

Research and Development System



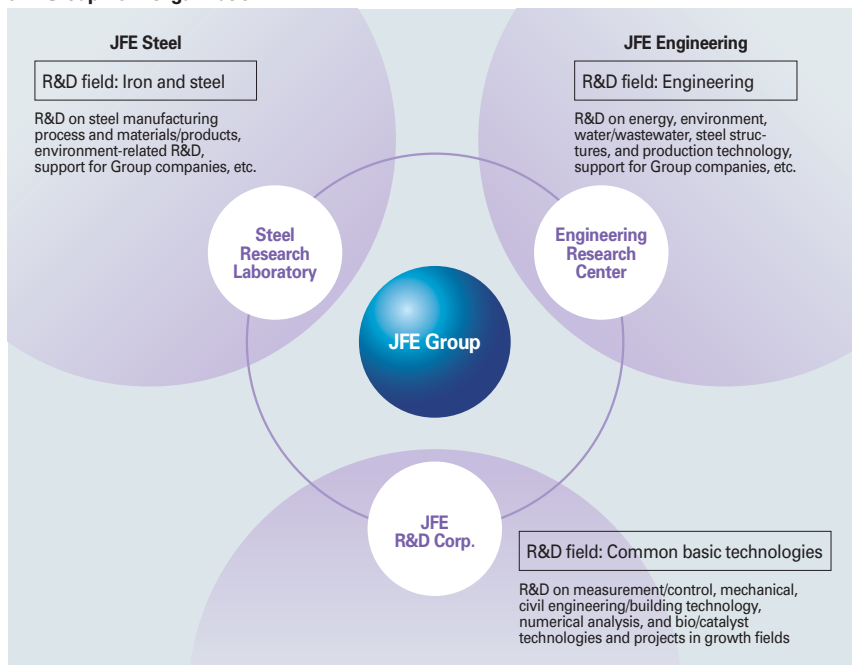
Concept of the 3 Research Organization System in the JFE Group

JFE Group organized the three-laboratory system in April 2003 with the Steel Research Laboratory, the Engineering Research Center, and JFE R&D Corporation.

The Steel Research Laboratory and the Engineering Research Center were organized in JFE Steel and JFE Engineering respectively with the aim of integrating the three functions of development, manufacturing, and sales. To maximize synergies in the JFE Group as whole, R&D on basic technologies common to steel and engineering is concentrated in JFE R&D Corporation.

The goals of R&D in the JFE Group are to develop “Only 1” and “No. 1” products/technologies and explore advanced R&D topics which will provide the foundation for future businesses.

JFE Group R&D Organization



Research and Development System of JFE Group

| Development Completed (Already Commercialized) | Under Development |
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| <ul style="list-style-type: none"> ● Preventing Global Warming <ul style="list-style-type: none"> • High tensile strength steel sheets (NANO HITEN) (780MPa grade) • High purity silicon ingot for solar cells • Environment-friendly regenerative burner • Clathrate hydrate slurry (CHS) latent heat air-conditioning system • Circulating fluidized bed (CFB) furnace for sewerage sludge ● Building a Recycling-oriented Society <ul style="list-style-type: none"> • High-temperature waste gasifying & direct melting • JFE THERMOSELECT gasifying & melting • Electric resistance municipal waste incinerator ash melting • Plasma ash melting • Next-generation stoker furnace (Hyper 21 Stoker System) • JFE hybrid activated carbon with high thermal conductivity • Waste plastic recycling system for BF feed • Waste-to-resource recycling system • RDF^{*1} (Refuse Derived Fuel) carbonizing system • Effective use of landfill site/gasification and melting of disposed waste • Acid fermentation system of sewage sludge | <ul style="list-style-type: none"> ● Reducing Environmental Loads <ul style="list-style-type: none"> • Fly ash dioxin treatment (Hi-Clean DX) • Reducing technology for dioxins in flue gas (Gas-Clean DX) • Environment-friendly high-efficiency arc furnace (ECOARC) • Advanced sewage treatment system using microorganism carriers (Bio-Tube, Pegasus) • Lake & river purification equipment (River-Float) • Accelerated oxidizing treatment system (AOP more) • Simulation of biological reactions • Soil contamination 3-D imaging system • Slag recycling technologies • Low-dioxin combustion control system • Waste incinerator operation training simulator • Dioxin precursor analyzer • New dioxin analysis method • Automatic monitoring system for heavy metals ● Developing Clean Energy <ul style="list-style-type: none"> • Mass production technology for new clean energy source - DME • High efficiency fuel cell - SOFC • Natural gas hydrate ● Building a Recycling-oriented Society <ul style="list-style-type: none"> • New activated coke production process • 100% recycling technology for waste stainless steel pickling acid • Biomass CFB gasification and power generating technology • Sludge solubilization system ● Preventing Global Warming <ul style="list-style-type: none"> • New low-CO₂ sintering process • High tensile strength steel sheets (NANO HITEN) (980MPa grade, etc.) • Refrigeration system powered by low grade waste heat • Slag recycling technology (Marine Block) • Innovative ironmaking technology using Float Smelter ● Reducing Environmental Loads <ul style="list-style-type: none"> • Low-sludge biological water treatment technology |

*1) RDF (Refuge Derived Fuel) Solid fuel made from flammable waste after crushing and compression forming