



1. Product Concept

These days demand for environmentally- and user-friendly machines is increasing amid growing fears of global warming and environmental degradation. This phenomenon can be seen in the industry of foundry. Under these circumstances we have been developing energy-saving foundry machines with hydraulic power units and electric motors. The ACE Seiatsu molding machine developed by a complexity of molding functions and introduction of new technologies is our environmentally-friendly concept machine, which improves energy-saving and work environment.

2. Technical summary of product

1) Energy saving

Air consumption is considerably reduced by the aeration sand filling system that enables the sand filling with lower compressed air of about 0.1 MPa than that of our conventional blowing sand filling. Further, hydraulic power is reduced due to less number of actuators by application of single work station as well as introduction of energy-saving control circuit using the gravity of the upper unit structure of the machine and requiring no hydraulic power. As a result the total energy consumption is reduced to one-third in comparison with our traditional molding machine.

2) Reduction of spill sand

The flat mold back face created by preset segment squeezing system as well as uniform height by feed back control at change of sand character enables the minimum scraped sand volume by sand cutter that is one-third in comparison with that of our traditional machine.

3) Space saving

The single station molding machine composed of an integration of sand filling unit and squeezing unit realizes a compact structure due to a complexity of machine elements and a simple lower unit by moving up and down the upper unit. As a result the depth of pit is minimized.

4) Working environment

Splashing of parting agent inside the sealed molding flask enables flying of less parting agent in the atmosphere, clean working environment, better application of parting agent on the pattern and reduction of parting consumption to one-second. The noise level is also considerably reduced due to no shuttle movement of sand filling unit, low pressure aeration and very low of air flow noise and exhaust noise.

5) Molding quality

Air flow from the inside face by the aeration system decreases the resistance between the sand and the hopper surface and enables smooth and uniform density without compacting sand. Especially for the complicated parts or small pockets of the mold where sand can not be filled by its gravitation an arrangement of vent plugs in the complicated parts or small pockets enables better sand filling and improved sand density. Furthermore, complex squeezing of the pre-molded sand improves uniformity and strength of the entire mold. Superior mold stripping property enables a stable and better stripping with less draft in comparison with our traditional machine.

6) High productivity

The single station increases molding speed by 20% without accelerating the speed of each actuator.

7) IT technologies

Our traditional flask molding machine requires many skilled operators who maintain and adjust a machine on the spot. The ACE realizes reduced maintenance work by introduction of an operation analysis control system for monitoring the movement of actuators and valves as well as hydraulic and pneumatic pressure, and further a quick response to machine troubles and shorter down time of the machine by sharing the operation records with our customer.

3. Summary

The ACE molding machine achieved our concept of a molding machine realizing excellent mold quality, considerable energy-saving and environmentally-friendly machine. We think that it is necessary for us to develop environmentally-friendly machine not only for molding machines but also for overall molding plants.

Table 1. Machine Description

Model		ACE-3	ACE-4		ACE-5		ACE-6	
Mold Size(mm)	min.	500x600	600x750	600x750	700x900	700x900	900x1000	900x1000
	max.	550x700	650x850	650x850	800x1000	800x1000	1000x1200	1000x1200
Mold Height(mm)		150,200	200,250	300	200,250	300	250,300	350
Molding Ratio(Molds/hr)		150	150	135	144	130	120	108