

Industrial innovation

An overview of the funded projects from the Targeted Programme Industry

3D material measurements for innovative technologies (14IND01)

Advanced 3D chemical measurements for high-value manufacturing

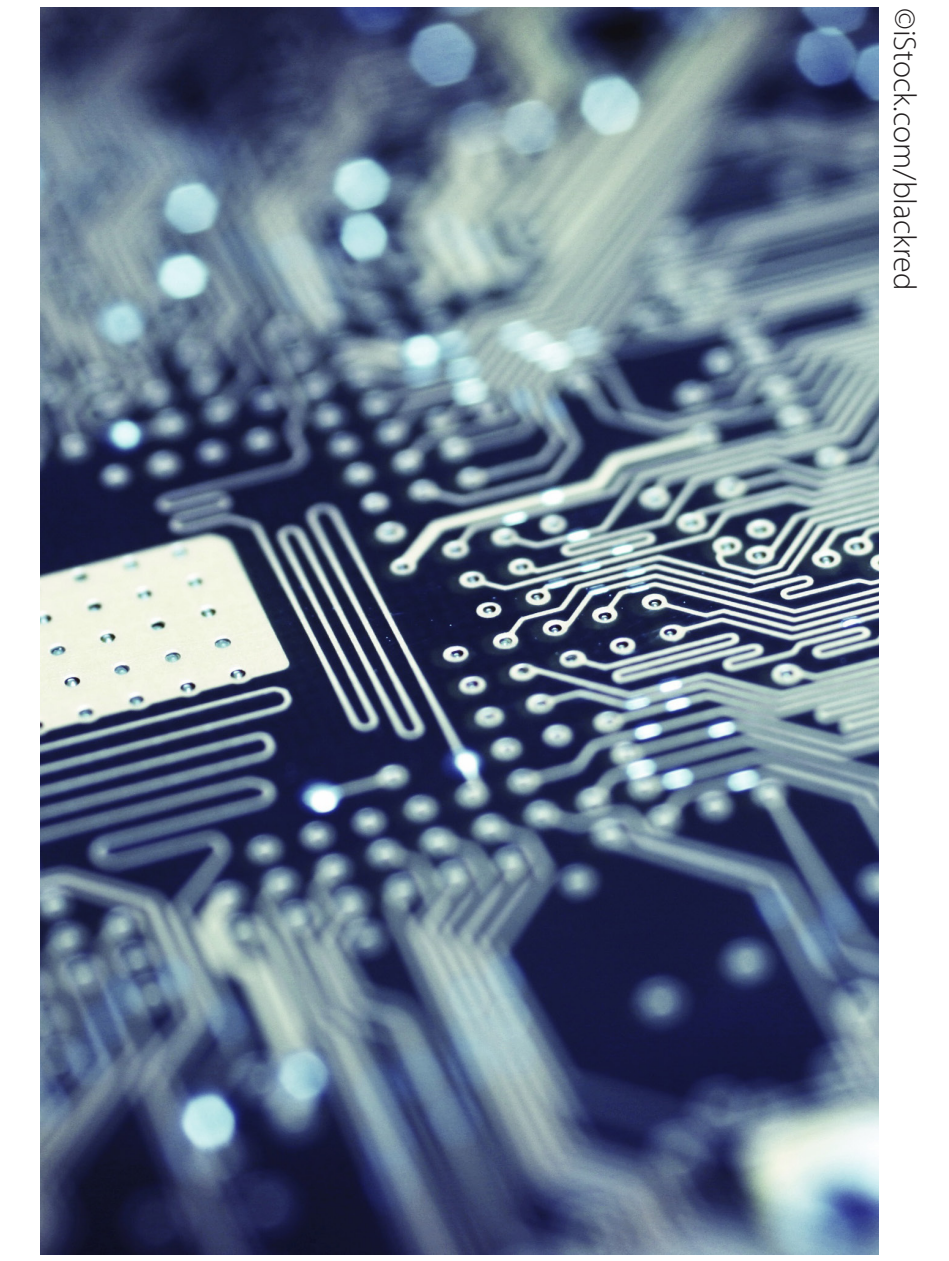
Consumer demand for faster, smarter and cheaper technologies is driving innovative solutions based on 3D architectures, 3D printing and a rapidly expanding library of complex materials. This project will develop advanced measurement techniques for 3D-resolved chemical composition and interfacial material properties, providing manufacturers with state-of-the-art measurement capabilities to enable exploitation of complex materials.



Supporting high-frequency technologies (14IND02)

Microwave measurements for high-frequency microchips

Increasing demands for higher data rates, and the development of high-resolution imaging, are pushing up the operating frequency of electronic components in many industrial applications. This project will develop methods for accurate, traceable measurement of high-frequency microchips, accelerating the development of devices for high-speed and microwave applications, such as wireless communications and medical sensing.



Smaller is stronger (14IND03)

Supporting length-scale engineering for lighter, stronger materials

According to conventional theory, a small and large beam of the same material will fail under the same stress; however, in reality, the smaller beam is stronger, demonstrating a length-scale effect. This project will produce design rules and develop new measurement techniques to enable industry to exploit length-scale engineered materials and create components that are lighter, stronger, and more fatigue and wear resistant.



Enhancing efficiency through temperature measurement (14IND04)

Improving temperature measurement capability in high-value manufacturing

High-value manufacturing processes are heavily reliant on accurate, traceable temperature measurement, with some requiring reliable control at temperatures up to 2000 °C. This project will improve temperature measurement capability in industry with new sensors and calibration techniques, which will minimise product rejection, increase energy efficiency and reduce costs for manufacturers.



Secure quantum communications (14IND05)

Optical metrology for quantum-enhanced telecommunications

Quantum Key Distribution (QKD) uses quantum mechanics to offer a level of data security beyond that possible with current systems, and could provide improved security in sectors such as banking, commerce, government and medicine. This project aims to develop the measurement and calibration techniques needed to accelerate the development and commercial success of QKD technologies.



Improving efficiency and safety with pressure measurement (14IND06)

New industrial standards in the intermediate pressure range

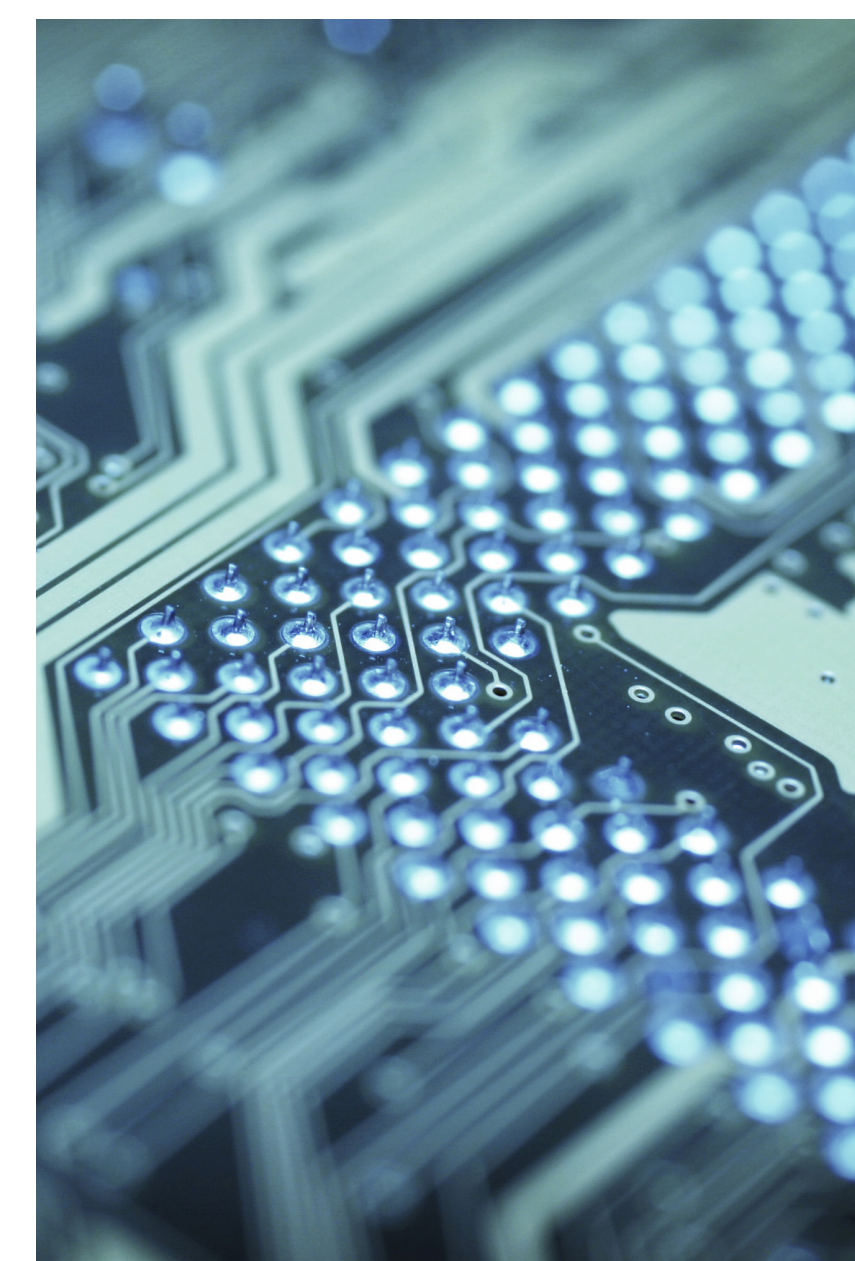
Accurate intermediate-range pressure measurements are essential for industrial processes, such as those used in power plants and pharmaceutical production, to satisfy international requirements regarding safety and performance. This project will develop new standards and calibration methods for intermediate-range pressures, to increase the efficiency of industrial processes, provide a basis for new technologies and reduce the risk of environmental contamination.



Enhancing performance with 3D microchips (14IND07)

Measurement techniques for manufacturing 3D integrated circuits

3D microchips offer the electronics industry reduced power consumption and increased speed over their 2D counterparts. This project will develop the technology and measurement infrastructure needed to accurately characterise 3D microchips, enabling the European semiconductor industry to lower manufacturing costs and time to market, and supporting the development of new, innovative products.



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Ultra-high voltage grids (14IND08)

Extending test methods for the electrical power industry

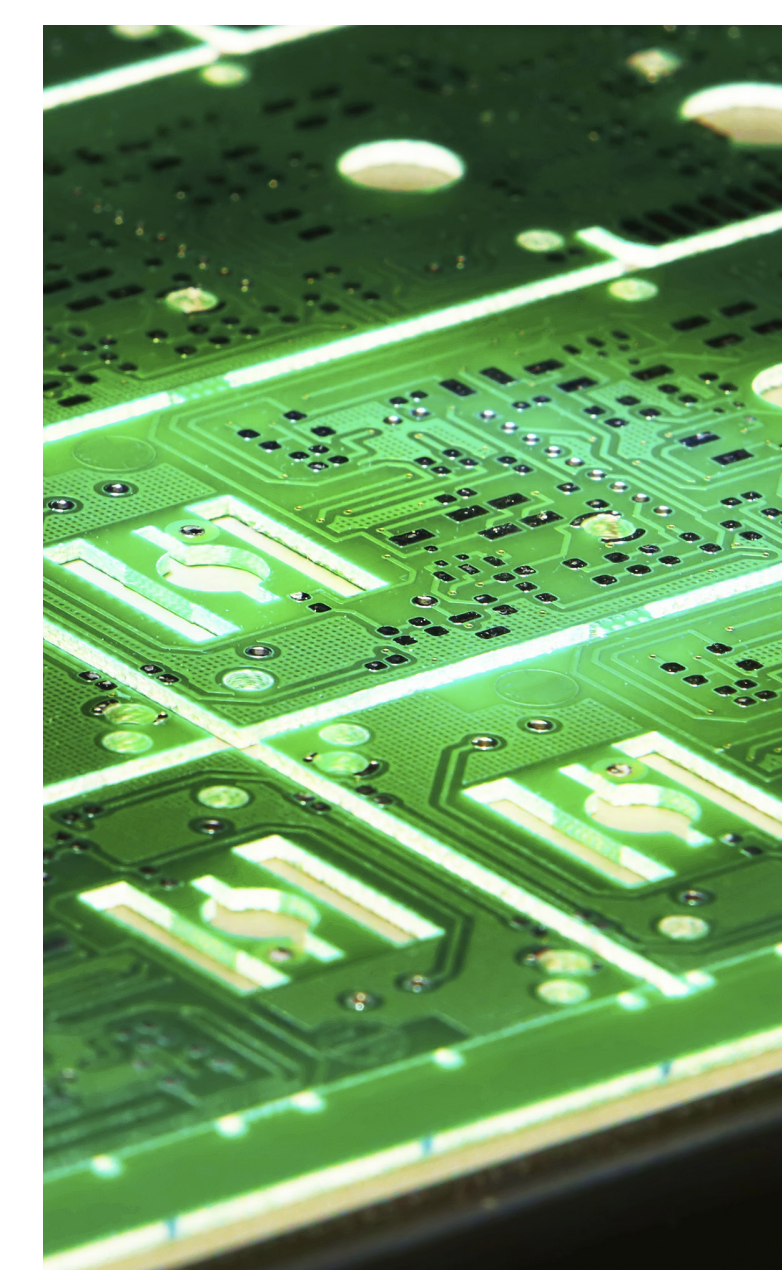
Energy efficiency requirements are driving the development of electricity grids which operate at higher voltages and with lower losses. This project will develop the measurement capability needed to validate the performance of grid equipment under high-voltage operating conditions, to improve quality and efficiency and maintain the competitiveness of Europe's high-voltage electricity industry.



Enabling highly-parallel manufacturing (14IND09)

Measuring large-scale, fine-feature printed electronics

Highly-parallel manufacturing techniques promise to cut the cost of electronics by rapidly producing identical devices with high feature resolutions simultaneously on large surfaces. This project will develop the metrological tools needed to implement improved highly-parallel manufacturing processes, enabling innovation and efficiency gains in technologies such as photovoltaics, self-cleaning surfaces and instant disposable medical tests.



Next generation communications (14IND10)

Developing metrology for 5G communications

5G mobile networks, planned for deployment from 2020, will provide a data transfer rate more than 1000 times greater than that of 4G systems. This project will develop the necessary measurement infrastructure and standards underpinning the development of 5G communications, giving European industry a competitive edge in the emerging 5G technologies market.



Improving efficiency with humidity monitoring (14IND11)

Humidity measurements at high temperatures and transient conditions

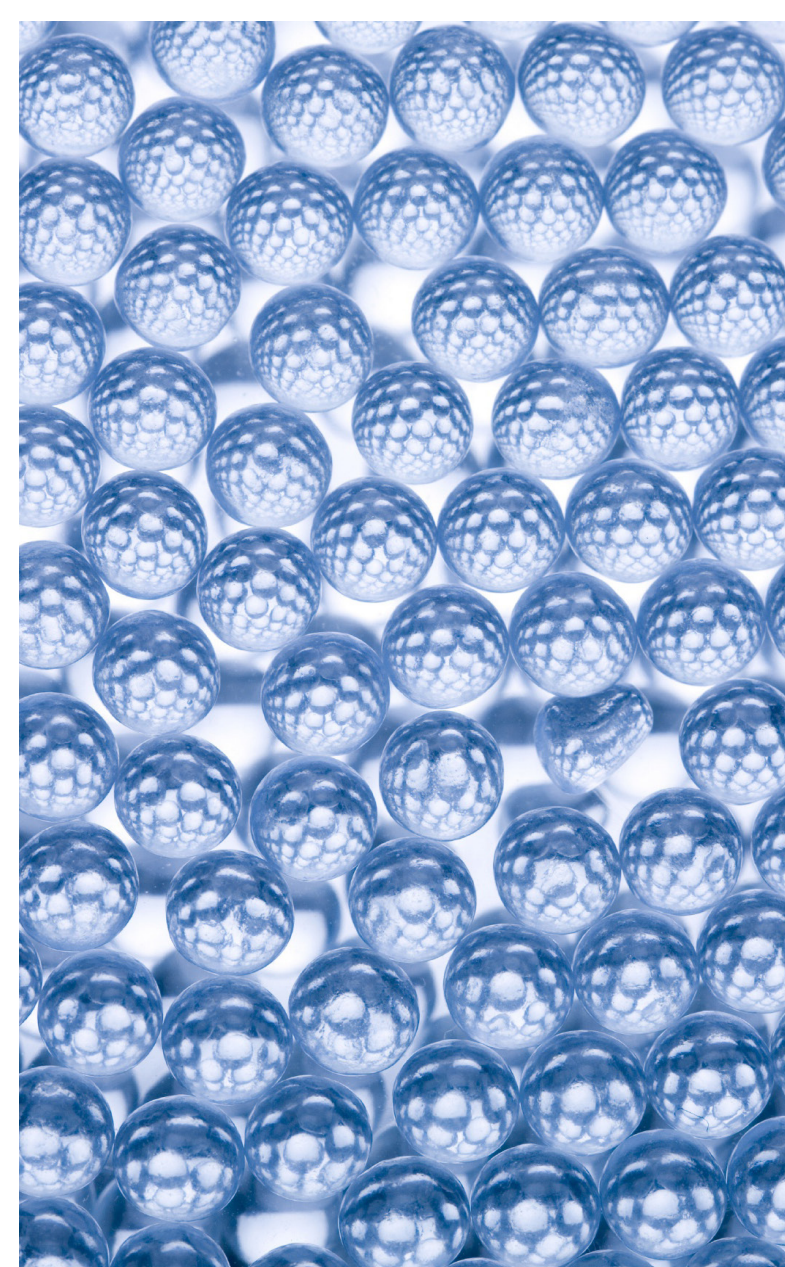
Air humidity directly affects the quality of pharmaceutical and food products during both production and storage. Improving the reliability of humidity measurements could save millions of euros across European industry each year. This project will significantly improve the speed and accuracy of industrial humidity measurements by developing new measurement and calibration techniques tailored to industrially-relevant operating conditions.



Supporting innovation with nanoparticles (14IND12)

Measuring nanoparticle concentration and chemistry

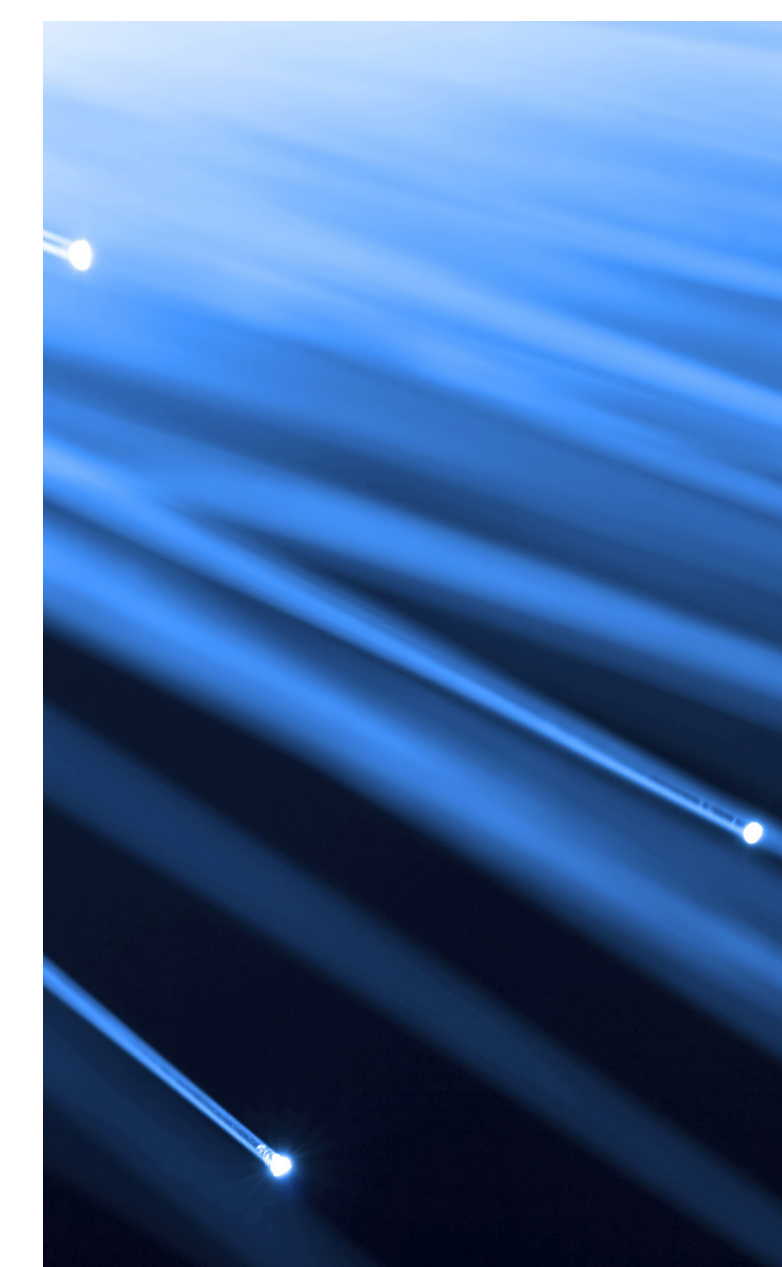
Nanoparticles' unique and tuneable properties make them ideal for use in a wide variety of innovative products, from conductive inks for printed electronics to drug delivery agents for the pharmaceutical industry. This project will provide industry with the techniques needed to measure nanoparticle number concentration and surface chemistry, supporting the development of high performance nanoparticles for advanced technologies.



Next generation optical fibres (14IND13)

Improved metrology for the photonics industry

Optical fibres and other photonic components are being increasingly implemented in rapidly-growing and demanding areas such as aviation electronics, telecommunications and the automotive industry. This project will develop characterisation techniques for the latest generation of photonic components and devices, supporting innovation within the European photonics industry and enabling faster, cheaper data connections.



Testing wind turbines (14IND14)

Traceable torque measurements for improved turbine testing

Reliability of wind energy supply depends on the reliability of the turbines themselves, and several test facilities have been constructed to support the development of robust wind turbine generators. This project aims to provide traceability for torque measurements using nacelle test facilities over their full operating range, allowing manufacturers to reliably verify product quality and supporting Europe's wind energy industry.

