NPE2024 The Plastics Show | MADE FOR YOU

Produced by PLASTICS INDUSTRY ASSOCIATION

Automotive Industry Plastic Materials

Tuesday, May, 7, 2024• Panel Discussion

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ChasePlastics®
Redefining Resin Distribution®

Automotive Industry Plastics Material Update

Chelsea Barriga
Senior Account Manager • Chase Plastics

Panel Discussion

01

Jason Merkle

Chase Plastics

Technical Manager

02

Eric Jaarda

SABIC Specialties

Sr. Manager

Automotive Specifications

03

Jose Chirino

Envalior

Technical Director Americas

01 Chase Plastics Automotive Trends

ChasePlastics®

Redefining Resin Distribution®

Chase Plastic Services, Inc., is a successful North American full-service thermoplastic resin distribution company headquartered in Clarkston, Michigan. We service large, medium and small size applications with major concentration on specialty and engineering thermoplastics.

Kevin Chase, CEO, and Carole Chase, Vice-President

Real service from real people

Outrageous Service: it's unheard of and rare in our industry – but it's what we pride ourselves on and it's the center of our Core Values. From real people answering the phone when you call to real engineers providing expertise on your floor when you're down, we're here to help you succeed. We're beholden to our Core Values that promote **high expectations, independence, teamwork, execution, and character.** Through these, you can expect accountability not only for our performance, but from the performance of our valued suppliers, so that you're receiving quality products when and where you need them, every time you place an order.

Redefining Resin Distribution

Real Flexibility

- Double- and triple-sourced materials
- Materials in stock, ready to be delivered
- Low minimum order size
- Blending and repacking services; custom labeling
- Core, general and custom stocking programs, including blanket orders, consignment, etc.
- Bilingual account managers, technical service, customer service, credit and logistics representatives

The industry's **broadest product line** featuring more than 35,000 specialty, engineering and commodity thermoplastics

Real Insight

- Corporate- and field-based technical service and technical development engineers
- Advanced inventory and supply chain management technology
- Technical service and technical development support in person and via phone, email or video
- Technically skilled sales professionals with engineering backgrounds
- Exclusive Chase the Knowledge webinars and blog
- ISO 9001:2015 Certified

Technical Insight through our dedicated Technical Engineering Team

Real Responsiveness

- Quickest written responses to quote requests in the industry
- 2-hour callback commitment
- Same-day shipping for in-stock materials
- Global supply and distribution network with 32 strategically located warehouses throughout North America
- Chase Plastics de Mexico with centralized warehouses in Querétaro, Monterrey and Juárez

An empowered sales team able to make pricing decisions without corporate approval

Real Dedication

- Privately owned and operated by the original 1992 founders, Kevin and Carole Chase
- Commitment to partnership through an in-depth understanding of our customers' evolving businesses, processes, and products
- A knowledgeable, dedicated account manager in your area
- Continuous evaluation and expansion of our supplier base and warehouse network
- Net Promoter Score = 95%
- Customer Satisfaction Rating = 97%

Dedicated account teams comprising sales, customer service, credit, engineering and supply chain management professionals – for each customer, from day one!

Chase Plastics Technical Development Support

Material selection
Choosing the best material for a new or existing application can be difficult. Our team specializes in finding the ideal product that fits the needs of the application and our customer.

Processing assistance
Whether over the phone, via video chat, or in person, we are prepared to help get your processes and materials running smoothly and efficiently. From prototype runs to troubleshooting, our engineers can provide insight on optimizing various thermoplastic processes.

Design review
With years of processing experience, the Chase technical team can offer critical advice on part and tool design to help ensure manufacturing ease and failure avoidance.

Parts and materials testing
By partnering with accredited labs all throughout North America, we are ready to tackle your mechanical, chemical, and physical testing needs.

Metal-to-plastic conversions
Increasing complexity and calls for lighter parts continue to push the boundaries of metal component replacements with plastic. Allow us to bring experience and a broad engineering thermoplastic portfolio to find a durable alternative to metal.

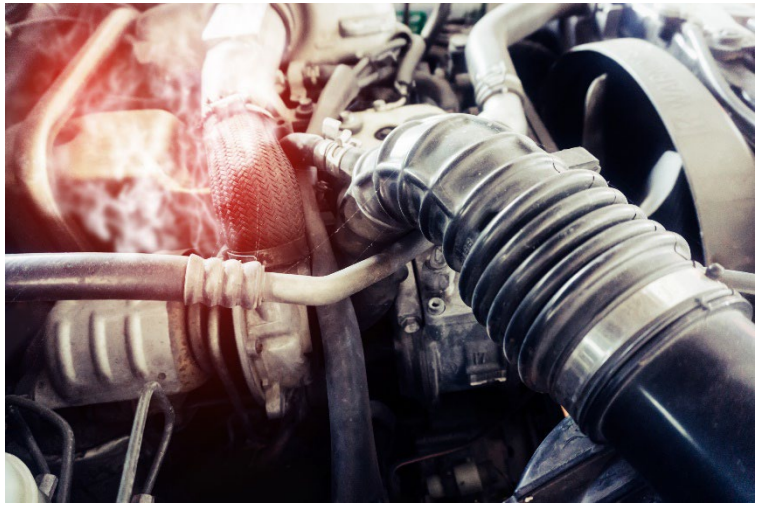
Educational training
The Chase technical team has the information, knowledge and willingness to educate our valued customers on products and processing for continuous improvement. These events can be customized around your team's needs at your facility, our headquarters, or an independent site.

Access to technical tools
Regulatory Approval Details - UL, Automotive, FDA, NSF, USP Class VI, REACH/RoHS/California Prop 65, Conflict Minerals

- Data Sheets and Processing Guides
- Safety Data Sheets (SDS)
- Product certifications
- Product brochures and chips/plaques

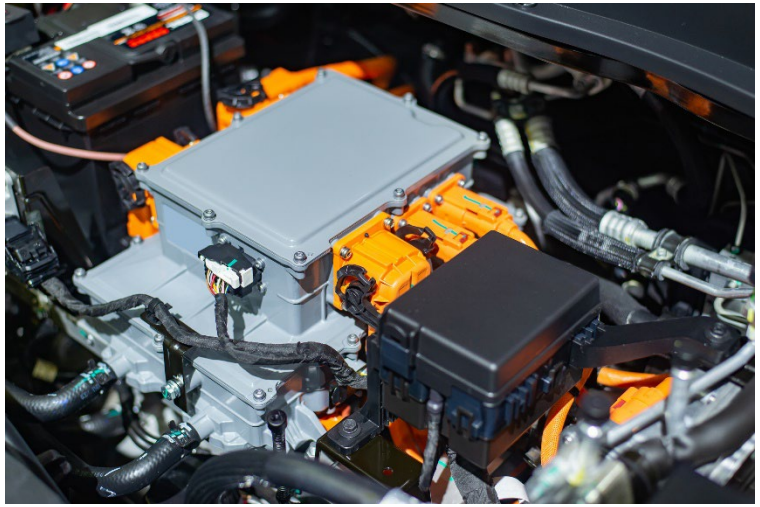
Challenges Under the Hood

Higher Temperature Exposures



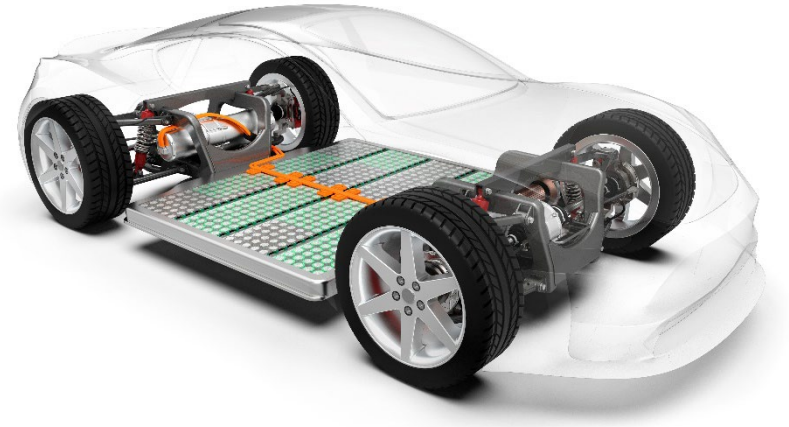
Longer High Temperature Exposure

High Voltage Application Constraints



Electrification Shift for Polymers

- Flammability Needs
- Battery Acid/Electrolyte Exposures (Chemical Resistance)
- Impact Energy Management
- Changes in Environment Temperatures
- New aesthetic and interior resistance needs
- Charging Infrastructure
- High Voltage Cautions
- Range-Extending Capabilities
- Warranty/Cost/Ease to Replace



Sustainability

Recycling Processes:

Process intended to save resources (virgin raw material, energy, etc.)

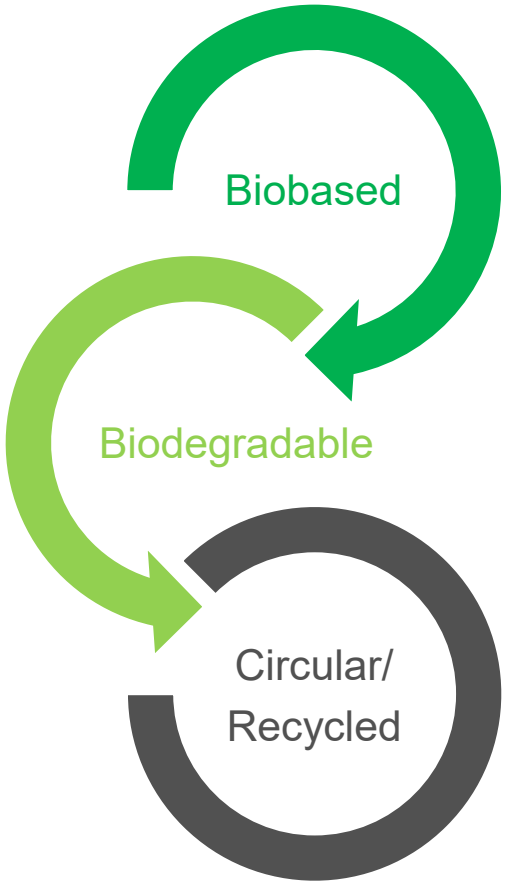
Mechanical: Process in which the material is not significantly changed and simply undergoes physical change.

Chemical: Process in which the material is depolymerized and repolymerized into a new polymer; undergoes a chemical change

"Bio" Options:

Biobased: (beginning of life) these materials are made, in part or in whole, from bio/renewable carbons (plant-based) compared to standard petro/fossil fuel-based carbons.

Biodegradable or Compostable: (end of life) these materials can undergo biodegradation, a chemical process in which microorganisms convert the materials into natural substances like water, carbon dioxide, and compost.



- Things to Consider
  - Color
  - Performance
  - Recycling Content Requirements
  - Recyclability
  - Cost

“

As one of the leaders in the plastics industry, we have a tremendous responsibility not just to engage in sustainable practices, but to set standards and act as champions and influencers so that others will follow our lead. It’s up to us to protect our natural resources and make an impact.

Kevin Chase, CEO, Chase Plastics

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CHEMISTRY THAT MATTERS™

Specialties

Introducing Specialties

THE HOME OF UNIQUE OFFERINGS WITHIN SABIC

- NPE 2024

SABIC AT A GLANCE

Specialties

1976
Company established

31,000
Employees around the world

50
Countries of operations

9,948
Global patents and pending applications

Top 2
Chemical Brand Value*

4.72
US$ bn
Estimated Brand Value*

83.46
US$ bn
Total assets

4.41
US$ bn
Net income

52.92
US$ bn
Annual revenue

≈ 150
New products each year

65
World-class plants worldwide

WE ARE ONE OF THE WORLD'S MOST DIVERSIFIED CHEMICALS BUSINESS

Specialties

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 Resins & Additives
- Specialty Compounds

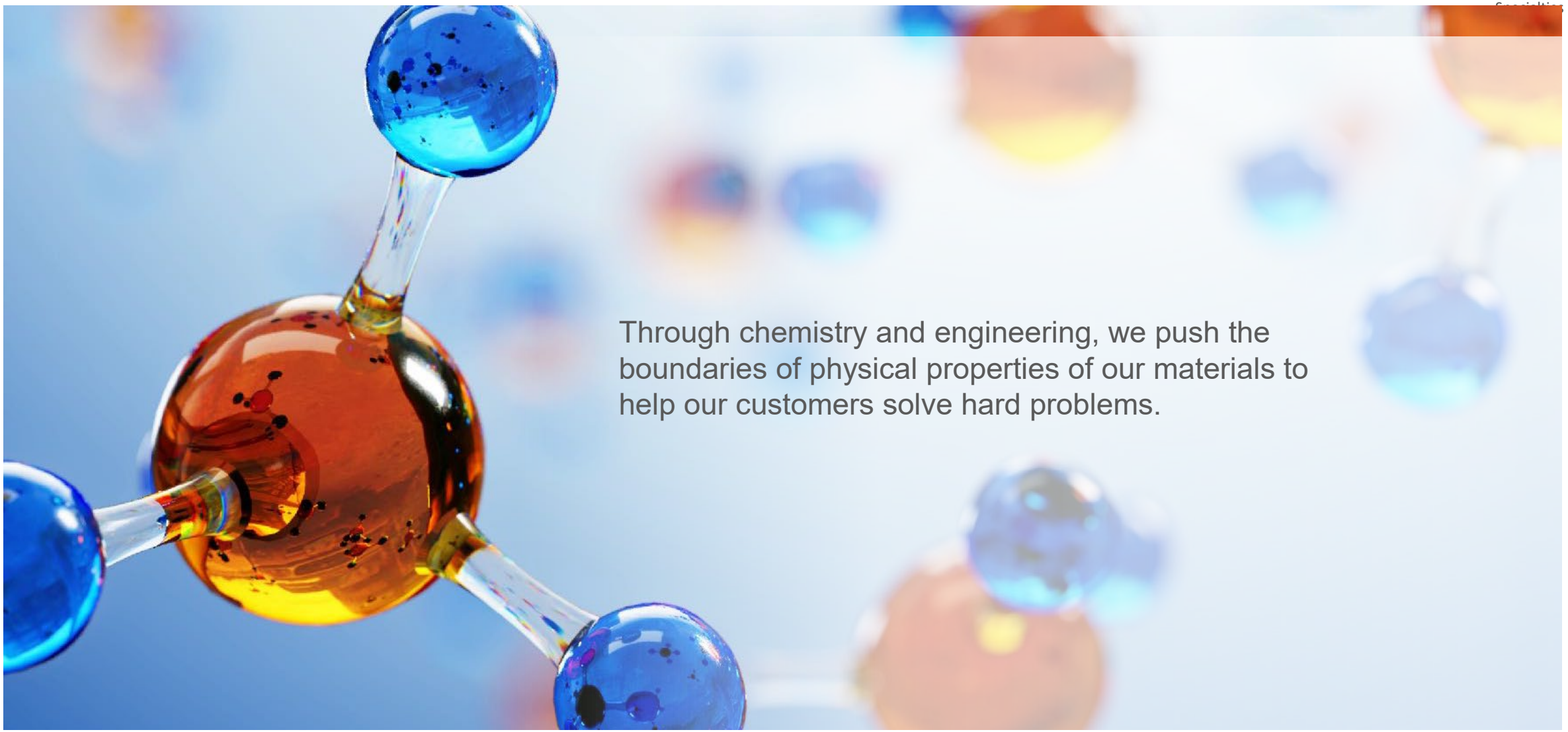
AGRI-NUTRIENTS

- 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

Designing materials to meet customers' challenges



Through chemistry and engineering, we push the boundaries of physical properties of our materials to help our customers solve hard problems.

PUSHING THE BOUNDARIES for NET-ZERO CARBON TARGETS

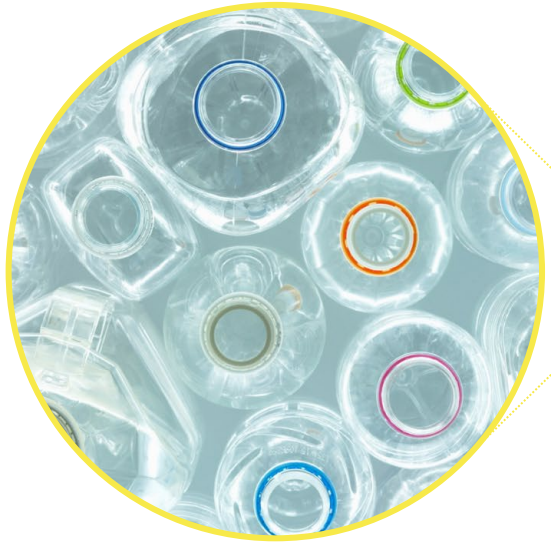
- ONE HUNDRED MILLION BOTTLES. AND COUNTING.
- UPCYCLING OF POST CONSUMER WASTE PET INTO LNP™ ELCRIN™ iQ PRODUCTS

LNP ELCRIN iQ is a proprietary technology of SABIC, which uses chemical de-polymerization to process recycled PET plastics into a polymer - polybutylene terephthalate (PBT). Holding the **Social Responsibility Certification** across the entire value chain,

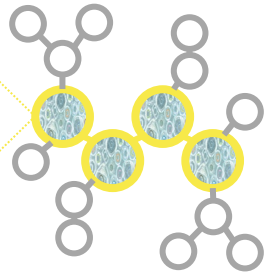
LNP ELCRIN iQ compounded resins contain up to **60%** recycled content (by weight) and are used in consumer and durable goods.

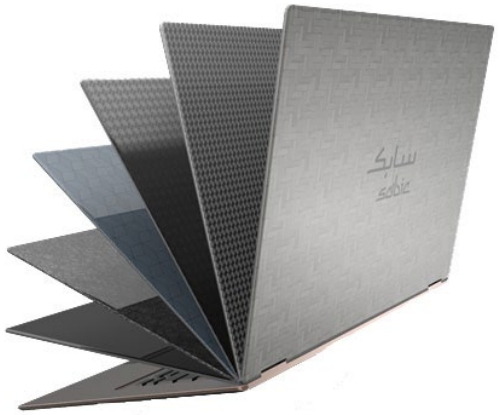
ENABLING CARBON NEUTRALITY

Compared to virgin resin, **LNP ELCRIN iQ** product has a smaller “cradle-to-gate” environmental footprint, as measured by Cumulative Energy Demand (CED) and Global Warming Potential (GWP). By displacing the virgin raw materials, **LNP ELCRIN iQ** resin has been shown through peer-reviewed life cycle assessment to reduce the energy and carbon footprint of the material by up to **29%** and **43%**, respectively*.



THE MONOMER IN PET BOTTLES IS UPCYCLED IN PBT COMPOUNDS, WHICH ARE USED IN CONSUMER AND DURABLE GOODS.





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PUSHING THE BOUNDARIES OF COLOR & AESTHETICS

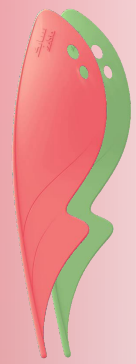
Weatherability	LNP™ SLX resin
Color coding	LNP™ COLORCOMP™ compounds
Impact	LNP EXL resin
Special colors	Visual Effects resins

CONSUMER GOODS

COLORXPRESS™ Services help deliver the right colors and **Visual effects**, in the right place, at the right time, every time with global consistency.

Long-term weatherable **LNP SLX resin** combines gloss retention, color stability and mechanical properties.

While many applications require paint, **LNP COLORCOMP compounds** can meet branding needs with a wide variety of custom colors, eliminating a secondary process.

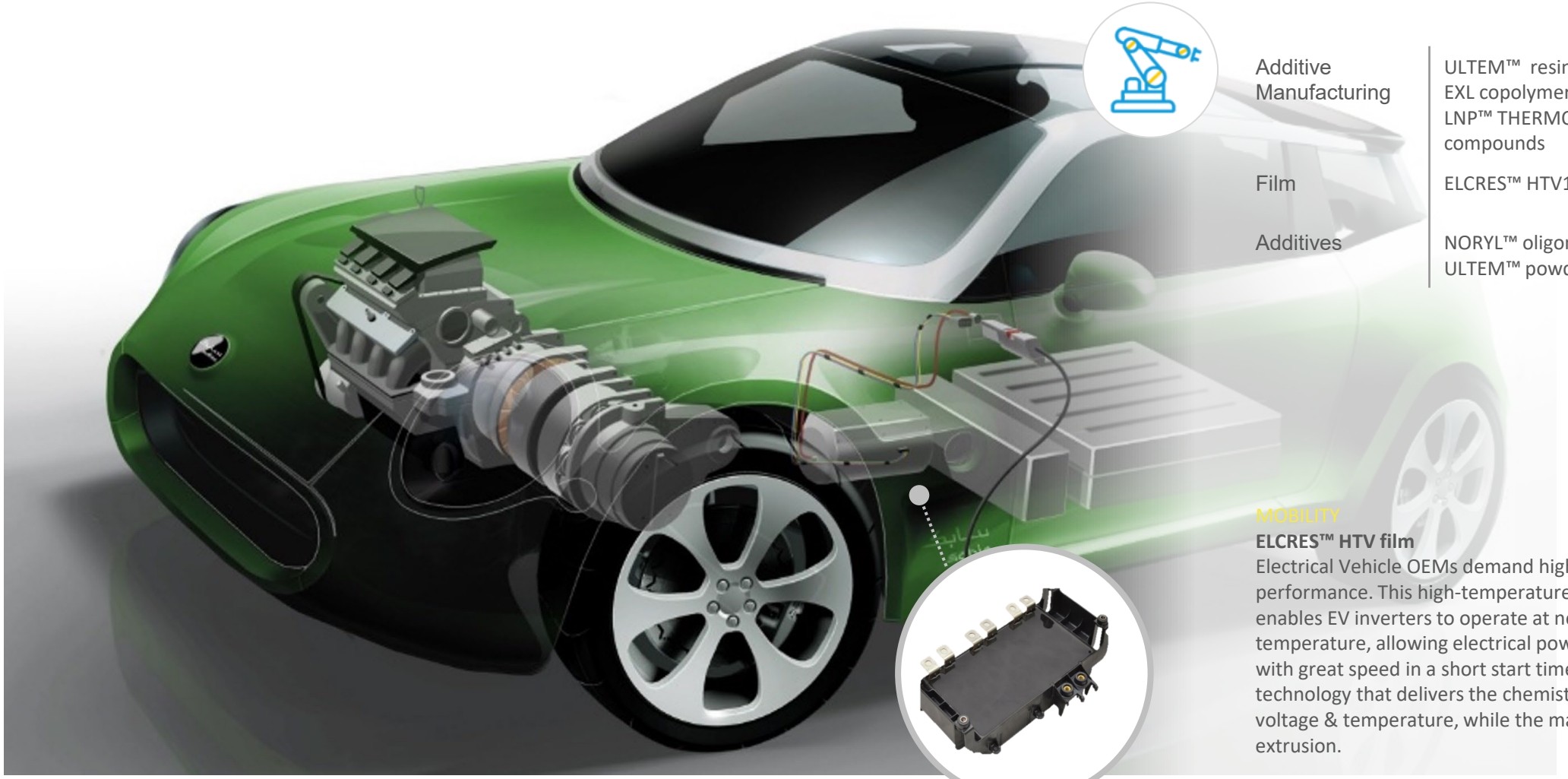


VOAR

EXPRESSION 2021/2022
Visual Effects

PUSHING BOUNDARIES of physical properties to enable new PROCESS Technologies

Specialties



Additive Manufacturing	ULTEM™ resins and filaments EXL copolymer filament LNP™ THERMOCOMP™ AM compounds
Film	ELCRES™ HTV150 5-micron film
Additives	NORYL™ oligomers ULTEM™ powders

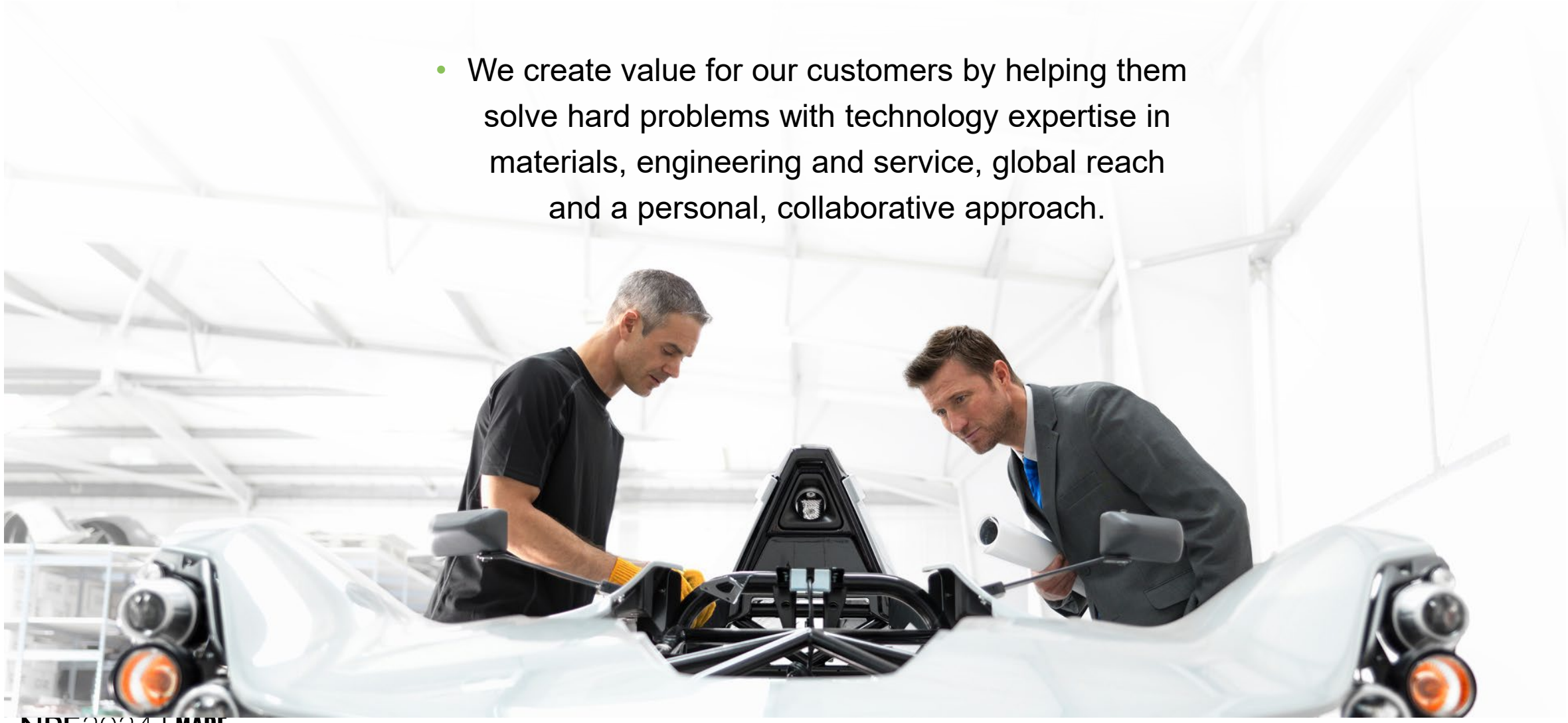
MOBILITY

ELCRES™ HTV film

Electrical Vehicle OEMs demand higher power performance. This high-temperature-voltage 5-micron film enables EV inverters to operate at next generation temperature, allowing electrical power trains to perform with great speed in a short start time - thanks to SABIC's technology that delivers the chemistry to handle the voltage & temperature, while the material allows ultra-thin extrusion.

We invest in relationships

- We create value for our customers by helping them solve hard problems with technology expertise in materials, engineering and service, global reach and a personal, collaborative approach.



ENGINEERING POLYMERS AND AUTOMOTIVE TRENDS

Envalior

Imagine the Future

NPE

- Jose Chirino,
- Technical Director AMERICAS

- May, 2024

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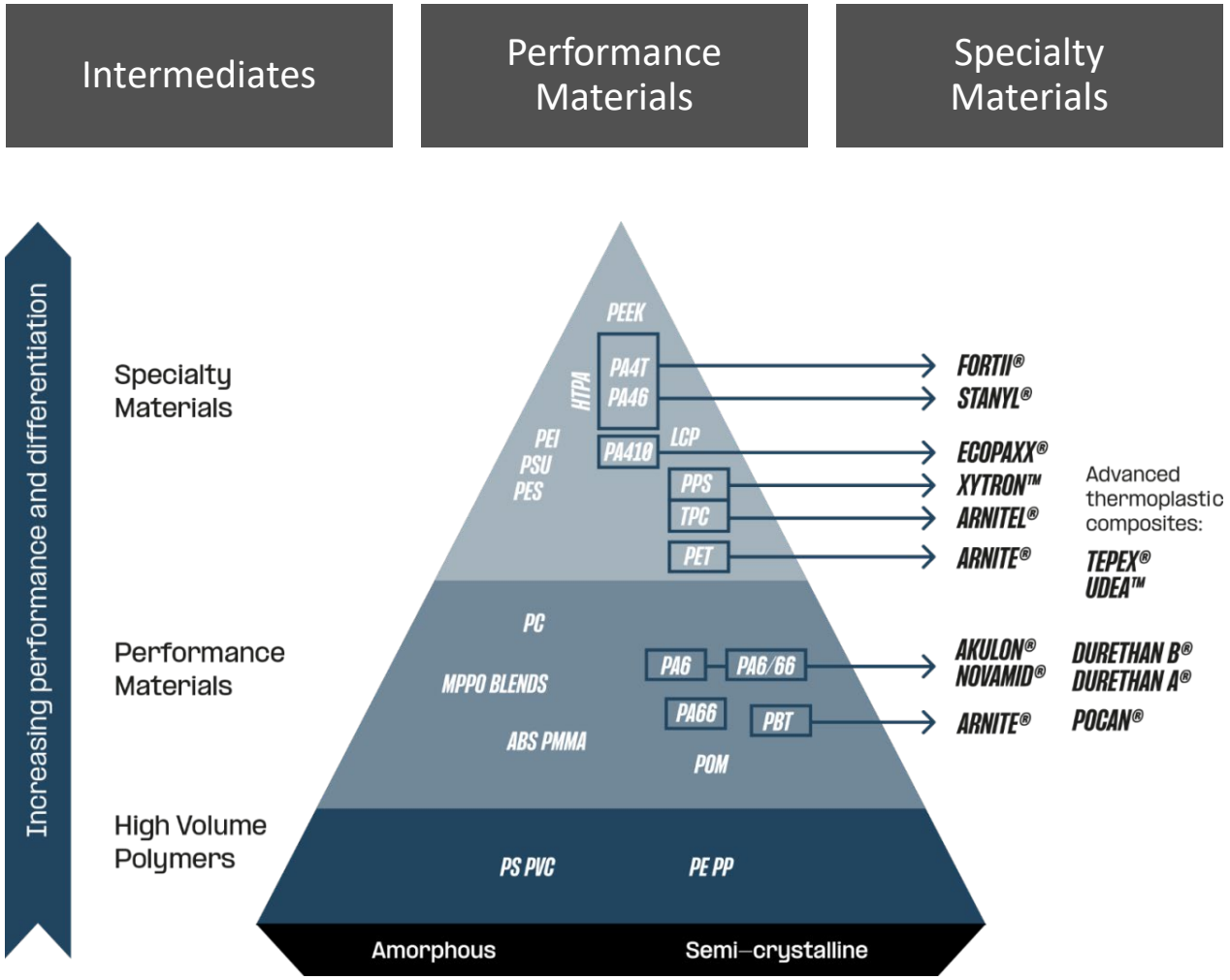
A STRONG *HERITAGE*

DSM
Engineering
Materials

LANXESS
High Performance Materials

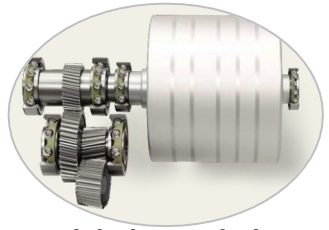
BROAD AND *UNIQUELY POSITIONED* PORTFOLIO



Trends	Applications	Technology	Technology	Development Partner

- Lightweight design
- Cost down
- 800V Charging
- 48 Bus System
- Thermal runaway protection
	- Battery Technology
	  - Thermal runaway
	  - Plastic enclosures
	- Lightweight design
	  - Air Springs
	  - Cross Car Beams
	- Fuel Systems
	- High Voltage
	- E-Motors
	- Fuel cells
	- Auto E&E
	- CVJ Boots
		- Welding
		- Foaming
		-Thermal Management
		- EMI Shielding
		- Metal/Plastic Hybrids
		- E-Friendly Materials
		- CAE
			-PCF reduction	- Global Organization
				- Quality Commitment
				- Application Design
				- Development Support
				- Product Development
				- CAE

Envalior enables cost/weight reduction in key applications



Lightweight e-Axle

Safe & Reliable High Voltage Connector & Plugs

Low-permeation H2 and gasoline tanks

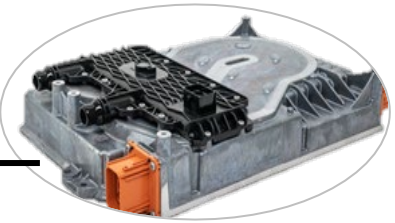
Safe Battery Housings and Electrolyte Additives

Smaller, lighter actuation systems

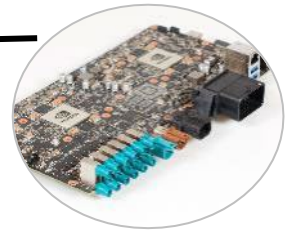
Lightweight Seating

Lightweight Air springs

Thermal mgt. system



Low leaching robust fuel cell systems

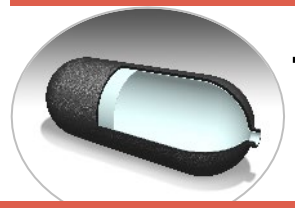


Electro corrosion-resistant FAKRA and HSD connectors

Envalior enables cost/weight reduction in key applications

High Dimensional Stability (PPS)

Improved Electrical Properties, UV and Impact performance (PBT)



Low Temperature Impact. High Heat Resistance (PA6)

Flame Retardancy, High Impact, Thermal Runaway

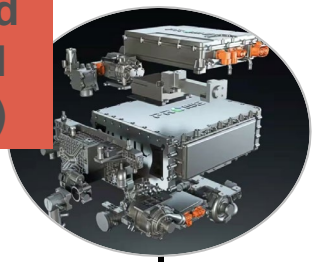
High Modulus, Low Carbon Footprint (PA6)

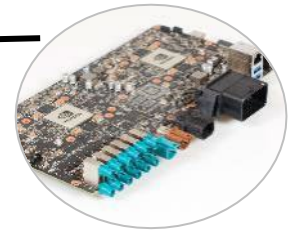
Low Friction (PA46)

High Modulus, Improved Fatigue (PA6)

HR Resistance (PA66)

Chemical and Dimensional Stable (PPS)





Halogen Free, Wide Processing Window (PA4T)

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