

*Proposal full title*  
**Multifunctional & Integrated Piezoelectric Devices**

*Proposal Acronym*  
**MIND**

*Priority*  
**Priority 3 – NMP – Stage 2**

*NMP research areas:*  
**NMP-2003-3.4.2.1.1. Understanding Materials Phenomena**  
(under NMP-2. Knowledge-based Multifunctional Materials, NMP-2.1 Development of fundamental knowledge)

*And secondary area*  
**NMP-2003-3.4.4.3. Mastering chemicals and creating new eco-efficient processes and synthesis routes.**

*Type of instrument*  
**Networks of Excellence (NE)**

*Co-ordinator name*  
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*Co-ordinator organisation name*  
**Ferroperm Piezoceramics A/S – Kvistgaard – Denmark**

*Objectives*

The objectives of the NE "MIND" are to increase the level of understanding of all phenomena in piezoelectric materials and structures, and to apply this knowledge to the design of new and improved devices such as sensors, transducers, actuators & motors for applications ranging from medical diagnostics and therapy to industrial measurements, as well as transportation and products for the citizens. This NE proposal aims at the creation of a European Institute on piezoelectric materials, structures and devices ; through durable integration of research teams covering expertise ranging from material synthesis to integrated device development. The scientific objectives will concentrate on miniaturisation and integration of piezoelectric structures (namely on silicon), and multifunctional devices such as multiple sensors or intelligent structures, in which the piezoelectric properties are combined to other properties to obtain new or improved devices.

This will be made possible through the association of a wide range of scientific competencies (chemistry and process engineering, solid state physics, material characterisation and measurement science, micro / nano - technology and MEMS, numerical modelling, device design, manufacture and test) all working towards common objectives: investigation of phenomena in piezoelectric/ferroelectric materials, optimisation of properties for different applications, and integration of piezoelectric structures in devices. Such expertise is currently disseminated in many groups throughout Europe, without common management structures. MIND network will therefore integrate human resources and equipment both scientifically (exchanges of personnel, methods, processes) and structurally (information flow, interactive internet resources and forums, meetings, common scientific strategy and organisation, common training degrees). A durable administrative structure is expected to be set up before the end of the third year of operation.

*Partnership*

<b>Participant number and acronym</b>	<b>Participant organisation name</b>	<b>Country</b>
1 – FP	Ferroperm Piezoceramics A/S	Denmark
2 – LUSI	Laboratoire d’Ultrasons, Signaux et Instrumentation (Université François Rabelais – CNRS)	France
3 – LC	Laboratoire de Céramique (Ecole Polytechnique Fédérale de Lausanne)	Switzerland
4 – JSI	Jozef Stefan Institute	Slovenia
5 – CU	Cranfield University	UK
6 – ICMM	Interdepartamental Group of Functional Ferroelectric Materials. ICMM	Spain
7 – SPMS	Laboratoire Structures, Propriétés et Modélisation des Solides (CNRS-UMR 8580 Ecole Centrale Paris)	France
8 – SCT	SIEMENS Corporate Technology - Erlangen	Germany
9 – ISSP	Institute of Solid State Physics (University of Latvia)	Latvia
10 – NPL	National Physical Laboratory	UK
11 – CRF	Centro Ricerche Fiat	Italy