ENERGETICS

ASG/DENERG - Innovative design of critical components for superconducting cables and assessment of their thermo-electrical performances

Funded By	Dipartimento DENERG ASG SUPERCONDUCTORS SPA [P.iva/CF:01234890992]
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Context of the research activity	The research will address the topic of terminations and cryogenic transfer line for superconducting power cables.
Objectives	Termination for superconducting cables must satisfy several requirements in terms of efficient transmission of current through current lead. Design of such component are subject to the Wiedemann-Franz law. Scope of the study is to go beyond it and design and test a current lead applying the latest principles of TPMS (Triply Periodic Minimal Surface) and manufactured by the most appropriate additive manufacturing technology fulfilling stringent requirements. Additional scope is the design, implementation and operation of a test bench to assess the thermal performances of a cryogenic transfer line used as containment duct of the superconducting cable and the relevant cryogenic fluid. Unavailability of off-shelf components, short length of samples to be tested, fluid and its operating temperature, He at 20-25 K, represent the main challenges for this task.
Skills and competencies for the development of the activity	The candidate should have an established know-how in heat transfer and cryogenics.