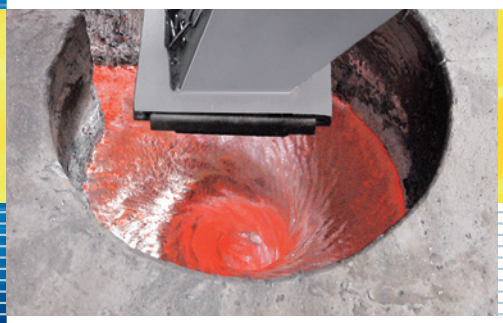
Non-contact Style

PERMANENT MAGNET TYPE ALUMINUM CHIP MELTING SYSTEM

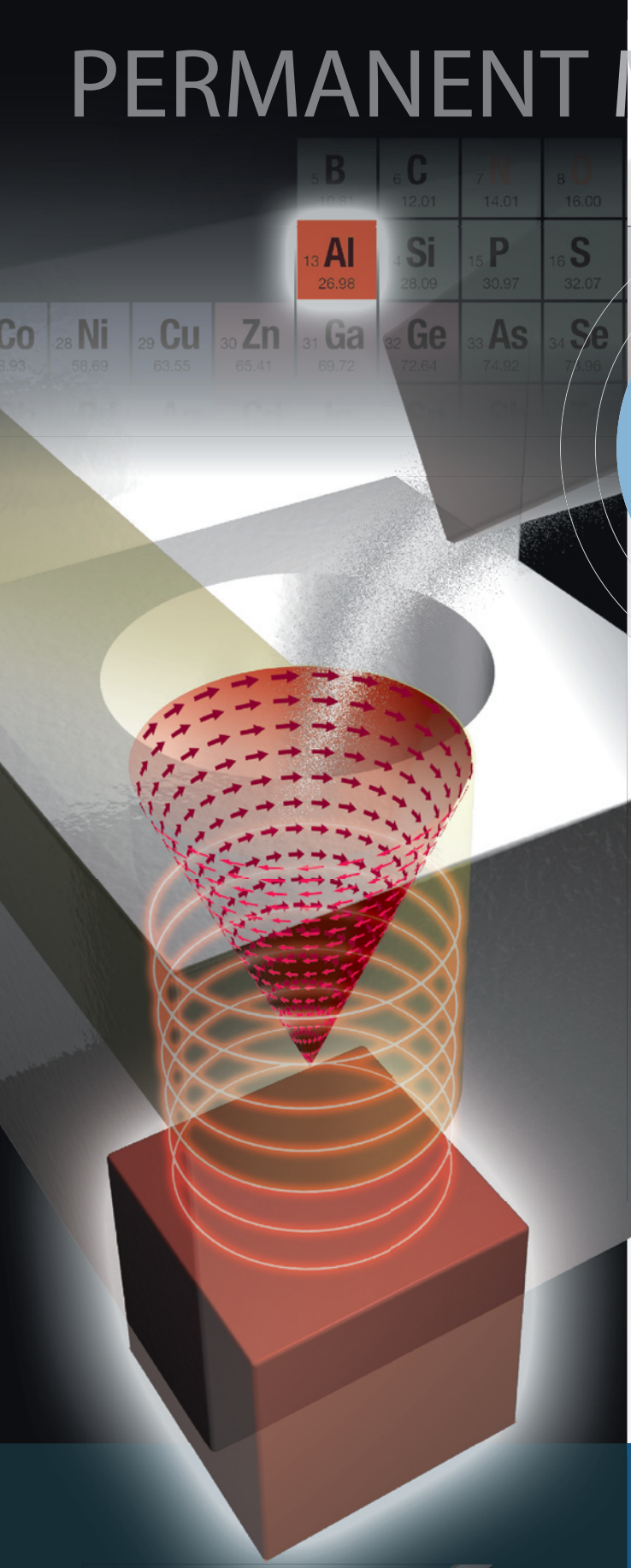


The permanent magnet type melting system has great advantages including low running cost, maintenance-free, energy saving, easy operation and space saving design when compared to electromagnetic induction agitation systems or machine agitation systems.

NIHON KOHNETSU INDUSTRIAL CO.,LTD.

PERMANENT MAGNET TYPE ALU

We have achieved non-contact molten metal



Permanent magnet is installed under the material charging hole.

Actualization

Aluminum chip melting system by non-contact molten metal agitation

Heating and holding chamber

Actualization

Excellent circulation of molten metal

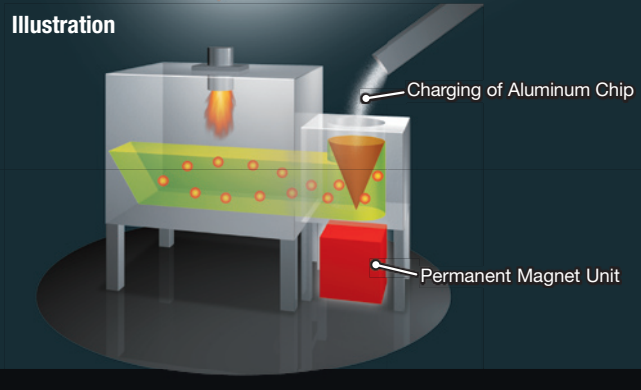
Advantages of molten metal agitation

1. *Improvement of molten metal quality*
   - Homogenization of molten metal components
   - Homogenization temperature (±2°C) of molten metal
2. *Improvement of yield rate (98% or more)*
3. *Improvement of energy consumption*
4. *Inhibition of oxide generation*
5. *Long operation life of refractories*

Purpose

- Melting of aluminum chips, machining chips, UBC and solid biscuit
- Powerful circulation makes the unit perfect for use as a furnace for the adjustment of composition of molten metal.

Illustration



Sample Installation

Molten Metal Agitation Unit. (Vortex chamber)

Aluminum Chip Melting

UMINUM CHIP MELTING SYSTEM

agitation by employing a permanent magnet.

The permanent magnet type melting system has great advantages including low running cost, maintenance-free, energy saving, easy operation and space saving design when compared to electromagnetic induction agitation systems or machine agitation systems.

This system has been a commercial realization through a partnership with Zmag.
Zmag has developed the world's first non-contact style permanent magnet type aluminum chip melting system.

Advantages of molten metal agitation

① Improvement of molten metal quality

- **Homogenization of molten metal components**
  Powerful circulation makes the adjustment of composition easy. Component segregation can be adjusted extremely small for both circumferential direction and depth direction.
  Perfect for use as a furnace for the adjustment of composition of molten metal
- **Homogenization temperature (±2°C) of molten metal**
  Heat transfer volume from the burner is improved by the circulation function. Molten metal temperature can homogenize for both the circumferential direction and depth direction.

② Improvement of yield rate (98% or more)

Charged melting materials of vortex chamber can keep 98% or more yield rate because materials will be convoluted at once into molten metal without oxidation.

③ Improvement of energy consumption

Gas consumption is cut by 20% by homogenization of molten metal temperature and atmosphere temperature. (Comparison with our products)

④ Inhibition of oxide generation

Generation of oxide can be inhibited. (Homogenization of molten metal temperature can prevent overheating of molten metal and therefore inhibit molten metal oxidation.)

⑤ Long operation life of refractories

Refractories can be long operation life. (Homogenization of molten metal temperature can prevent overheating of molten metal and therefore inhibit refractory reduction.)

Other features

- **Circulation power can control stepless adjustment and maintain stable power.**
- **Continuous melting and unmanned operation is possible.**
  Materials can be melted continuously without need for monitoring operators.
- **The molten metal agitation unit can be installed as an extension for the existing melting and holding furnace.**

Cost performance

- **Cost performance of aluminum chip reclamation with our permanent magnet type aluminum chip melting system**

*The numerical values below are approximate calculations and will differ according to conditions of customer use.

	Processing volume	
	300 kg/hr (1,150 ton/year)	500 kg/hr (1,920 ton/year)
Comparison with reclamation ingot purchase	¥60,700,000/year	¥148,400,000/year
Comparison with molten metal purchase	¥83,700,000/year	¥186,800,000/year

Comparison with traditional chip melting system

Low running cost **Maintenance-free**

- **Unnecessary spare parts (consumable goods) and maintenance work**
  Electromagnetic induction agitation system requires spare parts including water cooling device, coil etc. and maintenance work. Machine agitation system requires spare parts including impeller, pump etc. and maintenance work.

Energy saving

- **Power consumption about 1/10 (Compared with electromagnetic induction agitation system)**

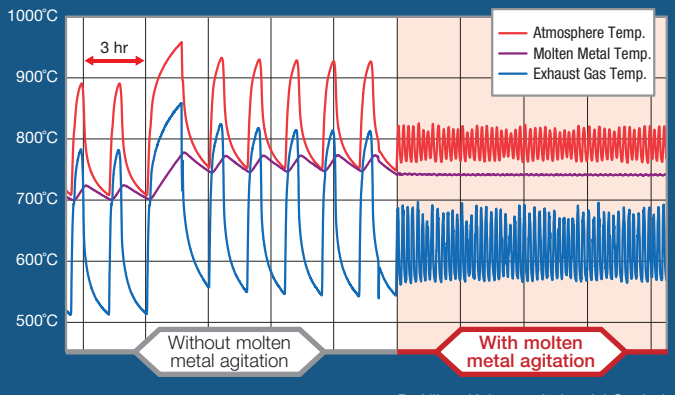
Easy operation

- **Molten metal circulation can be trouble-free operation at the touch of a button thanks to the simple configuration.**

Space saving design

- **Smaller footprint**
  About a 50% reduction in footprint size is possible because our heating and holding chamber has concomitant vortex chamber only. (Compared with electromagnetic induction agitation system or machine agitation system)

Changes of internal furnace environment via molten metal agitation



By Nihon Kohnetsu Industrial Co, Ltd.

Specification List

Type	PM200	PM300	PM500	PM1000
Processing Volume	– 200 kg/hr	– 300 kg/hr	– 500 kg/hr	– 1000 g/h
Electric Power	2.2 kW	3.7 kW	5.5 kW	11 kW

*Detailed specifications will be decided on order

Options

(1) Regenerative Burner (Gas consumption: 35% cut — compared with gas burner)
(2) Non-contact type level sensor (Automatic control of melting volume, Molten metal volume indication by ultrasonic wave)
(3) Automatic air-to-fuel ratio control

Latest Technologies and Good Faith

Experienced Technology & Consistent Sincerity
All for the customer

We, NIHON KOHNETSU INDUSTRIAL CO., LTD., meet the needs of the customers through developing, designing, manufacturing and maintaining thermal equipment. We strive for continuous improvement of our business activities while considering the environment and contributing to local communities, the global environment, and aggressive challenge of our employee's affluent, healthy life.

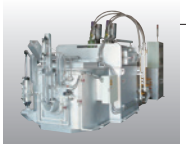
Products

Melting Furnace

① Tower Type Centralized Melting Furnace
② Pressure Type Pouring Holding Furnace
③ I.R. Type Dosing Melting Furnace
④ Immersion Melting Furnace

Heat Treatment Furnace

① T-4, T-5, T-6 Heat Treatment Furnace
② Batch Type Heat Treatment Dual Furnace
③ Tray-less type Heat Treatment Furnace



Holding Furnace

① Immersion Gas Burner Type Holding Furnace
② Under Heater Type Holding Furnace
③ Pressure Type Pouring Holding Furnace
④ Under Heater Type LP Holding Furnace

Industrial Equipment/ Molding Equipment

① Shell Machine
② Mold (Die) Heating Equipment
③ Used Sand Reclamation Equipment
④ Molding Sand Heating Equipment

NIHON KOHNETSU INDUSTRIAL CO.,LTD.

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