



# ROLL COVERING FOR THE TRANSFORMATION OF PLASTIC MATERIALS

## CAST FILM EXTRUSION

Single and multi-layer plastic film products are often obtained by flat cast extrusion. This technology is specifically suited for the production of food packaging and technical films, as well as for stretch and bubble film (PE, PET, PP, PVB, PS...). Furthermore cast film extrusion allows an easy combination with laminating, coating, embossing and printing units.

The plastic film can be extruded directly at the desired thickness, but often a lengthwise stretching unit will be used to reduce the thickness and create the right tension.

Elastomer coated rollers are used mostly in the transfer section, just before or during winding or slitting. Also in the converting processes, covered rolls play an important role.

Cast extrusion is also used to produce a bonding film (hot melt) to laminate different substrates as non-woven, paper, aluminium or plastic.

### DESIRED PROPERTIES

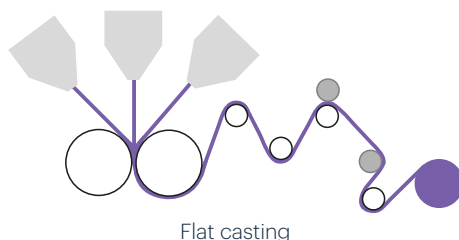
- Abrasion resistance
- Temperature resistance
- Resistance to high mechanical and dynamical efforts
- *Antistatic properties*

## THE EXTRUSION PROCESS

### UNIDIRECTIONAL FILM

Quite some packaging films are extruded directly onto the correct web format. The film is cast onto or in between chrome plated metal rolls. In many cases, the film thickness is being reduced by a longitudinal stretching process. A series of heated tensioning rolls is used to weaken the film, while increasing the speed.

Elastomer coated nip rollers can be used to enhance and control the stretching process.



Solution	Product	Characteristics and advantages
<b>Standard</b>	<b>NipFoil-Plus</b> Beige 70 shore A	<ul style="list-style-type: none"> <li>• Excellent resistance to ozone</li> <li>• Increased mechanical and dynamical properties</li> <li>• Excellent abrasion resistance</li> <li>• Temperature resistance up to 130 ° C</li> </ul>
	<b>NipFoil-XP-AS</b> Black 65 shore A	<ul style="list-style-type: none"> <li>• Excellent resistance to ozone</li> <li>• Increased mechanical and dynamical properties</li> <li>• Excellent abrasion resistance</li> <li>• Temperature resistance up to 130 ° C</li> <li>• Anti-static</li> </ul>
<b>High performance</b>	<b>NipFoil-HP</b> Black 65 shore A	<ul style="list-style-type: none"> <li>• Excellent resistance to ozone</li> <li>• Increased mechanical and dynamical properties</li> <li>• Excellent abrasion resistance</li> <li>• Temperature resistance up to 150 ° C</li> </ul>
<b>High temperature</b>	<b>NipFoil-HT</b> Red 60-70 shore A	<ul style="list-style-type: none"> <li>• Excellent resistance to ozone</li> <li>• Good mechanical performance</li> <li>• Excellent temperature resistance up to 180°C</li> <li>• Excellent non-stick properties</li> </ul>

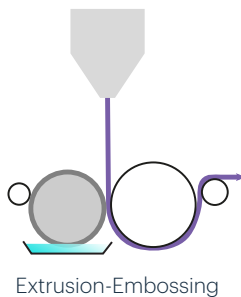
## BIDIRECTIONAL FILM

Various film types for food packaging and for technical applications are produced by flat casting, followed by longitudinal and transversal stretching (machine direction orientation and web direction orientation).

We refer to the specific Hannecard Leaflet "Bi-oriented plastic films".

### DESIRED PROPERTIES

- Constant and homogenous contact nip
- Good elastic response
- High abrasion resistance
- Excellent temperature resistance
- Combination of grip and release properties



## EXTRUSION-EMBOSSING

For the production of breathable films, PE and other plastic materials can be cast directly onto an embossing cylinder. Breathable films are used in medical, hygiene, building and packaging applications. At the same time, the film can be cast onto a tissue or non-woven substrate.

A rubber coated back-up roller is used to create the correct application pressure. Often, this roller is cooled from the inside and outside. Depending on the film type and on the desired gloss, a water bath can be used to cool the back-up roll, in combination with a squeegee roller. In other cases, the back-up roll will be cooled with a chill roll.

Type	Product	Characteristics
<b>Standard</b>	<b>BupFoil-S</b> White 70 shore A	<ul style="list-style-type: none"> <li>• Excellent ozone and temperature resistance (up to 130 °C)</li> <li>• Outstanding abrasion resistance</li> <li>• Excellent physical properties</li> <li>• Recommended for water bath cooling</li> </ul>
<b>High temperature</b>	<b>BupFoil-XP</b> Grey Double layer 60 and 80 shore A	<ul style="list-style-type: none"> <li>• Excellent ozone and temperature resistance (up to 200 °C)</li> <li>• Good abrasion resistance</li> <li>• Good physical properties</li> <li>• Anti-adhesive</li> <li>• Recommended for dry or absent cooling</li> </ul>
<b>Special</b>	<b>Lotus-FEP</b> Black	<ul style="list-style-type: none"> <li>• Combination of special, elastic rubber base layer and outside Teflon® FEP sleeve*</li> <li>• Temperature resistance up to 220 °C</li> <li>• For complete anti-adhesive properties</li> </ul>

\* Teflon® is a registered trademark of DuPont

### DESIRED PROPERTIES

- Temperature resistance
- Low dynamic heat build-up
- Good elastic response
- Abrasion resistance



## EXTRUSION-COATING AND EXTRUSION-LAMINATION

Plastic film can be laminated immediately under the extrusion point. As such, laminates can be produced with aluminium, board, tissue and non-woven materials, as well as with different other plastic film types for the most diverse applications.

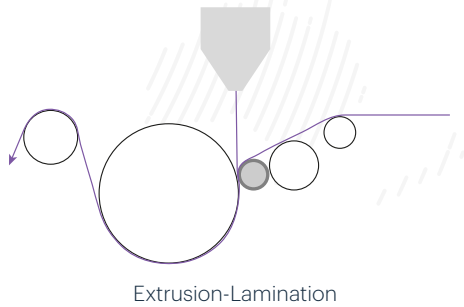
Finally, laminates can be produced using the cast film as a bonding layer (hot melt lamination).

A rubber coated back-up roll will be used to assure the right pressure nip. Often, this roll is submitted to a double nip, using a chill roll to avoid bending deformation of the back-up roll, at the same time providing cooling and controlling the process temperature.

Often, a PTFE non-stick tape is used to avoid sticking of the hot film on the rubber beyond the edges of the laminate. In other cases, a non-stick rubber covering will be preferred.

Embossing and laminating can be combined in a single operation.

Hannecard solutions for the back-up roller :



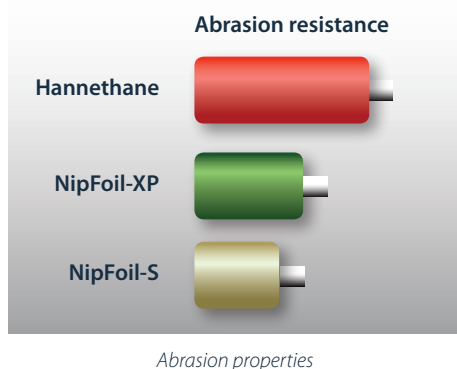
Type	Product	Characteristics
Standard	<b>Kalmat</b> Black 85-95 shore A	<ul style="list-style-type: none"> <li>• Good temperature resistance (up to 120 °C)</li> <li>• Very good abrasion resistance</li> <li>• Low heat build-up, stable pressure nip</li> <li>• Low surface roughness for defect-free lamination</li> </ul>
	<b>MMX-Mate</b> Black 85-95 shore A	<ul style="list-style-type: none"> <li>• Very good temperature resistance (up to 160 °C)</li> <li>• Excellent abrasion resistance</li> <li>• Very low heat build-up</li> <li>• Stable pressure nip even under the most stringent conditions</li> </ul>
Anti-adhesive	<b>Vulcan</b> Red 60-80 shore A	<ul style="list-style-type: none"> <li>• Excellent temperature resistance (up to 260 °C)</li> <li>• Good physical properties</li> <li>• Anti-adhesive</li> </ul>
	<b>BupFoil-XP</b> Grey Double layer 60 and 80 shore A	<ul style="list-style-type: none"> <li>• Recommended for combined coating and embossing applications</li> <li>• Temperature resistance up to 200 °C</li> <li>• Anti-adhesive properties</li> </ul>
	<b>Lotus-FEP</b> Black	<ul style="list-style-type: none"> <li>• Combination of special, elastic rubber base layer and outside Teflon® FEP sleeve*</li> <li>• Temperature resistance up to 220 °C</li> <li>• For complete anti-adhesive properties</li> </ul>

\* Teflon® is a registered trademark of DuPont

## TRANSFER AND FINISHING SECTION

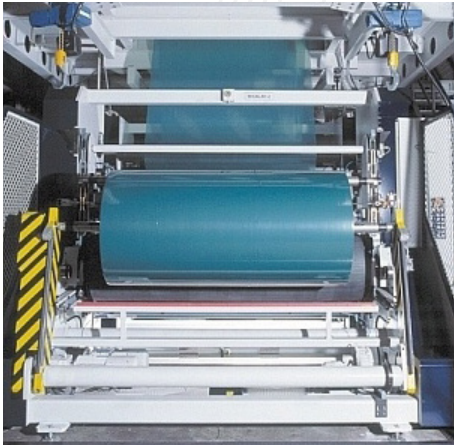
### Nip Rolls

Nip rolls can be used in contact with the plastic film for various reasons : tension control, mechanical stretching, Corona or flame treatment, winding and slitting.



Type	Product	Characteristics
Standard	<b>NipFoil-S</b> Grey - Rubber 40-80 shore A	<ul style="list-style-type: none"> <li>• Excellent ozone and temperature resistance (up to 125 °C)</li> <li>• Good abrasion resistance</li> <li>• Good physical properties</li> </ul>
Standard Antistatic	<b>NipFoil-S-AS</b> Black - Rubber 50-90 shore A	<ul style="list-style-type: none"> <li>• Excellent ozone and temperature resistance (up to 125 °C)</li> <li>• Good abrasion resistance</li> <li>• Good physical properties</li> </ul>
High end	<b>NipFoil-XP</b> Green/Grey - Rubber 50-80 shore A	<ul style="list-style-type: none"> <li>• Excellent ozone and temperature resistance (up to 125 °C)</li> <li>• Improved abrasion resistance</li> <li>• Very good physical properties</li> </ul>
High end Antistatic	<b>NipFoil-XP-AS</b> Black - Rubber 50-80 shore A	<ul style="list-style-type: none"> <li>• Excellent ozone and temperature resistance (up to 125 °C)</li> <li>• Improved abrasion resistance</li> <li>• Very good physical properties</li> </ul>
	<b>NipFoil-XPE-AS*</b> Black - Rubber 65-90 shore A	<ul style="list-style-type: none"> <li>• Excellent ozone and temperature resistance (up to 140 °C)</li> <li>• Very good abrasion resistance and physical properties</li> </ul>

\* New generation Hannecard ECO quality



Type	Product	Characteristics
Standard	<b>Hannethane</b> Blue/Brown - PU 25-60 shore A	<ul style="list-style-type: none"> <li>• Very good ozone resistance</li> <li>• Temperature resistance max. 80 °C</li> <li>• Outstanding abrasion resistance</li> <li>• Excellent physical properties</li> </ul>
	<b>Hannethane-XP</b> Brown - PU 70-95 shore A	<ul style="list-style-type: none"> <li>• Very good ozone resistance</li> <li>• Temperature resistance max. 90 °C</li> <li>• Outstanding abrasion resistance</li> <li>• Excellent physical properties</li> </ul>
Standard Antistatic	<b>Hannethane-AS</b> Black - PU 40-90 shore A	<ul style="list-style-type: none"> <li>• Very good ozone resistance</li> <li>• Temperature resistance max. 80 °C</li> <li>• Outstanding abrasion resistance</li> <li>• Excellent physical properties</li> <li>• Slightly antistatic</li> </ul>
Semi-conductive	<b>Hannethane-SC</b> Black - PU 40-85 shore A	<ul style="list-style-type: none"> <li>• Very good ozone resistance</li> <li>• Temperature resistance max. 80 °C</li> <li>• Outstanding abrasion resistance</li> <li>• Excellent physical properties</li> <li>• Surface resistivity 10-1000 kΩ</li> </ul>
Special solution "High Release"	<b>HanneRelease</b> Black - PU 40-85 shore A	<ul style="list-style-type: none"> <li>• Very good ozone resistance</li> <li>• Temperature resistance max. 80 °C</li> <li>• Outstanding abrasion resistance</li> <li>• Excellent physical properties</li> <li>• Antistatic</li> <li>• Improved release and non-stick properties</li> </ul>

## RELATED DOCUMENTS

- Solutions - 'Plastic film industry'
- Solutions - 'Winding & Slitting'
- Solutions - 'Bi-oriented plastic film'
- Solutions - 'Blown Extrusion'
- Solutions - 'Corona treatment'
- Solutions - 'Plastic film spreading'
- Solutions - 'PVC & other soft plastics processing'

## Spreader rolls

Spreader rolls are used to avoid the appearance of wrinkles during the film transport. They can be metallic or rubber coated and they generally contain a spreader type groove profile.

Also curved (banana) rollers are often used. Hannecard proposes multiple covering and finishing types. Our solutions can be found in the leaflet "Plastic film spreading"

## Winding & slitting rolls

To improve the winding quality, elastomer covered contact, lay-on and drum rolls are used in contact with the film bobbin. Their composition and finishing is very critical in order to assure the absence of wrinkles and a correct bobbin shape.

We refer to our leaflet "Winding and slitting" for detailed information on the Hannecard range.

## Corona rolls

By means of the Corona treatment, an electrostatic discharge is applied on the film surface in order to improve the printability and the adherence during a following lamination and/or coating process.

The back or detour roll needs to have very stable electrical insulating properties and needs to resist to high ozone concentrations.

See our leaflet "Corona treatment" for more info on our solutions.

## MORE INFORMATION?

For more information, please contact your local Hannecard partner or visit our website at: [www.hannecard.com](http://www.hannecard.com)