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Niobium coating of complex accelerating cavities geometries

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Superconducting thin film coatings offer a valuable alternative to conventional bulk niobium cavities mainly by reducing the cost of raw material and enhancing the heat exchange efficiency thanks to the copper substrate thermal conductivity. The current and future superconducting radiofrequency (SRF) cavities designs and working frequencies lead to a variety of shapes and sizes to be coated. In this work we present an update of CERN activities in this field with an overview of current cavities production and R&D. We will focus on the coating of HIE-ISOLDE substrate using a double cathode setup to minimize the inner and outer conductor thickness differences and on the coating of the Wide Open Waveguide (WOW) cavity, an alternative Nb/Cu crab cavity, with support of plasma and transport simulations. Finally, we will discuss the impact of the substrate quality and preparation and the way it affects the coated layer properties.

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