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Robert Bosch GmbH
Postfach 10 60 50
70049 Stuttgart

Media und Public Relations
Leitung: René Ziegler
Presse-Forum:
www.bosch-presse.de

Press release

Bosch's iDisc helps alleviate particulate-emission problem in cities

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New brake disc generates up to 90 percent less brake dust

- Bosch board of management member Hoheisel: "iDisc is the brake disc 2.0. Its market potential is tremendous."
- Brakes and tires responsible for 32 percent of driving-related particulate emissions.
- iDisc's carbide coating reduces brake wear and tear while enhancing operating safety.
- iDisc is scheduled to go into production for a European manufacturer in November 2017.
- Demand for car brake discs stood at more than 330 million units in 2016.

Stuttgart, Germany – Guardian angels have many faces. Perfectly round, the size of a plate, and thick as a thumb, the brake disc is one of them. Long before ABS, ESP, airbags, and other features, they were making driving safer and significantly shortening stopping distances, thereby helping prevent many traffic accidents. Today, however, there is another reason why brake discs are at the center of public attention: brake dust. Most particulate pollution from road traffic is caused by road, tire, and brake wear rather than fuel combustion. According to the Baden-Württemberg state environmental agency, brakes and tires are responsible for 32 percent of driving-related particulate emissions, roughly half of which is brake dust. Significantly reducing brake dust is therefore essential to improving the air, especially in cities. That is precisely why Bosch has developed the iDisc. Compared to a conventional brake disc, it generates up to 90 percent less brake dust. "It's not just under the hood that Bosch is working to keep the air clean," says Dr. Dirk Hoheisel, member of th6e Bosch board of management. "The iDisc is the brake disc 2.0. Its market potential is tremendous." The iDisc is scheduled to go into production for a European manufacturer in November 2017.

Robert Bosch GmbH
Postfach 10 60 50
70049 Stuttgart, Germany

E-mail Joern.Ebberg@de.bosch.com
Phone +49 711 811-26223
Fax +49 711 811-5187718

Corporate Communications
and Brand Management
Senior Vice President: Dr. Christoph Zemelka
www.bosch-press.com

iDisc is turning the brake disc market upside down

The unique selling point of the iDisc (the “i” stands for innovation) is a tungsten-carbide coating that is currently only available from Bosch. The technology is based on a conventional cast iron brake disc. To transform a conventional disc into an iDisc, the friction rings are mechanically, thermally, and galvanically treated before being coated. All this is part of a process developed by Bosch researchers over a period of many years. In terms of price, the iDisc is roughly three times more expensive than a normal cast iron brake disc, and three times less expensive than a ceramic brake disc. The price is likely to continue falling as production volume increases. “The iDisc has everything it takes to replace the conventional cast iron brake disc and become the new standard in the brake disc market,” says Hoheisel. “Given the continued particulate pollution debate in many countries and large cities around the world, there is nothing standing in the way of its breakthrough” – especially since brake discs will be needed in cars for decades to come, and production volumes are continuing to rise. For cars alone, demand for brake discs stood at more than 330 million units worldwide in 2016.

No gouging marks, no rust

Another argument in favor of the iDisc is its many positive qualities. In addition to a dramatic reduction in brake dust, the carbide coating also ensures greater operating safety. The braking performance is similar to that of a ceramic brake, especially when it comes to fading, as the reduction in stopping power following repeated braking maneuvers is known. Like a ceramic brake disc, the iDisc is highly stable in this respect and loses little deceleration performance. Wear is also significantly reduced. Depending on the strength of the carbide coating, the iDisc’s service life is twice that of a normal brake disc. Gouging marks on the friction ring? Not a chance. Corrosion is also not an issue – a major advantage, especially in electric cars. Because they recover braking energy in a process known as recuperation, electric cars put less strain on the brakes and often have to contend with rust formation on friction rings. The temporary slight decline in responsiveness during braking associated with this does not occur with the iDisc.

Dirty rims are a thing of the past

Fans of rims will also love the iDisc. The brake disc’s shiny carbide coating makes it a treat for the eyes. Wear-resistant and corrosion-free, it remains beautiful even after years of use, making it a perfect match for the trend toward open rims. Best of all, the 90 percent reduction in brake dust with the iDisc eliminates the need to regularly clean rims with aggressive cleaning products. Protecting the environment can also have practical benefits.

Press photos: #1283194 #1283418 #1283419

Related link: www.bosch-mobility-solutions.com

Contact person for press inquiries:

Jörn Ebberg,

phone: +49 711 811-26223

Mobility Solutions is the largest Bosch Group business sector. In 2016, its sales came to 43.9 billion euros, or 60 percent of total group sales. This makes the Bosch Group one of the leading automotive suppliers. The Mobility Solutions business sector combines the group's expertise in three mobility domains – automation, electrification, and connectivity – and offers its customers integrated mobility solutions. Its main areas of activity are injection technology and powertrain peripherals for internal-combustion engines, diverse solutions for powertrain electrification, vehicle safety systems, driver-assistance and automated functions, technology for user-friendly infotainment as well as vehicle-to-vehicle and vehicle-to-infrastructure communication, repair-shop concepts, and technology and services for the automotive aftermarket. Bosch is synonymous with important automotive innovations, such as electronic engine management, the ESP anti-skid system, and common-rail diesel technology.

The Bosch Group is a leading global supplier of technology and services. It employs roughly 390,000 associates worldwide (as of December 31, 2016). The company generated sales of 73.1 billion euros in 2016. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT company, Bosch offers innovative solutions for smart homes, smart cities, connected mobility, and connected manufacturing. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to deliver innovations for a connected life. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life." The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiaries and regional companies in some 60 countries. Including sales and service partners, Bosch's global manufacturing and sales network covers nearly every country in the world. The basis for the company's future growth is its innovative strength. At 120 locations across the globe, Bosch employs some 59,000 associates in research and development.

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Press release
Bosch compact

Bosch solutions for urban mobility

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- Connected parking saves fuel and time – and reduces stress
- 48-volt drive systems make electric scooters an urban reality
- 300 projects for tomorrow's diesel engines

Coup: Bosch already offers mobility services for large cities. The Coup e-scooter sharing service is one example. After debuting in Berlin, it has now been launched in Paris. Bosch has put 1,600 e-scooters on the road – and more are on the way. Anyone 21 years of age or older with an international or EU category B driver's license can use this service. The Coup app enables users to find, reserve, and pay for the nearest e-scooter and then simply ride away on it – all without a key. A helmet and two charged batteries are stored under the seat. Coup makes sure the batteries are always charged so that customers do not have to worry about anything. Powered by electricity from renewable sources, the e-scooters can travel as fast as 45 kph. Users can park them in specially designated zones within Coup's area of operations.

Multimodal: In July 2017, Bosch launched the test phase for a mobility assistant that analyzes real-time data to find the quickest route through a city. This app guides commuters to their destinations efficiently, allows cities to regulate traffic volumes, and enables mobility providers to enhance utilization of their various means of transport.

Connected parking: Step by step, Bosch projects are helping take the stress out of the search for parking. At present, this search accounts for one-third of urban traffic. Whether community-based parking, active parking lot management, or automated valet parking – Bosch solutions for connected and automated parking save time and fuel, and spare people's nerves.

Finding a parking space: Bosch community-based parking simplifies the search for a suitable space. Using the ultrasonic sensors of their parking assist system, cars identify and measure the gaps between parked cars as they drive past them. The data gathered is transferred in real time to a digital parking-space map

Robert Bosch GmbH
Postfach 10 60 50
D-70049 Stuttgart,
Germany

Email Florian.Flaig@de.bosch.com
Phone +49 711 811-6282
Fax +49 711 811-5180386

Corporate Communications
and Brand Management
Senior Vice President: Dr. Christoph Zemelka
www.bosch-press.com

that can help guide drivers to available spaces. Together with Mercedes-Benz and other manufacturers, Bosch is testing this service in cities across Germany and elsewhere in Europe. This system is to be expanded so that drivers can pay parking fees digitally.

Connected cars: By 2025, connectivity will have clearly changed driving for everybody. Connected functions will save almost 400,000 metric tons of CO_2 – as much as one major German national park can capture and store in three years. Strategies such as community-based parking and active parking-space management can reduce the number of kilometers driven in search of parking spaces by 480 million, while highly automated driving can also save fuel.

RDE: This year will see the first-time certification of diesel models that comply with the Euro 6 standards for real driving emissions, or RDE. Bosch is currently pursuing some 300 RDE projects with its customers. The company wants to support automakers in their efforts to make nitrogen-oxide driving emissions from diesel vehicles even lower. In urban test drives, Bosch has already shown this is possible.

Particulate filters: In Europe, Bosch will no longer be carrying out engineering work for spark-ignition engines that are not fitted with a particulate filter. Such filters have helped significantly reduce the particulate emissions of diesel engines, and this is now a goal for gasoline engines as well.

48-volt drive system for light electric vehicles: Bosch has developed a finely tuned 48-volt drive system – comprising a motor, control unit, battery, charger, display, and app – that is ideal for urban mobility. This drive system makes for efficient urban mobility and, thanks to its rapid acceleration from a standstill, for greater driving enjoyment. Whether two, three, or four wheels, this system is available for all classes of light electric vehicles. As it is made up of off-the-shelf automotive components, manufacturers will have the benefit of production-tested parts and minimal development expense. This gives both established OEMs and new players in the market the opportunity to launch vehicles within 12 to 18 months.

Final mile: Bosch electromobility is already in evidence in German urban delivery traffic. Bosch supplies the powertrain system for the German Post Office's Streetscooters. This is Europe's largest electric-vehicle fleet.

Keeping Bosch associates mobile no matter what: All Bosch locations in the Stuttgart metropolitan area rely on public transportation on days when particulate-pollution warnings are issued. In such cases, Bosch associates who work in Stuttgart can use their company ID as a ticket for work-related trips by public transportation. This special arrangement between the transportation authorities in Stuttgart and Bosch is yet another mobility solution the supplier of technology and services offers its workforce. It also allows Bosch to support the city's efforts to combat particulate pollution.

Contact person for press inquiries
Florian Flaig,
Phone: +49 711 811-6282

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