

## // Fuel cell stack prototypes



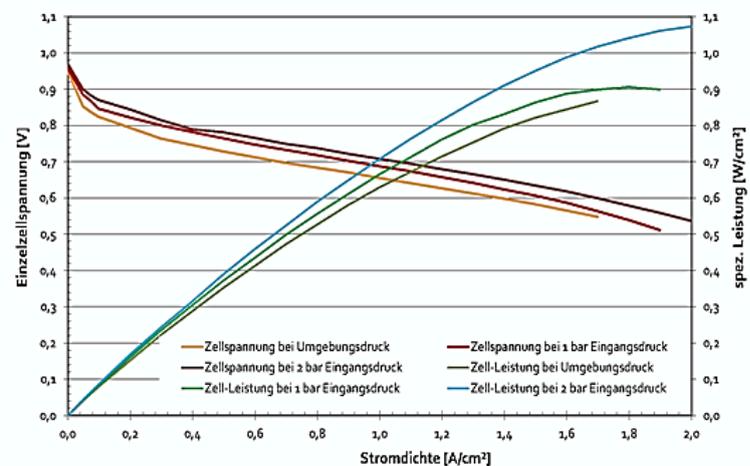
Suitable prototypes can be produced and tested in response to customer requests both for existing designs and for designs developed at ZSW. Designs currently available at ZSW are described here. BZ is the German abbreviation for fuel cell (Brennstoffzelle), and the number represents the active surface area of the individual cell.

### STACKS IN ZSW DESIGN

ZSW's expertise in the area of stack design is reflected in the considerable number of application-specific design concepts available. These vary not just in terms of active surface per cell, but with regard to bipolar plate concepts, pressure loss and operating temperature range too. The stacks all have a high specific output, and are safe within the broad operating ranges intended, operationally reliable and scalable to a significant degree in terms of number of cells. Where necessary, adjustments to take into account specific customer requirements are also possible.

#### BZ-100

Stack design BZ-100 includes a fuel cell system now in its fifth development generation with distinct bipolar plates in various designs that facilitate extensive adaptation of the fuel cell in line with customer-specific requirements. Stacks in this design are available both for hydrogen-air and reformat-air applications. In both cases, operation both under atmospheric pressure and excess pressure is possible. The BZ-100 design has a very high power density.



Typical characteristics for BZ-100 stack in hydrogen/air operation

### **BZ-100-HT**

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In the BZ-100-HT stack design, variants are also available for increased operating temperatures. These high-temperature fuel cell stacks (HT-PEMFC) are available in particular for reformat applications with increased residual CO content.

### **BZ-100-M**

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This design is currently in the pilot stage and includes an active surface of 100 cm<sup>2</sup> in a rectangular design. The design features particularly compact dimensions of the stacks.

### **BZ-100-FL**

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The ZSW stack design BZ-100-FL is also available optimised for operation with liquid fuels. The liquid reactants methanol/air (DMFC) and ethanol/air are available.

### **BZ-130**

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Stack design BZ-130 is intended for hydrogen-air operation and designed for portable fuel cell systems. Design BZ-130 has a favourable power density and very low downstream pressure loss, as well as an extremely low auxiliary power requirement.

### **BZ-160**

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Stack design BZ-160 is a high-temperature PEM fuel cell (HT-PEMFC) for reformat applications.

### **BZ-300**

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BZ-300 is a test platform for mobile applications.

### **BZ-560**

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This stack design has an active surface of 560 cm<sup>2</sup>.

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