# The Helm project challenges production

## Italia at the forefront in ceramic composites technology

SEVENTH FRAMEWORK PROGRAMME

Born from an idea by professor Andrea Lazzeri, research professor at the University of Pisa civil and industrial engineering department and manager of the Instm (National Interuniversity Consortium of Materials Science and Technology) unit, the Helm project challenges the latest manufacturing technology bringing improvements to quality, production and costs of low density ceramics; materials that, in strategic industrial sectors like transport and energy, represent a highly promising innovation. The protagonists of this avant-garde project are the radiofrequencies, microwaves and high-frequency electromagnetic heating methods that are soon to replace the currently used traditional production procedures and estimated to reduce overall production times by around 60%. The idea of Helm was innovative enough to have it selected at the first stage of the 7PQ Call-2011, from among 162 proposals in the nanotechnology sector: the only project backed by twenty international companies with exclusively Italian coordination and direction. Indeed, the Pisa Instm is the Group leader with the support of the Warrant Group as administrative coordinator and project dissemination and exploitation manager. "The consortium working on the Helm project – comments professor Andrea Lazzeri – is an extraordinary example of cooperation between universities, research centres and industry, which includes several small/medium businesses. With the synergy of these strengths we're achieving significant results in scientific fields that have direct applications in industry. And on this level, Helm is absolutely strategic: the demands of industry and the market are the main drivers in the development of high-frequency electro-magnetic thermal technology. Helm is targeted at the most important niche markets for C/SiC or SiC/SiC and EG composites. CmC are advanced materials in which Europe has global leadership. Industry needs new solutions to stay competitive: the market demands high-performance, low-cost products".

The Helm project sets out to study and demonstrate new industrial solutions and manufacturing processes to reduce production times and costs and improve the quality and performance of advanced ceramic materials, such as light ceramics and fibre-reinforced ceramic composites

**Project name:** High-Frequency Electro-Magnetic Technologies for Advanced Processing of Ceramic Matrix Composites and Graphite Expansion.
**Number:** 280464
**Call:** Nmp.2011.4.0-1
**Duration:** 36 months
**Starting date:** 1st June 2012
**Co-financing:** 7,151,000 Euro
**Topic:** Fp7-Nmp
**Coordinator:** National Interuniversity Consortium of Materials Science and Technology
**Partners:** CNR (National Research Council), Supsi (The University of Applied Sciences and Arts of Southern Switzerland); Schunk Kohlenstoff-Technik Gmbh; Herakles Sa; Warrant Group Srl; Sairem Iberica Sl; Eads Deutschland Gmbh; Fundacion Tecnalia Research & Innovation; Archer Technicoat Limited; Erbicol Sa; Fricke Und Mallah Microwave Technology Gmbh; Baltic State Technical University Voenmekh Named After D.F. Ustinov; Brembo Sgl Carbon Ceramic Brakes Spa; Cvt Gmbh & Co Kg; Fundacion Circe Centro de Investigacion de Recursos y Consumos Energeticos; Snecma Propulsion Solide; Timcal Sa; Universidad de Alicante; Steinbeis Advanced Risk Technologies Gmbh; Petroceramics Spa
**Website:** www.Helm-Project.Eu/

**What is INSTM?** The National Interuniversity Consortium of Materials Science and Technology (Instm) has been an affirmed reality in the field of national and international research for more than 20 years. In Italia it is the largest of the interuniversity consortiums, grouping together 45 universities, in practical terms all those that conduct research on advanced materials and related technology. What the Consortium does is bring together and concentrate the efforts of individual research groups to achieve the 'critical mass' of interdisciplinary skills capable of taking on highly competitive innovative research projects, as well as acting as an authoritative point of reference capable of attracting funding for the universities and the dissemination of information on material science and technology and innovation in general. The success of this strategy is confirmed by the large number and quality of the national and international projects in which Instm has taken part. To date, the Consortium has taken part in 225 projects, 83 of which financed by the UE (including Helm), distributed equally between the IV, V, VI and VII Framework Programs. In the VII Framework Program, Instm has a 17.56% share of the financed projects, one percentage point above the national average.