

Elevated stiffness with high crystalline homo polypropylene

A highly crystalline homo polypropylene is now available to flexible packaging markets in Asia Pacific and the Middle East



The trend in flexible packaging film is moving towards multilayer co-extrusion film structures with enhanced film properties and performance features. Flexible packaging converters are continuously sourcing for raw materials which give the best performance in order to maintain its market competitiveness.

A high crystalline polypropylene (PP) is now available in applications where its extraordinary high stiffness is an advantage. Main applications include co-extrusion cast film, especially in metallising film, and lamination film. With its significant high stiffness, potential downgauging of 20 - 30% is achievable without sacrificing other film properties, such as high heat resistance and excellent barrier properties. Table 1 summarises key characteristics of high crystalline homo PP compared to standard homo PP.

Vacuum metallisable cast polypropylene (VMCPP) film applications

High crystalline homo PP is recommended for the core layer in vacuum metallisable cast polypropylene (VMCPP) film applications. High film stiffness is a critical requirement to achieve even aluminum deposition onto the running base cast PP film during the metallisation process. On top of that, VMCPP film makers will also enjoy the following benefits such as good heat resistance and excellent barrier properties of VMCPP films using high crystalline homo PP. In addition,

absence of migratory additive allows it to achieve and maintain high pretreatment level before secondary processing.

Lamination cast PP (CPP) film applications

In lamination cast PP film, high crystalline homo PP can be applied in either core or skin layer and co-extruded with copolymer resin. Similarly, a combination of excellent mechanical and barrier performance provides new opportunities in FFS packaging. Traditionally, cast PP film will be laminated with BOPP film during the secondary process. High crystalline homo PP co-extrusion film allows converters to achieve effective production cost saving as lamination step is not necessary and good printing quality is still ensured. In addition, it also provides downgauging potential and this will also lead to direct material cost savings significantly.

Twist wrap film applications

For twist wrap film applications, high crystalline homo PP is used as core layer to provide the stiffness or as surface layer to allow metallization. The film structure provides clear economic advantage versus the traditional packing as it offers not only downgauging potential but also flexibilities in subsequent converting. Good twist retention and excellent deadfold are guaranteed.

Technology that delivers desired benefits

High crystalline homo PP, based on Borstar technology, is produced utilising Borealis Nucleation Technology (BNT). BNT technology is the key to optimise the morphology of PP. As shown in the following electron microscope images, PP spherulites size are finer and more homogenous for BNT polypropylene, as compared to talc nucleated and non-nucleated PP. Due to its extremely high

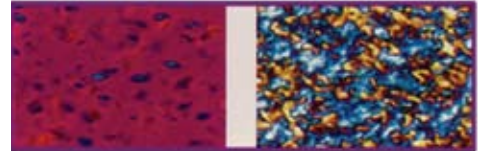
Key characteristics	Properties	High crystalline homo PP	Standard homo PP
High stiffness	Flexural Modulus (MPa)	2100	1400
High heat resistance	Melting point (°C)	164-170	160-166
	VSP (°C)	158	154
Excellent barrier	O2TR (cc/m ² /24h)	1500-1600	2500
	WVTR (%/m ² /24h)	4	6

Table 1: Comparison of high crystalline homo PP and standard homo PP

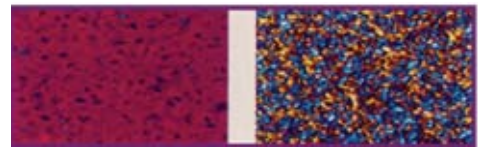
Technical Guide



Non-nucleated pp



Talc-nucleated pp



BNT pp

crystalline structure, this homo PP can achieve much higher stiffness (flexural modulus is ~ 50% higher) than standard homo PP available in the market at present.

Optimising the PP morphology with BNT technology

Borstar is Borealis' proprietary technology that supports differentiated polyethylene and polypropylene products. This process is particularly qualified to tailor the molecular architecture of both PP and PE combining excellent processability and mechanical properties. Borstar uses a multi reactor system that offers unparalleled possibilities when designing polyolefins for specific applications, such as high crystalline homo PP.

Explore new applications and opportunities

Bormod HD915CF, a high crystalline homo PP from Borouge will be produced in Ruwais, Abu Dhabi in one of the new PP production lines during third quarter of 2010. It will be the first time that Borouge will launch high crystalline homo PP to other markets outside Europe, being confident that high crystalline homo PP will be of great interest to flexible packaging market in Asia Pacific and Middle East region. Borouge is looking forward to co-work with flexible packaging converters and brand owners closely to explore novel opportunities and challenging applications.

About Borouge

Borouge's moulding business specialises in supplying advanced polyolefin plastics for injection and blow moulding processing technologies. Utilising leading technologies such as Borstar and BNT (Borealis Nucleation Technology) offers a product portfolio for a variety of high-performance packaging applications. With over 50 years of experience and pioneering solutions, Borouge together with Borealis have established a leading position on the film and moulding market across Europe, the Middle East and Asia.