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Facts & Figures

About Fraunhofer Institute for Ceramic Technologies and Systems IKTS

- Fraunhofer IKTS conducts applied research into advanced ceramics.
- With 832 employees (as of 31.12.2023) at 13 different locations and an annual budget of € 90.8 million in 2023 (as of 13.3.2024), Fraunhofer IKTS is the largest ceramics research institute in Europe.
- As a research and technology service provider, Fraunhofer IKTS develops modern high-performance ceramic materials, industry-relevant manufacturing processes and prototype components and systems in complete production lines up to pilot scale. The portfolio is supplemented by expertise in materials diagnostics and testing.
- Fraunhofer IKTS demonstrates the potential of ceramic materials in a constantly growing range of application areas. The development work is derived from the needs of the nine market-oriented business areas - supplemented by strategic preliminary research.
- The focus is on holistic, sustainable and economical solutions for the energy transition, resource conservation and digitalization.
- Fraunhofer IKTS has more than 20 years of experience in the development and construction of electrochemical reactors for the production and use of hydrogen and has extensive expertise along the entire value chain: from material to system, including economic feasibility studies. Industrial electrolysis is one of the most important fields of activity.
- In the field of high-temperature electrolysis (SOEC), Fraunhofer IKTS has developed various stack designs, builds prototypes and tests their suitability for different applications and load profiles, including techno-economic evaluation.
- www.ikts.fraunhofer.de/en.html
- Social Media: [LinkedIn](#), [Instagram](#), [YouTube](#)

About thyssenkrupp nucera AG & Co. KGaA, Dortmund (Germany)

- thyssenkrupp nucera offers world-leading technologies for highly efficient electrolysis plants. The company has extensive expertise in the planning, procurement and construction of electrochemical plants.
 - Its track record includes more than 600 successfully installed projects with a total capacity of more than 10 gigawatts.
 - The company currently has two technologies at its disposal: alkaline water electrolysis and chlor-alkali electrolysis.
 - With its water electrolysis technology for the production of green hydrogen, thyssenkrupp nucera is creating innovative solutions on an industrial scale for green value chains and a decarbonized industry - a major step towards climate neutrality.
 - Customers include companies such as NEOM in Saudi Arabia, Stegra (formalely H2 Green Steel) in Sweden, Shell in the Netherlands, Moeve (Cepsa) in Spain, and several more.
 - thyssenkrupp nucera successfully completed an IPO in July 2023 and is listed on the Frankfurt Stock Exchange.
 - The electrolysis specialist generated sales of EUR 862 million in the past financial year 2023/2024 (corresponding prior-year period: EUR 661 million). The number of employees rose to 1.1012 (previous year: 675) by the end of the financial year (September 30, 2024).
 - www.thyssenkrupp-nucera.com
 - Social Media: LinkedIn [thyssenkrupp nucera](#) | LinkedIn
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The Management of thyssenkrupp nucera

Dr. Werner Ponikwar

CEO thyssenkrupp nucera AG & Co. KGaA (as Executive Board member of the General Partner thyssenkrupp Management AG)

Professional background:

Holding a Ph.D. in Chemistry from the LMU Munich, Dr. Werner Ponikwar has gained 20+ years of experience in the chemical industry. He held leading positions including business development, corporate strategy and management at German stock-listed companies such as Evonik Degussa and Linde.



In his last role, he served as CEO of Linde Hydrogen FuelTech, a global technology provider of hydrogen refuelling stations, focused on the full product life cycle, incl. the development, manufacturing, sales, erection and service. As the new CEO of thyssenkrupp nucera, he will drive the development of the business to a standalone company to become a global hydrogen technology champion. As the CEO of thyssenkrupp nucera, Dr. Werner Ponikwar is responsible for sizing the business in all regions with a clear vision and growth strategy.

Dr. Arno Pfannschmidt

CFO thyssenkrupp nucera AG & Co. KGaA (as Executive Board member of the General Partner thyssenkrupp Management AG)
Born 1961, degree (Dipl.-Volksw.) in economics and a doctorate (Dr. rer. pol.) in transaction cost economics from the University of Bonn.

Professional background:

Arno Pfannschmidt has more than 25 years' professional experience in accounting, taxes, controlling, finance and M&A at thyssenkrupp.

For over 20 of these years, he has been in CFO functions at subsidiaries within various Business Areas, such as Stainless Steel, Elevator and Marine Systems, including assignments to Italy, South Korea and Sweden.



On September 1, 2014, Arno Pfannschmidt was appointed CFO of thyssenkrupp Electrolysis GmbH, and continued in this function after the Closing of the Joint Venture with De Nora. He manages the Group's CFO functions.

Fulvio Federico – CTO (Chief Technology Officer)

CTO thyssenkrupp nucera AG & Co. KGaA (as Executive Board member of the General Partner thyssenkrupp Management AG)
Born in Milano in 1966, studied Chemical Engineering at Politecnico di Milano.

Professional background:

Fulvio Federico has 30 years' professional experience in design, development and manufacturing of cells and processes for the electrochemical industry. In 1993 he joined De Nora for the research and development of electrolyzers for conventional chlor-alkali as well as for new processes, especially those using oxygen depolarized cathodes.

He was participating in projects and leading projects in new technology developments for De Nora and, since 2001, for Uhdenora and partners, from basic concept until industrialization (e.g. the HCl-ODC electrolysis, NaCl-ODC, zero-gap retrofit, new chlor-alkali BM Gen. v6, etc.).

In April 2015 he joined thyssenkrupp nucera (former: thyssenkrupp Uhde Chlorine Engineers) as Head of Global Technology, coordinating the R&D activities. On 1 October 2017 Fulvio Federico was appointed CTO.



Management of Fraunhofer Institute for Ceramic Technologies and Systems IKTS

Prof. Dr. rer. nat. habil. Alexander Michaelis

Institute Director of Fraunhofer IKTS and Professor of Inorganic Non-Metallic Materials at TU Dresden

Prof. Alexander Michaelis studied physics at the University of Düsseldorf and completed his doctorate in materials science there. He has more than 30 years of professional experience in ceramics, energy and environmental technology. After holding positions at the University of North Carolina (USA), Siemens AG (USA) and Bayer AG, he became head of the “Development of New Business Areas” department at Bayer subsidiary H.C. Starck GmbH. Prof. Michaelis has been Professor of Inorganic Non-Metallic Materials at the Technical University of Dresden since 2002. He has been Institute Director of Fraunhofer IKTS since 2004. He holds 42 patent families and has received numerous awards, including the ACerS Bridge Building Award, the “Medal of Leadership” of the American Ceramic Society, the Fraunhofer Medal and the LEE HSUN Award on Materials Science of the Chinese Academy. Prof. Michaelis is an academy member of the World Academy of Ceramics WAC, a fellow of the American Ceramic Society (ACerS) and the European Ceramic Society. From 2019 to 2023, he was President of the German Ceramic Society (DKG e. V.) and is still Chairman of the DKG Research Association (FDKG).



Dr. rer. nat. Roland Weidl

Deputy Institute Director Fraunhofer IKTS,
Site Manager Arnstadt

Dr. Roland Weidl studied physics at the Justus Liebig University in Giessen and obtained his doctorate in solid state physics at the Friedrich Schiller University in Jena. He has almost 30 years of professional experience in energy research and technology development. After his research activities at INNOVENT Technologieentwicklung e. V. Jena, he moved to SCHOTT Solar Thin Film GmbH, where he was responsible for product management. From 2014 to 2023, Dr. Weidl headed the „System Integration and Technology Transfer” department at Fraunhofer IKTS with the research areas of fuel cell systems and high-temperature batteries. Since 2020, Dr. Roland Weidl has been site manager of Fraunhofer IKTS in Arnstadt with the Battery Innovation and Technology Center BITC and the “WaTTh - Industrial Hydrogen Technologies Thuringia”. In 2023, he was appointed Deputy Director of the institute. He received the



Thuringian Research Award for Applied Research in 2019 and has already received the Fraunhofer Prize “Best Customer Acquisition of the Year” on two occasions (2019, 2022).

Prof. Dr. rer nat. Michael Stelter

Deputy Institute Director of Fraunhofer IKTS and Professor of Technical Environmental Chemistry at Friedrich Schiller University Jena.

Prof. Michael Stelter studied Physical Chemistry and Electrochemistry as well as Technology Assessment at Chemnitz University of Technology, where he also obtained his doctorate. He has more than 20 years of professional experience in energy and environmental technology. He worked in a leading position at Sachsenring AG in the field of “Advanced Development Vehicle Systems” and at Webasto AG in the field of “Fuel Cell Systems/Functional Ceramics”. He has held various positions at Fraunhofer IKTS since 2005 and has been Deputy Institute Director with a focus on marketing and strategy since 2013. He is Director at the Center for Energy and Environmental Chemistry (CEEC) at Friedrich Schiller University Jena, a board member of the Thuringian Renewable Energy Network (ThEEN) e. V. and spokesman for the Thuringian Water Innovation Cluster ThWIC.



Prof. Dr. rer nat. Ingolf Voigt

Deputy Institute Director Fraunhofer IKTS,
Site Manager Hermsdorf

Prof. Ingolf Voigt studied chemistry at the Friedrich Schiller University in Jena and received his doctorate in solid state chemistry. He has more than 30 years of experience in ceramics and environmental technology. From 1993, he worked at the Hermsdorf Institute for Technical Ceramics HITK, first as a scientist, then as group and division manager and later as Deputy Institute Director. After the integration of HITK into Fraunhofer IKTS, he took over the management of the “Environmental Technology and Bioenergy” department from 2010 to 2013 and has been part of the institute management and head of the Hermsdorf site since 2013. With a focus on ceramic technology and membrane technology, he is a lecturer at Friedrich Schiller University and Ernst Abbe University Jena. The latter awarded him an honorary professorship in 2018. Prof. Voigt has received several awards, including the Thuringian Research Prize, the Joseph von Fraunhofer Prize and the Corporate



Environmental Achievement Award from the American Ceramic Society. In addition to numerous other committee activities, Prof. Voigt is a board member of Tridelta Campus Hermsdorf e. V. and is committed to the development and networking of industry and research in Eastern Thuringia.

Dr.-Ing. Christian Wunderlich

Deputy Institute Director Fraunhofer IKTS,
Site Manager Dresden-Klotzsche



Dr. Christian Wunderlich studied and completed his doctorate at the TU Chemnitz in the field of mechanical engineering. He has more than 25 years of professional experience in R&D management. He worked in management positions at SKF GmbH Application Technology, Sachsenring AG Zwickau and Alstom Ballard GmbH in Canada before becoming responsible for APU development at Webasto AG in 2002. In 2003, he initiated a cooperation project between the partners Webasto, H.C. Starck and Fraunhofer IKTS for the commercialization of SOFC stacks. In 2005, staxera GmbH was founded as a joint venture – the first supplier of integrated SOFC stacks and stack modules. From 2005 to 2011, Dr. Wunderlich led the company as CEO before it was sold to Sunfire GmbH in 2011. Since 2011, Dr. Wunderlich has been working at Fraunhofer IKTS, initially as head of the department “System Integration and Technology Transfer”. Since 2014, he has been Deputy Institute Director and Site Director at Fraunhofer IKTS Dresden-Klotzsche. He heads the business units Nondestructive Testing and Monitoring as well as Mechanical and Automotive Engineering.

Dr.-Ing. Michael Zins

Deputy Institute Director Fraunhofer IKTS,
Administrative Director



Dr. Michael Zins studied mechanical engineering at RWTH Aachen University, where he completed his doctorate at the Institute for Ceramic Components in the field of mechanical engineering. He has many years of experience in ceramic technology and is well connected in the ceramics industry. From 1993 to 2015, he was Managing Director and Managing Partner of Technologie Agentur Struktur Keramik TASK GmbH in Aachen and Dresden. At the same time, he took over the management of the Structural Ceramics research division at Fraunhofer IKTS with four departments in 2002. He has

been Deputy Institute Director and Administrative Director since 2006. For many years, he headed the Fraunhofer-Gesellschaft's AdvanCer Alliance for Advanced Ceramics as well as other strategic project initiatives. As Administrative Director of Fraunhofer IKTS, which consists of several departments, he is responsible for strategic organizational development as well as organizational and contractual issues.

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Electrolysis technologies at a glance

- **Alkaline water electrolysis (AWE)** is a process for producing hydrogen from water using electricity. If electricity from renewable energy sources is used, it is green hydrogen.
 - **Chlor-alkali electrolysis** is a process for producing the important basic chemicals chlorine, hydrogen and caustic soda from sodium chloride and water.
 - **PEM electrolysis** (Proton Exchange Membrane) is a water electrolysis process. In contrast to alkaline electrolysis, it is carried out in an acidic medium.
 - In high-temperature solid oxide electrolysis (**SOEC**), a fuel cell converts water vapor into hydrogen and oxygen in reverse mode at very high temperatures.
 - **AEM electrolysis** (anion exchange membrane electrolysis) is a combination of the PEM (proton exchange membrane) and AEL (alkaline electrolysis) electrolysis processes.
 - For further information see [Glossar - thyssenkrupp nucera \(thyssenkrupp-nucera.com\)](#) and [Electrolysis – Fraunhofer IKTS](#)
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Important Links (Photos & Videos)

- **Press release:** [Press releases - thyssenkrupp nucera \(thyssenkrupp-nucera.com\)](https://www.thyssenkrupp-nucera.com/press-releases)
 - **Photos & Videos** (products, management, HQ):
thyssenkrupp nucera: [Publications & Media - thyssenkrupp nucera \(thyssenkrupp-nucera.com\)](https://www.thyssenkrupp-nucera.com/publications-media)
Fraunhofer Institute for Ceramic Technologies and Systems IKTS:
[Press/Media – Fraunhofer IKTS](https://www.fraunhofer-ikts.de/press-media)
 - **Interview with Professor Alexander Michaelis and Dr. Werner Ponikwar on SOEC "Shaping the Green Energy Future":** [Shaping the Green Energy Future - thyssenkrupp nucera \(new-era-insights.com\)](https://www.thyssenkrupp-nucera.com/new-era-insights)
 - **Brochures**
thyssenkrupp nucera: [Rethinking existing infrastructures | Startseite - thyssenkrupp nucera \(thyssenkrupp-nucera.com\)](https://www.thyssenkrupp-nucera.com/rethinking-existing-infrastructures)
Fraunhofer Institute for Ceramic Technologies and Systems IKTS:
[Flyer: Fraunhofer IKTS in profile](https://www.fraunhofer-ikts.de/flyer)
[Brochure: Hydrogen Technologies](https://www.fraunhofer-ikts.de/brochure-hydrogen-technologies)
[Infographic: Value chain for green hydrogen](https://www.fraunhofer-ikts.de/infographic-value-chain-green-hydrogen)
 - **Website:**
thyssenkrupp nucera: [Rethinking existing infrastructures | Home - thyssenkrupp nucera \(thyssenkrupp-nucera.com\)](https://www.thyssenkrupp-nucera.com/rethinking-existing-infrastructures)
Fraunhofer Institute for Ceramic Technologies and Systems IKTS:
www.ikts.fraunhofer.de/en.html
 - **Glossary:** [Glossary - thyssenkrupp nucera \(thyssenkrupp-nucera.com\)](https://www.thyssenkrupp-nucera.com/glossary)
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