

Commercial Success with Advanced SCLAIRTECH™ Technology



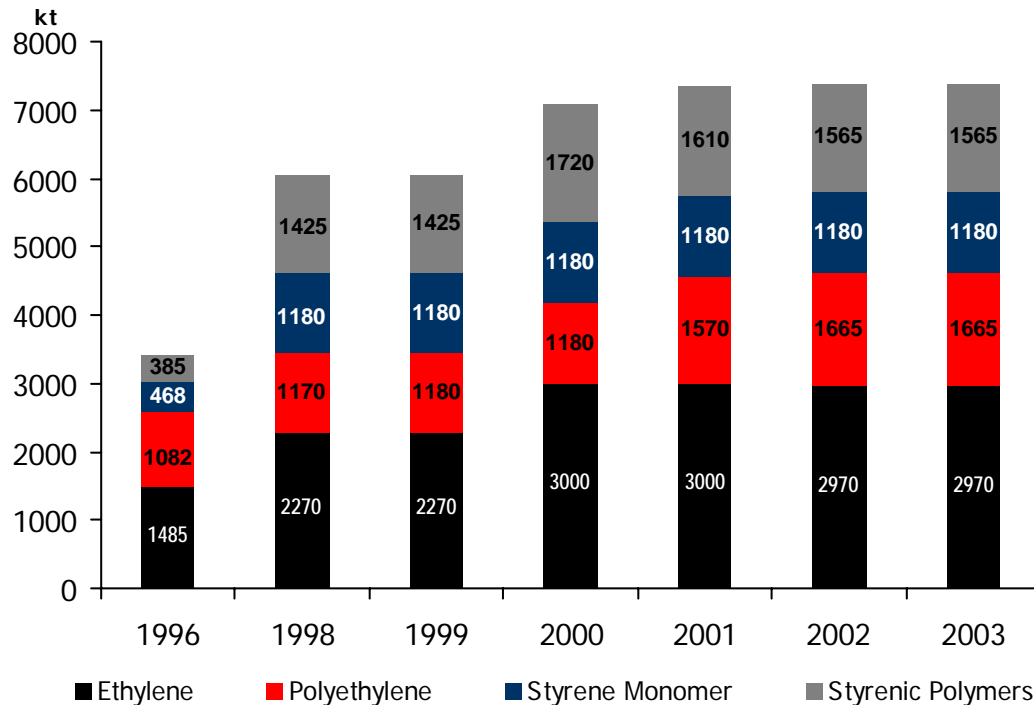
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This is NOVA Chemicals

Format

- Introduction to NOVA Chemicals
- Introduction to Advanced SCLAIRTECH Technology
- SCLAIR® Polyethylene Product Slate
- SURPASS® Polyethylene Product Slate
 - Performance
 - Features & Benefits
 - Customer Successes
- Summary

NOVA Chemicals' Corporate Profile



Ethylene, polyethylene, styrene and polystyrene manufactured in North America and Europe

Global sales offices and licensees

4000+ employees

2003 Q3 net income US \$(65) million

2004 Q3 net income US \$56 million

Shares trade on New York and Toronto exchanges under "NCX"

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NOVA Chemicals' PE Business

- 3.5 billion lbs PE per year
- VLDPE, LLDPE, HDPE and LDPE grades
- Advanced SCLAIRTECH Technology (PE2)
 - Single or dual reactor solution octene grades
 - Both Ziegler-Natta (ZN) and single-site catalysts

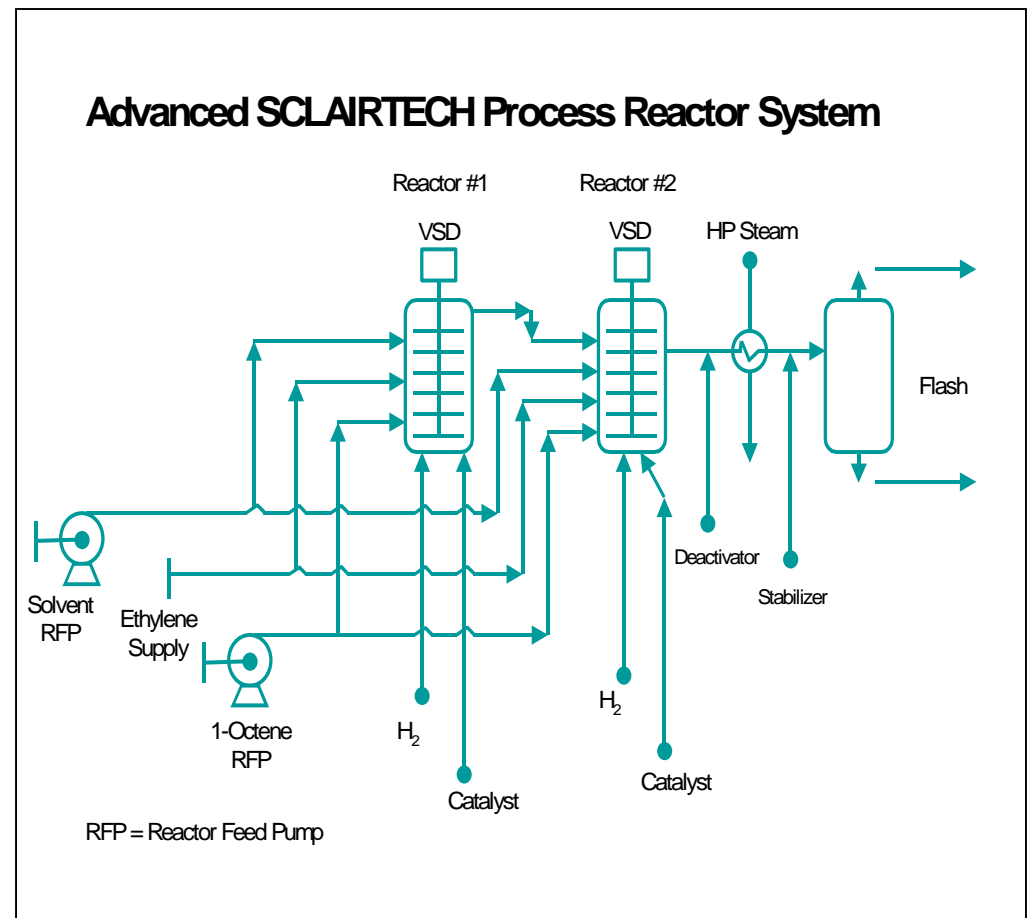
NCX Plant	Process	Comonomer	Capacity (M lb/yr)
PE2*	Solution	C8	850
SCLAIR	Solution	C4	670
PE1	Gas Phase	C4, C6	1,310
HDPE	Gas Phase	C4, C6	500
LDPE	High Pressure	n/a	320

* Start-up in 2001

Advanced SCLAIRTECH Technology

Features include

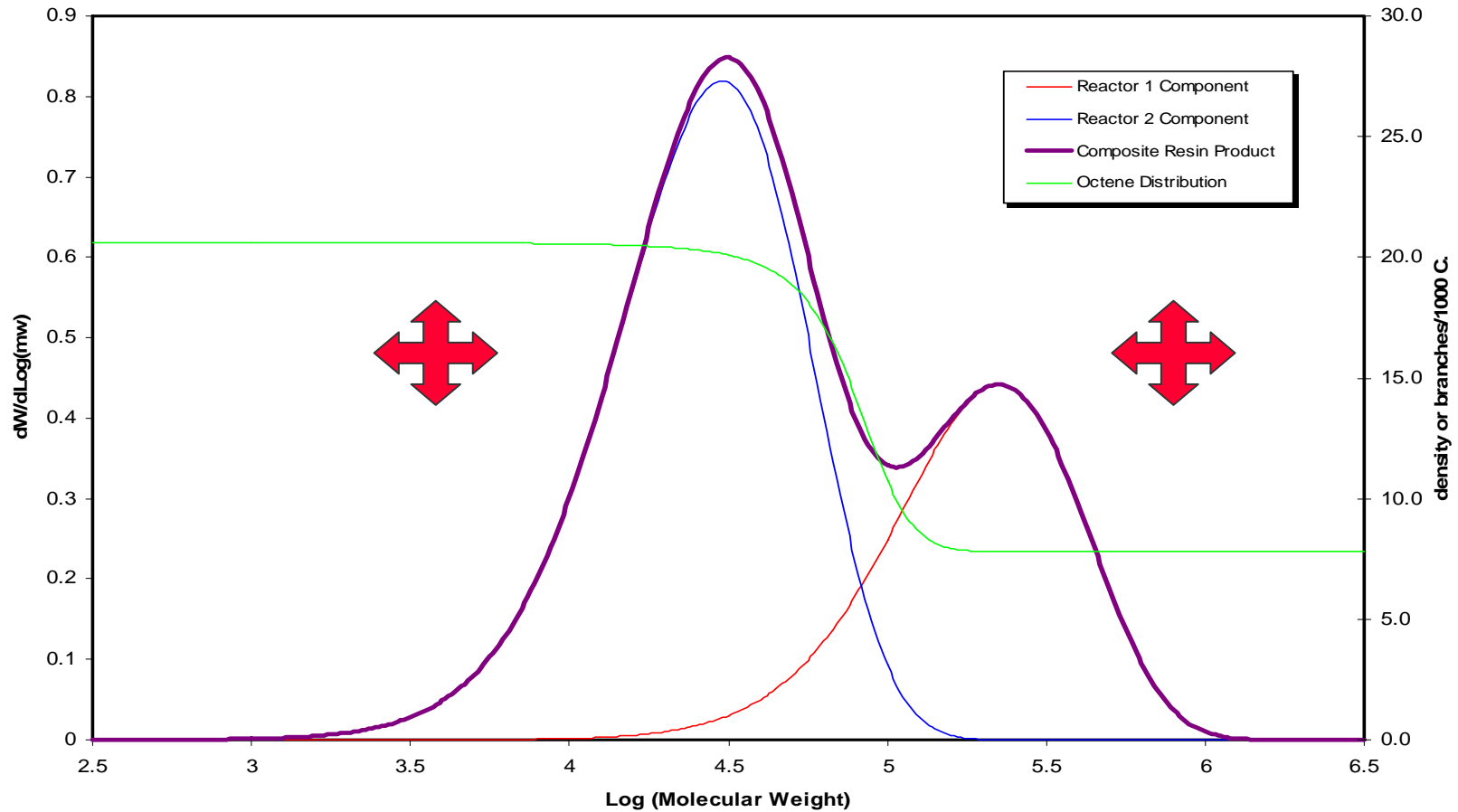
- Intensively mixed reactors (short residence time)
- Proprietary ZN and Single Site catalysts
- Tremendous flexibility in product design
 - 0.905 – 0.965 g/cc
 - 0.4 – 150 melt index
 - Narrow to broad molecular weight distributions



Vision: “Value adding PE resins through advanced technology”

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Resin Design on the Advanced SCLAIRTECH Technology Platform



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SCLAIR Product Slate @ PE2

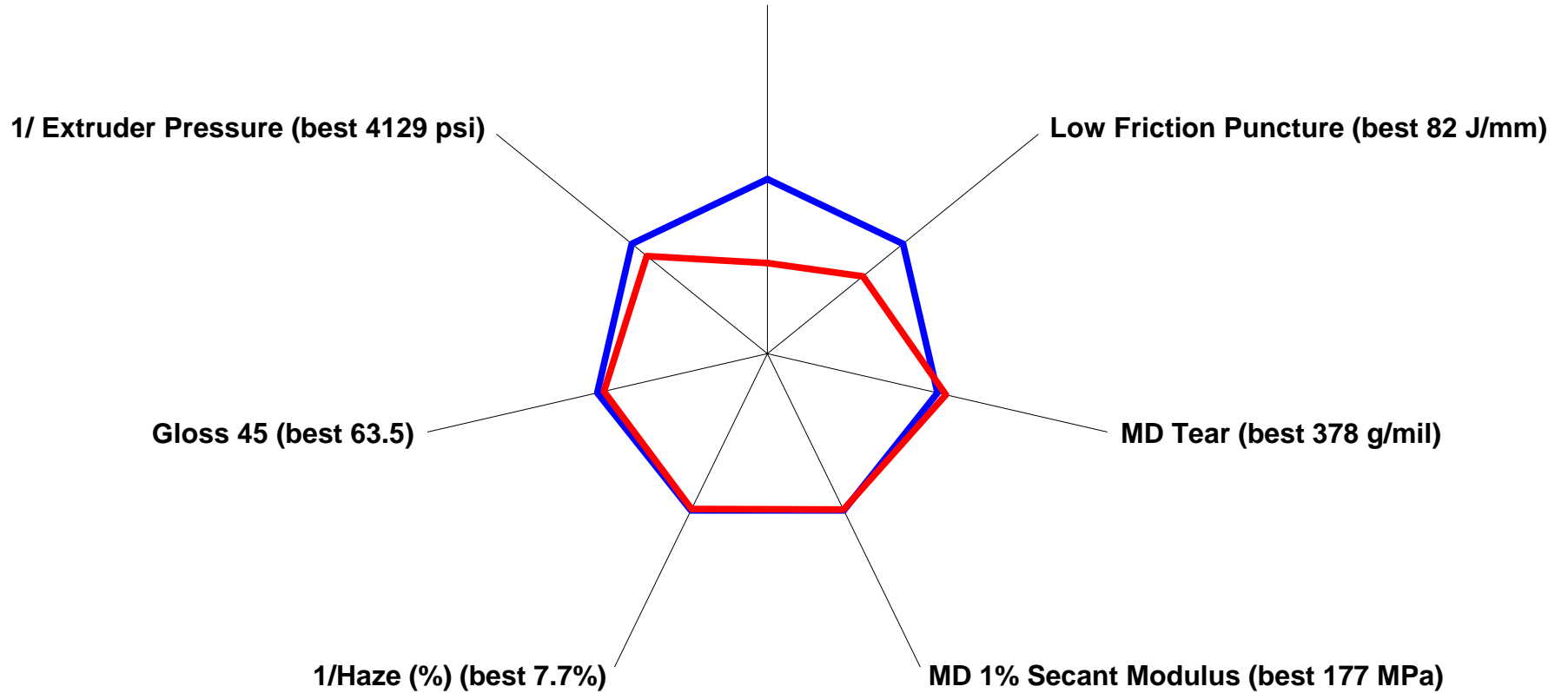
SCLAIR Grade	MI (dg/min)	Density (g/cm ³)	Additives*	Application
FP112-A	0.9	0.912	A	Sealant Film
FP120-A	1.0	0.920	A	Blown Film
FP120-B	1.0	0.920	A, S, B	Blown Film
FP120-C	1.0	0.920	A, P	Blown Film
FP120-D	1.0	0.920	A, S, B, P	Blown Film
FP120-F	1.0	0.920	A, B, P	Blown Film
FP026-F	0.8	0.926	A, B, P	Blown Film
FG220-A	2.3	0.920	A	Cast Stretch Film
IG453-A	7.0	0.953	A, U	Injection Molding
IG454-A	9.0	0.954	A, U	Injection Molding
IG762-A	7.0	0.962	A, U	Injection Molding

* A = antioxidant, S = slip, B = antiblock, P = process aid, U = UV stabilizer

SCLAIR Film Product Comparison

SCLAIR Film Comparison

Dart Impact (best 424 g/mil)



— SCLAIR FP120-C

— Competitive 0.920 d ZN Octene LLDPE

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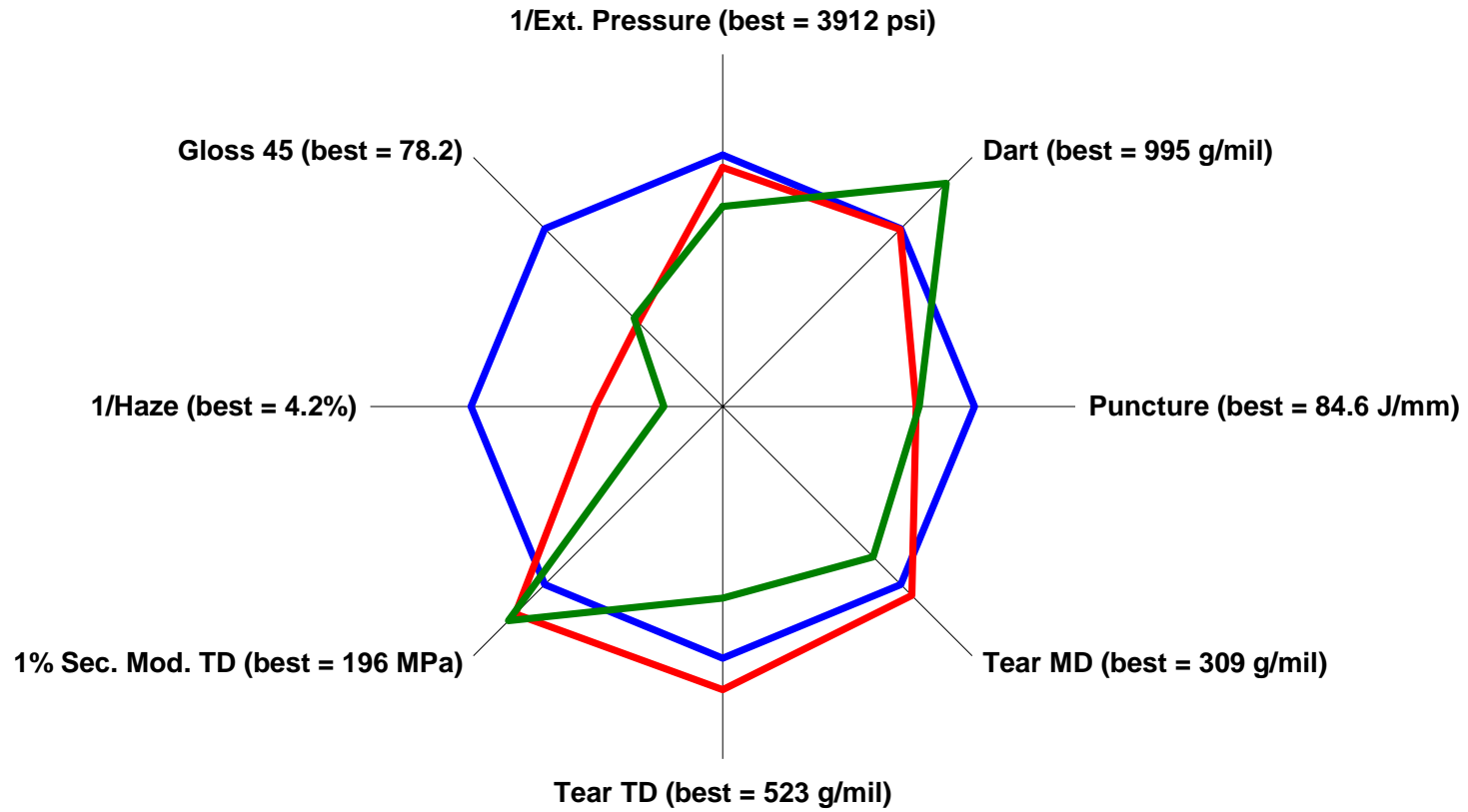
SURPASS Product Slate @ PE2

SURPASS Grade	MI (dg/min)	Density (g/cm ³)	Additives*	Application
HPs900-C	1.0	0.917	A, P	Sealant Film
FPs117-C	1.0	0.917	A, P	Blown Film
FPs117-D	1.0	0.917	A,S, B, P	Blown Film
FPs117-F	1.0	0.917	A, B, P	Blown Film
FPs317-A	4.0	0.917	A	Cast Stretch Film
IFs932-A	150	0.932	A	High Flow Injection Molding
RMs244-U/UG	1.7	0.944	A, U	Rotomolding
RMs539-U/UG	5.2	0.939	A, U	Rotomolding

* A = antioxidant, S = slip, B = antiblock, P = process aid, U = UV stabilizer, G = ground

SURPASS Film Product Comparison

Sealant Film Comparison



— SURPASS HPs900-C — Competitive 0.916 d SSC octene LLDPE — Competitive 0.918 d SSC hexene LLDPE

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SURPASS Film Features & Benefits

- Excellent processability for increased extruder outputs, or reduced LDPE blending
- High and balanced dart, tear, and puncture performance
- Excellent optical properties alone or in LDPE blends
- Sealability of a mLLDPE, with low seal initiation temperature and high seal strength
- Very low gel for critical applications such as lamination film
- Very low grease fraction and volatiles, resulting in less contribution to film organoleptics in food packaging

SURPASS[®]

High-Performance Film

*Recommended Applications
and Customer Successes*

Based on

Advanced SCLAIRTECH Technology

Recommended Applications for SURPASS sLLDPE Films

- **FPs117-C/D/F and HPs900-C**

- High toughness applications: e.g. Frozen food packaging, ice bags, heavy duty sacks
 - High and balanced tear strength
 - High dart impact and puncture performance
 - Critical seal applications: e.g. Liquid pouch packaging, food packaging, lamination film
 - Low seal initiation temperature with rapid seal response and high seal strength
 - Very low gel levels

- **Additional Applications for HPs900-C**

- High clarity applications: e.g. Food packaging, reverse printed laminations
 - Superior gloss and sparkle, low haze
- Sealant layer in co-extruded film for food packaging and liquid pouch packaging
 - Toughness and sealability of 100% sLLDPE are required in addition to excellent optical properties

SURPASS Film

Customer Success (1)

- **Application:** Clear Produce Bags
- **Resin Used:** SURPASS FPs117-C
- **Resin Displaced:** Competitive ZN octene VLDPE as a blend component
- **Structure:** 25 micron clear monofilm
- **Reasons For Conversion:**
 - Superior physical property combination, especially puncture
 - Improved film clarity, lower resin cost

SURPASS Film

Customer Success (2)



- **Application:** Vegetable Oil and Condiment Sachets
- **Resin Used:** SURPASS FPs117-C
- **Resins Displaced:** Competitive ZN C₈ LLDPE and mC₆ LLDPE in rich blends
- **Structure:** Clear printed monolayer film, 20-40 microns thick
- **Reasons For Conversion:**
 - Passed industry standard burst test which is 80-100 kg weight placed on filled sachet for 3-5 minutes
 - Superior processibility (pressure drop of 20-25%), translatable to higher output
 - Excellent sealability, especially through contamination

SURPASS Film

Customer Success (3)

- **Application:** Produce Packaging
- **Resin Used:** SURPASS FP_s117-F
- **Resin Displaced:** Competitive mC₈ LLDPE in a rich blend with LDPE
- **Structure:** 50 micron clear monolayer film
- **Reasons For Conversion:**
 - Improved impact and puncture resistance
 - Improved film clarity
 - Improved sealability
 - 5% material cost savings



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SURPASS Film

Customer Success (4)

- **Application:** Ice Bags
- **Resin Used:** SURPASS FPs117-F
- **Resin Displaced:** Competitive mC₈ LLDPE in a rich blend with LDPE
- **Structure:** 38 and 60 micron clear monofilm
- **Reasons for Conversion:**
 - 15% improved dart impact and puncture, 10% higher gloss
 - 15% higher output due to lower amperage and extruder pressure while reducing LDPE from 20% to 10%
 - Structures downgaged by 12 micron from original thicknesses
 - Previous occasional failures eliminated. Resin specified for appl.



SURPASS Film

Customer Success (5)

- **Application:** Protective Industrial Wrapping Film
- **Resin Used:** SURPASS FPs117-F
- **Resin Displaced:** New product – replaced woven sheeting
- **Structure:** Three layer coex with FPs117-F in rich blend with LDPE in outer and inner skins. ZN C₈ LLDPE and VLDPE in core
- **Reasons For Success:**
 - New product competes favourably with conventional woven sheeting
 - More flexible, stretchable, and resistant to tear. Improved seal
 - Quicker wrapping , improved production rates, and less expensive

SURPASS Film

Customer Success (6)

- **Applications:** High Clarity Freezer Film and Produce Film
- **Resin Used:** SURPASS HPs900-C
- **Resin Displaced:** Competitive mC₆ LLDPE
- **Structure:** Three layer coex with rich blend of LLDPE and LDPE in the skin layers (C₄ LLDPE in the core)
- **Reasons For Conversion:**
 - Superior processibility with 20% amperage and 10% pressure reduction, translatable to corresponding output increase
 - Equivalent clarity and sealability

SURPASS Film

Customer Success (7)

- **Application:** Liquid Pouch Packaging
- **Resin used:** SURPASS HPs900-C
- **Resin Displaced:** Competitive ZN C₈ LLDPE in rich blend with LDPE
- **Structure:** Monolayer film at 50 micron replaced three layer coex at 80 micron
- **Reasons for Conversion:**
 - Significant cost reduction
 - Excellent organoleptics
 - Improved clarity
 - Equivalent strength and sealability



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Summary

- Advanced SCLAIRTECH technology has been translated into a fully developed, commercial product slate utilizing ZN and SSC technology
- New product developments in performance film will build on existing product attributes
- Most of all, the needs of our customers are being met through the value benefits of SURPASS and SCLAIR Polyethylene resins

“The Vision has become a reality!”