



BMW Motorrad

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The Ultimate Riding Machine

# INTELLIGENT DESIGN.

BMW MOTORRAD: HELMET EXPERTS

**BMW/helmets**





# A SAFE RIDE IS AN **ENJOYABLE RIDE.**

BMW Motorrad stands for excitement, freedom, and unlimited riding pleasure. We put all our passion and expertise into making outstanding bikes, and the same applies to our helmets – because top-quality helmets make motorcycling even more enjoyable and safe.

Every helmet is the result of a long, involved production process, which can take up to three years from initial design to completion. Our highly skilled engineers and designers are working towards one goal – to make the best possible helmets – and they know exactly what is involved, because they are all motorcyclists themselves.

So what characterizes the ideal helmet? Simple: it's all about intelligence. The intelligence to be prepared for everything, and to achieve the maximum safety and comfort while meeting the rider's specific needs. BMW Motorrad does this by drawing on its decades of experience and the high-tech backing of the BMW Group.

On the following pages, we describe the complex process involved in creating a helmet.



# THE TEN COMMANDMENTS: PRODUCING AN INTELLIGENT HELMET.

**BMW doesn't just make helmets – it makes the best helmets.  
As a result, every new design must meet extremely high standards.**

## Safety

BMW Motorrad helmets meet and in many respects exceed the current European safety standard, ECE-22-05. All helmets have EPS (expanded polystyrene) inner shells of varying thicknesses so that all parts provide maximum protection.

## Fit

A perfect fit is essential for safety and comfort. BMW Motorrad helmets have cheek and neck pads in different sizes to suit each individual rider.

## Ventilation

All BMW Motorrad helmets incorporate highly effective negative pressure ventilation. The AirFlow helmet was the first in the world to use the AirFlow principle. In its successor, the AirFlow 2, the vents have been optimally positioned using computer simulations and wind tunnel measurements.

## Functionality

The BMW Motorrad range includes the right helmet for just about every use. For example, the flip-up System 6 helmet is designed for maximum comfort and one-hand operation, with an integrated sun visor and a four-hinge mechanism.

## Fasteners

All BMW Motorrad helmets have an additional neck strap which keeps them in position in the event of an impact. This features a simple-to-operate snap lock or double-D fastener, depending on the type of helmet.

## Comfort

Nearly all BMW Motorrad helmets have a removable, washable, breathable, antibacterial inner lining.

## Weight

Every gram saved increases the riding pleasure. Despite its sophisticated chin section and standard double visor, the size 58/59 System 6 helmet weighs in at around 1,570 grams, while the Enduro Carbon is just over 1,100 grams, making it one of the world's lightest enduro helmets.

## Aerodynamics/aeroacoustics

BMW Motorrad has its own wind tunnel, something that other manufacturers can only dream of. This means we can test every design under repeatable conditions and ensure the aerodynamics and aeroacoustics are as good as they possibly can be. As a result, our helmets are some of the lightest in their class and offer the ultimate in safety and comfort.

## Design

A good helmet must offer outstanding protection and eye-catching looks, and ours feature dynamic design that sets new standards.

## Visors

BMW Motorrad visors have highly effective anti-scratch, anti-fog coatings. The System 6, Sport and DoubleR helmets are fitted with double visors as standard, to prevent misting.







THE CONCEPT

# MANY DIFFERENT NEEDS. ONE HELMET.

The first thing we think about when designing a helmet is the rider who will wear it: it must meet their specific needs while providing a maximum of safety, comfort and good looks. Our helmets are designed to be the best for you, not the most convenient for us, so before we start designing a new model, our product managers consider all the key issues involved: what do riders need? What must the new helmet be able to do? What kind of strains will it be exposed to? What innovative solutions and materials are available, and how can we make best use of them?

All of these needs, ideas and insights are brought together in the specification manual – the bible of helmet design. This is the basis on which the new helmet is created and each stage of the development process occurs.

As a result, BMW Motorrad helmets have all the features that riders need, including the right overall design, visor, and lining.





STYLING **A VISION**  
TAKES SHAPE.

The manual goes to the design department, where the specifications are translated into a new helmet, with the emphasis not only on safety and practicality but also on aesthetic aspects like shape and colour.

Of course, safety is the number one priority, but we go even further: "We also seek to combine this with comfort and style. The design needs to be coherent, supporting the rider with features like good aerodynamics and not distracting them with problems like poor sight angles." This is the motto of the BMW Motorrad design department.

The first stage involves producing two-dimensional sketches – a process that every designer has a different approach to. Some do line drawings, while others start on the colour scheme straight away. But the one thing they all have in common is a passion for designing helmets

The most promising designs are worked out in more detail, including technical drawings and computer models, and then the product managers and engineers select two basic options.

Experienced model-makers make life-size clay replicas of the final designs, working with meticulous care from technical drawings and specifications.

The pros and cons of each model are discussed in detail before the final decision is made. A new helmet is born.





CONSTRUCTION

# MANY COMPLEX PROCESSES.

ONE SIMPLE GOAL:  
PRODUCING THE BEST HELMET.

Once the design decision is made, the designers and engineers start working with the clay model.

First, every detail of the model is measured by laser and converted into a virtual version. "We use CAD to turn the data into a digital helmet," explains helmet development manager Bernhard Neuheuser. "Then we optimize all the details on screen."

Rapid prototyping technology is used to produce rough-cut, realistic images of the helmet from the CAD data. Aspects of the helmet, such as its

aerodynamics, are tested and improved over a period of around nine months.

The prototype helmets are then ready and can be worn and tested under real-life conditions. "We take more trouble to fine-tune the helmets than just about anyone else," Neuheuser explains. "We use our own methods, such as special test-rider procedures, to ensure that newly acquired knowledge is implemented immediately." In this way, ideas about how the helmet should work gradually take shape, and it gets better and better over time.

The test riders use each new version as it is completed, and the pilot version is released a couple of weeks before series production begins. This is the same helmet that actually goes on sale in stores, but BMW Motorrad still continues to fine-tune both the helmet and its production processes.

This ensures that new production helmets meet our own and our customers' extremely high standards.





People who buy BMW Motorrad helmets expect the very best, which is where our quality control specialists come in. They thoroughly check each new helmet and iron out even the tiniest of problems. No detail is too small to be tested, from the UV resistance of the paint to the moisture-wicking properties of the fabrics.

Every stage of the production process involves testing the helmet to its limits. In addition to the usual controls, BMW Motorrad also carries out tests in a rain chamber and durability tests. Not only must the helmet pass extensive in-house checks, it is also subjected to countless hours of riding by in-house specialists. We even investigate to see

what happens if helmets are deliberately misused, which often provides us with good ideas for future production techniques. We destroy countless helmets in order to identify weaknesses and correct them immediately, always working to the very highest standards. If even a single helmet fails a test, we repeat the whole process until we get everything 100% right. Our quality control also exceeds the legal requirements – for example, in terms of the number of helmets that must be tested.

In this way, we ensure that BMW Motorrad helmets easily comply with current safety standards and meet riders' needs.



QUALITY CONTROL  
TESTING HELMETS  
**TO THEIR LIMITS.**





QUALITY CONTROL

# STANDARDS ARE THERE TO BE EXCEEDED.



## WHAT HELMETS MUST BE ABLE TO DO: ECE-22-05.

Under the European Union's ECE-22-05 standard, helmets must meet strict specifications in order to be approved. The certification process covers the following areas:

- Geometry and angle of sight, to ensure that the rider has a clear view of road conditions
- Impact protection for the forehead, back and crown of the head, the ears, and the chin
- Rigidity: a maximum permanent deformation of 15 mm applies
- Surface friction
- Chin strap pull resistance, slippage and wear
- Visor transparency, strength and scratch resistance
- Spectral analysis of the visor

ECE-22-05 lays down strict test procedures. Two examples:

- Impact protection test: the back, front, sides and top of the helmet must withstand an impact at up to 7.5 metres per second. It must be resistant to temperatures of -20°C to +50°C. Various parameters are also used to calculate the head injury criterion, a measurement of the expected skull and brain damage in the event of an impact. As you might expect, BMW Motorrad helmets comfortably meet the applicable standard.
- In one test, a machine attempts to pull the helmet off a dummy head – with the chin strap fastened! The helmet is allowed to twist by only 30 degrees. Again, BMW Motorrad helmets' standard neck straps perform significantly better than required by the standard.

Again and again, these standard tests show that all BMW Motorrad helmets exceed the ECE requirements.

### CRYSTAL CLEAR: THE ECE-22-05 VISOR TESTS.

The visor of a motorcycle helmet represents a potential vulnerability, because it needs to combine strength, optical clarity and comfort. So we place special emphasis on our injection-moulded, three-dimensionally curved visors during the complex production process.

They are required to undergo tough testing, for example by being hit with a three-kilogram steel cone without splitting. The scratchproof coating is sandblasted and then tested for light scatter. Double-glazed visors regularly perform better in misting tests, and have been fitted as standard to the BMW Sport and System helmets for years.

The visor's optical quality is particularly important for motorcycle riders, as it must not create visual distortion. BMW Motorrad visors are classified as optical quality class 2. All of our untinted visors admit over 80% of visible light and filter out 99.998% of harmful UV rays, in accordance with DIN 1836.



# RUNNING THE GAUNTLET IN MUNICH.

A good helmet must be equipped for extreme conditions, so passing the standard ECE-22-05 tests is just the first step in a long process. Our test laboratory in Munich exposes them to additional extreme stresses before they earn their stripes as BMW Motorrad helmets.



## WHAT A BMW MOTORRAD HELMET MUST BE ABLE TO DO.

### 1. The UV test:

We expose the helmets to UV light in our climate chamber to ensure that their special multiple coatings do not fade.

### 2. The rain test:

The rain chamber simulates bad weather conditions, with water coming not just from above, but also from below, as it would if the rider were caught in the spray of a passing truck, and with a headwind blowing the rain at the front of the helmet. If the inside is still snug and dry, the helmet goes on to the next test.

### 3. The aeroacoustic test:

Testing in the acoustics laboratory ensures that the helmet blocks out unnecessary noise by simulating noise levels at different speeds, and redesigning the helmet accordingly.

### 4. The aerodynamic test:

We analyse every last detail of the helmet's aerodynamics in our wind tunnel, and it passes the test only if these are perfect.

### 5. The real-life test:

Robots can never replace human beings where subjective perceptions are concerned. That's why we use expert riders to test our helmets over long distances.





Manufacturing BMW Motorrad helmets is a very complex process, requiring a great deal of specialist expertise – both from us and our suppliers. We achieve these high standards of quality using a combination of many years' experience, state-of-the-art production technology, and careful craftsmanship. At BMW Motorrad, mass production is an alien concept.

The production of the BMW Enduro Carbon helmet is an especially complex process, involving the hand assembly of 38 components made from three different materials.

We use a pressure oven, known as an autoclave, to bake them together at 7 bar and 120°C. The result is a thin but extremely tough shell.

The BMW System 6 helmet is made up of 180 parts, assembled with minute precision. The shell is cut to shape using a jet of water 0.15 mm in diameter at a pressure of 3,000 bar, working to a tolerance of tenths of a millimetre.

Expert workers then carefully hand-assemble the helmet, so every one is a unique creation.

PRODUCTION EVERY ONE  
**IS UNIQUE.**



# CARBON ENDURO HELMET

Uncompromisingly tough, but extremely lightweight, the Enduro Carbon helmet is ideally suited to the extreme conditions of off-road riding.

- Weighs just 1,150 grams
- Carbon and Kevlar laminate outer shell
- Five-section EPS (expanded polystyrene) inner shell
- Alcantara and DuPont Coolmax inner lining
- Visor with anti-scratch and anti-fog coating

# SYSTEM 6 HELMET

Leading-edge technology and comfort: the System 6 helmet offers outstanding aero-acoustics and a host of other features, in a compact design weighing only 1,570 grams.

- Compatible with BMW Motorrad communication system
- Double-glazed, scratchproof coating on both sides, extra-large field of vision and drop-down sun visor
- Four-hinge mechanism for maximum aerodynamic performance, even with chin section flipped up
- Sophisticated ventilation

# ENDURO HELMET

Supremely tough – and supremely comfortable. The BMW Enduro helmet weighs just 1,380 grams, with Carbon and Kevlar-reinforced fabric for optimum versatility.

- Chin strap with double-D fastener
- Injection-moulded visor with anti-scratch and anti-fog coating
- Easily removable peak
- Removable chin spoiler
- Additional neck straps for secure hold



# SPORT HELMET

High-performance protection: the Sport helmet gets you safely across the finishing line and helps you to keep a cool head along the way.

- Double-glazed visor
- Adjustable head and visor ventilation
- Moisture-wicking inner lining (removable and washable)
- Compatible with BMW Motorrad communication system



# AirFlow 2 HELMET

Motorcycling is about enjoying the rush of the wind. The generously sized vents in the shell of the AirFlow 2 let you feel it like never before, but the short visor protects your eyes and nose from unpleasant draughts.

- Closable air vents
- Visor retracts into helmet
- Compatible with BMW Motorrad communication system



# DoubleR HELMET

The lightweight 1,380-gram DoubleR puts you in pole position – and looks great into the bargain.

- Double-D fastener
- Effective visor and head ventilation
- Scratch-resistant double-glazed visor
- Helmet in original racing colours, matched to the S 1000 RR
- Spoiler specifically designed for improved high-speed stability on the S 1000 RR







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The Ultimate  
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Helmets

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