

PACKAGING INNOVATION

COFFEE

Radical improvements in coffee packaging are being rolled out across Europe using PP-based barrier flexible packaging. Non-recyclable laminates – predominantly based on PET and Aluminum foil or Metallized PET – are now shifting to PP mono-material solutions that are compatible with mechanical recycling streams while delivering equivalent protection and packaging performances.

Over the last 40 years flexible packaging for coffee has mostly consisted of 3 or 4-ply constructions based on thin Aluminum foil to provide sufficient barrier to aromas, gases, oils, light and moisture.

New cost effective polypropylene (PP) films have recently been developed to provide Ultra High Barrier (UHB) properties on thin BOPP films along with improved mechanical and thermal properties. In combination with low heat seal threshold cast PP films to substitute the more traditional LLDPE blown films, PP barrier laminates can run efficiently

on coffee packaging machinery with some modifications. On top of being mechanical recyclable for PP-streams, significant reductions in unit weight are being achieved as PP is the lowest density or highest surface yield polymer used for flexibles. Depending on the packaging formats involved, there are two or three-ply laminate options using BOPP films with different barrier technologies – ranging from thin layer co-extrusion to very thin layer water-based or vacuum-based depositions – which deliver broad mono-material solutions to the world of coffee packaging. Barrier requirements can vary for different coffees, whether whole bean, roast & ground, single serve formats (PODS) or soluble (freeze-dried) varieties, as well as with different packaging formats: VFFS, SUP, lidding, HFFS, sachets or stick packs.

A summary follows with the main PP-based structures currently being implemented in Europe across coffee types and corresponding packaging formats.



Protection

THE KEY PACKAGING REQUIREMENT FOR COFFEE

Several barrier options are available either in 2 or 3-ply PP mono-material laminates depending on the packaging format or the visual design being pursued by brand-owners.

Metallyte™ OPP films provide the broadest range of barrier with good protection to UV light, either with very high water vapor barrier (WVTR) for freeze-dried instant coffees, but also with very high Oxygen barrier (OTR) levels to ensure modified atmospheric packaging (MAP) is maintained whether it is with gas flushing N₂ typically using a gas valve or for vacuum (brick pack) formats. UHB films deliver high barrier to fats, oils and aromas for the best coffee qualities.

Alox-Lyte™ OPP films using a transparent barrier vacuum deposition technology provide an option to coffee roasters to reveal their product in a window to differentiate on the display shelves, while still offering good balance of barrier properties with good WVTR & OTR.

Bicor™ OPP films using a transparent water based barrier coating technology (EVOH or PVOH based) can provide the most cost-effective barrier solutions with excellent gas and aroma barrier for use in 2-ply reverse printed laminates.

OPP Barrier Film	WVTR	OTR	AROMA	LAMINATE
Metallyte MM883	0.1	0.1	++++	3-ply
Metallyte MM288	0.1	25	++	3-ply
Alox-Lyte AO893	0.7	0.5	++++	3-ply
Alox-Lyte AO894	0.7	0.5	++++	2-ply
Bicor MB866, MB890	5	0.5	++++	2-ply



Main packaging formats

PROVIDING VERSATILE PACKAGING FEATURES FOR COFFEE

						
COFFEE	HFFS	VFFS	SUP	SACHETS	STICK PACK	LIDDING
SOLUBLE & MIXES			•	•	•	
R&G		•	•			
VACUUM		•				
WHOLE BEAN		•	•			
PODS & COLLATION	•	•		•		•

OPP films provide a broad range of **packaging features** tailored to the different pack formats used across coffee categories. Bicor™ clear OPP films with a gloss or matte finish, with sealable or non-sealable configuration, and most recently with improved heat stability, can be selected to replace PET films or even Paper. For heat seal inner webs, a lower seal initiation (SIT) cast PP film grade should be used to optimize the seal operating window, or optionally with a Bicor Ultra Seal OPP films (MB344US) for flat seal formats (pouches) or when puncture resistance is essential.

“On top of being mechanically recyclable, PP mono-material laminates deliver significant reductions in packaging weights”



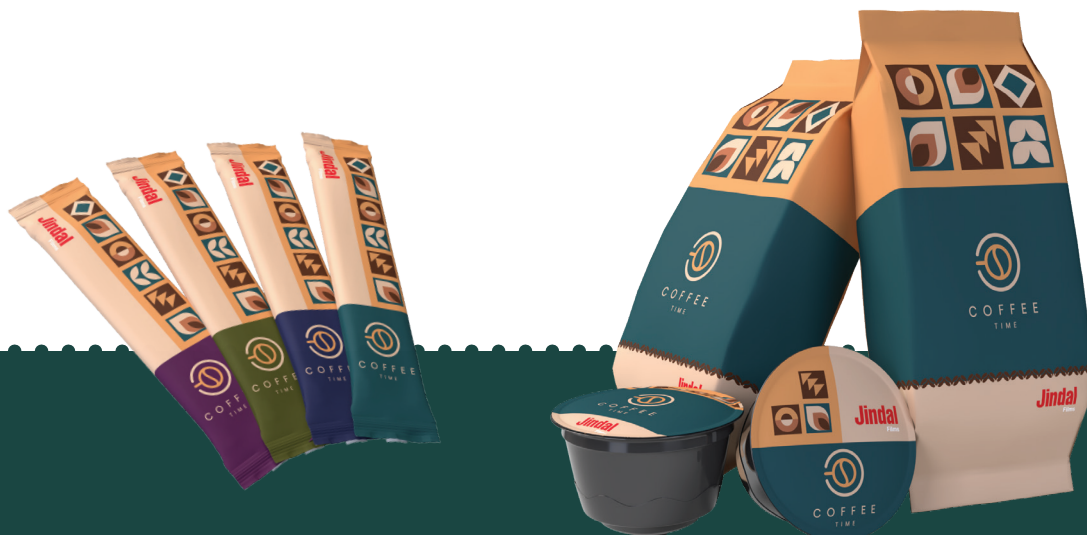


Main packaging solutions

DELIVERING PP MONO-MATERIAL SOLUTIONS FOR COFFEE

OPP films provide a broad range of **barrier performances** tailored to the different types of coffees (whole bean, ground, soluble & mixes). Bicor™ and Alox-Lyte™ transparent films enable efficient barrier packaging solutions in 2 or 3-ply with the option of displaying the coffee through a window. Metallyte™ films deliver the best protection to replace alu-foil or Met-PET in combination with a printed cleat Bicor outer web and a low SIT cast PP Film.

LAMINATE	MAIN PACK FORMAT	KEY ATTRIBUTE	PP SOLUTION
PET/ALU/PE	HFFS, VFFS, SUP, PODS, Vacuum, Sticks, Sachets, Lid	Barrier	MB100/MM883/Cast PP
PET/ALU/PET/PE	Whole bean, Vacuum	Puncture resistance	MB100/MM883/Cast PP MB100/MU842/Cast PP
OPP/ALU or Met-PET/PE	VFFS, POD collation	External seals	MB400/MM883/Cast PP GNR/MM883/Cast PP
PET/Met - PET/PE	VFFSS, SUP, POD collation	Barrier	MB100/MM883/Cast PP
OPP or PET/barrier PE	VFFS	Transparency & lower cost	MB866/Cast PP MB890/Cast PP AO894/Cast PP
PET/PET-SiOx or AlOx/PE	VFFS, SUP, Lid	Transparency	MB100/AO893/Cast PP



“Shifting from non-recyclable laminates towards PP-based laminates allows brand-owners to conform to the mono-material guidelines being increasingly adopted in Europe.”

Recyclability

PACKAGING FOR OUR PLANET!

Focus on improved flex-pack recyclability has become a must for most beverage companies. Converting to PP mono-material solutions is becoming an increasing priority due to the expanding PP-streams across Europe and to align with the CEFLEX design guidelines for a circular economy (D4ACE)

Shifting from non-recyclable laminates - such as PET/ALU/PE or PET/Met-PET/PE - towards PP based barrier laminates allows brand-owners to conform to the future mono-material guidelines being increasingly adopted across Europe. PP films have the best balance of properties - barrier, thermal and mechanical - to make a smooth transition away from previous mixed plastics solutions. Reaching >90% mono-material PP composition will allow flexible packaging to be further mechanically recycled for non-food rigid packaging or injection molding applications. Typical coffee fitments such as valves, zippers and to a lesser extent spouts are already available with PP raw materials. Optics, stiffness, heat resistance, barrier and haptic properties are all functional requirements delivered by PP laminates to sustain the enjoyment of coffee lovers across segments and pack formats.

PP based solutions are available with high gloss or matt finish, either in transparent or opaque designs without affecting the ability of current sorting equipment to detect them with NIR and are all compatible with today's extrusion systems commonly used for mechanical recycling operations.





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