

Proven custom solutions from a leader in ATF viscometrics

Evonik shifts fuel economy into high gear





VISCOPLEX® viscosity index improvers and DRIVON™ technology

Evonik sees the big picture — driving fuel efficiency, conserving energy and advancing innovation. As a world leader of additives and base oils for the lubricant, fuel and refinery process markets, Evonik helps formulators in achieving better fuel efficiency and enhanced product performance. With state-of-the-art facilities around the world and one of the largest research and development, manufacturing and distribution networks in the industry,

Evonik offers global supply security, fast delivery and worldwide technical expertise for VISCOPLEX® viscosity index improvers.

The Oil Additives specialists at Evonik have bundled their high-end products, formulation concepts and services for resource-efficient automotive lubricants into DRIVON™ technology. DRIVON™ technology enables lubricant marketers to formulate modern cost-efficient engine oil, transmission and gear oils that satisfy the

future requirements for enhanced fuel economy. It delivers premium value to lubricant marketers seeking optimal cost-performance and opens up further possibilities for improved, fuel-efficient lubricants using products tailored to customer needs. In this way, DRIVON™ technology delivers solutions that raise expectations for the next generation of lubricant technology.

Design elements for driveline fluid fuel economy

Today's advanced automatic transmission (AT) technologies, such as automatic transmissions with up to nine steps, dual clutch transmissions (DCT) and continuously variable transmissions (CVT), are diverse and highly complex. Transmission fluids and lubricant additives serving these modern transmissions require specific performance attributes to complement the sophisticated hardware design. VISCOPLEX® viscosity index improvers address these technical needs, enabling the fluids and the equipment to achieve optimal performance.

VISCOPLEX® viscosity index improvers have a track record of industry success, meeting all rheological targets of modern transmission fluid specifications.

VISCOPLEX® viscosity index improvers from the DRIVON™ technology toolbox are true design elements for fuel economy. One of the most valuable assets in the DRIVON™ technology toolbox are comb polymers, exemplified by VISCOPLEX® 12-199, whose well-defined architecture drives the viscosity/temperature relationship to the extreme at outstanding efficiency and fuel

economy performance. Backed by world-class innovation and application capabilities, DRIVON™ technology provides premium fuel economy with global supply position and technical support. Evonik is dedicated to meeting specific lubricant requirements that assist in customizing transmission fluid.

DRIVON™ technology — meeting fuel efficiency targets — worldwide.

Products, knowledge and experience to customize solutions

VISCOPLEX® viscosity index improvers from both DRIVON™ technology and our established polymer portfolio are tailored to meet OEM specifications and formulator requirements. Please discuss your specific needs with our local representatives. Count on the Oil Additives specialists at Evonik to provide the most cost-efficient solution.

Evonik invests to stay a step ahead of the marketplace and anticipate future formulation needs. Ongoing dialogue and exchanges both guide and enrich Evonik's ability to innovate and develop the products for the future.

Typical VISCOPLEX® viscosity index improvers for ATF/CVTF/DCTF

VISCOPLEX®	DRIVON™ technology	Dispersancy	PSSI KRL 20h (150N)	Application
12-075	✓		9	Fuel economy fluids, MERCON® LV
12-199	✓		26	Enhanced fuel economy fluids
12-209	✓	✓	26	Enhanced fuel economy fluids
12-105	✓	✓	35	Fuel economy fluids
12-115		✓	38	DEXRON®-VI, MERCON® V
12-292		✓	38	
12-150			40	Special fluids
12-320		✓	42	
12-413		✓	68	
12-501		✓	75	
12-709		✓	90	DEXRON®-III, MERCON®, UTTO



Custom formulations

Evonik takes pride in delivering the best solutions for modern transmission fluids. Through rigorous technical evaluation, dedicated fundamental research and active interaction with global OEMs:

- Evonik's business is in-step with the latest trends in fluid technology and transmission development.
- Specialists apply the knowledge to tailor products that maximize formulation efficiency.
- Evonik's products support efforts to increase global fuel economy through fuel-efficient transmission fluids.

Evonik's technology centers and manufacturing facilities are strategically located around the world with technical specialists that formulate custom-tailored lubricant additives solutions.

Technology centers

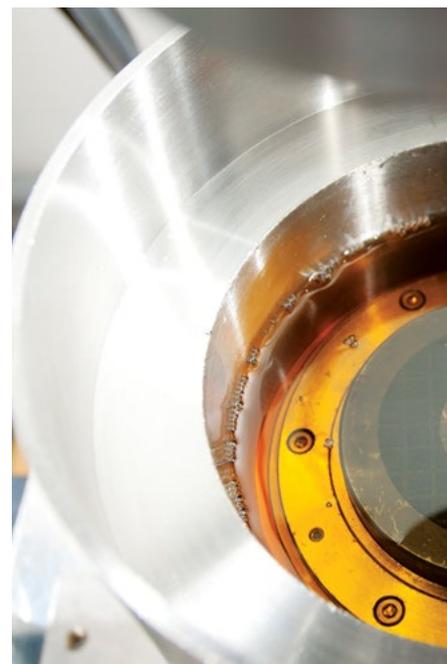
- Darmstadt, Germany
- Horsham, Pennsylvania, USA
- Tsukuba, Japan
- Shanghai, China

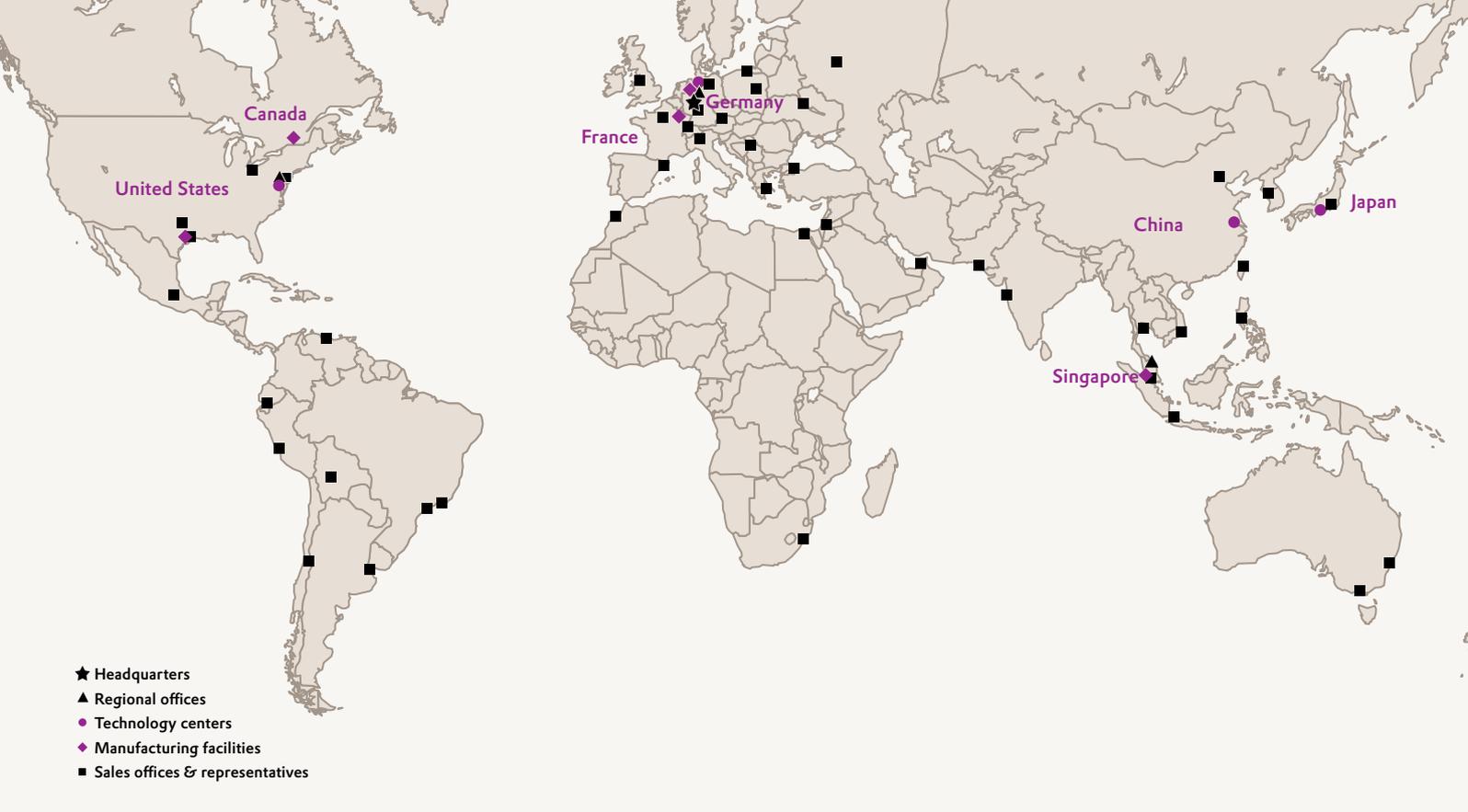
Manufacturing facilities

- Darmstadt, Germany
- Houston, Texas, USA
- Lauterbourg, France
- Morrisburg, Ontario, Canada
- Singapore
- Weiterstadt, Germany

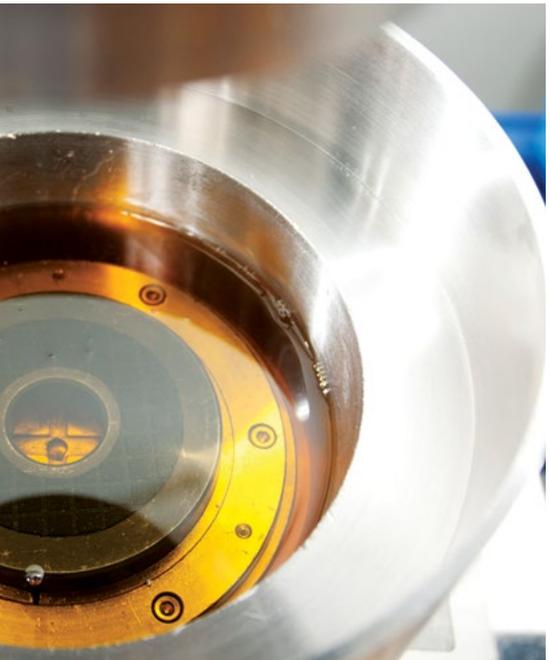
Focus on supply assurance

With plants located in each key global region and internal systems that ensure an ability to manufacture specific additives at multiple locations, Evonik significantly reduces supply risk for customers worldwide. Evonik's goal is to ensure faultless, uninterrupted global supply in today's volatile markets.





With a networked team in every region of the world, the Oil Additives specialists at Evonik are ready to address fuel efficiency challenges.



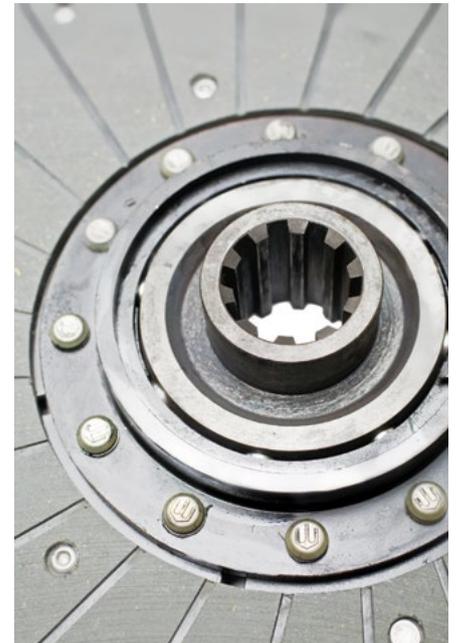
Viscosity is the key to performance advantages

VISCOPLEX® viscosity index improvers assure superior rheological properties and enhanced performance, meeting or exceeding all requirements for global OEM specifications for automatic transmission fluids. VISCOPLEX® viscosity index improvers deliver:

- Precise viscosity control to enable efficient, low viscosity lubricants
- Effective high-temperature thickening to enable economical treat cost
- Outstanding cold-temperature rheological behavior that improves cold-start performance
- Superior shear stability to ensure consistent viscosity control under severe mechanical shear conditions

- Effective dispersancy to lessen the deposition of oil oxidation products
- Excellent base stock adaptability and additives package compatibility to maintain formulation flexibility

Extensive experience enables Evonik to extend functional design well beyond fundamental viscometrics. Evonik is developing next generation technology that evolves from a rich base of viscosity index improver knowledge, using polymer architecture to create extraordinary formulating advantages.





Comprehensive technical assistance

No one offers more technical support than Evonik. With a truly global technical presence, customers can count on responsive, reliable support that's delivered with a focus on their convenience. Evonik supports customer formulation development by conducting performance tests, including those listed on this page.

Evonik amplifies its customer commitment with full vehicle assessment, such as chassis dynamometer emissions tests and selective field test support.

Rheological analysis and testing services

- Kinematic Viscosity
- Brookfield Viscosity
- KRL/Tapered Roller Bearing Shear Test
- Sonic Shear

Bench testing for tribological properties

- FZG Failure Testing
- FZG Efficiency Test
- Mini Traction Machine (MTM)
- Wet Clutch Tribometer
- Ultra-Thin Film Interferometry
- FE8 Testing

VISCOPLEX[®] viscosity index improvers for ATF, CVTF and DCTF — customized to achieve maximum performance

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