

At home in your world

**Lumicene®**

**Metallocene Polyethylene  
for Blown and Cast Films**



**TOTAL PETROCHEMICALS**



**TOTAL**

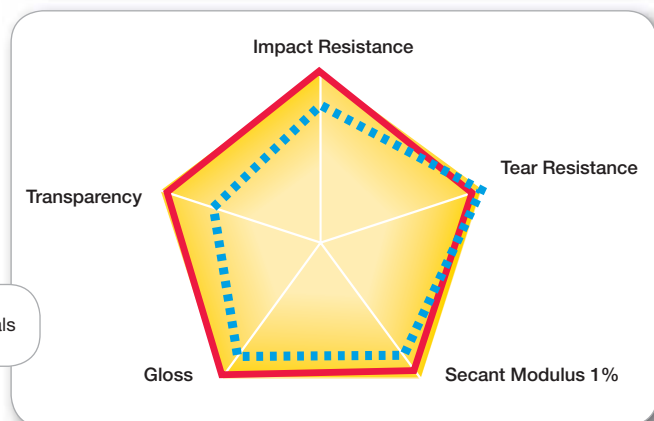
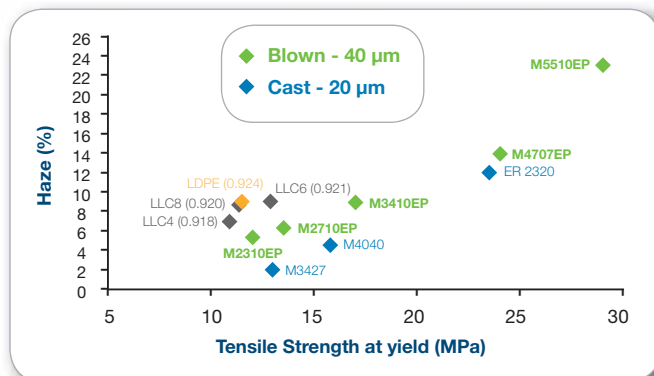
# Blown film with Lumicene® Metallocene grades

## Unique combination of Downgauging and Optical properties

With Total Petrochemicals Lumicene® metallocene resins (mPE), there is no need to compromise film stiffness for film transparency. You get both !

Film stiffness is very often the key to successfully downgauging film structures. It guarantees good mechanical strength as well as a smooth and efficient handling on film converting machines.

The downgauge exercise provides the most cost effective solutions for film converters. Downgauging also allows end users to meet weight reduction targets in line with environmental and sustainability challenges.



▬▬▬ 55 µm without Metallocene  
▬▬▬ 45 µm with 35% of Total Petrochemicals Lumicene® Metallocene

## Metallocene resins with superior processing behaviour

Total Petrochemicals Lumicene® mPE's are unique metallocene resins as they offer a clearly better processing behaviour compared to conventional metallocene resins available on the market:

- > Unique rheology accounting for up to 15% lower extrusion pressure
- > Better bubble stability allowing good gauge control
- > Excellent drawdown potential allowing to manufacture very thin films.

## Unique innovative solutions for Finished Products

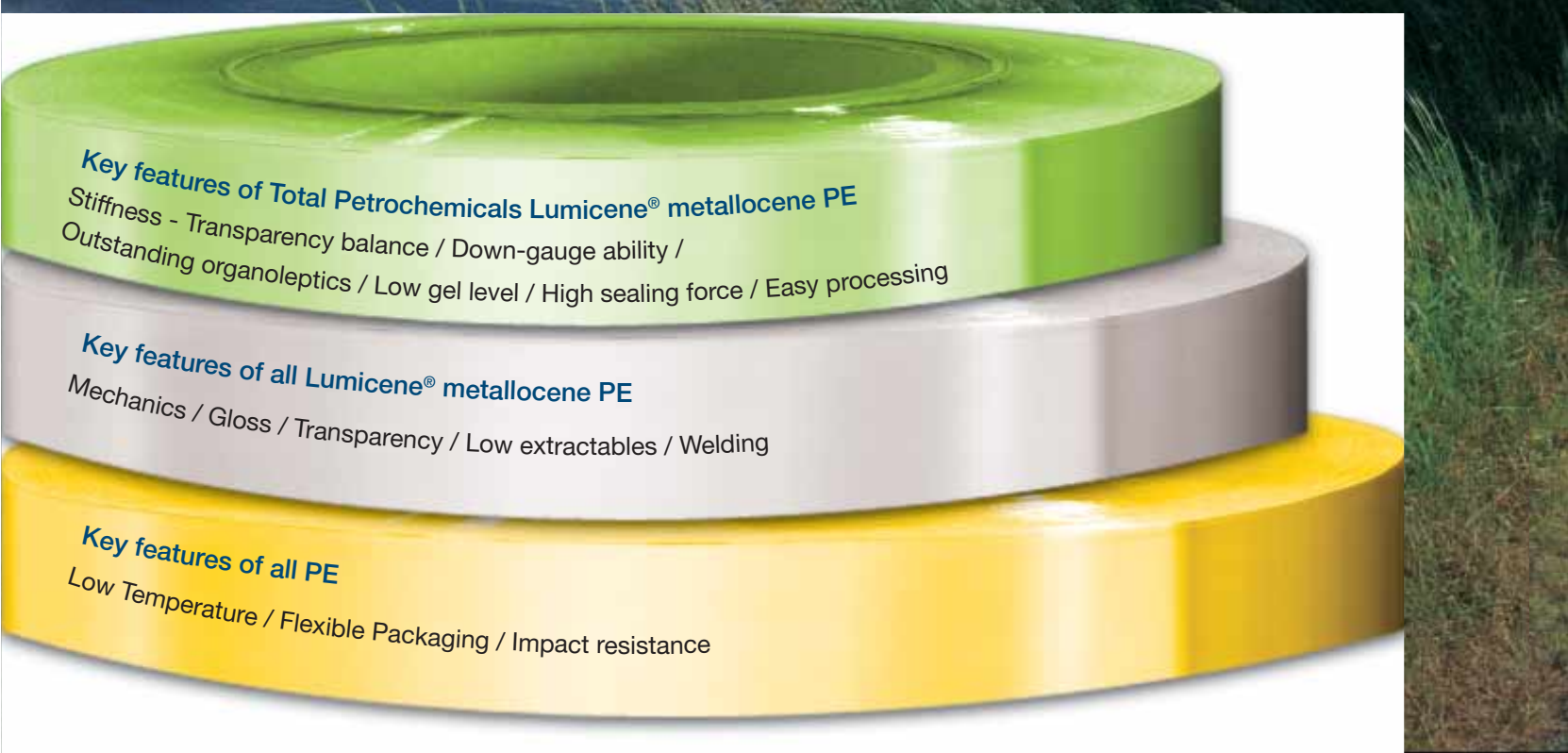
Total Petrochemicals Lumicene® metallocenes can be used in blends, co-extrusion or even pure and offer the most competitive and innovative solutions throughout the value chain.

Total Petrochemicals Lumicene® metallocene range	Extruders & Converters benefits	End-User benefits
Easy Processing	High throughput / Low pressure / Bubble stability	Cost competitive
Draw-down	Down-gauging	Packaging weight reduction
Stiffness / Mechanics / Sealing properties	High speed on automatic packaging lines	Packaging cohesion and integrity
Improved optics	Glossy & transparent films	Aesthetics
Specificities: Low gel level / outstanding organoleptical properties	High added value product Excellent printability	Convenience
<b>Lightweight</b>	<b>Cost-effective</b>	<b>Solutions</b>





**Total Petrochemicals Research Feluy  
Belgium**



**Key features of Total Petrochemicals Lumicene® metallocene PE**  
Stiffness - Transparency balance / Down-gauge ability /  
Outstanding organoleptics / Low gel level / High sealing force / Easy processing

**Key features of all Lumicene® metallocene PE**  
Mechanics / Gloss / Transparency / Low extractables / Welding

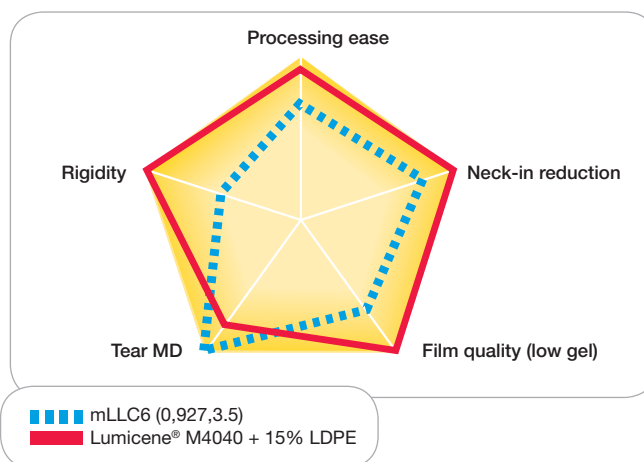
**Key features of all PE**  
Low Temperature / Flexible Packaging / Impact resistance

# Cast film with Lumicene® Metallocene grades

## Unique combination of Down-gauging, Optics and Processing

Total Petrochemicals Lumicene® mPE cast film resins have been specifically designed to meet the highly demanding processing requirements of cast extrusion minimising die-deposit.

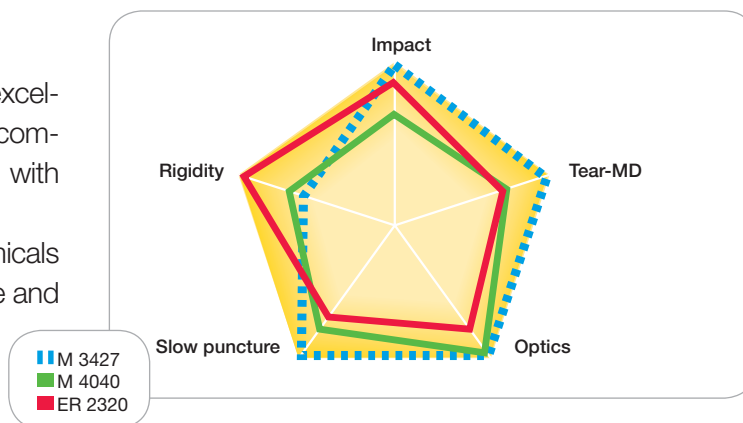
- > They show good thermal resistance, low neck-in, low extrusion pressure, low gel level and outstanding draw-ability even at extreme line speed.
- > Cast films produced with Lumicene® metallocene resins exhibit excellent optical properties (haze: 1.7% - 5.5%) in combination with high stiffness and seal strength.



## Cast film range: an overview

The combination of high stiffness, good optics and excellent draw-ability enables film downgauging for cost-competitiveness and packaging waste reduction in line with environmental challenges.

The addition of 10-20 % of LDPE to Total Petrochemicals Lumicene® mPE grades will boost film tear resistance and optics without impairing the other properties.



## Unique innovative solutions for Finished Products

Total Petrochemicals Lumicene® metallocene range can be used in blends, co-extrusion or pure and offer the most competitive and innovative solutions throughout the value chain.

Total Petrochemicals Lumicene® metallocene range	Extruders & Converters benefits	End-User
Easy Processing: low pressure; low neck-in	High throughput / production cost reduction	Cost competitive
Draw-ability/low gel level/ high stiffness	Down-gauging	Packaging weight reduction
Stiffness / Mechanics / Sealing properties	Highest automatic packaging speed lines	Packaging cohesion and integrity
Improved optics	Glossy & excellent printability	Aesthetics
Outstanding organoleptical properties	High added value product	Convenience
Natural adhesion to PP	Down-gauging Wider film structure options Higher PP regrind incorporation	Innovation
<b>Lightweight</b>	<b>Cost-effective</b>	<b>Solutions</b>

# Total Petrochemicals

## your Partner for Polyethylene Film Extrusion

Total Petrochemicals manufactures polyethylene at six production sites around the world: Antwerp and Feluy and Belgium, Gonfreville and Carling in France, Bayport in the United States and in Mesaieed-Qatar (Middle East). Worldwide PE production capacities of these sites account for more than 2 millions tonnes.

The many technological advances coming from the Research and Development teams in Total Petrochemicals Research Feluy (Belgium), have enabled Total Petrochemicals to create innovative and cost effective solutions in line with customer requirements and the evolving market demands.

The strictest product quality control combined with our knowledge of the production technology guarantees outstanding product quality and consistency. A customer-oriented organization that offers a dedicated sales force and efficient technical service makes Total Petrochemicals the ideal partner for your film extrusion business.

## Total Petrochemicals Lumicene® metallocene grade slate



Blown film range	Density (g/cm <sup>3</sup> )	Melt flow rate 190°C - 2.16 kg (g/10 min)
M 2310 EP	0.923	0.9
M 2710 EP	0.927	0.9
M 3410 EP	0.934	0.9
M 4707 EP	0.947	0.7
M 5510 EP	0.956	1.2

Cast film range	Density (g/cm <sup>3</sup> )	Melt flow rate 190°C - 2.16 kg (g/10 min)
M 3427	0.934	2.7
M 4040	0.940	4.0
ER 2320	0.960	4.0



# Total Petrochemicals

## A world-class player

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 automobile 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 feedstock, such as ethane in Qatar, or strong synergies with refining such as aromatics units on the site of the future Jubail refinery.

### > Headquarters in Brussels

### > 3 business units

- Base Chemicals (olefins, C4 fractions and aromatics)
- Polyolefins (Polyethylene, Polypropylene)
- Styrenics (styrene, polystyrene)

### > 19 industrial facilities

Europe, United States, Asia and Middle East

### > 23 sales offices

throughout the world

### > 3 R&D centres

Feluy (Belgium), La Porte (United States) and Mont/Lacq (France)

### > 2008 sales

13,1 billion euros

### > Over, 6,250 employees

worldwide

#### Marketing and Sales

TOTAL PETROCHEMICALS  
a division of sa PetroFina nv  
rue de l'Industrie, 52, Nijverheidsstraat  
B-1040 Brussels - Belgium  
Phone : +32 (0) 2 288 91 11  
Fax : +32 (0) 2 288 35 36

✉ : [polyethylene@total.com](mailto:polyethylene@total.com)

🌐 : [www.totalpetrochemicals.com](http://www.totalpetrochemicals.com)

#### Technical Service and Development

TOTAL PETROCHEMICALS RESEARCH FELUY sa  
Zone Industrielle C  
B-7181 Feluy - Belgium  
Phone : +32 (0) 2 288 40 05  
Fax : +32 (0) 2 288 46 60

