

Supercharger Systems

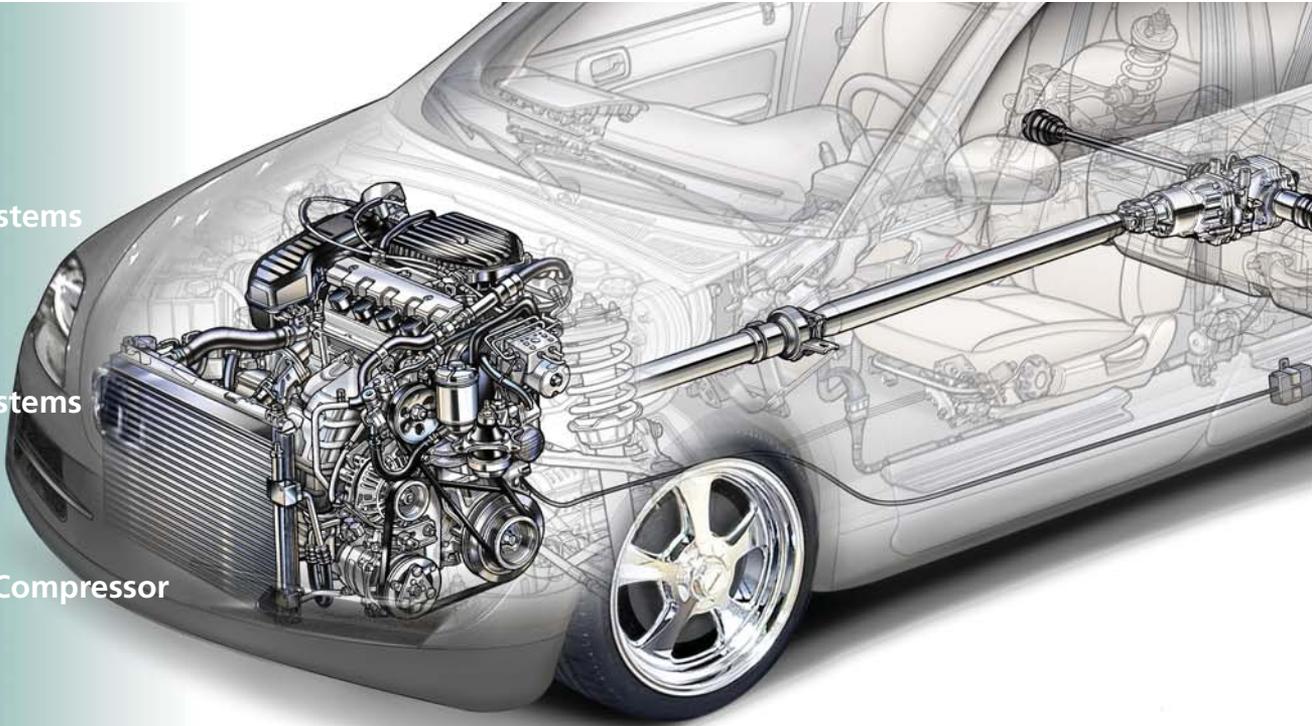
Turbocharger Systems

Air Conditioner Compressor

Piston Coatings

Transmissions

Idle Speed Systems



Driving the Future:
Enabling **Innovative**
Powertrain Design

Molykote® Lubricants for Powertrain Applications



Automotive
Solutions

DOW CORNING

Molykote® Powertrain Solutions— Driving the Future: Enabling Innovative Powertrain Design

When it comes to providing high performance, reliability, flexibility of design and value in increasingly sophisticated powertrain components, designers and engineers around the world turn to Dow Corning for Molykote® lubrication solutions.

For trouble-free performance under changing conditions, you can trust Dow Corning engineers to provide lubrication solutions early in your design process to minimize costly, time-consuming changes. We can even customize products, eliminating the guesswork that can run up costs and delay production.

Every Molykote automotive product and service is backed by the Dow Corning commitment to provide the design and processing answers you need to ensure your customer's satisfaction.

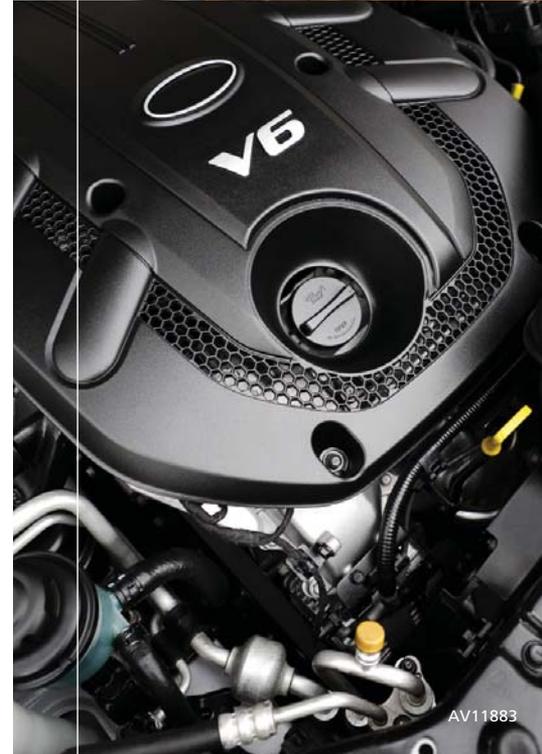
Molykote state-of-the-art lubricants offer good lubricity, manage friction, and extend service temperature range and warranty life. In addition, they are non-toxic, environmentally friendly, and fulfill all international regulatory requirements.

Solutions for the Powertrain Industry

Dow Corning is a leader and innovator in developing sealing and lubrication solutions for powertrain components and systems to maximize efficiency and value. For example, technologies such as Cure-in-place and Dispensed Foam Gasketing provide OEMs and Tiers with opportunities for dramatic cost savings – without sacrificing long-term performance.



AV11882



AV11883



AV11878

In addition, Molykote brand lubricants from Dow Corning have a proven record in gasket coatings, piston coatings, HVAC compressor pistons, bearings, and gear coatings to keep vehicles running smoothly. Torque transfer and viscous coupling fluids are known industry-wide for their performance in demanding applications.

Molykote® Brand Lubricants from Dow Corning

Designed to work under extremes of load, speed and temperature, as well as in exposure to fuel and corrosive exhaust gas, Molykote lubricants have excellent thermal stability, mechanical and corrosive resistance, and good compatibility with elastomers and plastics widely used in powertrain components.

Our product range and engineering expertise make us the ideal partner for cooperation and development projects for modified or new products.

- **Tailored approach** – Dow Corning has global capabilities but can tailor a solution that can satisfy local needs.
- **Simple and exact** – We offer a wide selection of specialty lubricants for all applications to help you make the right choice the first time.
- **Environmentally friendly** – Our lubricants and silicone-based products do not contain heavy metals or unwanted chemicals to comply with our customers' increasing requirements in terms of environmentally friendly products.
- **Total solution** – Specialty lubricants are the core portion of our powertrain components solutions, but Dow Corning also offers selected silicone compounds, sealants, adhesives and protective coatings for a complete product range.

Molykote® Long-life Specialty Lubricants

Ordinary lubricants often cannot meet the increased technical demands of today's sophisticated powertrain components. In many applications, specialty lubricants are required to perform under extreme conditions such as low and high temperatures, variable speeds and loads, and exposure to fuel and exhaust gases.

The Molykote line of specialty lubricants for powertrain components includes:

- **Greases** – Thick or semi-fluid dispersions of a thickening agent in a lubricating liquid. High-performance greases are designed for dynamic metal-to-metal, metal-to-rubber, metal-to-plastic and plastic-to-plastic applications. Most greases are based on synthetic formulations that have excellent resistance to thermal degradation. Many are fortified with solid lubricant additive technology to provide effective lubrication under extreme load conditions. High-performance fluorinated greases are designed for extended service at higher temperatures and higher loads, and in harsh chemical environments.
- **Pastes** – High concentrations of solid lubricants dispersed in oil for convenient application. These lubricants have high concentrations of solid lubricants blended in various base oils. They are used where a high concentration of solid lubricant is required, such as initial run-in and areas exposed to high loads.
- **Anti-friction coatings** – Paint-like products that contain submicron sized particles of solid lubricants, dispersed through carefully selected resin blends and solvents. After curing, the coating forms a dry lubricating film that can help prevent corrosion and is aesthetically pleasing. Anti-friction coatings are ideal for applications involving dusty environments or for inaccessible areas containing parts that need long-term lubrication.

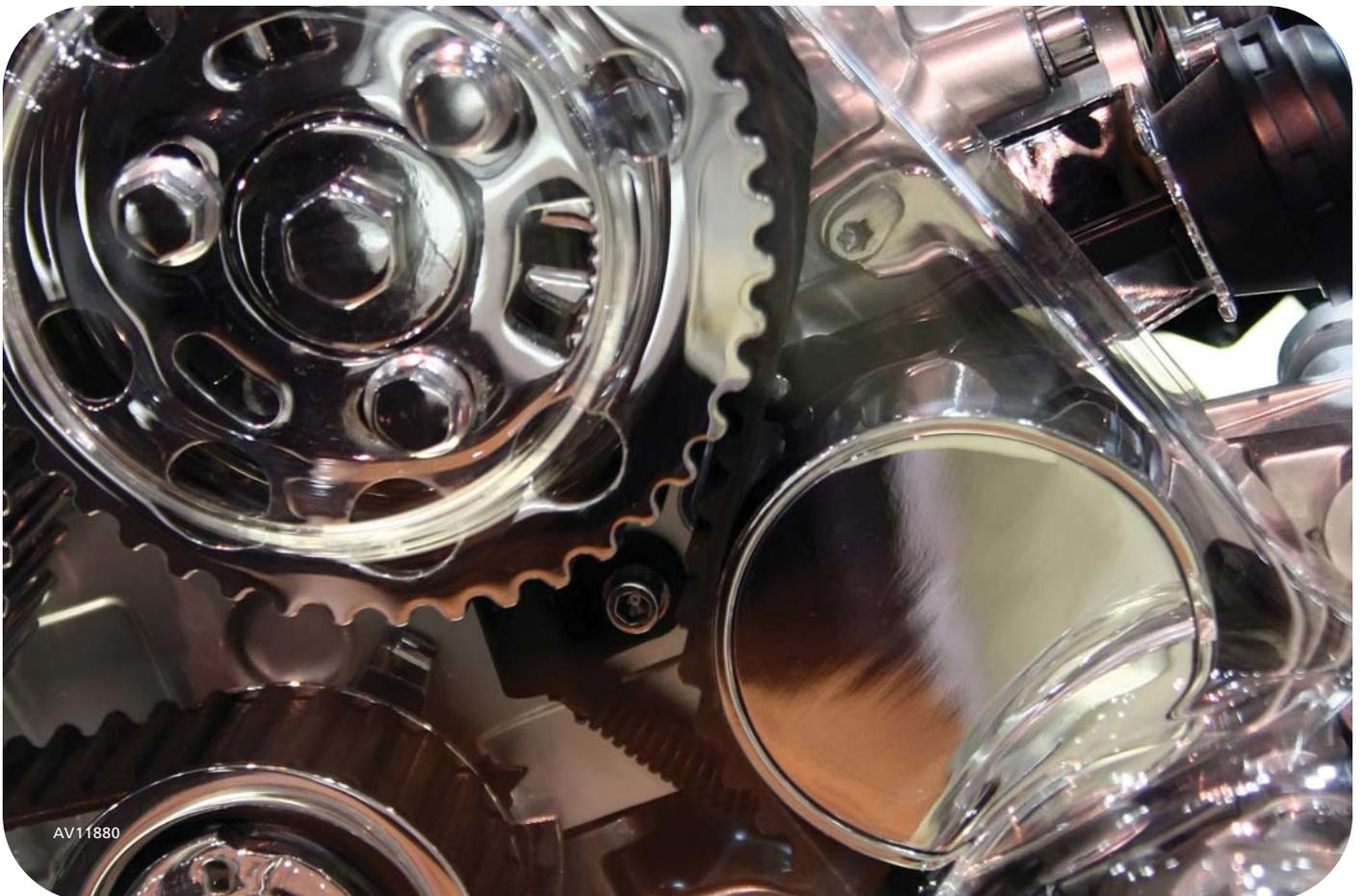
Dow Corning: One Company, Many Automotive Solutions

As the global leader in silicon-based technology and with more than 60 years of experience as a leading automotive supplier, Dow Corning provides products, services and business solutions to meet your needs exactly. Whether you need to boost performance, lower costs, or increase customer satisfaction with your automotive systems, modules and components, we have experts who can help.

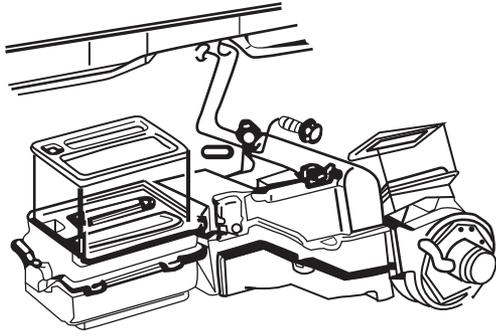
When you select Dow Corning as your business partner, you get fully integrated application and engineering support along with high-quality products and materials. From parts manufacturing to consulting to critical components' design, our experts can customize solutions that provide comfort, reliability and safety for vehicles today and for the future.

Specialty lubricants are the core portion of our powertrain solutions, but Dow Corning also offers selected silicone rubber and sealants to complete the product range

- **Silicone rubbers** – Widely used for connector seals and diaphragms to seal moisture and dust. They feature high temperature stability and low temperature elasticity.
- **Silicone adhesives/sealants** – These products are designed for applications which demand a strong but flexible bond, such as when bonding materials with differing thermal expansion rates.



Product Recommendations



Sub-Segment

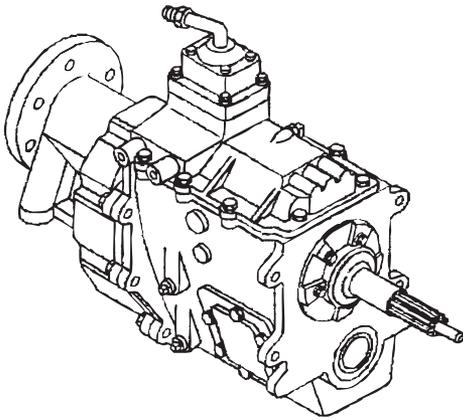
Part

Cooling & Climate Control

- Fan Clutch
- Fan Clutch Torque Bearing
- Hose Assembly Lube
- Bearing Grease on Water Pump
- AC Compressor Bearings
- HVAC Diverter Doors

Engine

- Piston Coating
- Cam shaft, crank shaft, push rods, valves, lifters, distributor gear, valve springs, timing chain, Crankshaft pilot bushing
- Exhaust manifold gasket coating
- Cylinder head gasket coatings
- Engine bolts/studs

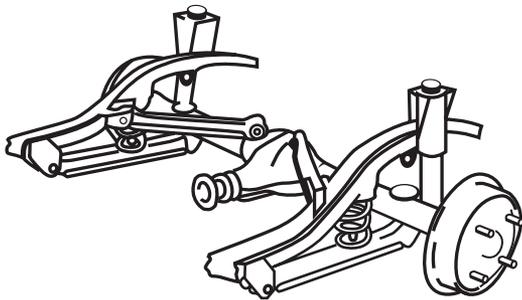


Transmission - Manual

- Dual mass fly wheel
- Clutch spline shaft
- Clutch release bearing
- Mechanical clutch cable
- Clutch arm pivot ball
- Transmission gears
- Tail shaft spline
- Clutch lining

Transmission - Automatic

- Tail shaft spline
- Assembly bolts
- AWD viscous coupling unit

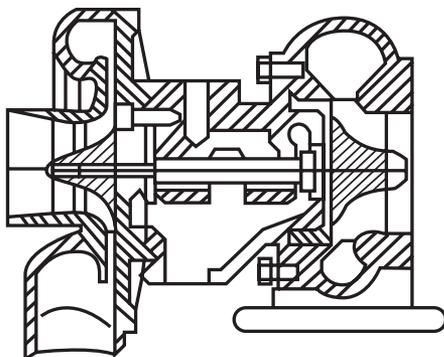


Drivetrain - Rear Wheel & All-Wheel Drive

- Universal joints
- Differential gears
- Front wheel bearings (regreaseable)
- Rear wheel bearings (sealed)

Drivetrain - Front-Wheel Drive

- Differential gears
- Limited slip differential
- Front/Rear wheel bearings (sealed)



Fuel / Air Systems

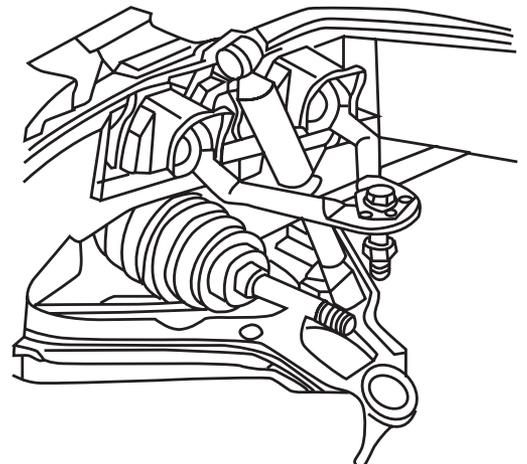
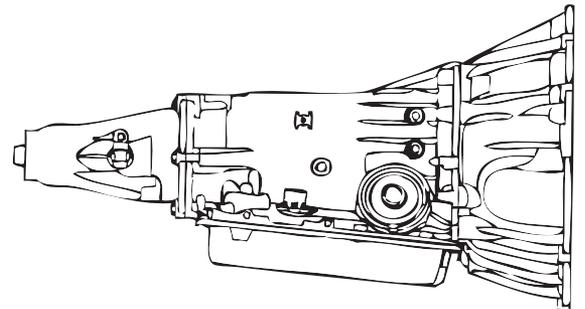
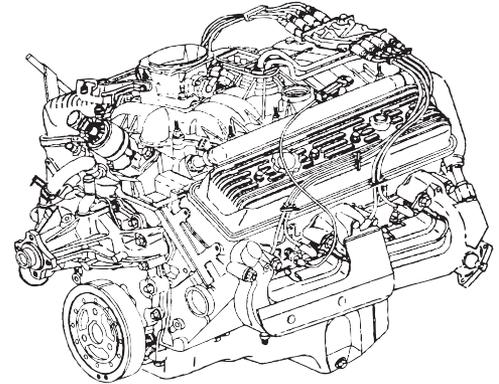
- Supercharger bearings
- Turbocharger bearings
- Butterfly shaft turbo
- Butterfly valve throttle body
- EGR valve
- Throttle position sensor
- Idle speed control valve

	Temperature (°C)	Base Oil	Substrate	Recommendation
	-46°C to 200°C	Silicone Fluid	N/A	211 Fluids, Q2-
	-40°C to 230°C	Fluorosilicone	Metal to Metal	FS-841
	-65°C to 250°C	PFPE	Metal to Metal	HP-300 Grease
	-40°C to 232°C	Fluorosilicone	Metal to Metal	3451 Grease
	0°C to 10°C	Silicone/Water Emulsion	Rubber to Metal/Plastic	346 Emulsion
	-60°C to 130°C	PAO	Metal to Metal	G-2001
	-46°C to 182°C	Ester	Metal to Metal	BG-20 Syntheti
	-60°C to 130°C	PAO	Metal to Metal	G-2001
	-50°C to 150°C	PAO	Metal to Metal Plastic to Plastic	MH-62
	-75°C to 380°C	AFC	Aluminum to Aluminum	D 88
	-70°C to 380°C	AFC	Aluminum to Cast Iron	D 10
	-75°C to 300°C	AFC	Aluminum to Cast Iron	PA-744
ers, oil pump gears, piston rings, sprockets and piston coating	-70°C to 380°C	AFC	Metal to Metal	7409
	-40°C to 204°C	Silicone	Metal to bronze	44MA
	-70°C to 380°C	AFC	Metal to Metal	7620
	-180°C to 450°C	AFC	Metal to Metal	D 321-R
	-70°C to 380°C	AFC	Metal to Metal	7620
	-70°C to 250°C	AFC	Metal to Metal	3484
	-40°C to 1200°C	Mineral Oil	Metal to Metal	P 74
	-40°C to 1150°C	Mineral Oil	Metal to Metal	1000 Anti-seize
	-40°C to 1200°C	Mineral Oil	Metal to Metal	P 40
	-40°C to 200°C	PAG Grease	Metal to Metal	G-3600
	-70°C to 380°C	AFC	Metal to Metal	7409
	32°C to 400°C	Mineral Oil	Metal to Metal	G-n Paste
	-46°C to 182°C	Ester	Metal to Metal	BG-20 Syntheti
	-60°C to 130°C	PAO	Metal to Metal	G-2001
	-30°C to 130°C	Mineral Oil	Metal to Metal	BR-2
	-73°C to 180°C	Silicone	Metal to Plastic, Metal to Rubber, Plastic to Plastic	33 light
	32°C to 400°C	Mineral Oil	Metal to Metal	G-n Paste
	-70°C to 380°C	AFC	Metal to Metal	7409
	-70°C to 250°C	AFC	Metal to Metal	7400 Anti-Frict
	-70°C to 380°C	AFC	Metal to Metal	7409
	32°C to 400°C	Mineral Oil	Metal to Metal	G-n Paste
	-10°C to 150°C	EP Polymer	Metal to Metal, Metal to Plastic, Metal to Rubber	EM D-110
	-40°C to 650°C	Solid Lube	Composite to Metal	D-29
	-70°C to 380°C	AFC	Metal to Metal	7409
	32°C to 400°C	Mineral Oil	Metal to Metal	G-n Paste
	-10°C to 150°C	Synthetic Oil	Metal to Metal, Metal to Plastic, Metal to Rubber	EM D-110
	-70°C to 250°C	AFC	Metal to Metal	3484
	-40°C to 315°C	Silicone Fluid	Aluminum and steel housings	3-9160
	-40°C to 315°C	Silicone Fluid	Aluminum and steel housings	3-9161
	-40°C to 315°C	Silicone Fluid	Aluminum and steel housings	3-9162
	-30°C to 130°C	Mineral Oil	Metal to Metal	BR-2
	-40°C to 177°C	PAO	Metal to Metal	G-4700
	-70°C to 380°C	AFC	Metal to Metal	7409
	-30°C to 130°C	Mineral Oil	Metal to Metal	BR-2
	-35°C to 130°C	Mineral Oil	Metal to Metal	LT 2/78
	-40°C to 177°C	PAO	Metal to Metal	G-4700
	-46°C to 182°C	Ester	Metal to Metal	BG-20 Syntheti
	-46°C to 182°C	Ester	Metal to Metal	BG-20 Syntheti
	-60°C to 130°C	PAO	Metal to Metal	G-2001
	-70°C to 380°C	AFC	Metal to Metal	7409
	-70°C to 250°C	AFC	Metal to Metal, Metal to Plastic	106
	-46°C to 182°C	Ester	Metal to Metal	BG-20 Syntheti
	-46°C to 182°C	BG-20	Metal to Metal	BG-20 Syntheti
	-60°C to 130°C	PAO	Metal to Metal	G-2001
	-40°C to 230°C	Fluorosilicone	Metal to Metal or Metal to Plastic	FS-841
	-70°C to 250°C	AFC	Metal to Metal	7400 Anti-Frict
	-200°C to 430°C	AFC	Metal to Metal or Metal to Plastic	3400A Leadfrec
	-200°C to 430°C	AFC	Metal to Metal or Metal to Plastic	3400A Leadfrec
	-70°C to 250°C	AFC	Metal to Metal	7400 Anti-Frict
	-40°C to 232°C	Fluorosilicone	Metal to Plastic or Metal to Rubber	3451 Grease
	-65°C to 250°C	PFPE	Metal to Metal, Metal to Plastic or Metal to Rubber	HP-300 Grease
	-65°C to 250°C	PFPE	Metal to Metal or Metal to Plastic	HF-30 Oil
	-65°C to 250°C	PFPE	Metal to Metal, Metal to Plastic or Metal to Rubber	HP-300 Grease
	-65°C to 250°C	PFPE	Metal to Metal, Metal to Plastic or Metal to Rubber	HP-300 Grease
	-40°C to 232°C	Fluorosilicone	Metal to Plastic or Metal to Rubber	3451 Grease

ed Molykote Product

Product Features

1353 or Q5-1468	<p>Viscosity can be tailored to engine cooling requirements</p> <p>For higher speed bearings</p> <p>Premium performance in presence of chemicals</p> <p>Economic alternative</p> <p>Lubricant for ease of assembly</p> <p>Lower viscosity base oil for high-speed bearings</p>
c Bearing Grease	<p>High speed bearing grease</p> <p>High speed bearing grease</p>
	<p>Low friction at low temperatures</p>
	<p>Low friction, noise reduction</p>
	<p>Lower friction</p>
	<p>High load capacity, break-in</p> <p>High load capability, break-in</p> <p>High load capability, roll coating version of 7409</p> <p>High temp, air dry</p> <p>High load capability, roll coating version of 7409</p> <p>Corrosion protection and dry lubrication</p> <p>Corrosion protection, Metal-free</p>
e	<p>Low cost</p> <p>Metal-free, beige color</p>
	<p>Specially formulated for application</p> <p>Corrosion protection, high loads</p> <p>High loads</p>
c Bearing Grease	<p>High-speed bearings</p> <p>High-speed bearings</p> <p>Low cost, high loads</p> <p>Fluid resistance, cold temp performance</p> <p>High loads</p>
ion Coating	<p>Corrosion protection, high load capability</p> <p>Water-based</p> <p>Corrosion protection, high load capability</p> <p>High loads</p> <p>Dampening grease</p> <p>Lubricity additive</p>
	<p>Corrosion protection, high load capability</p> <p>High loads</p> <p>Dampening grease</p> <p>Added corrosion protection and dry lubrication</p> <p>High temperature, shear resistance</p> <p>High temperature, shear resistance</p> <p>High temperature, shear resistance</p>
	<p>High loads, cost-effective</p> <p>Higher temps, high loads</p> <p>Corrosion protection, high loads</p> <p>High loads, cost-effective</p> <p>High loads, cost-effective</p> <p>High temps, high loads</p>
c Bearing Grease	<p>Formulated for high speed bearings</p>
c Bearing Grease	<p>Formulated for high speed bearings</p> <p>Formulated for high speed bearings</p>
	<p>Corrosion protection, high loads</p> <p>Low coefficient of friction</p> <p>Formulated for high speed bearings</p>
c Bearing Grease	<p>Ideal for high-speed bearings</p> <p>Ideal for high-speed bearings</p>
ion Coating	<p>Chemical & high temperature resistance</p> <p>Water-based</p>
e	<p>Low coefficient of friction & fuel resistance</p> <p>Low coefficient of friction & fuel resistance</p>
ion Coating	<p>Water-based</p> <p>Chemical resistance</p> <p>Chemical & high temperature resistance</p> <p>Chemical resistance</p>



How To Contact Us

Dow Corning has sales offices, manufacturing sites, as well as science and technology laboratories around the globe. For more information, visit www.dowcorning.com/automotive or www.molykote.com, or call one of our primary locations listed here.

Your Global Connection

The Americas

World Headquarters (United States)
TEL: + 1 989 496 6000
Automotive Development Center North America
TEL: + 1 734 454 2000
Brazil
Dow Corning do Brasil Ltda.
TEL: + 55 11 3759 4300

Asia

Asia Headquarters (Japan)
TEL: + 81 3 3287 8300
FAX: + 81 3 3287 1088
China
TEL: + 86 21 2306 5500
FAX: + 86 21 6351 2600
Technical Information Center
TEL: + 86 21 3774 7110
Toll free: 400 880 7110

India
TEL: + 91 22 6694 6868
FAX: + 91 22 6694 6848

Korea
TEL: + 82 2 551 7600
FAX: + 82 2 551 6400

Singapore
TEL: + 65 6253 6611
FAX: + 65 6253 6070

Thailand
TEL: + 66 2634 7078
FAX: + 66 2634 7076

Australia & New Zealand
Dow Corning Australia Pty Ltd.
TEL: + 61 1300 360 732

Europe

European Headquarters (Belgium)
Dow Corning S.A.
TEL: + 32 64 88 80 00

Germany
Dow Corning GmbH
Technical Information Center
TEL: + 49 611 237 964

France
Dow Corning France S.A.
Sales Office
TEL: + 33 47 284 1360

Italy
Dow Corning S.p.A.
Sales Office
TEL: + 39 0298 8321

Spain
Dow Corning Iberica
Sales Office
TEL: + 34 93 363 6900

United Kingdom
Customer Service Center Northern Europe
Sales Office
TEL: + 44 1676 528 000

Global Presence. Local Support.

Dow Corning's global presence in the automotive market enables you to develop specifications centrally while providing consistent high-quality products and services locally. Through our global sales, application engineering, product development, and manufacturing and delivery capabilities, our quality is consistent around the globe. This also enables a more effective and efficient product customization process—no matter where you are located!

LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that Dow Corning's products are safe, effective, and fully satisfactory for the intended use. Suggestions of uses should not be taken as inducements to infringe any particular patent.

Dow Corning's sole warranty is that the product will meet the Dow Corning sales specifications in effect at the time of shipment.

Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted.

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invent the future.™*

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