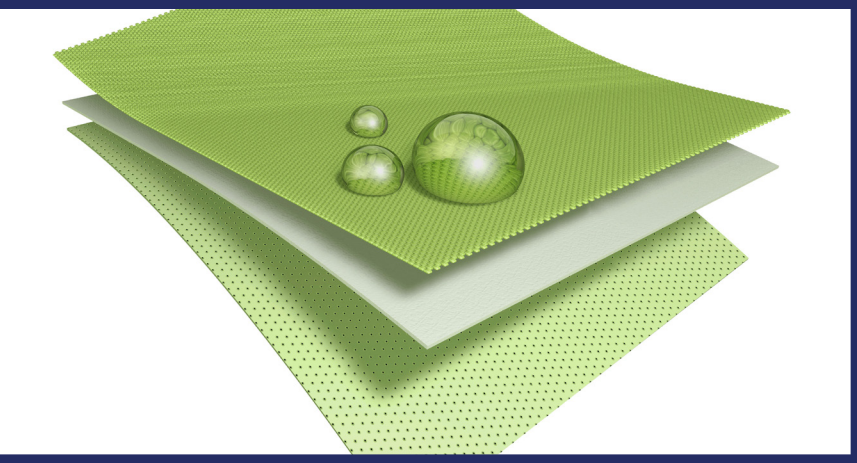
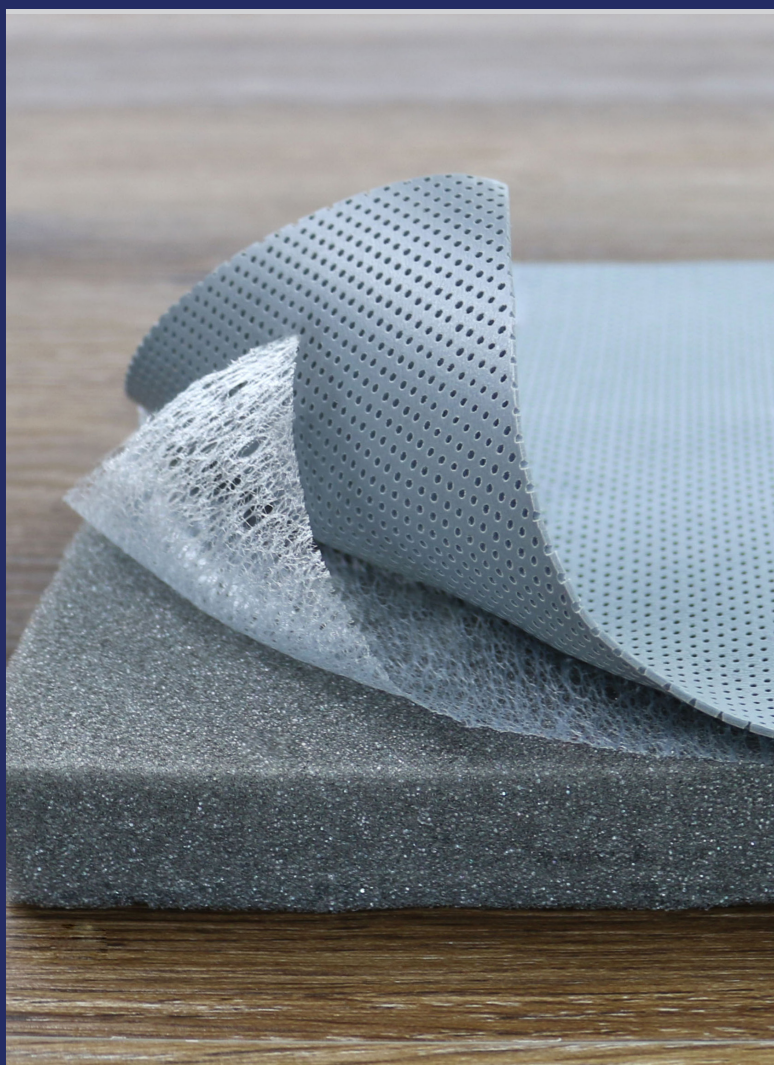
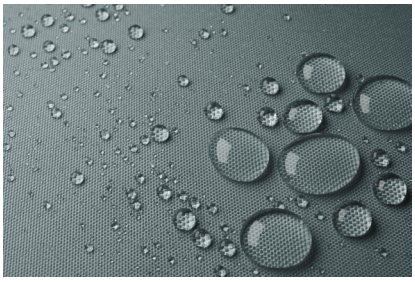
BOSTIK

Adhesive and Lamination Equipment Compatibility Guide





Making an efficient, effective decision on textiles, foams and other substrates is crucial in the lamination and converting industry. In particular, it's important to ensure your adhesive, equipment and lamination methods are aligned. Adhesives play a major role in the following:



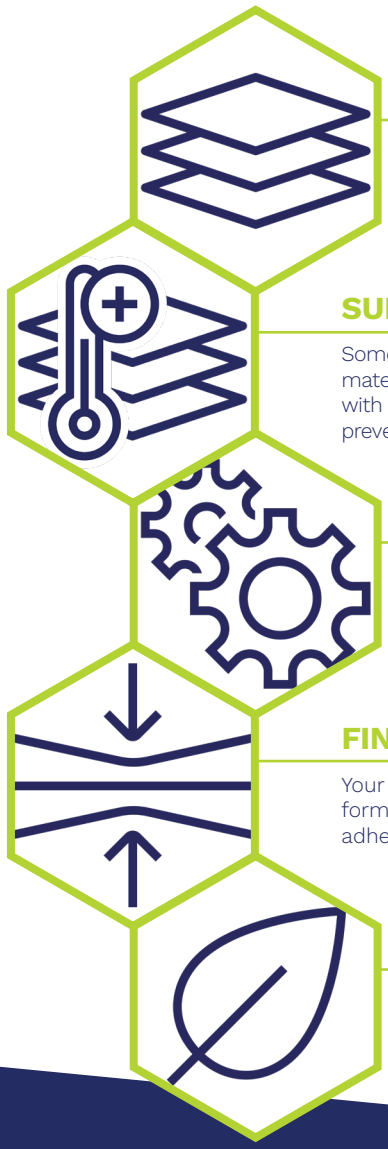
LAMINATION PROCESS PARAMETERS

SUBSTRATE DEFORMATION

LIKELIHOOD OF PRODUCTION AND PERFORMANCE ISSUES

Ensure Proper Adhesive Technology Selection

The right adhesive technology can reduce the likelihood of production and performance issues. To help ensure the right one is chosen, think about the following:



SUBSTRATE COMPATIBILITY

The adhesive needs to be chemically compatible to the substrate you're bonding. For example, a polyester-based adhesive will bond well to a polyester-based substrate and enable you to achieve needed performance levels.

SUBSTRATE HEAT SENSITIVITY

Some substrates are more sensitive to heat than others, which can lead to material distortion. This impacts adhesive technology selection. Substrates with a melting point below 100°C may require specific adhesive options to help prevent substrate deformation.

PROCESS EFFICIENCIES

To keep bonding processes efficient, ensure your substrates are in the needed product form, such as a continuous rolled good. Additionally, note how many substrates you have and any varied sizes or parameters, as these will impact adhesive selection.

FINISHED GOOD PHYSICAL PROPERTIES

Your finished good's end-use properties, including flexibility, rigidity and form, will influence the adhesive selection process. This is because each adhesive technology offers different physical characteristics.

FINISHED GOOD SUSTAINABILITY

Consider what will happen to your finished good at the end of its life. For example, if it needs to be recycled or composted, you will need to choose an adhesive technology that meets those requirements.

Bostik offers a line of specialty hot melt adhesives designed to address these varied needs. Comprised of pellets, powders, webs and films and based on EVA, copolyester, copolyamide, TPU and polyolefin chemistries, they are suitable for both coating and heat lamination systems. Additionally, Bostik experts work directly with you to ensure proper technology selection.

Meet Lamination Equipment and Process Needs

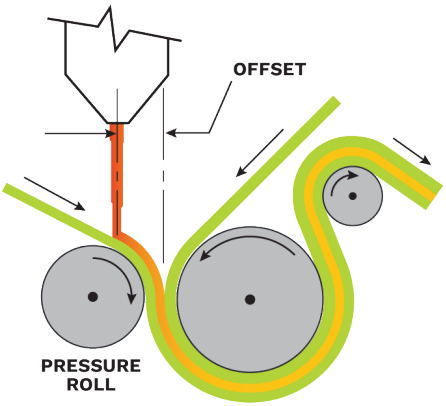
In addition to thinking about your adhesive technology selection, the following guide is designed to help you understand what equipment works best with a given technology to ensure compatibility.

Slot Die and Extrusion Coating

COMPATIBLE ADHESIVE TECHNOLOGY: **PELLETS**

This equipment process applies adhesives in a molten state through a slot-like orifice where line speed, pump speed, orifice size and die height provide an accurate roll-to-roll application for both flexible and semi-rigid materials.

- **Substrate type:** Rolled goods
- **Processes:** Continuous, high-speed, varying widths and patterns
- **Adhesive application:** Wide coating thickness range, full coverage, continuous coating
- **How to melt the adhesive:** Melt tank or extruder
- **Heat sensitive material:** Compatible

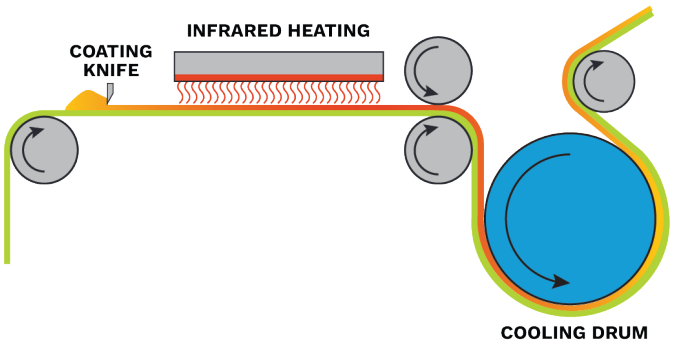


Knife Coating

COMPATIBLE ADHESIVE TECHNOLOGY: **POWDERS (DRY AND/OR PASTE FORM)**

This equipment applies an accurate coating of adhesive to rolled goods or continuous rigid sheets via a metering blade.

- **Substrate type:** Rolled goods, continuous sheets
- **Processes:** Continuous, high-speed, varying widths
- **Adhesive application:** Wide coating thickness range, full coverage, continuous coating
- **How to melt the adhesive:** Oven drying
- **Heat sensitive material:** Compatible

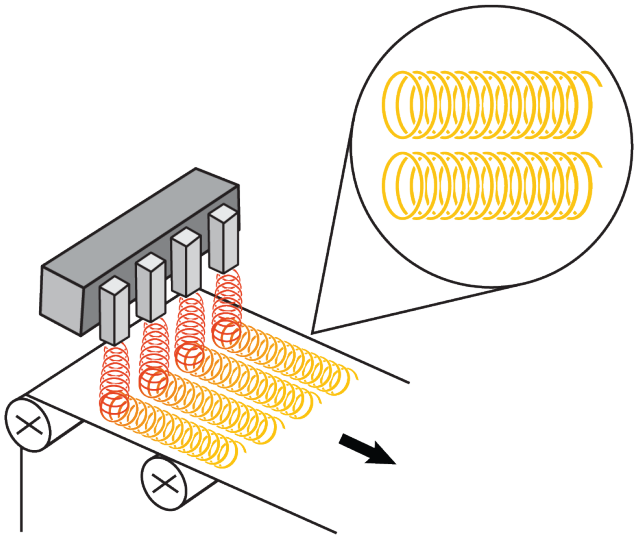


Spiral Spray

COMPATIBLE ADHESIVE TECHNOLOGY:
PELLETS

The spiral spray process applies molten adhesives in a spiral-like fiber pattern, yielding a large adhesive coverage surface area. This process allows for porosity and breathability in the adhesive layer and is compatible with continuous or discontinuous application on roll to roll, sheet fed or individual panels.

- **Substrate type:** Rolled goods, continuous and individual sheets
- **Processes:** Continuous, high-speed, varying widths
- **Adhesive application:** Fiberized in random or spiral pattern
- **How to melt the adhesive:** Melt tank, drum unloader, extruder
- **Heat sensitive material:** Compatible

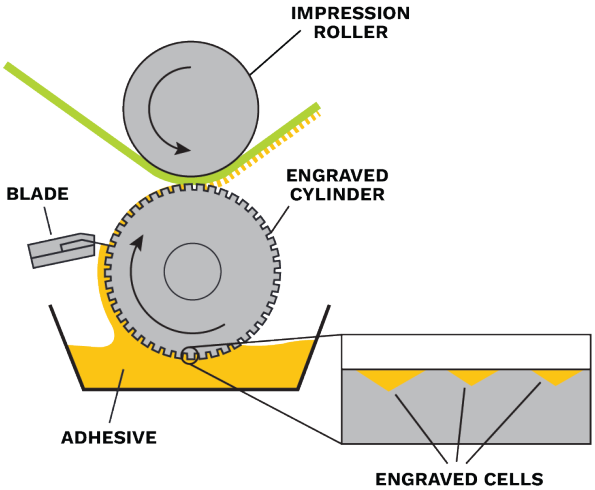


Rotogravure

COMPATIBLE ADHESIVE TECHNOLOGY:
PELLETS AND POWDERS (IN PASTE FORM)

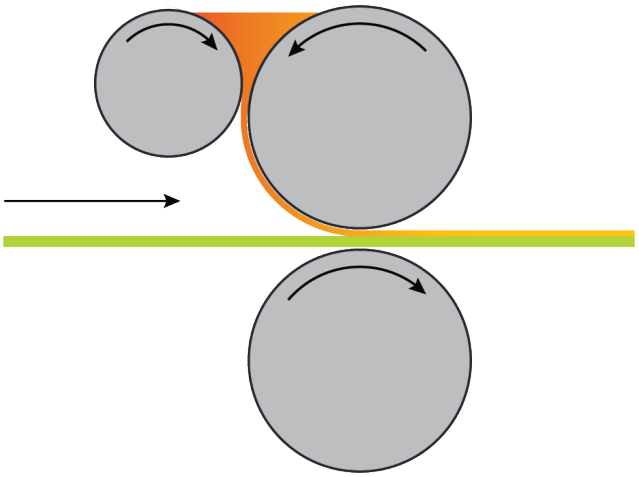
Rotogravure (or gravure printing) uses an etched, rotating cylinder that picks up adhesive in a pan/trough. After adhesive pick up, a doctor blade removes any excess adhesive from the cylinder. The gravure cylinder rotates and compresses against the rolled good or sheeted substrate to apply the adhesive. Full lamination to a second substrate occurs immediately after adhesive application and subsequently dried/bonded in an oven.

- **Substrate type:** Rolled goods, continuous and individual sheets
- **Processes:** Continuous, high-speed, varying widths
- **Adhesive application:** Thin coat or patterned (dot, diamond or custom)
- **How to melt the adhesive:** Oven drying
- **Heat sensitive material:** Compatible



Roll Coating

COMPATIBLE ADHESIVE TECHNOLOGY: **PELLETS**

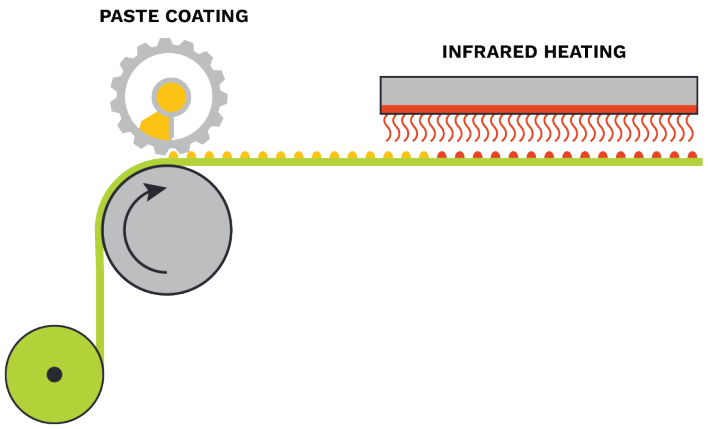


This equipment has a series of compression rollers and a primary heated roller that take molten hot melt adhesives and coat onto a primary substrate (either rigid or flexible). Doctor roller and heated roller gap distance, roller temperature and compression pressure manage the adhesive application. Patterned rollers are available to apply adhesive in a discontinuous method.

- **Substrate type:** Rolled goods, semi-stiff continuous sheets, individual rigid panels
- **Processes:** Continuous or semi-continuous, medium speed
- **Adhesive application:** Apply pooled, molten hot melt adhesive via rollers to primary substrate in thin-coat or pattern. Nip secondary substrate to primary substrate immediately after application
- **How to melt the adhesive:** Melt on rollers or pre-melted in tank or extruder and pumped onto rollers
- **Heat sensitive material compatible:** To be tested on equipment

Rotary Screen Printing

COMPATIBLE ADHESIVE TECHNOLOGY: **POWDERS (IN PASTE FORM)**



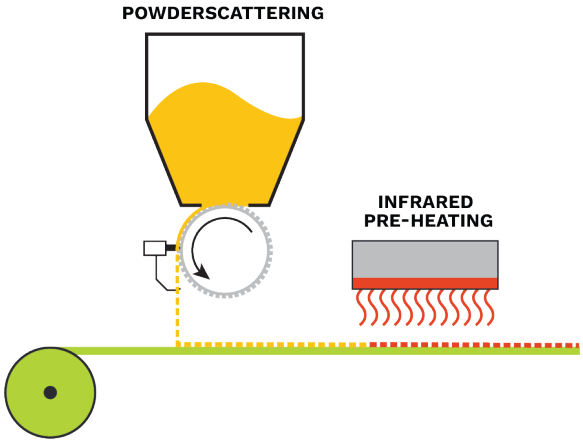
Rotary screen printing is a continuous process where a perforated or patterned roller applies a paste-based adhesive, from the inside of the roller, onto rolled goods. To create a bond, the adhesive laminates to a second substrate through heated ovens and compression rollers.

- **Substrates:** Rolled goods
- **Processes:** Continuous, medium speed
- **Adhesive application:** Rotary screen as a paste (usually with ink), various pattern or dot applications
- **How to melt the adhesive:** Oven drying
- **Heat sensitive material compatible:** Substrate dependent

Scatter Coating

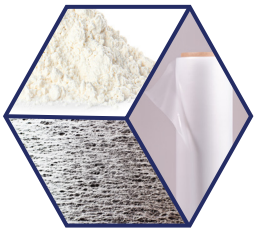
COMPATIBLE ADHESIVE TECHNOLOGY:
POWDERS

Scatter coating is a method where powder is spread evenly onto a substrate's surface with a rotating scatter roller. The scatter roller determines how much powder is applied through a dosing mechanism as well as its rotation speed and the production line speed.



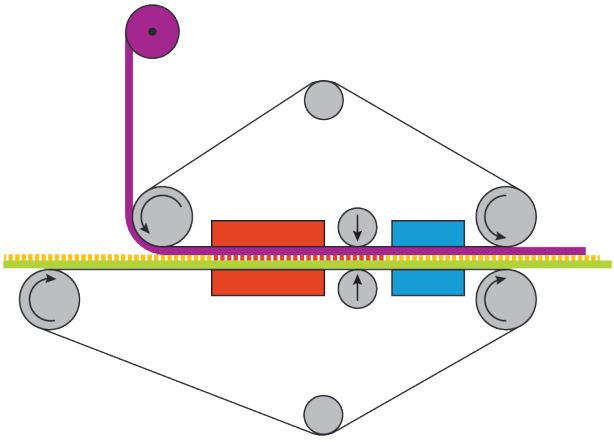
- **Substrate type:** Rolled goods, continuous sheets, individual panels
- **Processes:** Continuous or semi-continuous, medium speed, varying widths
- **Adhesive application:** Apply powder in varied coat weights to primary substrate and nip to secondary substrate
- **How to melt the adhesive:** IR oven followed by pressure under a nip roller or heated, flatbed laminator, drum calendar or nip roller with pressure
- **Heat sensitive material:** Compatible

Flatbed/Belt Laminator



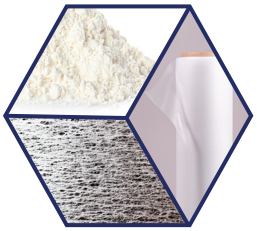
COMPATIBLE ADHESIVE TECHNOLOGY:
POWDERS, WEBS AND FILMS

Flatbed/belt lamination is a process where flat substrates are bonded together using heat and pressure. The heat and pressure are applied through opposing conveyor belts, compressing two substrates, which "sandwich" an adhesive layer (powder, web, film) to form a bond.



- **Substrate type:** Rolled goods, continuous sheets, individual panels
- **Processes:** Continuous or semi-continuous, medium speed, varying widths
- **Adhesive application:**
  - **Webs or Films:** Unroll adhesive in selected geometry (thickness and width)
  - **Powder:** Use scatter coater for pre-application
- **How to melt the adhesive:** Preheated with IR oven and/or under belt pressure with recommended heat and line speed
- **Heat sensitive material:** Compatible

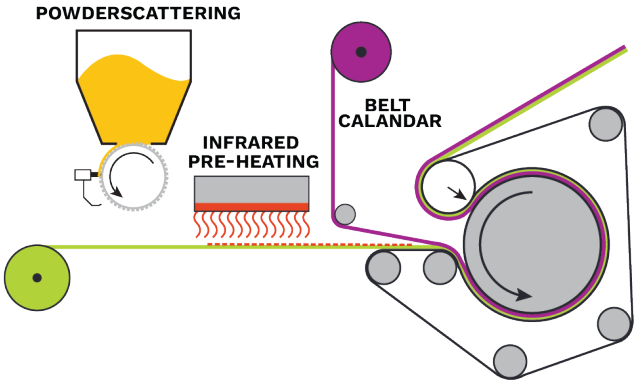
Drum Calendar



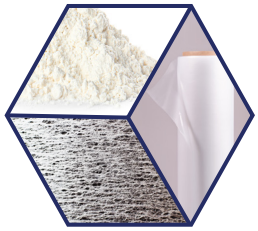
COMPATIBLE ADHESIVE TECHNOLOGY:
POWDERS, WEBS AND FILMS

This equipment and adhesive technology allow for a continuous process in which a belt carries flexible rolled goods around the circumference of a large, heated drum roller, providing pressure and contact time for lamination.

- **Substrate type:** Rolled flexible goods
- **Processes:** Continuous, medium speed
- **Adhesive application:**
  - **Web or Film:** Unroll adhesive in selected geometry (thickness and width)
  - **Powder:** Use scatter coater for pre-application
- **How to melt the adhesive:** Preheated with IR oven and/or under belt pressure with recommended heat and line speed
- **Heat sensitive material:** Compatible



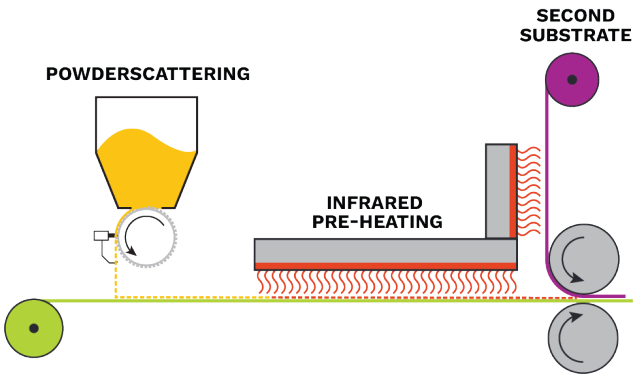
Nip Roller



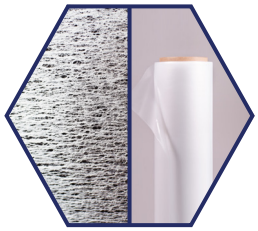
COMPATIBLE ADHESIVE TECHNOLOGY:
POWDERS, WEBS AND FILMS

This equipment enables a single contact point, providing pressure to laminate preheated, roll to roll, continuous sheet or individual panel substrates.

- **Substrate type:** Rolled goods, continuous sheets, individual panels
- **Process:** Continuous or semi-continuous
- **Adhesive application:**
  - **Web or Film:** Unroll adhesive in selected geometry (thickness and width)
  - **Powder:** Use scatter coater for pre-application
- **How to melt the adhesive:** Preheated with IR oven and/or under roller pressure with recommended heat and line speed
- **Heat sensitive material:** Compatible



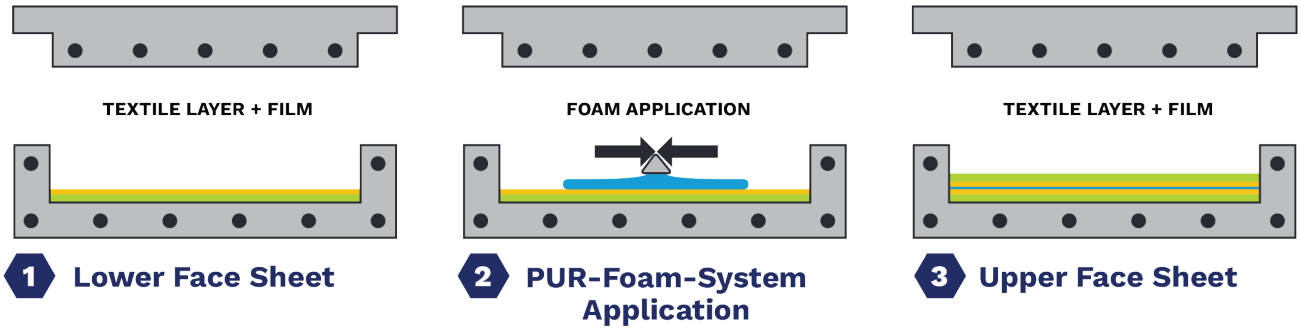
Injection and Compression Molding



COMPATIBLE ADHESIVE TECHNOLOGY:
WEBS AND FILMS

This equipment uses individual foam or plastic panels in combination with single or multilayer films as barrier/lamination layers in a semi-continuous process for 3D foam structures.

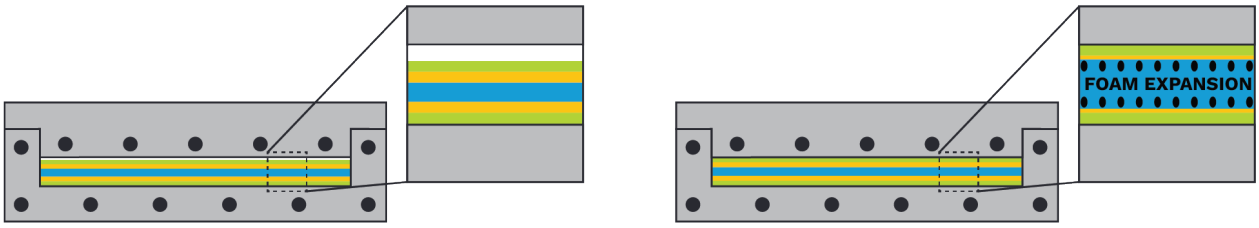
- **Substrate type:** Sheets or customized shapes
- **Process:** Discontinuous
- **Adhesive application:** Pre-laminate, pre-coat or position between layers to be welded
- **How to melt the adhesive:** Activate through heat, pressure and contact time
- **Heat sensitive material:** Compatible



1 Lower Face Sheet

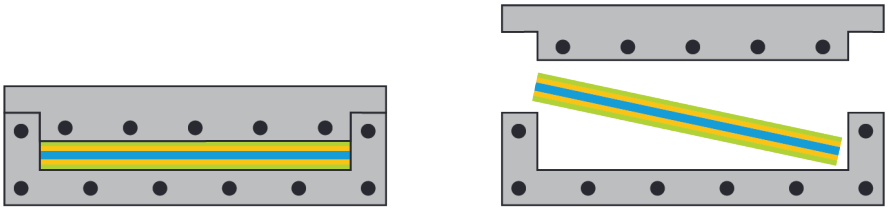
2 PUR-Foam-System Application

3 Upper Face Sheet



4 Mold Closing to End Part Thickness

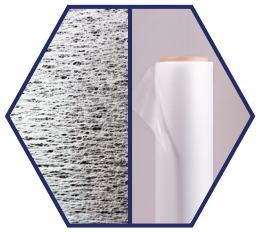
5 Foam Expansion



6 Curing of the Sandwich

7 Sandwich Demolding

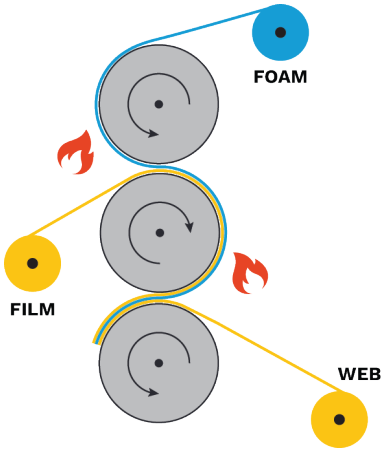
Flame Lamination



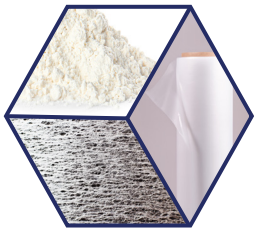
COMPATIBLE ADHESIVE TECHNOLOGY:
WEBS AND FILMS

This process uses direct flame onto substrates where heat melts the primary substrate surface and pre-tacks materials such as webs and film adhesive to said substrate. This prelaminated structure is then used for lamination to secondary substrates in other processes like flatbed or drum calendaring.

- **Substrate type:** Rolled goods, continuous sheets
- **Process:** Continuous, high speed
- **Adhesive application:** Unroll adhesive in selected geometry (thickness and width)
- **How to melt the adhesive:** Flame heats foam surface before applying adhesive with pressure under nip roller
- **Heat sensitive material compatible:** To be tested on equipment



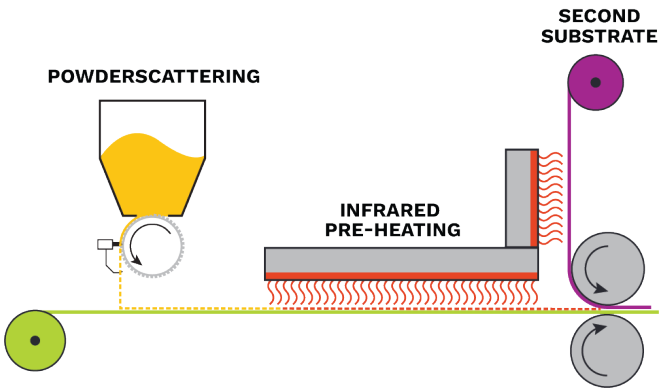
IR Oven Preheat



COMPATIBLE ADHESIVE TECHNOLOGY:
POWDERS, WEBS AND FILMS

This process uses IR ovens to melt pre-applied adhesives or substrates to ensure strong, high-quality bonds when materials are compressed together for lamination.

- **Substrate type:** Rolled goods, continuous sheets, individual panels
- **Process:** Continuous or semi-continuous, medium speed, varying widths
- **Adhesive application:**
  - **Web or Film:** Unroll adhesive in selected geometry (thickness and width)
  - **Powder:** Use scatter coater for pre-application (refer to powder scattering)
- **How to melt the adhesive:** Determine temperature for IR oven and dwell time heat bond line. Use pressure through a nip roller, drum calendar, flat bed laminator for bonding to second substrate.
- **Heat sensitive material:** Compatible



The chart below serves as a quick reference guide to assess equipment and adhesive compatibility.

MELT TANK/EXTRUDER	PELLETS	POWDER	WEB	FILM
Slot Die and Extrusion Coating	x			
Spiral Spray	x			
Rotogravure	x	x		
Roll Coating	x			
HEAT AND PRESSURE	**PELLETS**	**POWDER**	**WEB**	**FILM**
Rotary Screen Printing		x		
Knife Coating		x		
Scatter Coating		x		
Flat Bed/Belt Laminator		x	x	x
Drum Calendar		x	x	x
Nip Roller		x	x	x
Flame Lamination			x	x
Hot Injection/Compression Molding			x	x
Cold Injection/Compression Molding			x	x
IR Oven Preheat		x	x	x

Want to learn more about lamination and converting equipment and adhesive technology compatibility?
Contact a Bostik expert today!

IMPORTANT – PLEASE READ BEFORE USING THIS BROCHURE
LEGAL DISCLAIMER

Legal Disclaimer: All information contained herein is believed to be accurate as of the date of publication, is provided "as-is" and is subject to change without notice. This is not a warranty, an agreement, or substitute for expert or professional advice. Bostik Inc. expressly disclaims and assumes no liability for the use of the products or reliance on this information. It is the sole responsibility of the user to determine the suitability of any products for user's application(s). NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED (INCLUDING SUITABILITY FOR USE IN ANY MEDICAL DEVICE OR MEDICAL APPLICATION), IS MADE CONCERNING THE PRODUCTS OR THE INFORMATION PROVIDED HEREIN. The information provided relates only to the specific products designated herein and may not be valid where such products are used in combination with other materials or in any process. The performance of the product, its shelf life, and application characteristics depends on many variables, and changes in these variables can impact product performance. You are responsible to test the suitability of any product in advance for any intended use or application and before commercialization. Nothing herein shall be construed as a license for the use of any product in a manner that might infringe any patent and it should not be construed as an inducement to infringe any patent. Please carefully review the Safety Data Sheet for the product.

The Company adheres to a strict policy that applies to the use of any of its products in medical device applications. This policy can be found at https://www.arkema.com/global/en/social-responsibility/innovation-and-sustainable-solutions/responsible-product-management/medical-device-policy/ which is incorporated herein by reference and made a part hereof. Except as expressly authorized, the Company (i) has designated specific medical grade compositions for products used in medical device applications and Company products not so designated are not authorized for use in medical device applications and (ii) strictly prohibits the use of any of its products in medical device applications that are implanted in the body or in contact with bodily fluids or tissues for greater than 30 days. The Company does not design, manufacture and/or directly sell any medical devices. The Company does not co-design, or offer assistance to any purchaser of its products, in their design, manufacture and/or sale of products for medical devices. It is the sole responsibility of the manufacturer of medical devices to determine the suitability of all raw material, products and components, including any medical grade products, in order to ensure that the medical device is safe for end-use and complies with all applicable legal and regulatory requirements and to conduct all necessary tests and inspections.

04.19.23

Adhesive solutions by ARKEMA