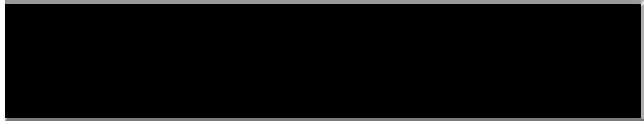


Ironmaking Research Department is in charge of development on ironmaking processes that can contribute to environment-friendly and resource-saving production.



Numerical simulation is a key technology for use of low grade resources. JFE Steel has developed new sintering technologies suitable for increase in productivity and also contribution to reduction of CO₂ emissions. Various characteristics of iron ore to improve ironmaking productivity. Simulations of burden distribution, pulverized coal combustion, chemical reaction and heat transfer have been studied based on measured data. Super-SINTER by utilizing natural gas is one of our latest innovative technologies for improving sinter quality and reduction of CO₂ emissions. of blast furnaces and experiments with particle flow by Discrete Element Method (DEM) and so on.

Gas flow
Gas pressure

Solid
temperature

Compressive
stress

Ore
Coke



Chemical reaction and
heat transfer simulation

3D DEM simulation

Conventional method
Texture of sintered ore

Super-SINTER method
Texture of sintered ore



Coal structure in the molecular size and mechanism of carbonization. Innovative raw material, Ferro coke, is composed of metallic iron and behavior in coke making process have been studied. Those researches are contributing to utilization of various kinds of coal resources and cost reduction. Ferro coke greatly reduces CO₂ emissions in the blast furnace. Production process for utilizing Ferro coke was studied by using the pilot plant at Keihin District, East Japan Works.

Carbonization
Briquette

Lump coke

Ferro coke pilot plant

Large scale 250kg test coke oven

Coke microstructure

Appearance and microstructure of Ferro coke