

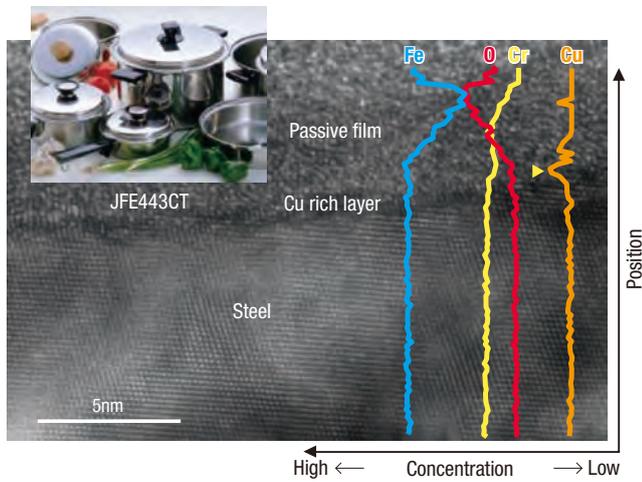


Analysis & Characterization

JFE Steel is in the vanguard of chemical analysis and micro-beam analysis techniques, which are indispensable to the research and development of modern steel materials and processes.

Nanostructure Imaging & Analysis Techniques

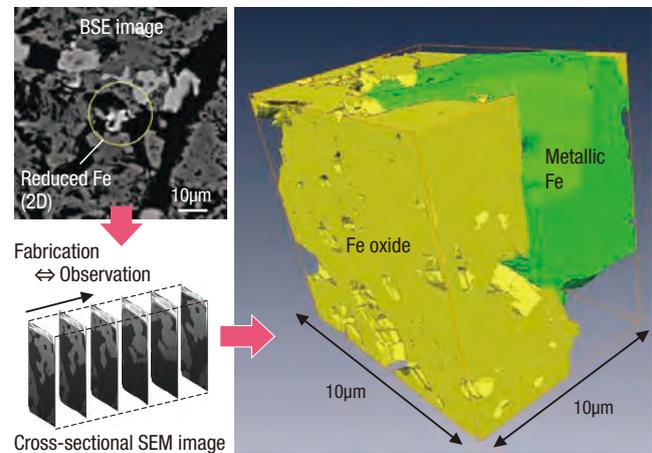
We are challenging for designing materials and optimizing manufacturing processes by characterizing from micrometer to sub-nanometer scale microstructures of materials by using various advanced microscopic techniques.



The cross-sectional image and the sub-nanometer scale analysis across a passive film on a JFE443CT stainless steel by using the aberration corrected scanning transmission electron microscope.

3D/4D Structure Imaging

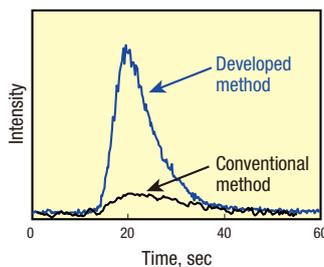
3 and 4 dimensional structural imaging techniques assist in revealing the internal structures and dynamic changes of materials are developed for designing novel products and processes with high performance and high reliability.



3D image of internal texture of iron oxide revealed by focused ion beam (FIB) combined scanning electron microscope (SEM) dual beam system. Volume 15µm × 10µm × 10µm.

Trace Analysis & Speciation

JFE steel has developed an analytical method which enables highly precise and rapid quantitative analysis of ultra low sulfur (ULS) contained in steel. The developed method is "ultraviolet fluorescence (UVF) method after combustion", which combined high frequency induction furnace and the continuous UVF analyzer of sulfur dioxide.



Comparison of SO₂ extraction curves obtained by combustion of ULS steel

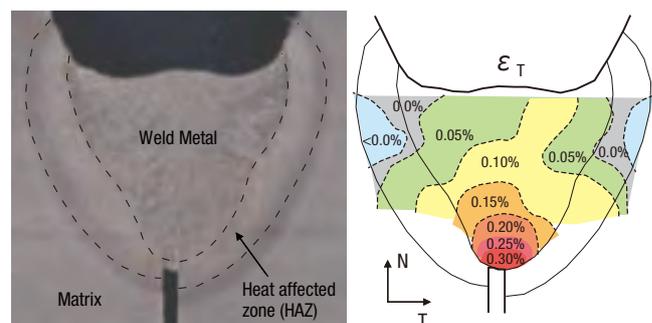


Newly developed UVF ultra low S analyzer

Neutron & Synchrotron

For investigating relations between mechanical properties and microstructures, we are using the quantum beam facilities, such as J-PARC for neutron beam and SPring-8 for synchrotron radiation beam.

J-PARC: Japan Proton Accelerator Research Complex
SPring-8: Super Photon ring-8 GeV



Strain distribution toward transverse direction in welded joint measured through neutron beam