

Automatic release agent-free moulding process

Foam&Film®

The **Cannon-patented F&F® process** is based on a thermoforming film technology, eliminating all cleaning and spraying operations. It consists in the introduction, within the moulding sequence, of a **TPO or TPU film**. By using a vacuum effect, this film adheres perfectly and smoothly to the mould cavity without any creases or wrinkle formation.

The mould is equipped with a **dedicated frame device**, specifically designed to hold the film. A heating system with accurate control, ensures that the film reaches the desired temperature prior to the thermoforming phase and subsequent injection of Polyurethane into the mould.

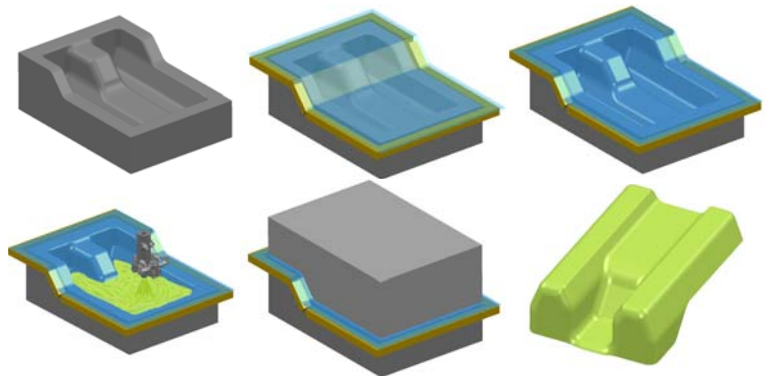
SINGLE AND TRI-DIMENSIONAL FRAME

The **specially designed and patented frame**, integrated into the mould, holds the film in position during the thermoforming process.

It receives the **film** after it is **unrolled** and cut dimensionally.

The frame then moves the film in front of an **infrared lamp** for few seconds to heat. A control system ensures the desired temperature. Special infrared heaters are used to ensure high efficiency and very low thermal inertia.

Once the film is heated, the frame moves it **onto the mould** where it's **vacuum-formed**, preventing folds or wrinkles.



Dimensional frame sequence example



Quality parts are obtained reducing cost with a shorter and regular production cycle

BENEFITS

- Operator intervention is **no** longer required for **mould cleaning and** application of **release agent**
- Polyurethane or Thermoplastic film can be used
- No dimensional limitation on parts to be moulded
- Possible delivery of wrapped parts
- Cheap process



Easy release out of the mould and elimination of all cleaning and spraying operation

TWO TYPES OF FILM

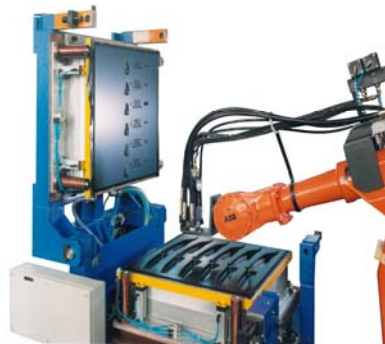
ADHESIVE FILM

TPU film (Thermoplastic - Polyurethane)

- Cold and/or hot process
- Good adhesion to the foam
- Good properties
- Expensive

TPO film (Polyolephine)

- Hot process only
- Corona treatment required for adhesion
- Good adhesion to foam
- Low cost

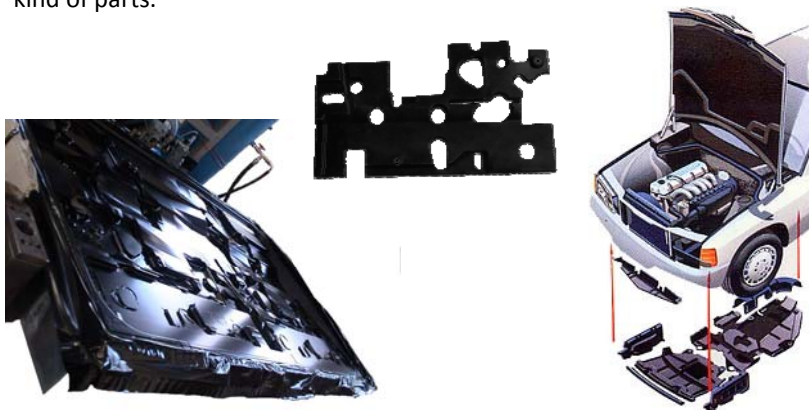


Detail of the foaming mixing head - the film is applied on the upper mould.

Films adhering to the product become an integral part of the finished parts, making them water/oil-proof - parts close to motor (i.e. side shields) or weather-beaten areas.

The film can be used also to produce parts made of different materials (i.e. flexible PU + R.RIM thermal insulating product with acoustical product). The film in this case sticks the two materials together.

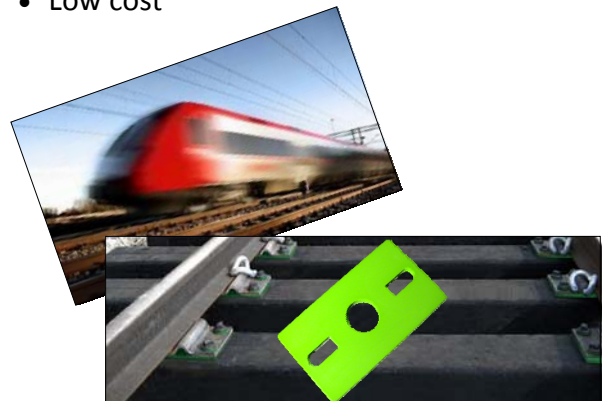
Fully automated lines have been developed by Cannon to produce these kind of parts.



RELEASE FILM

TPO film (Polyolephine)

- Hot process only
- Easy process
- Good releasing from the foam
- Several detachable cycles
- Low cost



Films adhering to the mould can be used several times, replacing release agent spraying.

SOME APPLICATIONS

- Sound insulation parts
- Carpet back-foaming
- Seat cushion
- Anti-vibration parts/shock absorbers



Example of a fully automated line

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