

3D body scanning at BMW



## The car ... a true lifeworld

**When a customer enters his (future) car, he expects a lot. And the brand must keep its promise — also in terms of comfort and safe operation. So ergonomics is a core competency for BMW and the company promotes it accordingly.**

**KomfortZone talks to Head Ergonomist Peer-Oliver Wagner about his understanding of ergonomics and how a car can become one of life's quality features.**



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**KomfortZone: The BMW brand is among the best-known in the world. How does ergonomics contribute to this?**

**Wagner:** The ergonomic translation for “driving pleasure” is to ask yourself, “How does our customer want to use his vehicle? What does he want to experience with it and how will it ideally fit into his world? This could be his leisure time, for instance. More and more people are taking their bicycles with them in the car. In other countries, the buyers may not even drive themselves, they are driven by others. They want to work or relax in the back seat. We can fulfill all these requirements — not only with a wide range of offers, but with an integrated ergonomic concept that can meet all the configuration possibilities of our vehicles.

**KomfortZone: What particularly distinguishes the ergonomics at BMW?**

**Wagner:** It’s mainly true to life. We make cars that integrate themselves naturally into the lives of our customers. For us, ergonomics is a part of the whole picture. Our focus is not just on interior design, we also address the interplay of the human being, the vehicle and the environment. That’s why we’re naturally very interested in whether or not you’re sitting comfortably — but we also find it very important exactly what you perceive in the vehicle and how you perceive it, if you can stow your

mobile telephone away quickly and easily and put your coffee down in the ideal storage location, for instance. And how you see the vehicle interior, of course. This is what we mean when we say, a BMW has to fit like a suit. The driver must have the intuitive feeling that the car belongs to him like a part of his body.

**KomfortZone: How intensively do you promote this approach? Or does it demand more of you?**

**Wagner:** I used to be a product designer, so this point of view suits me very much. For me, the central issue in product development is the human being. The car I can change and the environment itself is self-changing — but I can’t make human beings shorter or taller. Of course, there are a number of equally vital technical topics. After all, I first and foremost want to *drive* my BMW. And that desire is also linked with expectations. But for us the human being always takes center stage. We ergonomists at BMW represent the customer in the development process. I like that. And I think we’ve been very successful with this work up till now.

**KomfortZone: How much do the different ergonomic vehicle concepts differ from one another?**

**Wagner:** The BMW baseline of course remains in each model, but we always keep asking ourselves exactly what the customer wants to experience with this car.





This results in differences: The driving experience in a BMW Series 5 and a roadster is totally different, for example. After six hours of driving, I want to get out of the limousine relaxed and fit for my meeting. In a Roadster I want to feel the curves, I want to drive in a much more active and sporting manner than I would in the limousine. From an ergonomic standpoint, this applies to the arm rests, for instance. When I'm driving in a relaxed posture, I need them — but if I'm driving more dynamically, I don't want them in my way.

**KomfortZone: How do you put this into practice?**

**Wagner:** With a well-thought-out combination of virtual and physical tests. We can anticipate in advance many studies in RAMSIS on the digital model. Especially in areas regarding objective aspects in posture, visibility and reachability. We look for a special collective in RAMSIS for every vehicle. We then represent this with some relevant people from our pool of test persons. We have a 3D body scanner through which we constantly expand the pool. We currently have the anthropometric data of around 800 people in our system.

**KomfortZone: And what's the specific ergonomics secret of a BMW?**

**Wagner:** It's not really a secret, you can test it for yourself in any one of our models. In a BMW everyone

has the space he or she requires. We also support drivers through a defined ergonomic position in the car, one which easily allows long driving periods without the danger of having a leg fall asleep, for instance. Our ergonomics have a lot to do with dynamics, even if that does sound like a paradox at first: In the car you actually have a static posture, meaning that you have little opportunity to change the seat position again and again as you would perhaps do on a sofa. However, seat and steering wheel must permit slight but constantly occurring postural changes without reducing the level of ergonomic quality or the safety level of seat belt and airbags. So besides leg room we also look at all the other aspects like the softness of the seat, air conditioning, foot room, seat width — simply everything that you can touch in the car.

**KomfortZone: How does RAMSIS fit into your concept?**

**Wagner:** In RAMSIS, we appreciate the objective assessment of posture, reachability and visibility. We supplement more complex motion information or subjective perception with real tests. Here's an example of this: We check the view of the traffic lights objectively with RAMSIS — for all of our active markets, by the way. And the question of whether or not the feeling of space is generous enough is answered with the cooperation of our test persons. The degree to which we involve physi-



cal tests depends on whether or not we're designing a completely new model or redesigning one which has already been introduced.

**KomfortZone:** You have been involved in the German serial measurement program SizeGERMANY right from the start. Was any aspect of this particularly important to you?

**Wagner:** Yes, it's definitely the current, high-quality data material which is the result of the objective acquisition methods using body scanners and the capturing of the human being's dimensions in 3D. We could measure individual test persons ourselves, of course, but we could never tackle 13,000 men, women and children who are all measured in the same way — and with  $\pm 1$  mm accuracy in accordance with the DIN standard. We now have a secular growth prognosis until 2038, for instance.

**KomfortZone:** Did anything particularly surprise you regarding the SizeGERMANY results?

**Wagner:** We hadn't reckoned with the much greater spans in the population development: The lean stay lean, the overweight gain still more weight. Since SizeGERMANY, we have been facing the challenge to accommodate many more ergonomic extremes into our vehicles. For example, we searched for intelligent design methods in order to offer a seat belt which would provide safety and

comfort for a 12 year-old child and a 6' 2"<sup>\*8</sup> man weighing 220 pounds — and we found them.

**KomfortZone:** What trends do you see developing in the coming years?

**Wagner:** We're intensively monitoring all the aspects which result from demographic development. And of course, based on our philosophy, we also monitor the future role that our vehicles will play with our customers. From an ergonomic standpoint, I find the prediction of movement and perhaps movement restrictions very important. This is also one of the topics we would like to see included in RAMSIS in the long term. The earlier we can discuss ergonomic issues, the better it will be for ourselves and our customers. And this works best with digital models.

#### Peer-Oliver Wagner ... the person

Peer-Oliver Wagner has been the Head of Ergonomics and Comfort for the BMW Group since 2006. Together with around 20 ergonomists he designs the ergonomic development of all vehicle models of the Munich corporation.

\* 1.90 m