

## ELECTROSLAG REMELTING FURNACES

Research and production firm COMTERM develops and markets multi-purpose electroslag remelting furnaces for the production of high-quality ingots, hollow blanks, and blanks variable cross-section of steel and ferrous and non-ferrous alloys metals, conforming to modern industry requirements. Developing new ESR furnace, COMTERM lays in their ideology on new ways of smelted ingots quality management. This applies directly to the design of the furnace and to design of its units and systems.

Solutions used by the company to create furnace equipment, provide:

- The use of different schemes of remelting:  
in mold with a bottom (closed from one side);  
in short collar mold, including the increased width of molds melting part;  
in the mold with a working space of complex configuration.
- Implementation of monofilar ("electrode-pallet ") and bifilar ("electrode-electrode") electrical circuits of remelting process;
- The use of different types of power supplies:  
AC single-phase transformers;  
sources with regulated frequency of alternating current in the range 0.5 – 5.0 Hz, as well as to lead the remelting process using DC-current of "direct" and "inverse" polarity;
- Reliable control system of relative movement of mold, consumable electrode and ingot;
- Controlled speed of the consumable electrodes movement, using intelligent controller for support of technology required operating current values and voltage on the slag bath and the most effective power distribution in slag and molten metal bath.

automatic support of the electric mode, including management of the power supply current frequency, without allowing emergence of an electric imbalance

measurement of weight of electrodes and control of remelting speed

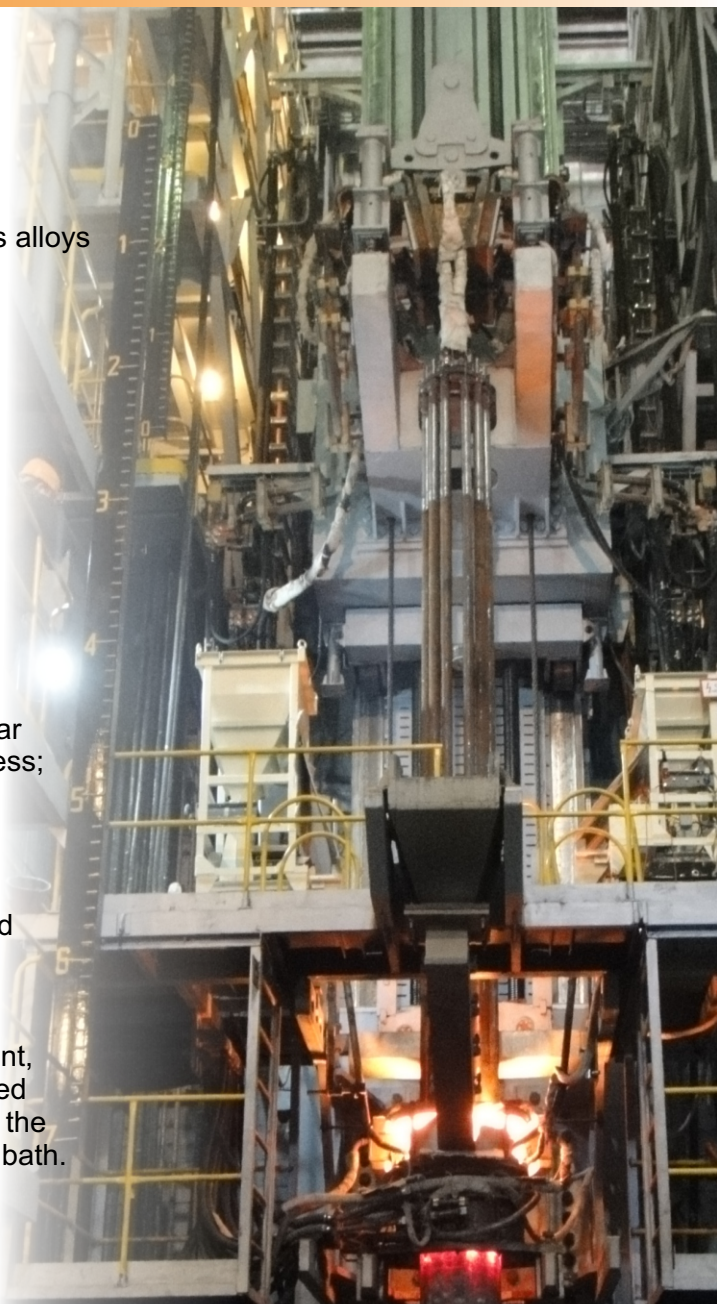
control of position of "slag-metal" border using the contactless level gage

**main functions of ESRF control system**

the differentiated management of electric and slag mode;

continuous control of basic equipment elements conditions, recognition of emergency and supernumerary situations.

control of current parameters of the metal and slag, including temperature and oxidation



Smelting of hollow billet using the furnace ESRF-15/30.



## SPECIFICATIONS ESR FURNACES FOR MELTING INGOTS

Parameter	ESRF-0,15	ESRF – 0,75	ESRF – 3	ESRF – 7,5	ESRF – 15	ESRF – 40
Number of positions	1	1*	1*	1*	1* or 2*	1* or 2*
Power, kVA	400	750	2500	4800***	4800***	8000***
Primary voltage, V	380	380	6000/10000	6000/10000	6000/10000	6000/10000
Frequency, Hz	50	50	50	50, 0,5 ÷ 5,0	50, 0,5 ÷ 5,0	50, 0,5 ÷ 5,0
Idling voltage, V	60	75	120	120, 75	120, 75	120, 75
Mold diameter (max), mm	150	300	450	700	1000	1500
Electrode diameter (max), mm	110	250	380	600	850	1200
Maximum ingot mass, kg	150	750	3000	7500	20000	40000
Maximum current, kA	6,0	10,0	14,0	20,5	25,0	35,8
Water flow for cooling, m <sup>3</sup> /hour	15	25	50	70	100	300
Overall dimensions (without power supply)**, mm	4000x4000 x5500	5000x6000 x7000	5000x7500 x12000	7500x10000 x12000	7500x10000 x14000	10000x10000 x18000

\* - two schemes of remelting are realized: in a stationary and mobile crystallizer;

\*\* - it is specified at coordination of the specification on furnace. \*\*\* - power source of industrial frequency.

- 1-forming part of the mold,
- 2-broadened part of the mold,
- 3-detector of metal level,
- 4 -traverse of core,
- 5- device,
- 6- consumable electrode rods,
- 7- suspension bracket.

### Model of industrial equipment for the production of hollow billets



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AUTOMATION OF ALL TYPES OF FURNACES



MANUFACTURE OF SPARE PARTS FOR FURNACES