



The **B-Class** with Fuel Cell Electric Drive Technology - The propulsion system of tomorrow

Mercedes-Benz

«Our philosophy is quite simple: we do our best for people who expect the best.»

Dr. Dieter Zetsche

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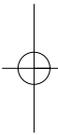
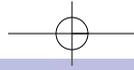
# Drive the car of tomorrow ... today!

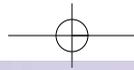
Efficient and environmentally friendly mobility for the present and the future: fuel cell technology makes the vision of emission-free driving a reality. The Mercedes-Benz B-Class F-CELL is the first series-produced electric vehicle with fuel cell propulsion that is suitable for

everyday use. The car emits only water and no pollutants. Mercedes-Benz sets new benchmarks in powertrain technology and clean fuels, as well as efficiency and comfort. Emission free driving has never been so enjoyable.







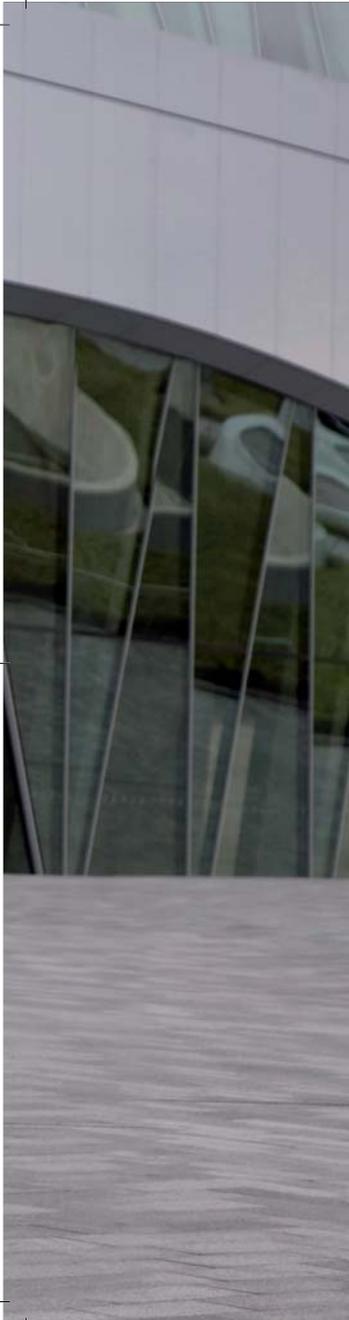




## A distinctive appearance - dynamic and quiet.

The exterior design of the B-Class F-CELL is unique. A dynamic appearance is created by the standard sports package, including 16-inch ten-spoke light-alloy wheels and reflecting trim strips on the rear bumpers. The chrome trim gives the car's sporty character an additional elegant

sparkle. By contrast, the barely audible noise of the B-Class F-CELL is pure understatement. Even under extreme load, the electric motor can hardly be heard very different from what one is accustomed to from conventional cars with internal combustion engines.



## Dynamic as a whole – innovative in detail.

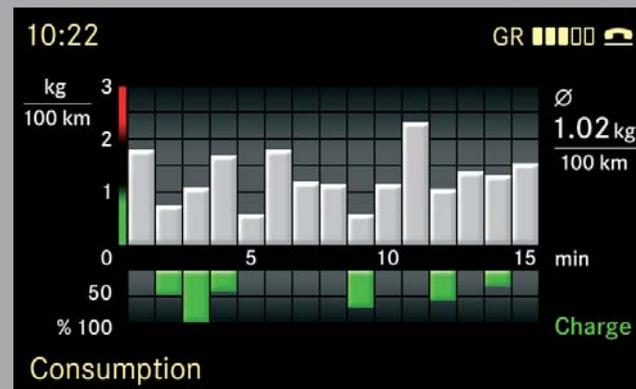
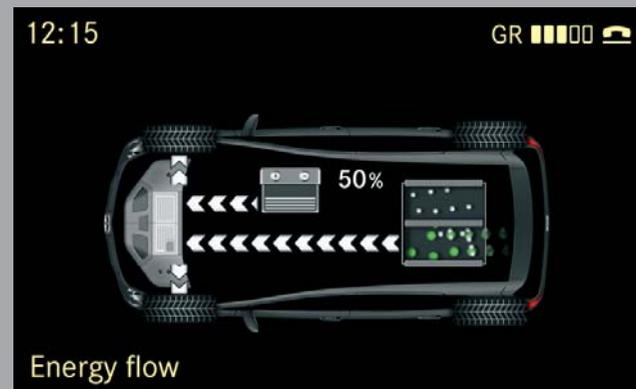
You won't miss anything in the first series produced fuel cell vehicle by Mercedes-Benz. First-class equipment and fuel cell-specific features provide for a maximum level of comfort.

The passenger compartment features the typical Mercedes-Benz appointments for this class. Superb leather seats and aluminum applications enhance the experience. The integrated COMAND APS system allows for numerous multimedia applications.

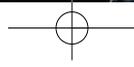
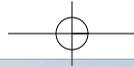
Instrumentation is adapted to fuel cell specific requirements. The control system COMAND APS is supplemented with an energy flow diagram for the propulsion system which also keeps the driver informed about the current fuel consumption. The integrated navigation system easily guides you to the next hydrogen fueling station.

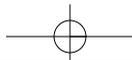
With the automatic climate control THERMOTRONIC as standard, separate temperatures can be set for the driver and front passenger.

High-quality appeal, love of detail and a spacious interior are the impressions the B-Class F-CELL will leave with you.



F-CELL-specific displays in COMAND APS







## Protecting the environment at idle.

The B-Class F-CELL is designed for maximum efficiency. The fuel cell drive is complemented with a start-stop system which allows fuel cell cars to be twice as efficient as a car with a modern internal combustion engine. This saves hydrogen while waiting at traffic lights or in traffic jams thereby, reducing the energy consumption of the car.

Under low load conditions, the fuel cell system is not required and thus the hydrogen supply is stopped. When accelerating again, the battery provides all the power needed. Reaching a certain level of power demand, the fuel cell system is seamlessly activated again.





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## When you drive, you continue to protect the environment.

The B-Class F-CELL is equipped with an electric drivetrain which powers the front wheels. Energy comes from the fuel cell which efficiently generates electricity to power a high performance electric motor at the front axle. This electric engine then powers the car.

The impressive torque of 290 Nm of torque available from a standing start, enables a driving performance comparable to a B180 CDI.

Regardless of whether you drive in the city or on the highway, the B-Class F-CELL is quiet, dynamic, and a pleasure to drive. Yet, fuel consumption is very low and no pollutants or greenhouse gases are emitted.

The newly designed fuel cell stack of the B-Class F-CELL is smaller and more powerful than its predecessor, yet more fuel efficient. In addition, the system features cold-start capability achieved by innovations like an optimized operating strategy and the new humidifier/dehumidifier system of the fuel cell stack.

This makes it superior to all previous fuel cell drives. Within just a few years, fuel cell vehicles will be fully competitive in terms of power, comfort, driving pleasure, and safety, the B-Class F-CELL already is.



# Your own power plant. Energy for being on the road.

The entire fuel cell system and hydrogen tanks are accommodated in the sandwich floor below the passenger cabin of the B-Class F-CELL. A high-voltage battery is located in the rear of the car, while the electric drive and the cooling systems are found in the engine compartment.

The fuel cell system is designed modularly and consists of the following components:

**1) Fuel Cell Stack:** Many fuel cells are stacked together end to end. Here, the reaction between hydrogen and oxygen creates electricity, the only "emission" being pure water vapor (steam).

**2) Tank system:** Compressed-gas cylinders in which the hydrogen is stored at a pressure up to approx. 700 bar.

**3) Battery:** The lithium-ion battery stores electricity to support acceleration. It is supplied from the fuel cell system and from regeneration. Regeneration means that braking energy is captured and converted to electricity.

**4) Electric motor:** High-torque electric motor that is powered by the electricity from the fuel cell system and the battery. The electric motor drives the front wheels of the car.



# Produce water? This drive can do a lot more.

Indeed, the B-Class F-CELL only emits pure water. However, this is only a by-product. The main purpose of the fuel cell system is to enable a highly-efficient chemical reaction, transforming fuel into power.

This reaction between hydrogen and oxygen in the fuel cell stack provides the electricity for the electric drive of the car. The required hydrogen is stored in the hydrogen tanks, while the oxygen is taken from the ambient air.

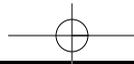
The heart of the fuel cell is a proton exchange membrane, i.e. a plastic foil with the thickness of only one tenth of a millimeter. It separates hydrogen and oxygen gases. It is covered on both sides by a very thin platinum coating, acting as a catalyst. It dissociates the hydrogen into positively charged protons and negatively charged electrons.

The protons pass through the membrane and react with the oxygen, forming water. Electrons, however, cannot travel through the membrane and are held back.

The surplus of electrons on the hydrogen side and corresponding deficit of electrons on the oxygen side results in the formation of a cathode and an anode. Connecting the two creates an electric current, which is utilized to power the car.

The base load of the vehicle is covered by the fuel cell system or the battery. For power peaks, e.g. at acceleration, the combined energy of both the fuel cell system and the battery can be used.

When the brakes are applied, the electric motor functions as a generator and retrieves the kinetic energy, charging the battery.



Electrical  
energy

Anode

Cathode

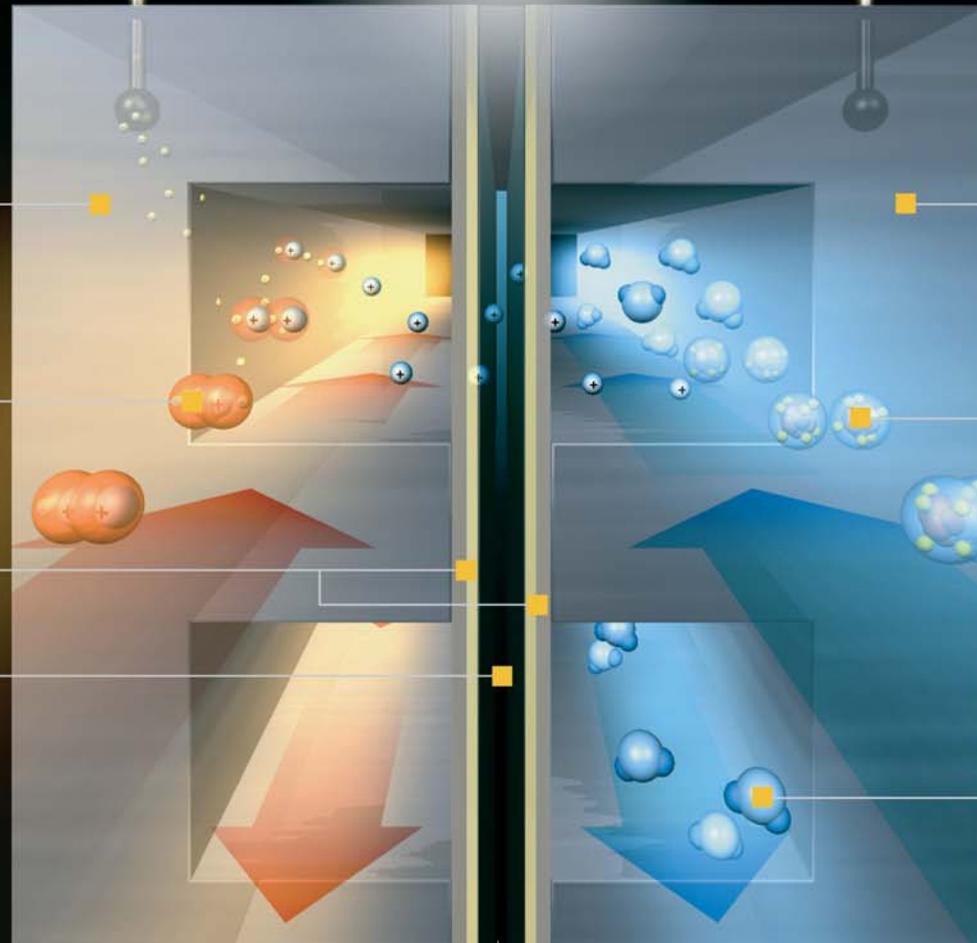
Fuel  
[Hydrogen]

Ambient air  
◀ [Oxygen]

Catalyst

Membrane

▶ Water [H<sub>2</sub>O]  
+ Heat + Air





Hydrogen fueling station by Linde in Lohhof near Munich



## Driving with hydrogen. Freedom and independence.

The hydrogen required for your B-Class F-CELL is already available at several fueling stations.

The refueling process is quick, easy and safe, similar to fueling a conventional car. At the same time, hydrogen fueling is much cleaner than today.

Hydrogen is a new fuel with unique advantages for the transportation sector. It can be derived from numerous fossil and renewable sources making us more energy independent.

As hydrogen can easily be shipped and stored, it is possible to decouple energy production and usage – both in terms of time and space. This makes hydrogen the ideal energy carrier.

For a large-scale market introduction of fuel cell vehicles it is essential that a dense network of fueling stations is established. To achieve this goal, car manufacturers are working hand in hand with oil companies, electric supply companies, and public decision-makers worldwide.



Hydrogen can be derived from regenerative energy sources.



# Innovative by tradition. The inventor of the automobile paves the way for sustainable mobility.

With its unique automotive history and as the inventor of the automobile, Mercedes-Benz is determined to set the pace for the whole car industry.

Berta Benz, the wife of co-founder Carl Benz, already enjoyed the freedom of a new kind of mobility back in 1888. Today, our engineers are working on the next mobility revolution: the fuel cell concept.

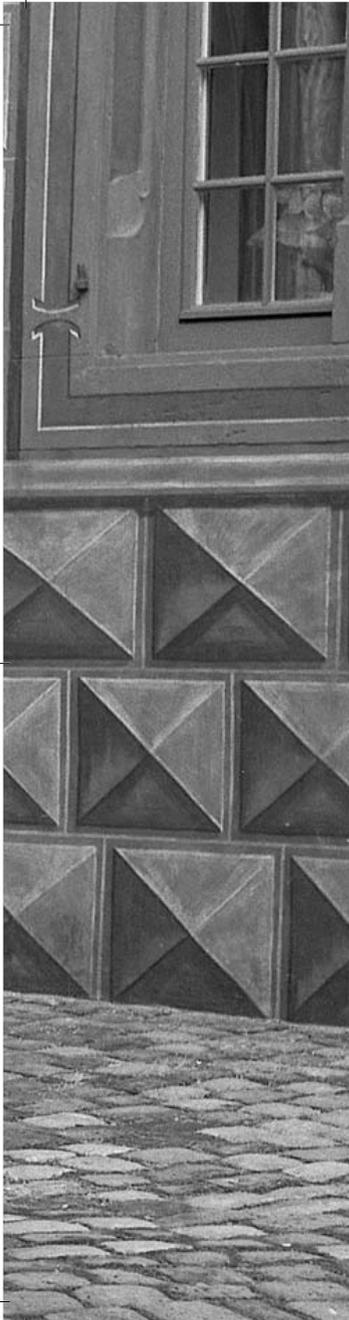
We are taking responsibility for both society and environment, and are therefore determined to make mobility sustainable and viable for the future.

Thus, in the technical development of driving technology we will focus on three areas: The further optimization of

high-tech combustion engines, an additional increase in efficiency by hybridization, and emission-free driving with fuel cell and battery electric vehicles.



Fuel Cell Roadster: Homage to 120 years of automotive history

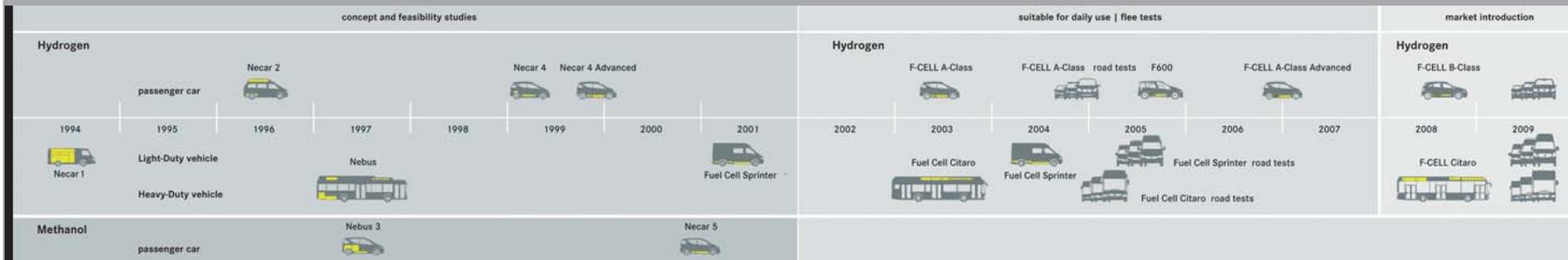


# Singular experience. Prepared for the future.

The first drivable fuel cell vehicle of Mercedes-Benz was presented in 1994 and is regarded as the pioneer of this forward-looking technology. During the next few years, numerous concept cars and prototypes were built to prove the feasibility of fuel cell technology to power cars. Among them were busses, vans, and passenger cars. At the beginning of 2000, the first fleet of fuel cell cars was built and, for the first time, field tested in everyday use by customers.

With each generation of vehicles and drive systems the output was enhanced, while at the same time reducing component size.

Today, our engineers have the knowledge and experience in fuel cell technology to ensure Mercedes-Benz a leading position within the automotive industry.

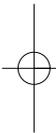
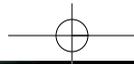


More than 4,000,000 kilometers covered with fuel cell vehicles since 1994



Mercedes-Benz A-Class with fuel cell drivetrain





## The future is blue. Concept BlueZERO.

A successor to the B-Class F-CELL is already being developed. The Mercedes-Benz BlueZERO F-CELL gives an indication of the next generation of fuel cell vehicles.

Based on a single vehicle architecture, this intelligent, modular concept allows for further models with additional drive architectures, along with the fuel cell vehicle.

The BlueZERO E-CELL is powered by a lithium-ion battery that is charged from electrical outlets.

The BlueZERO E-CELL PLUS also gets energy from an on-board battery however it can also be recharged by a generator which is powered by an internal combustion engine, located in the rear of the car.

The concept BlueZERO is yet another clear statement by Mercedes-Benz that environmental awareness and driving pleasure will continue to go together in our vehicles of the future.



## Standard equipment.\*

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16-inch ten-spoke light-alloy wheels, size 205/60 R 16

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Aluminum trim strips

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COMAND APS with map-based hard-disc navigation, LINGUATRONIC, DVD-changer, hydrogen fueling stations integrated in navigation maps, detailed fuel consumption indicator, energy flow diagram

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Exterior chrome package, adaptive brake lights

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Fixed center armrest, removable in the rear, with cup holder

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Heated front seats

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Leather seating in alpaca grey

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Lighting package, consisting of interior mirror with automatic dimming function, rain sensor, headlamp switch-off delay, locator lighting, bulb failure indicator, reading light for driver, reading light in rear, illuminated vanity mirror, footwell lights

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Power folding exterior mirrors

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Power one touch electric front and rear windows

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Seat Comfort Package: front seats are electrically height adjustable, with seat cushion angle adjustment.

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Single-speed automatic transmission (1 forward and 1 reverse gear) with cruise control

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Special metallic paint bonamit silver

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Sports package, steering wheel featuring two aluminum highlights and fine leather trim, leather trimmed gearshift and handbrake lever, pedals fitted with stainless steel caps, featuring black rubber studs, reflecting trim strips on the rear bumpers

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THERMOTRONIC luxury automatic climate control

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Tire pressure loss warning system

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White illuminated of instrument panel, fuel cell-specific contents, power meter, state of charge indicator for high-voltage battery

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16-inch ten-spoke light-alloy wheels



Gearshift lever for 1-speed transmission



Outstanding flexibility and a huge cargo volume

\* No options available

# Technical data.<sup>1</sup>

## VEHICLE DATA

Peak power	100 KW (136 PS)
Net power	70 KW (95 PS)
Max torque	290 Nm
Top speed	170 km/h
Acceleration, 0 - 100 km/h	11,4 seconds
Curb weight <sup>2</sup>	1.809 kg
Gross vehicle weight <sup>3</sup>	2.084 kg
Payload <sup>3</sup>	275 kg
Cargo capacity	545 - 1345 litres
Fuel economy (NEDC)	0,97 kg H <sub>2</sub> /100 km
CO <sub>2</sub> -Emissions	0,0 g/km
Range (NEDC)	385 km

## POWERTRAIN

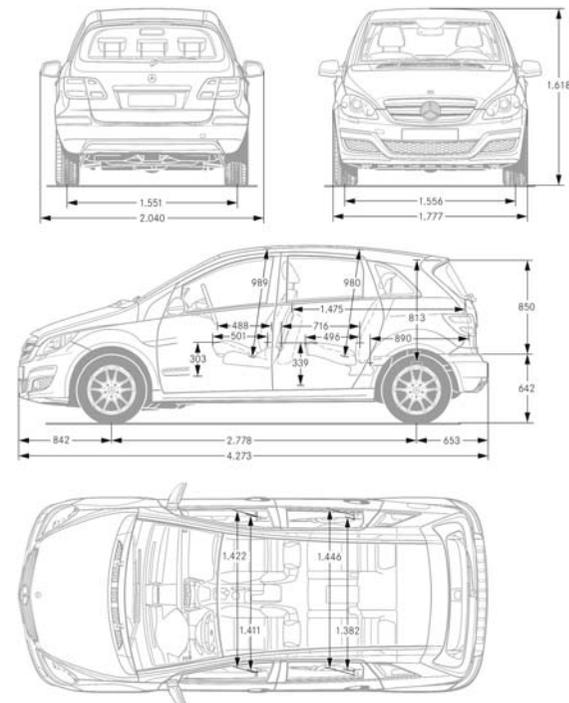
Stack technology	PEM (Proton Exchange Membrane)
Fuel tank capacity	3,7 kg H <sub>2</sub>
Fuel tank system pressure	700 bar
Battery technology	Lithium-ion, liquid-cooled
Battery capacity	1,4 kWh
Coldstart capability	-25 °C

<sup>1</sup> Preliminary data. Specifications subject to change without notice. Definite data especially consumption and range data according to NEDC have not been available yet at editorial deadline. The figures are not based on an individual model and do not constitute part of the product offer; they are provided solely for purposes of comparison between different vehicle models.

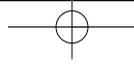
<sup>2</sup> Figures according to Directive 92 / 21 / EC, as amended by 95 / 48 / EC (curb weight with fuel tank 90 % full, driver, 68 kg and luggage, 7 kg).

<sup>3</sup> According to EC directive.

## DIMENSIONS <sup>4</sup>



<sup>4</sup> All measurements in millimeters. The dimensions shown are mean values and apply to the unladen B-Class F-CELL model.



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Visit us at the IAA 2009 in Frankfurt am Main, Germany.

The Mercedes-Benz B-Class F-CELL will have its world premiere there.

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