



# The Luxury Line

FOCUS ON PANAMERA  
TECHNOLOGY



The Porsche plant in Leipzig ranks as the world's most modern automobile plant. Thanks to a new production and logistics system, the Cayenne and the Panamera, the fourth production series, can be assembled on a single production line.

By  
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Sometimes it's not only the vehicles but the automobile plant that gets the experts excited. When Porsche CEO Michael Macht thinks of Leipzig, he feels like he's almost at eye-level with the future. "We're already very close to the vision of the lean factory," says Macht, who, as the former board member responsible for production and logistics at Porsche, has been instrumental in shaping the Leipzig model.

Siegfried Bülow, too, is looking forward to his daily wonder every morning. When he enters the plant gate, the business manager of Porsche Leipzig GmbH always savors the "magnificent view." The 300-hectare (740-acre) property is dominated on the left by the Customer Center, which is shaped like a diamond and more than 32 meters (105 feet) in height. On the right, modern industrial architecture involving a great deal of glass envelops the office complex and the production sites of the very successful Cayenne model and the new Panamera. "Back in 2000 there was nothing here but open fields," Bülow keeps reminding himself. "It's incredible what's been created here. Porsche has been building its own perfect world."

The ideal world for production of fascinating automobiles: with the start of full production of the Panamera, the company headed into a new era of manufacturing. Thanks to a new production and logistics system in Leipzig, the Cayenne and the Panamera can be very efficiently assembled on a single production line—notwithstanding countless optional features. "In no other factory in the world are the principles of lean manufacturing applied as thoroughly as in Leipzig," says Michael Macht.

By the early 1990s, the principles of lean manufacturing were already putting Porsche back on the track of success. At that time, the company completely converted its production to emulate the



**"WHAT WE HAVE TO DO DIFFERS GREATLY FROM ONE VEHICLE TO THE NEXT, BECAUSE EACH CAR COMES WITH AN INDIVIDUAL SET OF CUSTOMER OPTIONS."**

*Daniel Spindler works on the cockpit assembly of the Panamera in Leipzig*



**"THE FACT THAT WE'RE PRODUCING THE PANAMERA IN LEIPZIG IS A VERY BIG DEAL IN THIS REGION. MY FRIENDS AND ACQUAINTANCES KEEP ASKING ME: ARE YOU BUILDING IT YET? WHAT'S THE RIDE LIKE? ANY NEWS?"**

*Rene Jacobi works in Leipzig, assembling the engine with the transmission*

familiar Japanese example. Ever since, the Porsche Improvement Process (PVP) has been integrated into everyday operations to ensure the continuous optimization of production processes. In this context, Porsche concentrates more and more on its core competencies: the assembly of delivered components and sub-assemblies, quality assurance, and the management of the complex value network in conjunction with the suppliers.

The planning of the Leipzig plant, which began operations in August of 2002, already benefited from the experience gathered in Zuffenhausen. Siegfried Bülow explains, "We are a modular factory." It took about €127 million to build this plant "on the green meadow" in which more than 250,000 Cayennes have been assembled to date—in addition to 1,270 units of the Carrera GT super sports car assembled manually on a small line between 2003 and 2006.

The Panamera has required some expensive additions to the facilities. Porsche invested €150 million in the past three years to come as close as possible to the ideal concept of an efficient factory. This includes an additional assembly hall spanning 25,000 square meters (269,000 square feet), a logistics center, a prototype and analysis center, and a trainee shop. Porsche furthermore adapted the Cayenne assembly to the requirements of a model mix with the Panamera. A team around Wolfgang Reiss, head of Total Vehicle Planning, Production and Quality, succeeded in smoothly integrating the Panamera project with the Cayenne production. Reiss notes: "We've met all the engineering objectives on time and on budget."

The key element of the new system is a meticulously designed timetable and process sequence continually updated in accord with the orders received for new vehicles. All suppliers receive a weekly shipping schedule with about seven days' lead time. It de-



**"I AM PROUD TO BE WORKING FOR SUCH A COMPANY. THE PANAMERA IS THE BEST EXAMPLE. A WONDERFUL CAR THAT'S BOUND TO BE A BIG HIT."**

*Abdullah Bektas removes an engine from the conveyor belt in Zuffenhausen*

fines which items and quantities must be ready at a specified time for pickup by truck. The parts are received at the Leipzig logistics center at frequent intervals, immediately distributed to the line, and assembled within a few hours. Expensive inventories are thus not needed—a benefit that's unique in the auto industry in this particular context.

The new system was first implemented in the modern engine plant in Zuffenhausen. There, too, the production had to be adapted to the requirements of the Panamera engines, which differ from the Cayenne engines in such details as magnesium parts and aluminum bolts. "Among other changes, we had to completely revise the bolting process, because aluminum doesn't behave like steel," says Christian Will, head of the engine plant. The engines for both models are trucked to Leipzig.

Other plants as well are integrated into the new logistics concept. The painted bodyshell of the Panamera is made in the modern VW plant in Hanover. That's where Porsche Consulting originally supported the implementation of lean manufacturing. These bodies are shipped from there to Leipzig by rail—in the exact sequence that the plan requires them to be available at the line. The Cayenne bodies are shipped by rail as well, from the VW plant in Bratislava. Precise scheduling of the trains arriving from both directions ensures smooth production flow. More effort was required to attune the assemblies of the Cayenne and Panamera models to each other. Unlike the Panamera bodies, the Cayenne bodies arrive already partly equipped. Therefore, the Panamera is first processed to the same production stage on a specially designed single line (interior and underbody), then both bodies are processed together on the mixed line. "A masterful achievement by the planners and logisticians," Macht extols. Dual test lines are needed only at the end because of the long process times in quality control. Sophisticated production engi-▶

**"WE WERE PROUD WHEN THE DECISION CAME DOWN TO BUILD THE PANAMERA HERE. AND NOW OUR WORK IS MORE INTERESTING, BECAUSE THE PREPARATIONS OF THE PANAMERA AND CAYENNE FOR THE MIXED LINE ARE QUITE DIFFERENT."**

*Dirk Schubert is assembling the drivetrain and the body*



**“JUST LOOK AT THE WONDERFUL FLOW OF THOSE JOINT LINES. AND THEN AT THE WHOLE VEHICLE. IF I COULD, I’D ORDER A PANAMERA RIGHT NOW.”**

*Harald Kleeberg, last but not least, performs quality control in Leipzig*



neering meets the most exacting ergonomic requirements. Special production gear includes pivoting suspensions, an electric overhead conveyor for bodyshells, and vertically adjustable assembly platforms.

Michael Macht is sure of it: “Without this lean manufacturing system it wouldn’t be possible at all to produce vehicles like the Panamera in Germany at a reasonable price.” That matters, because for Porsche the country of origin is still a prime mark of quality. So with the Gran Turismo, too, Porsche works mainly with domestic suppliers. The level of German net content is about 70 percent. “We’ve become the second home for Porsche after Zuffenhausen,” Bülow believes, “and we’re totally in accord with the company regarding the ‘Made in Germany’ mark of quality. Making the Panamera will be our masterwork.”

All this work is done entirely by skilled employees from this region. In the Leipzig plant alone, the Panamera accounts for about 300 additional jobs. New hires start their training with a one-week event presenting information about the company. As Bülow puts it, “We inoculate them with a healthy dose of the Porsche virus.” That’s one of several reasons why motivation is higher than the average age would suggest. The mean age of the over 570 employees is 35. Sixteen percent of them are women. And the thirty or so trainees enjoy the best of conditions in the trainee shop. What counts most at the Porsche line is teamwork. Up to ten skilled workers form a team which completes difficult tasks in fifty minutes or less. Each team member must be adept at every skill. And the team compositions are as diverse as possible: old and young, experienced and inexperienced, male and female.

One more reason why Siegfried Bülow enjoys the view when he enters the plant gate every morning. “We may not be a dream factory,” he muses, “but we are producing dreams.”



# A Plant as Paradigm

## Porsche Leipzig: The First Ten Years

### FOCUS ON PANAMERA THE COMPANY



An innovative production system, its own biotope, and a close relationship to the region: for the past ten years, Porsche Leipzig GmbH has been a refreshing addition to the local scene. As Michael Macht, chairman of Porsche AG expresses it, “Not once have we regretted choosing Leipzig.”

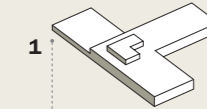
Twenty years after the fall of the Berlin Wall, Porsche Leipzig and the Panamera are writing the next pages of the success story which began just ten years ago, with the founding of Porsche Leipzig GmbH and the onset of Cayenne production. For approximately €127 million, Porsche built a factory that strictly follows the principles of lean production and that is now being further optimized for the Panamera. This has helped Leipzig and the main production plant to grow ever closer together. Not only was the new plant designed in Zuffenhausen, but its innovative production and logistics system was developed and proven there, as well.

But it’s not just Porsche car production that has attracted attention. The Customer Center, which is visible over a considerable distance, rises into the sky, a symbol of the bond between Porsche and Leipzig. The 32-meter (105-ft.) high tower, whose nickname “Diamant” was prompted by its distinctive diamond shape, intrigues Porsche fans from all over the world. So far, over 10,000 customers have come to Leipzig to personally take delivery of their Cayennes, and to get a look behind the scenes on guided tours of the plant. The Diamant is also a popular venue for meetings, family events, and concerts.

The attractions also include the driving events on the test track. This 3.75-kilometer (2.3-mile) test track, drawing on designer Hermann Tilke’s extensive Formula One experience, is studded with 1:1 replicas of renowned racetrack bends, including Loews (Monaco), Suzuka S, Curve di Lesmo (Monza), and Corkscrew (Laguna Seca). And the 6-kilometer (3.7-mile) off-road track for the Cayenne adds an exciting flourish to the visitor’s driving experience.

### 1999

The Leipzig Porsche plant is built



1 Production hall

### 2001

Start of construction of the Customer Center



2 Customer Center

### 2003

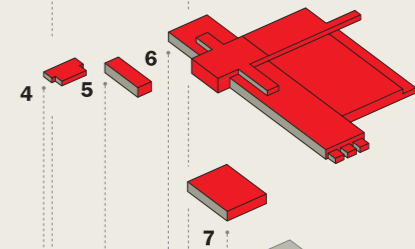
Expansion of the production hall for the Carrera GT



3 Carrera GT production hall

### 2006

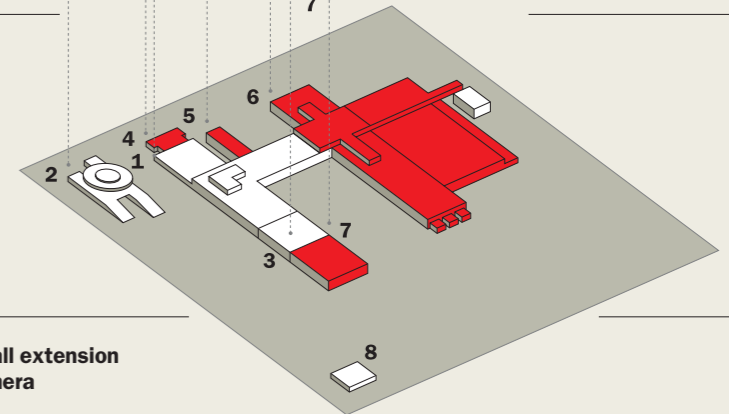
Plant expansion for Panamera production



4 Hall extension  
5 Production hall  
6 Production hall extension  
7 Large Panamera production hall

### 2009

The Porsche plant in Leipzig



8 Entrance

Moreover, Porsche has made its mark within the city of Leipzig. Five years ago, it attracted particular regard thanks to its commitment to assisting Leipzig’s historic St. Nicholas Church. The company’s donation of €1.8 million facilitated the complete restoration of the church’s famous Ladegast organ. In addition, Porsche designers created a completely new console for the organ, which is “started” on the left-hand side, reflecting the location of the ignition in every Porsche vehicle. The prayers for peace which took place at the church in 1989 had been the starting point for the Monday demonstrations during the GDR’s peaceful revolution.

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