HALLSTAR

PLASTICIZERS FOR
AUTOMOTIVE APPLICATIONS

DRIVING NEXT GENERATION SOLUTIONS

Hallstar works collaboratively to deliver next generation solutions for critical automotive applications.

Today's vehicles are expected to last years longer with fewer repair and maintenance issues. To stay competitive, manufacturers need components that stay durable and flexible while withstanding extreme temperatures, oil and gas exposure and the demands of increasingly sophisticated automotive technology.

Hallstar offers solutions for every area of the car from tires and engines to air bags and floor mats. Our portfolio also includes the leading edge of phthalate replacement technology, which often exceeds performance expectations without environmental impact.

Tailored solutions for critical applications

Hallstar's ability to continually invent and formulate with esters to solve problems and craft important functionality is based on decades of esterification experience.

We also offer our own molecular design system, the Paraplex Approach, to quickly create unique plasticizer solutions based on tightly defined performance requirements. Together, we can explore new possibilities and create next generation automotive products.

LET'S WORK WONDERS™

INTERIOR

The interior's PVC-based parts experience extreme heat and direct sunlight, ultimately leading to windshield fogging from plasticizers that have volatized and essentially evaporated from the PVC. Our polymeric plasticizers have excellent permanence with minimal volatility. These plasticizers also help the interior remain flexible in colder conditions.

Seatbacks and Side Door Panels

These interior pieces require long-term flexibility and low plasticizer migration for minimal fogging as well as humidity resistance

- Paraplex® A-8000 is a polymeric ester that provides excellent flexibility and permanence with low fogging

Dashboard

Dashboards need low plasticizer migration for minimal fogging as well as migration resistance to polyurethane foam

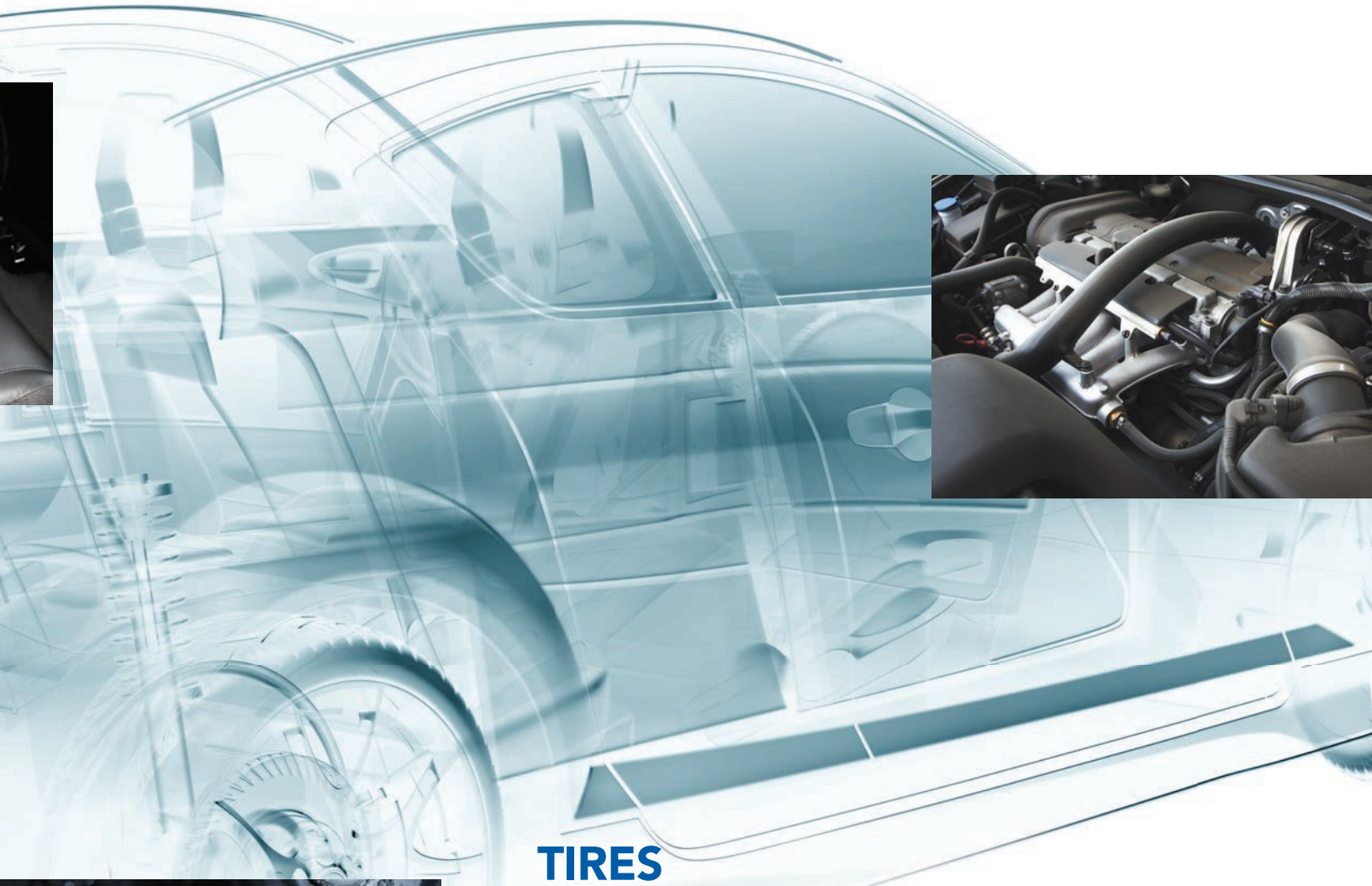
- Paraplex® A-8225 is a polymeric ester with excellent low fogging characteristics and permanence
- Paraplex® A-8862 is our latest innovative polymeric ester that provides ultra-low fogging as well as migration resistance and excellent low temperature flexibility

Air Bag Covers

These covers require excellent low temperature flexibility/ usability to ensure they operate on demand over a wide range of operating conditions with solid longevity

- Plasthall® CF and DBEES are both excellent choices for this application

Learn more about Hallstar's plasticizer solutions for the automotive industry at **www.hallstar.com.**



TIRES

The automotive industry is facing more stringent regulations for stopping distance and fuel economy. Tires must meet these demands with improved traction in all conditions while providing low roll resistance.

Tire Tread – SBR/NR

- StarTread® A-700 provides the best overall performance for winter and wet traction
- StarTread® A-400 offers the best overall winter traction and low roll resistance
- StarTread® A-900 provides excellent overall wet traction
- StarTread® liquid plasticizers are also available in Dry Liquid Concentrate form

ENGINE

The demands on automobile engine elastomer components have never been higher. Smaller engines trying to generate more horsepower are operating at elevated temperatures and in harsher operating conditions. The need for superior functionality requires high performance ester plasticizers and magnesium oxides. Whether the application requires low and/or high performance usability or extraction resistance to hydrocarbon fluids, Hallstar has an ester plasticizer that will meet or exceed the ever increasing physical property requirements.

Power Train Belt – HNBR

These belts need to perform under a wide range of temperature conditions over a long operating life

- TegMeR® 812 exhibits the best aged low temperature properties
- Paraplex® A-8000 provides excellent high and low temperature properties

Oil Cooler Hose – NBR, HNBR

These hoses must be resistant to various grades of engine oil and operate under a wide range of temperatures

- Plasthall® 7050 provides good oil resistance and low temperature properties
- Plasthall® DBEEA (226) is a high performance monomeric for low temperature performance
- Paraplex® A-8000 is a polymeric ester with excellent oil resistance and high temperature properties

Head Gasket – NBR

Head gaskets must perform under a wide range of temperature conditions, especially high heat, under compression and with oil contact

- Plasthall® 7050 is a specialty monomeric that provides both high heat and oil resistance
- Paraplex® A-8000 is a polymeric ester that provides excellent high temperature properties and permanence

Transmission Cooler Hose – AEM/ACM

This type of hose must carry transmission fluid at a wide range of temperatures and also needs oil/fuel resistance

- TP-759® provides low temperature properties
- TegMeR® 812 provides both high and low temperature properties
- Paraplex® A-8000 is a polymeric ester with excellent fluid resistance and permanence

Turbocharger – AEM/ACM

Turbochargers operate at high temperatures under severe conditions, but also need low temperature flexibility

- TP-759® provides low temperature properties
- TegMeR® 812 provides a wide operating range of both high and low temperature properties
- Paraplex® A-8000 is a polymeric ester with excellent fluid resistance and permanence

Transmission Seal – AEM/ACM

These seals operate at high temperatures under severe conditions, but also need low temperature flexibility and good compression set

- TP-759® provides low temperature properties
- TegMeR® 812 provides a wide operating range of both high and low temperature properties
- Paraplex® A-8000 is a polymeric ester with excellent fluid resistance and permanence

Power Steering Hose – CPE

Power steering hoses require oil resistance and must operate over a wide temperature range with good heat aging

- Plasthall® P-670 is a specialty polymeric that provides both high and low temperature usability and heat aging
- Paraplex® G-62 can be used as a secondary plasticizer to improve heat aged physicals

Crankshaft Seal – FKM

These specialized seals require superior performance to last upwards of 150,000 miles. The following provide superior HF absorbance, faster cure rates and excellent compression set:

- Maglite® D (RX)
- Maglite® D SSF
- Maglite® DE

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