



Complex of the metallurgical equipment for producing high-quality ingots from wrought aluminium alloys



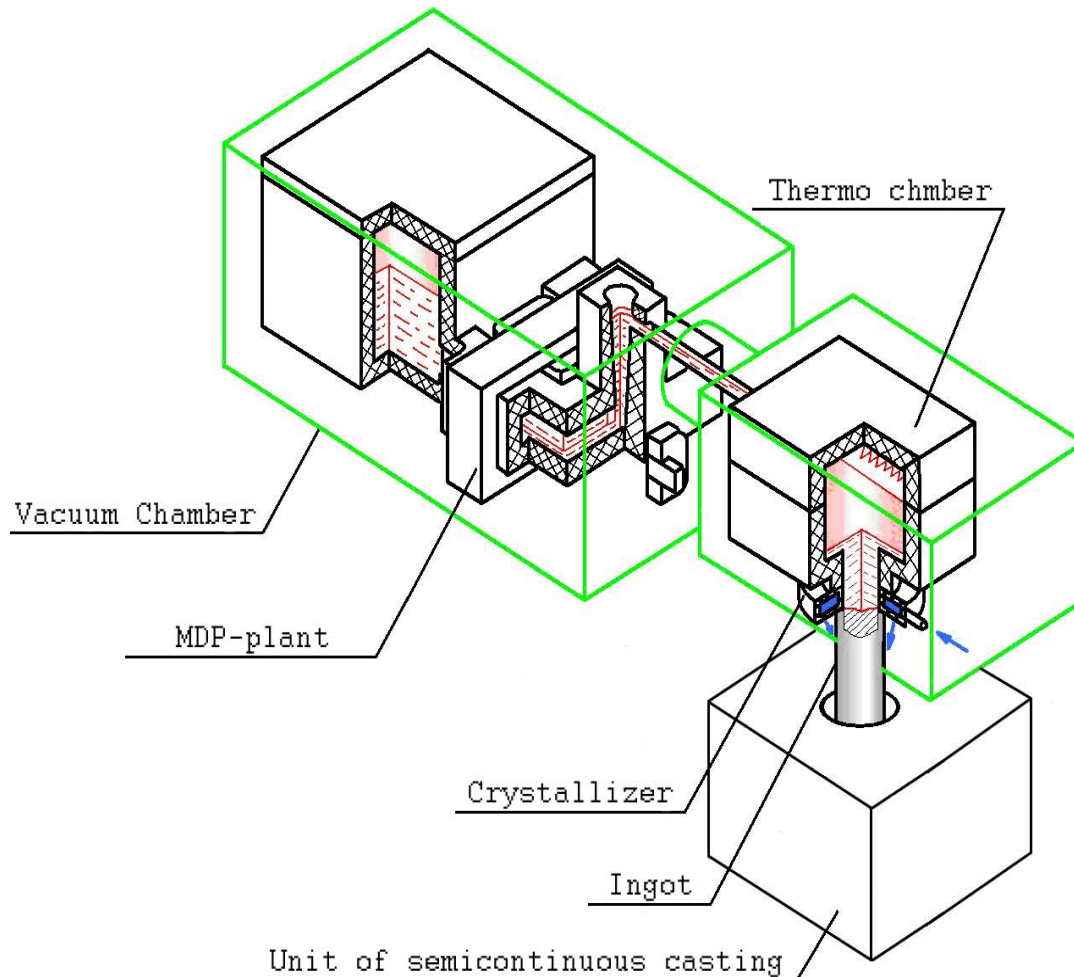
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Principle of the Complex operation

The Complex consists of:

- the vacuum magneto-dynamic installation and
- a machine for semi-continuous casting alloys (equipped with the crystallizer, which has a sublimating coating, provide electromagnetic stirring, and a heated thermal nozzle).



Function of the Complex

- The magneto-dynamic machine serves for
 - the preparation of a wrought aluminium alloy and
 - as a dozer of the liquid alloy and implements regulated electromagnetic pouring the alloy in the crystallizer of the machine for semi-continuous casting ingots under protective argon atmosphere.
- The alloy preparation includes melting charge materials, refining the alloy in vacuum and filtration with porous ceramic filter, modifying the alloy with transitional metals. During the preparation, the alloy is heated with the help of an inductor and at the same time is stirred with the help of an electromagnet.



Technical characteristics

- ❑ The crucible useful capacity, kg – 600.
- ❑ The metal maximum temperature, °C – 750.
- ❑ Operated vacuum, kPa (Hg, mm) – up to 0.133 (1).
- ❑ The ingot diameter, mm – up to 500.
- ❑ The ingot length, mm – up to 4000.



Advantages of the Complex

- It is attained:
 - high speed of dissolving charge components with high melting temperature;
 - homogeneity of the alloy and its chemical composition;
 - low residual content of hydrogen;
 - high percentage of the modifier's assimilation.
- Machine ensures:
 - producing ingots without the gas and shrinkage porosity;
 - fine-crystalline uniform structure of ingots;
 - ingots surface, not demanding machining;



Advantages of the Complex

- The elaborated Complex enables to manufacture ingots of high strength aluminium alloys based on Al-Mg of the 5556 type, Al-Mg-Zn of the 7046 type, Al-Mg-Zn-Cu of the 7075 type, Al-Li-Mg-Cu-Zn of the 8090 type, as well as new alloys modified with Sc.
- Mechanical properties of pressed semi-products from these alloys after heat treatment can reach the following values: UTS–700–750 MPa, δ – 8–12 %.

