



Innovative high performance Alloys and Coatings for
Highly Efficient intensive energy processes

WELCOME WORDS

FROM THE COORDINATOR



In November 2021, the Horizon 2020-funded initiative ACHIEF marked one year into its research to develop novel materials for improving the Energy Intensive Industries. With a year full of dynamic work and expert meetings, the ACHIEF foundation has been laid.

For the last 12 months, partners met and discussed on a monthly basis the ongoing project activities and work plan. Furthermore, the consortium met with a board of external experts several times to provide knowledge and advice on the different technical topics.

Additionally, ACHIEF consortium has set and agreed on project management rules and quality policy to ensure that all activities and deliverables are internally approved. Moreover, the consortium has created a project website and marketing materials. Partners have also developed a management plan describing how the data to be collected will be generated, processed, and/or shared by the ACHIEF consortium.

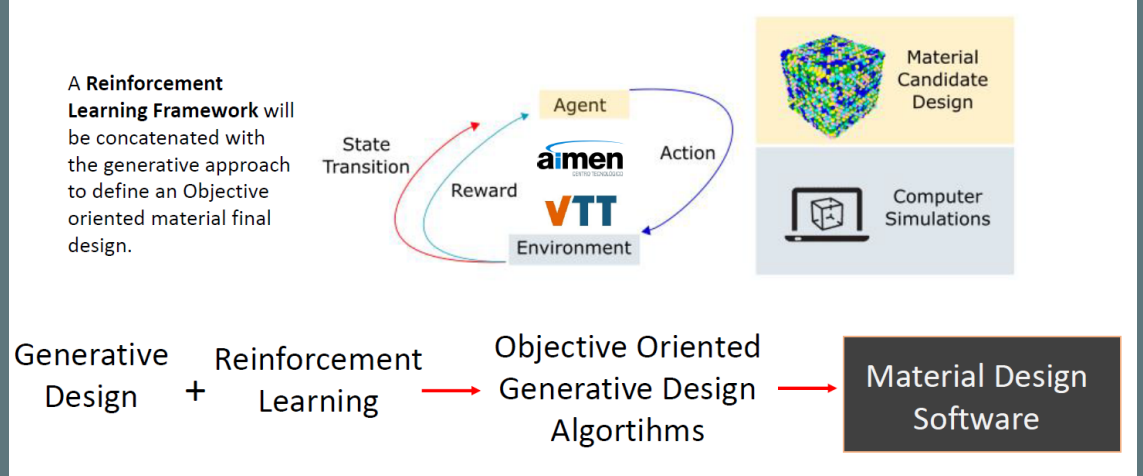
One year ACHIEF project



One year after the project's start, the ACHIEF partners are successfully moving forward with the creation of a more efficient and sustainable Energy Intensive Industrial sector.

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Computational modelling & artificial intelligence progress



The very first part of the technical concept of ACHIEF initiative is providing an artificial intelligence aided toolbox. From the beginning of the project, ACHIEF has started working on the artificial intelligence (AI) aided toolbox. The AI toolbox will help us develop models for the mechanical, wear and chemical behavior of the novel materials that are to be created.

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Development of Polymer Derived Ceramics coatings for high-temperature corrosion protection

CEA has started with the development of the Polymer Derived Ceramic (PDC) coatings for high-temperature corrosion protection. The goal is to create easily applicable and cheap anti-corrosive coating based PDC, as well as fillers for industrial user case.



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Development of High Entropy Super Alloys for high- temperature strength and wear resistance

Since July 2021, AIMEN together with CEA, VTT, CONSTELLIUM, ArcelorMittal and Seamthesis have been actively working on the design by using machine learning techniques in order to develop HESA powders. They are to be deposited using different laser techniques as Powder Bed Fusion, Directed Energy Deposition and Laser Cladding.



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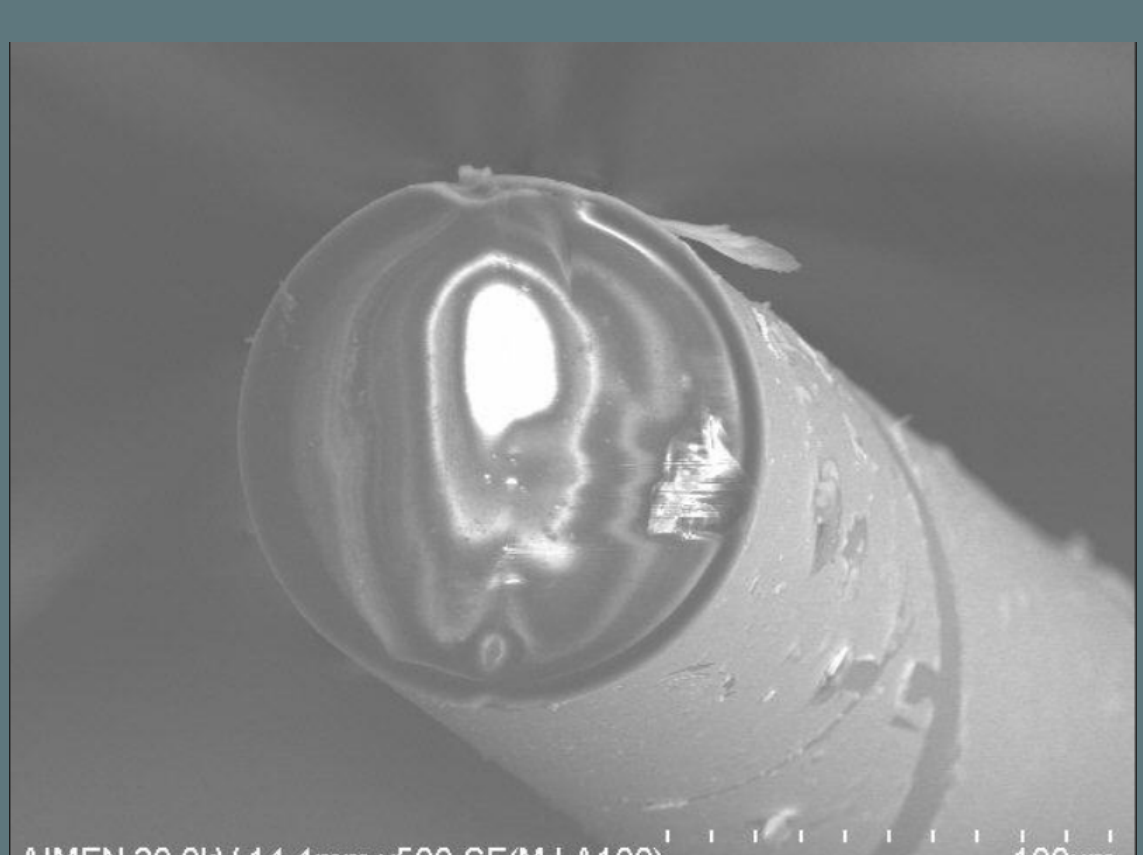
Optimized Cr-steels for creep resistance development

TECNALIA is leading the development of the optimized Cr-steels for creep resistance in ACHIEF project. Along with TRI, they work together to develop novel Cr-steel grades with improved 15% creep resistance. Moreover, these two partners will also aim to optimize the heat treatment conditions for an improved control of the microstructure and precipitates (carbides, Laves phase, etc.) during tempering.



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Sensors development & embedding progress



Since November 2021, LOPTEK is developing the sensors and their implementation. More specifically, LOPTEK will develop robust high temperature and strain fibre optics sensors and an advanced electrochemical sensor. These sensors will be then embedded in the selected materials components that will be implemented during the demonstration phase to monitor temperature/strain but also corrosion and degradation phenomena in situ and in real time.

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