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# Hybrid heated FAST /SPS with additional voltage support

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## Hybrid heated FAST/SPS with additional voltage support

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Hybrid heated FAST/SPS is a technique combining two separate, independently operated heating sources (direct electrical heating and induction heating) enabling more flexible and homogeneous heating of large sized parts. New tool concepts can be applied for example consisting of a die with inner hexagonal boron nitride (hBN) isolation. This hBN liner enables a complete pass through of the current across the densified material. Additionally, these results will be accompanied by the influence of a higher voltage source attached leading to "Flash Effect" under FAST/SPS conditions. This will be demonstrated for  $ZrO_2$ - and SiC-materials. The densification behavior as a function of the material's composition and densification parameters will be discussed in terms of the evolution of electrical resistivity of a sintering compact with increasing temperature, the temperature distribution monitored by measuring the temperature at different places, microstructural evolution and Finite Element Simulations.