
At home in your world
Polypropylene
Cast and Blown Film
TOTAL PETROCHEMICALS
TOTAL

Total Petrochemicals confirms its commitment to the film markets

In its desire to serve its customers better, Total Petrochemicals has extended its cast film product range with four new references. These grades have been designed to address the whole range of cast film applications *(cfr fig 1)*:

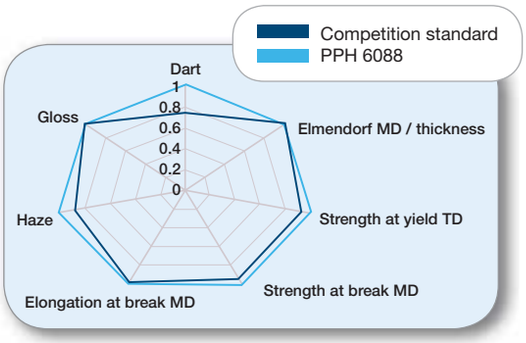

Figure 1

- Two homopolymer grades - **PPH 6080** & its slip and antiblock additivated version **PPH 6088** – bringing excellent optical properties, high stiffness, high heat resistance and good sterilisability.
- Two random copolymer grades – **PPR 6280** & its slip and antiblock additivated version **PPR 6288** – bringing outstanding optical properties, very good heat sealing and sterilisability.

These references are the starting point of a new standard reference in the film market.

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lumicene®

Lumicene® PE & PP the "Total" synergy between metallocene

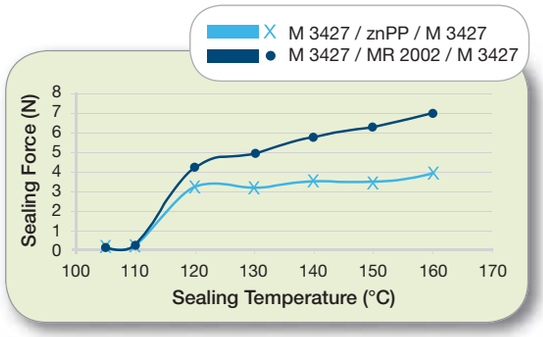

Figure 2

The use of coextrusion technology delivers the combination of mechanical, thermal and optical properties of polypropylene together with the tear and impact resistance of polyethylene. This exceptional set of properties is maximised thanks to the combined use of metallocene PE and metallocene PP.

Indeed, this unique metallocene technology platform, offered by Total Petrochemicals - under the brand name Lumicene® - brings an excellent inter-layer adhesion *(cfr fig 2)* which gives the great advantage of avoiding the use of tie layers between the materials.

High quality film for sensitive food packaging

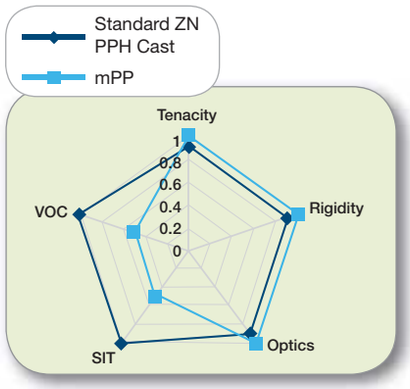

Figure 3

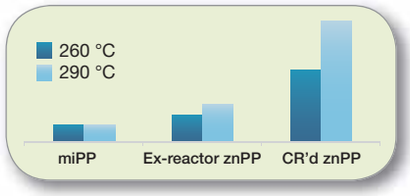

Figure 4

Films made of Lumicene® **MR 2002** display an outstanding set of properties in comparison with conventional ZN PPH cast grades *(cfr fig 3)*.

On top of outstanding optics and superior tenacity, **MR 2002** offers cost saving opportunities to the packaging industry. First of all, technically speaking, the very narrow molecular weight distribution of **MR 2002** allows high extrusion speed on cast lines. Secondly, the higher rigidity of the film produced with **MR 2002** allows our customer to go one step further in terms of downgauging. Finally, the lower SIT reached with **MR 2002** will benefit to final user in terms of production throughput.

MR 2002 is also highly recommended for sensitive food applications. The extremely low extractable content is favourable for the best organoleptic properties. This can be seen in *fig 4* when **MR 2002** fumes emissions are approx 4 times lower than controlled rheology ZnPP, hence a significant reduction in die and roll deposit and so much lower potential for flavour modification.

Medical film

Random copolymer **PPM R021** is specially designed to fulfill the European and American pharmacopoeia. It can be processed on both cast and blown film lines and is appreciated for its excellent mechanical properties and good optics. Films made with **PPM R021** are especially suitable for the production of sterilizable transparent medical pouches.

Hood film

Random copolymer, **PPR 3260** features thermal properties between those of polypropylene homopolymer and those of polyethylene. These properties are particularly valuable in the inner layer of shrink-wrap palletizing film. It prevents film adhesion onto the surface of goods during the heating phase.

Total Petrochemicals

commitment to the packaging industry

A long-standing and first choice supplier to the packaging sector, Total Petrochemicals has developed a comprehensive range of polyolefins grades covering the various technologies used in the production of both monolayer and multilayer film.

Ever attentive to the needs of the packaging sector, Total Petrochemicals offers specific grades for the manufacturing of thermoformable sheets, injection molded articles or bi-oriented polypropylene film (BOPP). Total Petrochemicals also offers a comprehensive range of polypropylene grades for cast and blown film producers. Suitable for every type of production line, these products meet all the requirements in terms of film property and processability. Thanks to it's complete Research and Development structure (from catalysis to "pellets") Total Petrochemicals commits itself to design the future of packaging with it's customers.

The strictest product quality control along with the mastery of our production technology guarantees outstanding product quality and consistency.

Grade	MFI (230°C, 2.16 kg)	MWD	Melting range	C2 content	Slip agent	Antiblocking agent	Ca stearate	Flexural modulus	Characteristics	Applications
	g/10 min		°C	%				MPa		
Cast Film Grades										
PPH 4026	3	B	160 - 165	0	none	none	no	2000	high film modulus and antistatic	twist, labelling and lamination films, hot fill, food packaging
PPH 4070	3	B	160 - 165	0	none	none	no	1900	high film modulus	twist, labelling and lamination films, hot fill, metallization, food packaging
PPH 5060	6.0	M	160 - 165	0	none	none	yes	1400	stiff film	packaging films
PPH 6080	9.0	N	160 - 165	0	none	none	yes	1350	excellent optical properties, high stiffness, high heat resistance, retortable	food, textile, flower and general packaging, stationary film
PPH 6088	9.0	N	160 - 165	0	yes	yes	yes	1300	excellent optical properties, high stiffness, high heat resistance, retortable	food, textile, flower and general packaging, stationary film
PPH 7060	12.0	M	160 - 165	0	none	none	yes	1450	outstanding optics, high stiffness	food packaging, labelling
lumicene® MR 2002	15.0	N	150 - 155	0	none	none	yes	1300	very narrow molecular weight distribution, low VOC	sensitive food packaging with outstanding optics
PPR 6280	8.0	N	144 - 146	medium	none	none	yes	950	very good optical properties, sterilisable, good sealing properties	food, textile, flower and magazine packaging, hygiene applications, stationary film, lamination film
PPR 6288	8.0	N	144 - 146	medium	yes	yes	yes	950	very good optical properties, sterilisable, good sealing properties	food, textile and magazine packaging, hygiene applications, stationary film, lamination film
PPR 7220	10.0	M	143 - 145	medium	none	none	yes	1200	excellent optical properties, very good sealing characteristics	food packaging, lamination films
PPC 3660	1.3	M	160 - 165	high	none	none	yes	1200	outstanding mechanical properties	food packaging, stand up pouches, lamination films, sterilisable applications
PPC 5660	7.0	M	160 - 165	medium	none	none	yes	1200	good mechanical properties	non-transparent packaging film
Blown Film Grades										
PPH 3050	2.0	M	160 - 165	0	none	none	no	1300	high stiffness, high heat resistance	core layer of coextruded structures for tobacco, textile, food packaging
PPR 3221	1.8	M	143 - 145	medium	none	none	no	900	outstanding optical properties, easy heat weldability	highly transparent and glossy flexible packaging
PPR 3260	1.8	M	144 - 146	medium	none	none	yes	1000	easy heat weldability	flexible packaging
PPR 3261	1.8	M	144 - 146	medium	none	none	yes	900	easy heat weldability	flexible soft packaging
PPC 2660	0.8	M	160 - 165	high	none	none	yes	1100	outstanding mechanical properties	food packaging, stand up pouches, lamination films, sterilisable applications
PPC 3660	1.3	M	160 - 165	high	none	none	yes	1200	superior mechanical properties	food packaging, stand up pouches, lamination films, sterilisable applications
PPC 3666	1.5	M	160 - 165	high	none	none	yes	1200	lower die pressure	food packaging, stand up pouches, lamination films, sterilisable applications

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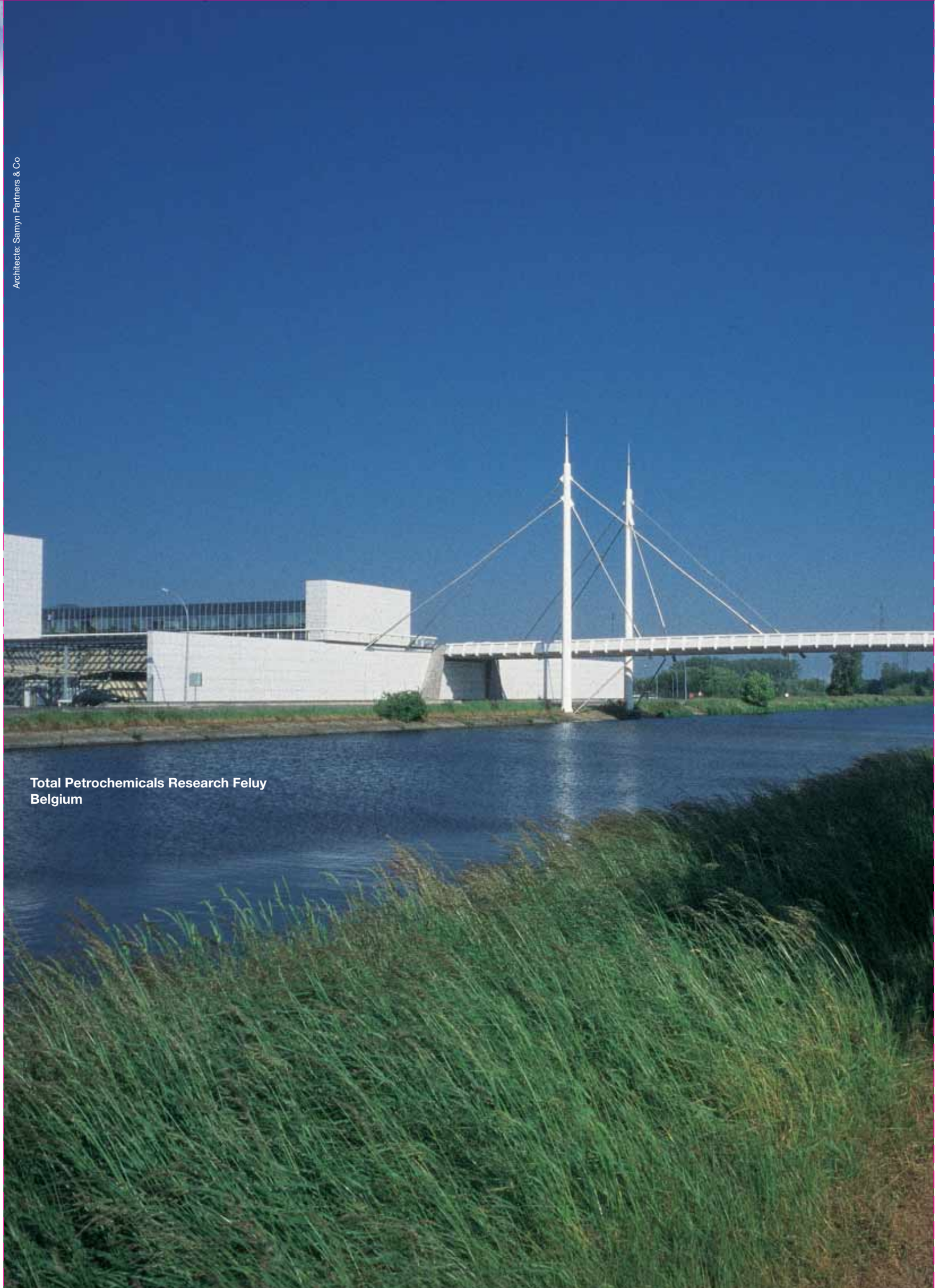

Architecte: Samyn Partners & Co

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Solutions for retortable packaging

Polypropylene is appreciated both for the mechanical properties it gives to the film and for its excellent temperature stability. These properties are particularly advantageous for instance in the manufacture of retortable or microwavable package (stand up pouches).

Polypropylene block copolymers **PPC 2660** or **PPC 3660** feature excellent mechanical properties as well as very high perforation resistance. In addition, both grades provide very high seal strength, which guaranties the seal integrity over the package shelf life. Films produced with **PPC 2660** or **PPC 3660** display high impact properties and low gels level, which make them particularly suitable for lamination.

PPC 2660 has a very high viscosity. This makes it suitable for blown film. Like **PPC 3660** it is a gel free material with good processability offering outstanding bubble stability.

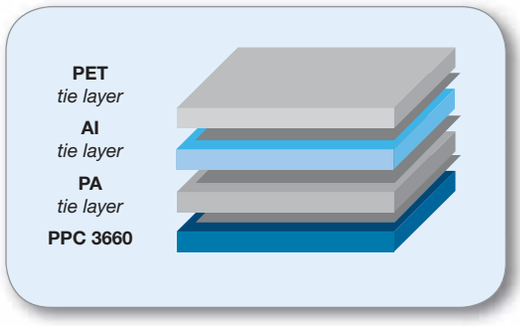

Figure 5: multilayer structure of a retort pouch with PPC 3660 as the seal resin

Blown Film for transparent packaging

In blown film Total Petrochemicals recommends to use **PPR 3221** in the outer layer of multilayer films *(cfr fig 6)*. Films with **PPC 2660** or Total Petrochemicals *Lumicene®* polyethylene as core layer and **PPR 3221** as skin layer offer remarkable gloss and transparency. These films are particularly adapted for the manufacture of bread bags or textile packaging.

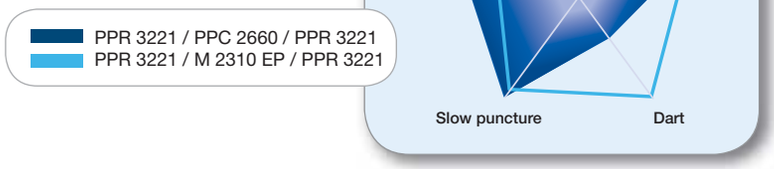

Figure 6: 40µm three layers coextruded blown films

High stiffness film

PPH 4026 has been especially developed for the production of very stiff film. Processed on cast film lines, **PPH 4026** allows significant downgauging. Its specific design enables to maintain higher stiffness at elevated temperature compared to conventional resins.

PPH 4070 has been specially designed to combine stiffness and metallization. Both product are beneficial for hot filling or the retort process.

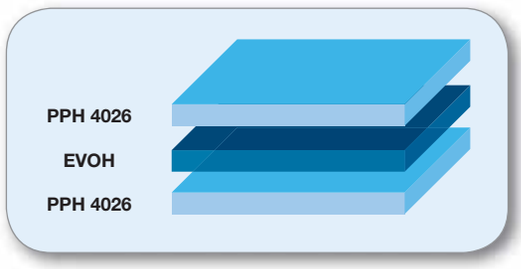

Figure 7: multilayer barrier for retortable and microwavable packaging

Total Petrochemicals

a Petrochemicals World Major

Total Petrochemicals, one of the world's leading petrochemicals producers, brings together the petrochemicals activities of the Total Group: base chemicals and their related polymers (polyethylene, polypropylene and polystyrene).

With about 6,250 employees worldwide, Total Petrochemicals is present in Europe, the United States, the Middle East and Asia. Our products serve numerous consumer and industrial markets, including packaging, construction and the car industry.

As part of the Total Group, Total Petrochemicals draws on strong synergies with Total's refining business, particularly in Europe and the United States, as well as with its exploration and production segment, mainly in the Middle East. To ensure ongoing development, Total Petrochemicals pursues a strategy aimed at improving the competitiveness of its plants in Europe and the United States, as strengthening its position in Asia and at developing projects that benefit from a more favourable access to raw materials, such as ethane in Qatar, or strong synergies with refining such as aromatics units on the site of the future Jubail refinery.

Photo Collection Total Petrochemicals/Michel Clinckemaille/Entercom

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