



The Atom Probe Microscope for Research & Industry



Building on 30 years of success in Atom Probe Tomography instrumentation and application, CAMECA announces EIKOS™, the atom probe microscope that enables routine, high performance 3D nano-analysis for both research and industry.

CAMECA EIKOS: Accessible APT!

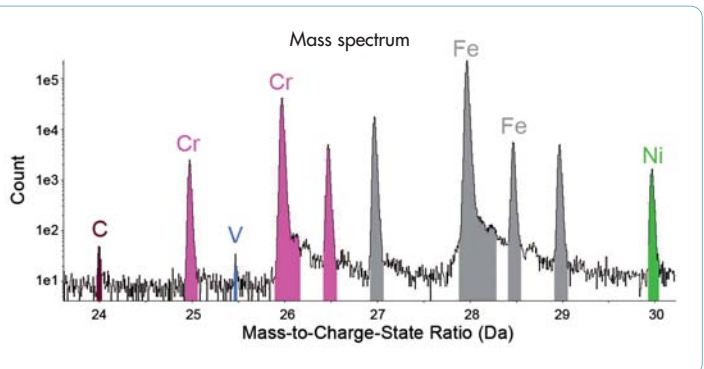
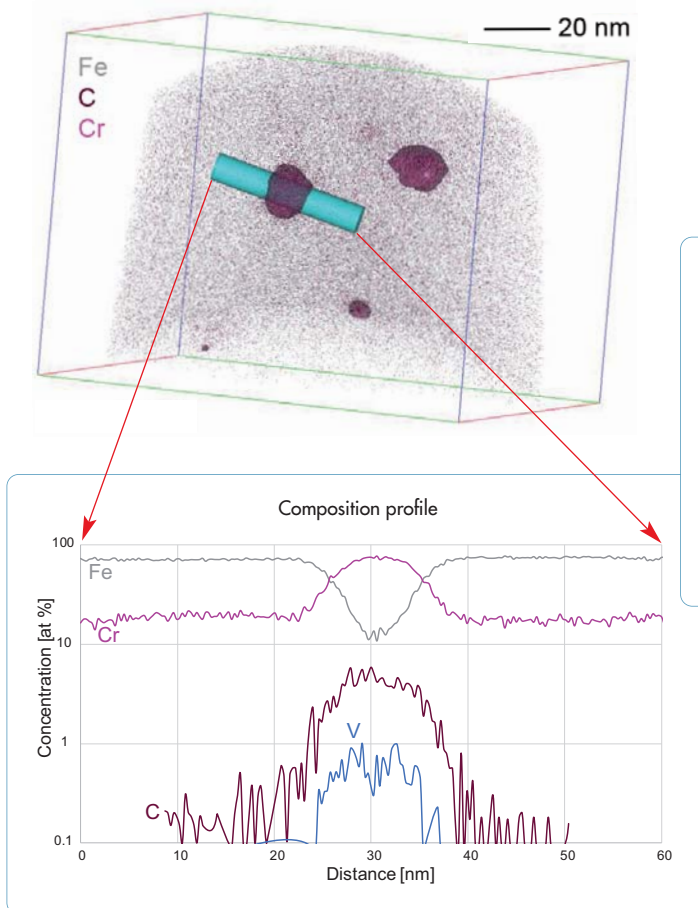
The new EIKOS platform provides accessibility to Atom Probe Tomography with ease of use and a low cost of ownership. Utilizing standard microscopy sample preparation methods, it delivers nanoscale structural information enabling new understanding of materials for research and faster development of products for industrial applications.

EIKOS addresses a wide range of APT applications that have been demonstrated for over 30 years. The base EIKOS model with voltage pulsing enables a variety of metallurgical applications. The full configuration, EIKOS-X, expands the applications space into thin films, coatings and semiconductors.

Key features of the EIKOS platform

- 3D tomography with nanoscale characterization of microstructures
- High spatial resolution single atom detection with high efficiency
- Equal sensitivity to all elements and their isotopes
- Quantitative composition measurement (sub-nm to near micron scale)
- Available in voltage or voltage & laser configurations
- Mature data analysis methods
- Standard specimen preparation methods

Stainless steel analysis obtained with EIKOS Atom Probe.



Top: nanoscale 3D mapping clearly revealing the MoN and C rich precipitates that add strength and corrosion resistance to this alloy. Precipitates displayed by a concentration surface of 20% carbon.

Middle right: Mass spectrum demonstrating excellent trace element detection: e.g. vanadium in steel ~ 30ppm.

Left: concentration profile through the nanoscale vanadium and molybdenum rich chrome carbide – demonstrating detection, and quantification with nanoscale resolution.

EIKOS is available in two configurations:

EIKOS

The base EIKOS system operates in voltage mode and incorporates a reflectron design to provide excellent mass resolving power and signal to noise. A pre-aligned integrated counter electrode ensures ease of use and high reliability. The voltage pulsing system provides very high data quality on a wide variety of metallurgical applications.

The base EIKOS system will be field upgradable to the EIKOS-X.

EIKOS-X

The fully configured EIKOS-X system combines all the outstanding features of the base EIKOS (voltage pulsed, reflectron based functionality, pre-aligned counter electrode) and adds a fully integrated, automated laser pulsing module with a computer controlled focused spot design to provide access to a larger application range.

With EIKOS, CAMECA delivers a new Atom Probe design ensuring ease of use in both industrial and research applications.

The EIKOS Atom Probe has been designed to maximize utility for the development of commercial alloys and essential research at the university level. The design, layout and footprint provide incredible flexibility for site requirements. High reliability and ease of use are made possible thanks to two major instrumental innovations.

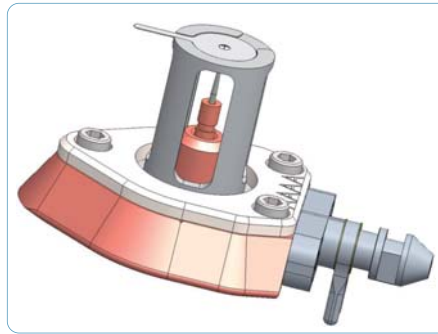
Integrated Counter Electrode

The innovative prealigned counter electrode design completely eliminates the need for in-situ alignment. It offers exceptional ease of use and enables the simplified and robust EIKOS design, utilizing a standard reflectron-based detection system optimized for excellent signal-to-noise and sensitivity over a wide range of material types.

New laser system

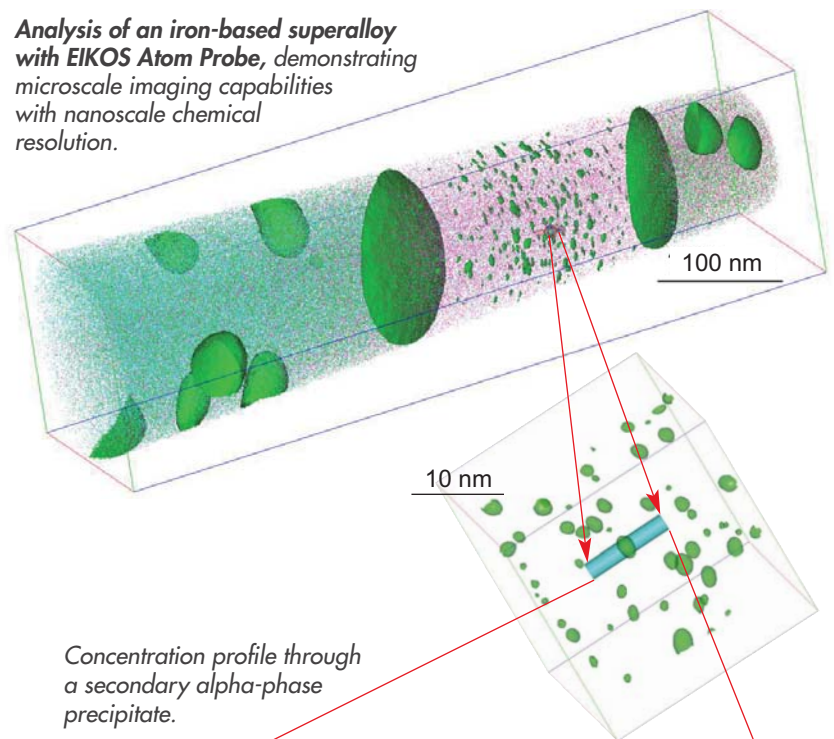
With its new 532 nm laser pulse system, CAMECA has put a premium on simplicity, from the reliability of the industrial grade hardware to the easy to use control interface integrated into the Atom Probe Control Center™ software.

With the field upgradable laser module, the EIKOS-X delivers 3D atomic scale data across a wider applications space.

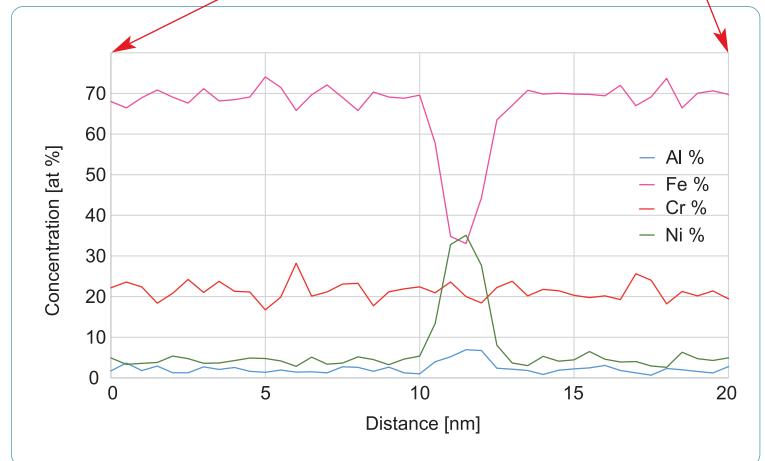


The new electrode design allows pre-alignment of the specimen tip to the counter electrode outside of the vacuum system. Its high-reliability improves the ease of use of the EIKOS system and practically eliminates costly consumables and in-vacuum alignment protocols.

Analysis of an iron-based superalloy with EIKOS Atom Probe, demonstrating microscale imaging capabilities with nanoscale chemical resolution.



Concentration profile through a secondary alpha-phase precipitate.



At least five chemically distinct phases are captured in this 3D dataset. The nanoscale chemical information allows a clear understanding of how processing and the resultant nanostructure affect real-world performance properties – like the high creep resistance of this iron-based superalloy.

The new EIKOS platform utilizes proven technology to access a wide variety of applications including:

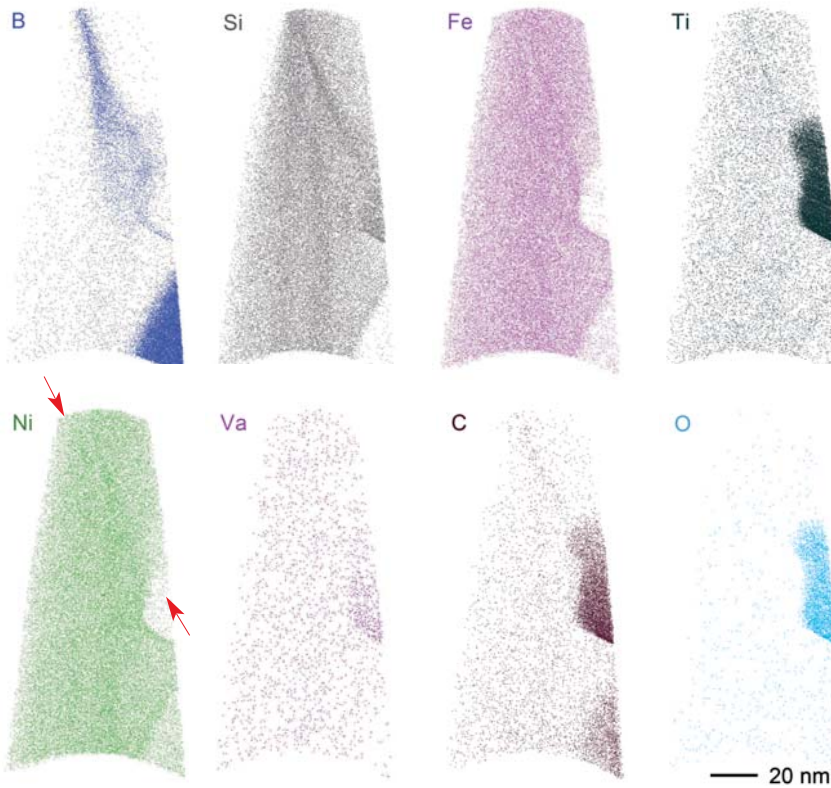
- Steels
- Light alloys
- Superalloys
- High entropy alloys
- Bulk metallic glasses
- Nuclear structural materials
- Thin films
- Coatings



The Atom Probe for cost-effective alloy development and nanoscale materials research.



The name EIKOS is derived from the Greek word for image, a powerful microscope providing stunning, quantitative images.



These thin (10 nm) slices of the 3D APT images “Virtual TEM Lamella”, acquired with the EIKOS Atom Probe, show an Inconel grain boundary decorated with a complicated titanium carbide/oxide precipitate.

These precipitates are engineered to provide excellent high temperature creep resistance that makes Inconel such a versatile alloy in aggressive environments like jet engines and chemical processing plants.

Arrows on the Ni image indicate the t-EBSD targeted grain boundary that was captured in this specimen. This grain boundary is decorated with two C rich particles, one that is Ti/O rich and one that is B rich.

CAMECA is the world premier provider of microanalytical instrumentation. We deliver cutting-edge science and metrology solutions, and offer our customers unparalleled support and maintenance service through the comprehensive AMECARE program.

Corporate Headquarters:

29 Quai des Grésillons • 92622 Gennevilliers Cedex • FRANCE
Phone: +33 1 43 34 62 00 • cameca.info@ametek.com

CAMECA Atom Probe Technology Center:

5500 Nobel Drive • Madison WI 53711 • USA
Tel: +1 608 274 6880 • cameca.leap@ametek.com

CAMECA Subsidiaries or International AMETEK Offices:

AMETEK do Brasil CAMECA Business Unit • cameca@ametek.com.br
AMETEK China CAMECA Business Unit • cameca-china.sales@ametek.com.cn
CAMECA Germany • sales.cameca@ametek.de
AMETEK India CAMECA Business Unit • cameca-india@ametek.com
AMETEK Japan CAMECA Business Unit • cameca-japan.info@ametek.co.jp
AMETEK Korea CAMECA Business Unit • cameca-korea.info@ametek.co.kr
CAMECA Taiwan Corp. Ltd. • sales.cameca@ametek.com.tw
CAMECA Instruments, Inc. USA • cameca.us-sales@ametek.com



www.cameca.com
www.atomprobe.com