

The Complete Technical Guide for Adhesive Tape

In this comprehensive guide to *all things adhesive tape*, we're sharing 45 years of experience with you including:

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- [A Brief History of Tape](#)
- [How Adhesive Tape is Made](#)
- [What Makes Tape Stick](#)
- [Advantages of Pressure Sensitive Tape](#)
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Read on to find out why adhesive tape is quickly replacing glues and fasteners in manufacturing and construction, and how you can use it on your project today.

What is Adhesive Tape?

Adhesive tape (a.k.a. pressure sensitive tape, PSA tape, self-stick tape, or sticky tape) consists of a pressure-sensitive adhesive coated onto a backing material such as paper, plastic film, cloth, or metal foil.

Some tapes have removable release liners that protect the adhesive until the liner is removed. Some have layers of adhesives, primers, easy release materials, filaments, printing, etc. made for specific functions.

Pressure-sensitive adhesives (PSAs) do not require water, solvent, or heat activation to bond to materials such as paper, plastic, glass, wood, cement, and metal.

PSA tapes are tacky at room temperature in dry form, and they adhere firmly to a variety of surfaces and require only the application of a finger or hand. Technically speaking, that's a [bonding pressure](#) of 14.5 – 29 psi =[^] 10 – 20 N/cm² or greater.

Single-sided tapes allow bonding to a surface or joining of two adjacent or overlapping materials. [Double-sided tape](#) (adhesive on both sides) allows the joining of two items back-to-back.

A Brief History of Tape

The history of stickiness didn't start with tape. It's credited to the bees. Or rather, woodworkers in ancient Egypt used glue made from natural, viscous substances like beeswax and resin to hold materials together.

In modern times before tape, glues and epoxies did most of the sticky work. But they had serious drawbacks, especially in household use. Messiness, permanence, and drying to a hard finish all made traditional glues less-than-ideal.

It wasn't until 1925 that adhesive tape, as we know it today, was invented.

According to [How Stuff Works](#):

"Masking tape, as it became known, was intended to solve a very specific problem: applying two-toned paint jobs to cars. Before masking tape, auto shops were "masking off" for each color application using glue and paper. Peeling off the paper ruined countless paint jobs. Richard Drew, a young research assistant, witnessed one such ruined job and the furious cursing that followed. Drew, who had absolutely zero experience in adhesives, decided, apparently on the spot, to create an adhesive that could be removed from dry paint without peeling it off. Two years later, masking tape was introduced."

Today, adhesive tape comes in all shapes and sizes, with

varying degrees of stickiness, and for close to [45 years](#), [ECHOtape](#) has helped our customers match their specific application needs with the right pressure-sensitive tape.

And in that time, we have found that the majority of people have the same complaints and questions about tape. Here's *almost* everything you need to know about adhesive tape as an industry professional.

How is Adhesive Tape Made?

We could tell you how adhesive tape is made, but this video by The Science Channel is much more fun:

As an aside, this video is also a great example of how tape is used in splicing. But that's another topic for another time.

What Makes Tape Stick?

While the adhesive used on pressure-sensitive tapes might seem alike – they are all tacky, adhere well, and resist stresses – they are actually quite different. There are pros and cons for each tape type, be it rubber/resin, synthetic rubber, acrylic, and silicone-based adhesives.

Rubber/Resin is the oldest type of adhesive based on natural rubber, but it needs a resin to make it into an adhesive.

For many jobs, rubber/resin adhesives offer many advantages:

- It is often a less expensive adhesive.
- Has an initial high tack, as opposed to acrylic which needs time to cure.
- Sticks well to many different surfaces, including some hard-to-stick-to materials.
- Rubber-based adhesives provide highly flexible bonds and are usually based on butadiene-styrene, butyl, polyisobutylene or nitrile compounds.
- It can be formulated to adhere at colder temperatures, but there is a limit, and rubber/resin adhesives have limitations at higher temperatures in its basic form.
- Epoxy resins exhibit high strength and low shrinkage during curing and are known for their toughness and resistance to chemical and environmental damages.

When it comes to disadvantages, rubber/resin's main weakness is that both the rubber and the resin are prone to oxidation from the air. Therefore, exposure to ultraviolet light from the sun and other light sources can break down in heat.

Synthetic Rubber can be used in place of natural rubber. Offering much higher adhesion and shear resistance than natural rubber-based adhesives; as a result, it is very good for sealing packages and cartons.

Acrylic Adhesives Most of the weaknesses of rubber/resin

adhesives are overcome by a single component of pressure-sensitive adhesive based on “acrylic” chemistry. Acrylic is colorless and is stable to oxidation and exposure to ultraviolet light. The stability to oxidation can give an acrylic adhesive tape many years of protection against ultraviolet light. However, it is more expensive – about twice as much as rubber/resins; it’s not quite so good as natural rubber on harder-to-adhere surfaces, and it needs significant time to cure.

Silicone-based Adhesives give many years of service life. Like acrylics, silicone can be used against the skin, so it has many medical applications as well as uses in the electrical industry where temperature is a challenge (e.g., jet engines). Silicone adhesives and sealants have a high degree of flexibility and are resistant to very high temperatures. However, silicones are the most expensive adhesives of all, typically twice as much as acrylics.

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What are the Advantages of Pressure Sensitive Tape?

Traditional adhesives essentially transform from a liquid form into a solid one to adhere. Those processes are a function of the type of adhesive and how it is engineered to work and for

what purpose. The interesting aspect of pressure-sensitive tapes is that they are “just liquid enough” to sufficiently wet the surface the tape contacts.

Conversely, these pressure-sensitive adhesives have enough of a solid-state character to resist any forces trying to remove it. As a result, pressure-sensitive adhesive tapes deliver the ideal means of fastening and offer the following significant advantages:

- Other than ensuring that the surface is clean and dry, there is no preparation necessary.
- Compared with trying to secure something with fasteners such as screws (which can cause various issues depending on the surface to which you need to attach) adhering something with tape can take seconds.
- No special tools are needed, other than something to cut the tape (scissors or a tape dispenser). Many tapes can even be torn by hand. Compared with fasteners such as screws, this is a much easier installation option.
- It isn't messy to use – there are no brushes or application tools and there is no surplus of adhesive or waste of materials.
- Tape is extremely inexpensive compared to sealants, and provides an incredible number of uses per roll.
- Tape can be applied as a die-cut to the exact area needed, further minimizing waste.

- It is uniform in thickness, giving a precise bond.
- It is instantaneous, which means no waiting for drying or chemical reaction.
- The finished bond is stress-free. All other adhesives create stress in the joint when changing state, which can potentially weaken the bond.
- It comes in many different varieties, some of which are tailor-made to very specific applications.

Why Tape Is Better Than Glue

On a job site full of tools and equipment, *the right adhesive tapes can go further than a bucket of screws, for a lot less money.* The versatility of adhesive tape makes it a practical substitute to replace traditional fasteners.

- **Overall, the most compelling case for using tape over glue is that there's less mess, and tape takes less time to get the job done.**
- Available in a range of widths to suit multiple projects, adhesive tape is rated to support pounds per square inch while varying thicknesses and bonding properties combine to **provide construction-strength adhesion for the unique challenges of dissimilar surfaces.**
- Many adhesive tapes **feature a weather and UV-resistant**

stick for “tough to adhere to” surfaces like plastic, glass, and wood.

How To Choose the Right Tape

We get this question a lot: *How do we actually know that it's the right tape for the application and that it's going to last?* And that's totally fair.

Almost everyone we know has a tape failure story, but tape isn't the same as what you grew up with, or even what you used five years ago. Just as the cell phone in your pocket has gotten smaller, faster and smarter, adhesive technology has gotten stronger and more versatile.

On a job site full of tools and specialty equipment, tape may seem as ubiquitous as a hammer and nails. However, nothing beats tape for versatility, portability, and ease of use... that is IF you have the right tape for the job at hand. And that's the conundrum, isn't it? The sheer volume of pressure-sensitive adhesives is so overwhelming that it's hard to know where to begin.

To help, we've created an infographic as a portable field guide for builders and contractors. [You can find it here:](#)

THE SECRET TO CHOOSING THE RIGHT TAPE

A GUIDE FOR BUILDERS + CONTRACTORS



What Conditions Make Tape Fail?

When it comes to tape, you may think you can't believe everything you read. Upon review, a tape's specification sheet can indicate that its adhesive properties are good, but when you use it, the resulting adhesion is poor.

Of course, when this happens, the tape tends to get the blame. But it isn't always your tape for example that is at fault. In fact, it may be the surrounding conditions or even the surface that you are trying to stick the tape to.

If you're facing this challenge, carefully consider every condition that could affect your tape. These can include several variables:

Temperature

Carefully factor in the temperature. Are both the tape and the surface at least 18°C/65°F? The tackiness of the adhesive tape is very temperature-dependent, and **the colder the conditions, the poorer the bond will be**. If you must work at lower temperatures, then use an adhesive tape specifically designed for colder climates.

Related: [Why Tape Doesn't Stick in the Cold](#)

Surface: Is the surface clean? Traces of dust, dirt, grease, and even the slightest trace of moisture will contaminate the adhesive surface and act as a barrier between the two. To best prepare, the surface, give it a quick wash with rubbing alcohol and dry it with a clean cloth.

Uniformity

The typical adhesive tape has a very thin, flat smooth layer of adhesive. Is your surface also flat and smooth, so that the two can uniformly contact one another? If your surface is rough and full of micro “hills and valleys,” the tape can only make contact at the high points – which will result in a weak bond. With a moderately rough surface, you will need a tape with a much thicker adhesive that can fill these valleys, thus providing a major improvement in contact. If it is too rough, then you may need a foam tape with enough deformation to make a good bond.

Chemistry

Is the surface you are working with a plastic or other material? Is it covered with paint or another coating that has a naturally low adhesion or even release quality? Regular adhesive tape won't stick to waxed surfaces, Teflon®, or silicone, and will even have difficulty sticking to polyethylene. A very tacky tape will help, as well as tapes with an adhesive that is based on natural rubber, *but you may need to turn to an adhesive tape specifically designed for your specific surface.*

As a very last resort, you may need to change the character of your surface to get an adhesive tape to stick to it. This could mean roughening it with an abrasive or even treating it with a prime coat that is compatible with both the surface and the adhesive.



How To Test Tape

When a customer comes to us with a challenge, we actually test the tape for them and with them.

There are two ways to do this: Real-world field testing and lab testing. Ideally, we get to do both, like at [The Durability Lab](#), but the bottom line is that the real world test matters most.

What good is a lab report when your building envelope leaks like a sieve, or your flying splice failed because the

adhesive didn't stick fast enough? Not good at all.

So here we're going to walk you through the most common tape testing variables we use at ECHOtape.

Know Your Substrate

One of the most critical aspects of our application trials is to test the tape on the actual substrate which is where real-world applications come into play.

For years, lab tape testing was performed on standardized substrates, like steel, and it did not differentiate performance based on a specific material. Over the last five decades, we have learned how critical a factor this is. The tape may work on one specific substrate and fail on others. Sometimes the tape works on a substrate, but when any changes to the chemistry or condition of the substrate change, the tape could end up failing. Even a small change can have a major effect.

Take, for example, splicing tapes. In many situations, customers need a quick stick while materials are still moving (called a *flying splice*), but then the tape needs to permanently adhere for long-term performance. We first test splicing tape by hand on the substrate – paper, cardboard, flexographic materials – and then see if it pulls fibers. This is good because this shows that the tape has a quick stick.

Then, we move it to the actual machine for real-world testing. A splice can take a blink of an eye and so you need to test the tape in the manufacturing process

Permanent or Temporary Bonding?

Which one you want makes a difference in how you test tape. Here are some more behind-the-scenes insights to our application testing process.

For **temporary bonding**, we are trying to discover whether tape adheres quickly and comes off cleanly..an important field test when considering [protective film](#) or [stucco tape](#). In this scenario, we will apply the same environmental conditions to the adhesives, and see how it performs. Does it apply quickly and evenly? Does it remove easily and without residue? We can certainly duplicate this in the lab, but there's no replacement for real world testing. Which is why it's important that our clients understand that field tape testing takes time. If your issue is stucco tape isn't sticking in 90°F and 100% humidity, it doesn't do us any good to test it in the fall when it's 60°F and 20% humidity.

Permanent bonding is a different animal. Oftentimes, the tape needs to cure to assess performance, like acrylic adhesives that need 72 hours to set. There are two common real-world tests we use here:

- **Shear strength.** This is the force pulling down on the tape. To assess shear strength, we can hang a weight and see what happens. Does the tape slide? Where is the force trying to pull it apart? That is what you need to know when you test bonding.
- **Peel Strength.** Here we measure the degree of adhesion by lifting at 180-degrees, then lifting it the opposite

direction. How well does it stick? Does it delaminate, or rip off the substrate? If it delaminates, it means the tape is stronger than the substrate, something you look for when you need extreme bonding power.

Ultraviolet (UV) Exposure and Aging

UV light is a type of electromagnetic radiation, as are radio waves, infrared radiation, X-rays and gamma rays. It's invisible to the human eye, but it makes a profound effect on adhesives. With prolonged exposure to ultraviolet light, certain chemical materials, such as natural and some synthetic rubbers as well as polyethylene, can experience negative changes to their properties; resulting in them becoming hard and brittle. Absolutely *not* the qualities you want in a tape that needs to hold for any duration in a particular application. (Read our behind the scenes report on [The Durability Lab here.](#))

The good news is that you can minimize the effects of UV light by choosing the right tape. For outdoor use, it is best to stay away from adhesive tapes with a natural or synthetic rubber adhesive. Unless the adhesive has been specially treated with ultraviolet stabilizers or the backing has an ultraviolet light barrier, like a premium outdoor stucco duct tape. There are also adhesive tapes that have been specially designed for prolonged outdoor exposure typically using an acrylic adhesive.

Extreme Temperatures

We are the leaders in [cold weather tape](#) for good reason: our home offices in Canada are ground zero for sub-freezing environmental conditions.

It doesn't get any more real than that.

Still, we do also conduct lab testing. Using a temperature-controlled, environmental chamber, we bring temperatures down below -30°F and assess the outcome. Does it stick, and does it stay secure? The same is true for heat, although real-world tape testing is done in Arizona, Florida, and Texas.

How To Understand An Adhesive Tape Spec Sheet



NEW!

CL-W6064

Industrial Strength Utility Grade Duct Tape

FEATURES

- Aggressive adhesive provides superior holding power
- Excellent quick stick to a wide variety of smooth and rough surfaces
- Flexible backing conforms well to irregular surfaces
- Smooth unwind makes it easier to apply in the field
- Our fine mesh easy-tear cloth leaves a clean crisp edge when torn by hand
- Tape lays flat so there is no twisting and curling
- Smooth unwind makes it easier to apply in the field
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APPLICATIONS

- General purpose construction uses and repair
- Patching and seaming a wide variety of materials
- Temporary holding and bonding
- Hanging and patching polyethylene sheeting
- Sealing polyethylene waste disposal bags
- Smooth unwind makes it easier to apply in the field
- Maintenance applications in manufacturing environment
- Bundling and color coding

TECHNICAL DATA

Thickness	7.0 mils
Carrier	Polyester cloth/polyethylene film
Tensile	17 lbs./in.
Adhesive	Synthetic solvent rubber
Adhesion	65 oz./in.
Elongation	12%
Colors	Black, silver, yellow, red, blue, green, white



For engineers and general contractors, both the tape sample and the specification sheet should be closely reviewed when considering their uses. But what detail does the specification sheet provide and how can the maximum benefit be derived? Here's what you need to look for, whether it's high-bond foam tape, stucco tape or industrial-strength construction-grade duct tape:

- **Construction properties:** The specification sheet will initially provide an accurate verbal description of the tape's construction as well as a summary of its properties. By this information alone, you will know whether or not this is the kind of tape needed.
- **Versatility:** Adhesive tape is highly versatile, and any individual tape can prove to have many other uses than were intended when it was first designed. A pressure-sensitive tape consists of one or more soft amorphous broad molecular weight polymers and often contains several other chemicals. Because of this, even though it is manufactured to tight quality-control specifications, it can't be manufactured to the precision expected of an accurately machined metal part.
- **Adhesive type:** A natural rubber-based system is the general-purpose workhorse type of tape, but if you have special needs from your tape – such as long-term aging, resistance to ultraviolet light, or non-corrosive properties – you will need to look for the higher performance acrylic. *The adhesion level quoted is determined in a test environment (on a steel surface) in a very specific way, so your own end-use probably won't duplicate this. But the specifications should serve as a helpful guide to what level of adhesion you can expect when compared to the adhesion*

quotes of other tapes.

- **Tensile strength and elongation information:** The relationship between the tensile strength quoted and its elongation is far from linear, but you can get a rough estimate of the elongation expected when the typical slight application tensile force of less than a pound or two is applied to the tape. With plastic films, this stretch will be elastic and the tape will want to recover, but with paper, it will be “dead stretch” with no recovery.
 - **Temperature limits:** Where the tape is intended for a higher temperature operation, the upper temperature limit will be quoted. Note however there is no tolerance with the upper working temperature, so the tape should not be used above this quote.
 - **Resistance to shear:** The resistance to shear (minimized effect of adhesive bleed or the “oozing” of adhesive beyond the tape) will also be given when it is key to good performance.
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What is Adhesion Value, Exactly?

Tapes are often rated by adhesion value, which can be helpful **if** you know what it means. Here are a few examples:

- Looking for a removable tape? You definitely need low adhesion. A protective tape offers the lowest adhesion – at around 10 ounces per inch – while a masking tape would be around 25-35 ounces per inch.
 - A more difficult surface? You will need a higher adhesion level, perhaps even up to 45-60 ounces per inch. Additionally, if the tape is for a permanent application, it will usually call for a high adhesion value.
 - If the use is both permanent and on a porous surface, such as corrugated cardboard, then as long as the adhesive strength of the tape to the cardboard is higher than the internal strength of the cardboard (as evidenced by the tape tearing the surface of the cardboard), there is ample adhesion for the job – making adhesions of 60-100 ounces per inch totally unnecessary.
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- If the tape is for a rough surface, it means that the adhesive contact could be poor. So it may not be a high adhesion tape that is needed, but one with a thicker adhesive to better contact the surface. Similarly, a tackier tape might work better on a hard-to-adhere surface than one with a higher adhesion.
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Tensile Force vs. Shear Force

When it comes to determining if a particular tape is right for your construction project, there are two forces to consider: tensile force and shear force.

Tensile force influences the elastic property of the adhesive. Specifically, it will first stretch the adhesive before finally pulling it away from the surface. If a tensile force causes a failure, it will most likely *be in the adhesive at the surface*. Therefore, adhesion testing that measures the elastic character of the adhesive, and how much force it can take, will help you select the right tape.

A **shear force** works parallel to the surface – it is the major force at work in double-sided tapes. Shear force resistance testing – often called “Holding Power” – is an effective way to measure the internal strength of the adhesive (known as “cohesion”).

Most adhesive failures or separation occur as a combination of both tensile and shear forces, it is extremely helpful to know what forces could potentially affect your tape.

Keep in mind that if the outside force is large enough, and is continuously applied, all tapes will eventually fail. It's not a matter of “if,” but “when” – it may take an hour, a week, a year, or more, *but if a tape isn't designed to withstand the outside forces, it will eventually fail.*

Release Liners: What Are They and Why Do You Need Them?

For tape, because of how it is dispensed, the adhesive part must contact its own backing yet still be able to unwind easily. To achieve this, the backing must provide a low-adhesion release surface. In other words...not stick to itself!

- Paper tapes need a coating known as backsize, as well as a low-surface energy coating known as a release coat. Plastic films only require a release coat.
- The backing on foam tape won't allow the adhesive to come in contact with it
- For aluminum foil tapes, the act of unwinding it from its own backing will cause it to ripple and distort the foil, which will adversely affect the contact area as well as the appearance.

For all of the above, the best solution is to use a facing material with a low surface energy, usually a paper or a plastic film that has been treated with a silicone release coat. They could also be a polyethylene film that already has a low enough surface energy to work as release facing, or even a silicone-coated polyester film.





Adhesive Tape is a Universal Tool

In short, pressure-sensitive adhesive tape is the industrialist's dream come true. It is the universal tool that simply and conveniently solves many different fastening challenges. These tapes come in a wide variety of backings, each suitable for specific end-uses. This is exactly why adhesive tape use is on the rise in high-performance building and construction. If you're still using glues, sealants or even nails, consider pressure-sensitive tape.

[Contact the ECHOtape team](#) today to find the right tape for your application.

Related:

- [The Complete Guide to Duct Tape](#)
 - [8 Reasons Double Sided Tape Will Fail](#)
 - [The Durability Lab & The Value of Site Visits](#)
 - [The ECHOtape Story](#)
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10 Simple Tips to Remove Adhesive Tape Residue



What's the No. 1 reason why [contractors love to use adhesive tape](#) on the job site? Because it sticks in almost any condition. That, of course, is the same reason why we loathe it when it won't come off. Heavy duty construction adhesives and their sticky, gooey tape residue can be a real challenge to remove from surfaces.

Why does this happen, and what can you do about it? Our site did a great job explaining why residue occurs, but what you really want to know is... how can you remove tape residue without damaging the underlying material, right?!

10 Simple Solutions to Remove Tape Residue

1. **Test first!** Please test your residue remover in an unnoticeable area first to make sure there will be no damage to the surface. This is especially true for wood, painted surfaces and any high gloss finished surface as the agents in some removers can dull the surface and or discolor them!
2. **Make it quick.** Think of tape like a band-aid. Removing it slowly allows flow and separation, creating more stickiness (and pain!), while ripping it off in one motion makes for a clean, less painful removal. This is not necessarily true for all surfaces; this is an ideal technique for tape that has been on for a few days while the tape is still tacky, but if the tape has dried out take a little more time to take it off not to damage the surfaces as the surface may also be affected if the tape has been on too long especially painted walls.
3. **Scrape it.** To remove small amounts of construction adhesives from your paneling, molding, and floor, use a putty knife to scrape the adhesive off. Just be careful not to drive the edge of the knife too hard on the surface to avoid causing damage. (For stone or mirrored scratch-resistant surfaces, consider using a straight blade to scrape residue away.)

4. **Try warm, soapy water.** For surfaces such as acrylic, plaster, asphalt, copper, enamel, glass, linoleum, marble, pewter, plexiglass, and all things vinyl, all you need is warm, sudsy water. The warm water will soften the tape so it can be removed with a sponge or cloth.
5. **Apply heat.** Much like warm water softens tape, heat can help melt stubborn adhesives without damaging the surface of your floor or wall. Just one minute with a hairdryer, heat gun or even a blow torch will do the trick. Gently scrape off the adhesive while you apply heat on the surface of your floor or wall. Once the surface is cold, the construction adhesive tends to harden, so it becomes difficult for you to remove it without damaging your floor or wall.
6. **Apply pressure.** Stubborn construction adhesives on rocks, bricks, concrete, and other hard materials can be removed by blasting the surface with high-powered water pressure system or through sandblasting. Water pressure and sandblasting work well, but they can also leave some marks on the surface of the rock, bricks, and other hard materials, so keep that in mind.
7. **Brush it off.** Do not use soap on stone surfaces such as bluestone, brick, concrete, granite, limestone, terrazzo, and masonry tile. It will leave a hard-to-removes scum. Instead, mix together a solution of laundry detergent or baking soda with a little water to form a paste. With a soft brush (a toothbrush is good for small areas) gently spread the solution over the

gummy portion until it is removed, and then rinse with clear warm water

8. **Alcohol to the rescue.** Consider using a little rubbing alcohol, which is a non-solvent for pressure-sensitive adhesives. When you apply rubbing alcohol, the adhesive residue will lose its adhesion and will precipitate. This can also work with acetone, or nail polish remover. Keep in mind that alcohol or acetone may damage painted surfaces, so be careful when using these substances.
9. **Commercial products.** Should these methods not work, some contractors we know swear by [Goo Gone](#) or Goof Off.
10. **WD-40.** Use a rag with a bit of texture to it – for example, terry cloth as opposed to an old t-shirt – and soak a small area of it with WD-40, then scrub at the residue. If there is a lot of residue, you can spray the residue and let it sit for just a minute before scrubbing. Obviously, don't do this on anything that the oil in WD-40 would harm! After removing the residue, it's really important to wash off any WD-40 remnants with soapy water and dry before reapplying new adhesive.

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How To Prevent Tape Residue

First, it helps to know [why tape sticks](#) and what role your surface plays in adhesion. Only then can you choose the correct tape. [Duct tape](#) on drywall? Not a good idea. Some

people prefer to use [Gaffer's Tape](#) to duct tape because it leaves far less residue. That's true – it's wonderful tape – but it's also much more expensive than duct tape and it isn't always the right solution for a construction project. All this to say that a little research will go a long way in preventing any sticky issues.

Always, always clean and dry your surface before applying tape. Dirt, grease, lint, old paint, wet paint, plaster... it all increases the probability of extra adhesion (a.k.a. Leftover residue), but more importantly, it's can be [the reason that makes the tape fail](#). You could also consider updating your tape. Removing old tape, cleaning the surface and applying fresh tape reduces the adhesion build-up. This is especially true of [masking tape](#).

Last, but not least, there are specialty tapes specifically designed to leave no residue (i.e. [stucco tape](#)). If residue issues create more work on site, it may be worth considering [a more expensive tape that does the job properly](#) the first time. Sometimes the true cost of the project isn't just the price of the tape, but the labor it saves as well.

Still not sure which tape to choose? Download our PDF, [The Secret to Choosing The Right Tape](#), and browse our selection of [high-quality tape](#) solutions! To learn more about how [ECHOtape](#) can help you, [contact us](#) with any questions. We love to solve tape challenges!

Why Doesn't Adhesive Tape Stick in the Cold?

Why doesn't your adhesive tape stick in the cold weather? Why does it become dry, brittle, and offers little-to-no tack? Why does it lift and peel within days?

To fully understand the reason why adhesive tape doesn't stick in the cold requires consideration of the variety of different types of adhesives available and the way they are created. Some are applied as a liquid and then they transform into a solid. Depending on their function, they are engineered accordingly.

What Exactly Happens to Tape in the Cold?

What makes [adhesive tape](#) different from other adhesives is that they have the properties of *both a liquid and a solid*. The liquid component is needed to provide the "wetness" (tack or stickiness) for good initial contact, and the solid component is critical to resist any forces (AKA sheer strength) that could threaten to remove the application.

Yet when cold temperatures occur, the liquid component of the adhesive tape hardens, similar to what happens to butter in the refrigerator. The tape loses its natural form and its overall tackiness. It can therefore no longer make the adequate contact needed for good adhesion. If the temperatures continue to drop, the tape will eventually freeze, turning the liquid component into a tack-free solid.

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When Does Tape Freeze in the Cold?

So at what temperature does this happen? It depends on the type and design of the adhesive. Typical adhesive tapes will freeze long before the freezing temperature of water is reached; while other specially designed tapes will continue to stick below freezing temperatures.

When the tape won't stick because it's too cold, you have two options:

- Increase the temperature of the tape and the surface the tape is applied to; ideally to around 20 degrees Celsius.
- Get a tape that is specifically engineered and designed to work in cold weather

Bottom line is that when you are working on a tape application in cold weather, you will need a cold-weather tape that's

right for the job. Not all tapes are designed to work in this type of weather. ECHOtape's global head office is in Canada, so we have been attuned to this issue since the inception [of the company](#). Look to us when you need a cold-weather tape that can work!

For more information about tape visit [The Complete Technical Guide to Adhesive Tape](#). or [contact us](#) with any questions you may have about your cold weather tape requirements.

Why Adhesive Tape Doesn't Stick (And How To Make Tape Stick Better)

No matter the situation, ***"it won't stick"*** is the single most common complaint we hear about any adhesive. And the tape gets all the blame.

But after four decades of investigating tape complaints and perfecting sticky formulas for many applications, we've found that **the problem is rarely the tape alone**. Here's why your tape doesn't stick, and a checklist to help you troubleshoot your sticky issues

Why Your Tape Doesn't Stick – A Checklist

According to Risa Edelstein, ECHOtape's Director of Marketing:

"Nine out of 10 times, when customers say, 'Your tape is not working,' the problem is not the tape. Usually, the wrong tape is being used – be it one that is not engineered to adhere in extreme temperatures or remove easily from stucco. Temperature, weather, surface conditions, chemistry and application all play vital roles in sticky success – or failure as the case may be."

Since there are so many factors that go into the effectiveness of tape, we created a checklist to help you troubleshoot your sticky issues.

Has The Same Tape Worked Before?

If you used the same type of tape before and it worked, but now it doesn't, then consider what has changed. Are the conditions different – colder, wetter, hotter? Did you apply it differently?

This should be the first step in diagnosing why your tape isn't sticking.

Is The Tape New?

If the tape is new and it isn't sticking, it might be the wrong tape for the job. Visit [The Complete Technical Guide to Adhesive Tape](#) to find a downloadable infographic on the subject.

Was The Surface Clean?

Ideally, the surface must be **clean, dry, and oil free**. When in doubt, wash the surface with rubbing alcohol and dry it thoroughly with a soft cloth.

Was It The Surface Texture?

Do you have a flat, smooth surface that makes good contact with the tape's adhesive? Or do you have a rough surface that leads to minimal contact and requires a thick adhesive? Try testing the tape on a flat, clean surface (metal or glass always works well), and see if your tape adheres well there. If so, your problem may be a rough surface.

Could It Be Chemistry?

Some surfaces like polyethylene or PVC or concrete are especially hard to adhere. A tacky tape will help, but if not, try a different roll and see if the trouble persists. Or as described above, try the tape on a flat, clean glass or metal surface. If it sticks well, chances are the problem is the surface and not the tape.

Are You Trying To Stick To Cardboard?

If so, remember that cardboard is sometimes made from recycled material, which tends to have many small fibers on the surface that break away very easily. You may need a tape that is designed explicitly for recycled cardboard.

Could The Tape Be Too Old?

Like most products, adhesive tapes will deteriorate over time and lose their adhesive properties. Does your problem disappear when a fresh roll of tape is used? If not, it's time to toss out that old tape.

Could It Be The Temperature?

Most tapes won't stick if the roll or the surface is too cold. Learn more about [cold weather issues here](#).

Was It Installed Properly?

It may seem simple, but knowing how to apply tape properly plays a huge role in whether or not the adhesive sticks. As the name '*pressure sensitive adhesive*' implies, there needs to be an application pressure across the entire width to get the contact necessary for a good bond. If you don't have good pressure, you won't have a good bond.

Could It Be You?

Are your hands clean, or could you be inadvertently causing

contamination? For example, if you recently worked on a car engine or used hand cream, you could be adversely affecting the surface. Clean your hands a try again.

How to Make Tape Stick Better



If you're struggling with duct tape that doesn't stick, or any other type of tape for that matter, there are a few steps

you can take.

Clean the Surface

Tape works best when the surface area is clean, meaning 100% free of dirt, oil, and debris. You want to eliminate anything that can get between the surface and the tape in order to create direct contact with the adhesive.

Use the Right Tape

Tape is extremely versatile, but that doesn't mean that one kind of tape can handle every type of job (although duct tape comes close). When you have a project that requires joining two surfaces, make sure to use the right tape for the job. For instance, if the surface is not very smooth, use a tape with a thick adhesive.

For more information, check out our guide to [choosing the right tape](#).

Store Your Tape Properly

Store your tape at room temperature, away from light and moisture to prolong its longevity. Tape stored in wet and hot environments will degrade much faster than properly stored tape. Cold temperatures can also dry out the adhesive, rendering the tape virtually worthless.

Use New Tape

If your old tape wasn't stored properly, or if it's very old, it's time to pick up a new roll. Just like anything, tape isn't invincible to the effects of time. And double-sided tape is twice as susceptible, so it needs to be replaced more frequently.

Check the Temperature

If the tape or the surface is too hot or too cold, it won't stick. If it's sweltering outside, wait until the evening when it cools down to apply the tape. If it's too cold, try to warm up the tape and the surface before application.

Clean Your Hands

If your hands are greasy or dirty, they can disrupt the adhesive bond of tape. If you recently worked with oil or apply lotion, grease can get on the tape and ruin its stickiness.

Likewise, dirt and mud can get between the surface and the adhesive and disrupt the bond.

When In Doubt, Test It Out

Our motto at [ECHOtape](#) is: **When in doubt, test it out!** Start

by simply using a different roll of tape – preferably the same kind, but from a different batch – to determine if the problem persists.

It's all about experimenting and problem-solving.

If you've gone through our checklist and tried everything, but your tape still doesn't stick, [contact us](#). We love to solve tape challenges!

4 Quick Tests for Tape in the Field

We get this question a lot: *How do we actually know that it's the right tape for the application and that it's going to last?* And that's totally fair. Almost everyone we know has a tape failure story, but pressure sensitive tape isn't the same as what you grew up with, or even what you used five years ago. BUT... you don't have to take our word for it. When a customer comes to us with a challenge, we actually test the tape for them and with them.



There are two ways we do this: Real-world field testing and lab testing. Ideally, we get to do both, but the bottom line is that the real world test matters most. We explore the most common tape testing variables we use here at ECHOtape in our post, [The Complete Technical Guide to Adhesive Tape](#). Think substrate testing, shear strength, tensile force, and UV exposure. All of which are great; we love a good lab analysis report. But... what do you do when you're on a job site and need to know more about a tape's properties? Try

one, or all, of the following field tests.

Four Quick Tape Tests to Use In The Field

Acrylic or Rubber? Not sure if the tape has an acrylic or rubber adhesive? Try **The Sniff Test**. A colorless transparent adhesive suggests that it might be an acrylic tape, typically providing good adhesion in extreme temperatures. To check, strip a fresh piece from the roll, put your nose close to the fresh surface and smell it. If it smells a little acrid it could be acrylic. If it smells smoky or like rubber, chances are good that the tape is a natural rubber (or hot melt type, see next paragraph) which offers superior holding power in the 45° to 120°F range.

Hot melt or not? To determine if your tape is made with a hotmelt adhesive, try the **“Duck’s Foot” test**. Make a little nick in the tape and then very slowly tear the tape and examine what’s happening in the tear itself. Is it separating, or is a web of adhesive like a duck’s foot appearing across the tear? The telltale sign of the duck’s foot tells you that it is most likely a hot melt adhesive tape. (To learn more about adhesives and what they do, visit our [Complete Technical Guide to Tape.](#))

Is the tape still good? Will it stick? If you aren’t sure how old the tape is or where it’s been stored, you should start by checking the adhesive levels. Your best bet is to use a flat,

smooth, consistent test surface. We've found that glass works well; just make sure the glass is clean and dry and try to conduct this test in "comfortable" temperatures, since cold weather will lead to poor results, even with good tape.

Start by removing two or three layers from the tape you're testing (to avoid tape that might have been contaminated), and then tear off several inches. Keep your fingers at the ends of the length of tape, lay it on the glass, and smooth it down with your fingers. Next, take a credit card and use it as a squeegee, sliding it toward you over the tape surface two or three times. If you are comparing your roll of tape with another roll, you may want to repeat this with a sample from that roll.

Take one end of the tape and peel it from the glass at right angles, stripping it at about one inch every five seconds. If it holds pretty well, then you know that both the tack (the tape bonding to the glass) and the adhesion (the tape sticking to the glass) are both satisfactory. You can also check the glass surface for any adhesive residue. A good tape will remove cleanly.

How good is my general purpose duct tape? Not all duct tapes are created equal. With hundreds of variations on the market, how do you know you have the right one for your job? Start by looking carefully at the back. Does it have little dimples, or can you see a very strong and distinct cloth pattern? By counting the cloth or dimples, you can determine the weave of cloth being used. Low-end duct tapes can have a count as low



as seven yarns per inch along the tape and 18 yarns per inch across the tape. Just like bed sheets, the higher the count, the higher the quality of tape.

Remember: Not all [adhesives](#) are created equal, so make sure you consider all the facts related to your job, including the surface, the temperature, ultraviolet light, the type of application you are trying to create, and more.

That said, even after more than [40 years testing tape](#) in real life, and in the lab, we are still learning new things every single day. Part of that is thanks to our customers, who are constantly pushing us to innovate products that meet their needs. Did we answer your questions about testing tape in the field or on the job site? If not, [tell us about it](#) and let's see what happens!

How to Store Adhesive Tape

When it comes to food, refrigeration protects the items from spoilage and “use by” dates help guarantee freshness. If only all products came with such clear guidelines, right? While your metal tools or hammers might be impervious to the elements, building materials like latex paint and adhesive tape can, and will, degrade over time. Tape storage is a key element in longevity. Why? Well... it all comes down to how tape is made.

A Closer Look at Adhesive Tapes

Pressure sensitive adhesive tapes are only possible by chemistry, which in and of itself is always vulnerable to physical and environmental stressors. (We explain more about the chemistry of tape [here](#).) Materials like natural rubber used in the adhesive, or certain resins utilized in pressure-sensitive adhesives, can have their bonds broken by the effects of oxygen, as well as exposure to extreme heat, and from natural and artificial light sources. These reactions organically continue over time which can often cause changes to the tape’s adhesive properties.

But that’s just one example. Adhesive tape degradation comes down to four simple causes:

Applied Stress: mechanical, electrical, radiation, or other stresses.

Temperature: the higher the temperature, the more rapid the change.

Environment: can be the gases, liquids or solids that come in contact with the object.

The overall effects of these three types of changes are governed by how long each condition exists. In other words, they are all dependent upon **Time**, the fourth controlling factor. For tape, aging is particularly impactful as chemical changes gradually occur between the several components of the tape itself.

Makes sense, right?

While tape manufacturers may add antioxidants in addition to heat and light stabilizers into their various formulas to offset the effects of aging, *these do not protect a tape's reliability indefinitely*. Like using sunscreen at the beach, these are temporary measures. Only longer-term solutions will deter the degradation process.

To avoid the natural course of chemistry undermining the integrity of any tape, the first step is to always follow the manufacturer's suggested storage and use. Proper storage not only extends the shelf life of your tape but ensures its effectiveness and gives you the best value for your dollar.

The Best Tape Storage Tips

So how can you keep your tape inventory at the same optimal quality as the first day it is delivered to the job site?

1. First, you should store tape somewhere away from the light, particularly windows. *Ultraviolet light can even penetrate the packaging with time.*
2. Then, you should store the tape in a cool place; the cooler the better, preferably 60°F/15°C or cooler.
3. Also, make sure to keep it dry. Even the presence of moisture in the air can contribute to a chemical reaction. *Just take it out of storage a day or two before you need it to let it recover to room temperature.*
4. You should also store your tape in such a way that you know when each lot was delivered so that you can use the oldest tape first.
5. Find out from your supplier what a safe height would be to stack the cases of tape and the skids on top of one another. Certain tapes can be crushed and badly damaged when the boxes are overloaded. Ideally, the storage should be on racks and take up just one skid.
6. Besides proper stacking and cool, dark, and dry storage, best tape storage practices dictate rotation of stock to yield the best value out of your adhesive tapes.

4 Tips for Storing Tape in Your Truck

While certain jobs call for specific tools, it's always useful to keep the basics on-hand. Maybe you have a go-to tool kit or maybe you keep your supplies in your truck box. Either way, it's worth looking into how you store your tape on the go.

Understand each tape's properties. Read the manufacturer's specifications and recommended tips for tape storage. Some tapes are designed to stand up to high heat temperatures. Therefore it's adhesive will fare better in your truck over a long summer of 90°+ days than standard duct tape will.

Avoid exposure to direct sunlight. Do not leave your tape near the window where it can soak in UV rays for a prolonged period of time. Ultraviolet light can affect the chemistry of a tape's adhesive and cause it to become hard and brittle.

Be mindful of temperatures. Try to avoid both extreme heat and cold. High heat can melt a tape's adhesive and cause it to become a sticky mess. At the other extreme, if left in your truck amid freezing temperatures tape's adhesive may become too brittle to work. Ideally, tape should be stored in a cool, dry location. This isn't always possible to try to keep tape stored somewhere else other than your truck when outside temperatures get to extremes. If that is impossible, keep only the amount you will use in a day in the truck and keep restocking as needed.

Have a system for cycling your tape. No matter how well you take care of your tape, you cannot maintain its reliability indefinitely. The best solution is to cycle your tape. Devise a labeling system so that you use the oldest tape first.

If you aren't sure how old your tape is, test it first. There's a great post about [testing tape quickly in the field](#) here.

While tape doesn't get better with age when left to its own devices, paying attention to the variables that maintain a product's integrity will ensure it is ready to use when needed.

If you have any questions about aging in adhesive tape, or how to minimize it, please [contact the ECHOtape team](#) today. We've been [helping customers](#) find the right tape for more than 40 years. Our friendly, knowledgeable experts are ready for any question – no matter how technical!