



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under GA No 101004730.

Task 9.3 Progress @



Liquid Tin Diffusion system progress

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iFAST



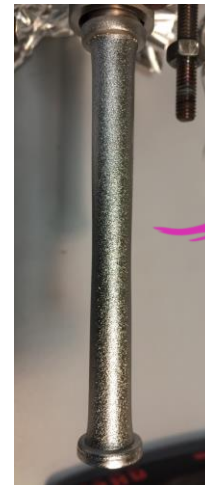
Nb₃Sn Cylindrical target production by tin liquid diffusion (dipping)



Nb target



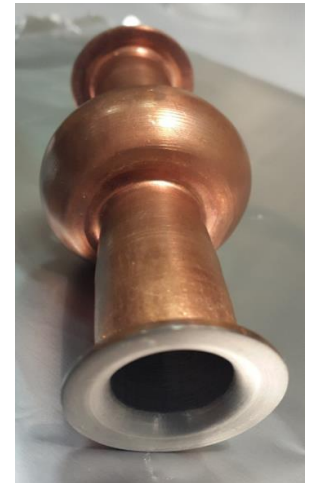
Dipping
in Liquid Tin
+ Annealing



Nb₃Sn on Nb target



Magnetron Sputtering



Nb₃Sn Cylindrical target production by tin liquid diffusion (dipping)



Inconel chamber replaced by a Nb chamber

After the first test (30 min @ 1000 °C) a very thick film of Nb₂O₅ growth on the external surface

Solution

New custom vacuum chamber system that contains the Nb chamber and new inductive heating system

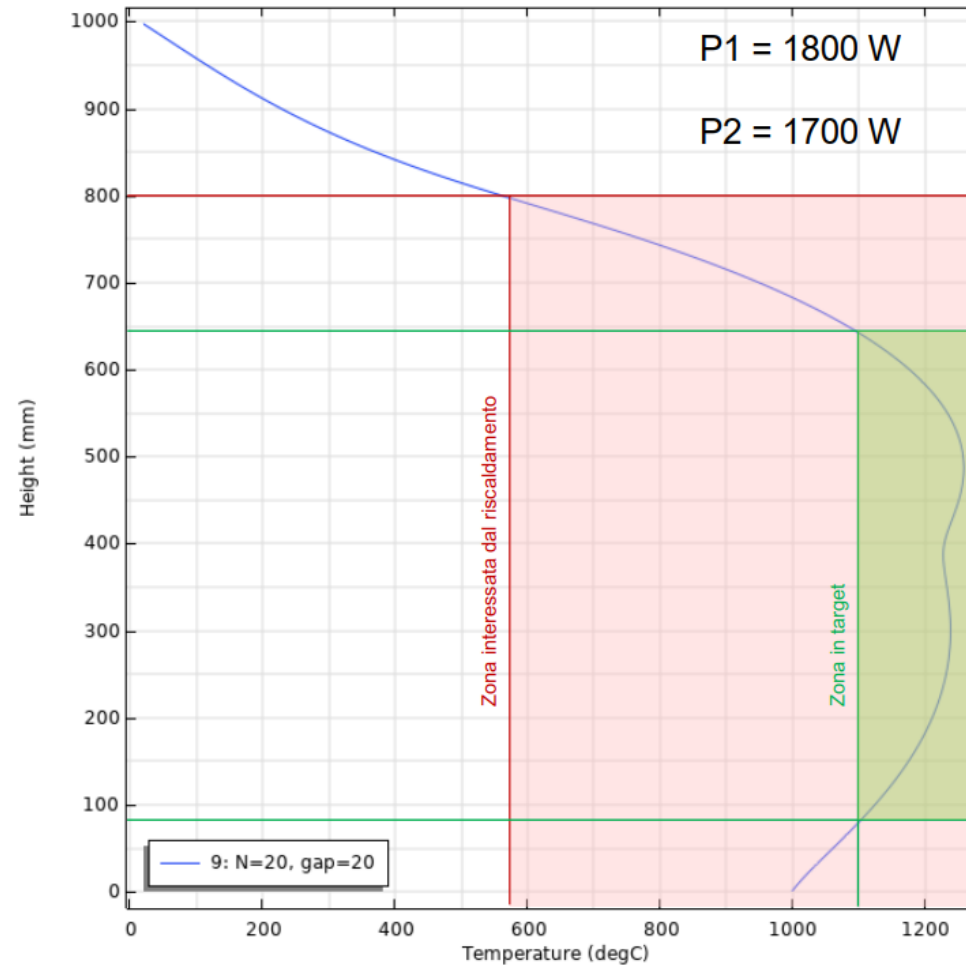
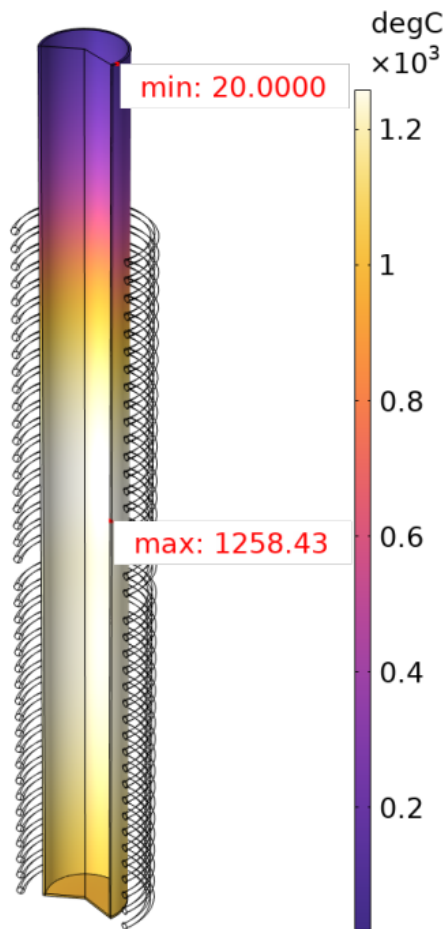
- Integral chamber cooling;
- 2 viewports for monitoring;
- Single vacuum pump solution for the entire system
- 3 kW total power
- Process entirely automated and remotely controlled
- More reliable system and more accurate temperature control

System already commissioned and arriving within end of May



Inductive heating system simulations

Both inductors maximum temperature test

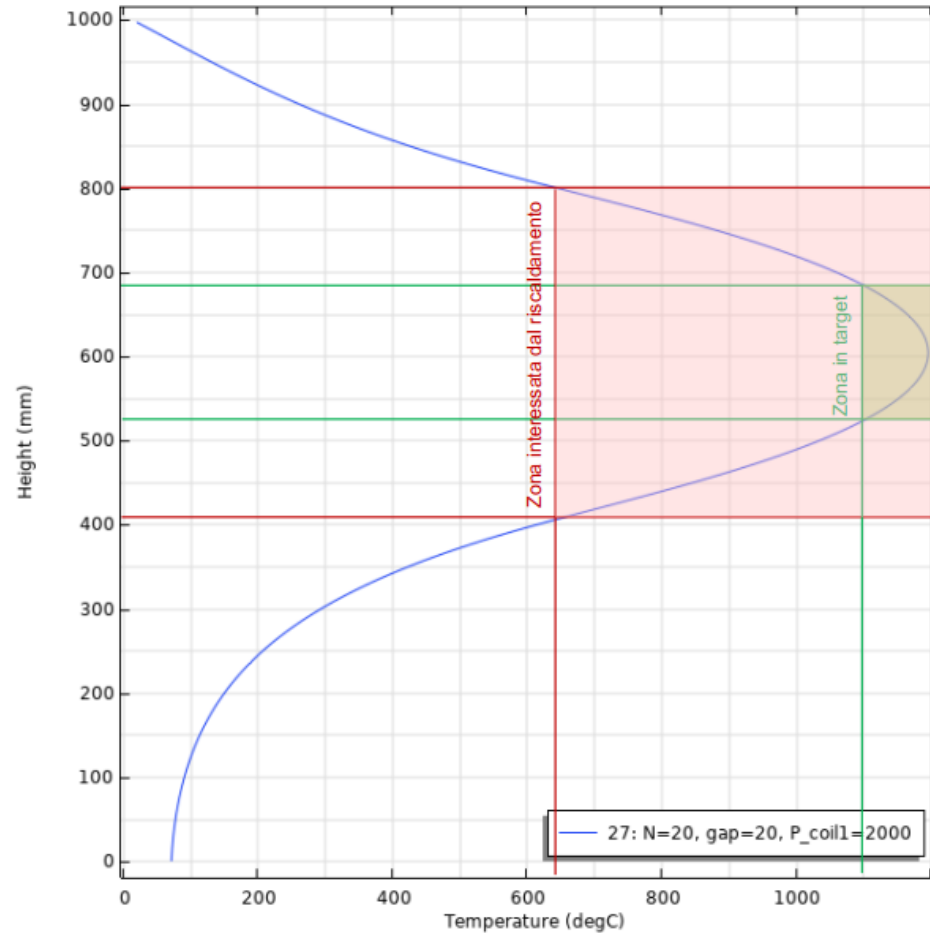
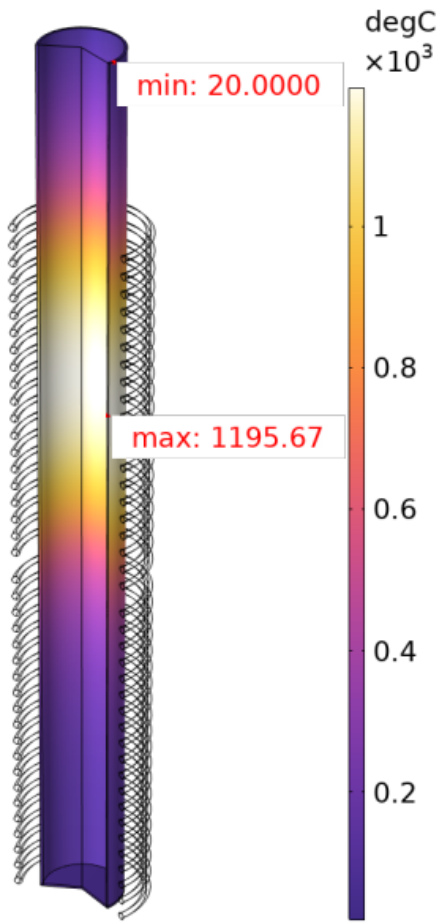


| | |
|-------------|---------|
| Power on Nb | 2638 W |
| Losses | 861 W |
| Yield | 75,3 % |
| I1 (RMS) | 151,6 A |
| I2 (RMS) | 144,4 A |

Over 70% of the target zone is heated more than 1100°C on the Nb chamber's surface.

Inductive heating system simulations

Single inductor maximum temperature test



| | |
|-------------|--------|
| Power on Nb | 1463 W |
| Losses | 564 W |
| Yeld | 73 % |
| I2 (RMS) | 167 A |

Single inductor heating meets target temperature of $>1000^{\circ}\text{C}$

In coparison with the old resistive heating, target temperatures are easily reached even with single inductor heating

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Thanks for your attention



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