

Perfect cutting technology for the perfect sports car

The Italian automaker Pagani makes some of the world's most exclusive supercars. The chassis consists entirely of carbon-fiber parts. For cutting, Pagani has been relying on equipment from Swiss cutting-system manufacturer Zünd for more than 15 years. A few months back, the company installed a new Zünd G3 L-2500.

They represent the pinnacle of perfection and are named after the Inca wind god Huayra, and Zonda, a chinook wind in Argentina. We are talking about the exclusive supercars made by Italian limited-edition automobile manufacturer Pagani. That their names reference winds is no coincidence since the designs of these boutique sports cars are pushing the envelope of aerodynamics. With a chassis made entirely of carbon-based composites, the Pagani Huayra BC weighs in at a scant 1,200 kg or barely more than 2,600 lbs. This translates into a competition-pulverizing power-to-weight ratio of 1.9 kg per hp. Modified 12-cylinder AMG engines supply the necessary power and at 750 hp leave hurricane-force winds in their wake on the race track.

ON THE CUTTING EDGE BETWEEN ARTISANAL AND INDUSTRIAL

In San Cesario sul Panaro near Modena, Italy's automotive nerve center and home of Ferrari, Lamborghini and Maserati, Horacio Pagani and his team have spent the past 25 years perfecting their designs. Having worked for Lamborghini, the visionary young engineer quickly became an expert in the making of carbon fiber parts for Ferrari and various Formula 1 teams. In 1992 he established his own manufacturing firm.

For cutting carbon fiber parts, Pagani has for many years relied on innovative Swiss



cutting technology from Zünd. A few months ago, the company installed a new Zünd G3 L-2500 cutting system, replacing their older Zünd PN L-2500. The PN machine had been serving the company well for the past 16 years. At the end of 2015, Pagani moved into an ultra-modern manufacturing facility, a stone's throw away from their previous location. The primary goal was to gain more space and optimize individual production steps, explains PR Manager Luca Venturi. "Our production volume will remain at fewer than 50 cars per year since for us, maintaining exclusivity is far more important than increasing sales". Nevertheless, efficiency, cost savings, and sound invest-

ment are considerations that are palpable throughout the company. While the majority of parts that go into a Pagani are painstakingly crafted by hand, cutting with the new Zünd G3 cutter is one of the few phases of production that have undergone complete automation.

RELIABLE TOOLS FOR CHALLENGING MATERIALS

Each Pagani chassis is constructed from precisely 240 carbon-based composite components. The exact combination of carbon fiber that goes into each part is a closely guarded company secret. Depending on the required stiffness and strength, close to 10 different compos-



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ites are used. One of these combines titanium and carbon fiber in a composite called Carbotanium, developed and patented by Pagani. It is roughly six times lighter than steel and provides the best strength-to-weight ratio in the automotive industry. Cutting titanium-reinforced carbon fiber is extremely challenging. For Roberto Malmusi, Composite Department Manager at Pagani, the Zünd Electric Oscillating Tool – EOT is the perfect tool for this application: “The EOT is extremely versatile, and we actually use it for cutting all types of carbon fiber materials quickly and efficiently”. Pagani also has a need for processing honeycomb materials. These are cut on the same Zünd G3 machine using the Pneumatic Oscillating Tool – POT, an air-driven tool with extended, 8 mm stroke that provides the force needed to reliably and productively process this type of material.

MATERIAL SAVINGS OF MORE THAN 20%

Pagani carbon fiber components are strictly made to order. The state-of-the-art Zünd nesting function ensures that all parts are optimally laid out on the material. The software automatically calculates the best placement of even the most complex cut contours and nests them together as tightly as possible. This automated process significantly reduces the time required for job preparation and setup, and maximizes material yield while minimizing cut waste. “Besides the tremendous labor savings, the automated nesting function has also helped us achieve an impressive 20% or more in material savings”, explains Malmusi. “The fact that we were already familiar with the Zünd PN and software was a plus, but even so, the layout of the G3 user interface Zünd Cut Center – ZCC is very intuitive and makes the system extremely easy to use. Consequently, the time it took for our operator to learn the new system was very short. Because of its open architecture, the G3 was also exceedingly easy to integrate in our existing production workflow”.

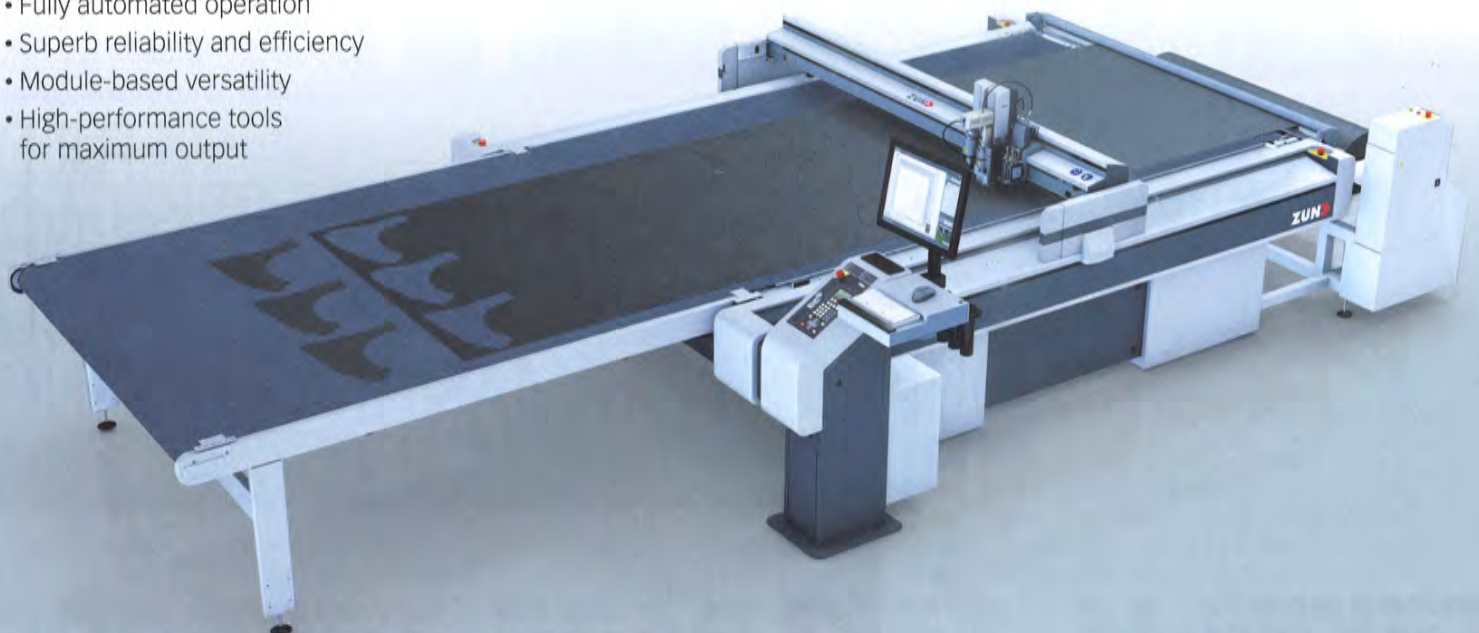
PERFORMANCE AT ITS BEST

The new Zünd G3 cutting system is per-

fectly equipped to handle the rigorous demands of processing carbon fiber. The electronics box, for instance, is specially protected against contamination from electrically conductive carbon fibers and the damage they can cause. Some of the tooling, too, was developed specifically for use in applications involving composites, with positive air pressure protecting the mechanical parts of the high-performance tools from abrasive dust particles. Pagani’s decision to stay with Zünd cutting technology was based not only on clear technical and performance advantages, but other factors played into the decision as well. To Malmusi, these were equally important: “For years we have maintained a great partnership with Zünd Italy. Zünd has tremendous know-how in processing composite materials and was able to provide highly competent and thorough guidance. “Malmusi is emphatic when it comes to the productivity of the new Zünd G3: “Compared to the PN machine we replaced, we have seen an increase in productivity of more than 20%. The performance of the new cutter is truly amazing. There is no doubt in our minds that, with the Zünd G3, we have purchased the most advanced and most productive digital cutting system on the market”.

Highly automated, efficient and reliable

- Fully automated operation
- Superb reliability and efficiency
- Module-based versatility
- High-performance tools for maximum output



ZÜND
swiss cutting systems