



Duratec uses CATIA PLM Express to manufacture custom-made bicycles for professionals and cycling aficionados. In addition to creating marketing documentation, employees on the shop floor use assembly drawings created with 3DVIA Composer using the original CATIA geometry, improving clarity and precision.

By Dora Lainé

Duratec makes bicycles as unique as their owners

From 1987 when 17 year old Milan Duchek, future founder of Duratec, tried to improve his bicycle with self-made components made in his cellar to Paralympian cyclist Jiri Ježek's multiple medals at the recent Beijing Paralympic Games, Duratec bicycles have continuously improved in quality and technology by steering away from mainstream bicycle production, giving cyclists an entirely different perception of riding.

Innovation is the key to achieving original and characteristic designs. "Our philosophy is to create a bike with perfect driving properties," said Milan Duchek, Chief Executive Officer, Duratec. "Customers can start with one of our aluminium alloy and carbon frames and choose from standard components and assemblies or provide us with specifications so that we can build the bike of their dreams, perfectly tailored to their needs."

BICYCLES TAILORED TO THE RIDER

In addition to a bicycle's technical requirements such as number of gears, weight and frame size, Duratec also designs its bikes so that they respond to each rider's specific characteristics such as seating geometry, distance to reach the handle bars, saddle inclination and size and so on. Duratec optimizes the design of its bike frames and seating geometry (to calculate the right position on the bike) using measuring instruments and software developed by bikefitting.com, a Dutch company whose products determine

optimum bicycle positioning and frame geometry. "Based on the results obtained with this measuring equipment we can tailor the geometry of our frames and seats (optimized position) for each individual," said Milan Duchek.

Once Duratec designs and produces the ideal tailor-made frame, the latter serves as the basis for the manufacturing stage where technicians prepare the various parts of the frame sometimes in cooperation with the customer. "Customers can choose a variety of characteristics such as frame color, handwritten signature, nicknames, or even blood type and have them inscribed directly on the frame. Once the frame meets the customer's final approval, we start to assemble the entire bicycle." The complete process, from order placement to bicycle delivery takes three-four weeks.

COMPLEX SURFACING AND KNOW-HOW MANAGEMENT

Duratec adopted CATIA PLM Express for its sophisticated surfacing capabilities and its design-to-NC associativity. Designers use CATIA's feature based design for its components and milled or molded parts as well as for associated tooling. Generative shape capabilities along with CATIA's feature-based approach help create and modify the surfaces of a frame's complex shape while its knowledge ware capabilities are used to embed knowledge in its designs and leverage this knowledge to reduce downstream errors that can hinder production. "CATIA is not only used to design individual components, we also use it to support our production process



Paralympic World Champion

Jiri Ježek is the winner and world champion in individual time trial race (Paralympic world championships in road cycling in Baie-Comeau, Canada). Congratulation!

SUCCESS STORY



with specific company-based procedures, based on our know-how, for manufacturing composite parts," said Milan Duchek.

3DVIA Player and Composer are the cornerstone of Duratec's customer manuals, marketing materials and manufacturing and assembly procedures. "Since a composite frame consists of several hundred sections that need to be assembled, it would be difficult, if we did not have 3DVIA Composer, to show our technicians with clear and visual instructions, how to assemble these sections," explained Milan Duchek.

Duratec uses the CAA V5 product Type 3 for parametric text creation and raster image conversion into 2D curves in two areas. One is for transferring raster logos on the frame surface. "The great thing about Type 3 is its ability to automatically re-calculate 3D logos and texts that are on the frame when we change the frame surface. This helps us control their location every time the frame size changes," said Milan Duchek.

"The second area is for mold production where numbers that specify the mold that is associated to each frame model and size are automatically generated."

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Milan Duchek, Chief Executive Officer, Duratec

The DS solutions have helped Duratec shorten its product development cycle by 30% and reduce the number of physical prototypes required for verification before going to production. "We consider the DS portfolio as the most complete in terms of design, manufacturing and documentation. We are breaking ground with CATIA and 3DVIA Composer and hope to grow our installation in the near future so that more of our designers can benefit from these solutions."

For more information: www.duratec.eu/en

Duratec in brief

Duratec designs and manufactures bicycles for enthusiasts and professional cyclists in its premises in Město Touškov, Czech Republic. It collaborates on many occasions with its users to design bicycles that are not only enjoyable to ride but that will win races too. Its latest product line combines innovation and technology thanks to the AFCF method (accurately fitted continuous fiber) entirely developed by Duratec and built into models such as its Cult CR3 series.

