



Competitive Labor Cost
Export From China To Oversea
Fast Catch up Bonded tech

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Equipment Detail



①Raw Materials

Yuxiang Magnets has two types of raw materials in use: ordinary book mold and strip cast alloys (see picture above). Strip cast alloys are the latest development in production technology for casting rare earth alloys and they provide a better chemical stability.

The crushing process of strip cast alloys necessitates the use of the hydrogen decrepitation process where hydrogen is removed after decrepitation. Yuxiang Magnets have developed two different kinds of equipment for the HD process



Hydrogen Decrepitation, Crushing

The lumps and strips of the alloys are pulverized with the Hydrogen Decrepitation process. When exposed to hydrogen at room temperature hydrates are formed inside the metal in an exothermic process which creates large stresses and microcracks inside the alloy and the metal is crushed into particles (> 2 mm).



②Coarse crushing machine, Mid-crushing Machine



milling chamber are agitated vigorously with high pressure nitrogen so that the particles hit each others and mill themselves. A cyclone separates the finest particles and the right powder fraction is homogenized in a conical mixer. The powder is stored in special powder vessels under a shielding gas.



Average granularity tester

This apparatus is developed according to the theory of air permeance that could fast measure average diameter of the powder & grain. People often call it Fells or Fells super-sieve. It is an absolutely necessary measuring device of magnetic material, powder metallurgy



④Pressor with magnetic field

Alignment in Magnetic Field

Magnets are either individually die pressed or machined from isostatically pressed blocks. Isostatic pressing (i-grades) gives a 3-5 % higher remanence than axial die pressing. In die pressing the powder particles are aligned before compaction by a magnetic field. The magnetic field is either parallel (axial, a-grades) or perpendicular (transverse, t-grades) to the direction of pressing. Better alignment and higher remanence are achieved by transverse pressing than by axial pressing.

In axially pressed arc segment the alignment can be either diametrical or radial.

In isostatic pressing the powder which is inside the rubber mold is aligned in a pulse magnetizer.



Static average-pressure auto pressing

Yuxiang Magnets has mechanical and hydraulic presses from 6 tonnes to 140 tonnes with fully automatic handling of green compacts. The size of die pressed magnets varies from some grammes up to hundreds of grammes. The weight of the isostatically pressed magnet can be in kilogrammes. Our 140 tonnes press allows the pressing of large magnets for 100×100×25mm.

Yuxiang has very flexible computer assisted tool design system. A press tool can be obtained within 3-6 weeks depending on the size. In several cases the delivery time can be shortened.



Porosity of green compacts disappears during sintering and they become fully dense metallic parts. The other steps are needed for optimum intrinsic coercivity.

Yuxiang Magnets has the most modern sintering furnaces which together with the process control system guarantee optimum and consistent magnetic properties.

Machining

Yuxiang Magnets has around 15 different types of grinding and slicing machines: through feed and batch surface grinders, through feed arc segment grinding machines, centerless grinders, grinding machine for rings, CNC profile grinding machine, OD diamond slicing machines, ID diamond slicing machine.

Yuxiang has developed fully automatic feeding of arc segments into the through feed grinding machine where the position of the magnet in feeding is determined by laser and CCD camera which enables one operator to use 3-4 machines simultaneously.

Coating

In environments where corrosion is possible, the magnets can be protected with epoxy-, metallic epoxy- or metal coatings.

Yuxiang has an in-house automatic electrolytic Ni- and Ni+Zn-coating line. Together with subcontractors Yuxiang can offer Sn- and Al+Cr coatings. Epoxy, for example black epoxy and metallic epoxy, for example Deltatone coatings, are provided by subcontractors.

Depending on the environment and the use of the magnets, Yuxiang and subcontractors will find the most suitable protection for each application due to our know-how and experience in this field. Magnets can also be delivered phosphatized for protection during transportation and storage.

Coatings are tested with salt-fog tests, autoclave tests or any other specified tests.

⑥Magnetizer

Magnetizing and Packing

The last stage of the production is magnetization, in the direction of the alignment, which is done in a copper coil with a pulse magnetizer. In the pulse magnetizer banks of capacitors are charged with



electricity which is transferred via a semiconductor switch into the coil in a few milliseconds. The magnetic field strength needed for the sintered Nd-Fe-B magnets is 2400 kA/m. We also deliver unmagnetized magnets if needed.

The magnets are visually inspected and packed for despatch in our packing department. Yuxiang is open to discuss the most cost efficient packing with the customer.



Quality Control

The Yuxiang process is designed to produce high quality. Raw materials are checked at the very beginning. Statistical Process Control is utilized in every process stage. The magnetic properties are checked both after sintering and prior to delivery.

Customer wishes any special measurement can be discussed.