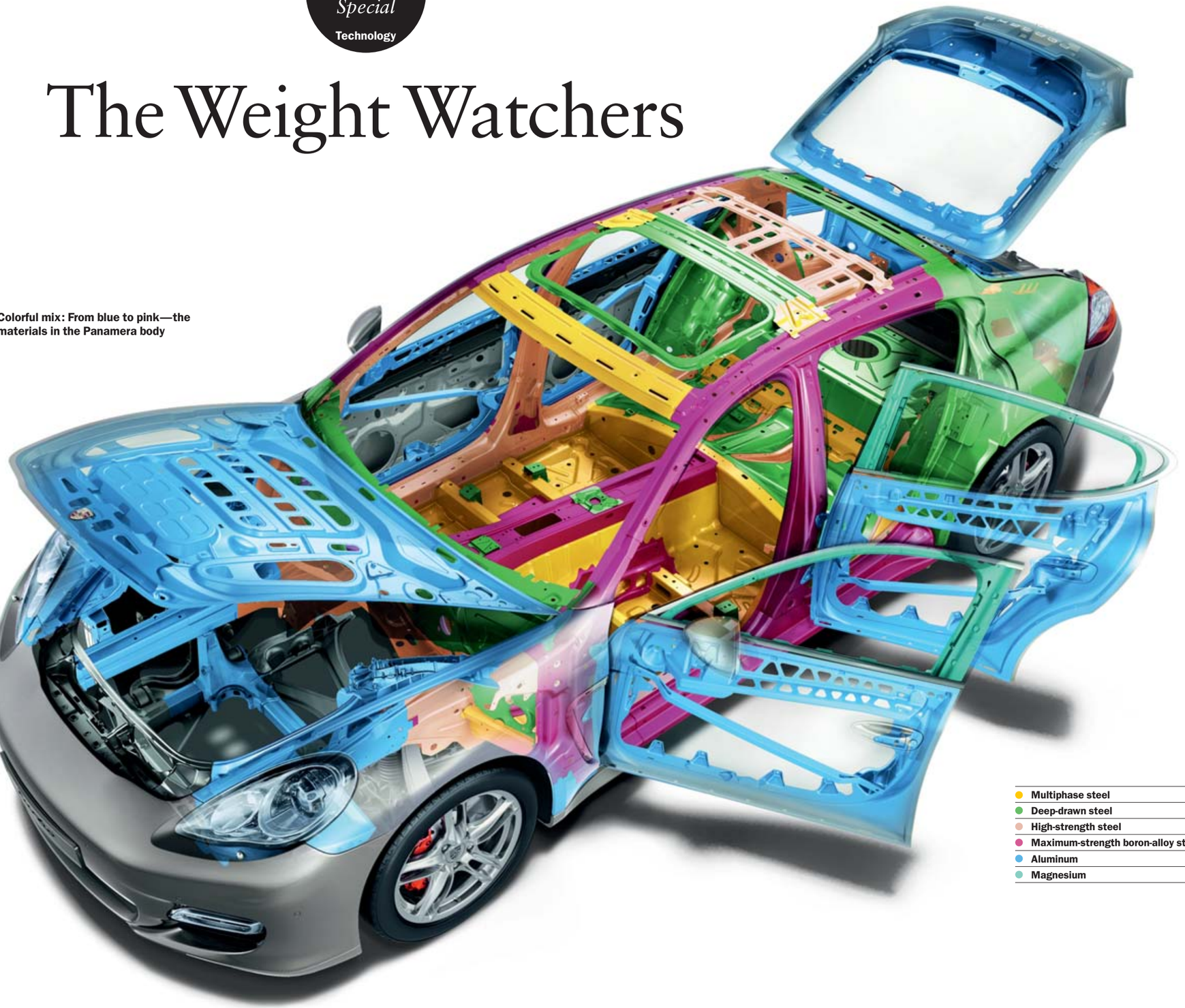
Panamera Special Technology

The Weight Watchers



Colorful mix: From blue to pink—the materials in the Panamera body

Panamera Special Technology

The Panamera's great figure is not just a matter of its extraordinary design. In order for the superb new lines not to throw their weight around, Porsche developers concentrated resolutely on lightweight construction—with tangible results. The new Gran Turismo is rich in comfort, admirable in fuel consumption, and hungry for top performance.

By
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Illustrations by
Porsche

If you want to keep typical Porsche characteristics in luxury vehicles as well, you have to keep the cars light. But every engineer will tell you that this is anything but easy in practice. Comfort-enhancing features are normally heavy on the wheels and can take the edge off of performance. And that means higher fuel consumption. But when Porsche developed the Panamera to make its first showing in the premium class, one thing was clear from the start—no edge will be missing.

One might visualize the project like this: to keep its development aims clear, Porsche used a model in the shape of an isosceles triangle. One corner represented power, and a second corner stood for the efficiency expected from a Porsche. The third corner represented the highest level of comfort ever offered in a vehicle from Zuffenhausen. Intelligently combined, these three apparently conflicting aims yield a fascinating result—the Panamera.

Tried-and-true means do not necessarily mean progress. As a newcomer to the segment, Porsche therefore did not start off with the usual contours for this class of vehicle. The Panamera is the broadest car in its sector, but also the lowest. Its low rear roofline is possible thanks to an interior design featuring two separate rear seats. And compared to the ample room in the Cayenne engine compartment, its front V8 assembly had to stoop quite a bit. The low lines of this four-door car—still rather unusual in this premium segment—signal that for all the comfort-oriented features, the driver and passengers can look forward to a sporty experience. A major exterior feature—one that is characteristic for higher-powered Porsche models—is not even noticeable at first glance. Very cleverly, the rear spoiler nearly fades into the window frame. In the Panamera Turbo, it's even a four-way spoiler. At 90 km/h (56 mph), it doesn't just move with consummate ease into place; it also broadens. At a track speed of 205 km/h (127 mph), the outer wing pushes steeply against the wind to provide even greater downforce.

To support its extremely sporty aerodynamics, the Panamera also features a fully lined underbody. It weighs 40 percent less than conventional underbodies, and reduces air resistance as well as lift. This helps to reduce fuel consumption while enhancing the driving dynamics. Such a design element has been used on sports cars, such as the high-performance Carrera GT, but not yet in the premium sedan class. ▸

**Superb wind conditions:
Its closed underbody and low lines make the Panamera an unofficial sports car**

Now you see it, now you don't: When not extended, the rear spoiler looks like it's part of the windshield frame

If you venture further into the vehicle body, you'll find an intelligent mix of materials that rejects every superfluous gram of weight. All the components have been made from the best-possible materials and with the dimensions requisite for their functions. Maximum-strength boron-alloy steel, which is responsible for the bearing structure, accounts for 16 percent of the material mixture. Then there is deep-drawn steel that is easy to shape (20 percent), high-strength steel (25 percent), and multiphase steel (11 percent). Aluminum (22 percent) gives components such as doors, fenders, the engine hood, and the tailgate both form and strength. The window frames and front-end subframe are made of magnesium. Stainless steel and plastic round out this high-tech mélange.

With its aluminum construction, the comfortable rear seating arrangement also contributes to the weight-optimized design of the Panamera—and yields a novelty in this class. Never before has there been an option for so many individual settings, and at the same time the chance to expand the trunk from 450 to 1,263 liters (16 to 45 cubic feet) thanks to the 60/40 folding seat backs. Weight reduction even played an important role in the four-zone climate control system. A single unit allows the temperature to be individually adjusted for each seat. This design enhances energy efficiency thanks to its short water and coolant circuits—which also, by the way, adds space to the interior and helps reduce the noise level. Another new feature is the four-quadrant sun sensor on the front windshield. It indicates not only the sun's intensity vis-à-vis the air-conditioning system, but also the angle of incidence of its rays—even when they come from behind.

The vehicle body makers set themselves the challenge of meeting the demands for power, efficiency, and comfort to the smallest detail. Not to be outdone, the experts in other areas did their part to lower any weight that hinders performance—efforts which also help reduce fuel consumption and CO_2 emissions. The powertrain specialists need only point to the Porsche double-clutch transmission (PDK). Used for the first time in a vehicle of this class, it ensures unusually sporty handling. Together with the direct fuel injection system, it plays a crucial role in reducing fuel consumption. Furthermore, the PDK weighs 15 kilograms (33 pounds) less than a conventional automatic transmission. The chassis/suspension specialists opted for lightweight axles consisting in large part of aluminum. Even the acoustics experts, who strictly speaking are "only" responsible for getting the sound levels of the interior right, did their part as well. Their composite glazing with a special acoustic coating is lighter than conventional single-pane safety glass.

Taken together, this car is as well thought out as it sounds. And the results say it all. The Panamera S—the entry model—weighs just over 1,770 kilograms (3,900 pounds). It is powered by a 4.8-liter V8 engine that generates 400 hp and can sprint from zero to 100 km/h (62 mph) in 5.4 seconds. With its PDK, it needs only 10.8 liters of gas to travel 100 kilometers in the New European Driving Cycle. As we said, there's a lot to be done if you want to keep things light and easy.

Extend and broaden: The Turbo's rear spoiler doesn't just take up position—it also moves laterally