

A NEW GENERATION OF HYBRID POWERTRAIN

Punch Powertrain

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ONLINE READER ENQUIRY CARD NO. 523

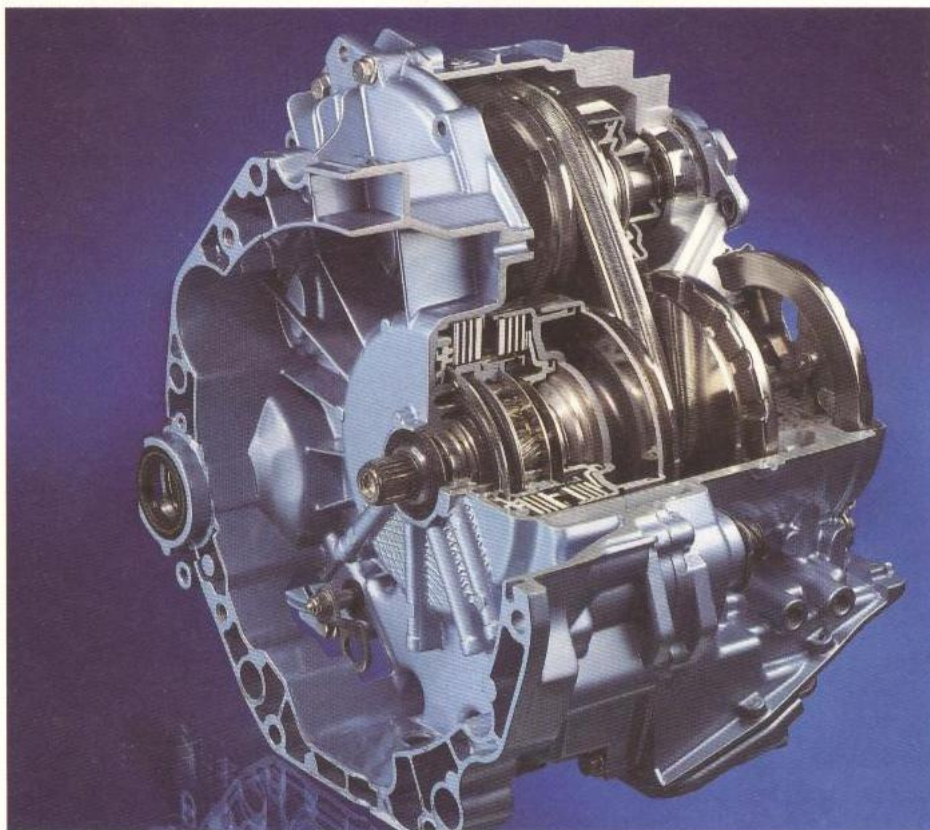
For more than 20 years, Punch Powertrain, which is based in Belgium and China, has been pioneering state-of-the-art powertrain technology and processes. Today, it manufactures and markets the cutting-edge VT2 CVT transmission, which has already proven its effectiveness in the hybrid powertrains for the Hyundai Accent/Kia Rio and the Lotus/Proton EVE demonstrator.

Punch Powertrain is currently developing a new generation hybrid powertrain. Since the introduction of mass-produced hybrid vehicles in the 1990s, progress has been made in the fields of electric motors, batteries and brake systems. The new generation hybrid powertrain is an intelligent combination of these latest technological advancements and Punch Powertrain's leading transmission technology, resulting in a compact, efficient and safe package, fully exploits the potential of its CVT.

The new hybrid powertrain is ideally suited for small and medium passenger cars or vans with similar powertrains, and would require only minor modifications to a conventional vehicle's design with few, if any, compromises in terms of storage capacity or towing capability.

The continuous nature of the CVT transmission offers maximum flexibility to optimize powertrain performance and driveability, resulting in a 25% reduction in fuel consumption for petrol-driven cars and substantially lower emission levels. Further more, this new generation of hybrid powertrain will have an electric range in city traffic of no less than 10km.

To provide this optimum performance at an affordable unit cost, every single component and system is being redesigned to reduce costs without compromising on functionality or quality.



Punch Powertrain is working on a new hybrid powertrain that fully exploits the potential of the company's CVT

TURBOCHARGER MATERIALS

Sandvik Hard Materials

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During the last decade, the turbochargers market has been growing at a rapid rate, therefore supporting the increasing simultaneous demands for more engine output and higher comfort levels when driving.

While facing ever more stringent emissions regulations and focusing on fuel-efficient vehicles, turbocharger operating conditions (which include such aspects as high temperature, vibration and erosion conditions with chemical attack by species in the oil and fuel) have dramatically increased material mechanical stress levels.

Therefore, automotive engineers are looking for innovative ways to increase dependability of automotive components. By their specific properties, Sandvik cemented carbide and cermet materials can provide solutions to many of the challenges caused by the latest developments and breakthroughs made in turbocharger applications.

Sandvik grade H10F is offering 1600 HV30 (92.0 HRA) hardness, a TRS at 3700 N/mm² and a young modulus of 580kN/mm². This combination of properties allows the material to sustain a wide range of erosion, compressive and cycling stresses solicitations even at temperatures of up to 450°C, where the hardness remains 75% of that at room temperature. For automotive engineers, this makes H10F grade an interesting and versatile material in this range of temperature levels.

MATERIAL TECHNOLOGY

Saint-Gobain

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Saint-Gobain Performance Plastics offers an alternative to high-performance plastics with the company's Meldin® product line.

The Meldin 7000 is a material family based on polyimide developed to go head-to-head with DuPont's Vespel® SP product line. These materials exhibit extremely high geometric stability at elevated temperatures and can be formed into complex parts using a direct forming (DF) process. Meldin 7000 comes in five different grades, depending on the application requirements, and is available both in basic shapes for prototyping purposes as well as DF parts. The DF process allows for very cost-efficient manufacturing of parts. This means Meldin 7000 can be used in automotive applications, where it replaces expensive coatings in order to be able to use cast-iron parts instead.

Meldin Engineered Thermoplastics offer the market a line of injection moldable high temperature polymers with low wear and high strength not present in other supplier's product ranges. The Meldin 3100 materials have been tailored to offer superior wear and friction performance compared to any known competing material available on the market. Four different grades are available and each grade is designed for one or two very specific applications, such as piston rings, thrust washers and structural wear parts. Meldin 3100 materials are able to improve the customers overall product life-cycle costs, hence reducing the overall cost structure.

With over 40 years experience in materials technology, Saint-Gobain has been recognized as a leader in the high performance polymer components business in the automotive industry. Examples of the company's brands include Norglide, Rulon and Meldin. Saint-Gobain is now introducing two new material families in the latter product line: Meldin 3100 and Meldin 7000.