

**FOUNDRY TECHNOLOGY**

# Horizontal Parting Flaskless Molding Machine



# Aeration sand filling makes mold difference.

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“Good castings depend on good molds” is the common saying among professional foundrymen worldwide for quite a long time.

This saying carries more stringent and profound meaning today, because the requirements for the cast products are getting more and more severe.

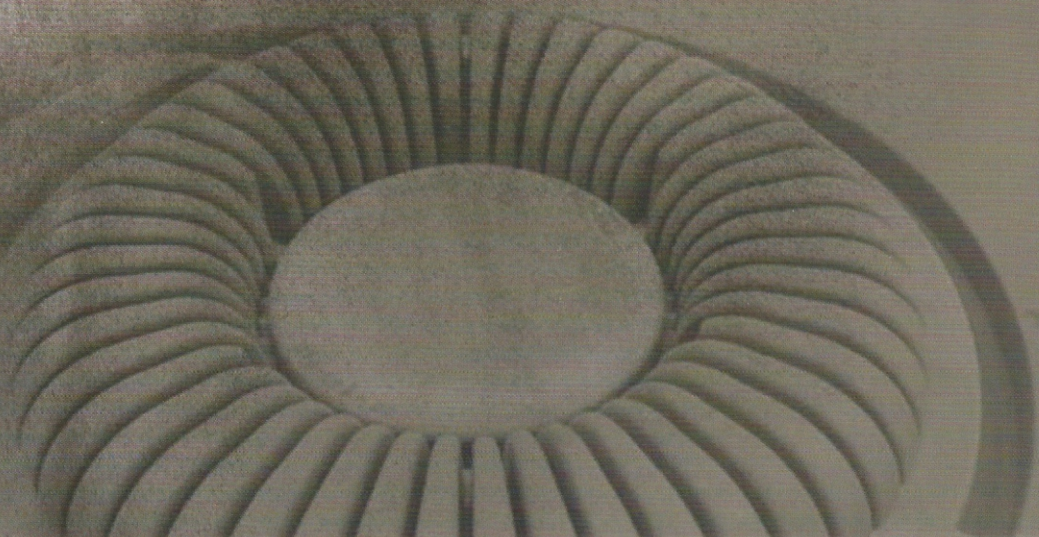
In fact, high quality molds in dimensions, hardness and strength are critical and indispensable for the production of high quality castings.

Under this circumstance, we, Sinto adhered to “Uniform mold sand filling” as one of the basics for the mass production of superior quality molds.

This concept has been materialized by “Aeration Sand Filling” system.

Aeration air at comparatively low pressure range fluidizes sand in sand tank and delivers it uniformly to every cavity and corner of pattern.

The new molding machine series has been developed by combining the aeration sand filling with the most advanced molding technology.



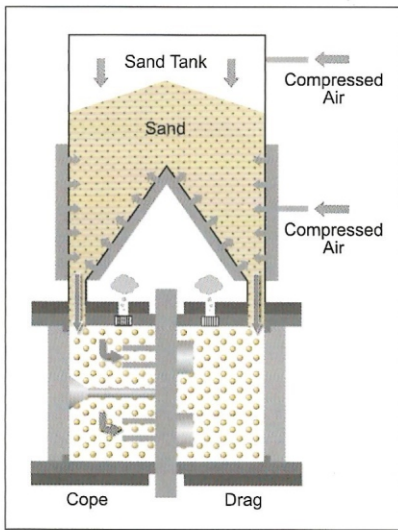
# Aeration Sand Filling Technology

Low pressure air fluidizes the sand to fill the complicated edges and pockets in the pattern with sand.

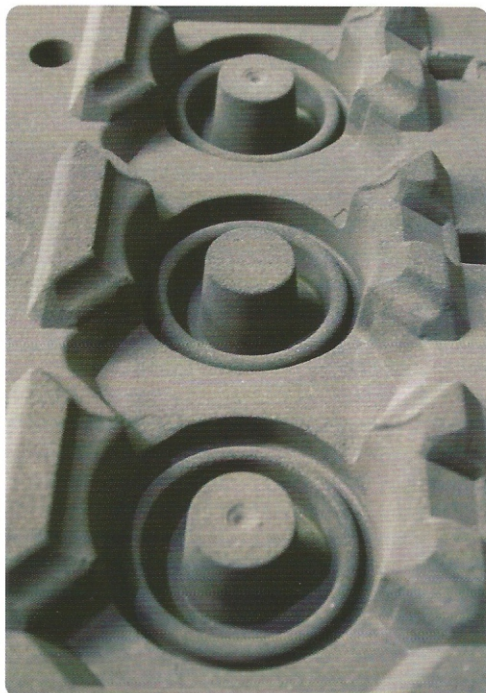
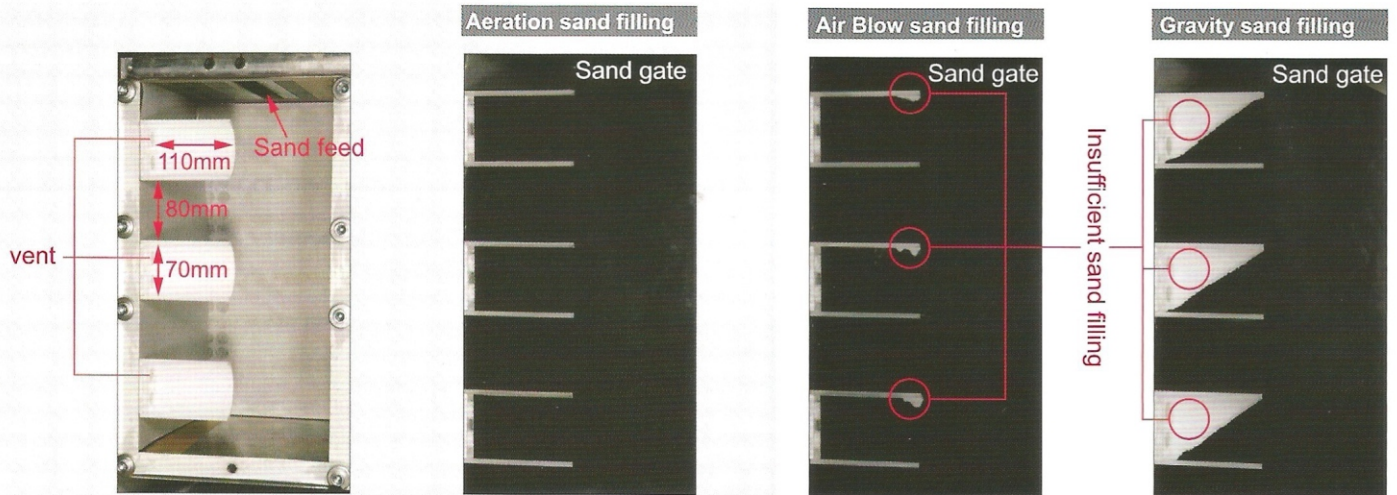
## Feature

**Primary sand filling that is ideal for the production of molds with superior accuracy and uniformly high strength**

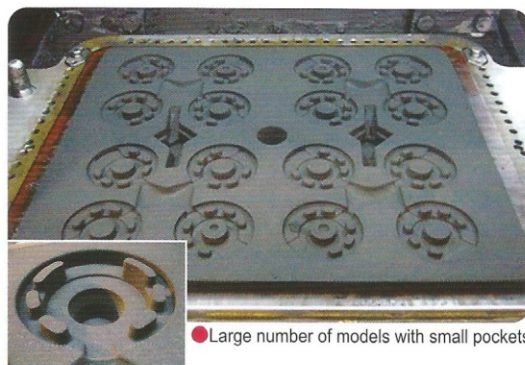
- Achieves uniform sand filling density.
- Uniform sand filling is realized without causing bridging at the complicated pattern profiles and throat of narrow pockets.
- Air consumption is reduced by as much as 70% compared to blow system. (compared to Sinto conventional flaskless models)
- Low noise FCMX·FBOX···75 dB(A) FDNX···72 dB(A)



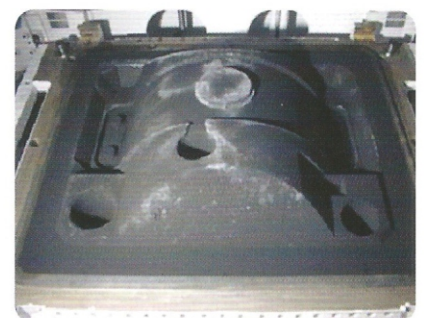
## □ Sand filling demo as observed by Sinto sand filling verification test device



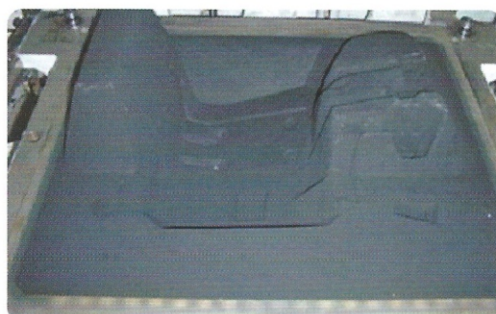
● Complicated pattern configurations with pockets



● Large number of models with small pockets



● Rugged wavy surface



● Thin mold wall and deep cavity



● Deep profile and complicated pockets

# Horizontal Parting Flaskless Molding Machine

# FCM<sup>X</sup> series

High speed with core setting time & Spacious working space

Molding Rate (MAX): **200** molds/hr

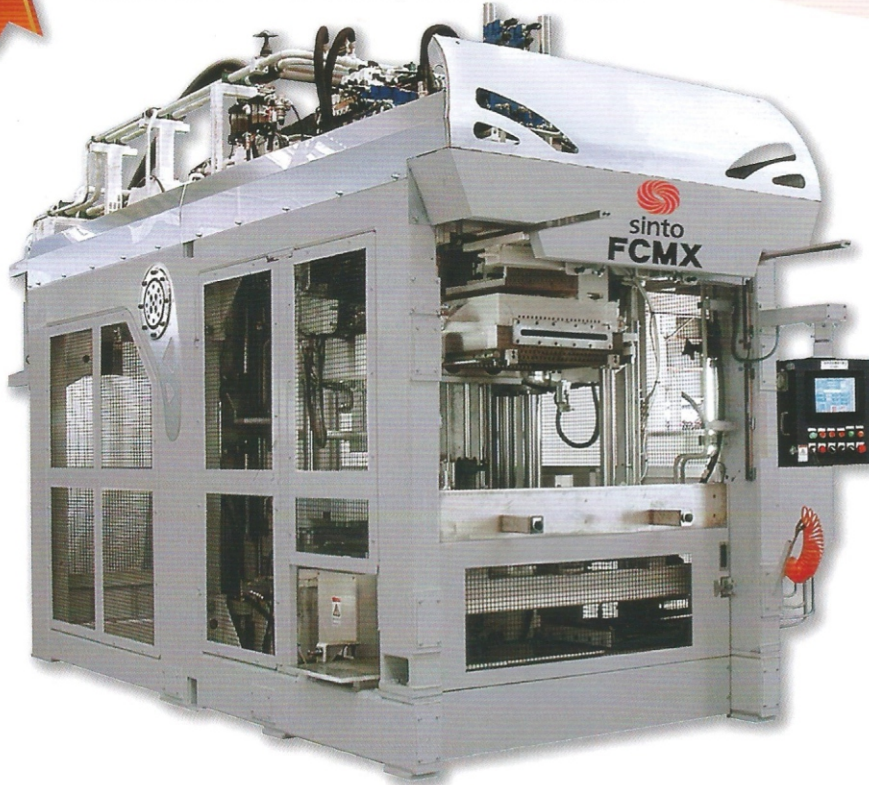
\*Including 9 sec for core setting

FCMX-I and II



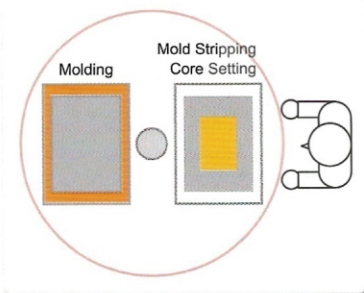
### Award of Japan

- 27th President's Award for Outstanding Energy Saving Machinery by Japan Machinery Federation 2006
- Toyota Award 2007 by Japan Foundry Engineering Society
- Included in the category of preferential taxation for energy saving machines by Ministry of Economy, Trade & Industry
- Okochi Memorial Production Award by Okochi Memorial Foundation



With aeration sand filling system

### 2-Station design



- Excellent mold strength and accuracy have been realized with the use of "Aeration Sand Filling" and "Centered Supporting Mechanism".
- The "squeeze pressure balance control" ensures stable molding by improving the pattern transferability and preventing pattern distortion.
- The "mold height feedback control" reduces the sand consumption and compensates for compactability variations.
- Environment-friendly and energy-saving. The noise level is as low as 75 dB (A).

### ● Centered Supporting Mechanism with Double Guides

FCMX, without pins and bushes, achieves highly precise pattern draw and mold matching by supporting cope and drag flasks with robust guiding.

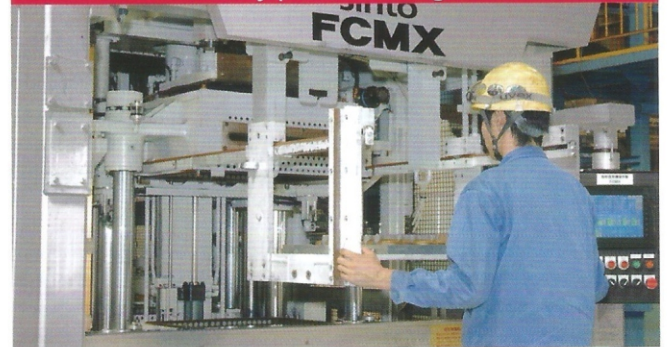


### Spacious working space allowing core setting by 2 operators



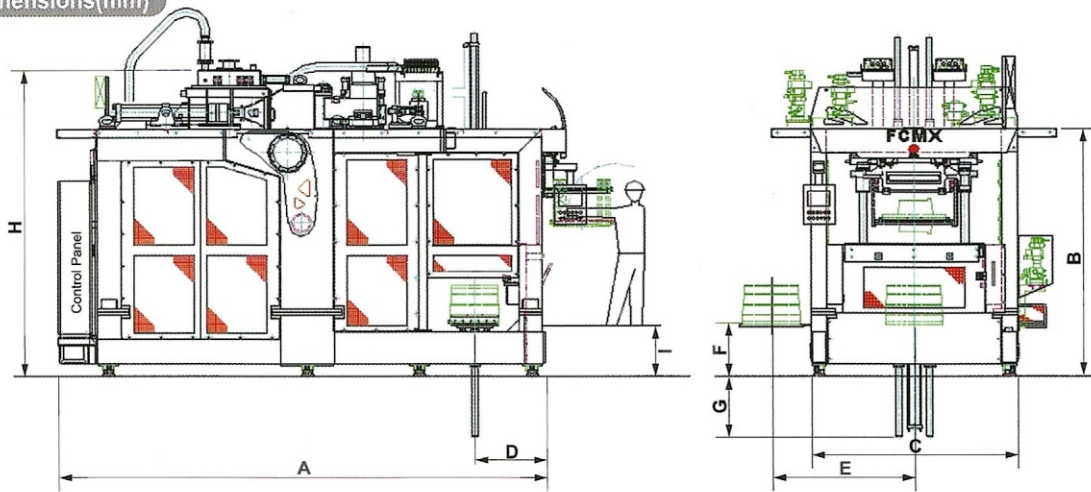
Core setting

### Easy pattern change



Matchplate is taken out quite easily by shifting to Pattern Change mode.

## Machine Dimensions(mm)



| Model No. | A     | B     | C     | D   | E     | F   | G   | H     | I   |
|-----------|-------|-------|-------|-----|-------|-----|-----|-------|-----|
| FCMX-I    | 4,870 | 2,640 | 2,100 | 610 | 1,450 | 505 | 570 | 3,196 | 300 |
| FCMX-II   | 5,100 | 2,640 | 2,200 | 655 | 1,550 | 505 | 610 | 3,268 | 300 |
| FCMX-III  | 6,140 | 3,100 | 2,640 | 890 | 1,800 | 655 | 735 | 3,850 | 640 |

## Specifications

| Model No.  |                     | FCMX-I   | FCMX-II  | FCMX-III                                       |
|--|---------------------|--|--|--|
| Mold Size  | Width x Length (mm) | 500×400<br>508×406 (20"×16")<br>520×420        | 550×450<br>610×508 (24"×20")                   | 700×600  |
|  | Height (mm)         | Cope:130-200<br>Drag:130-200<br>Optionally set | Cope:130-200<br>Drag:130-200<br>Optionally set | Cope:180-250<br>Drag:180-250<br>Optionally set |
| Molding System   |                     | Aeration Sand Filling + Squeeze                |  |  |
| Molding Rate (Max) *1)<br>(Including 9 sec for core setting) |                     | 200 molds/hr<br>(18 sec/mold)                  | 200 molds/hr<br>(18 sec/mold)                  | 171 molds/hr<br>(21 sec/mold)                  |
| Squeeze Surface Pressure (Max)                               |                     | 1.0 MPa. 4 selectable stages                   |  |  |
| Aeration Pressure  |                     | 0.05-0.18 MPa                                  |  |  |
| Power System   |                     | Air & Oil (30 kW-Water cooled)                 | Air & Oil (37 kW-Water cooled)                 | Air & Oil (30 kW+30 kW-Water cooled)           |
| Air Consumption  |                     | 0.6 m <sup>3</sup> (N)/mold                    | 0.7 m <sup>3</sup> (N)/mold                    | 1.5 m <sup>3</sup> (N)/mold                    |
| Operating Air Pressure                                       |                     | 0.5~0.55 MPa                                   |  |  |
| Weight of Mold (Min-Max)                                     |                     | 78 kg-131 kg                                   | 97 kg-186 kg                                   | 226 kg-315 kg                                  |

\*1) Molding speed shown above stands for the fastest case with the mold thickness setting of Thick/Thick.

### Remarks

- 1) CE version is also available as an option.
- 2) The above specifications and dimensions are subject to change without notice.

## Option



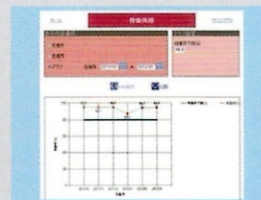
- **Automatic pattern changer**  
Automatic changeover of the master plate reduces replacement cycle time eliminating required man-hours. (Includes one master plate)



- **Magnet type sprue cup**  
Sprue change can be done with a single press of a button reducing man-hours required for sprue attachment.



- **Aeration tank nozzle (UHPE)**  
UHPE nozzle reduces nozzle wear achieving less maintenance and longer life.



- **Molding analysis monitor software**  
Operation status data is collected during molding and graphed for easier traceability. (Recommended PC: Molding analysis monitor PC)



- **Molding analysis monitor PC**  
This custom PC is recommended for use with the molding analysis monitor software.

- **Cold climate specifications (Hydraulic unit heater)**  
Reduces heating time for hydraulic unit operating oil.

- **Hot climate specifications (Operation panel air conditioner)**  
Prevents overheating inside the operation panel.

- **Receiver tank**  
Stable supply of compressed air.

- **Recommended spare parts**  
These are the spare parts we recommend keeping on hand as well as the consumables required for the first year of operation.