



Driving a Better Way



HIGH PERFORMANCE ...LOW COST ...MAXIMUM VALUE

- > **The global automotive industry is more competitive and demanding than ever.**

This presents increasing challenges for OEMs and their suppliers. It also opens up a world of opportunities to those who can meet the marketplace's need for faster, better and more cost effective components, subassemblies and systems delivered at any time, anywhere around the world.

Powder Metallurgy (P/M) is meeting those needs in a big way. Led by GKN Sinter Metals – the world's largest producer of powder metal parts.

Look inside the world's leading automobiles and commercial vehicles and chances are, you'll find a GKN P/M part. With over 10,000 parts, there is most likely a GKN cost-effective part for your automotive application.

- > **The world is discovering the significant cost efficiencies and performance advantages of GKN P/M components.**

And, for good reason. Produced at net or near-net shape, dimensional accuracy is achieved at high strength, with less weight, virtually no waste and often eliminating labor-intensive machining operations. Plus, GKN P/M parts offer breakthrough material and process technology, superior design flexibility and surpass the highest quality standards.

From main bearing caps, sprockets and gears to connecting rods and shifting components, GKN technology can be found in engines, transmissions, and body & chassis applications worldwide. Our material capabilities are equally extensive, successfully using materials such as aluminum, iron, stainless steel, low-to-high-alloy steels, special alloys and composites.



> MEETING A WORLD OF NEEDS



> Unparalleled process technologies maximize results

GKN is a leader in innovative powder metal technologies. Powder forging offers improved strength and density as well as tighter tolerances. Metal Injection Molding (MIM) combines the material flexibility of powder metallurgy and the design flexibility of plastic molding. And, through warm compaction, material properties such as ductility are enhanced.

> Engineering expertise and sophisticated quality management

To ensure that our P/M products adhere to your specifications for functionality, quality and performance, we offer comprehensive, expert engineering services. From practical performance testing and efficiency calculations to design optimization, validation and on-time launch performance, we'll assist you with your next

new program, or we can cost-effectively convert existing parts. State-of-the-art tools include 3D performance and economic modeling, finite element analysis (FEA), rapid prototyping and automated statistical control of weight with press feedback, advanced product testing and validation capabilities include axial apply deformation testing, stroker fatigue test machines, and torsional torque test rigs.

> Global presence ... local support

GKN's global presence links you with the latest advancements in powder metal technology – wherever they occur. While multi-site, local content manufacturing as well as local customer service provide the support you need. Worldwide Centers of Excellence focus on best practices and the latest advancements in specific technologies. "best-of-the-best".



Vincenza Giurdanella of GKN presents you the key points:

- GKN Sinter Metals is the No.1 Powder Metal Company in the world
- The company's global footprint is in close proximity to its customers
- Full range of supply in development and testing in small and large applications, across all processes

> GKN INNOVATION IS YOUR COMPETITIVE EDGE

Body & Chassis Components

> Advanced manufacturing solutions set us apart.

GKN's body & chasis components include:

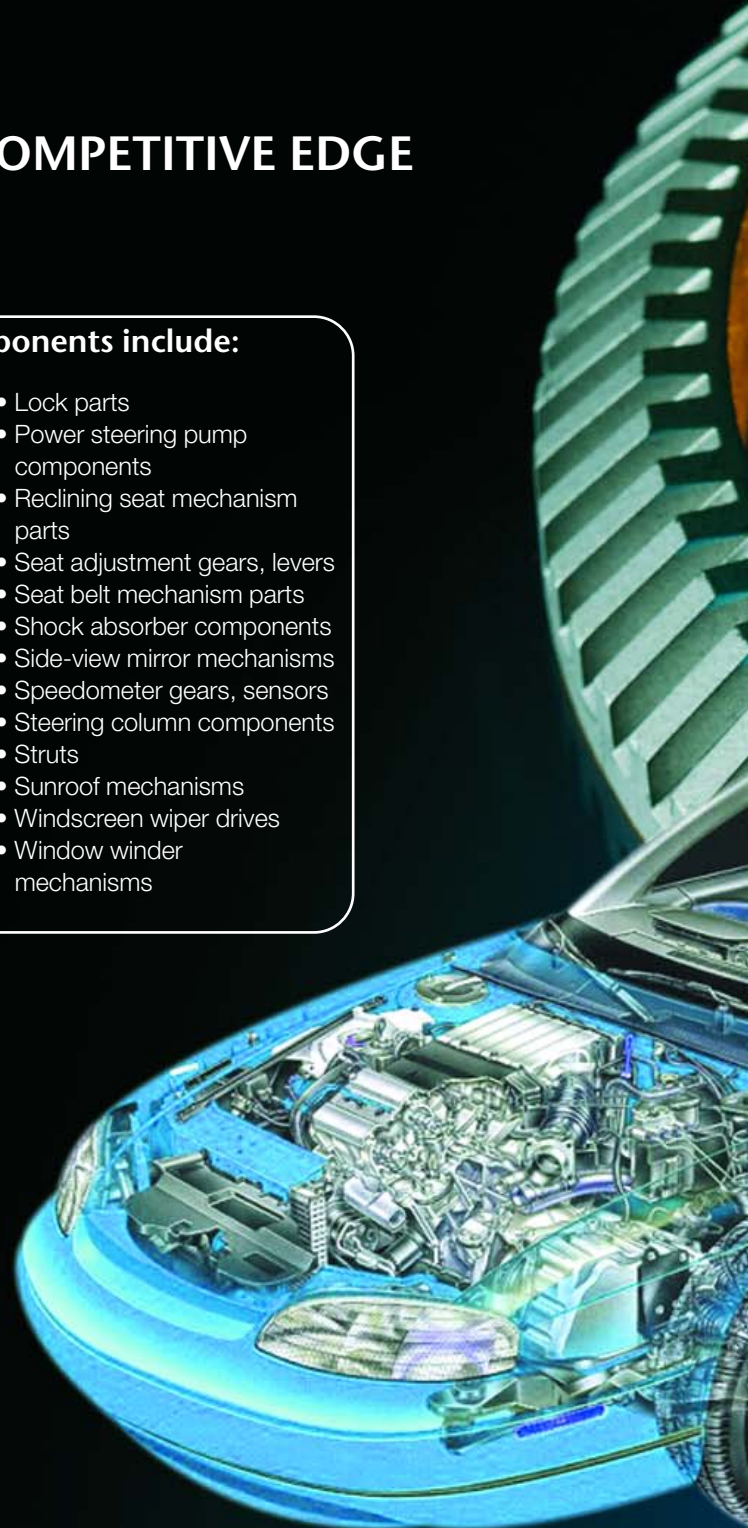
- ABS sensor rings
- A/C components
- Airbag mechanism parts, filters
- Axle bearing caps
- Brake disc pad supports
- Brake pistons, nuts, gear drums
- Brake valve spacers & plates
- Cruise control inserts
- Door, sunroof hinges
- Electric motor cores, armatures
- Emission control plates
- Fasteners
- Gears for locking, roof, door mechanisms
- Levers
- Lock parts
- Power steering pump components
- Reclining seat mechanism parts
- Seat adjustment gears, levers
- Seat belt mechanism parts
- Shock absorber components
- Side-view mirror mechanisms
- Speedometer gears, sensors
- Steering column components
- Struts
- Sunroof mechanisms
- Windscreen wiper drives
- Window winder mechanisms

Transmission Components

> PM parts can meet your needs for complex geometric features.

Other GKN transmission solutions include:

- Bushings
- Clutch hubs
- Clutch adjusting rings
- Clutch pressure plates
- Clutch releases, spring seats
- Drive hubs
- Driveshaft balancers
- Gear levers, arms
- Gear plates
- Guide sleeves
- Lock-up components
- Lugs
- Parking gears
- Retainers
- Shift forks, levers
- Spacers
- Stator plates
- Synchronizer cones, hubs, rings, sleeves
- Transfer case components
- Transmission shaft hubs
- Torque converter races
- Torque converter stators, thrust bearings, assemblies
- Torque converter turbine hubs
- Washers

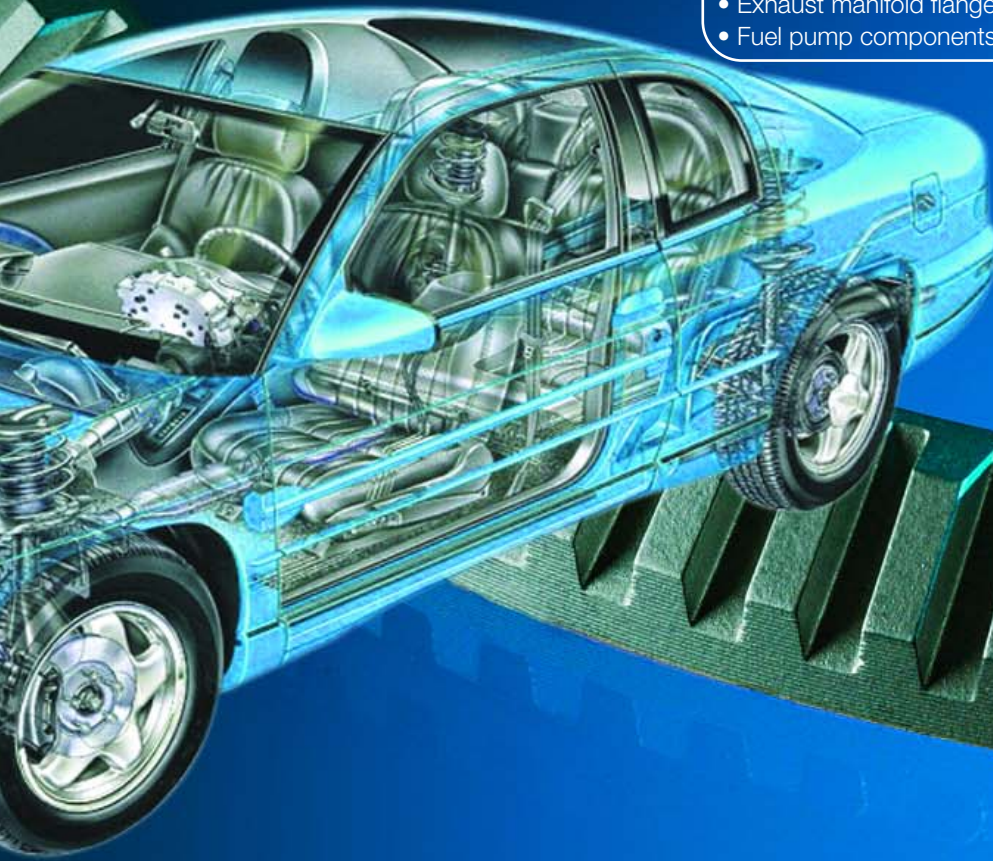


Engine Products

➤ Discover the PM advantage compared to other production methods

GKN's wide range of engine products includes:

- Alternator pulleys, bearings
- Balance shaft mechanisms
- Bedplate inserts
- Belt & chain tensioner cams
- Bushings and bearings
- Cam caps (aluminum)
- Camshaft adjusters, brackets, lobes
- Camshaft sensor rings
- Cooling system inserts
- Crescent and vane pumps
- Cylinder liners
- Distributor pole pieces, gears
- Engine balance shafts
- Engine mounting inserts
- Exhaust manifold flanges
- Fuel pump components
- Oil pump gears, rotors
- Piston cooling nozzles
- Pivots & pedestals
- Pole pieces
- Restrictors
- Rocker arms, inserts, brackets
- Sensor rings for position controls
- Spacers
- Starter motor pinion gears
- Throttle cams
- Torque limiters
- Turbocharger thrust bearings
- Valve lifter guides
- Valve seats, rings
- Water pump components



Ute Koop of GKN presents you the key points:

- Technical Leadership, GKN is your partner for complex and high strength metal products
- GKN P/M parts have been perfected in seven decades
- High flexibility, fast response and secure sampling



TOTAL SOLUTION ... DELIVERED

What you need – when you need it. This is the cornerstone of GKN Sinter Metals’ “total solutions” approach. Our emphasis on delivering the best possible solutions begins when our global resources go to work identifying ways to reduce costs, increase performance and improve quality. It continues into our unmatched P/M manufacturing capabilities. And, quite frankly, it never ends because we are always striving for continuous improvement and better ways to serve you.

EXPECT  MORE

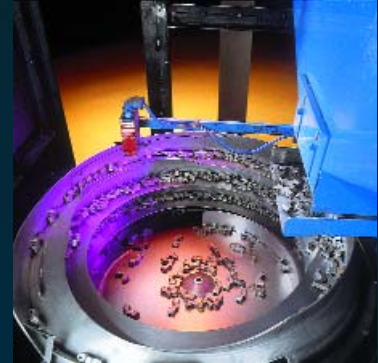
> THE WORLD'S MOST ADVANCED P/M MANUFACTURING

With over 30 manufacturing facilities around the world, we supply a full range of production processes and press tonnage ranging from 5 to over 2,500 tons. Our capabilities include in-house tooling as well as the world's largest compacting press. By applying GKN's Global Lean Enterprise Program we continuously improve the value creation for our customers. We eliminate waste in all business processes - not only in production - but on all levels of the organization - from 5s in a production cell to lean leadership training on all management levels.

> Superior customer service equals bottom line savings

Not only does GKN Sinter Metals offer local supply, we offer unequalled local customer support. Locally-based engineers who understand your applications. Extensive sales support. Coordination of logistics, inventory management and P/M technology training.

Process and products innovation. Global engineering and manufacturing expertise. Commitment to customer service. This is GKN Sinter Metals driving a better way.



Wai Han Lee of GKN presents you the key points:

- Environmental friendly technology, energy savings due to reduced machining and scrap minimization technology
- Unparalleled process technologies maximize results
- Certified quality management



About GKN Sinter Metals

GKN Sinter Metals – a wholly owned subsidiary of U.K.-based GKN plc, a global industrial company – is the world's largest producer of precision powder metal products. With a focus on superior delivery, quality and total solutions, the company offers extensive technical expertise in design, testing and various process technologies. GKN Sinter Metals offers a full range of more than 10,000 complex shape, high strength products for the automotive, commercial vehicle, home appliance, lawn and garden, office equipment, power tool, recreational vehicle and process industry markets. The company's global footprint spans more than 13 countries across five continents. GKN Sinter Metals is in close proximity to its customers with more than 30 global locations and a workforce of approximately 5,500 employees.

For more information about GKN's world of solutions visit www.gknsintermetals.com

Production Plants

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