IFAST: Task 4.4 Summary

ColUSM
23 April 2021

Federico Carra, CERN
IFAST Task 4.4 (May 2021 – April 2024)

IFAST (Innovation Fostering in Accelerator Science and Technology) [https://ifast-project.eu/](https://ifast-project.eu/)

IFAST is a collection of joint R&D activities with industry and strategy groups to develop ideas and technologies for the next generation of particle accelerators, grouped into 13 thematic areas.

EU contribution 10 M€ (50% of total budget)

WP4: Managing innovation, new materials – WP leader M. Losasso (CERN). Define priorities for new innovative developments inside the project, set up and manage an Innovation Fund to support new initiatives in the second phase of the project. Develop new materials for accelerator and commercial applications.

Task 4.4: Large scale Carbide-Carbon Materials for multipurpose applications (CERN, Nanoker). Promote an extensive use of carbide-carbon materials (CCM) in high-energy particle physics (HEP) and in the industry.

Production objectives:
- Produce a CCM plate with volume ≥ 1800 cm³ (*e.g.* Ø230 x 45)
- Reduce cost of finished components to 8÷10 €/cm³
Task 4.4 milestones and deliverables

<table>
<thead>
<tr>
<th>Deliverable Number</th>
<th>Deliverable Title</th>
<th>Type</th>
<th>Dissemination level</th>
<th>Due Date (in months)</th>
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</thead>
<tbody>
<tr>
<td>MS14</td>
<td>Evaluation of a CCM alternative to Molybdenum-Graphite</td>
<td>Report</td>
<td>-</td>
<td>12</td>
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<tr>
<td>D4.4</td>
<td>Production of large-size CCM plates</td>
<td>Demonstrator</td>
<td>Public</td>
<td>24</td>
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<tr>
<td><strong>Production targets</strong></td>
<td><strong>End of production report</strong></td>
<td>Report</td>
<td>Public</td>
<td>48</td>
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</table>

D4.4: Production of large-size CCM plates

Production of two large CCM plates (cross section > 400 cm²) in a single sintering cycle.

*e. g. 2 plates Ø230 x 30*
# Task 4.4 budget (May 2021 – April 2024)

<table>
<thead>
<tr>
<th>Beneficiary short name</th>
<th>Person-months</th>
<th>Monthly personnel cost</th>
<th>Personnel costs</th>
<th>Travel</th>
<th>Equipment and consumables</th>
<th>Other direct costs</th>
<th>Sub-contracting</th>
<th>Material direct costs</th>
<th>Total direct costs</th>
<th>Total indirect costs</th>
<th>Total costs (direct + indirect)</th>
<th>EC requested funding</th>
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<tbody>
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<td><strong>253,750.00</strong></td>
<td><strong>120,000.00</strong></td>
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</table>
F. Carra - 23 April 2021

Task planning (May 2021 – April 2024)

- Technical specification of the CCM (CERN)
  - Production of 2 MoGr (NB-8404Ng) upscaled plates Ø230 x 30 (NNK)
  - Investigation of CCM alternative to MoGr, with lower sintering T (NNK)

- Acceptance tests of the 2 MoGr upscaled plates (NNK, CERN)
  - Production of 2 alternative CCM upscaled plates D230, t30 (NNK)

- Production of 1 MoGr or other CCM big plate Ø230 x 45 (NNK)
  - Acceptance tests of the 2 alternative CCM upscaled plates (NNK, CERN)
2021/early 2022 Timeline (proposal)

- **April-May:** preparation of technical spec (CERN) and preparation of machine upscaling setup

  May 2021: IFAST starting!

- **June-September:**
  - Test of production of one upcaled NB-8404Ng plate and, if successful, NNK testing (Sigmatest, machining of 1 block + metrology?) – (NNK)
  - R&D on alternative CCMs (CrGr, high-density MoGr?) – (NNK)

- **October-December:**
  - Test at CERN of upscaled NB-8404Ng, including springback, UHV, etc. (CERN)
  - R&D on alternative CCMs (NNK)

- **January-March 2022:** summary of R&D on alternative CCM and **milestone MS24 preparation**

- **April 2022:** submission of milestone MS24
Discussion

QUESTIONS?
COMMENTS?
Additional IFAST WP4 item

- In the frame of IFAST WP4 (task 4.3), there is the possibility of irradiating some low-density material at GSI in the second half of April this year.

- We could provide Nanoker with 3 rods 10x10x120 mm$^3$ of MoGr (2 grades) and TiGr (1 grade), for cutting:
  - 6 samples per each of the three grades, 10x10x0.2÷0.5 mm
  - Can Nanoker send us a quotation for the cutting?
  - If we ship the material to Nanoker by the end of March, is it feasible to have the samples at GSI 2 weeks after?
  - No budget code for IFAST exists yet: can Nanoker accept a delayed payment for the cutting, until when budget codes available?