

Complementary studies (measures and modelling) on the running of cascade plasma torch applied on zirconia coatings

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In order to master them and to have as large a vision as possible of the potential applications of segmented anode torches (cascade plasma torch), experiments were carried out and a model developed. The aim consists to obtain optimized microstructures according to the final properties sought. Results concern zirconia powder sprayed. Diagnostics are implemented (electric measurements, temperature of the substrate, thermal fluxes, particles in-flights characteristics...) to characterize and to understand the behavior of the plasma jet and particles as a function of the operating parameters of the process. To complete these measurements, a model is also developed to access quantities such as temperature, plasma velocity or the mean electric field. The results of the experiments and of the model are compared and discussed. They allow highlighting sets of operating parameters in agreement with the microstructures of the deposits.