Super Heated Steam
—Characteristic Features—

Saturated Water vapor, which is created by general boiler system, is heated up by Electromagnetic Induction Heating Coil. Heat Energy per Unit Volume is very big. This fact enables very fast heating.
If Super heated Steam is applied Drying Process, Heat-up speed becomes much faster at the inversion Point of 170℃ compared with Hot Air or Humid Air.
In general, Drying speed with Super Heated Steam is 3 times faster than the speed with Hot Air.

- Summary of Super Heated Steam Character -

① Bigger Heat Amount per Unit Volume than Hot Air.
② Drying Efficiency becomes very high at Inversion Point (170℃).
③ Inert Gas enables Non-Oxidizing Process.
④ Convection Heating, Radiant Heat Transfer, Membrane Aggregation Heat Transfer is possible.

- Reference -

Enthalpy of Super Heated Steam / Hot Air
- 200℃ Air (60% Humidity at 20℃)
- 200℃ Super Heated Steam (heated up from 20℃)

△ Av. Specific Heat of Liquid Water approx. 4 kJ/kg
△ Evaporative Latent Heat of Water at 100℃ approx. 2,256 kJ/kg
△ Av. Specific Heat of Vapor Water approx. 2 kJ/kg
Comparison with Competitors
Showing the Heat Exchanger Part in 1/10 Scale.
※Comparing in Power Input 20kW Inverter Condition

◇ Company A
Heating Element φ120
Saturated Vapor
→ 500°C
Flow rate 40kg/h

◇ Company B
Heating Element φ260
Saturated Vapor
→ 500°C
Flow rate 60kg/h
The Coil is Water-Cooling Type.
Water-Cooling System is additionally necessary.

◇ Nomura Engineering Co.
Heating Element φ110
Saturated Vapor
→ 500～550°C
Nominal Flow rate ~120kg/h

The above Company B’s Performance (500°C/60kg/hr) can be achieved by 10kW Inverter by Nomura Engineering Co.

The Coil is Air-Cooling Type.
With Simple Air-Fan.
Nominal Output: 500°C/100kg/hr
Max Flow Rate: 150kg/hr
Max Temp: 600°C
※Experimental Performance (with Water-Cooling System)
   (with 40kW Inverter)
   → Max Achieved Temp: 800°C