Your Research Partner for Digitally Integrated Production

Our goal is a sustainable production – inventive, human-centered and resource-efficient.

With the help of application-oriented research, we develop solutions along the entire industrial value circle. Our guiding idea is a digitally integrated production in which man and machine interact on the basis of data and can thus adapt flexibly and proactively to changing requirements.

Fraunhofer IPK is a research and development institution in the field of production technology. With our distinctive IT competency, we offer system solutions, individual technologies and services for digitally integrated production. We provide comprehensive support to companies from product development, planning and control of machines and systems, including technologies for parts manufacturing, to comprehensive automation and management of factory operations. We also transfer production engineering solutions to areas of application outside industry, such as traffic and safety. As an institute of the Fraunhofer-Gesellschaft, we tailor our work to fit the needs and requirements of our customers and partners. With its market orientation and high real-world value, our R&D helps to sharpen their long-term competitive edge. We develop forward-looking novel solutions and modernize, optimize and upgrade existing technologies and applications.

Fraunhofer IPK Profile

Established:
1976

Staff:
410 employees

Budget in 2023:
24.2 M €

Spin-offs:
60

Location:
Production Technology Center (PTZ) Berlin

Customers:
Industry, associations, administration, politics

International markets:
Europe, Asia, North and South America

Contact

We are situated at the Charlottenburg Spreebogen in the Production Technology Center (PTZ) Berlin, where we are housed under the same roof as TU Berlin's IWF.

Fraunhofer Institute for Production Systems and Design Technology IPK
Pascalstrasse 8–9
10587 Berlin

Phone +49 30 39006-140
Fax +49 30 39006-392
info@ipk.fraunhofer.de
www.ipk.fraunhofer.de

Our experts for your topic

Finding answers to the challenges facing industry – Fraunhofer IPK has the right people to do just that. Contact us directly and in person.

Acting Director
Prof. Dr.-Ing. Holger Kohl
Phone +49 30 39006-233
holger.kohl@ipk.fraunhofer.de

Cooperations and Collaboration
Jens Fischler
Phone +49 30 39006-332
jens.fischler@ipk.fraunhofer.de

Fraunhofer IPK in Social Media

instagram.com/
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You can find contacts to our areas of expertise on our website at
www.ipk.fraunhofer.de/contact-persons

Fraunhofer IPK

Fraunhofer Institute for Production Systems and Design Technology IPK

Research and development made in Berlin

We Optimize Production

Digitally Integrated Production

We see digitally integrated production as a mission to provide companies with comprehensive support along their entire value chain. To this end, the various competencies of our research areas are perfectly intertwined.

Corporate and production management

We develop solutions for managing the sustainable and digital transformation of manufacturing companies. In addition, we help to introduce resilient and agile processes as well as to plan and realize sustainable and circular value creation systems.
Selected competencies: Process and factory management, sustainable value creation and circular economy, knowledge and competence management

Digital Engineering

We realize the vision of a complete digitalization of product development and planning processes – so that you as a manufacturer or user can consider the later phases of your product's lifecycle at an early stage.
Selected competencies: Digital twins, data management and PLM, model-based systems engineering

Production processes and facilities

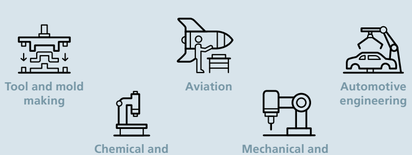
We optimize existing production systems, develop new machines, machining strategies as well as manufacturing technologies, including for joining and coating, and realize future-oriented tool concepts. We also offer special expertise in the field of machine and system management.
Selected competencies: Ultra- and high-precision as well as high-performance manufacturing, high-performance and precision machines as well as system management, additive manufacturing

Automation

We create new approaches for an efficient, highly flexible and safe automation of machines, systems and processes for production, as well as for logistics and circular economy processes.
Selected competencies: Machine learning for industrial processes, industrial image processing, industrial robotics

Target industries

Our commercial customers include small and medium-sized enterprises in particular, as well as globally operating industrial and service companies from these five industries:



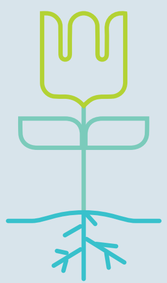
We Develop Your Application

Whether globally active corporation or regional SME: Fraunhofer IPK is your research and development partner on the road to digital transformation.

Our mandate

As an institute of the Fraunhofer-Gesellschaft, we are a central link between research and practice: We transfer basic innovations from fundamental research into industrial application. Additionally, we support companies with their individual application-oriented challenges. Our funding is made up by one third each from the following sources:

- Base funding
- Publicly funded research
- Contract research revenue



Industrial application
– Companies

Application-oriented research
– Fraunhofer Institutes
– Industry-owned development centers

Basic research
– Universities
– Max-Planck-Institutes
– Helmholtz Centers

Here's how you can work with us

Any number of challenges your company is facing can be the starting point for a cooperation with Fraunhofer IPK: You would like more efficient processes. Your company lacks the necessary know-how or production resources to process new materials. Or maybe legal requirements demand new approaches.

Against the backdrop of such tasks, we systematically and scientifically develop holistic solutions that take into account the constraints and conditions within industry. Two forms of cooperation with industrial clients are possible here: contract research in bilateral projects and joint applications for public funding.

Contract research
- It is possible to start immediately.
- Projects can be partly (co-) funded through grants.
- Individual company requirements can be addressed in a targeted approach.
- Results do not have to be published.

Public funding
- Funding allows a broad scope for researching potential solutions.
- Numerous partners can participate in the project on an equitable basis.
- A corresponding funding scheme must be available (e.g. at BMWE, BMFTR, BMV, CIM, EU).
- Fundings of 30 to 90 % are possible.
- Results must be published.

Get in touch

Let us find the ideal funding structure for your development task.

Our Solutions

Versatile, individual, adaptive and flexible solutions provide precise answers to challenges our clients are facing. Here are three examples of practical projects we implemented for industrial partners:

1

LUFTHANSA TECHNIK GROUP

Scan2DMU: Virtual modification of aircraft cabins

Project description:
Interior fittings for aircraft are planned virtually. Aircraft manufacturers provide CAD data for this purpose, which does not correspond with the actual state of construction of a delivered aircraft. It is therefore not possible to validate the designs exactly with this data. A solution was developed for Lufthansa Technik that uses 3D interior scans to adapt the CAD data to the actual construction status.

»Scan2DMU enables us to use real aircraft states of construction as the basis for 3D design, eliminating significant costs for testing and reworking.«

Sebastian Riedemann, Head of Project, Lufthansa Technik Group

2

ZEISS INDUSTRIAL QUALITY SOLUTIONS

Minimizing distortion in additive manufacturing

Project description:
Distortion is a major problem for achieving high component accuracies in additive manufacturing. In a joint project, the ability of Zeiss' reverse engineering software to drastically reduce distortion in additively manufactured components and eliminate iteration loops for design adaptation was demonstrated.

»Thanks to Fraunhofer IPK's outstanding domain expertise, we were able to open up new fields of application and markets for our software.«

Dominik Schmid, Principal Software Innovation, Carl Zeiss Industrielle Messtechnik GmbH

3

SMS GROUP

Multi-wire submerged arc welding of large pipes

Project description:
In multi-wire submerged arc welding, reciprocal effects between the welding wires can occur and disrupt the welding process. To meet this challenge, we developed a multi-wire submerged arc welding process for longitudinal seam welding of large pipes for SMS group that is material-compatible and reliable.

»The great advantage of working with Fraunhofer IPK is that we can test complex industrial manufacturing processes and new developments for customers in advance.«

Michael Stark, General Manager, SSAW Pipes and Welding Technology, SMS group

Our solution for your challenge

As part of our in-house and pre-competitive research, we develop system solutions, individual technologies and services that offer promising approaches to your challenge. You can find these developments on our »Expertise and Technologies« page. If you cannot find an answer to your specific request there, please do not hesitate to get in touch with our contact persons.