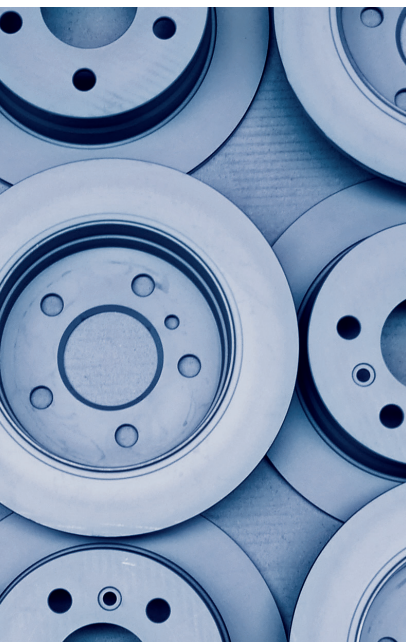
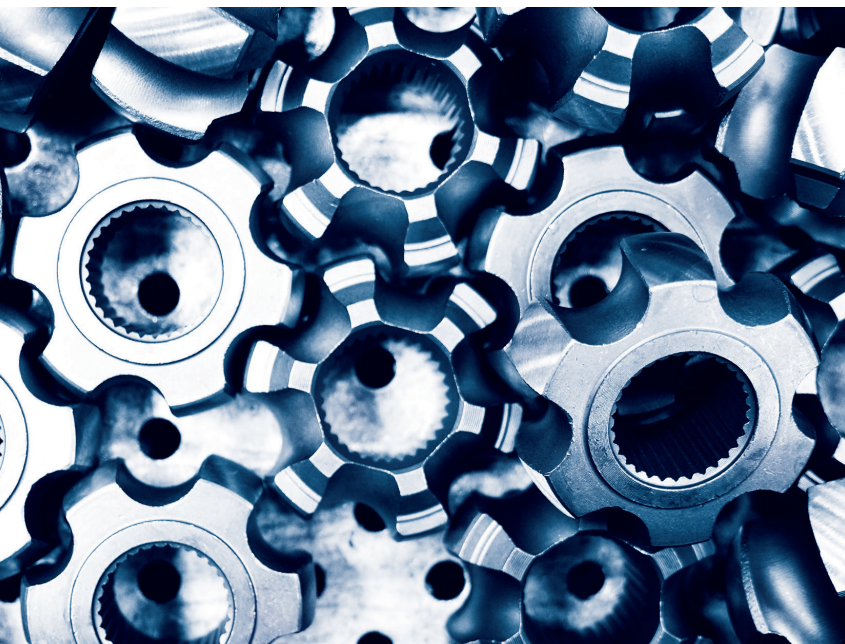
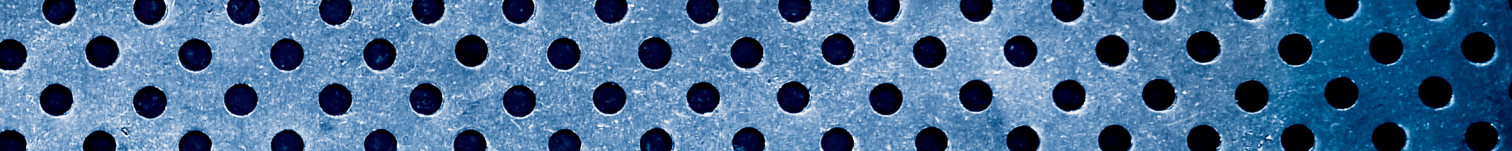




PRODUCT OVERVIEW



metelligroup
AUTOMOTIVE PASSION



REAL PARTS FROM A REAL MANUFACTURER

You might not know it, but there is one thing that sets our product apart from all the others. Every single part manufactured by the Metelli Group was conceived with one and the same objective – to match or improve on the OEM part it was designed to replace. And how do we go about that?

We begin by analysing each OEM part. While reverse engineering the part, we carry out our own metallurgic analysis – often enabling us to offer a better material or compound. Once we have recreated the design with 3D CAD systems, our R&D team are able to suggest further improvements. Like our quality standards, you'll find we use the same software, machine tools and robotic assembly lines as the major automakers.

Of course, our parts comply with the same quality and safety standards as the originals. And like OEM parts, once ours have been tested in computer simulation, we test them in real life (in the plant and on the road). Then we prepare and pack them to meet your specific demands – in our purpose-designed packaging.

This is how we match or improve on every automotive part we set out to replace. You might even say this is what makes our parts more real than their predecessors.

Welcome to the real automotive parts of the Metelli Group.

ENGINE PARTS



VALVE GUIDES

We make intake and exhaust valve guides using ferrous or non ferrous metals. The **cast iron** (ferrous) is more resistant to wear, while copper based alloys (non ferrous) provide optimal heat conductivity.

Then we make valve guides in **sintered steel**. With selflubricating properties and greater resistance to high temperatures, these are ideal for aspirated and turbocharged engines with very high performance.



VALVE SEATS

Our valve seats are made of high temperature **resistant chromium alloy steel** or **special cast iron**. Then, for greater heat conduction, we make **sintered** valve seats using metals and carbides with high mechanical and thermal properties.



VALVE SHIMS & ADJUSTING PADS

Made with **case-hardening steel**, the accuracy of our valve shims is measured in hundredths of a millimetre. This enables them to meet the small tolerances demanded. In fact, the increments of sizes are just five hundredths of a millimetre.

WATER PUMPS



WATER PUMPS



As European leaders for aftermarket and as **original equipment suppliers**, our water pumps are hard to beat. In fact, we often improve on the standards of other original products, and we have even developed our own patented products.

Today we cover the entire European, American and Asian car parc, with approximately 1.000 items. The casting of the water pump is carried out in-house by the **Metelli Group foundry**.

TRUCK WATER PUMPS



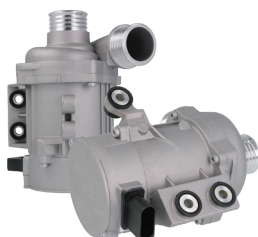
Our truck range covers from the most modern vehicles right back to models from the 1960s. From the most modern **"fail safe"** technology with electromagnetic pulley, up to the most standard and widespread solutions with more than 120 references which include about 250 different models.

SWITCHABLE WATER PUMPS

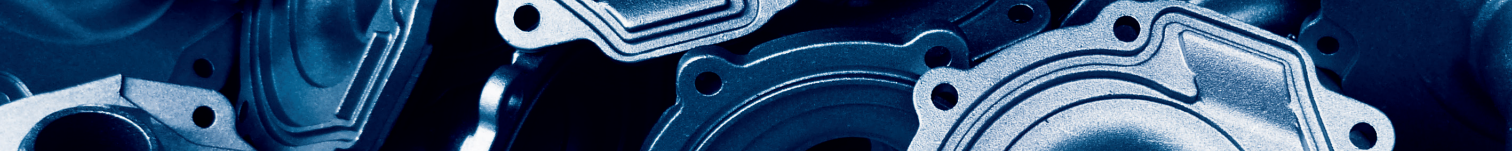


They regulate the flow of water through a gate operated either pneumatically or electronically. Compared to the lip seals, the membrane system presents the following advantages including no friction against the shaft, and thus less chances of wearing and less chances of damage caused by metal particles in the cooling circuit. Metelli has **patented** its constructive solution.

PRIMARY ELECTRIC WATER PUMPS



They operate by means of an impulse emitted by the control unit, activating an electric motor inside the pump and thereby allowing it to rotate. The water pump has been subjected to laboratory tests that guarantee the technical and qualitative performance with results equal to or greater than the OE. Metelli has developed a new solution of Electric water pump with **dry rotor**.



AUXILIARY ELECTRIC WATER PUMPS



With the constant technologies evolution, more and more cars are fitted with auxiliary water pumps used for various purposes: to support heating of the passenger compartment in vehicles fitted with a Start/Stop system, to cool the batteries in electric and hybrid vehicles, to cool the turbo charger and to cool the gear box. The technology of these pumps differs greatly from that of primary water pumps in terms of weight, size, material and regarding the electronic components they contain.

TIMING BELT KITS WITH AND WITHOUT WATER PUMP



A single kit that includes: water pump, tensioner, belt, idler pulleys and accessories that can be ordered with a single product code, minimizing identification errors. The water pumps, tensioners and idler pulleys are **produced by Metelli Group** and the belts are from premium suppliers. Our timing belt kit with water pumps are **guaranteed for 5 years**.

TIMING CHAIN KIT



The timing chain, performs the fundamental task of synchronising the motion between the camshaft and the crankshaft. This coordinated movement is fundamental to the four strokes that take place inside the engine: intake stroke, compression stroke, power stroke and exhaust stroke. The chain's life has been improved, through a **system of holes that increases its self-lubrication and reduces wear**.

There are 5 main components in a timing chain kit including: chain, guide, tensioner, crankshaft and camshaft sprockets and accessories.

TRANSMISSION PARTS



CONSTANT VELOCITY JOINTS

Our wheel-side and gear-side constant velocity joints come with the relevant boot, clamps, bolts, nuts, seeger, locking rings and grease. Our steel outer race, cage and inner race are manufactured and treated for maximum resistance to wear. Most articles have an ABS ring made in a sintered material or forged steel.



FRONT-COUPLING CONSTANT VELOCITY JOINTS

We have created a new type of CVJ with front coupling and 6 or 8 balls and we are one of the very few manufacturers who have produced this technology for the aftermarket. The tothing integrated in the outer race cup allows the grooved shaft to be completely eliminated, thus reducing weight as well as overall dimensions. For this type of constant velocity joints we have invested in the cold moulding process, thanks to which the tothing obtained guarantees optimum drive torque transmission resistance.



8-BALLS CONSTANT VELOCITY JOINTS

8-balls constant velocity joints allow a reduction in size with accompanying weight reduction. They have numerous advantages including greater efficiency in torque transmission from the differential to the wheel, lower operating temperature, reduced vibrations and reduction in CO² emissions.



BOOT KITS

The kit consists of boot, clamps, bolts, nuts, seeger, locking rings and grease. We use two different materials for the boots mostly **rubber** as it's easier to install and most reliable over time, but also **thermoplastic**, which is more resistant to wear and corrosion from aggressive agents.



DRIVESHAFTS

Our range of **ready-to-use** driveshafts covers the aftermarket demands of the entire European car parc (including those of our OE customers). The components, wheel side joint, gear side joint, shaft and seal systems are all already assembled. This means they're quick and easy to install.



WHEEL BEARING KITS

The wheel bearing is a very important safety element as it has to withstand considerable axial and radial stress due to bends, kerbs, acceleration, landslides, rough roads and the weight of the vehicle. The main function of the wheel bearing is to reduce the mechanical friction of the constant velocity joint that rotates inside the spindle, ensuring that the axle shafts transmit the rotational movement to the wheels correctly, even during steering.

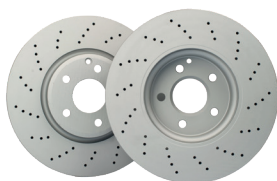
All the bearings are **protected and internally lubricated** with a specific high-performance grease.

Also available with toothed phonic wheels and ABS rings (Magnetic Encoder).

BRAKE PARTS: FRICTION



BRAKE DISCS



Our range covers the entire European, American and Asian car parc. Our **Metelli Cifam and Trusting** brand brake discs are made in cast iron with varying percentages of carbon according to the performance needed by the vehicle. We have solid discs and selfventilated discs, and a wide range of coated brake discs **DSP®** to keep them looking good. Furthermore, the DSP® paint makes the disc ready to use, so there's no need to degrease them before mounting. Every disc is **ECE R90** certified.

BRAKE PADS



Depending on the specifications, our brake pads are made with compounds of different composite materials. We launched our very own compound **Hybrix®** a patented technology which sets a new benchmark in the field. This has allowed us to obtain the highest level of the American **Better Brake Law** certification, identified by a logo with three black leaves  guaranteeing a copper content of no more than 0,5%. We also have developed a new compound for electric and hybrid applications called **Hybrix®-Repower**. Brake pads made with the Hybrix®-Repower compound have an unmatched combination of performance and comfort. Of course, they're certified according to **ECE R90**, and as an added bonus they're copper-free. The experience over many years has allowed us to create a wide range of highly performing brake pads, called **Fri.Tech. Competition**, for those who want to be present in the world of racing as a protagonist with **R60 and R80** certificates.



WEAR SENSOR INDICATORS



Some pads have wear indicators that let the driver know when the time has come to change them. Wear indicators are cables inserted in the friction material or located close to it, in some cases with a probe covered with an insulating material which gradually wears away due to the friction with the disc and eventually leaves the cable exposed, creating an electric contact that triggers an indicator light on the dashboard.

Metelli offers a wide range of wear indicators for passenger cars, LCV and trucks.

BRAKE SHOES



The range of brake shoes is **ECE R90** certified and is made with meticulous attention to detail using high quality raw materials. It must guarantee perfect adherence to the drum from the first installation, in order to effectively perform the auxiliary handbrake function. All the brake shoes are constantly checked and subjected to material checks. The metallic support has to undergo accurate machining and strict controls in order to guarantee a perfect curve and the right orthogonality.



PRE-MOUNTED BRAKE KITS

We have the most extensive range on the market. With all the components pre-mounted, our brake kit allows you to replace every worn component making assembly **easier, faster and safer**. Also, to make life quicker and easier when ordering, we have pre-mounted brake shoes kits (self adjusting with wheel cylinders) and reduced fast kits (without wheel cylinders).

BRAKE PARTS: HYDRAULIC



WHEEL AND BRAKE MASTER CYLINDERS



Wheel and brake master cylinders are produced with the same original equipment technologies. We are suppliers to the main manufacturers of braking systems. All wheel brake cylinders components undergo checks during the production phase to ensure the compliance with the strictest standards. Low pressure pneumatic tightness tests are carried out on 100% of assembled products by using high-precision certified instruments, which ensure the product reliability.



We have wheel cylinders available for french vehicles with pressure relief valve (CRCI). In case of failure of this valve braking on the rear axle becomes unstable. To prevent this, Metelli tests 100% of the valves with low and high pressure pneumatic tightness tests carried out on automated assembly machines.

We have introduced a new type of compact brake master cylinders called helical. Where required in the car, our brake master cylinders meet the functional requirements for braking systems equipped with ABS, ESP and ASR. The performance has been approved on a new test bench which enables the simulation of the brake master cylinder activation in ABS and ESP mode, as well as allowing specific tests to be performed on the internal valves.

PRESSURE REGULATING VALVES



The pressure regulating valve works for adjusting the hydraulic pressure delivered to the brake wheel cylinders or brake calipers in keeping with the pressure exerted on the brake pedal and the vehicle load.

The range of pressure regulating valve covers almost all the vehicles that require this component. The high production technology and the mounting of its components ensures the high quality of our product, complying with all the OE specifications.



SLAVE AND CLUTCH MASTER CYLINDERS

The clutch master cylinder transforms the pressure exerted on the pedal into hydraulic pressure, transferring it to the slave cylinder that activates the clutch disc via the clutch thrust bearing. Our range of clutches is growing continuously, divided into clutch master cylinders and slave cylinders. All our references are scrupulously tested following the OE specification.



CONCENTRIC SLAVE CYLINDERS

Our **Metelli and Cifam** brand concentric slave cylinders combine the thrust bearing and the clutch slave cylinder in one element.

The clutch is then operated directly by the concentric actuator. The concentric slave cylinder must be changed each time the clutch plate is replaced. Its structure offers numerous advantages including: compact design, long life, less weight, less force to be applied on the clutch pedal, self-adjusting and greater heat resistance.



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