

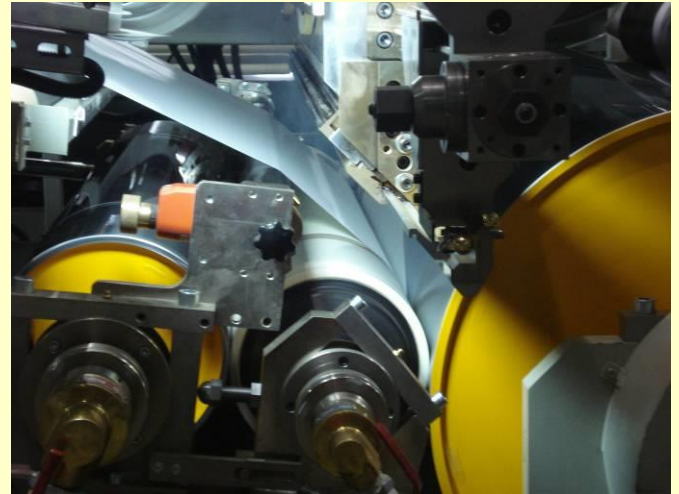


Extusion coating

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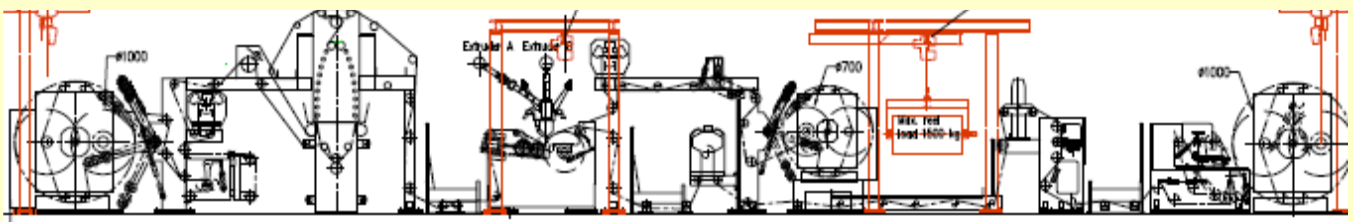
GAP is a global player in the flexible packaging sector, where we proudly supply the finest names in the industry with our double and triple bubble lines to produce speciality biaxially oriented shrinkable films and technical casting lines. Our company is possessing, ***under one roof, both extrusion as well as web converting capabilities*** thus worth to be considered a reliable partner to interview with whenever a ***coating or lamination*** project might arise, our capabilities are more than skin deep. As we also belong to the plastic environment, our roots in the area of polymer processing and associated technology jargons do play an important role to qualify our proposals.

The extrusion coating process, now been used for over six decades to produce composite new materials for various industries, Initially the products were relatively simple coated papers, made using a single head extrusion



coater, but even with that simple equipment it was possible to apply a coating to one side of the substrate in one pass and, by passing the substrate through the machine again, the other side could be coated or even laminated to a foil. A third pass will then give the ability to coat on top of the foil to produce a composite structure.

Typical extrusion coating lay out.





Possible combination

Machine model	Unwind 1	Single coating	Unwind 2	Tandem coating if present
LF+FF+HP	Paper	PE		
LF+FF+HP	Paper	PE	Paper	
LF+FF+HP	Paper	PE	Aluminium	PE
LF+FF	Paper	PE	Film	
LF+FF	Paper	PLA	r	
LF+FF	Paper	PLA	Paper	
LF+FF	BOPP	PP		
LF+FF	BOPP	PP or PE	BOPP MET	
LF+FF	Aluminium	PE		
FF	Aluminium	PE	Aluminium	PE
LF+FF	BOPET	PE	PE	
LF+FF	BOPET	PE	MET	
NWC	Non Woven	PE	BOPP	
LF+FF+NWC	Non woven up to 50 sgm	PE		
LF+FF	Paper	EVOH- / ADH	PE	PE
LF+FF+HP	Paper	PA / ADH / EVOH-44 / ADH	PE	PE
LF+FF	Paper	PA / ADH / LDPE / ADH / EVOH-29 / ADH	PE	PE
LF+FF	Paper	ADH / EVOH-32 / ADH	PE	

The extrusion coating process is virtually pollution-free. On long runs the economics of extrusion coating are very favourable because of the potential significant increases in production rates.

Extrusion coating lines are not particularly energy intensive. The ability to produce multi-layer composite laminates in one

pass particularly with the use of coextrusion is very attractive.

In many cases the use of coextrusion enables much thinner films to be laminated to produce the same barrier properties as those produced on conventional adhesive coating and laminating machines.

The advent of new extrudable resins permits to give added adhesion, barrier and heat sealable properties. An extrusion coated layer can replace a film lamination, with the benefit of a more tailored



“extrusion coating process is virtually pollution-free.”



GAP Unwinder & Rewinder

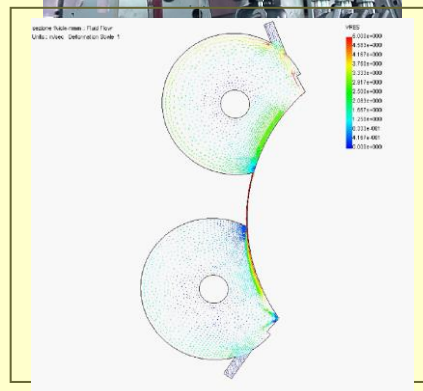
GAP unwinder, auxially unwinders and winder up to 1800 mm winder are specifically designed accordingly to the material to handle like : paper , board , plastic film , aluminum . Winder can be supplied with Pneumatic shafts or shaftless Semiautomatic or fully automatic splice system Fix or movable arms to help roll pick up Roll can be load by lifting platform or crane. Fly splice in one direction on both direction Dedicate splice for aluminum foil

Gap & taper winding



Primer coating

Chemical primers will provide the adhesion required particularly in food packaging. In particular use of chemical primers can allow extrusion coating at substantially lower temperatures without loss of adhesion –this is particularly valuable in extrusion coating of food packaging materials since the lower extrusion temperature means a lower degree of resin degradation and therefore less odour imparted to the goods packaged. The primers can also impart certain barrier properties as well as maintaining adequate adhesion under difficult process conditions.





GAP screws

In extrusion coating a high melt temperature is required and the GAP extruder is capable of delivering a specific melt temperature over a wide range of output rates. Almost without exception this requirement will be extended to include several different types of resins.

A typical extruder screw which will be used as the basis for further discussion is the one commonly known as "Maddock".

This design features:

- Feed Section
- Transition Section
- First Metering Section
- Barrier Mixing Section (the Maddock properly said)
- Second Metering Section.

The polymers enter the feed section at room temperature and by a combination of barrel heat and shear energy from the screw is melted, mixed, heated and pump.



GAP extruder assembly

In extrusion coating GAP control high extrudate temperature with a high degree of homogeneity to obtain the ideal situation for good coating. In addition, and most important, we are aiming at these conditions over a wide screw speed range. The temperature of the extrudate is governed by many variables but the specific ones to consider are screw design, barrel temperature, the polymer viscosity and the extrusion output rate or screw speed.

Extruder has been studied to deliver high uniform melt temperature and stable out put





GAP Feed Block and die system

Coextrusion coating with the conventional centre fed dies the combining adaptor or feed block assembly is used to combine the melt flows before entering the die.

The layer ratio and uniformity are dependent on resin rheology, temperature and extruder output since a similar viscosity is required for each material.

It is also possible to change the internal flow geometry within the combining chamber to physically adjust the thickness and the flowing conditions (viscosity and velocity matching) of the melt streams. The uniformity of the total thickness across the film is obtained by adjustment of the final die lip opening with manual or automatic adjustment



GAP Chill roll & lamination



The lamination group is design and built to provide a uniform temperature on the chill roll surface with particular water flow circulation. GAP has different size and finish surface of the chill roll accordingly to the out put and to the material to be laminated.

Quick removable chill roll easy change.

Pressure roll covered by particular coating heat resistance.

Adjustable tapes for overcoating



Main data	flexible		Heavy paper	Fabric / non wovens / Cloth
	Light flex (LF)	Flex flex (FF)	HP	NWC
Modello				
Width	800-1300	800-1300-1500	800-1500	800-2000
Speed	200 mt/1	(FF 35) up to 350 mt/1 (FF 50) up to 500 mt/1'	(HP 20) up to 200 mt/1 (HP 35) up to 350 mt/1	170
Unwinder	800 mm	800- 1000-1300 mm	1200-1500-1800 mm	1500 mm
Splice	One direction	Two direction adding TDS optional	Two direction adding TDS optional	Stop and go
Extruder assembly	Single-coex	Single-coex	Single - coex	Single to coex
Extruders size available	60 (260 kg/h) - 75 (320 Kg/h) - 90 (450 Kg/h)- 120 (530 Kg/h) - 130 (700 Kg/h) - 160 (950 Kg/k)			
Die	Manual	Manual / Automatic	Manual / Automatic	Manual
Chill Roll size	600 mm	600-900 mm	600-900 mm	600 mm
Unwinding material from first unwinder	Paper up to 120 gsm BOPP + BOPET+BOPA	Paper up to 200 gsm +BOPP + BOPET+BOPA + Aluminium	Paper up to 350 GSM	Non woven 300 Gsm
Unwinding material from second unwinder	Aluminium (Reduce speed for splice) + CPP + BOPP + Paper up to 120 gsm	Aluminium (Splice at full speed) + CPP + BOPP + Paper up to 200 gsm	Aluminium (Splice at full speed)	BOPP printed ,
Treatment available	Corona treatment	Corona treatment	Flame	Corona treatment
Winder diameter	1000 mm	1000 mm 1300 mm	1800 mm 2000 mm	1500 mm
Type of winder available	Turret fix arm Shaft design	Turret fix arm Turret with movable arms Shaft and shaftless design	Turret with movable arms Shaft and shaftless design	Single shaft Turret fix arm Shaft design
Primer after first unwinder	Water base Available	Water base Available	Water base Available	Not available
Additional gravure coating unit (lacquering) after or before extrusion	Water base available to lacquering one side of the complex	Water base available to lacquering one side of the complex	Water base available to lacquering one side of the complex	Not available