

# Adhesive Films – the Technology

## Technologies

Flat film or sheet extrusion	Film and coatings
Blown film extrusion	Mono Coex
Slit film extrusion	Mono Coex

## Raw material classes

Polyethylene, grafted	PE, PE-LD, PE-LLD, PE-HD
Polypropylene, grafted	PP
Ethylene copolymers	EVA, EAA, ethylene terpolymers
Copolyesters	CoPES
Copolyamides	CoPA
Thermoplastic polyurethanes	TPU

## Film manufacture

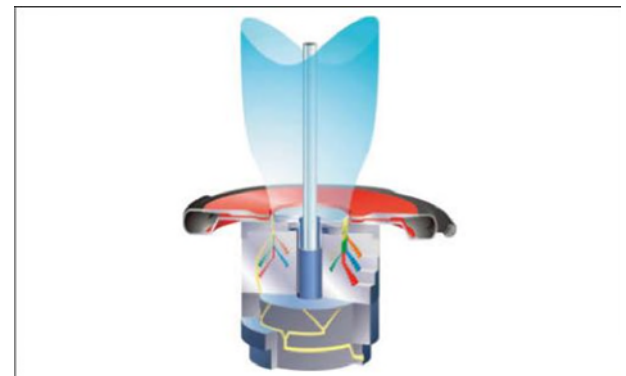
Adhesive Films are made by adding the ingredients (especially polymers and additives in pellets to extruders, where they are melted and thoroughly mixed as they are moved forward by the extruder screw. The resultant melt is distributed in the die such that it yields a film of the desired thickness when drawn off and cooled. The die determines the shape of the film: a slot die yields a flat film and an annular die is used to produce a blown film.

Flat film extrusion (see schematic diagram on the right) is ideal for coating customer's substrates because these act as carrier at the die. It can also be used to process tacky raw materials, in which case the coated substrate is a release carrier, such as siliconized paper. Pontacol can perform monolayer extrusion and monolayer coating.

Blown film (see schematic diagram, right) exits the die in tubular form and is cut to rolls of the desired width by knives. Maximum use of the parison circumference is obtained by subsequently cutting the wound tube at one side and opening it over a

triangle. Pontacol can produce blown film in one, three and five layers.

A speciality of Pontacol is film slitting, in which we cut slits 4–8 mm in length into the film. This not only makes the film softer and air permeable, but also allows it to be heat-shrunk – which causes the slits to open (see diagram at the bottom right).



Schematic structure of a 5-layer blown film die.

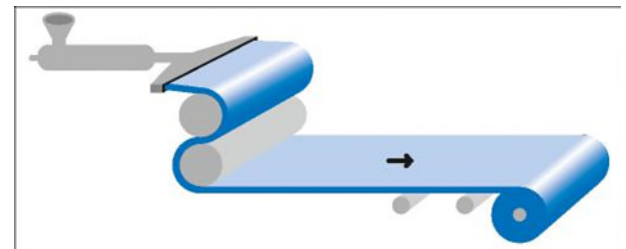


Diagram of flat film extrusion.

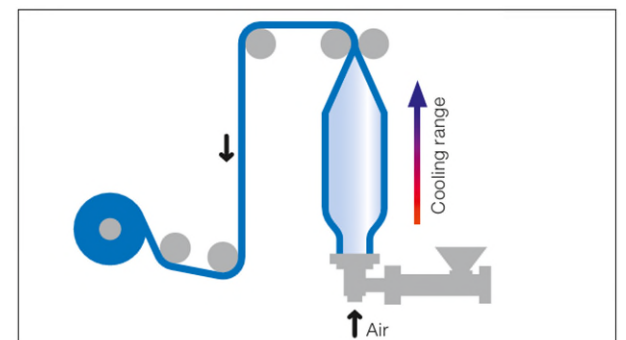


Diagram of blown film extrusion.



## Advantages of adhesive film technology

- Clean, efficient, ecologically sound processing
- Slit films are air permeable, have a softer feel and are easier to process
- Blocking and non-blocking types can be produced
- Pre-tested quality
- Can be reactivated with heat (80–180 °C) and pressure
- Bonded joint can be separated again by heat
- Long storage times possible
- Variable gauge and width
- Seals, protects or blocks reliably
- Uniform application of adhesive layer
- High level of automation at short cycle times
- Simple and inexpensive handling
- Hardly any cleaning; little scrap
- Processing of large surfaces combined with simple logistics
- End product has no known harmful effects
- Little or no odour
- No emission of harmful substances during processing

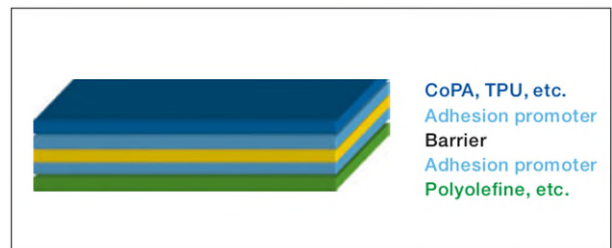
## Advantages of multilayer films

- Several production steps possible concurrently, e.g. bonding and finishing in one step
- Different adhesive properties in one step
- Reliable bond, even between incompatible substrates
- Opens scope for new combinations of materials
- Clean edges
- Enhanced surface finishes
- Thermoformable in three dimensions
- Two layers in a single pass

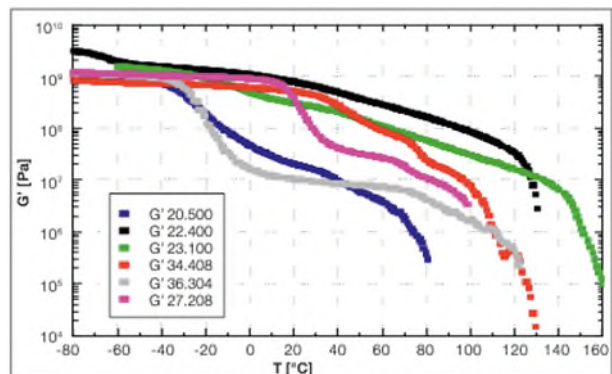
## Bonding applications

- Textiles to each other, with leather or PUR and PE foam
- Metals to each other, to foam or fabric
- Glassfibre fabric to plastic film
- Glassfibre laminate to foam

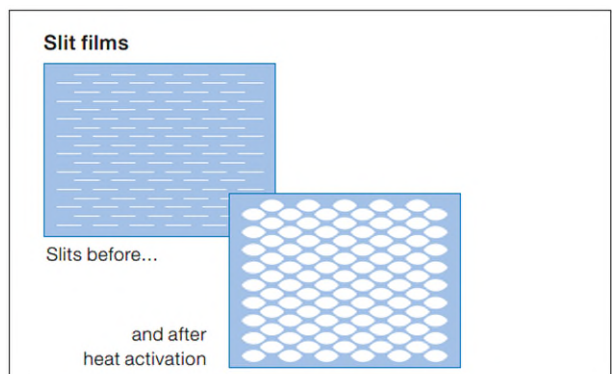
- PVC/ABS to foam and textile
- Wood/wood fibre products to numerous substrates
- All kinds of honeycomb to numerous substrates
- Chip bonding
- Seam sealing



Multilayer films for multifunctional applications.



Shear modulus of typical adhesive films in function of temperature.

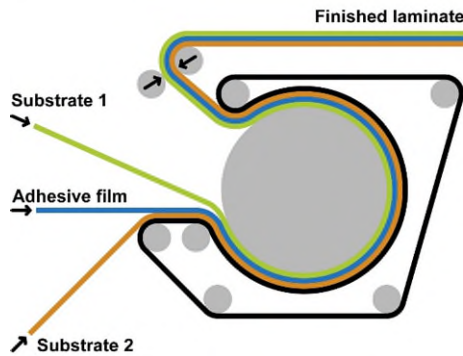


Opening of slit film.

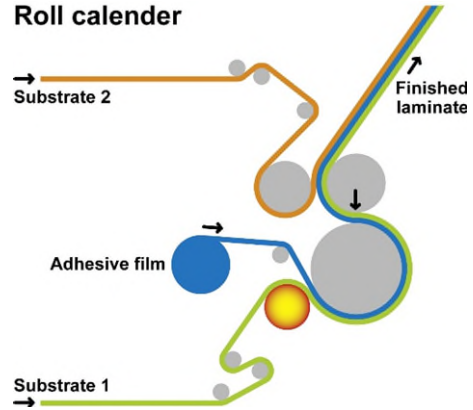


## Processing forms

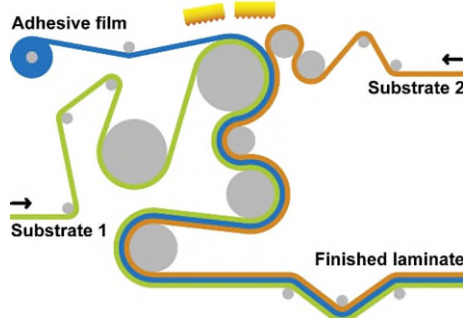
### Transfer calender



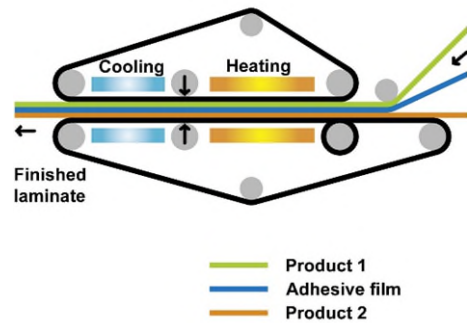
### Roll calender



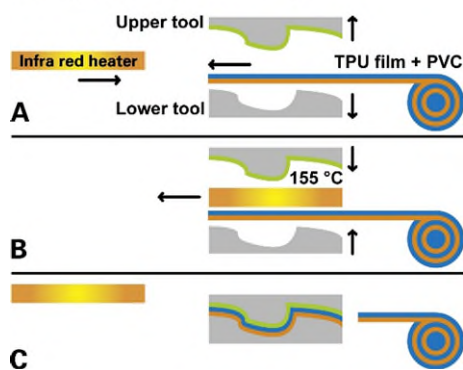
### IR roll calender



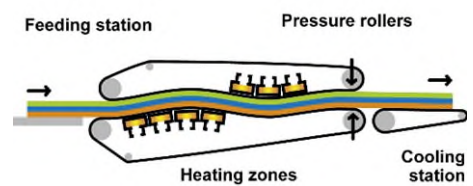
### Flatbed calender



### Compression moulding



### Laminating machine with curved contact surface



## Manufacturers of these stations

Meyer-Maschinenbau in Rötze, Germany ([www.meyer-machines.com](http://www.meyer-machines.com))

Klieverik Heli BV in Oldenzaal, Netherlands ([www.klieverik.com](http://www.klieverik.com))

Reliant Machinery in Luton, UK ([www.reliant-machinery.com](http://www.reliant-machinery.com))

Schott & Meissner in Blaufelden, Germany ([www.schott-meissner.de](http://www.schott-meissner.de))

Held Technologie GmbH in Trossingen, Germany ([www.held-tech.de](http://www.held-tech.de))

TechnoPartner Samtronic GmbH in Göppingen, Germany ([www.technopartner.de](http://www.technopartner.de))

Monti Antonio S.p.A in Thiene, Italy ([www.montiantonio.com](http://www.montiantonio.com))

Telconic Ultrasonics in Bronschhofen, Switzerland ([www.telconic.com](http://www.telconic.com))