

Micro channel cooling

Milestones proposal

Year 1

- 1) Requirement system definition in operational condition. Technology constraints for DRIE on chip design.
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- 2) Simulation TFD & TS study: results for a realistic HL-LHC system.
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- 3) CO₂ refrigeration system capable of providing carrier fluid liquid CO₂ to feed a test station with saturation temperatures from -30 ° C to +10 ° C with dedicated DAQ system.
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- 4) Micro channel prototypes for Dp study: single tube (200-500 um), realistic length (300-600 mm). (CO₂)

Year 2

- 1) DRIE micro channel technique: design and production of prototypes in FBK/CNM. Cross process compatibility WBS 1.
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- 2) Optimization of manifold for “a stave”, production of Interconnections parts (Hydraulic & Mechanic & Transmission Infterface Materials) for manifold.
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- 3) Set-up of Recycling CO₂ refrigerator system (TRACI), Tuned for a realistic stave (100W at -30 C). (un esemplare ?) Performance study.

Year 3

- 1) Final Prototype layout after optimization step. Production of parts: cooling channels and interconnections.
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- 2) Set-up of optimized CO₂ refrigerator system
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- 3) System demonstrator: performance evaluation.