance even after the warranty has expired.

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