

**Name of the organization**

ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development)

**Name of the infrastructure / laboratory**

CR Casaccia /Nanoparticled, nanostructured and high surface materials laboratory (NANO Lab)

**Address and country of the infrastructure / laboratory**

ENEA C.R. Casaccia - Via Anguillarese 301 – 00123 Rome, Italy

**Person responsible of the access / Contact person**

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**Main field of activity of the infrastructure / laboratory**

► Hydrogen storage

**Short description of the infrastructure / laboratory**

The technology of High Energy Ball Milling (HEBM) devoted to synthesize and processing new materials, consists in treating solid state powder reagents so that repeated energy transfer events from the milling media (generally balls) to the milled powder occur. Mechanical energy release induces several physico-chemical transformations on the milled substrate: powder compounding (metal-ceramic composite mixtures can be obtained), Mechanical Alloying of metallic mixtures and even chemical synthesis of products starting from reagents can be obtained (Mechanosynthesis). Remarkable in this field is the possibility to synthesize systems of complex oxides. Due to the non equilibrium conditions of the powder treatment, materials produced by these processing technology (nanostructured and nanoparticled) exhibit peculiar characteristics none otherwise obtainable. HEBM is an enabling technology whose characteristics can lead to a sensible improvement in the whole hydrogen cycle system.

**Main research areas) of the infrastructure / laboratory**

The following techniques are routinely used as processing characterization tools: high temperature reactive atmosphere powder X-ray diffraction, SEM, thermal analysis (TG, DTA, DSC), light scattering (1nm-6um particle diameter range), surface area analyser (BET), thermal programmed desorption/reaction (TPD/TPR). The following technical items can be investigated in the field of: Thermochemical Hydrogen Production, Hydrogen storage, Hydrogen purification from Steam Reforming and/or other gases (CH<sub>4</sub>, CO,...) storage and purification, PEMFC, MCFC, SOFC

**Access not available yet.**

**Information on the installation will be further updated.**