

FastelFilm™

P/N: Pi-284

High Temperature Polyamide Based Thermal Bonding Film

FastelFilm Pi 284 thermal bonding film is a high strength polyamide based thermal bonding film designed for applications that experience high temperature device operating conditions. With the ability to manufacture FastelFilm Pi-284 in multiple film thicknesses, the high temperature characteristics make FastelFilm Pi 284 an ideal candidate for various applications where reliable strength and chemical resistant sealing is required at higher than normal operating conditions. With its robust polyamide formulation design, FastelFilm Pi 284 is suitable for exterior or interior device designs and bonds to a variety of substrate materials including plastics, aluminum, copper, stainless steel, ABS, ceramics as well as wood.

With a high melt point temperature, FastelFilm Pi 284 can be efficiently heat cycled in production using industry standard commercially available or custom heating/automated equipment. The high melt point of 140°C (284F) allows FastelFilm Pi 284 to offer quicker heat cycling times than other higher temperature (160°C+) competitive films designed to offer the same robust characteristics. As a free standing die cut adhesive film pad, FastelFilm Pi 284 allows for a clean “drop-in-place” installation/setup and instantly ready to be heat cycled above its melt point temperature putting into action its ability to conform and fill in any interface surface imperfections that may exist (leading to higher strength bonds). Once FastelFilm Pi 284 is allowed to quickly cool below 140°C (284F), the adhesive creates a secure long term reliable bond.



High temperature melt point
Shock / vibration resistant
Uniform bond line adhesion/sealing

Fast curing
Controlled flow
Quick installation and fixturing

Indefinite shelf life
Chemical / Solvent resistant
Die Cut, sheets or rolls

FastelFilm Pi 284 Temperature Requirements

Pi 284.....140°C / 284°F
 Minimum bond line temperature required to allow to melt and flow
 For lower temperature adhesives, see our FastelFilm standard or HPB product line

Standard FastelFilm Pi 284 Thicknesses

0.003” (0.08mm) 0.005” (0.13mm) 0.010” (0.25mm)
 0.015” (0.38mm) 0.020” (0.51mm) 0.030” (0.76mm)

* Custom film thicknesses available

Liner Type / Thickness

* 0.003” (0.08mm) Clear Polyester Liner

Adhesive Delivery Options

- * Die cut pads (individuals)
- * Die cut pads (continuous rolls)
- * Rolls or sheets

Product Film / Coating Options

- * Free standing adhesive film (standard)
- * Aluminum, copper or stainless
- * PET, PE, polyimide films
- * Customer defined substrates

Pi 284 Color

- * Translucent / orange tint (standard)
- * Adhesive coloring available

Other Information

- * No Outgassing
- * RoHS Compliant Material
- * 100% Waterproof

Regulations

- * ISO 9001 Certified
- * FastelFilm Pi284 is manufactured from ingredients regulated under the FDA Code of Federal Regulations 175.105 (adhesives)

FastelFilm Pi 284 is a high temperature polyamide based thermal bonding film that is designed to provide uniform adhesion strength between similar or dissimilar substrate surfaces. The ability to manufacture FastelFilm Pi 284 in many adhesive film thicknesses, rolls, sheets or pre-form die cuts allows us to meet a wide range of bonding requirements within multiple industries. FastelFilm Pi 284’s inherent flexibility from manufacturing to installation makes it an ideal solution for applications ranging from low volume (even prototypes) and/or high volume production environments. FastelFilm Pi 284 is manufactured to superior quality guidelines set forth by our ISO 9001:2008 Quality Standards and offers a quick turnkey solution from design to production.

Heat Curing Application Methods

FastelFilm Pi 284 can be heat cured using commercially available heating devices. When cycled past its low temperature melt point, Pi 284 will begin its controlled flow filling in any microscopic surface conditions that may exist on your mounting surface as well as adjust for any flatness conditions.

Recommended heating devices include a curing oven, heated press, hydraulic press, heated roller(s), heated flat plate, heat tunnel, heat gun or custom fixture/heating device.

Pi Type	Bondline Heating Temp (Full Bond)	Heating Time (Full Bond)	Pressure (Full Bond)	Bondline Heating Temp (Tack)	Heating Time (Tack)
284	170°C to 210°C	3 ~ 60 seconds (see note 1)	5 ~ 50 psi	120°C~130°C * 3 ~10 psi	1 ~ 10 seconds (see note 1)

* tack temperature should be kept below 130°C to prevent full phase-change of adhesive film

Note 1: required heating time (full bond or tack) will vary depending on your heating device, setup and substrate materials being adhered as well as Pi 284 film thickness. Testing within the scope of your application is recommended to determine your optimal setup, heating time, pressure and temperature to yield desired results. Temperatures, heating time and pressures listed are general recommendations only.

To obtain maximum adhesion, bonding surfaces should be clean, dry and free from grease, oils or debris.

FastelFilm Pi 284, once heated and begins its on-slot temperature drop, should be allowed to fully cool before applying stress.

The amount of pressure being applied to your substrate during setup should be determined beforehand in order to minimize the effects of the adhesive flowing into unwanted areas outside the desired mounting or sealing interface during heating at higher than normal pressures.

Want to cure FastelFilm Pi 284 alongside other heat curing materials?

Not a problem with Pi 284. FastelFilm Pi 284 Adhesive can be cycled higher than its recommended application temperatures for long periods of time if being cured alongside other heat required materials/adhesives that require longer cycling times in a curing oven.

Fastelfilm Pi 284 Physical Properties (free standing film)

Characteristic	Pi 284 Adhesive
Base Formulation	Heat Activated Thermal Bonding Film
Melt Point	140°C / 284°F
Adhesive Thickness Tolerances	+/- 10% of target thickness
Die Cut Pad Dimensional Tolerances	0.25mm (0.010") Typical
Liner Type / Thickness	0.08mm (0.003") PET Release Liner (Clear)
Solids	100% Solids
Color	Translucent / Orange Tint
Standard Sheet Sizes	30.5cm x 61cm (12.0" x 24.0")
Standard Roll Width	30.5cm (12.0") or 45.7cm (18.0")
Standard Roll Lengths	30.5m (100ft), 76.2m (1000ft) (depends upon thickness)
Die Cut Methods	Steel Rule Die, Flexible Die, Rotary Die Cutting

Storage & Shelf Life	Result
Storage Condition and Temperature	Cool Dry Location at or below 100°F / 38°C
Shelf Life	Indefinite if stored per storage conditions above

Substrate Options

Need Pi 284 coated at a specific thickness onto one or both sides of a substrate?

FastelFilm Pi 284 can be coated at varying thicknesses on a wide range of substrate types designed to meet a specific application requirement.

For custom coated substrates, please contact toll free 1-888-989-3832 (US) +1-949-369-7676 (international) or e-mail info@fasteladhesives.com

Foils	Aluminum 1100 1235	Copper 110 101	Stainless 304 321	Brass	Inconel
Plastics & Rubber	PET Film	Heat Stabilized PET	Polyimide HN And MT Films	Foams (Various Durometers)	Rubber (Various Types)
Other	Fabrics	Paper	Synthetics	Laminates	Customer Defined Substrate

FastelFilm Pi 284 Customer / Application Benefits

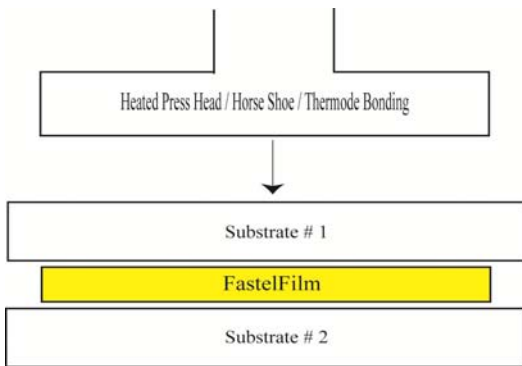
- * High temperature adhesive designed for reliability within higher temperature operating environments
- * Uniform adhesion strength resulting from Pi 284's consistent adhesive thickness
- * High performance bond between similar or dissimilar substrates as well as low surface energy materials
- * Chemical and Environmental resistance is ideal for interior or exterior applications
- * Assembly line flexibility, ease-of-use—from pick and place to hand placement assembly
- * Minimal waste — die-cut pads are matched to customer specific mounting outlines

Fastelfilm Pi 284 Typical Heating Methods

The following diagrams illustrate basic setups using various commercially available heating methods. Fastelfilm Pi 284 can be applied, heated and cured using common thermal induction methods including a curing oven, heated press, hydraulic press, heat tunnel, heated lamination rollers, heat gun or custom built fixture/heating device. Determining your optimal setup and heating method should be tested beforehand and is dependent on your substrates, setup pressure, heating device, heating time as well as Fastelfilm formulation and thickness being used. **With all setups, carrier liner should be removed first before applying.**

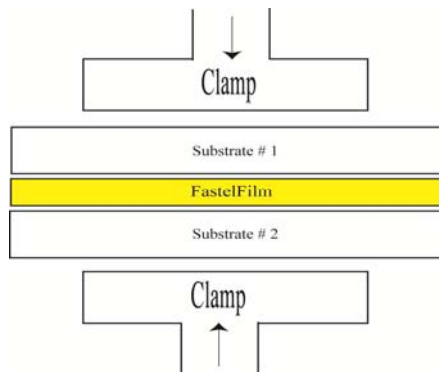
Apply heat using a heated press / horse shoe / thermode bonding method. Heat transfer through substrate # 1

Good for setups, tacking, small surface areas or low to mid volume applications



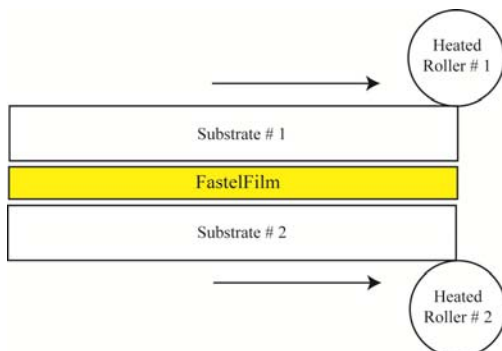
Clamp entire assembly together. Apply heat using multiple methods of heating including curing oven, heat tunnel or heat gun

Good for small or large surface areas as well as low, mid and high volume applications



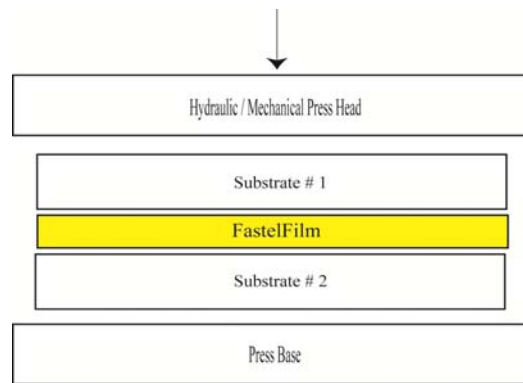
Process through top and bottom (or single) heated rollers. Heat will transfer through substrates.

Good for large or continuous surface areas for a mid to high volume application environment



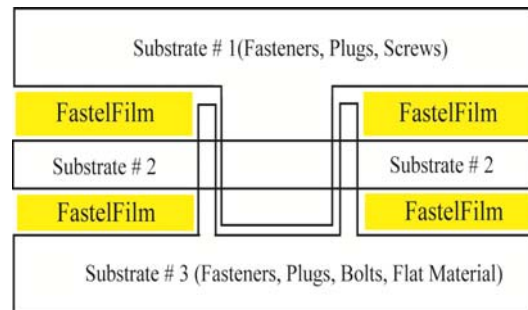
Apply heat using a hydraulic/mechanical press. Heat transfer through substrate # 1

Good for large surface areas or mid to high volume applications



General setup for bonding and sealing heads of mechanical fasteners / plugs / screws. Apply heat using a curing oven, heat tunnel, heat gun, hydraulic or mechanical press.

Good for small area high volume applications when wanting to bond and seal formed fasteners



Basic Examples

Washer Configuration



Frame Configuration



Fastelfilm Pi 284 Testing & Sampling

Adhesive material evaluation is always critical when designing in a new material or developing a new product. Sheet samples of Fastelfilm Pi 284 are available for preliminary testing to determine the optimal thickness, setup and heating method within the scope of your application requirements.

Want to test samples per your required die cut part? Our razor plotter sampling machine allows us to provide customers Pi 284 already cut to their required outline for testing. Plotter formed samples provide our customers the ability to test not only the adhesive, but their required outline as well without incurring the expense of production tooling.

Contact Fastel Adhesive Products at 1-888-989-3832 (US Only) +1-949-369-7676 (International) or e-mail info@fasteladhesives.com to request sample sheets or plotter formed samples for testing.