



Exceed™ Flow

Exceed™ Tough

Discover how ExxonMobil Exceed™ Flow and Exceed™ Tough metallocene polyethylene in masterbatch solutions can help improve the mechanical properties of final products such as molded products, pipes and fittings, and HFFR wire jacketing



Enhanced
heat shock
resistance



Better
pigment
dispersion



Improved
tensile
strength



Excellent
production
efficiency

Existing masterbatch (MB) formulations comprise a carrier, typically LLDPE or HDPE, and a coloring pigment such as carbon black (CB). Even though the masterbatch is used in small dosages in the final product, the carrier used can play a critical role in the strength of the final product. The high strength of the base resin can be compromised by the less-than-ideal strength of the masterbatch carrier.

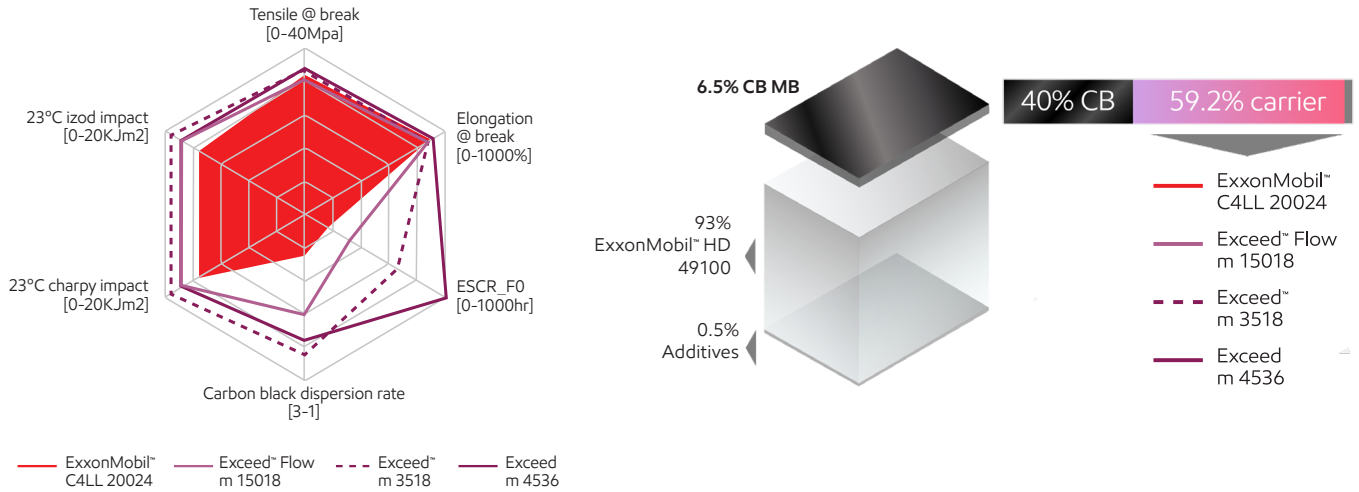
Masterbatches have a wide range of uses:

- Molded products
- Pipes and fittings
- HFFR (Halogen-Free Fire Retardant) wire jacketing

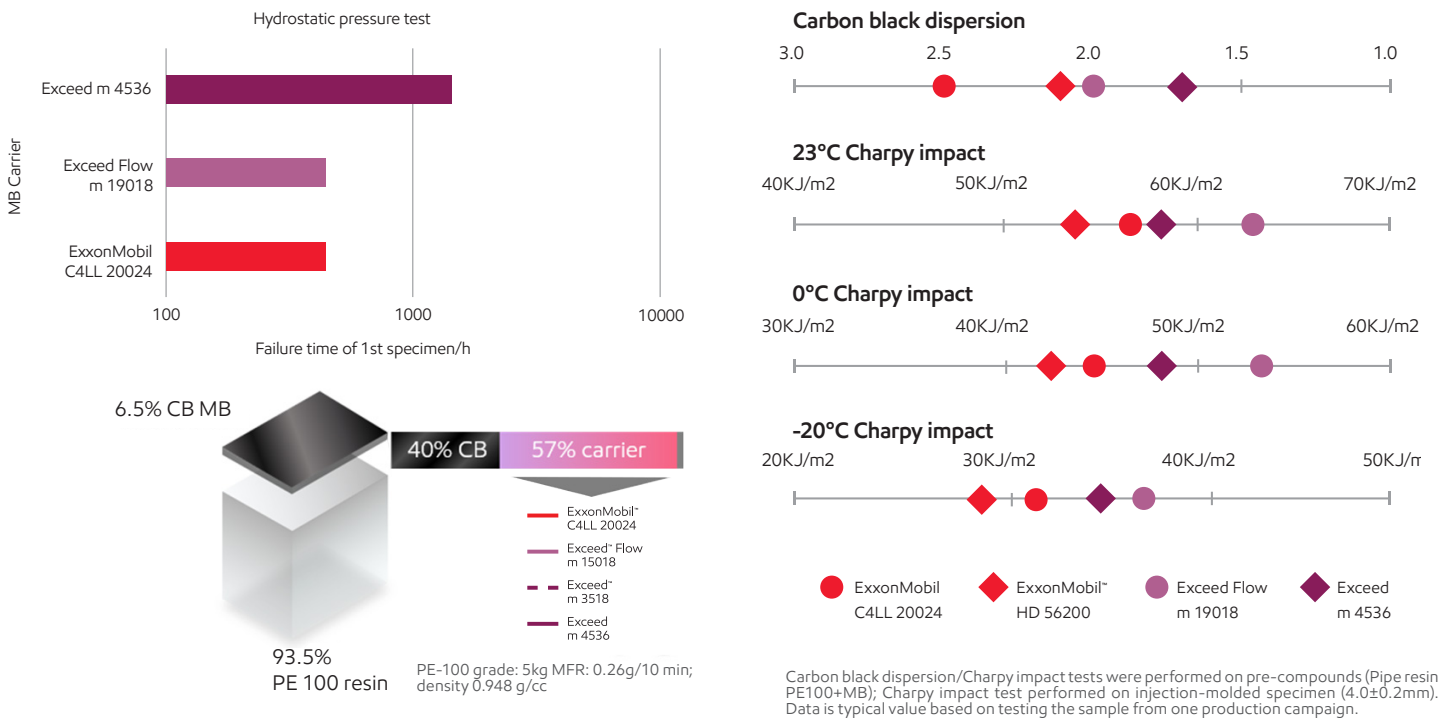
Test results

Tests were conducted using Exceed Flow and Exceed Tough metallocene PE carriers with LLDPE and HDPE carriers as reference as well as with different compounds. The tests showed that around 4% of metallocene PE carrier in pre-compounds gave rise to 20% higher notched impact value, higher ESCR F0 and better carbon dispersion (40% carbon black weight %).

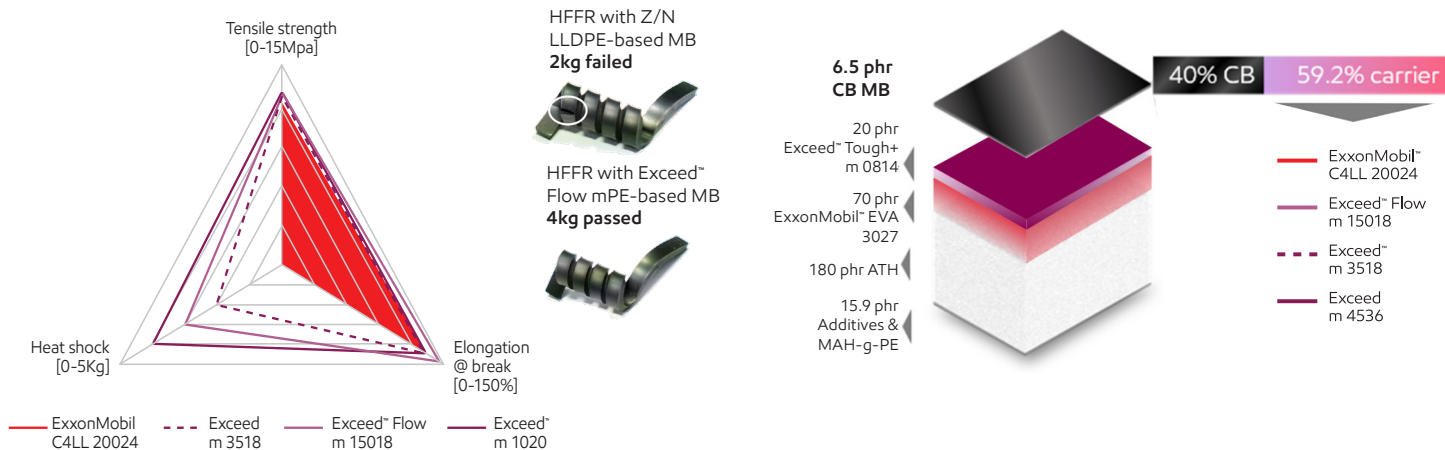
1) Molded products-ExxonMobil™ HD 49100 + 6.5 wt% of MB



2) Pipes and fittings-PE-100 pipe resin + 6.5 wt% of MB



3) HFFR wire jacketing-180 phr ATH + 6.5 phr MB



The results showed improved crack resistance as well as higher hydrostatic pressure resistance, which are desired qualities in pipes and fittings as well as molded products such as containers.

Tests performed on HFFR compounds, which are used for cable jacketing, showed better heat shock resistance.

Grade	MI (2.16 Kg, 190°C)	Density (g/cm ³)	Polymer type
ExxonMobil™ C4LL 20024	20	0.924	LLDPE
ExxonMobil™ HD 56200	20	0.956	HDPE
Exceed™ Flow m 19018	19	0.918	Metallocene polyethylene
Exceed™ Flow m 15018	15	0.918	Metallocene polyethylene
Exceed™ m 3518	3.5	0.918	Metallocene polyethylene
Exceed™ m 4536	4.5	0.936	Metallocene polyethylene
Exceed™ Flow m 1020	1.0	0.920	Metallocene polyethylene

Conclusion

Masterbatch carriers, despite their low dosage in the formulation, have an impact on the micro-environment of the pre-compound polymer structure. Tests where ExxonMobil performance PE is used as a carrier show that it plays a crucial role in helping to improve crack as well as heat shock resistance of the final products.



Test item	Test method	Test item	Test method
Carbon black dispersion	ExxonMobil test method	Izod impact	ExxonMobil test method
Tensile strength	ExxonMobil test method	DSC	ExxonMobil test method
Elongation	ExxonMobil test method	SAOS	ExxonMobil test method
Heat shock resistance	ExxonMobil test method	Melt index (190°C/2.16 kg)	Based on ASTM D1238
ESCR	ExxonMobil test method	Density	Based on ASTM D1505
Charpy impact	ExxonMobil test method	Pipe hydrostatic pressure test	GB/T 6111-2108

Data from tests performed by or on behalf of ExxonMobil

Contact us for more information: [exxonmobilchemical.com/sp](https://www.exxonmobilchemical.com/sp)

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Signature Polymers

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What's new: ExxonMobil Signature Polymers

All our polymers are now positioned under a single portfolio brand: Signature Polymers. The aim is to simplify our product architecture and naming to improve portfolio navigation for you. We would like to stress that our commitment to high quality products remains the same, it is the names that change. Everything else remains the same. We will be making these modifications over the next six months so you will see both old and new grade names highlighted during that time.

Here's a quick overview of brands and grade names that have changed in this document:

Legacy Commercial Name	New Commercial Name
Paxon™ BA 50-100 HDPE	ExxonMobil™ HD 49100HL
ExxonMobil™ LLDPE LL 6101	ExxonMobil™ C4LL 20024
Exceed™ 0015	Exceed™ Flow m 15018
Exceed 3518	Exceed™ m 3518
Exceed 4536	Exceed m 4536
Exceed 0019	Exceed Flow m 19018
Enable™ 2010	Exceed Flow m 1020
Exceed™ XP 8784	Exceed™ Tough+ m 0814
Escorene™ Ultra UL 00328	ExxonMobil™ EVA 3027
ExxonMobil™ HDPE HMA 016	ExxonMobil HD 56200

Some of our existing Exceed, Achieve, Paxon and premium PP/HD grades have moved to Exceed brand; most existing Enable grades have moved to Exceed Flow[+]; most of our existing Exceed XP grades have moved to Exceed Tough[+]; most of our existing Exceed S grades have moved to Exceed Stiff[+]. More details here https://www.exxonmobilchemical.com/en/brands/signature-polymers/exceed_high_performance_polymers or contact your ExxonMobil representative to know more.

Want to see what's changed in our portfolio? Go to [exxonmobilchemical.com/sptransform](https://www.exxonmobilchemical.com/sptransform)