

# The BMW ActiveHybrid 5. Contents.



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# 1. Intelligence breeds efficiency. The BMW ActiveHybrid 5.

BMW takes the development of intelligent hybrid drive systems to the next level with the introduction of the BMW ActiveHybrid 5 – another series-produced model in which a combustion engine and electric motor join forces to enhance both efficiency and the brand's hallmark driving pleasure. The BMW ActiveHybrid 5 brings together a BMW TwinPower Turbo six-cylinder in-line engine, an electric drive system and an eight-speed automatic gearbox for the first time. The latest generation of BMW ActiveHybrid technology also adds precisely controlled – and therefore extremely effective – intelligent energy management to the mix. All of which gives the BMW ActiveHybrid 5 an exceptional balance of performance and fuel economy for the premium executive car class.

The drive system generates combined output of 250 kW/340 hp, allows the car to be driven on electric power alone up to 60 km/h (37 mph), accelerates the BMW ActiveHybrid 5 from 0 to 100 km/h (62 mph) in 5.9 seconds, cuts average fuel consumption to between 6.4 and 7.0 litres per 100 kilometres (40 – 44 mpg imp) and has CO<sub>2</sub> emissions of just 149 – 163 g/km (figures according to EU test cycle, may vary according to the tyre format specified).

## **Latest-generation BMW ActiveHybrid technology: six-in-line engine, electric motor, lithium-ion battery.**

The 225 kW/306 hp six-cylinder in-line engine with BMW TwinPower Turbo technology in the BMW ActiveHybrid 5 is the same unit renowned for its free-revving capability, pulling power and efficiency in the BMW 535i. The electric motor, meanwhile, develops 40 kW/55 hp and is supplied with energy by a high-performance lithium-ion battery integrated into the luggage area. Power from the two drive systems is transferred to the rear wheels by the eight-speed automatic gearbox. In addition to its full-hybrid construction, which enables purely electric and therefore local emission-free driving in urban conditions, the BMW ActiveHybrid 5 boasts not just highly sporty performance but also a double-digit percentage improvement in fuel economy over the BMW 535i.

## **Superior efficiency thanks to ECO PRO mode including coasting and intelligent energy management.**

In order to fully exploit the potential of the BMW ActiveHybrid technology, the intelligent energy management of the power electronics uses a host of innovative functions to ensure the drive system runs efficiently. Charging of

the high-performance battery primarily takes place during coasting or braking, the electric motor performing the role of a generator feeding energy into the high-voltage battery. By contrast, under acceleration the electric motor takes on a boost function. Here, it assists the petrol engine by generating an ultra-dynamic burst of power, lending the sedan's sporty driving experience a sharper edge.

Moreover, while coasting at speeds of up to 160 km/h (100 mph) in ECO PRO mode, the combustion engine can be switched off and fully decoupled. This coasting mode combines comfortable driving with optimum utilisation of the kinetic energy already generated. To avoid periods with the engine running at idle – at junctions or in traffic tailbacks, for example – the BMW ActiveHybrid 5 is equipped with a hybrid start-stop function. Plus, the power electronics in the BMW ActiveHybrid 5 are linked up with the standard-fitted Navigation system Professional. This allows forward-looking analysis of the driving situation, enabling the drive components to be primed to deliver maximum efficiency (the effect may vary according to the quality of the available navigation data).

All the hybrid-specific components of the drive technology and energy management systems have been developed specially for use in the BMW ActiveHybrid 5. The result is an extremely well-rounded overall concept, which also provides a convincing demonstration of the BMW ActiveHybrid technology's qualities out on the road. Needless to say, all of the new hybrid components are designed to last for the life of the vehicle.

### **Design: sporty elegance with individual accents.**

The BMW ActiveHybrid 5 sees the sporty yet elegant body design of the BMW 5 Series Sedan complemented by bespoke touches which highlight the identity of its drive technology. The "ActiveHybrid 5" lettering on the C-pillars, the BMW kidney grille with galvanised slats and the exhaust matt chrome tailpipes set the exterior apart from the other models in the range. Available as an option, meanwhile, are 18-inch Streamline light-alloy wheels displaying exceptional aerodynamic efficiency. The BMW ActiveHybrid 5 is the only model in the BMW 5 Series line-up to be available in the exterior paint shade Bluewater metallic, and it also stands out visually from all other 5 Series variants with door sill strips bearing "ActiveHybrid 5" lettering, an aluminium plate on the centre console with the same ID, a bespoke engine cover and the visible "ActiveHybrid Power Unit" inscription on the special casing for the high-performance battery accommodated in the luggage area.

### **High-grade standard fittings, wide-ranging options.**

The selection of interior colours, upholstery and interior trim elements reflects the range offered for the other BMW 5 Series Sedan variants. And added to

the standard-fitted array of comfort-enhancing features is not only the Navigation system Professional, but also a 4-zone climate control system with stationary air conditioning. A wide range of driver assistance systems and BMW ConnectedDrive mobility services, as well as virtually all the other optional extras available for the conventionally powered BMW 5 Series Sedan, can also be specified for the BMW ActiveHybrid 5.

**Production at BMW Plant Dingolfing.**

The BMW ActiveHybrid 5 will be produced at BMW Plant Dingolfing – the BMW Group’s largest production plant worldwide – alongside the other BMW 5 Series models, ensuring that it benefits from the same high standards of quality and production efficiency. The integration into the production process of BMW ActiveHybrid technology is underpinned by the intelligent combination of state-of-the-art automated process engineering and the skilled craftsmanship of specially trained employees.

## 2. At a glance.



- BMW presents the third in its line of hybrid models with specially developed drive technology; the BMW ActiveHybrid 5 is a full hybrid based on the BMW 5 Series Sedan; unbeatable dynamics and a more effective balance between performance and fuel consumption than any rival; combined system output: 250 kW/340 hp, average fuel consumption in the EU test cycle: 6.4 – 7.0 litres/100 kilometres (40 – 44 mpg imp), CO<sub>2</sub> emissions: 149 – 163 g/km (figures may vary according to the tyre format selected).
- New generation of BMW ActiveHybrid technology; debut for the combination of a six-cylinder in-line petrol engine with BMW TwinPower Turbo technology and an electric motor; electric motor integrated into the housing of the eight-speed automatic gearbox; energy supplied by a lithium-ion high-performance battery positioned in the boot area between the wheel arches; all hybrid components designed to last the life of the car.
- Full-hybrid arrangement allows the car to reach 60 km/h (37 mph) and achieve a maximum range of four kilometres (just under 2.5 miles) on electric power alone; boost function brings together the power of the electric motor and petrol engine to deliver extremely dynamic acceleration of 0 – 100 km/h (62 mph) in 5.9 seconds; efficiency further enhanced by hybrid start-stop function, Brake Energy Regeneration and ECO PRO mode; coasting mode (with the combustion engine switched off) can be used at speeds up to 160 km/h (100 mph).
- Globally unique intelligent energy management; power electronics linked to standard Navigation system Professional; energy management system responds to navigation data – if of sufficient quality – to prepare the car's drive system in advance for the situation at hand.
- Comfort enhanced by addition – on this model – of stationary climate control; can be activated before journey begins; interior climate remains constant even during breaks in the journey and when the car is in coasting mode (with the combustion engine switched off).
- Hybrid-specific information shown in the instrument cluster and Control Display; energy flow and recuperation display, as well as boost function, shown in the rev counter; operating status, battery charge level and fuel consumption history can be viewed in the Control Display.

- Chassis technology and body structure shared with BMW 5 Series Sedan: double-wishbone front suspension, integral rear axle, Electronic Power Steering with Servotronic; Dynamic Damper Control available as an option; extensive safety equipment, including front and side airbags and side curtain head airbags; lithium-ion battery in special high-strength casing, positioned in the luggage area to provide it with optimum protection; intelligent lightweight design with bonnet, front side panels, doors and chassis components made from aluminium.
- Striking, bespoke touches for the sporty, elegant body design: “ActiveHybrid 5” lettering on the C-pillars and door sills, galvanised kidney grille slats, exhaust tailpipes in matt chrome; exclusive Bluewater metallic paintwork and 18-inch Streamline light-alloy wheels available as an option.
- Groundbreaking combination of advanced drive system technology and luxurious ambience thanks to particularly extensive standard equipment; eight-speed automatic gearbox, stationary climate control, Navigation system Professional, 4-zone automatic climate control and Driving Experience Control switch all come as standard; options include active seat ventilation, active seats, Comfort Access, sports automatic gearbox with shift paddles on the steering wheel, Soft Close Automatic function for the doors and boot lid, hands-free boot lid opening function, electrically operated glass roof, and high-quality audio and rear-seat entertainment systems.
- Extensive range of BMW ConnectedDrive features: BMW Head-Up Display, Park Distance Control, rear-view camera, Surround View, Adaptive Headlights, High-Beam Assistant, Speed Limit Info, BMW Parking Assistant, Lane Change Warning System, Lane Departure Warning System, BMW Night Vision with pedestrian detection, internet usage, extended integration of smartphones and music players, real-time traffic information and apps for receiving web radio and using Facebook and Twitter.
- Specifications and performance figures:  
**BMW ActiveHybrid 5:** Six-cylinder in-line petrol engine, BMW TwinPower Turbo technology with twin-scroll turbocharger, High Precision Direct Injection and VALVETRONIC;  
Displacement: 2,979 cc, output: 225 kW/306 hp at 5,800 rpm, max. torque: 400 Nm (295 lb-ft) at 1,200 – 5,000 rpm.  
Synchronous electric motor; output: 40 kW/55 hp, max. torque: 210 Nm (155 lb-ft);

Combined output: 250 kW/340 hp,  
max. combined torque: 450 Nm (332 lb-ft).  
Acceleration [0 – 100 km/h (62 mph)]: 5.9 seconds,  
top speed: 250 km/h (155 mph),  
top speed purely on electric power: 60 km/h (37 mph).  
Average fuel consumption\*: 6.4 – 7.0 litres/100 kilometres  
(40 – 44 mpg imp),  
CO<sub>2</sub> emissions\*: 149 – 163 g/km,  
exhaust standard: EU5.

\*As per the EU test cycle, figures may vary according to the tyre format specified



### 3. Powertrain: New-generation BMW ActiveHybrid technology.

- **Hybrid-related components: 40 kW/55 hp synchronous electric motor, lithium-ion high-voltage battery – developed specifically for this model.**
- **First BMW ActiveHybrid model with six-cylinder in-line engine.**
- **Electric motor and eight-speed automatic transmission share the same housing.**

BMW has developed its intelligent hybrid drive technology to the next level with a further ActiveHybrid production model. Again, a petrol engine is combined with an electric motor to enhance both efficiency and the brand's hallmark driving pleasure. The BMW ActiveHybrid 5 is the company's first model to combine a BMW TwinPower Turbo six-in-line engine, an electric motor and an eight-speed automatic transmission. The transmission sends combined power of up to 250 kW/340 hp to the rear wheels.

The BMW ActiveHybrid 5's synchronous electric motor is powered by a lithium-ion high-voltage battery housed between the wheel arches in the boot. The latest-generation BMW ActiveHybrid technology also adds precisely controlled – and therefore extremely efficient – energy management to the mix. This means that for a car in the premium executive class, the BMW ActiveHybrid 5 offers an exceptionally good balance between performance and fuel consumption.

All the hybrid-related powertrain and energy management components were developed specifically for the BMW ActiveHybrid 5. The result is an extremely well-integrated overall system which convincingly showcases the benefits of BMW ActiveHybrid technology out on the road. Needless to say, all the new hybrid components are designed to last the life of the vehicle.

#### **Award-winning engine is powerful and efficient: first BMW TwinPower Turbo six-in-line engine to be fitted in a hybrid model.**

The BMW ActiveHybrid 5 is the first hybrid model from BMW to use a six-cylinder in-line engine in its powertrain. Whereas the BMW ActiveHybrid 7 and BMW ActiveHybrid X6 both utilise a V8 engine, which is combined with either one or two electric motors, the internal combustion engine in BMW's third hybrid model is a 3.0-litre six-cylinder unit with BMW TwinPower Turbo technology. Also featured in the BMW 535i, this six-cylinder petrol engine



develops maximum power of 225 kW/306 hp at 5,800 rpm and maximum torque of 400 Newton metres (295 lb-ft) between 1,200 and 5,000 rpm, and has gained wide recognition as offering outstanding driving enjoyment and efficiency. It has already won the international “Engine of the Year” award two years in a row.

The six-cylinder powerplant’s BMW TwinPower Turbo technology comprises a twin-scroll turbocharger, High Precision Direct Injection and VALVETRONIC fully variable valve timing. This technology package improves throttle response, revving ability, refinement and efficiency, while an aluminium crankcase also optimises weight.

### **Electric motor: eager power delivery, compact design.**

The BMW ActiveHybrid 5’s synchronous electric motor develops a maximum output of 40 kW/55 hp. As well as supporting all-electric operation around town, it can also provide a performance-boosting function for the petrol engine to enable more powerful acceleration. In either case, the drive power is supplied instantly and without lag. Like all electric motors, this one develops its full torque – of 210 Newton metres (155 lb-ft) – from a standing start.

The electric motor is compactly integrated in the housing of the eight-speed automatic transmission, and is connected to the transmission by a clutch. Its operating temperature is controlled by the cooling system of the internal combustion engine.

Thanks among other things to its high internal efficiency and low weight, the eight-speed automatic transmission contributes to the efficiency of the powertrain as a whole. With its eight speeds, it combines a wide gear range with close ratio spacing. It also allows more use to be made of top gear, for a fuel-efficient, low-rpm driving style. The direct downshift capability and exceptionally short shift times can support very sporty driving too. Throughout, the high-performance transmission controller ensures that gear changes are always closely matched to the driver’s demands and the driving situation. Optionally, the BMW ActiveHybrid 5 can be supplied with a quick-shifting sports automatic transmission, whose dynamic characteristics are emphasised by a customised selector lever and steering wheel-mounted paddle shifts.

### **Lithium-ion high-voltage battery housed in the boot.**

The electric motor is powered by a lithium-ion high-voltage battery, which again was developed specifically for the BMW ActiveHybrid 5. The battery is encased in a special high-strength housing and positioned between the wheel arches in the boot. This provides optimal protection for the battery and helps to ensure a well-balanced weight distribution. The battery cooling

system is integrated into the air conditioning cooling circuit. The battery comprises 96 cells and has an effective energy capacity of 675 Wh.

In addition to its conventional 14V electrical system, the BMW ActiveHybrid 5 is also equipped with a high-voltage electrical system with a rated voltage of 317V. Linked by a voltage transformer, these two systems provide maximum electrical power throughout the operating range, for improved performance and comfort. Both the electric motor and the air conditioning compressor are powered exclusively by the lithium-ion high-voltage battery, via the high-voltage electrical system. This allows a pleasant interior climate to be maintained even when the internal combustion engine is switched off – i.e. when the car is at a standstill, operating purely on electric power or in coasting mode.



## 4. The driving experience: Innovative functions for maximum dynamics and efficiency.

- **All-electric operation up to a speed of 60 km/h (37 mph), coasting mode at any speed up to 160 km/h (100 mph).**
- **Hybrid start-stop function with stationary climate control for reduced fuel consumption with no compromises on comfort.**
- **World first: proactive intelligent energy management, based on integration of power electronics and navigation system.**

In the BMW 5 Series hybrid, BMW ActiveHybrid technology again combines a significant boost in driving enjoyment with a substantial reduction in fuel consumption and emissions. The precisely controlled power splitting between the internal combustion engine and the electric motor makes for an exhilarating hybrid driving experience. The BMW ActiveHybrid 5 is a full hybrid, which means that it is capable of operating solely on electric power, for zero-emission driving around town. At the same time it is also capable of very sporty performance – yet combines this with a double-digit percentage improvement in fuel consumption over the BMW 535i. Developed specifically for this model, the BMW ActiveHybrid technology reduces average fuel consumption to between 6.4 and 7.0 litres per 100 kilometres (40 – 44 mpg imp) and CO<sub>2</sub> emissions to 149 – 163 grams per kilometre (figures according to EU test cycle, may vary according to the tyre format specified).

To make the most of the ActiveHybrid technology in the BMW ActiveHybrid 5, the power electronics incorporate a range of innovative intelligent energy management functions whose aim is to ensure that the powertrain operates as efficiently as possible. In addition to the hybrid start-stop function, ECO PRO mode and the coasting mode (available at any speed up to 160 km/h / 100 mph), these functions also include a unique proactive powertrain control system. All these systems help to ensure that the energy supplied by the fuel is used as efficiently as possible.

### **Full-hybrid capabilities for zero tailpipe emissions around town, boost function for extra-dynamic performance.**

Up to a speed of 60 km/h (37 mph), the BMW ActiveHybrid 5 can operate in all-electric mode for zero emissions in town. Fully charged, the lithium-ion high-voltage battery provides an all-electric driving range of up to four kilometres (approx. 2.5 miles) at an average speed of 35 km/h (22 mph).

The internal combustion engine is only started when the driver requires more power; it is then engaged automatically. Its performance can be boosted by the electric motor to provide extra power when accelerating. Maximum combined power is 250 kW/340 hp, with maximum torque of 450 Newton metres (332 lb-ft). Under combined ICE/electric power, the BMW ActiveHybrid 5 delivers a 0 to 100 km/h (62 mph) acceleration time of 5.9 seconds. The governed top speed is 250 km/h (155 mph).

**Hybrid-specific auto start-stop function and coasting mode.**

The specially designed hybrid auto start-stop function ensures that comfort is not affected even when the vehicle is stopped in traffic for longer periods – because the automatic climate control is powered by the lithium-ion high-voltage battery. When moving off again, when the driver releases the brake, the vehicle will restart on either the electric motor alone or the electric motor and the petrol engine, depending on the high-voltage battery's current charge level and on how much power the driver wants.

ECO PRO mode, which can be activated with the Driving Experience Control switch, supports a particularly fuel-efficient driving style and makes more frequent use of all-electric mode. ECO PRO mode modifies the characteristics of the powertrain, including the transmission, while the electrically powered convenience functions are programmed for optimal energy efficiency.

A further function developed for the BMW ActiveHybrid 5 – the “coasting mode” – boosts efficiency by shutting the internal combustion engine down not only when the vehicle is stationary, or when driving in town, but also on overrun. Coasting mode switches off the petrol engine and disconnects it from the drive shaft. From this point on, the BMW ActiveHybrid 5 coasts soundlessly, with zero emissions and with no engine braking effect. The efficiency improvements are further enhanced by reduced rolling resistance tyres. In ECO PRO mode, the coasting function is available at any speed up to 160 km/h (100 mph). In any of the other modes selectable with the Driving Experience Control switch, the coasting mode is available at speeds up to 80 km/h (50 mph).

Even in coasting mode, all safety and comfort functions remain fully operational. When the engine is shut down, the stationary climate control continues to maintain a pleasant interior climate just as it does when the car is at a standstill or operating purely on electric power. The stationary climate control can also be used to cool the interior before getting into the vehicle.

## **Intelligent energy management with proactive analysis of the driving situation.**

In the BMW ActiveHybrid 5, the advanced-design power electronics have been developed a stage further. In addition to coordinating the operation of the internal combustion engine and electric motor with precise reference to the current driving situation, they also support proactive, forward-thinking analysis of the driving situation for even more efficient energy management. This is achieved by integrating the power electronics with the standard-fitted Navigation system Professional. The electronics can therefore access and analyse data that gives early warning of an upcoming change in external conditions or driver requirements. Based on this analysis, and subject to the quality of the navigation data, the vehicle can be prepared in advance for upcoming requirements so that all powertrain systems and the on-board electronics can be managed appropriately and in such a way as to make the most efficient possible use of the available energy.

Factors that may cause a change in powertrain operating strategy include the topography of the route and speed limits. For example, if the system knows that a downhill stretch is coming up soon, the BMW ActiveHybrid 5 can invest all the high-voltage battery's electrical energy in providing supplementary driving power, since the battery will be recharged during the forthcoming descent at no cost in terms of fuel consumption. On longer downhill sections the electric motor's generator function, too, can be enlisted to recharge the high-voltage battery with no loss of speed. The operating strategy can also be managed so as to ensure that the high-voltage battery is as fully charged as possible when nearing the end of the journey, thereby increasing the electric driving range on the "last lap".

The operating status of the powertrain components is shown in intuitive, model-specific displays in the instrument cluster and in the Control Display of the BMW ActiveHybrid 5. As well as the energy flow and energy recuperation display, these include a further gauge next to the rev counter which shows the boost effect being provided by the electric motor during acceleration. A model-specific menu in the iDrive operating system provides a variety of information – for example on the lithium-ion high-voltage battery's charge level and the power sharing between the internal combustion engine and the electric motor in the course of a journey. A fuel consumption history can also be displayed, which not only shows fuel consumption history for the previous 15 minutes but also how much driving power was provided by the electric motor.

**Exceptional hybrid model, typical BMW 5 Series: highest standards of driving dynamics, safety and comfort.**

The chassis specifications of the BMW ActiveHybrid 5 include a double-wishbone front axle and integral rear axle, Electric Power Steering including the Servotronic speed-sensitive power assist function, a high-performance brake system and 17-inch alloy wheels. Dynamic Damper Control, featuring electronically controlled damping, is optionally available. The Dynamic Stability Control (DSC) system, which stabilises the vehicle by applying braking pressure and reducing engine power, also incorporates functions such as Dynamic Traction Control (DTC), the Anti-lock Braking System (ABS), Cornering Brake Control (CBC), Dynamic Brake Control (DBC), Brake Assist, Fading Compensation, a Dry Braking function and Start-Off Assistant.

In the BMW ActiveHybrid 5, too, the standard-fitted Driving Experience Control switch offers ECO PRO, SPORT+, SPORT and COMFORT set-ups. If the optional Dynamic Damper Control is specified, it also offers COMFORT+. These different modes allow the driver to alter the accelerator response characteristics, engine response, the power steering characteristics, the DSC settings, the shift characteristics of the automatic transmission and, if the vehicle is equipped with Adaptive Drive, the damping characteristics as well.



## 5. Design: Detailed indications of outstanding efficiency.

- **Hybrid model based on the BMW 5 Series Sedan, with familiar sporty and elegant body design.**
- **Striking design touches: lettering on the C-pillars and door sills, special kidney grille slats and exhaust tailpipes.**
- **Exclusive Bluewater metallic paint finish and 18-inch Streamline light-alloy wheels available as options.**

Dynamic lines and precisely contoured surfaces give the body of the BMW 5 Series Sedan an unmistakable and expressive appearance. And that means the BMW ActiveHybrid 5 exudes a similarly assured presence, stylish elegance and promise of supreme sports performance the first time you set eyes on it. However, the hybrid 5 Series stands apart from its siblings visually with the addition of design features hinting at the pioneering drive technology beneath the surface. These eye-catching touches bring into even sharper focus the car's exceptional efficiency – which, along with their hallmark BMW driving pleasure, outstanding comfort and uncompromising premium quality, defines the character of all BMW 5 Series models.

The typically BMW proportions of the Sedan are headlined by a sweeping bonnet, short overhangs, long wheelbase and a roof line that swoops dynamically into the rear end. The front end, for example, is given expressive presence by the upright BMW kidney grille, V-shaped contours of the bonnet, broad, three-section styling of the air intake and powerfully flared wheel arches. The BMW ActiveHybrid 5 incorporates the brand's traditional kidney grille – which stands out with its galvanised slats – as a visual link to the engine behind it. The tops of the twin circular headlights, meanwhile, are levelled off by an accent strip, giving them the focused look typical of BMW cars. And if the optional xenon headlights are specified, the daytime running lights feature visually distinctive LED light rings.

### **Model lettering on the C-pillars and boot lid.**

Viewed from the side, the car's wedge shape underlines the sporty, forward-surgingly character of the Sedan. Its silhouette radiates a fine sense of balance, reflecting the even distribution of weight between the front and rear axles, while extra flaring around the rear wheel arches emphasises the presence of rear-wheel drive. High-quality details, such as the particularly tight line of the Hofmeister kink at the base of the C-pillar, chrome-coloured design elements

containing integrated side indicators and the door openers recessed into the side swage lines reinforce the Sedan's premium character. The hybrid model can also be identified by the "ActiveHybrid 5" lettering on its C-pillars.

The powerfully formed rear end, with its dominant horizontal lines, accentuates the sporting credentials of the Sedan. The L-shaped LED rear lights ensure the car is instantly recognisable at night. Identifying features of the hybrid model include additional "ActiveHybrid 5" lettering on the boot lid and matt chrome exhaust tailpipes integrated into the far left and right of the rear apron. The BMW ActiveHybrid 5 is the only member of the BMW 5 Series family which can be ordered in the exterior paint shade Bluewater metallic. 18-inch Streamline light-alloy wheels with optimised aerodynamic properties are also available exclusively for this model.

### **Open the door to subtlety.**

In common with its BMW 5 Series siblings, the interior of the BMW ActiveHybrid 5 is characterised by its driver-focused cockpit design and impressive spaciousness. However, the hybrid model also contains a selection of bespoke touches, including "ActiveHybrid 5" lettering on the front door sills and an aluminium plate with the same inscription in front of the gearbox's selector lever on the centre console. The ActiveHybrid 5 also stands apart from the other variants of the Sedan with its model-specific engine cover and "ActiveHybrid Power Unit" badge visible on the special casing of the high-performance battery in the luggage compartment.

Like all BMW 5 Series models, the BMW ActiveHybrid 5 boasts an instrument cluster with black panel technology. The rev counter, for example, also includes graphics detailing the electric motor's boost function and for the energy flow and recuperation display. The instrument cluster of the BMW ActiveHybrid 5 also comes as standard with a 9.2-inch display for extended display capability. In addition to the likewise standard navigation system, numerous other vehicle, entertainment and communications functions can be operated via the iDrive system, whose Control Display is integrated harmoniously into the Sedan's instrument panel.



## 6. Body and safety: Intelligent systems, perfectly integrated.



- **High body strength and optimised weight thanks to intelligent lightweight design.**
- **Integrated safety concept for hybrid components.**
- **High carrying capacity thanks to compact integration of lithium-ion high-voltage battery.**

The body structure of the BMW ActiveHybrid 5 meets highest standards of strength and intelligent lightweight design. Using the right materials in the right places not only provides an excellent basis for passive safety but also results in optimised weight, and therefore in improved efficiency and driving dynamics. The safety components are all carefully synchronised within a comprehensive system that was developed specifically for the BMW 5 Series Sedan and delivers outstanding levels of occupant protection. In addition, pedestrian protection is enhanced by special contouring of the front-end body components and by an active bonnet.

The BMW ActiveHybrid 5 has an extremely stiff passenger cell. Intelligent use of higher-strength multi-phase steels and hot-stamped ultra-high-tensile steel helps give the safety passenger cell maximum rigidity, combined with relatively low weight.

### **Comprehensive safety specification.**

In a collision, high-strength load-bearing structures and large deformation zones help to keep impact forces away from the passenger cell and also from the hybrid drive components. Standard safety features on the BMW ActiveHybrid 5 also include front and side airbags, side curtain head airbags for both rows of seats, three-point inertia-reel belts on all seats, front-seat belt force limiters, belt latch tensioners and active head restraints, and ISOFIX child seat attachments in the rear.

The optional Active Protection function helps to mitigate the risk of occupant injury in a collision. If an accident risk is detected this system, which is controlled by the central safety electronics, automatically closes the side windows and the sunroof (if fitted). At the same time the front seatbelts are pre-tensioned and, if comfort seats are fitted, their backrests are adjusted to an upright position.

The hybrid components are likewise protected by a comprehensive safety package. All elements of the high-voltage electrical system are protected by extensive insulation and specially designed connectors. The hybrid-related safety features protecting the lithium-ion high-voltage battery and the power electronics are integrated into the top-class comprehensive active and passive safety system featured on all BMW 5 Series models.

Since the lithium-ion high-performance battery is packaged in the boot, the load capacity (375 litres) of the BMW ActiveHybrid 5 is reduced by 145 litres compared with other BMW 5 Series Sedan models. The battery is encased in a special housing and is fitted in a protected position between the wheel arches, which also offers optimal security in a crash. The vertical partitioning between the battery and the boot means that there is no loss of height and width in the boot, which can still accommodate larger items of luggage. The positioning of the high-voltage battery near to the rear axle also contributes to the balanced weight distribution of the BMW ActiveHybrid 5.

#### **Optimised weight due to intelligent multi-material mix.**

Intelligent lightweight design is a further area where the BMW ActiveHybrid 5 sets standards in its class. The hybrid-related components result in a weight penalty of just 140 kilograms compared with the BMW 535i. The hybrid model also benefits from the intelligent multi-material mix developed for this model series. The bonnet, front side panels, front spring struts and the doors are all made of aluminium. The use of aluminium doors alone results in an overall vehicle weight saving of around 23 kilograms compared with conventional steel doors.

The hallmark BMW twin round headlamps, including LED light rings with sidelight and daytime running light functions, are standard specification, along with a light sensor and rain sensor. Optionally, bi-xenon headlights and Adaptive Headlights with cornering lights are available. To reduce the risk of rear-end collisions, the BMW ActiveHybrid 5 is equipped as standard with adaptive brake lights. If the driver brakes very sharply and the ABS system intervenes, drivers behind are warned by conspicuous flashing of the brake lights that they too should brake as hard as possible.



## 7. Equipment and BMW ConnectedDrive: Wide range of options, intelligent integration.

- **High-quality standard equipment, including 4-zone automatic climate control, stationary climate control and Navigation system Professional.**
- **Exclusive comfort-enhancing options: active seat ventilation, Soft Close Automatic function, heated steering wheel, Comfort Access and hands-free boot lid opening.**
- **Unrivalled variety of driver assistance systems and mobility services: Head-Up Display, Parking Assistant, BMW Night Vision, office functions, internet, real-time traffic information, apps.**

The BMW ActiveHybrid 5 combines its pioneering driving pleasure and efficiency-boosting drive technology with the customary comfort-enhancing properties of the BMW 5 Series. It also comes with a particularly extensive range of standard equipment, while almost all of the options available for the BMW 5 Series Sedan can also be specified to tailor the hybrid model to the owner's personal requirements and tastes.

The range of BMW ConnectedDrive features is impressively wide-reaching. These driver assistance systems and mobility services use the intelligent integration of the driver, car and outside world to optimise the comfort, safety and operation of the on-board infotainment functions.

### **Climate control with individual controls and stationary function.**

The 4-zone automatic climate control fitted as standard in the BMW ActiveHybrid 5 allows the ventilation and temperature to be controlled individually both for the driver and front passenger and in the rear. This system comprises comfort air vents, additional outlets in the B-pillars and a separate control unit on the rear face of the centre console. The BMW ActiveHybrid 5 sources the energy for its air conditioning compressor from the lithium-ion high-performance battery. The standard-fitted stationary climate control function allows the on-board temperature to be controlled even when the combustion engine is switched off. In order to cool the interior in advance, the system can also be activated from outside the car several minutes before the start of a journey, using the car key or by remote control.

The likewise standard Navigation system Professional includes hard disk storage for maps and music collections. It is operated using the iDrive system

which, in addition to the Controller with direct menu control buttons on the centre console, also includes a 10.2-inch monitor integrated into the instrument panel. The iDrive system is also used to operate a host of vehicle, communications and entertainment functions.

**Exclusive options for tailor-made comfort, extensive range of BMW ConnectedDrive features.**

Available in addition to the equipment fitted as standard are comfort and individuality-enhancing extras such as active seats, active seat ventilation, an electrically adjustable steering column and a heated steering wheel. The optional Comfort Access, meanwhile, includes hands-free boot lid opening, a Soft Close Automatic function can be specified for the doors, and an electrically operated glass roof and high-quality audio and rear-seat entertainment systems are also on the options list.

The selection of BMW ConnectedDrive systems available as an option for the BMW ActiveHybrid 5 includes Park Distance Control, a rear-view camera, Surround View, Adaptive Headlights and High-Beam Assistant. Other driver assistance systems on the options list are Speed Limit Info, BMW Parking Assistant, the Lane Change Warning System, the Lane Departure Warning System, BMW Night Vision with pedestrian detection and the BMW Head-Up Display. Plus, innovative technologies allow both the integration of an Apple iPhone (or other smartphones) and music players and the use of the real-time traffic information function and apps. Among other features, the apps option enables Apple iPhone owners to receive web radio stations and view Facebook and Twitter posts on the on-board monitor.

## 8. Production: Technology and quality of the highest standard.



- **BMW ActiveHybrid 5 built at BMW Plant Dingolfing together with all other BMW 5 Series models, the BMW 6 Series and BMW 7 Series.**
- **Unbeatable quality and efficiency achieved through the use of innovative product and process modules.**
- **Integration of hybrid components by trained experts, as in production of the BMW ActiveHybrid 7.**

The BMW ActiveHybrid 5 adds an even more efficient and technologically groundbreaking model to the BMW 5 Series range. The new model will be produced alongside the other variants of the BMW 5 Series at BMW Plant Dingolfing. The BMW 5 Series Sedan, BMW 5 Series Touring and BMW 5 Series Gran Turismo all roll off the assembly line at Dingolfing, the largest production plant for BMW cars worldwide. Plus, the plant also handles production of the BMW 6 Series and BMW 7 Series, including the BMW ActiveHybrid 7. And that makes the BMW ActiveHybrid 5 already the brand's second hybrid model to be produced at Dingolfing.

The BMW plant in Dingolfing, Lower Bavaria, has been part of the company's global production network since 1967. Today this network comprises 25 plants in 14 countries across five continents. 1973 saw the start of BMW vehicle production at the newly constructed Plant 2.4 in Dingolfing. Approximately 18,600 people currently work at the site, more than 12,000 of them in car production at Plant 2.4.

### **Integrated production optimises quality and efficiency.**

The shared vehicle architecture for the BMW 5 Series, 6 Series and 7 Series models forms the basis for integrated production at BMW Plant Dingolfing. Manufacturing quality and efficiency are optimised through the use of shared product and process modules. The flexible set-up of the production machinery ensures both even capacity utilisation across the plant and rapid delivery as part of the Customer-Oriented Sales and production Process (KOV).

Synergies are generated by the use of modular vehicle components, or product modules. The benchmark for the functionality and quality of these

components is provided by the extremely high standards that apply for the BMW 7 Series Luxury Sedan.

### **Ongoing improvement of the production process.**

BMW Plant Dingolfing operates according to the very latest principles of modern production process design and in line with the BMW Value-Added production system (VPS). Process-sharing is a typical example of this approach. Shared vehicle components provide the basis for using integrated production processes, in which top-quality multi-model production on a single assembly line is combined with integrated production planning. The result is that the BMW ActiveHybrid 5 is assembled on the same production line as all the variants of the BMW 5 Series Sedan, BMW 5 Series Touring and BMW 5 Series Gran Turismo. All hybrid-specific components are integrated during the series production process. Further advances are achieved by developments in the area of Value-Added Technology Processes (VTP) and logistics. The goal is to achieve one-piece flow of parts and materials from the supplier through to the completion of the vehicle.

In technological terms as well, the accent is on developing innovative production techniques. For example, the door production process is based on the results of research work carried out at the Dingolfing-based BMW Group Aluminium Competence Centre. Innovative processes have been introduced in sheet steel processing too. 50 million euros has been invested in two new sheet steel presses for the Dingolfing plant which are now turning out exceptionally high-quality body parts for the BMW ActiveHybrid 5. It makes BMW the world's first carmaker to use a hot-stamping technique whereby galvanised sheet steel is cold-formed, heated to a temperature of over 900 degrees Celsius, then immediately water-cooled to a temperature of around 70 degrees and hardened. This technique gives the components between three and four times the strength of conventional sheet steel.

### **Concentrated expertise in the field of hybrid technology.**

BMW Plant Dingolfing also carried out a rigorous programme of expertise development in the area of hybrid technology and its integration into the relevant models. The BMW ActiveHybrid 7 has been produced here since 2009. As with this model, the integration of all hybrid components into the BMW ActiveHybrid 5 will also be carried out by specially trained plant employees in a separate process stage. For example, installing the high-performance battery demands additional production know-how on account of its particularly high voltage (over 400 V).

The plant's targeted development of expertise has enabled hybrid BMW models to be incorporated into the integrated production process

through the intelligent fusion of state-of-the-art automated process engineering and the skilled craftsmanship of specially trained employees.

## 9. Specifications. BMW ActiveHybrid 5.



<b>BMW ActiveHybrid 5</b>		
<b>Body</b>		
No. of doors/seats		4 / 5
Length/width/height (unladen)	mm	4899 / 1860 / 1464
Wheelbase	mm	2968
Track, front/rear	mm	1600 / 1627
Ground clearance		141
Turning circle	m	11.95
Tank capacity	approx. l	67
Cooling system incl. heating	l	10.3
Engine oil <sup>2)</sup>	l	6.5
Weight, unladen, to DIN/EU	kg	1850 / 1925
Max load to DIN	kg	550
Max permissible weight	kg	2400
Max axle load, front/rear	kg	1140 / 1350
Max trailer load, braked (12%)/unbraked	kg	- / -
Max roof load/towbar download	kg	100 / -
Luggage comp capacity	l	375
Air drag	$c_d \times A$	0.28 x 2.35
<b>Engine</b>		
Configuration/No. of cyls./valves		R / 6 / 4
Engine technology		BMW TwinPower Turbo technology with twin-scroll turbocharging, High Precision Direct Petrol Injection and fully variable valve control (VALVETRONIC)
Effective capacity	cm <sup>3</sup>	2979
Bore/stroke	mm	89.6 / 84.0
Compression ratio	:1	10.2
Fuel grade		min RON 91
Output	kW/hp	225 / 306
at	min <sup>-1</sup>	5800
Torque	Nm	400
at	min <sup>-1</sup>	1200-5000
Output electric motor	kW/hp	40 / 55
Torque electric motor	Nm	210
System output	kW/hp	250 / 340
System torque	Nm	450
<b>Electrical system</b>		
Battery/Installation	Ah/-	90 +50 / luggage comp.
High-voltage battery	Wh	1350
Alternator	A/W	200 + 170 / 2800 + 2400
<b>Driving dynamics and safety</b>		
Suspension, front		Double track control arm with separate lower track arm level, aluminium, small steering roll radius, anti-dive
Suspension, rear		Integral-V multi-arm axle, aluminium, with anti-squat and anti-dive, double acoustic separation
Brakes, front		Frame-type aluminium single-piston floating-calliper disc brakes
Diameter	mm	348 x 36 / vented
Brakes, rear		Aluminium single-piston floating-calliper disc brakes
Diameter	mm	345 x 24 / vented
Driving stability systems		Standard: DSC incl. ABS and DTC (Dynamic Traction Control), CBC (Cornering Brake Control), DBC (Dynamic Brake Control), Dry Braking function, Fading Compensation, Start-Off Assistant, optional: Dynamic Damping Control
Safety equipment		Standard: airbags for driver and front passenger, side airbags for driver and front passenger, head airbags for front and rear seats, three-point inertia-reel seatbelts on all seats with belt stopper, belt latch tensioner and belt force limiter integrated in the front seats, crash-activated head restraints at the front, crash sensors, Tyre Defect Indicator
Steering		Electric Power Steering (EPS) with Servotronic
Steering ratio, overall	:1	17.1
Tyres, front/rear		225/55 R17 97W
Rims, front/rear		8J x 17 light-alloy



**BMW ActiveHybrid 5**

**BMW ConnectedDrive**

Comfort	Optional: BMW Assist incl. Enquiry Service, remote-control functions, Real-Time Traffic Information, BMW TeleServices, integration of mobile devices
Infotainment	Optional: internet access, BMW Online incl. Park Info, National Info, Google Local Search, News, Real-Time Weather, BMW Routes, Office functions, Bluetooth Audio Streaming, Online Update Music Tracks, apps
Safety	Optional: Adaptive Headlights with cornering lights, variable light distribution and adaptive headlight range control, High Beam Assistant, Park Distance Control, rear-view camera, Surround View incl. Top View and Side View, BMW Night Vision with pedestrian detection, Head-Up Display, Parking Assistant, Lane Change Warning, Lane Departure Warning, Speed Limit Info, Active Protection, Advanced eCall

**Transmission**

Type of gearbox	Eight-speed automatic with Steptronic		
Gear ratios	I	:1	4.714
	II	:1	3.143
	III	:1	2.106
	IV	:1	1.667
	V	:1	1.285
	VI	:1	1.000
	VII	:1	0.839
	VIII	:1	0.667
	R	:1	3.317
Final drive		:1	2.929

**Performance**

(System) Power/weight ratio	kg/kW	8.2 (7.4)
Output per litre	kW/l	75.5
Acceleration	0–100 km/h	s
	0–1000 m	s
in 4th gear	80–120km/h	s
Top speed	km/h	250

**BMW EfficientDynamics**

BMW EfficientDynamics standard features	BMW ActiveHybrid, Brake Energy Regeneration with energy flow and efficiency display, hybrid-specific Auto Start-Stop function, EPS (Electric Power Steering), ECO PRO mode, intelligent lightweight construction, air flap control, on-demand operation of ancillary units, climate compressor integrated in the high-voltage network, map-controlled oil pump, tyres with reduced rolling resistance
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**Fuel consumption EU<sup>3)</sup>**

with standard tyres: rims 8J x 17, tyres 225/55 R17 (option 2K1)		
Urban	l/100km	5.7
Extra-urban	l/100km	6.7
Combined	l/100km	6.4
CO <sub>2</sub>	g/km	149
rims 8J x 18 and tyres 245/45 R18 or winter tyres (option 2AU, 2HM, 2K2, 931)		
Urban	l/100km	6.1
Extra-urban	l/100km	7.3
Combined	l/100km	6.8
CO <sub>2</sub>	g/km	160
rims 8J x 18 front, 9J x 18 rear and tyres 245/45 R18 front, 275/40 R18 rear (option 2AH, 2DC, 2NC), rims 8.5J x 19 front, 9J x 19 rear and tyres 245/40 R19 front, 275/35 R19 rear (option 2K3, 2WC, 2MZ, 2ND), rims 8.5J x 20 front, 9J x 20 rear and tyres 245/35 R20 front, 275/30 R20 rear (option 2H9)		
Urban	l/100km	6.2
Extra-urban	l/100km	7.4
Combined	l/100km	7.0
CO <sub>2</sub>	g/km	163
Emission rating		EU5

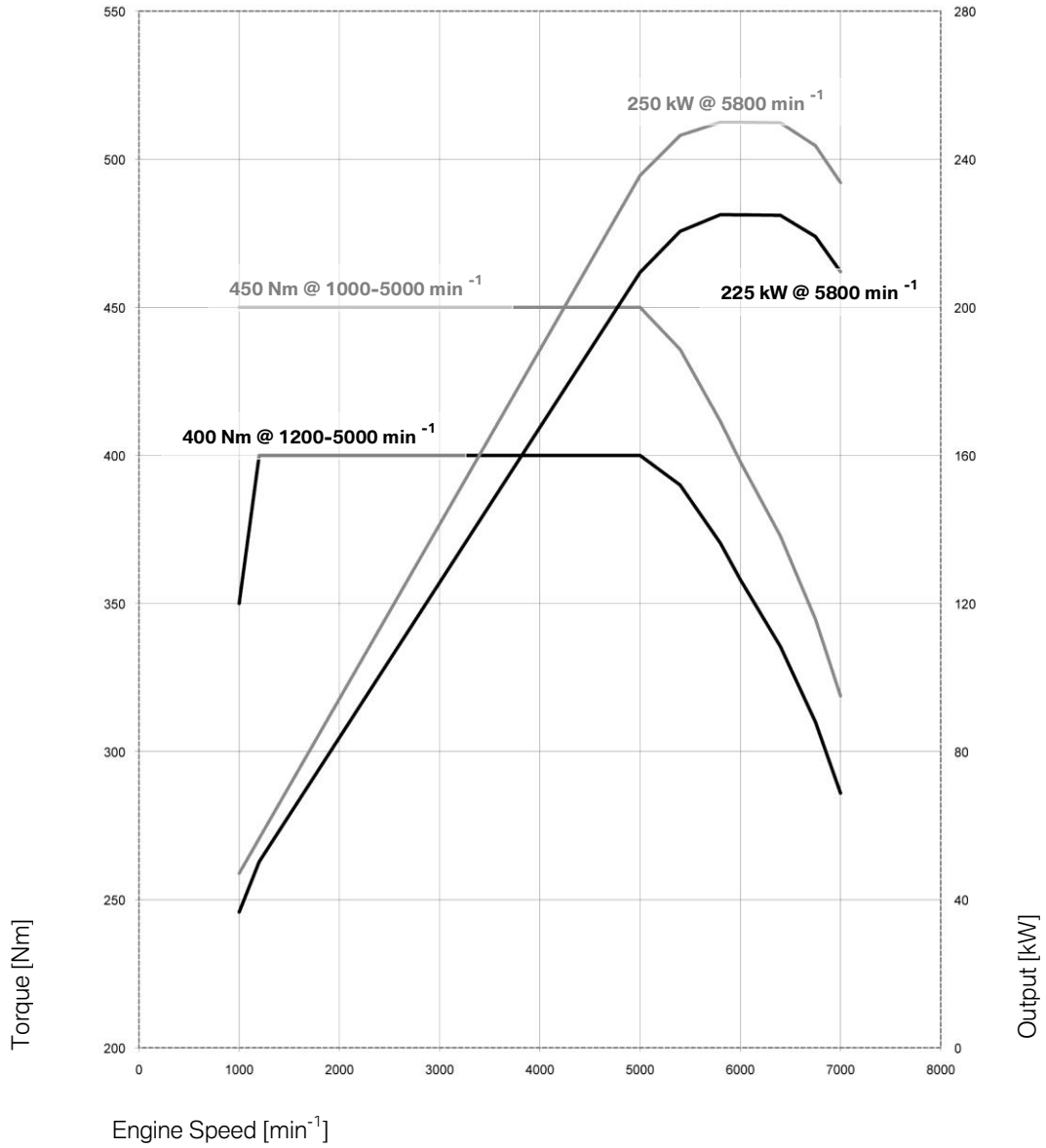
Specifications apply to ACEA markets; data relevant to homologation applicable in part only to Germany (weight)

<sup>1)</sup> Height with roof fin: 1475 mm

<sup>2)</sup> Oil change

<sup>3)</sup> Fuel consumption and CO<sub>2</sub> emissions vary according to the wheel and tyre sizes selected

# 10. Output and torque diagrams. BMW ActiveHybrid 5.



# 11. Exterior and interior dimensions. BMW ActiveHybrid 5.

