

REALIZATION OF ADVANCED CERAMIC COMPONENTS AND MATERIALS FOR THE PRODUCTION AND THE RECOVERY OF ENERGY

Innovations and Benefits - Advanced ceramics are characterized by having high temperature and corrosion resistance; due to these properties, advanced ceramics are the most promising materials in order to improve the efficiency and the sustainability of industrial processes, by the integration or the substitution of metallic materials.

ENEA has experience in the development of ceramic composites, monolithics and coatings, up to the engineering and the prototyping of the component; providing highly specialised technical support to the evaluation of innovative and commercial materials; testing of materials and components aimed at the determination of the thermo-mechanical and physical characteristics and also of the oxidation / corrosion resistance.

Uses - Advanced materials and components for:

- production of energy (non-renewable, renewable and nuclear)
- heat recovery plants and heat exchangers (at medium or high temperatures) for steel, cement, petrochemical, chemical, pharmaceutical and glass industries.

Past and present activities - Production of ceramic components and prototypes for heat exchangers and heat recovery plants; ceramic turbine blades for gas turbines and refractories for combustion chambers; leachable ceramic cores for investment casting; anti-corrosion and functional ceramic coatings. Thermomechanical characterization of nuclear materials. Tests of oxidation resistance and corrosion resistance by molten salts for heat exchangers and heat recovery units. Experimentation of materials for solar, wind and thermos photovoltaic systems.

Projects: SEMPRE, PROMOMAT, PUMA, BAYHEX.

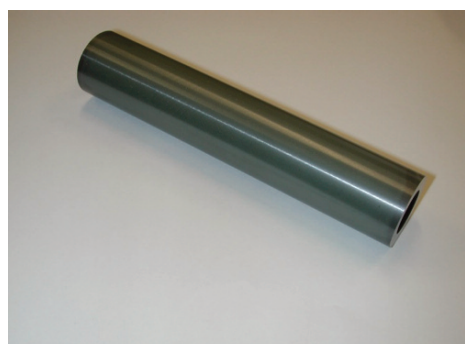
Collaborations with companies: Neubor glass, Ansaldo Energia, Stara Glass, Cetma, EMA - European Aerospace Microfusions.

Patents: IT0001323827 "Procedure for joining ceramic materials, in particular ceramic materials based on silicon carbide"; B02005A000311 - "Procedure for the production of sintered material based on silicon carbide and aluminum nitride".

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Silicon Carbide turbine blade



Ceramic self-passivating tubular component

