

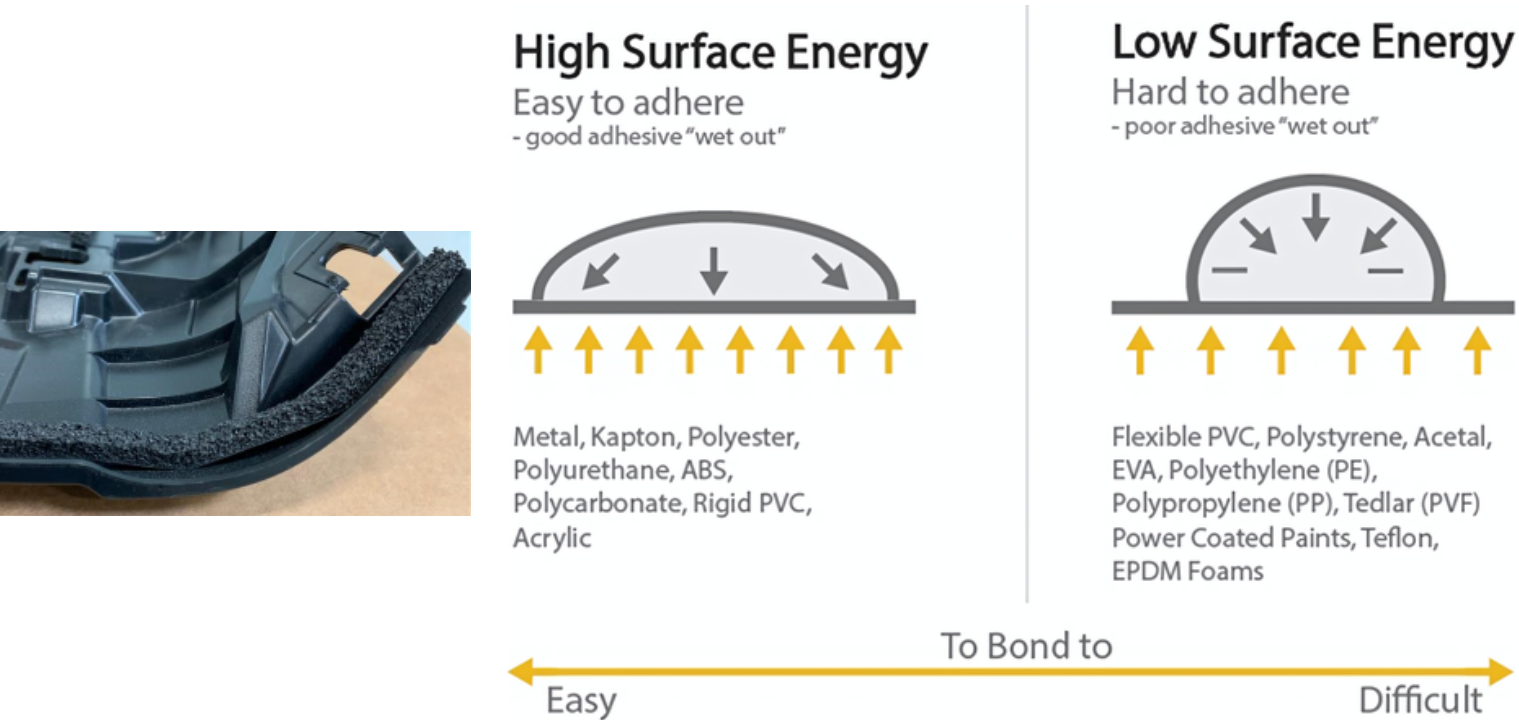
ADHESIVE FOAM TAPE APPLICATION

WET-OUT PROCEDURES AND SYSTEMS – A TECHNICAL COMPARISON

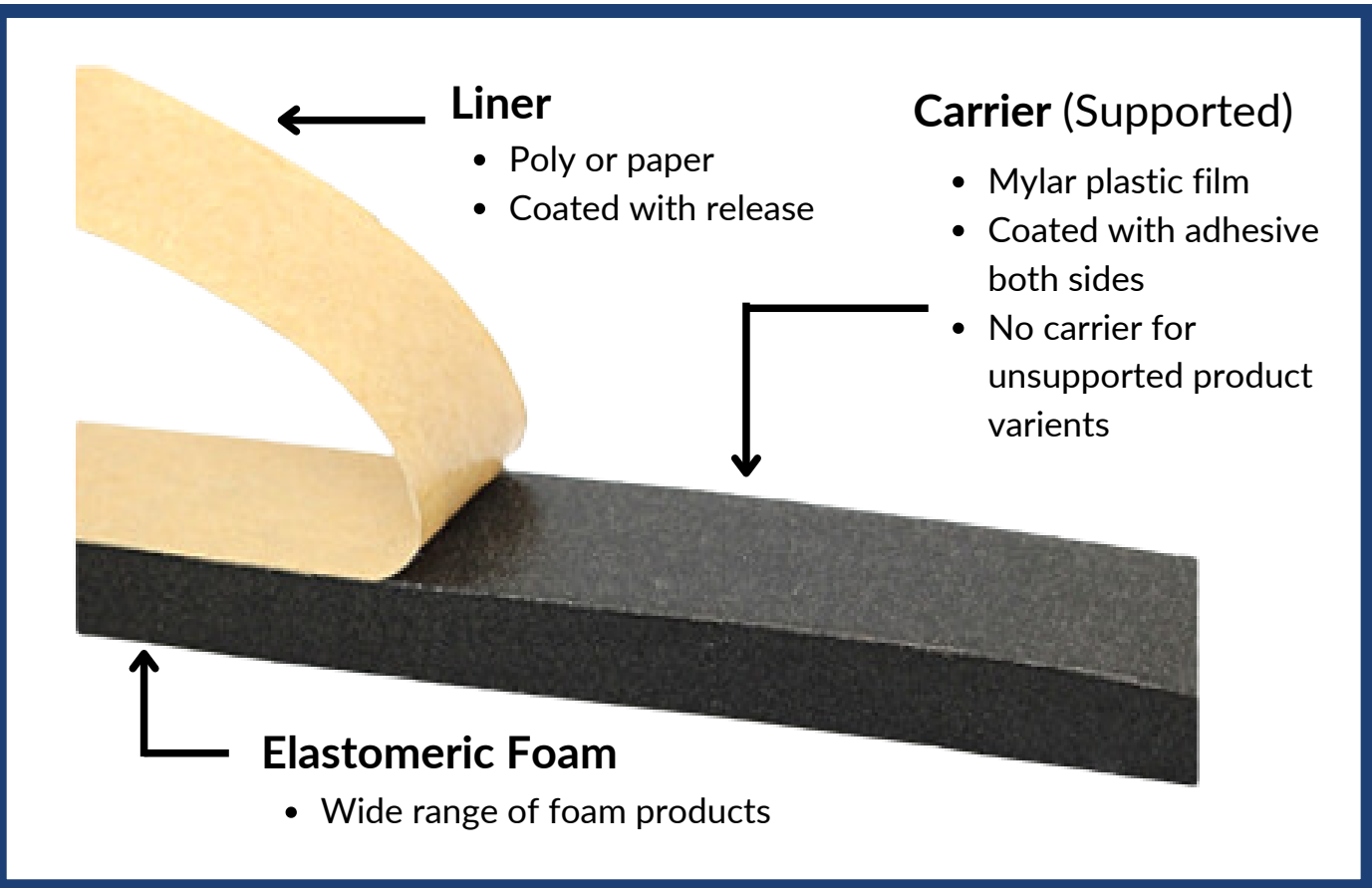
1) Why is wet out required?

Proper bonding to the substrate is essential for adhesive tape to provide its intended benefit. The RoboTape system is capable of installing adhesive foam tape to meet a variety of specifications.

Some adhesive tapes have pressure sensitive adhesive (PSA) which requires a certain amount of force to activate the adhesive. Generally, forces are specified by the manufacturer and can vary between 1-29 PSI. It is important to note the distinction between PSAs and general wet-out requirements. Certain equipment manufacturers use adhesive tape for critical applications, (such as preventing water intrusion into electronics enclosures) and therefore have developed their own internal ‘wet-out’ requirements. These requirements may differ from manufacturer specifications and our goal is to satisfy both.



Application constraints need to be considered before choosing an appropriate wet-out system. If cycle time is a concern, a separate wet-out station may be prohibitive. Whereas if size and space is limited, an integrated end effector wet-out may not be appropriate. The purpose of this document is to assist in identifying the appropriate wet-out means. This document is only a guideline, custom solutions may be necessary to meet all of the specifications.



Note: For proper bonding, surface must be clean, free from oil or contaminants and with adhesive selected specifically for the substrate. Bonding to low surface energy plastics requires special attention.

2) Integrated end effector wet out

An integrated wet-out system is a streamline addition to our RoboTape system. Generally speaking, it can reduce overall capital equipment while still providing necessary force feedback. It can be integrated to existing tools or new designs with minimal changes.

There are two types identified; fixed and actuated. Fixed rollers are an effective option when wet-out specifications are loose. The effectiveness has been proven through vigorous testing. Actuated rollers provide a degree of compliance while also allowing for integration of measurement and validation equipment. They are a preferred choice when specifications need to be met.

The chart below compares some of the integrated wet-out options.

System	Feedback & Control	Method	What is best?
Actuated roller	Manual	Pressure controlled via manual regulator and analogue position sensing	Ideal for when wet-out pressure is required but confirmation is not critical
Actuated roller	Basic	Pass-fail monitoring of wet-out pressure and analogue position sensing	Ideal for scenarios when wet-out is crucial and must be monitored within a range every cycle, data storage can be added
Actuated roller	Advanced	Live monitoring of wet-out pressure data and analogue position sensing	Ideal for crucial applications when live readings of pressure is necessary to ensure the proper application of the material, storage of data can be added
Actuated roller	Advanced with control	Live monitoring of wet-out pressure data with live pressure adjustments via proportional regulator and analogue position sensing	Ideal for crucial applications when live readings and adjustment of pressure is necessary to ensure the proper application of the material, storage of data can be added

3) Dedicated wet-out station

A dedicated wet-out station is an alternative option that can be beneficial by removing the process from the robot applicator head, thereby allowing for greater control over the wet-out process. In addition, wet-out measurement can be completed without the variability of the robotic movements. This can be a better choice when very precise measurement is required. Certain part geometry may also require the use of a dedicated wet-out station when a roller is ineffective at reaching the required areas. These systems can exist in a variety of forms including a contoured press-actuated tool, a robotic end effector or wet-out by component assembly.

Dedicated wet-out stations can also be combined with other operations such as camera inspection, deburr, clip install and part unload. This method may be preferred to split complexity between stations; in some scenarios it may even be possible to trim cycle time with this method.