

Proven Basic Model for Small Parts

DMF High efficiency aluminum melting and holding furnace for a melting capacity of 400 kg/h or less



The 8th New JSPMI Prize Minister's prize from the METI



Higher Melting Capacity for Large Parts Utilizing our Accumulated Technology

IMF

High efficiency aluminum melting and holding furnace for a melting capacity of 500 kg/h or more

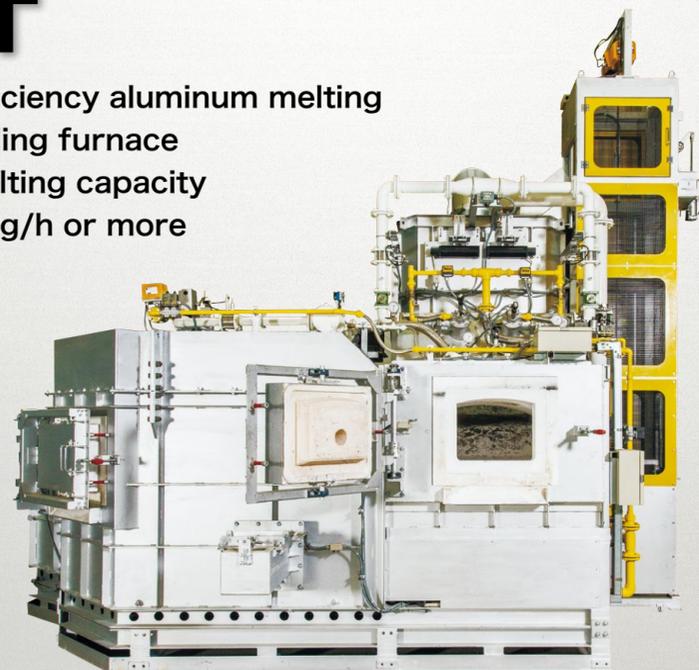


Table of specifications

Model	DMF-200	DMF-200S	DMF-380	IMF-600	IMF-1000	
Melting method	Individual melting / Tower system					
Melting capacity (kg/H)	200		380	600	1,000	
Holding capacity (kg)	280		500	1,500	2,500	
External dimensions	Width (mm)	2,500	3,100	4,000	5,000	
	Depth (mm)	2,000	2,400	3,000	3,150	
	Height (mm)	1,665	1,710	1,800	2,400	3,300
Loading gate size	Width (mm)	300	400	500	600	750
	Depth (mm)	200	300	300	350	400
Ladling gate size	Width (mm)	380	400	450	500	
	Depth (mm)	420	550	650	800	
	Depth (mm)	180	200	330	430	
Burner capacity	(kw)	116	116	233	349	
	Melting (kcal/h)	100,000	100,000	200,000	300,000	
	(quantity)	1	2	2	2	
	(kw)	—	35	35	35	58
	Dross (kcal/h)	—	30,000	30,000	30,000	50,000
	(quantity)	—	1	1	1	1
Holding (kcal/h)	(kw)	58	58	116	174	
	(quantity)	1	1	1	1	
Control unit / Function	Smart Furnace / Flow control, exhaust control, synchronized control of peripherals					

Diecast Aluminum Melting and Holding Furnaces

DMF[®] **IMF**[®]
Diecast Melting Furnace Intelligent Melting Furnace

Melt as much as needed



High performance while saving energy and space

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Pursuing Thermal Technology and a Green Future
MIYAMOTO

Solutions for Challenges in Aluminum Production Sites!

High efficiency individual aluminum melting and holding furnaces in pursuit of thermal efficiency, molten aluminum quality, and working environment improvement

Most of conventional aluminum melting and holding furnaces have challenges in thermal efficiency or molten aluminum quality as well as working environment, which have been managed by skilled workers on site.

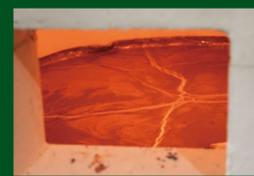
The DMF and IMF furnaces offered by MIYAMOTO KOGYOSHO are revolutionary aluminum melting and holding furnaces for aluminum die casting, which can overcome those challenges in aluminum production sites.

High efficiency

Environment improvement

Energy-saving

Space-saving

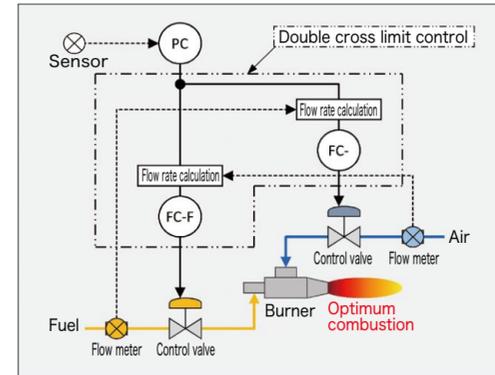


Waste reduction in synchronization with die casting machine

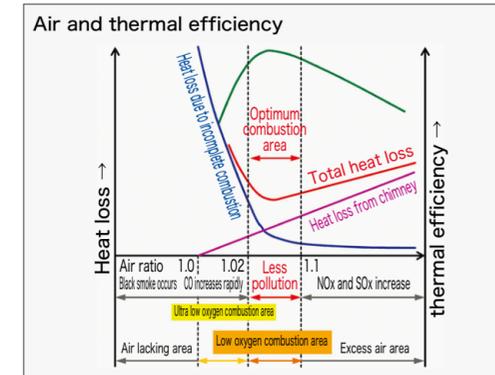
The DMF and IMF furnaces can melt hot-return and new materials as much as needed according to the casting cycle of the die casting machine. Precise thermal control helps to achieve safe and clean working environment and supply high quality molten aluminum.

DMF® Diecast Melting Furnace **IMF**® Intelligent Melting Furnace

Combustion under Flow Control



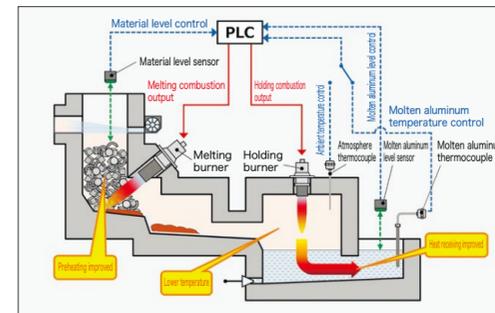
Combustion is under flow control so that the burner can operate in the optimum combustion area. The amount of combustible air and fuel flow rate are measured to control the air ratio according to the theoretical air needed to burn



the fuel. In addition, the double cross limit control function stabilizes the air ratio (1.05 to 1.1) even if the combustion output fluctuates, improving thermal efficiency and suppressing oxidation of materials.

* Air ratio can be set as required.

Melting Feedback Control

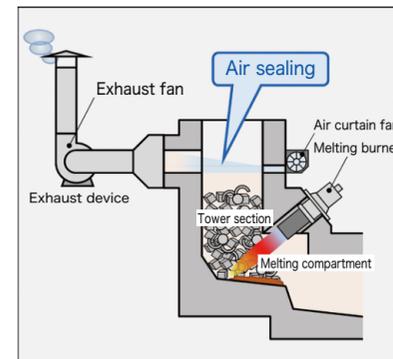


Melting feedback control is employed to stabilize material preheating, and melt and hold as much material as needed. A material level sensor is attached to the tower system to control the filling amount of material, and a molten aluminum level sensor is attached to the ladling gate to control the output of the melting burner.

[Advantages of this system]

- By keeping the filling amount constant, the material preheating is stabilized, improving the thermal efficiency.
- Changes in the molten aluminum level are detected so as to melt only the consumed amount to avoid wasteful heating.
- Since the molten aluminum level is kept constant, the heat transfer area in the holding chamber and ladling gate is maximized, which improves the heat transfer efficiency and melting temperature accuracy (melting temperature accuracy $\pm 5^{\circ}\text{C}$). Furthermore, when the heat transfer efficiency is improved, the ambient temperature in the holding chamber can be reduced, which suppresses oxide generation due to high temperature.

Air Sealing Mechanism



Air sealing mechanism is equipped to improve the thermal efficiency as well as to ensure a clean working environment. An air curtain fan and exhaust gas exit are installed near the material loading gate of the tower system to achieve air sealing at the loading gate. In addition, an exhaust fan is provided to control air suction according to the combustion amount and furnace operating conditions.

[Advantages of this system]

- Having door at the loading gate is unnecessary because there is no exhaust gas blowing from the loading gate, which improves the working environment.
- When cleaning inside the furnace, the work load can be reduced since there is no hot air blowing from the opening during the cleaning.
- Since exhaust gas is forcibly sucked, the gas can flow through materials even if the filling amount is large so that a high preheating effect can be obtained.

Other Features



Material loading gate

Thanks to air sealing mechanism, there is no need to attach a door. Casting and loading cycles can be shortened. At the same time, there is no exhaust gas blowing from the material loading gate, which improves the working environment.



Melting shelf

Materials are melted on the melting shelf in the melting chamber. Burner flames are effectively directed to the materials to achieve high melting efficiency and prevent insufficient melting of materials.



Cross trap

A cross trap in the form of multi-level slopes is provided. Molten aluminum is separated from dross and only clean molten aluminum is transferred to the holding chamber. Ultra-low-cement refractory castables are formed for the lining, ensuring durability, wettability and ease of cleaning.



Combustion system with flow control

Combustion devices for flow control and safety are arranged compactly around the burner. This combustion system ensures optimum combustion in consideration of not only thermal efficiency but also environment and safety.



Holding chamber

The holding chamber has a structure that ensures an excellent temperature distribution and heat transfer to molten aluminum, and has the lining of ultra-low-cement refractory castables, like the melting chamber, in order to ensure high molten aluminum quality.



Ladling gate

A molten aluminum level sensor is provided at the ladling gate to keep the level constant (melting feedback control). Since the molten aluminum level rarely fluctuates, less oxide is attached to the ladling gate so that clean molten aluminum can be supplied.



Smart Furnace®

Total control system for industrial furnace

Conventional control of industrial furnaces

- Conventionally high accuracy furnace control is achieved by using an expensive distributed control system (DCS), and only a limited number of engineers can operate such a system.

Smart Furnace

- Smart Furnace utilizes general-purpose control devices and offers the capabilities equal to DCS at a low cost.

Features of Smart Furnace

- 1 Simple operation on touch panel screen
- 2 Automatic recording of furnace operation results
- 3 All settings on one single system
- 4 Advanced control at will