

Continental Drives Basic Research on Tire and Road Wear Particles with the Help of a Supercomputer

- **Joint research project receives 43 million core hours of supercomputer time to further research decomposition of rubber polymers**
- **Project helps advance fundamental research for tire and road wear particles**
- **"The results of this basic research will help us to make the materials we use for the production of tires even more sustainable in the future," says Dr. Andreas Topp, Head of Materials, Process Development and Industrialization of the Tires business area at Continental**

Hanover, Germany, June 28, 2021. Continental, the University of Southern Denmark (SDU) and the École Normale Supérieure de Lyon in France have received a grant worth 43 million core hours of supercomputer time for their joint basic research project. The project, which aims to drive fundamental understanding of tire and road wear particles, has been in existence since 2014. Its goal is to learn more about the decomposition of rubber polymers to better understand the wear behavior of tires. The associated simulations of the behavior of complex polymer structures are very time-consuming. For this reason, the project partners applied for the Partnership for Advanced Computing in Europe (PRACE) initiative. With the digital computing power granted, they now have the opportunity to perform polymer simulations in greater depth and on a broader scale.

"With the help of the supercomputer, we can for the first time perform comprehensive simulations on molecular level. The results of this basic research will contribute to a more complete understanding of the formation of tire and road wear particles, and enable us to design the materials we use for tire construction even more sustainably in the future," says Dr. Andreas Topp, Head of Materials, Process Development and Industrialization of the Tires business area at Continental.

The support granted comes in the form of access to the 9.4 petaflops Joliot-Curie supercomputer at the CEA's Very Large Computing Center (TGCC) in Bruyères-le-Châtel, France. With its performance of 1,000 trillion calculations per second, it is one of the fastest supercomputers in the European Union. Supercomputers are used in science today, in addition to theory and experiment, to simulate particularly large and complex data sets so that they can be evaluated efficiently afterwards. Continental also uses supercomputers, for example, to develop future technologies in assisted, automated and autonomous driving.

Many issues about tire and road wear particles are still unresolved. "In recent years, we have systematically invested in the research and development of new, sustainable production processes as well as materials to make future tires even more energy-efficient and sustainable. Such processes are technologically very demanding and require a fundamental understanding of the tire material at various levels," says Dr. Peter Zmolek, Head of Materials Technology Research and Development of the Tires business area at Continental. He adds, "Our joint research project combines state-of-the-art calculation methods and innovative experimental approaches that give us a comprehensive understanding of the behavior of currently used materials. This technical knowledge is an important reference point, especially when evaluating new materials in terms of their ability to further reduce rolling resistance and tire wear, as well as providing a fundamental understanding of how to recycle polymer chains from end-of-life tires."

Optimum grip in any traffic situation is a key function of tires. Grip enables safety, for example when accelerating and braking. The transmission of power during this process results in combined wear particles from the material of the tire tread and the road surface. Continental's aim is to minimize the effect of tire and road wear particles on the environment by improved tire design. Continuous improvement of mileage and wear rate without compromising safety is therefore an important criterion in Continental's tire development.

Continental systematically invests in research and development in the fields of new technologies, alternative materials and environmentally compatible production processes. Through these efforts, by 2050 at the latest the premium tire manufacturer is aiming to gradually transition to 100 percent sustainably produced materials in its tire products. Continental is a member of various organizations, projects and initiatives that are researching the topic of tire and road wear, as well as being in continuous dialog with international institutions, national agencies and other industry sectors. For example, the tire manufacturer is a founding member of the Tire Industry Project (TIP), which drives research into the potential impacts of tires on the environment throughout their life cycle.

Continental develops pioneering technologies and services for sustainable and connected mobility of people and their goods. Founded in 1871, the technology company offers safe, efficient, intelligent and affordable solutions for vehicles, machines, traffic and transportation. In 2020, Continental generated sales of €37.7 billion and currently employs around 235,000 people in 58 countries and markets. In 2021, the company celebrates its 150th anniversary.

The **Tires business area** has 24 production and development locations worldwide. Continental is one of the leading tire manufacturers with more than 56,000 employees and posted sales of €11.7 billion in 2019 in this business area. Continental ranks among the technology leaders in tire production and offers a broad product range for passenger cars, commercial and special-purpose vehicles as well as two-wheelers. Through continuous investment in research and development, Continental makes a major contribution to safe, cost-effective and ecologically efficient mobility. The portfolio of the Tires business area includes services for the tire trade and fleet applications, as well as digital management systems for tires.

Press contact

Henry Schniewind
Head of External Communications
Continental Tires business area
Phone: +49 511 938-21810
Email: henry.schniewind@conti.de

Press portal
Media center

www.continental-press.com
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