

Driving hard on the race track: wear-resistant iglidur gears in the gearbox

The iglidur I6 gears from the 3D printer for car racing of the "Youth Discovers Technology" (Jugend entdeckt Technik - JET) challenge

Electromobility is a crucial topic of the future. For Germany to be in the pole position, it is important to inspire young minds to take up scientific and engineering professions. Towards this purpose, the annual JET Challenge takes place at the IdeenExpo in Hanover. Students are given the task of building a fast, tough and energy-efficient racing car from a standard, remote-controlled car with a limited budget. Wear-resistant 3D-printed gears from igus made from the high-performance plastic iglidur I6 helped in this endeavour.

Build a fast, energy-saving racing car from an ordinary, remote-controlled car and overtake all other teams in a race – that's the goal of the "Youth Discovers Technology" (Jugend entdeckt Technik - JET) Challenge, organised by the Society of German Engineers (Verein Deutscher Ingenieure - VDI) and the University of Hanover (Hochschule Hannover - HSH). As with the renowned models, the key factor is not speed alone, but also energy efficiency. In June 2019, visitors to the IdeenExpo can see the JET Challenge in action at the HSH trade fair stand. 25 teams compete for victory with their racing cars on a 1:10 scale on a 20-metre race track. The rules are strict. Available to each team is a budget of just 50 euros. Apart from battery, motor and speed controller, all components must be purchased, developed or built by yourself.

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The teams are currently preparing for the next IdeenExpo. Students of the Eugen Reintjes vocational school are relying on a wear-resistant and tough gear transmission to enhance the performance of their race car. The biggest difficulty with this gearbox was the gear procurement. Due to the small budget, the students couldn't afford big innovations. Finally, they found what they were looking for at the motion plastics specialist igus in Cologne: cost-effective, low-wear gears from the SLS printer. After a simple online configuration, the gears were printed and provided, made from the high-performance plastic iglidur I6.

High performance plastic makes race cars tough

Laboratory tests prove that the material I6 is significantly tougher than other plastics. In an experiment at our in-house test laboratory, the engineers tested gears made of polyoxymethylene (POM) and iglidur I6 at 12 revolutions per minute and loaded with 5Nm. A machined gear made of POM failed after 621,000 revolutions, while iglidur I6 was still in very good condition after one million revolutions. Thus, the team does not have to worry about potential failures. The gears in the racing car have already successfully completed an initial test run. The car is energy efficient and still reaches the top speed of 60km/h.

The young engineers support from igus promotes innovative projects

Innovative projects such as the race car gears for the JET Challenge are supported by igus as part of the young engineers support. The initiative supports young pupils, students and inventors in the development and execution of their technical projects. Further information on yes can be found at www.igus.eu/yes.

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ABOUT IGUS:

igus GmbH is a globally leading manufacturer of energy chain systems and polymer plain bearings. The Cologne-based family business has offices in 35 countries and employs 3.800 people around the world. In 2017, igus generated a turnover of 690 million euros with motion plastics, plastic components for moving applications. igus operates the largest test laboratories and factories in its sector to offer customers quick turnaround times on innovative products and solutions tailored to their needs.

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Caption:



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Wear-resistant 3D-printed gears made from the high-performance plastic iglidur I6 ensure a robust gearbox in racing cars. (Source: igus GmbH)