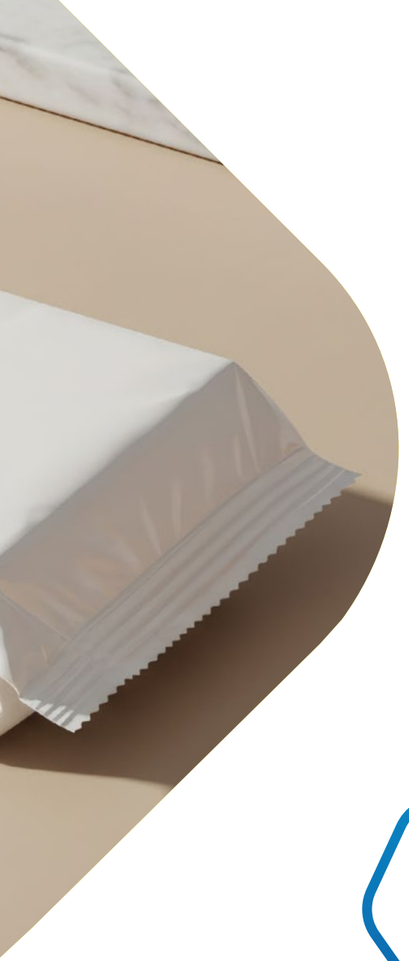
Polypropylene Films

Braskem



Braskem Symbios®

The Braskem Symbios® family was developed to meet the needs of the heat-sealable polypropylene film market and is primarily intended for automatic packaging processes.

Braskem Symbios®

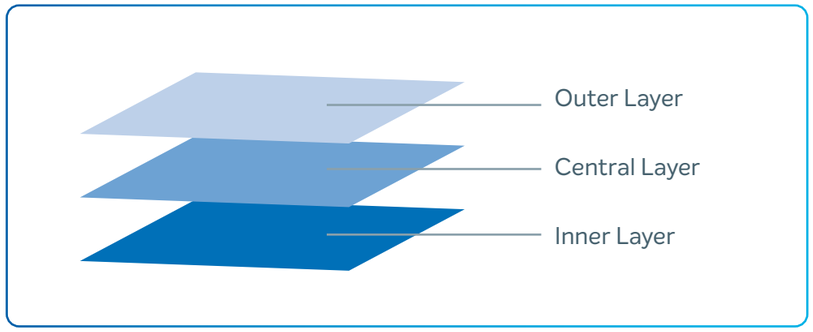
Applications

Biaxially Oriented Flat Films

Biaxially oriented or conventional polypropylene flat films are typically coextruded in three or more layers.

The central layer usually uses homopolymer polypropylene, which is responsible for the mechanical and structural properties of the films. The rest of the structure is formed by the adjacent and outer layers.

The Braskem Symbios® family was specially developed to meet the needs of the outer layers, combining differentiated functional properties with excellent processability due to its structural characteristics.



The advantages of using Braskem Symbios® are:

- Low initial sealing temperature
- Excellent optical properties
- Great processability
- Stiffness
- Thermal resistance
- Surface treatment retention
- Good performance in the metallization process
- High compatibility with adjacent layers
- Moisture barrier
- Packaging speed

GRADES PORTFOLIO		
Homopolymer	Proxess H33	
Random Copolymer	RF150SS	RF70
Heterophasic Copolymer	CP741	
Terpolymer	Symbios 4102	Symbios 4T05

Processability

Particularly in the biaxial orientation process, Braskem Symbios® combines a high melting temperature with a low sealing temperature, facilitating processability. Due to its reduced fraction of low molecular weight components, the product does not present issues with material deposition on heated rollers during longitudinal stretching.

The rheological characteristics of Braskem Symbios® were specially designed to optimize the performance of coextruded structures and biaxially oriented films.

Sealability

The Braskem Symbios® family combines a low initial sealing temperature with high sealing strength. These properties are essential requirements for automatic packaging processes, in which Braskem Symbios® performs better than conventional random copolymers and high-ethylene-content random copolymers.

Another important feature related to sealability is the higher hot tack resistance, a keyproperty for the speed of automatic packaging processes.

Braskem Symbios® offers superior hot tack performance, enabling higher packaging speeds and a broader sealing window.

Process

- Coextrusion of conventional films
- Coextrusion of biaxially oriented films

	Method ASTM	Units	Film Coextrusion					
			Symbios 4102	Symbios 3102	Proxess H33	Symbios 4T05	RF70	RF150SS
Control Properties								
Melt Flow Rate (230 °C/2,16 kg)	D 1238	g/10 min	5,5	9,0	3.3	5.5	7	1,5
Typical Film Properties								
Flexural Modulus 1% Secant (MD/TD)	D 882	MPa	360/410	380/360	1500	600	550	550
Tensile Strength at Yield (MD/TD)	D 882	MPa	15/17	16/15	35	-	20	22
Tensile Elonga on at Yield (MD/TD)	D 882	%	13/12	14/12	11	-	14	13
Haze	D 1003	%	0,3	0,4	0,3	-	3	0,3
Gloss 45°	D 2457	-	100	99	99	-	-	100
Sealing Initial Temperature	Braskem	°C	115	115	-	105	120	120
Applications			Flat die film coextrusion; Conventional heat-sealable film; Suitable for lamination and metallization processes.	Coextrusion of biaxially oriented and conventional films; Conventional heat-sealable film; Suitable for lamination and metallization processes.	Food packaging, metallized film, pearlized film, adhesive tapes, and suitable for lamination processes. It offers a wide processing window with excellent productivity and thickness profile control. The film has outstanding optical and mechanical properties. The product does NOT contain slip or anti-block additives, NOR calcium stearate as a neutralizer.	Terpolymer of propylene, butene, and ethylene with medium melt flow index and initial sealing temperature of 105°C. The product is free from slip and anti-block additives.	Used in combination with terpolymers to achieve higher seal strength in packaging.	Used in combination with terpolymers to achieve higher seal strength in packaging.

a) 30 µm thick film, obtained using a 50 mm tubular extruder and a blow-up ratio of 1.3:1 (MD = Machine Direction / TD = Transverse Direction)

Final Remarks

1. This resin complies with the olefin polymer regulation under 21 CFR, section 177.1520, of the U.S. Food and Drug Administration (FDA). The additives used are approved under appropriate FDA regulations.

2. The information provided herein is given in good faith, indicating typical values obtained in our laboratories, and should not be considered absolute or as a guarantee. Only the properties and values listed in the quality certificate should be considered as product guarantees.

3. For certain applications, Braskem has developed tailor-made resins to achieve specific characteristics.

4. In case of doubts regarding usage or to discuss other applications, please contact the Application Engineering team.

5. For safety, handling, personal protection, first aid, and waste disposal information, refer to the SDS – Safety Data Sheet. CAS registration number: 25895-47-0.

The values in this catalog may be subject to change without prior notice from Braskem.

PP Films

Braskem's wide range of polypropylene resins meets the most diverse market specifications.

The homopolymer lines (PH 0952, H 401, PH 0950, HP 525M, and PD 943XP), copolymers (RP 225M), and terpolymers (Symbios 3102, Symbios 4102) are suitable for a variety of mono- and multilayer structures of tubular and flat films for flexible packaging.

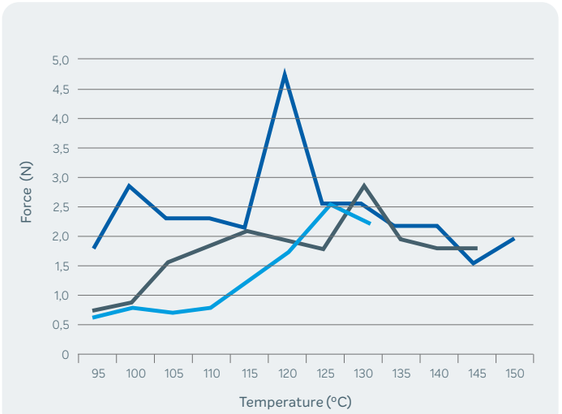
Process

Multilayer, tubular, and flat extruders can achieve better efficiency by using each resin specifically in its designated layer.

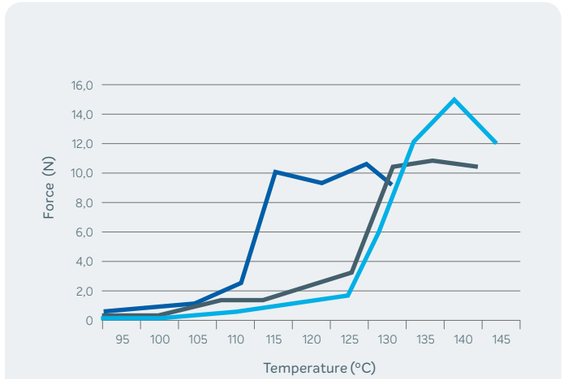
Thus, polyethylene and polypropylene resins can also be combined to create special structures that, for example, bring together the excellent puncture resistance of polyethylene films with the significant transparency and gloss of polypropylene films.

Sealing Properties

Heat Sealing



Seal Strength



Terpolymer Homopolymer Random Copolymer

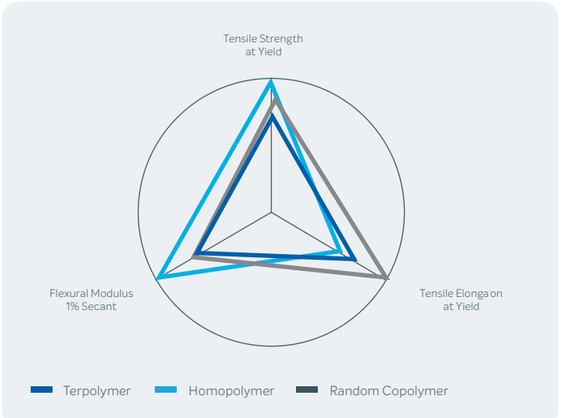
Flat Films Applications

Characteristics

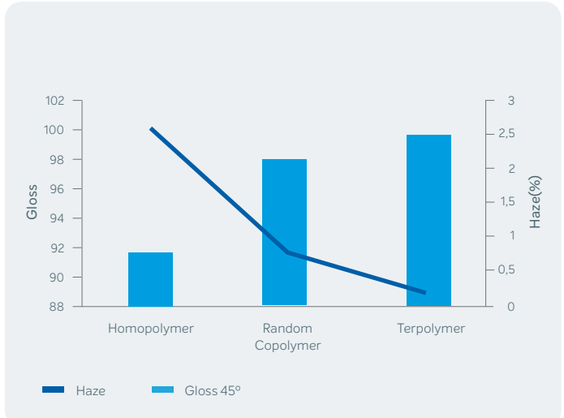
Braskem's PP homopolymer resins stand out in the production of high-gloss films for technical rolls, twist films, and thin films with high mechanical strength, accurate flatness, and minimal dimensional deformation.

The sealing resins—copolymers and terpolymers—offer high seal strength at low temperatures, resulting in greater productivity and hermetic sealing. They perform excellently in VFFS (Vertical Form Fill and Seal) and HFFS (Horizontal Form Fill and Seal) packaging lines. Terpolymers are ideal for films that must withstand high temperatures, such as cooking and sterilization processes.

Mechanical Properties



Optical Properties



Tubular Films Applications

- **Multilayer Films**
  - PP/PE structure for applications with esidue-free sealing — **HP 525M / Flexus 7200**
  - Structure for conversion — **PH 0952 / HP 525M / RP 225M / Symbios 3102**
- **Mono and Multilayer Films**
  - Medical and hospital products — **PH 0952 / HP 525M / RP 225M / Symbios 3102**
  - Packaging fo clothing and textile products — **H 401 / RP 225M / Symbios 3102**
  - Stationery films — **PH 0952 / RP 225M / Symbios 3102**
  - Twist films — **PH 0950 / RP 225M**
  - Technical rolls, general-use and food packaging — **PD 943XP / PH 0952 / HP 525M / RP 225M / Symbios 3102**
  - Labels — **PH0952 / HP 525M / RP 225M / Symbios 3102**

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