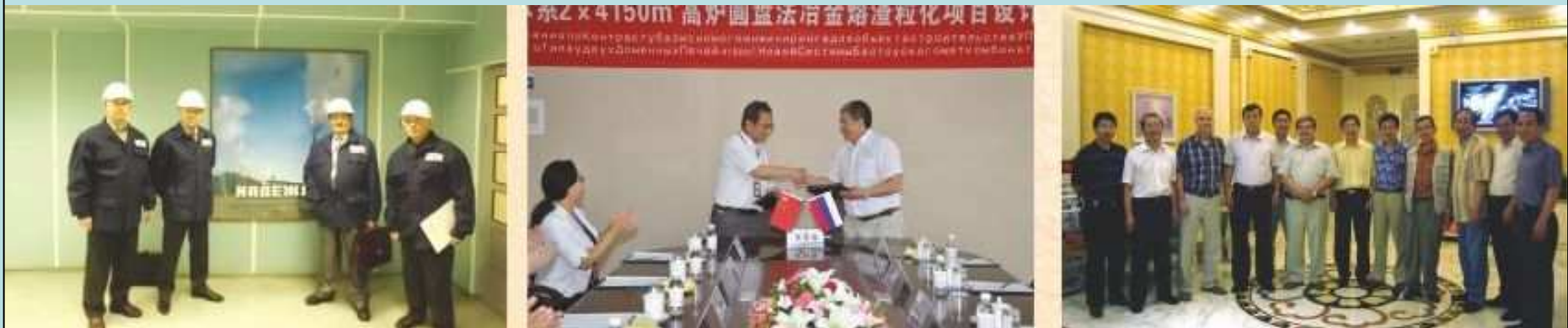


OJSC Scientific-Research Institute of Metallurgical Heat Engineering (OJSC VNIIMT)

Developments of OJSC Scientific-Research Institute of Metallurgical Heat Engineering (VNIIMT)



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OJSC Scientific-Research Institute of Metallurgical Heat Engineering (OJSC VNIIMT)

OJSC Scientific-Research Institute of Metallurgical Heat Engineering (VNIIMT) established in 1930 as Ural Division of All-Union Heat Engineering Institute is widely known in Russia and the CIS.

The Institute focuses on development of high-technology heat engineering units, energy efficient and ecologically friendly technologies in ferrous and non-ferrous metallurgy, machine-building and other fuel-consuming branches of industry.

Highly-qualified academic researchers, unique experimental and production facilities and own research and design centre enable efficient scientific-and-research, design-and-experimental, engineering and project works, delivery of equipment, designer's supervision and commissioning works including execution of turnkey contracts in the following areas



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OJSC Scientific-Research Institute of Metallurgical Heat Engineering (OJSC VNIIMT)

Sintering

Iron ore pellets production

Preparation of metallic and nonmetallic raw materials

Blast-furnace ironmaking

DRI (direct reduction of iron)

Lime production

Granulation of metal melts

Reheating furnaces

Heat-treatment furnaces

Furnaces with protective atmosphere and gas treatment units

Reheating, heat-treatment and drying furnaces with convection heat transfer

Rolled products

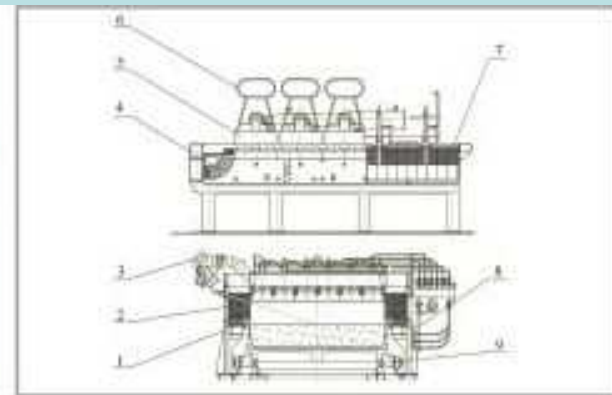
Manufacturing



Sintering

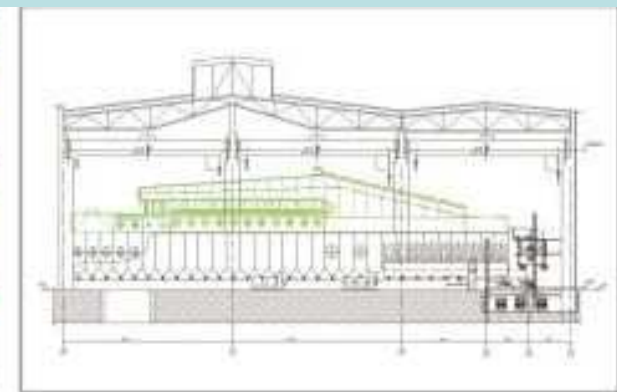
- development of techniques and modes of metal raw material heat treatment

design of energy-efficient agglomeration hearths and agglomeration gas heat recovery circuits allowing to reduce energy consumption and dust and gas emissions



Iron ore pellets production

- optimal traveling grate pelletizing furnaces for heat treatment of iron-ore pellets from various concentrates (hematite, magnetite, etc.) with optimal automatic process control system



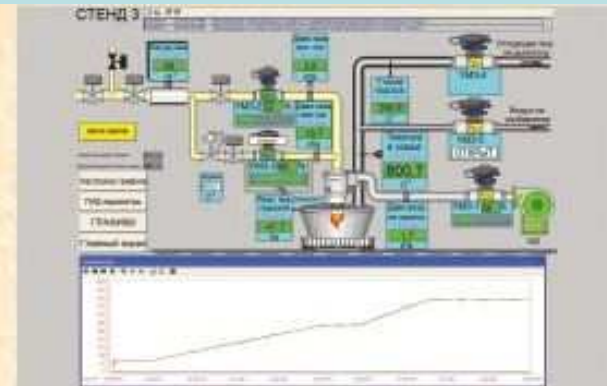
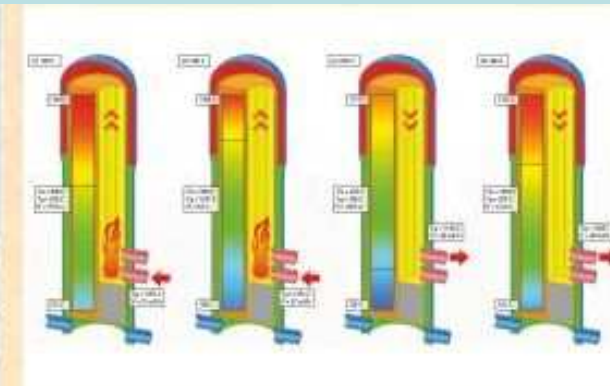
Preparation of metallic and nonmetallic raw materials

- **technique of iron-ore raw material dephosphorization by roasting and leaching**
- installations for drying high-moisture dispersive materials of various designs**
- efficient techniques of magnetizing roasting and subsequent dressing**
- technique of rare-earth element extraction (for example, germanium from germanium iron ores)**



Blast furnace ironmaking

- explosion-proof near-furnace systems of blast furnace slag granulation giving a high-quality product for cement production
- optimal control system for hot blast stoves
- an innovative bench for drying hot metal and steel-smelting ladles
- copper coolers and tuyeres of blast furnaces



DRI (direct reduction of iron)

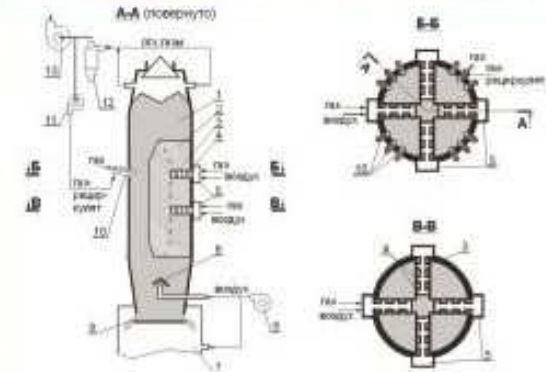
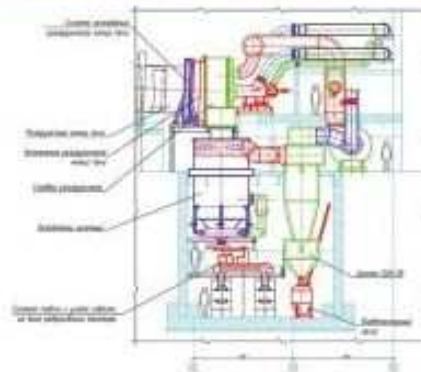
- **improvement of the reduction technique in shaft furnaces for radical improvement of technical and economic indicators of their operation (productivity is increased twice)**

technique of raw material reduction in rotary furnaces using coal as the reductant



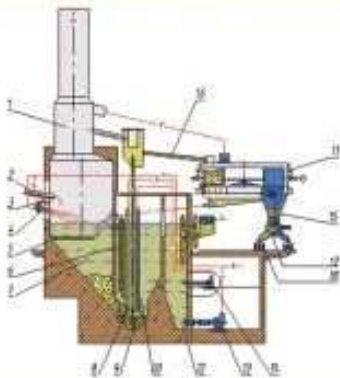
Lime production

- Development of the technique and increase of lime production process efficiency:
 - in shaft furnaces
 - in double-shaft furnaces
 - in rotary furnaces
 - in “stacked-tower preheater - rotary furnace” installations
 - in “shaft calciner - rotary furnace” installations (VNIIMT innovative technology)



Granulation of metal melts

- development of technologies and designs of explosion-proof plants for near-furnace granulation of metallurgical slag, molten metal, etc., including heat recovery



Reheating furnaces

- **development of new and update of the existing designs of furnaces for stock heating**
high-performance systems of reheating furnace firing with recovery and regeneration firing systems based on the innovative burner units designed by VNIIMT
switching the furnace firing systems to cheaper fuel types
development and implementation of optimal furnace operating parameters



Heat-treatment furnaces

- **Development of techniques and equipment for heat treatment of roll stock and metal products including those with protective atmospheres:**
thermochemical treatment conditions ensuring retention or directional change in chemical composition of metal surface
gas dampers for heat-treatment furnaces
spray quenching units and other elements of convective cooling systems



Furnaces with protective atmosphere and gas treatment units

- **development of the furnace structure, design, manufacture, delivery and commissioning works**
- development of a technology for treatment of articles and devices for protective gas generation**
- calculation, development and manufacture of endogas and exogas atmosphere generators for metal product thermochemical treatment units**
- gas analysis systems for monitoring and control of physico-chemical properties of protective process atmospheres**



Reheating, heat-treatment and drying furnaces with convection heat transfer

- development, design and manufacture using industrial heat-resistant (up to 900 oC) furnace fans designed by VNIIMT



Rolled products

- **techniques and units for controlled high-speed air-to-water cooling (quenching, spray systems) of rolled ferrous and non-ferrous metal products including thick plate on mill 5000**
replacement of oil quenching technology with VNIIMT's eco-friendly air-to-water technique
innovative technique of oily mill scale processing
line of wire rod accelerated air cooling with process improvement



Manufacturing

- **Manufacture and delivery of high-performance burner units and energy efficiency burning systems**
heat-resistant (furnace) fans (up to 900 oC)
copper coolers for blast furnaces and nonferrous furnaces based on VNIIMT technology
Pitot tubes for measuring flow rates and pressures



OJSC Scientific-Research Institute of Metallurgical Heat Engineering (OJSC VNIIMT)

OJSC VNIIMT developments are widely used in metallurgical enterprises of Russia, Ukraine, Kazakhstan, China, India and others

For detailed information on institute developments, please visit OJSC VNIIMT website at www.vniimt.ru

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