Analysis/evaluation, investigation, and analysis technology for next-generation automobiles

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Business Policy

Your Best Partner for "Monodzukuri"

JFE Techno-Research Corporation aims to be the client's best partner in solving

technical problems related to "monodzukuri" (Japanese-style manufacturing).

In a wide range of fields from the nano region to large-scale structures, we provide high reliability analysis and evaluation technologies using state-of-the-art analysis and testing equipment. Our technical staff of 500 experts possesses a wealth of experience, and is ready to assist clients in solving technical problems in all aspects of "monodzukuri": such as stabilization of product quality, added functions, and reduction of production costs.

quipment supply for imaging spectrum analyzer and imaging inspection system On-site measurement, diagnosis, and evaluation

Development of original products

Chemical analysis and property tests of raw
materials and products

Performance evaluation of materials and products Fracture and failure analysis of products Analysis of inorganic and organic materials

Measurement certification services

Production and inspection

Research, development, and design

Performance evaluations of materials and products

Fracture and failure analysis of materials and products

Analysis of organic materials / evaluation of films

Material strength and forming process technology

Investigation/analysis of causes of corrosion damage and corrosion protection technologies

Structural load tests and welding technologies Microstructure analysis

CAE solutions

Laboratory-scale material production Engineering for plant experiment equipment

We provide the optimum solutions to clients.

- "Visualization" of the essential nature of the problem.
- · More accurate, more timely solutions.
- · Proposals from the client's standpoint.

Environmental analysis, environmental surveys/assessments

Surveys and studies of energy-saving and water treatment technologies

Soil and groundwater surveys, special investigations
Prior art search, patent search, and patent strategy

Education, training, and system development Technical studies and market research

Translation, DTP, website creation, and information retrieval

Technical survey and support services

0. Introduction

This presentation introduces the following analysis and evaluation technologies:

- 1. Evaluation of next-generation battery materials,
- 2. Analysis of nano-region fine structure,
- 3. Characterization of material properties,
- 4. Trace and environmental analysis techniques,
- 5. Evaluation of surface-treated materials,
- 6. Evaluation of structural performance and dismantled investigation,
- 7. Non-destructive testing and numerical analysis.

1. Evaluation of battery materials

Our technical services;

- Lithium ion cell prototyping service (coin-type cell and laminate-type cell),
- (2) Charge and discharge performance evaluation,
- (3) Battery material analyses such as cross-sectional SEM and/or TEM observation (also in-situ analysis), without exposure to air.



Laminate type cell (capacity: 1.7 Ah)

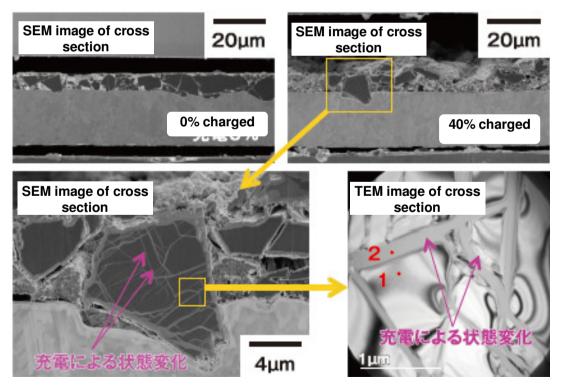
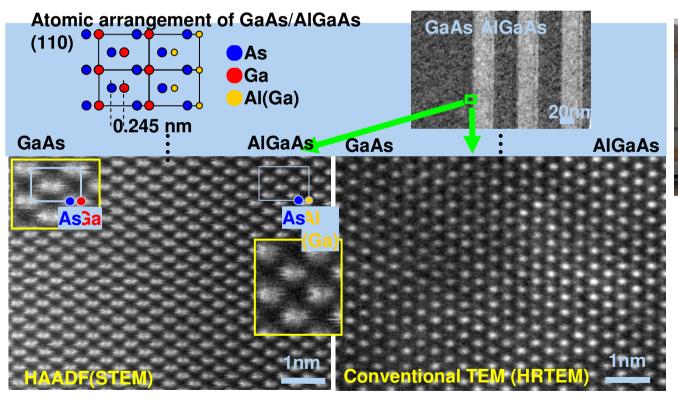


Fig. Cross-sectional views of battery materials

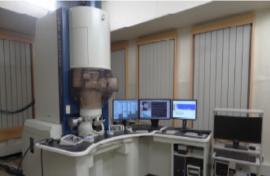
2. Analysis of nano-region fine structure

- (1) Using atomic resolved CS-STEM, for advanced material as power devices, thermoelectric element modules, and catalysts,
- (2) FIB sample processing with a cryo-system to obtain excellent images,
- (3) High resolution EBSD and FE-EPMA are possible to visualize the distribution of rare earth elements as Dy at grain boundaries Nd-Fe-B.

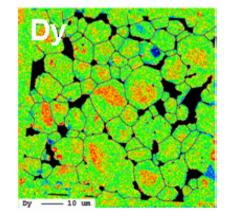




(Left) From the HAADF image of an ultra-high resolution TEM, the positions of atoms can be designated and the individual atoms can be observed.



Atomic resolved CS-STEM

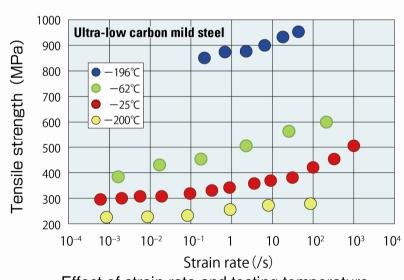


FE-EPMA grain map and Dy map

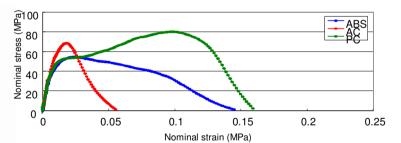
3. Characterization of material properties

- (1) Evaluation of material behavior (strength) at high strain rates, at temperatures from -196°C to 400°C, fatigue, fracture characteristics, and creep, for steels, metals, and resin materials
- (2) Corrosion research, anti-corrosion technology, and magnetic characterization,
- (3) Providing laser and CO2 welding technologies for dissimilar material joints and evaluations of weldability and joint quality.

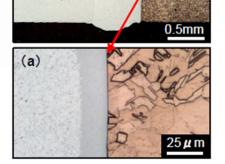
Pure Al



Effect of strain rate and testing temperature on tensile strength



S-s curves of ABS resin (ABS), acryl (AC), polycarbonate (PC) at room temperature, with strain rate: 1000/s

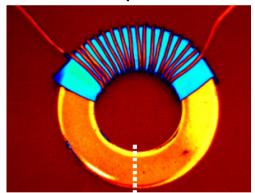


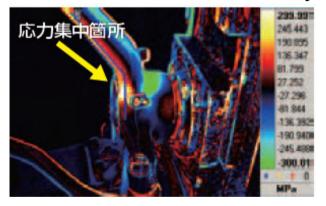
(a)

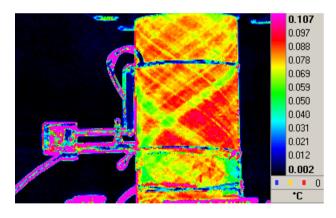
Cross-sectional observation of Al-Cu dissimilar material joint using laser welding [Joint strength: 80 MPa

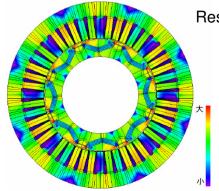
7. Non-destructive and numerical analysis.

- (1) Thermal analysis of magnetic materials and stress distribution measurements using high performance infrared camera techniques,
- (2) Surface and internal defect detection, such as thin films with different thickness distributions, using the imaging spectrometer and dry ultrasonic spectrometer,
- (3) Combination with numerical simulation analysis for verification between experimental results and numerical analysis.





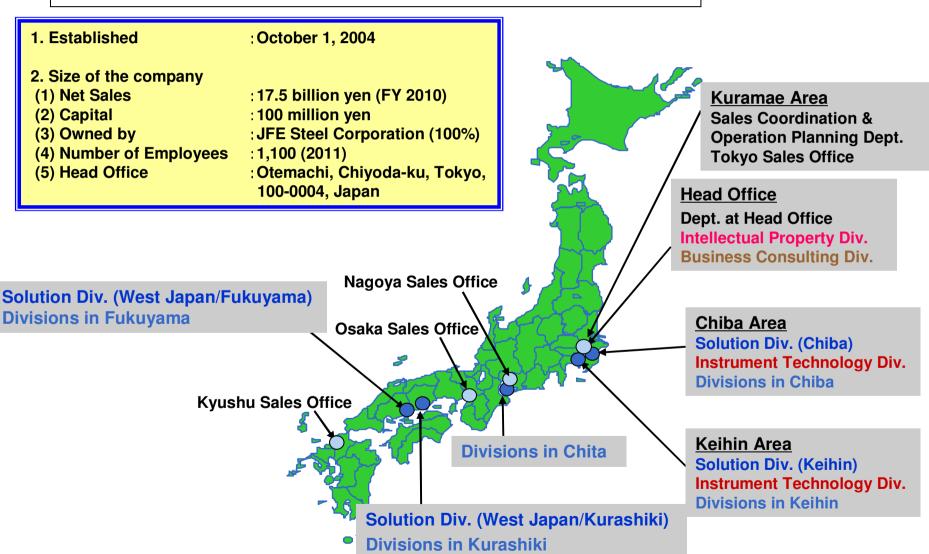




Results of stress distribution measurement with high performance infrared camera and heat analysis

Numerical analysis (magnetic induction) of motor for electric vehicles

Company Outline and Major Business Locations



Results:Our Commitment

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Please feel free to consult us!