CHEMISTRY THAT MATTERS™

MATERIALES ESTRUCTURALES PARA IN MOLD ELECTRONICS

Jordi de Tera –SABIC SPECIALTIES

Junio 2020

SABIC AT A GLANCE

Sr. Jordi de Tera
Sales Account Manager
SABIC SPECIALTIES

SABIC AT-A-GLANCE

1976
Company established

33,000
Employees around the world

50
Countries of operations

3rd
Largest global chemical company*

122nd
Largest public company in the world*

3.96
US$ bn
Estimated Brand Value**

85
US$ bn
Total assets

5.7
US$ bn
Net income

45
US$ bn
Annual revenue

≈ 150
New products each year

11,738
Global patent filings

64
World-class plants worldwide

*Forbes 2018 **Brand Finance, 2019

Sr. Jordi de Tera
Sales Account Manager
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BUSINESS PORTFOLIO

PETROCHEMICALS

- Polyolefins
- Polycarbonates and Blends
- PVC , Polyester and Polystyrene
- Functional Forms
- Synthetic Rubbers
- Specialty Polymers & Polymer Additives
- Fluids
- Glycols, Olefins, Oxygenates and Aromatics
- Chemical Intermediates & Industrial Gases

SPECIALTIES

- Specialty Engineered Thermoplastics
- Specialty Compounds
- Advanced Composites
- Additive Manufacturing
- Thermosets and Additives

AGRI-NUTRIENTS

Nitrogen
- Prilled Urea
- Granular Urea
- Ammonia

Phosphate
- DAP and Dark DAP
- MAP

Specialty
- NPK
- TGU

METALS*

Long Steel
- Rebar
- Wire Rod
- Rebar in Coil

Flat Steel
- Hot Rolled Coils
- Cold Rolled Coils
- Galvanized Rolled Coils
- Pre-painted Rolled Coils

* Supplied under SABIC brand through Hadeed, a fully-owned SABIC Affiliate

MATERIALES ESTRUCTURALES PARA IN MOLD ELECTRONICS

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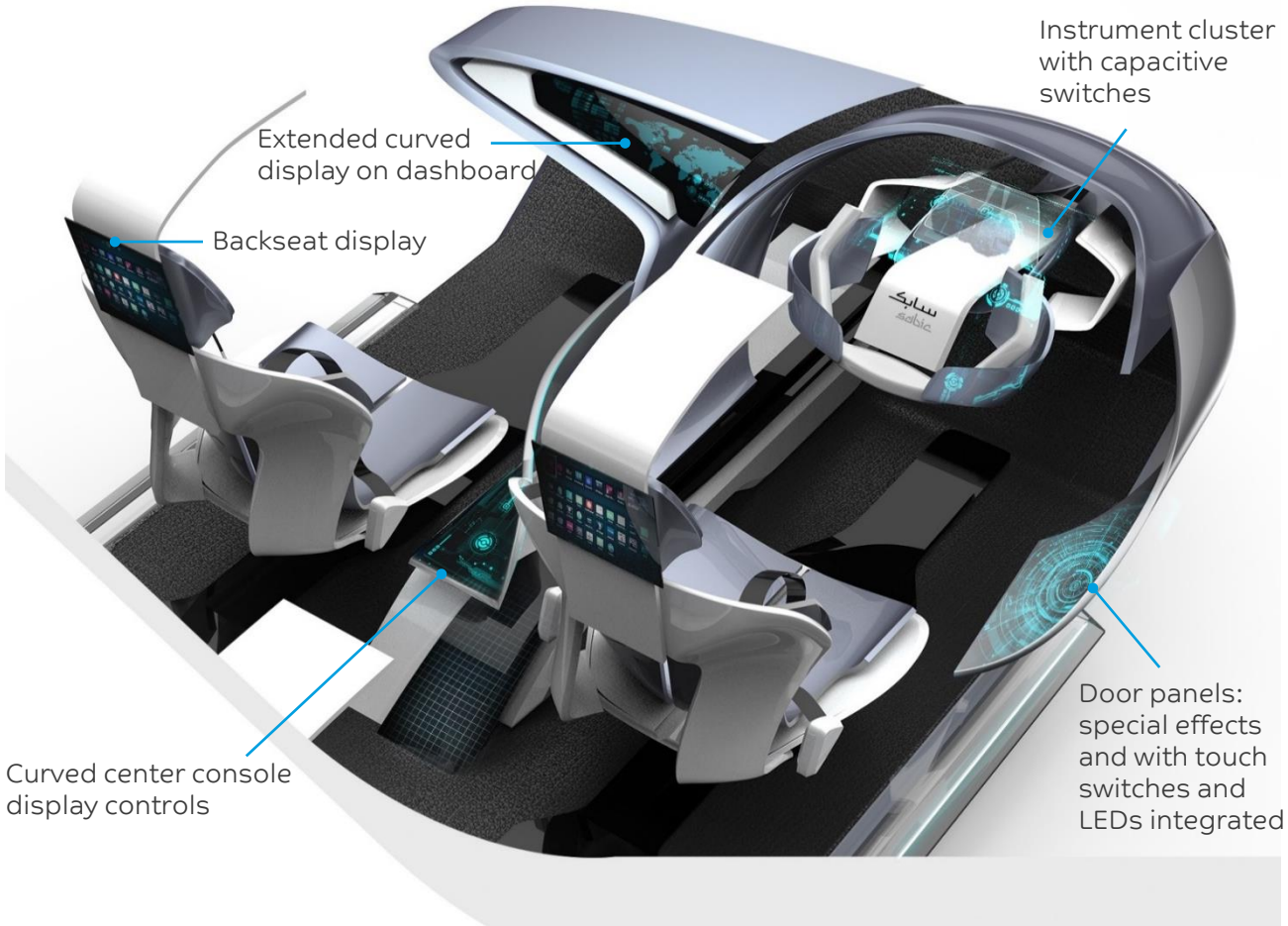
IN-MOLD ELECTRONICS: WHAT IS IT?

IN-MOLD ELECTRONICS (IME) = IN-MOLD DECORATION (IMD) + PRINTED ELECTRONICS



INTEGRATED COMPONENTS:

- Conductors
- Antennas
- LEDs
- IC components
- Transparent conductors
- Sensors
- Haptics-under development

Courtesy of Tactotek™

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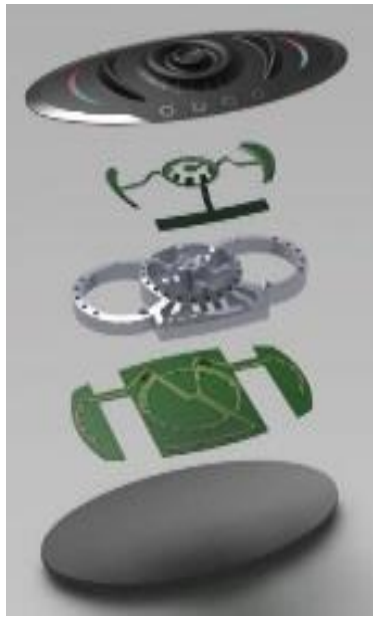
IME: VALUE PROPOSITION

TODAY



Several discrete components

Design

- Enables styling: 3D electronics & packaging optimization
- Enables haptic, communications, touch, sensors

Engineering

- Weight saving up to 70%
- Thickness reduction, up to 90%
- Assembly simplification and electronics protection
- Cost: One injection tool vs many

TOMORROW

One integrated part

I M E






Courtesy of Tactotek™

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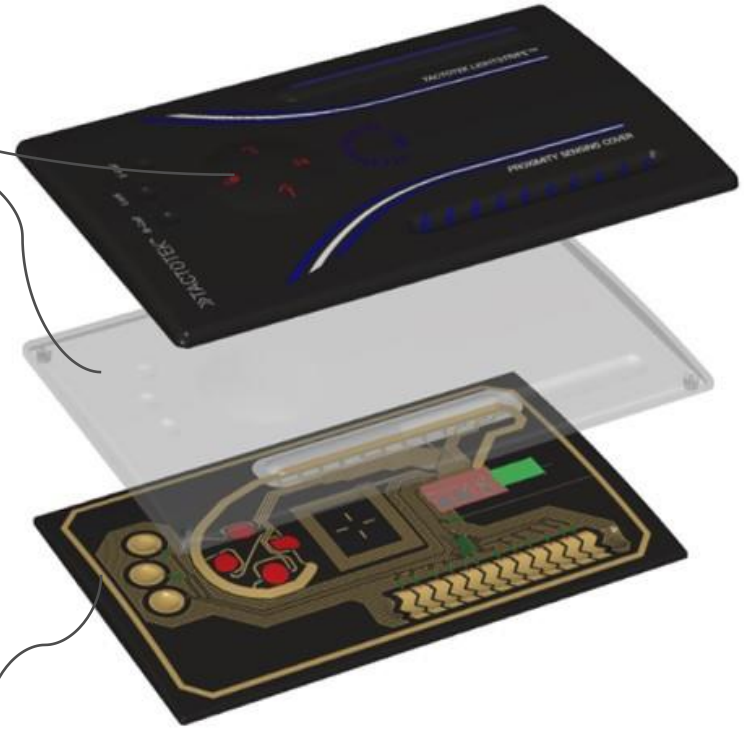
IME: SABIC'S SOLUTIONS

FILM A
Coated LEXAN ™ PC film HP92T, HP60T, HP40T, HP12T



OVERMOLDING RESINS

LEXAN™ Resin	
LEXAN™ HFD Resins	PC copolymer
LEXAN™ CXT Resins	PC copolymer
ULTEM™ Resins	PEI

FILM B
Uncoated formable PC film: examples LEXAN™ 8010, LEXAN™ 8A13E Uncoated high heat formable ULTEM™ 1000

SABIC OVERMOLD RESINS FOR IME

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Requirements for the structural material:

- High flow
- Dimensional stability
- Transparency
- Good mechanicals
- Protect the inks and the electronics

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SABIC OVERMOLD RESINS FOR IME

SABIC Solutions for IME

For small parts ⇨	PC	LEXAN™ Resins	LEXAN™ HF – Standard high Flow polycarbonate from SABIC PETCHEM
For medium / big parts ⇨	PC Copolymer	LEXAN™ HFD Resins	LEXAN™ HFD1830 & LEXAN™ HFD1930 (extreme high flow ductile /low temp processing)
	PC Copolymer	LEXAN™ EXL Resins	LEXAN™ EXL1810T (high flow, impact low temperature)
	PC Copolymer	LEXAN™ CFR Resins	LEXAN™ CFR9712 (high flow, flame retardant)
	PC Copolymer	LEXAN™ CXT Resins	LEXAN™ CXT17, CXT17UV, CXT19 and CXT19UV (high heat and UV resistant)
	PEI	ULTEM™ Resins	ULTEM™ 1010 (high heat solution, flame retardant)

Note: Other resin grades can be evaluated depending from application requirements

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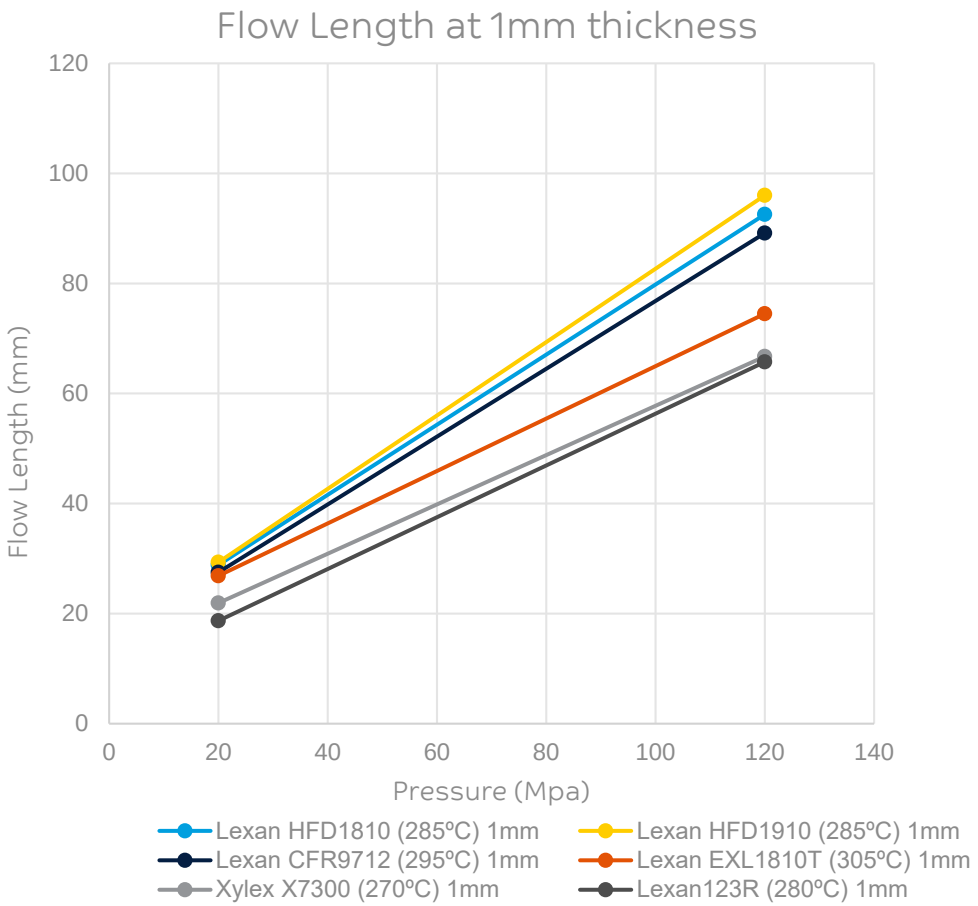
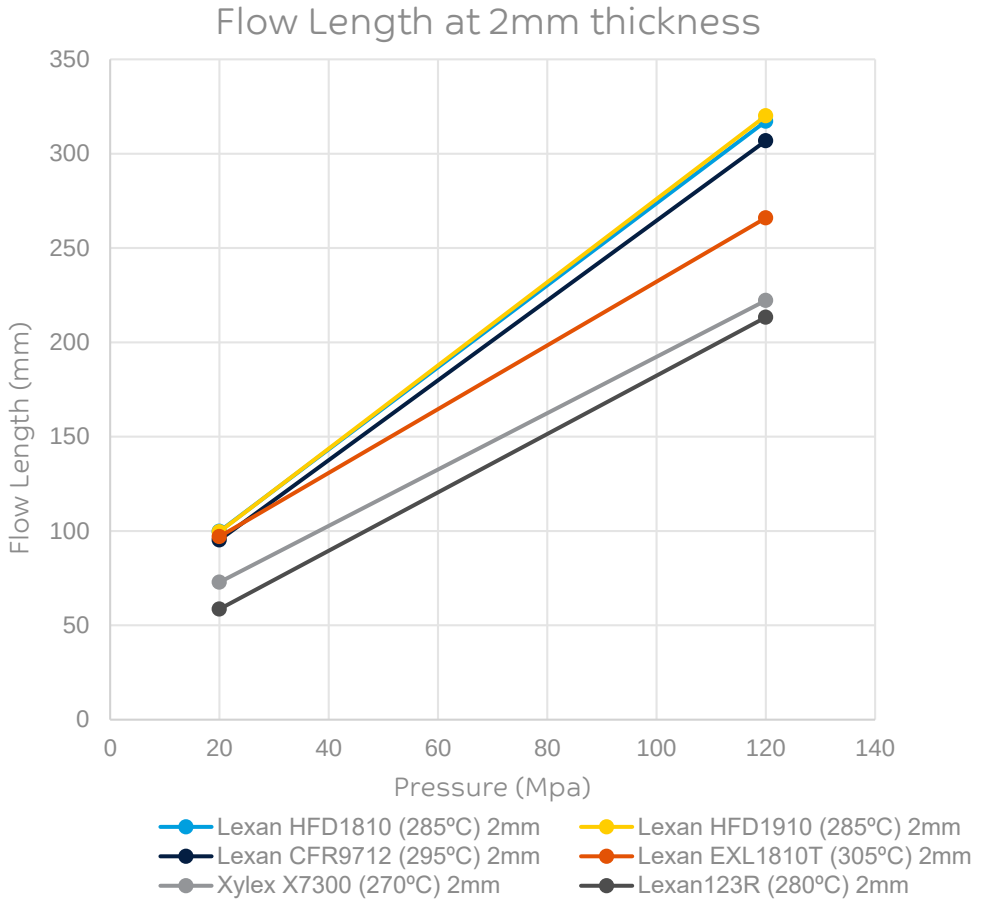
SABIC OVERMOLD RESINS FOR IME

Flow at different part thickness





Higher Flow grades are LEXAN™ HFD resins

LEXAN HFD RESINS

LEXAN™ HFD – SUPERIOR FLOW AND DUCTILITY

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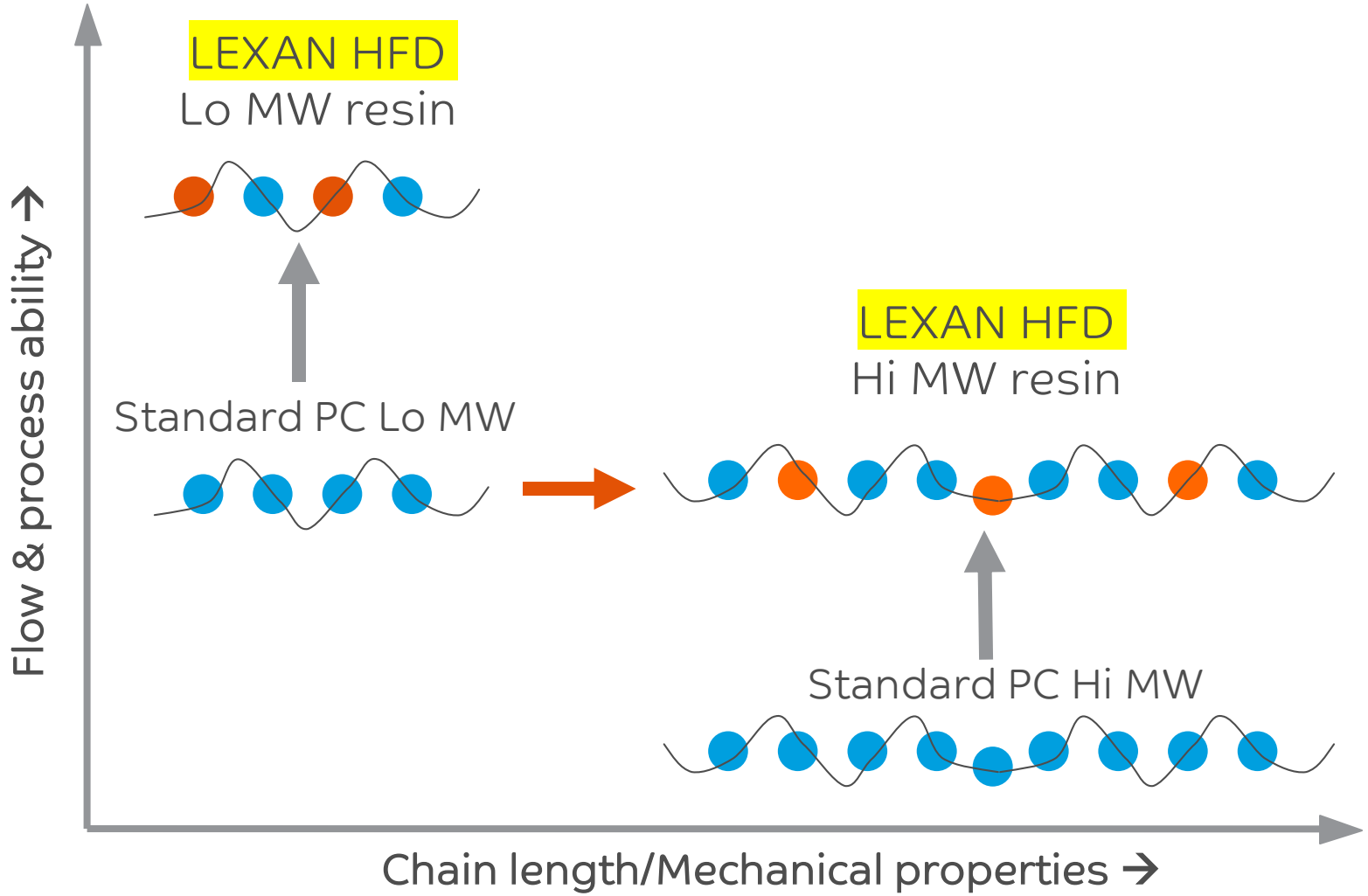

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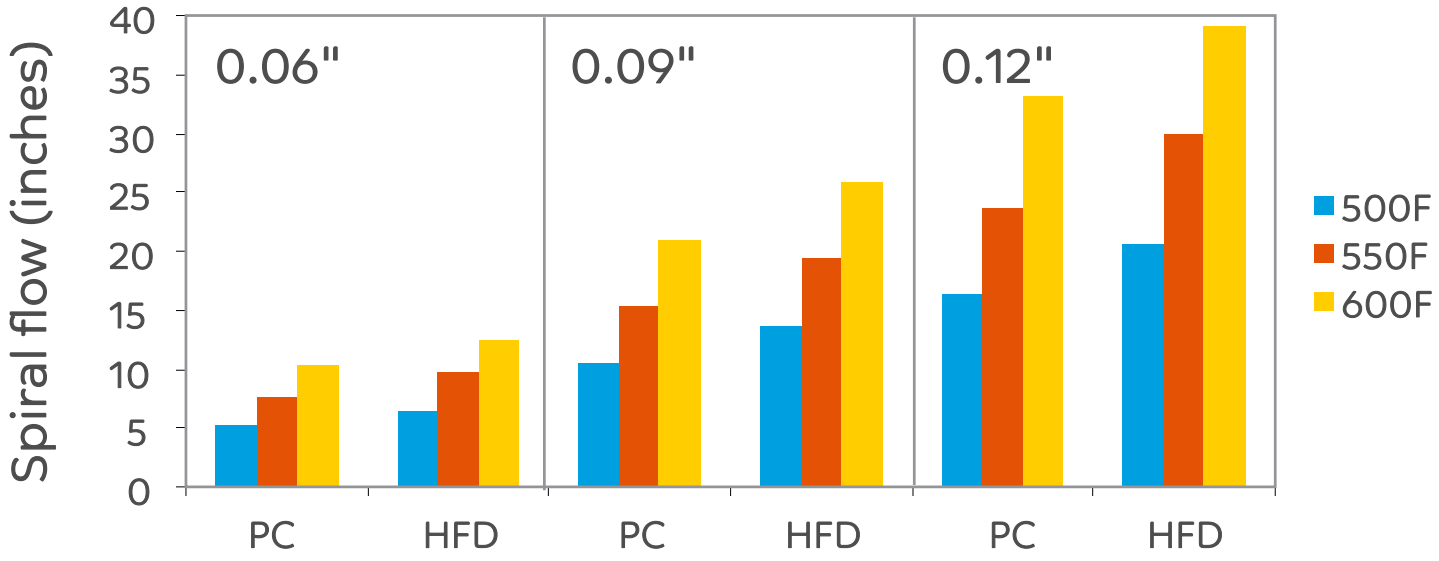
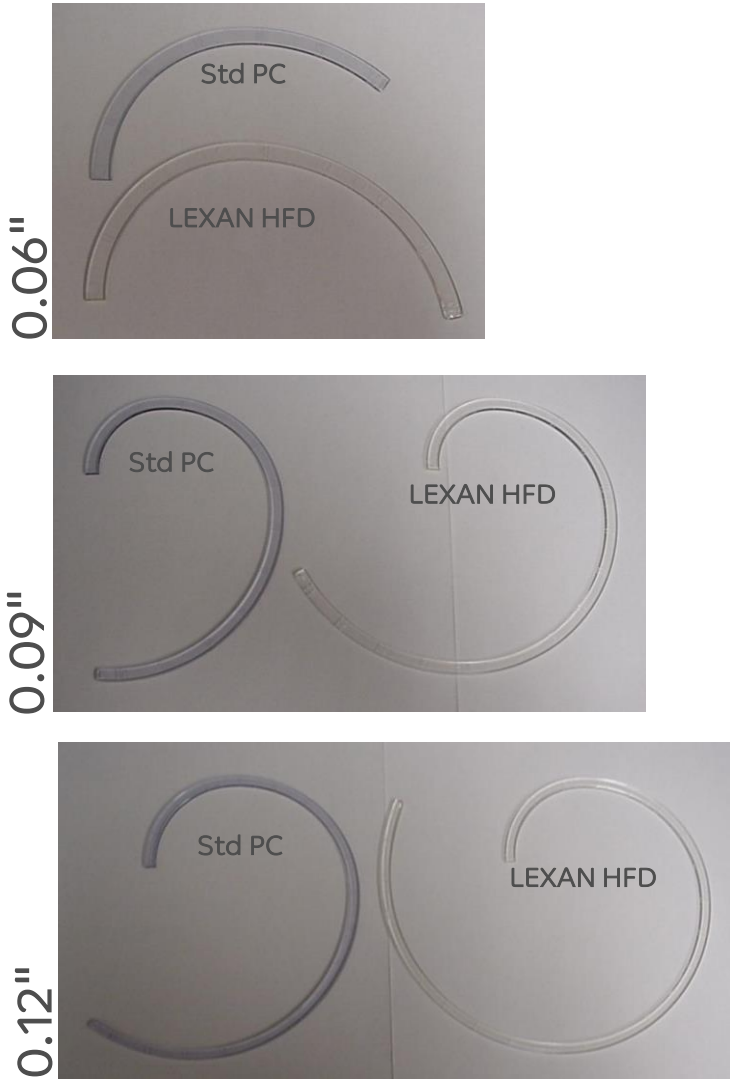
LEXAN™ HFD RESINS – SUPERIOR FLOW





LEXAN HFD resin has up to 40% more flow compared to similar PC resin

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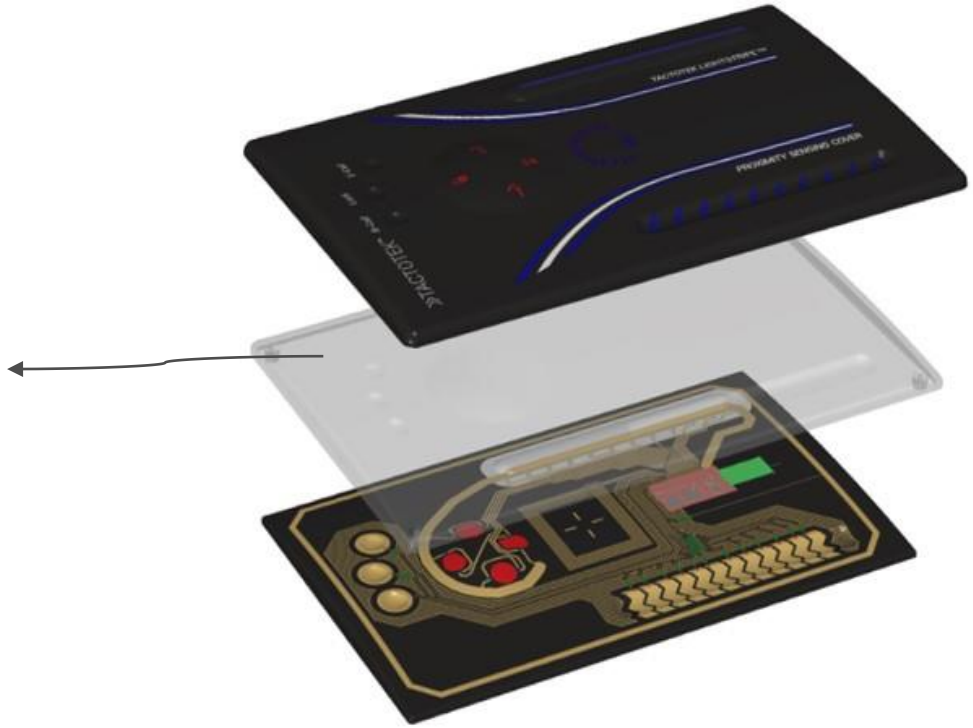
LEXAN™ HFD RESIN FOR OVERMOLDING

Enables lower temperature and pressure during overmolding, critical factors to protect the inks

Low Temp Processing PC resin
LEXAN ™ HFD



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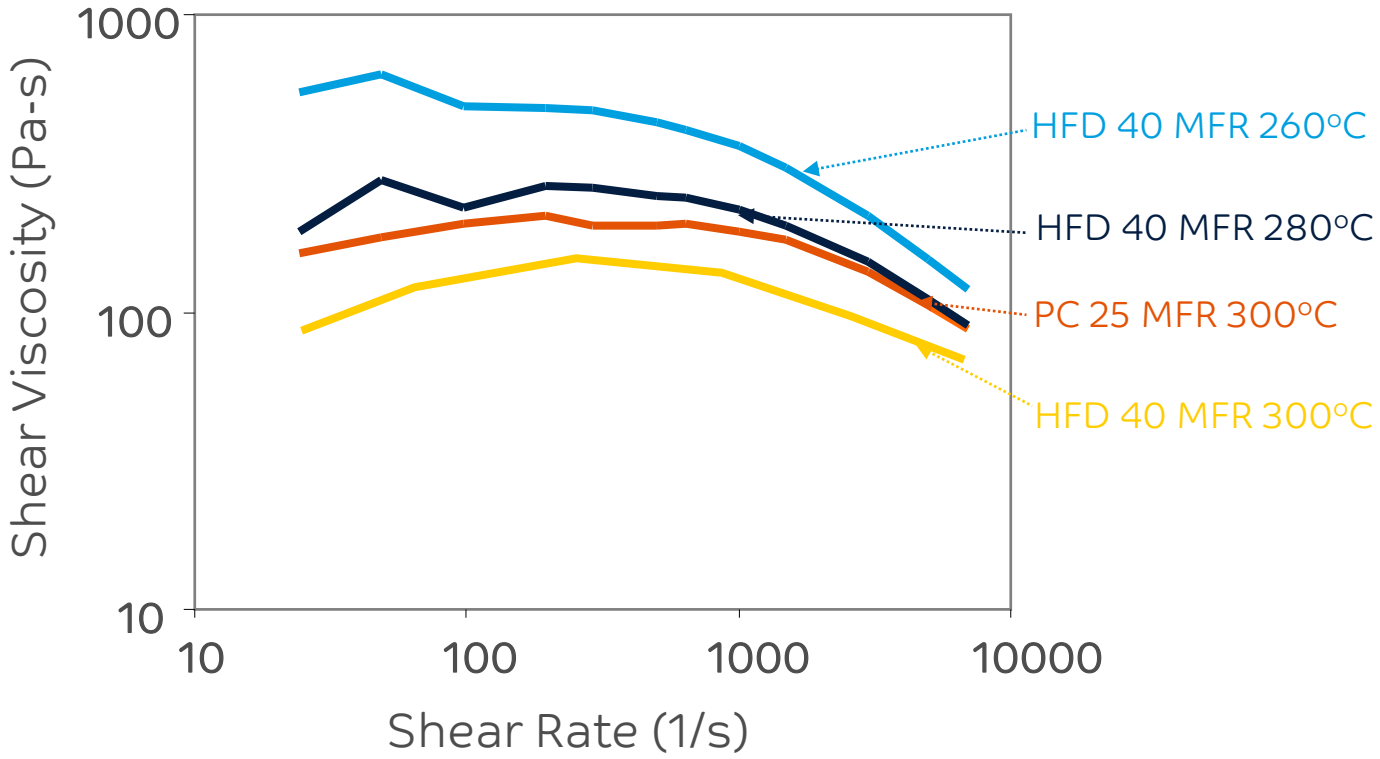
LEXAN™ HFD – LOW TEMPERATURE PROCESSING



LEXAN HFD resins can be used for touch panels and head up displays

What?

~20°C (40°F) lower processing temperatures for same mechanical properties

Where?

- Parts using temperature sensitive additives
- In Mold Decoration and In Mold Electronics
- Over molding with a second resin

LEXAN™ HFD – BIO & GREEN CONTENT

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<10% CASTOR OIL BASED

POST CONSUMER RECYCLE COMBINATIONS POSSIBLE

What?

- <10% bio/green content
- Bio-based, Post consumer recycle combinations possible

Where?

- Consumer electronics
- EPEAT and other environmental considerations

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LEXAN™ HFD RESINS – SUMMARY

LEXAN™ HFD is a polycarbonate based copolymer with:

- ✓ Improved toughness/ductility vs standard PC with same melt flow index
- ✓ Improved melt flow vs standard PC at same toughness/ductility
- ✓ ~20°C lower processing temperatures and pressure vs standard PC to protect the conductive and decorative inks

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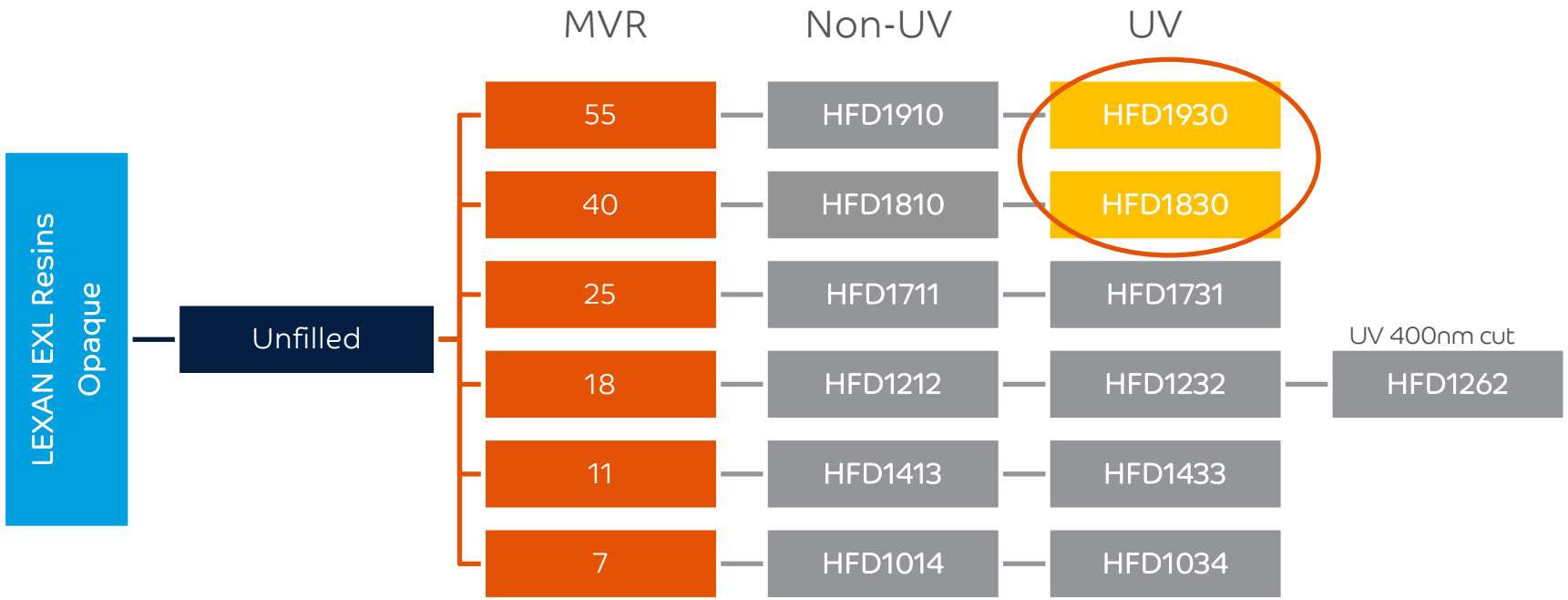
LEXAN™ HFD RESIN – PORTFOLIO



Highly Recommended Grades for IME

For more information to other grades in HFD portfolio,
please contact relevant LEXAN* Copolymer business manager in your region.


THANK YOU

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