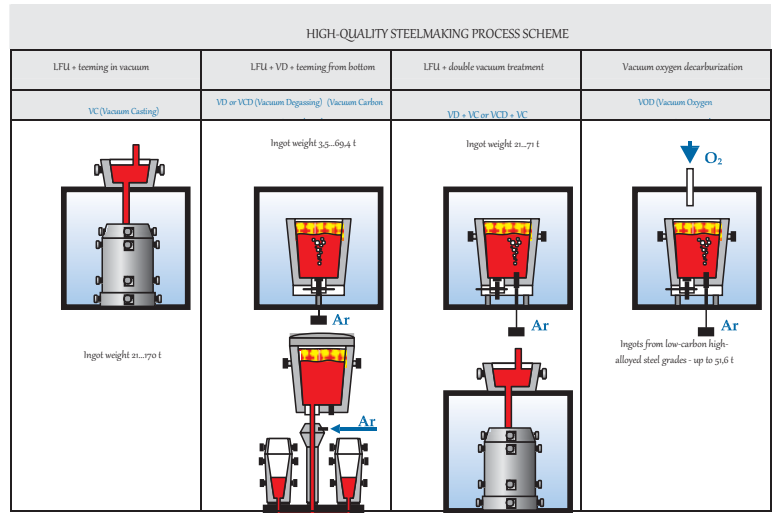


STEELMAKING

Process of quality steel production

Fully upgraded and formed according to its own engineering the steelmaking technological complex of NKMZ includes: 1 electric arc furnace EAF with the capacity of 50t; 2 electric arc furnaces EAF with the capacity of 12t each; 1 electric arc furnace EAF with the capacity of 5t; 2 after-furnace ladle steel treatment units "Ladle-furnace"; steel vacuum degassing area based on the steam-jet pump and 4 vacuum chambers including vacuum chamber for VD and VOD.

Steelmaking is effected in steelmaking units with minimum time consumption, then metal is treated in the ladle using the «Ladle-furnace» unit and vacuum degassed. Depending on the present chemical composition and required properties of steel, casting may be performed either in vacuum by top pouring or in air by bottom pouring. Technical capabilities of steelmaking facilities allow to produce forging ingots weighing from 1,6 to 170t and up to 200t of liquid metal for producing steel castings.



After-furnace ladle steel treatment

The "Ladle-furnace" unit is equipped with the slide-gate ladles of two type sizes: 60, 90 tons which allows treatment of up to 88 tons of liquid steel and allows pouring of steel treated in it for forging ingots producing weighing up to 170 tons. In the course of the after-furnace ladle steel refining the correction of chemical composition, reheating, flux-cored wire treatment by means of wire-feeders, argon blowing of metal are performed, which provides reduction of non-metallic inclusions (HB) and gases content in metal.

After-furnace steel treatment in the "ladle-furnace" unit (LFU) provides obtaining of steel having chemical composition and temperature of high preciseness, allows to produce desulphurating of metal up to the preset parameters, to reduce non-metallic inclusions content, and also LFU serves as accumulating and damping unit between melting unit (EAF) and facilities for steel teeming.

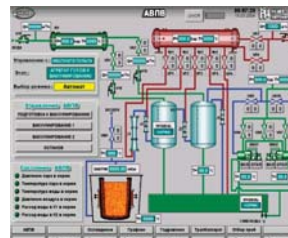
Equipment for steel vacuumizing in the ladle with argon blowing and, if necessary, with oxygen blowing based on the vacuum steam-jet pump is installed together with LFU in order to provide high degree of degassing, deoxidation, desulphurating, decarburizing, and non-metallic inclusions removing.



Steel vacuum degassing

Treatment of metal in vacuum chambers allows ingots weighing 21 to 170 tons to be cast in vacuum.

Vacuum chamber No.4 is furnished with argon, oxygen and nitrogen supplying system with wire feeders, used for steel modifying by means of powdered materials; sliding lid with video-supervision system; water-cooling oxygen lance; sampling unit, used for chemical composition of steel and gases content determining; unit for metal temperature measuring in vacuum. This equipment allows steel treatment conducting according to VD and VOD processes.



By means of VOD technology the high-chromium steel is obtained with the carbon content of $\leq 0,03\%$. The unified fleet of slide-gate ladles of the “Ladle-furnace” unit (having capacity 60, 90 tons) is used in order to effect steel vacuum degassing in the ladle (VD technology). Quality level of steel meets the highest world standards.

