

The Technical Guide to Splicing with Adhesive Tape

It's impossible not to take splicing for granted because it's hidden in the smallest, most disposable objects around you. Take, for example, your favorite morning coffee. That to go coffee cup? The corrugated sleeve? Both made possible by splicing, and splicing tape. The shipping box at the post office? Spliced. Foam meat tray? Spliced.

In this guide to *splicing with adhesive tape*, we're giving you all the information you need to know about choosing and using splicing tape in manufacturing and beyond.

- [What Types of Products Are Spliced?](#)
- [How to Choose the Right Splicing Tape](#)
- [5 Reasons Why Splicing Tape Fails](#)
- [How To Prevent Splicing Tape Failures](#)

What Types of Products use Adhesive Tape for Splices

So what is a splice, exactly?

In the tape world, a splice is a process by which two rolls are combined using tape in order to create one seamless

continuous roll. This is done because the roll of material is getting unwound and is going through some manufacturing or converting process to create an end-use product, like a coffee cup sleeve or an Amazon box.

In simple terms, when you have something on a roll (i.e. paper or film) and it needs to go through a converting process to make a finished product (i.e. envelopes, bags, boxes, newspapers, coffee sleeves, packaging), you need to “join” the rolls together to keep manufacturing process going. The process by which these two rolls are combined is called *splicing*. As one roll is unwound, it gets *spliced* roll to roll with tape.

- Anything that comes on a roll is spliced; for example, canvas, house-wrap, and tarps for trucks.
- Starbucks cups are spliced. First, there’s the paper to make the cup which is unwound and spliced, then converted into the cup shape. Then there’s the paper to make the sleeve by using a more expensive corrugated paper on the inside and smooth paper on the outside, both of which have been spliced.
- Corrugated material is the stuff that boxes are made from and they splice paper to make this. But corrugate paper and cardboard are not the same things. Corrugated (or pleated) material is made up of three different layers of paper: an inside liner, an outside liner, and fluting which runs in between. Cardboard is a heavy-duty paper stock known as paperboard. It’s rarely used in heavy-duty packaging. Instead, think cereal boxes and

other smaller consumer goods packages.

- Fruit and vegetable trays. Rolls of foam are spliced before they are converted to the foam trays that you see in grocery stores.
- Packaging in all forms is spliced. Shipping boxes begin the same way as coffee sleeves – corrugate paper that is spliced with three different layers. Coated film for packaging, such as potato chips, plastic bags, and chocolate bars, is spliced. It all starts as a wide roll of material which is then cut to narrower or shorter widths and lengths, which then go on a converting line to become the outer packaging.
- Laminate flooring starts as a giant sheet of vinyl that needs to be spliced.

Obviously, the list goes on, but you get the idea. Splicing makes our daily lives more efficient and more enjoyable, and [splicing tape](#) is the product that makes it possible.

That said, just as not all adhesives are created equal (read more about that in our [Complete Technical Guide to Adhesive Tape](#)), not all splices are the same, and not all splicing tapes share the same qualities. Newsprint requires a different kind of tape than Styrofoam. Corrugate paper is different than vinyl. If the tape doesn't stick properly, the machines have to be shut down and re-threaded. That can mean thousands and thousands of dollars in lost revenue. In fact, paper mills today do not stop machines at all – they run 24x7. Which is why finding the right tape for the right splice is paramount

How to Choose the Right Splicing Tape

Depending on what you are converting, the manufacturing process, and the substrate, there are all kinds of possible splices. Choosing the wrong one not only increases the risk of tearing but can slow down the converting process or stop it altogether.

Splicing tape is no different. Available in a variety of carriers with different adhesive systems, splicing tapes may be single or double-coated; have a polyester, film, or paper carriers; have high-temperature adhesives; be repulpable; the list goes on. How do you choose? Well, like much else in our industry, it's about [choosing the right tape](#) for the right application and conditions. Here's a quick primer:

Know the Application. What kind of splice is it and how will it be used?

- *Butt splice.* This is a single-sided splice. The paper is not overlapped; rather it butts up against each other and you use a single-sided tape to connect the two pieces over the seam.
- *Overlap splice.* This is a double-sided splice, where the ends are overlapped.
- *W or V splice.* Although W and V splices are being phased

out, the process was most often used in newsprint and paper mills. The W or V pattern of the tape application creates more surface area, making the seam less likely to tear.

Is this a Single or Double Coated application?

- *Single-coated splicing tape* is suitable for butt splicing.
- *Double-coated splicing tapes* are suitable for use with laminators, coaters, and other converting operations. [Double-sided tapes](#) are commonly used in flying splices, manual splices, core starting, and roll finishing applications.

What Kind of substrate are you sticking too? Paper. Corrugate. Foam. Rubber. Even metal can be spliced. You must know the material, or substrate, the tape is adhering to. For example, coated paper is harder to splice. Used for specialty applications, such as produce boxes and foodservice containers, coated paper requires an aggressive splicing tape with higher tack and quick start.

Special finishes that get laminated to wallboard, often used in anti-mold or fireproof products in commercial buildings, are also challenging. They may require an aggressive splicing tape with a very high-temperature range.

What field conditions are you dealing with?

- *Temperature.* Will the splice be subjected to heat? cold? For example, in certain manufacturing

processes, flying splices may often need to go through a heat chamber and so high-temperature resistance is critical so the tape does not fail.

- *How fast or how slow?* Manual or zero speed splices happen by hand, so the roll or machine is either not moving or is moving so slowly (zero speed) that getting a good stick is easier. Flying splices, on the other hand, happen quickly. Both rolls are moving very quickly, yet the splice still needs to get made. For example, the LA Times flying splice is 1200' per minute! This type of splice requires immediate high tack because there's only one chance to stick.
- *Moisture or Humidity.* Repulpable splicing tapes dissolve in water. These splicing tapes ensure that the substrate and adhesive do not gum up the machinery and stop the production process in the production of paper, where water is used.

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5 Reasons Why Splicing Tape Fails

Even if you know your substrate and field conditions, complications may still arise. Whether splicing tape fails because of weakness (snap or tear), carelessness (installation error), or conditions (extreme heat), shutting down any production line is not only incredibly expensive but potentially catastrophic. Which is why it's so important to understand how and why splicing tape failures happen. In

our experience, splicing tape failures typically occur for one of five reasons:

1. *Temperature.* Once a splice is made, many times they will get subjected to high heat down the manufacturing line. We're talking 350-degrees or higher. And as we already know, the tackiness of the adhesive tape is very temperature-dependent. Too cold and the tape won't bond. Too hot, and the bond might melt.
2. *Operator error.* It's not always roll and go. Did you put enough pressure on the tape? Did you clean the surface before applying the tape? Did you remember to remove the liner? (*Yes, that happened!*)
3. *Machine miscalibration.* Machines rely on two things to stay running properly: a skilled operator and routine calibration. If a splice bar isn't calibrated properly, the splice might fail. It appears like an adhesive failure, but a micrometer difference in pressure or angle could affect the success of the splice.
4. *Speed.* Flying splices are called that for a reason. They are splices done at very high speeds. You not only need a high tack for a quick stick, but you need it to hold. Splicing tape failures can happen if you do not get one of these features in the tape you select.
5. *Tape release.* This one is simple... you didn't choose the right tape for the substrate.

How To Prevent Splicing Tape Failures

1. *Test, and test again.* We get it. The package label made monumental promises, but generally speaking, tape testing should always be done prior to use and in the field with real conditions. Always test the tape to make sure it delivers the performance you expect.
2. *Check the temperature.* Carefully factor in the temperature variables, everything from storage temperature, ambient temperature, and running temperature.
3. *Check the speed and stress.* How fast does the tape have to be applied? How quickly does it need to adhere? What about the stress factor? Splicing tape has to handle stress because the tape is the only thing holding one roll to another.
4. *Consider the substrate.* The correct tape for the right surface is critical. With new and improved products being made every day by manufacturers, substrates changes, and sometimes the tape for splicing needs to as well.
5. *Proper storage.* Tape storage is sometimes critical for success. When materials are bought in bulk and stored in dirty, wet, or extremely hot or cold conditions for extended periods of time, the tape adhesive could deteriorate.

The bottom line: Every splice has a unique set of variables

which is why you need a unique splicing tape for the job. If you have questions or concerns about a splicing issue or tape failure, [let us help](#). We love solving tape challenges.

Paper Mills – Pivoting to Meet Market Demands

If you thought the paper and pulp industry was going to disappear, think again. True, there has been a marked decline in traditional paper industries like newsprint. However, global trends are driving the need for new and innovative paper products, putting pressure on paper mills and corrugators to innovate and change.

4 Trends Driving Change In the Paper Industry

As a company that's served the paper, pulp, and corrugate industries for four decades, we're keenly aware of how the digital revolution has wreaked havoc on the market. And while there were substantial downturns in the late 1990s and

early 2000s, paper mills are not disappearing—far from it.

We would argue that the industry is going through the most substantial transformation it has seen in many decades. Consider these four statistics as proof:

1. In 2020, the global production of pulp and paper reached 490 million tons, up from 390 million tons in 2018.
2. Global shipping volume surpassed 100 billion parcels in 2020, up from 74 billion parcels in 2017 according to Pitney Bowes.
3. More than 15% of pulp and paper product sales in the United States will occur online, driven by higher demand for raw materials and corrugated boxes.
4. A goal of collecting and recycling 55% of all plastic packages has been set by the European Union and is expected to be reached by 2030. This will impact the pulp and paper industry, in a good way. North America and Asia do not have such governmental standards in place, however in the U.S. particularly, anti-plastic consumer sentiment is expected to drive legislative change.

How Paper Mills Will Pivot and

Profit

While traditional markets like commercial print companies and newspapers have declined in recent years because of laser printing and online media, the opportunity for forest-products companies to innovate has never been greater. At ECHOtape, we see the following trends as opportunities for one of our core markets to pivot and profit.

Recyclable Products. At the forefront of this trend is recycling. The movement to reduce waste from plastic packaging is being driven by changing consumer preferences and for good reason. The massive islands of plastic waste floating in the Pacific Ocean have garnered extensive media attention over the past few years, heightening consumer awareness about the excessive plastic pollution both on land and sea. These preferences are spurring brand owners to replace plastic with renewable and recyclable alternatives and to address plastic in their sustainability goals.

As a result, **the demand by consumers for more sustainable packaging is driving the need for more and better-recycled products.** This has been a challenge in that some products contained coatings that were waterproof and problematic for recycling. Now there is a push to use protective coatings that are recyclable and it's a trend that will further develop in 2020 and beyond. The growing concern over the amount of packaging that could not be recycled has resulted in the involvement of the European Union in the area of plastic packaging. In North America, seven states in the U.S. have plastic bag legislation, and several cities have banned

plastic drinking straws. However, given the nature of the global marketplace, European policies may put pressure on the U.S. to do more.

Either way, this “anti-plastic” sentiment is beneficial to the pulp and paper industry in that it encourages biodegradable alternatives. Simply put, the problems associated with plastic result in a tremendous number of opportunities for paper mills. The development of alternative products will continue well into the next decade, especially as it relates to the banning of single-use plastic products.

Intelligent Packaging. It seems like just about everything is becoming a “smart” version of itself, so why not merge paper with new technology to create products that can do more than just wrap packages? This includes “smart packaging” containing built-in digital sensors. These products are grouped into two types: active packaging and intelligent packaging. Active packaging controls the environment of the product shipped, such as temperature. This could be important in shipping things like food products.

Digital “intelligent” packaging is becoming more important in two ways. First, more kinds of products are being shipped across the globe. Everything from cupcakes to fragile antiques. Being able to control the safe travel of these products and ensure their delivery is becoming more important.

Numbers back this up. U.S. demand for intelligent packaging is expected to grow 8 percent annually. The market was forecast to top \$3.5 billion in 2017. The two largest markets for this

type of packaging are food and beverages, due to new online food ordering and delivery, and pharmaceuticals that are increasing in demand by aging baby boomers.

The second way digital packaging is becoming more crucial is in overall safety. The threat of terrorism is a concern for government and corporation offices receiving packages daily. Having a digital way to identify contents and ensure safety, i.e. tamper-proof packaging, would be of high value. Also, consider money: Embedding traceable chips within “smart” paper money raises the possibility of banks and governments guarding against counterfeiting and fraud.

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Increased Corrugate Demand. Thanks to the explosion of eCommerce, there is a higher demand for raw materials and corrugated boxes, as well as an increase in the number of products that are required immediately with very little lead time. There is also a shift toward more lightweight packaging at all levels, including luxury brands. One of the benefits of lightweight packaging is that it can support the growth of a business by cutting expenses. Lightweight packaging lowers pulp expenses, reduces CO2 emissions and slashes shipping costs, which are just some of the many benefits.

Hygiene Products Packaging. As the middle class grows in developing nations worldwide, so goes the demand for hygiene products such as toilet paper, wipes, tissues, and paper towels, to name a few. Manufacturers in the pulp and paper industry have exploited this growth in socioeconomic status by

producing packaging that accommodates an increasing demand.

Advances in Food Packaging. Packaging for food seems to be in constant development. In recent years, there has been an increasing interest in [packaging products](#) that are resistant to grease, yet do not contain any fluorochemicals. Likewise, there is an increased interest in thermal packaging linked to the increase in food delivery services. Specifically, the explosion of third-party delivery service providers, such as GrubHub and UberEats, has created a need for thermal packaging. As long as consumers expect to have hot food delivered to their home expeditiously, there will be a thriving thermal market in pulp and paper. There are many possibilities and opportunities in this area that will emerge as e-commerce continues to evolve.

Nanocellulose Disruption. Completely new revenue streams are being developed by traditional paper mills through the extraction of nano-materials from cellulose fibers that can be used to enhance the performance of products unrelated to the paper industry such as paints, coatings, cosmetics, adhesives and video screens. That soft, comfortable rayon shirt or sweater is likely the result of a process that regenerates wood fiber called dissolving pulp into high-quality fabrics used throughout the textile industry.

As with any shifting industry trends and remarkable innovations, we're paying close attention. Our tape is used in the production and [converting processes](#) of all kinds of paper. As the industry develops these new substrates and materials,

they will be looking for new kinds of tape to get the coring, tabbing and splicing job done. [We're ready](#) to meet that challenge.

5 Reasons Why Splicing Tape Fails



No matter how it occurs, failure is frustrating and costly.

Especially when it comes to splicing tape failures. Whether it fails because of weakness (snap or tear), carelessness (installation error), or conditions (extreme heat), shutting down any production line is not only incredibly expensive, but potentially catastrophic.

Which is why it's so important to understand how and why splicing tape failures happen.

Most Common Splicing Tape Failures

In our experience, splicing tape failures typically occur for one of five reasons:

1. **Temperature.** Once a splice is made, many times they will get subjected to high heat down the manufacturing line. We're talking 350-degrees or higher. And as we already know, the tackiness of the adhesive tape is very temperature dependent. Too cold and the tape won't bond. Too hot, and the bond might melt.
2. **Operator error.** It's not always roll and go. Did you put enough pressure on the tape? Did you clean the surface before applying the tape? Did you remember to remove the liner? (*Yes, that happened!*)
3. **Machine mis-calibration.** Machines rely on two things to stay running properly: a skilled operator and routine calibration. If a splice bar isn't calibrated properly, the splice might fail. It appears like an adhesive failure, but a micrometer difference in pressure or

angle could affect the success of the splice.

4. **Speed.** Flying splices are called that for a reason. They are splices done at very high speeds. You not only need a high tack for quick stick, but you need it to hold. Splicing tape failures can happen if you do not get one of these features in the tape you select.
5. **Tape release.** This one is simple... you didn't choose the right tape for the substrate.

How To Prevent Splicing Tape Failures

1. Test, and test again. We get it. The package label made monumental promises, but generally speaking, tape testing should always be done prior to use and in the field with real conditions. Always test the tape to make sure it delivers the performance you expect.

2. Check the temperature. Carefully factor in the temperature variables, everything from storage temperature, ambient temperature and running temperature.

3. Check the speed and stress. How fast does the tape have to be applied? How quickly does it need to adhere? What about the stress factor? Splicing tape has to handle stress because the tape is the only thing holding one roll to another.

4. Consider the substrate. The correct tape for the right surface is critical. With new and improved products being made every day by manufacturers, substrates changes and

sometimes the tape for splicing needs to as well.

5. Proper storage. Tape storage is sometimes critical for success. When materials are bought in bulk and stored in dirty, wet or extremely hot or cold conditions for extended periods of time, the tape adhesive could deteriorate. (Read more about [extending the shelf life of your double-sided tape here.](#))

The bottom line: Every splice is different because of different substrates, converting conditions, etc. so you need to match the right tape to the right product.

For more information about tape visit [The Complete Technical Guide to Adhesive Tape.](#) To learn more about ECHOtape and how we help customers find the right tape for their job, you can read about us [here](#) or [contact us](#) with any questions you may have.

Know Your Splice



Depending on what you are converting, the manufacturing process and the substrate, [there all kinds of possible splices.](#) Choosing the wrong one not only increases the risk of tearing but can slow down the converting process or stop it all together

[Splicing tape](#) is no different. Available in a variety of carriers with different adhesive systems, splicing tapes may be single or double-coated; have a polyester, film, or paper carriers; have high-temperature adhesives; be repulpable; the list goes on. How do you choose? Well, like much else in our industry, it's about [choosing the right tape](#) for the right application and conditions. Here's a quick primer.

Know the Splicing Applications

Butt splice. This is a single-sided splice. The paper is not overlapped; rather it butts up against each other and you use a single-sided tape to connect the two pieces over the seam.

Overlap splice. This is double-sided splice, where the ends are overlapped.

W or V splice. Although W and V splices are being phased out, the process was most often used in newsprint and paper mills. The W or V pattern of the tape application creates more surface area, making the seam less likely to tear.

Single or Double Splice?

Single-coated splicing tape is suitable for butt splicing.

Double-coated splicing tapes are suitable for use with laminators, coaters, and other converting operations. They are commonly used in flying splices, manual splices, core starting, and roll finishing applications.

Know Your Material

Paper. Corrugate. Foam. Rubber. Even metal can be spliced. You must know the material, or substrate, the tape is adhering to. For example, coated paper is harder to splice. Used for specialty applications, such as produce boxes and food service containers, coated paper requires an aggressive splicing tape

with higher tack and quick start.

Special finishes that get laminated to wallboard, often used in anti-mold or fireproof products in commercial buildings, are also challenging. They may require an aggressive splicing tape with a very high-temperature range.

Know Your Field Conditions

Temperature. Will the splice be subjected to heat? cold? For example, in certain manufacturing processes, flying splices may often need to go through a heat chamber and so high-temperature resistance is critical so the tape does not fail.

How fast or how slow? Manual or zero speed splices happen by hand, so the roll or machine is either not moving or is moving so slowly (zero speed) that getting a good stick is easier. Flying splices, on the other hand, happen quickly. Both rolls are moving very quickly, yet the splice still needs to get made. For example, the LA Times flying splice is 1200' per minute! This type of splice requires immediate high tack because there's only one chance to stick.

Moisture or Humidity. *Repulpable splicing tapes* dissolve in water. These splicing tapes ensure that the substrate and adhesive do not gum up the machinery and stop the production process in the production of paper, where water is used.

Choose the Right Tape

Not all splicing tape is created equal. Make sure you consider all the facts – your application, material, and conditions. Only then can you match the right tape to your project. ECHOtape's full line of splicing tapes offers productivity and significant cost savings, regardless of what you are splicing.

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Splicing Tape 101

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In the tape world, a splice is a process by which two rolls are combined using tape in order to create one seamless

continuous roll. This is done because the roll of material is getting unwound and is going through some manufacturing or converting process to create an end use product, like a coffee cup sleeve or an Amazon box.

In simple terms, when you have something on a roll (i.e. paper or film) and it needs to go through a converting process to make a finished product (i.e. envelopes, bags, boxes, newspapers, coffee sleeves, packaging), you need to “join” the rolls together to keep manufacturing process going. The process by which these two rolls are combined is called *splicing*. As one roll is unwound, it gets *spliced* roll to roll with tape.

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Obviously, the list goes on, but you get the idea. Splicing makes our daily lives more efficient and more enjoyable, and [splicing tape](#) is the product that makes it possible.

That said, not all tapes are created equal. It's all about finding the right tape for the right application. Newsprint requires a different kind of tape than Styrofoam. Corrugate paper is different than vinyl. If the tape doesn't stick properly, the machines have to be shut down and re-threaded. That can mean thousands and thousands of dollars in lost revenue. In fact, paper mills today do not stop machines at all – they run 24x7. Most have a scheduling maintenance just

one time per year because it's so incredibly expensive to stop and then start the machines!

Different types of materials and manufacturing processes dictate the type of tape and adhesive needed to ensure optimal performance. It's all about finding the right tape for the application and the field conditions. Pretty much what we have been working on for 40+ years with many of our manufacturing clients, regardless of industry.

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