

# Numerical Simulation Of Electro-Thermo-Mechanical Phenomena During Resistance Sintering

S. BOURDON<sup>1</sup>, P. ROGEON<sup>2</sup>, V. BRUYERE<sup>3</sup>, P. NAMY<sup>3</sup>, C. DURAND<sup>1</sup>, S. ROURE<sup>1</sup>

<sup>1</sup>SCHNEIDER ELECTRIC, EYBENS, France

<sup>2</sup>Univ. Bretagne Sud, IRDL, LORIENT, France

<sup>3</sup>SIMTEC, 5 rue Felix Poulat, GRENOBLE, France

## Abstract

Resistance-sintering can be used in a powder metallurgy process as the heating step to consolidate a metallic compact previously obtained by pressing a powder-alloy. This fast-sintering process consolidates electrically conductive powders by simultaneous application of pressure and electrical current. An electro-thermo-mechanical model has been developed to simulate an industrial process involving silver-based electrical contacts composites. A transient numerical approach is used to solve this strong coupled problem. Specific laws, established thanks to extensive experimental characterizations, are implemented to describe the physical properties evolutions and the mechanical behavior of the composites during sintering. Finally, the numerical model is able to predict the dimensions and properties of the final sintered part.

## Figures used in the abstract

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**Figure 1** : Temperature distribution and current density streamlines during the sintering process