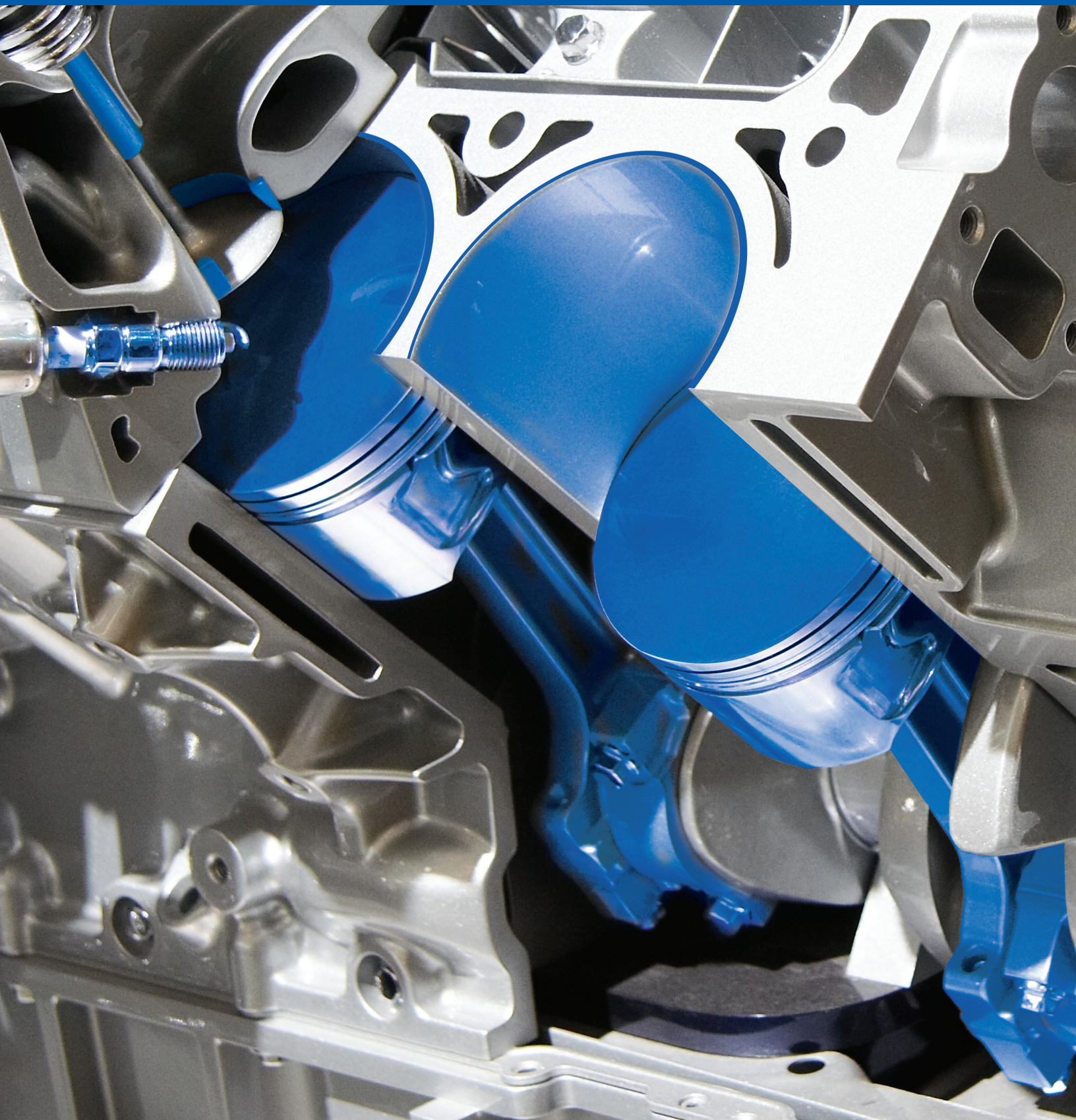

FEDERAL MOGUL
The Powertrain. It's what drives us.

The Heart of Powertrains.

The Federal-Mogul Powertrain mission is to be our customers' worldwide, first-choice partner by providing innovative best-value engineered product solutions. We foster commitment, enthusiasm and excellence in our world-class teams and strive to deliver flawless execution daily to achieve leadership in the markets in which we compete.



Leading Technology Portfolio

We are a preferred technology partner for our customers with locations in the Americas, Europe and Asia.

Federal-Mogul develops and delivers leading technologies that directly address specific customer, regulatory and market requirements like improved fuel economy, CO_2 emissions reduction, and enhanced durability. Federal-Mogul's advanced component designs, specialized coatings, and proprietary manufacturing processes facilitate friction reduction, engine downsizing and extend the capabilities of conventional materials.

Advanced engine and powertrain materials enable more efficient propulsion systems and facilitate vehicle lightweighting and engine downsizing for improved fuel economy and lower CO_2 emissions

- Federal-Mogul's Elastoval II ultra lightweight aluminum piston allows in high power gasoline engines a weight reduction of up to 15%
- DuraBowl® aluminum remelting process improves the fatigue strength of aluminum pistons to withstand mechanical and thermal loads produced by heavily boosted engines
- Advanced self-lubricating valve guide material allows valvetrains to operate at higher temperatures between 100°C (212°F) and 200°C (392°F) providing longer life in turbocharged engines
- The Nimbus® heat shield material provides efficient thermal protection and supports CO_2 reduction by enabling lightweight, highly-formable thermal management

Reducing engine friction has gained increased importance as manufacturers improve engine efficiency and reduce CO_2 emissions

- Advanced valve seat and valve guide technologies aid vehicle manufacturers in achieving CO_2 reduction strategies for new turbocharged, direct injection and ethanol capable downsized, high-output engines
- LKZ-Rings® enable low friction and reduced oil consumption due to a stepped surface and tapered contacting edge

Federal-Mogul is a global leader in the design, development and manufacture of advanced vehicle safety and protection products for gasoline, hybrid and electric vehicles

- CrushShield® durable textile sleeving absorbs and disperses energy, preventing damage to electrical cables and offering cut-through protection for fuel lines, electrical harnesses, and other critical components during crash situations
- EMI lightweight, flexible and durable shielding products reduce electromagnetic interference in vehicles
- ThermFlex® insulator is a lightweight thermal management sleeving that enables increased vehicle emissions performance and withstands temperatures beyond 900°C

Advanced coatings extend the capability of cast iron and aluminum engine technologies, ensure better lubrication and reduce component wear caused by friction

- EcoTough® low friction, wear-resistant piston skirt coating enables highly boosted engines and reduces piston friction up to 10% versus standard coatings
- Next generation coatings like CarboGlide® and DuroGlide® provide piston rings with maximum scuff resistance and reduce ring friction by up to 20%
- Innovative polymer coated IROX® bearing shells reduce fuel consumption and CO_2 emissions by withstanding mechanical and thermal loads produced by heavily boosted or start-stop engines

Pistons

Federal-Mogul has considerable expertise in providing next-generation pistons that address high mechanical and thermal loads. Our pistons feature optimized gallery locations for maximum cooling along with the latest material developments for increased strength and durability. State-of-the-art processes, technologies, coatings and engineered surfaces are evident in our products for not only superior performance, but to address the requirements of our customers.

Aluminum Diesel Pistons

- Optimized gallery locations for maximum cooling result in up to 10% lower bowl rim temperatures
- Advanced side-casting techniques significantly improve structural stability
- DuraBowl® reinforced combustion bowl rim and/or bowl base withstands high mechanical and thermal loads and significantly increases fatigue life
- Two-dimensional ultrasonic and eddy current inspection technique ensures defect-free castings for optimum durability

Aluminum Gasoline Pistons

- Designed in low friction, low mass and low NVH architectures
- Patented Elastoval skirt provides the highest strength-to-weight ratio
- Advanced piston technology for up to 20% lower friction
- Innovative EcoTough® coated piston reduces fuel consumption and CO_2 emissions
- Advanced Elastoval II piston for high power engines is light, and can withstand the higher pressures that occur late in the combustion cycle of highly charged downsized engines

Heavy Duty / Industrial Monosteel® Pistons

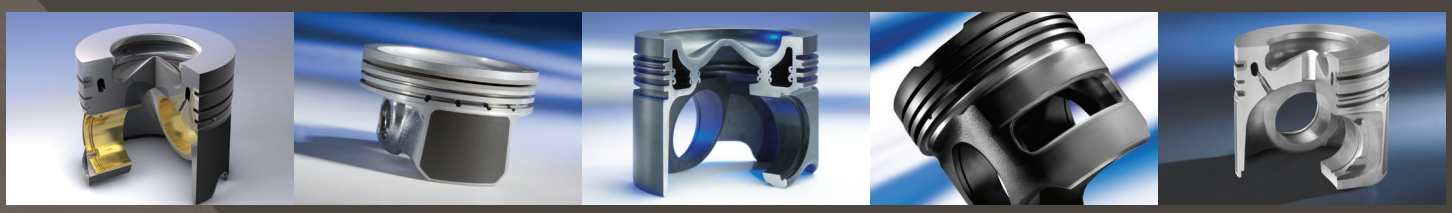
- Innovative Monosteel® diesel piston technology addresses the increasing thermal and mechanical challenges placed on heavy-duty diesel engines resulting from stringent emissions regulations, and the more recent improved fuel economy technology changes to combustion and exhaust systems for waste heat recovery
- A large, closed structural gallery with superior bowl rim and ring groove cooling, reduce groove distortion and improve oil control and gas sealing
- A full-length skirt for stable piston dynamics, reduces risk of liner cavitations and improves ring sealing

Heavy Duty / Industrial Magnum Monosteel™ Pistons

- Double-band piston skirt design, a first for modern diesel pistons
- Dual friction-welded construction, enabling large cooling galleries for high temperature resistance and strength
- Friction reduction of 17%, when compared to conventional steel piston designs

Passenger / Light Vehicle Diesel Steel Pistons

- Light vehicle diesel (LVD) piston design based on award-winning Monosteel® piston
- Advanced welding techniques for steel forgings create the strength and cooling potential of large galleries
- Innovative coatings and alternate steels address thermal challenges of small diameter LVD pistons
- Reduced compression height facilitates reduced overall engine height



Piston Rings

As a leader in powertrain innovation and technology, Federal-Mogul uses highly efficient casting and advanced machining manufacturing process technologies. We design and produce a wide product portfolio of rings with unique advanced low friction coatings and ring designs to reduce oil consumption.

GOETZE

Gasoline and Diesel Engine Piston Rings

- New ring designs reduce oil use, improve combustion chamber efficiency and enable better fuel economy and lower emissions
- Unique next-generation plasma and Physical Vapor Disposition (PVD) ring coatings provide maximum scuff resistance
- High Performance DuroGlide® PVD Cast Iron Rings set new benchmarks for ring performance, delivering lowest friction, best wear and excellent scuffing behavior
- Blitzchrome® ring side face protection provides more than 50% wear reduction
- Goetze Diamond Coating (GDC®) for piston rings offers 30% wear improvement
- LKZ-Ring® piston rings decrease oil consumption 50% and in-cylinder friction 15%
- CarboGlide® coating reduces ring friction 20%
- Advanced cast iron, cast steel and steel-wire materials

Piston Rings for Large Bore Engines

- 145 mm - 980 mm bore size for 4 and 2 stroke engines
- Gas tight gaps
- Sophisticated geometries
- Use of CGI, VGI, and other advanced grey cast iron materials as well as cast steel
- Plasma, ceramic, chrome-ceramic, GDC® and other coatings

Cylinder Liners

Federal-Mogul supplies a broad portfolio of advanced technologies designed to improve fuel economy, reduce vehicle emissions and enhance performance. We produce a wide variety of cylinder liners with unique designs to reduce fuel consumption.

GOETZE

Cylinder Liners for Passenger Cars and HD-Engines

- Hybrid Liner reduces oil consumption by 40%
- GOEDEL® Cylinder Liner material compositions serve all requirements, such as intermetallic bonding for lowest distortions and optimum heat transfer in combination with advanced tribology properties
- Extensive liner product range offers grey and alloyed, lamellar and vermicular compacted graphite iron (CGI), optional surface hardening and solutions for strength, performance and extended life
- Aluminum-coated automotive liners provide superior bonding, reduced distortion and improved oil economy
- Advanced analysis techniques for distortion reduction and improved piston ring sealing for extreme diesel cylinder pressures
- Extensive knowledge of advanced surface textures like Plateau Honing and related manufacturing strategies

Valve Seats & Guides

The company develops advanced and proprietary powder metal solutions enabling fuel efficiency and increased durability requirements generated by use of turbochargers/heavy-duty exhaust gas recirculation (EGR) concepts and other advanced engine designs.

Our valvetrain components are manufactured with solid lubricant technology to improve scuff resistance and machinability and suit a variety of gasoline, diesel and flexible fuel applications.

Valve Seats

- Copper-infiltrated valve seats deliver up to 50% wear improvement in abrasive EGR diesel environments
- Valve seat material based on high-speed steel contains wear-resistant carbides that are thermally stable at exhaust valve seat operating temperature
- Copper-infiltrated and dual-layer design ensures protection in the most arduous applications

Valve Guides

- Valve guides that outperform copper alloy and cast materials in dry environments required for reduced emissions
- Advanced valve guide material PMF-10E allows valve trains to operate at higher temperatures – between 100°C (212°F) and 200°C (392°F) – without increasing wear between the valve stem and guide
- Advanced valve guide material provides longer life in downsized turbocharged engines

Turbo Charger Bushings

- Self-lubricating materials aid wear resistance
- Advanced powder metal alloy turbo charger bushings are resistant to oxidation and operate at temperatures up to 1050°C

Ignition

In every internal combustion engine, ignition is the process that releases the power stored in the fuel. We are a market leader in the development of innovative, premium-quality ignition products. Federal-Mogul engineers develop ignition technologies as one integrated system, adapting to modern advances in engine design that demand more of ignition components than ever before.

SureFire Plus Plugs

- Best-in-class SureFire Plus innovative ceramic technology enables high energy and smaller plug designs to facilitate engine downsizing

Ignition Coils

- Ignition coils configured in plug top, multi-outlet, individual or multi-coil rail geometries

FB-M18 Industrial Plugs

- High-value FB-M18 Industrial plug for CNG or bio fuels in stationary engines enables an increased service life at a low operating cost

Champion® Dual Iridium Bridge Plug

- Champion® dual iridium Bridge plug features large electrodes and a dual-heat path through the bridge to improve heat extraction and reduce electrode wear rates, resulting in a plug life up to three times longer than current J-gap designs

Champion® Transit Class Spark Plugs

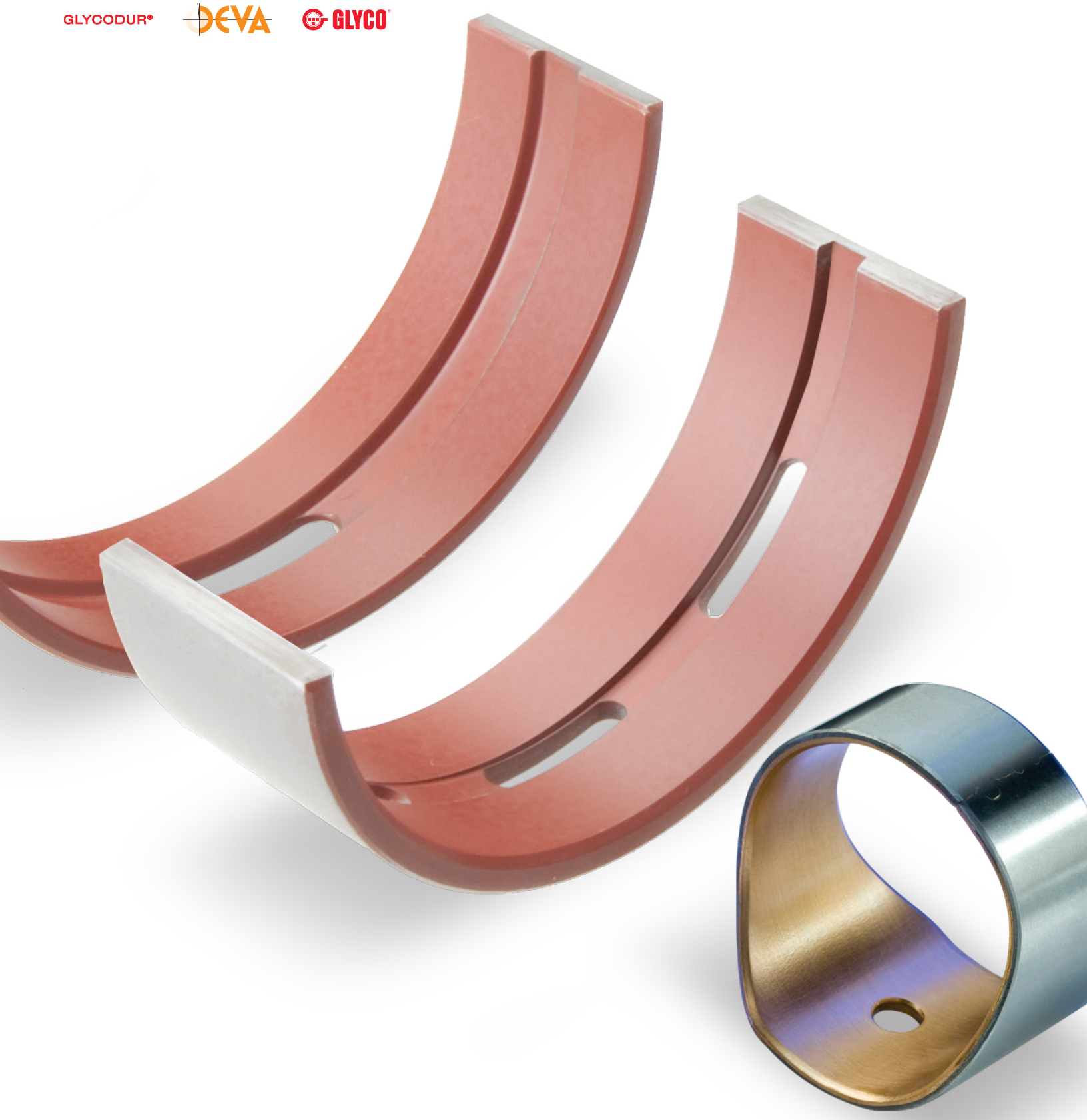
- Transit Class spark plugs offer improved durability and performance for commercial vehicle CNG applications

Federal-Mogul is developing Advanced Corona Ignition Systems for high performance engines with lean or high EGR strategies. ACIS is under development with several leading vehicle manufacturers.

Bearings & Bushings

We are an innovative market leader in bushings, thrust washers, and main and rod bearings for highly-loaded engines. Pioneering the development of lead-free electrocoating technologies, we continue to push performance boundaries and offer a complete range of lead-free, environmentally-friendly components, which are uniquely matched to a variety of applications.

GLYCODUR® DEVA GLYCO®



Bearings

- 2013 PACE™ Award winner, IROX® polymer coating reduces wear up to 500% and fatigue by 20% versus standard overlays
- Bearings with partial groove reduce oil pump losses by up to 30%
- Sophisticated flange bearing design is easy to assemble with individual material choice for radial and axial bearing surfaces
- Sputter bearings for ultra high-load applications facilitate significant improvement in fatigue performance over lead bearings

Bushings

- Lead-free, bi-metallic bushings meet ever-increasing demands for load capacity, sliding velocity and wear resistance
- Provide optimum support under static, dynamic, rotating, oscillating or sliding motion conditions

Glycodur®

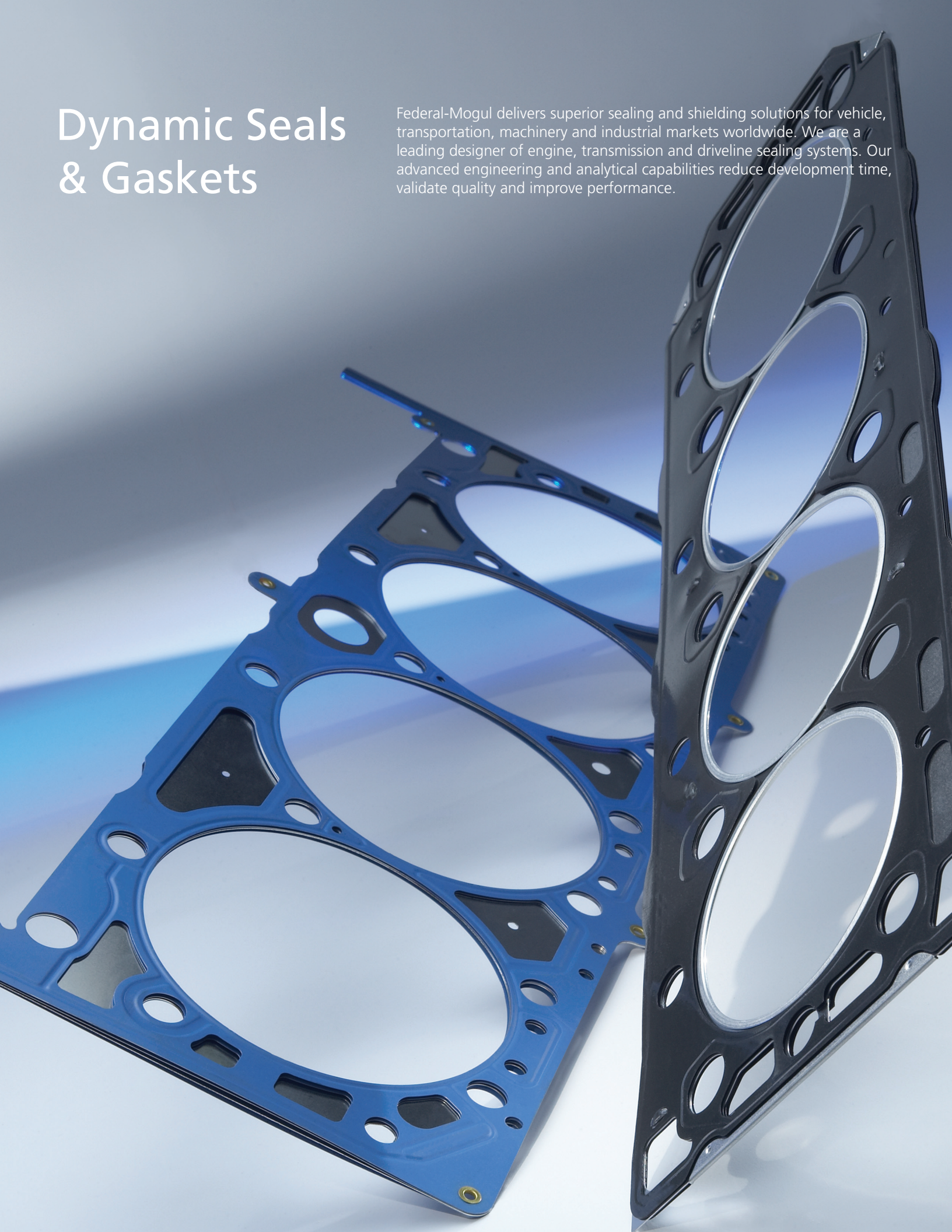
- Glycodur® plain bearings are maintenance-free and have excellent dry running properties
- Lead-free and produced from environmentally-friendly materials
- Precision bearings meet demanding requirements in dry operating conditions or lubricated with oil or fuel
- Feature high static and dynamic load capacities, a low wear rate and low coefficient of friction

DEVA®

- Self-lubricated bearings for industrial applications including hydroelectric power plants, windmills and construction
- DEVA® plain bearings meet the toughest demands in maintenance-free, self-lubricating industrial applications
- High-performance features include high wear resistance, low friction, excellent thermal and corrosion resistance, durability and immunity to abrasive particles
- DEVA® bearings are the preferred solution at high temperatures, underwater or in other extreme conditions

Dynamic Seals & Gaskets

Federal-Mogul delivers superior sealing and shielding solutions for vehicle, transportation, machinery and industrial markets worldwide. We are a leading designer of engine, transmission and driveline sealing systems. Our advanced engineering and analytical capabilities reduce development time, validate quality and improve performance.



MLS and Steel / Elastomer Cylinder Head Gaskets

- Advanced engineering and analytical capabilities reduce lead time and validate quality and performance
- Comprehensive portfolio of technologies designed to meet specific needs for light vehicle and commercial vehicle engine architectures
- Innovation to enable advanced combustion processes, emissions control and CO_2 reduction

Dynamic Seals

- Flat-Install®, the next-generation heavy-duty engine seal, with bonded polytetrafluoroethylene (PTFE) sealing element, offers high value and durability
- Innovative design provides easy fit for successful customer installations and superior dirt exclusion capability ensures extended seal life
- Advanced seal designs provide industry benchmarks for low torque and CO_2 reduction

Bonded Pistons

- 2013 PACE™ Award winning hydraulic actuators for automatic transmissions
- More than 300 million Federal-Mogul Unipistons® already in service
- High-performing Unipiston® products reduce assembly costs
- Material development and process technology ensure higher quality and improved durability

High Temperature Exhaust System Gaskets

- High Temperature Alloy (HTA) technology enables reliable sealing performance in highly-boosted engines where temperatures exceed the capability of traditional exhaust sealing materials
- Innovative High Temperature Coating (HTC) developed for thermal stability up to 1000ºC
- Portfolio of technical solutions tailored to meet the temperature needs of the application environment – exhaust manifold, turbocharger, and EGR

Engineered Elastomeric Gaskets

- Comprehensive range of materials expertise and engineered solutions for specific fluid and temperature environments
- Industry-leading analytical tools enable rapid development of sealing solutions and functionality that is “right the first time”

Heat Shields

- Complete product offering and continuous innovation give original equipment manufacturers tailored products to meet application requirements underhood and underbody
- Lightweight Nimbus® technology can provide up to 80% weight reduction compared to traditional heat shields

Systems Protection

Federal-Mogul's BentleyHarris® systems protection products provide innovative solutions to our automotive, heavy-duty, energy, industrial and transport customers.

BentleyHarris®

Abrasion

- Superior abrasion protection in easy-to-apply, flexible designs including expandable, self-wrapping and flat profile
- Ideal for instrument panel and engine harnesses; tubing, hose and cable assemblies

Thermal Management

- Excellent thermal insulation and radiant heat protection
- Innovative designs expand for flanges and bends with unique material combinations and self-sealing features
- Convective and radiant heat solutions for EGR tubes and exhaust systems; fuel and hydraulic lines; battery and control cables; wire harnesses; hoses and tubing

Electromagnetic Interference (EMI) Shielding

- Lightweight, durable and easy to install products
- Specially-designed yarn and wire technology combine for exceptional performance
- Addresses growing concerns for engine and instrument panel harnesses; power and battery cables; and starter assemblies

Noise, Vibration and Harshness

- Outstanding noise suppression and absorption properties
- Innovative material combinations to meet application conditions including eco-friendly alternatives
- Engineered to address NVH in interior door panels, headliners, HVAC systems, cables, hoses and tubing

Safety

- Durable textile sleeving offers cut-through protection for fuel lines, electrical harnesses, and other critical components during crash situations
- Innovative designs such as CrushShield® help vehicle designers meet current and emerging industry standards for high voltage electric vehicle systems and for mission-critical communications and safety systems