



GUIDE DEFENCE · 7 MIN READ

For research institutes: developing high-temperature solutions together

Collaboration models for research institutes: developing high-temperature solutions for defence applications together, with industrial implementation expertise.

Situation

Research institutes such as Fraunhofer, DLR, the Bundeswehr universities and technical universities develop new high-temperature materials and processes for defence applications. The transfer from laboratory to industrial application frequently fails for want of implementation expertise and industrial manufacturing capacity.

Defence-related research projects (EDF, BMVg studies, EU Horizon) increasingly require the involvement of industrial partners able to raise the technology readiness level (TRL) from 3–4 (laboratory) to 6–7 (demonstrator) and beyond.

Applying for funding (EDF, BMFTR, BMVg) is made easier by involving SMEs with proven industrial expertise — SME quotas and bonus scoring are built into many funding programmes.

Many high-temperature research projects require test furnaces, test rigs and industrial test environments that research institutes do not maintain themselves — an industrial partner with the appropriate infrastructure closes this gap.

Our approach

An industrial implementation partner for the TRL leap: from laboratory sample to an industrially manufacturable solution. Scaling up material formulations, developing manufacturing processes and building prototypes to industrial quality.

Test infrastructure: access to industrial furnaces, firing plant and test rigs for high-temperature trials under realistic conditions — temperatures, atmospheres, load cycles.

Joint project applications: participation as an industrial partner in research applications (EDF, BMFTR, ZIM, BMVg). Contributing industrial expertise, manufacturing capacity and market access to the consortium application.

IP strategy: joint patent applications with a clear exploitation agreement. The industrial partner takes on commercial exploitation; the research institute receives licence income and publication rights.

Long-term research collaboration: a framework agreement for recurring cooperation — jointly supervised doctoral candidates, bachelor's theses, working students and guest research visits.

Sequence

1. Initiation and ideas phase

A joint workshop to identify research topics at the interface between high-temperature technology and defence applications. Matching the institute's scientific expertise with the company's industrial capabilities and market access.

2. Project design and application

Joint preparation of the project application: research plan, work packages, resource planning, budget. The research institute takes the scientific lead, the industrial partner the implementation and exploitation plan. Coordination with the funding body.

3. Execution and technology transfer

Parallel work in the laboratory and in the industrial environment. Regular milestone reviews and technology transfer workshops. The industrial partner successively builds up manufacturing expertise for the new technology. Joint publications and patent applications.

4. Exploitation and follow-up projects

Industrial exploitation of the research results: product development, customer validation, series introduction. Evaluation of the collaboration and planning of follow-up projects. Building a long-term research partnership.

Frequently asked questions

Which research topics are particularly suitable for a collaboration?

Particularly suitable are topics where basic research meets industrial implementation: new refractory materials for extreme conditions (UHTC, CMC), additive manufacturing of ceramics, high-temperature sensor technology for condition monitoring, recycling processes for strategic raw materials and thermal barrier coatings for defence propulsion systems.

How are IP rights governed in the collaboration?

Before the project begins we conclude a cooperation agreement with clear IP provisions: background IP remains with the respective partner. Foreground IP (new inventions) is filed jointly with a defined split of exploitation rights. The research institute retains publication rights after an appropriate confidentiality period. The arrangement follows the recommendations of the DFG and the Fraunhofer model contracts.

Which funding programmes are suitable for joint projects?

The European Defence Fund (EDF) for EU-wide consortia, BMVg technology studies for national projects, ZIM (the Central Innovation Programme for SMEs) for bilateral collaborations, and BMFTR funding lines for materials technology and materials research. SME participation is rewarded with bonus points in many programmes.

Can students be involved in the collaboration?

Yes, involving students is expressly welcomed. We offer places for bachelor's and master's theses and for working students at the interface between research and industrial practice. Doctoral candidates can carry out parts of their experimental work in our industrial environment — with access to industrial furnaces and test rigs.

Let us talk about your project

Reply within 24 hours on working days.

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