

Your guide to tapes

Pressure sensitive adhesive tape is fast becoming a performance match for mechanical fixings and an aesthetically pleasing alternative.

The way to get tape to perform like fixings is knowing that you need to consider these three things...

- 1 Your job
- 2 Your materials
- 3 Surface environment

Only then can you match the right adhesive with your project and decide if you need heat-resistant, extra wide, or speciality outdoor double-sided tape, for example.

By thinking about and answering these questions with regards to the tape adhesive, you can increase the longevity and success of your projects.

Eliminate most tape failures by following this one simple rule: **Choose the right tape for the job.** Sounds easy enough, but as tempting as it may be to use one tape for a multitude of applications, this will cause endless problems with your results. Tapes are specific to projects and designed for specialised uses. You wouldn't use the same screw for every fitting, so why would you use the same tape?



Step 1: What surfaces are you bonding?

Choosing the right double-sided tape begins by evaluating the surface characteristics of the two substrates you're trying to stick together. For example, the flatter and smoother the surfaces are, i.e. glass, aluminum, PVC, smooth wood, ABS, polycarbonate, the thinner the tape can be. Conversely, the rougher the surface is, i.e. wood, cement, brick, fluted panels, the rougher the surface, the thicker the adhesive tape needs to be to provide adequate contact.

Step 2: What is your surface energy?

All surfaces have a property known as surface energy - the degree of attraction or repulsion force a material surface exerts on another material. Substrates with a high surface energy form very good surfaces for bonding, like glass, glazed tiles and bare metals.

Plastics can vary from reasonably easy to very poor. For example materials like silicone, polypropylene and polyethylene have "low surface energy" that conventional adhesives won't stick to at all. These materials are therefore very hard to stick to and call for a higher adhesion and a very tacky adhesive.

Chemical Migration

Liquids such as oils, plasticizers in PVC to provide flexibility, can migrate to the tape making the glue a gummy mess. Make sure you use a tape specifically designed for PVC applications.

It's also important to take treated surfaces into consideration. For example, if a surface is coated with paint, the tape might stick well to the coating, but if there is a weak bond (low surface energy) underneath, the tape and the paint might peel off.

Step 3: What temperature resistance do you need?

Next, take your environment into consideration and choose a temperature-resistant tape. 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 a double-sided tape specifically designed for colder climates. The same holds true for extremely hot or wet conditions. Humidity, dirt, and UV conditions all play a role.



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, wipe with a clean lint free cloth and a suitable solvent that does not attack the surface to be bonded. A popular choice is IPA.

As a last resort, you may need to change the character of your surface to get an adhesive tape to stick to it. This could mean keying it with an abrasive pad or applying a coat of primer that is compatible with both the surface and the adhesive.



Step 4: What other conditions should I consider?

How long do you need the tape to hold? Meaning, do you need a temporary or permanent solution? If you need to remove the tape, do you need it to be a clean removal?

- What will the tape be exposed to while you are applying it, and afterward? Consider moisture, heat, cold, water, UV, and dirt
- Does the tape need to be a certain thickness for the application to work?
- What width do you need? The correct surface to weight ratio needs to be considered - have you applied enough tape?
- Is there any heat involved in the application process, i.e. in manufacturing?



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Engineered Plastics

Engineered Plastics are very common in manufacturing: they're low-cost, strong and sturdy, yet they're also lightweight and easy to mold into complicated shapes to suit specific needs. Engineered Plastics have higher surface energies than LSE Plastics, so they're easier for tapes and adhesives to spread and adhere.



Low Surface Energy Plastics

LSE Plastics are generally soft, low-density and have a low melting point. These low surface energy materials stick together and repel liquids, making them difficult to bond. 3M has designed adhesives and tapes that work, but there are far fewer options to choose from.



Tape Storage

As a general rule, the storage of adhesive tapes should be at room or ambient temperature and at 50-70% relative humidity. Store out of direct sunlight in a clean environment. Individual tapes will have further storage information on their data sheets.