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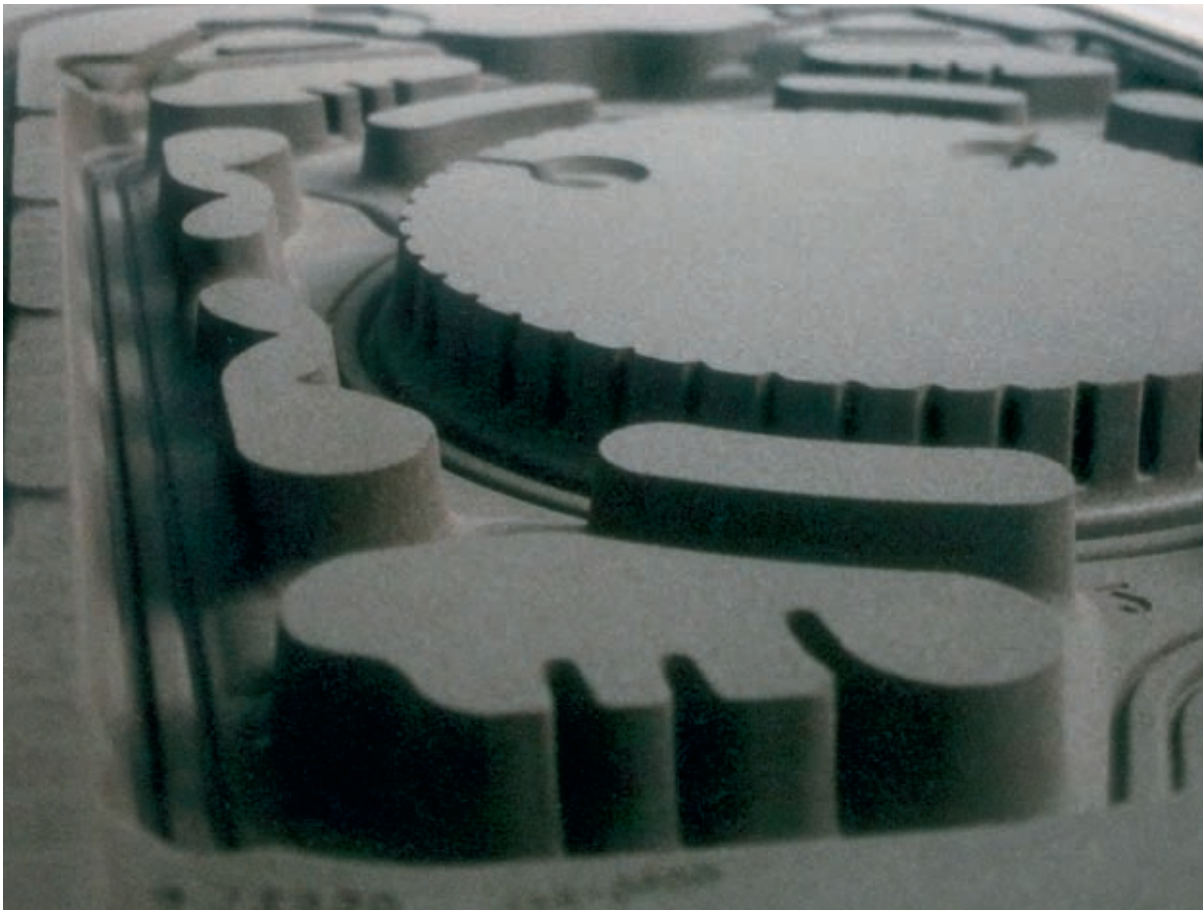
SEIATSU
AIR-FLOW SQUEEZE MOULDING PROCESS



SEIATSU... the process for producing consistently perfect moulds.

The process sequence.

The SEIATSU air flow squeeze moulding process is a method of compacting moulding sand. The required quantity of sand is released when the louvre shutters of the sand dosing hopper are opened. The mould is formed by a pattern plate mounted on a pattern bolster. A guiding frame on top of the moulding box guides the sand into the box (fig. 1).

The sand dosing hopper underneath the sand storage hopper then moves to the side and simultaneously the squeeze head moves in position over the mould. The machine table rises thus pressing the bottom bolster (including the moulding box and filling frame) against the squeeze head, hermetically sealing the system. The SEIATSU air flow valve is then opened. The air is passed through the moulding sand from the back of the mould and towards the pattern. Vents provided on the pattern plate or on the pattern itself facilitate the air flow simultaneously through all the components (fig 2).

The mould is then compacted by applying pressure in an arrangement that may use a squeeze plate, an elastic squeeze plate or a multi-ram press (fig. 3). Whilst the compacting process is proceeding the dosing hopper is refilled.

To separate the mould and the pattern the machine table is lowered and the sand dosing hopper and the squeezing head are moved back to their datum position (fig. 4).

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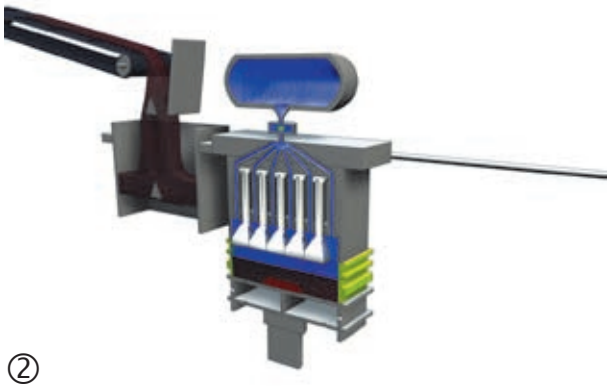
■ ***The sand is filled into the mould box to cover the pattern***



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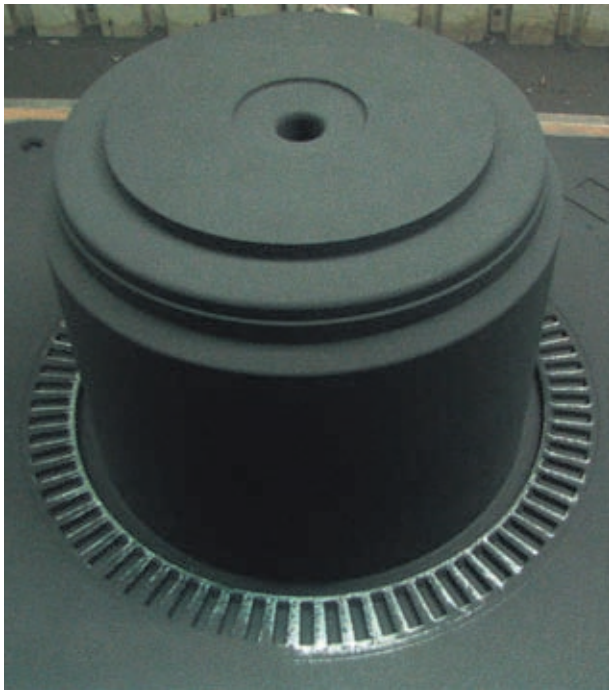
■ ***The SEIATSU AIRFLOW Squeeze Moulding Process is applied***



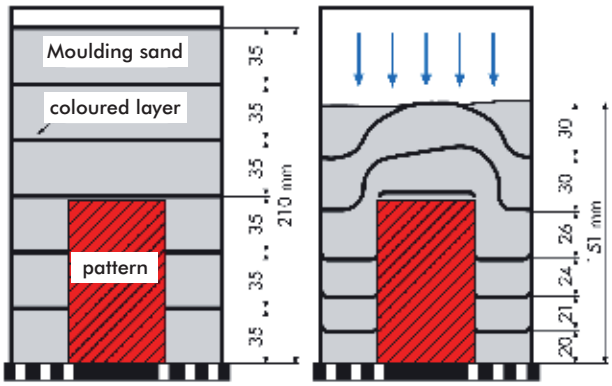
■ ***Mould example: Brake drum, Ø approx.: 500 mm***

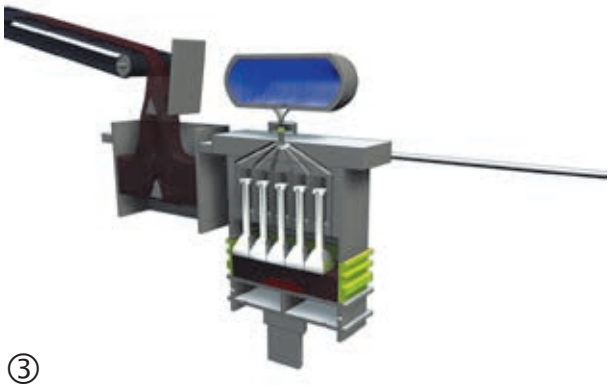
■ ***Mould example: Cylinder heads, flasksize: 1550 x 1100 mm***

The air-flow.

When penetrating the moulding sand the air flow results in a downward force on every grain of sand. Thus the air flow forces the sand into every recess in the mould pattern. The packing density increases in the direction of the flow, layer by layer, in such a way that the sand is most tightly compacted in the zones that are closest to the pattern.

To demonstrate this excellent compacting effect 35 mm high layers of sand of different colours were built up around a pattern. After the air flow was applied the thickness of the layer at the bottom was reduced to 20 mm whilst that at the top was 30 mm. With the subsequent pressing, a uniform compaction of the entire mould is achieved.





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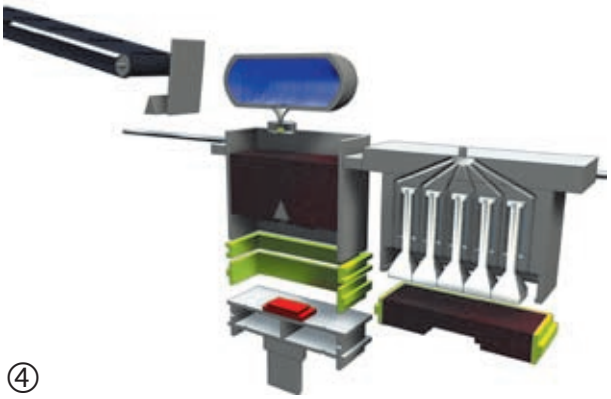
■ *After-compacting by multi-ram press*

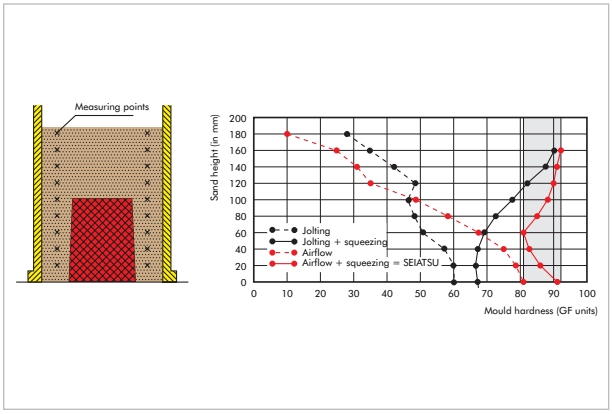


④

■ *Separation of pattern and mould*

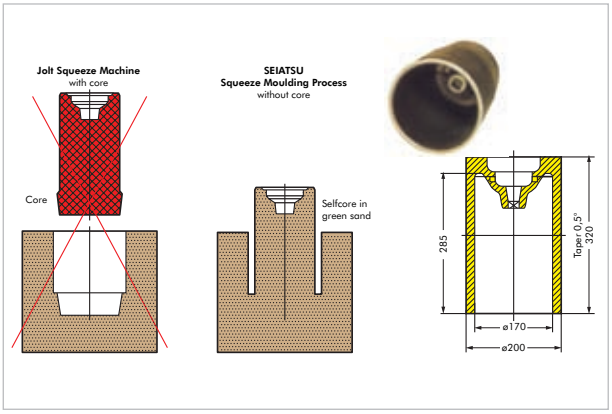
■ *Mould example: Bottom Flask for a flow clutch, rib width 2.5 mm, dia. approx. 400 mm Previously made using sand cores, now with green sand mold insert. After the finishing pressure is applied an even mold is formed.*

The advantages of the **SEIATSU** process.



Uniformly high mould hardness.

The moulds produced are uniformly hard resulting in the production of dimensionally accurate castings. The moulds produced by the SEIATSU air flow process are considerably harder than those produced by jolt squeezing.

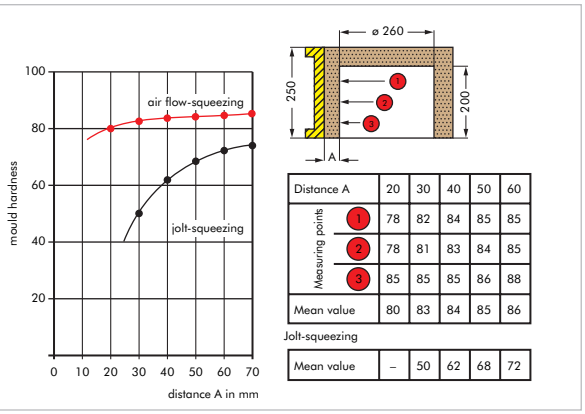


Fewer cores required.

In many cases cores can be eliminated when moulding complicated pattern shapes and extreme cods with the SEIATSU process

Reduced pattern draft.

Draft can be reduced to 0.5° when using the SEIATSU process, resulting in corresponding reductions in use of material and in machining costs.



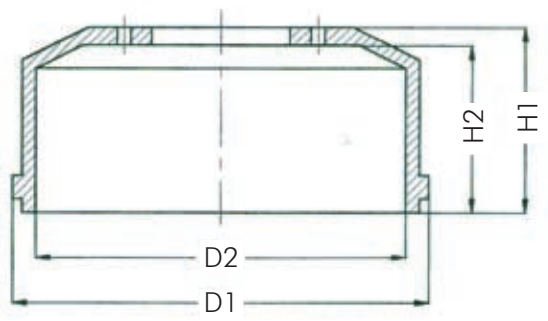
Distance A	20	30	40	50	60
Measuring points 1	78	82	84	85	85
Measuring points 2	78	81	83	84	85
Measuring points 3	85	85	85	86	88
Mean value	80	83	84	85	86

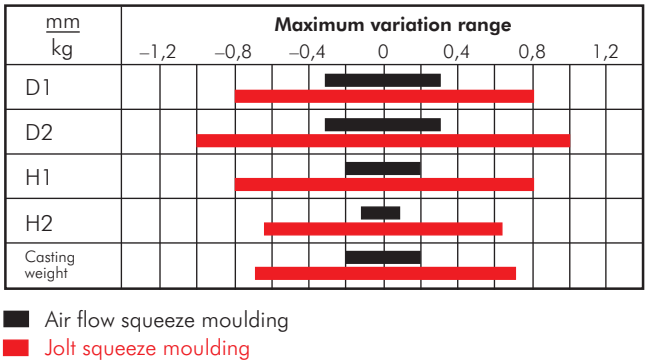
Jolt-squeezing

Mean value	–	50	62	68	72

Improved utilisation of the mould space.

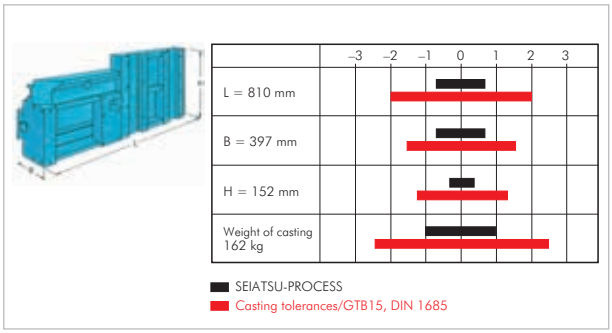
The ability to reduce the distance between patterns from each other and the side of the mould results in improved utilisation of the available space and hence more castings per mould.

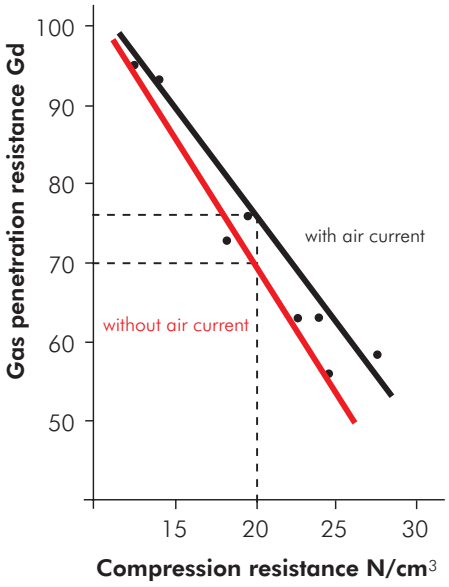




Reduction in fettling costs.

The SEIATSU process achieves consistently high general and surface quality, and dimensional accuracy with almost no burrs, so that fettling requirements and machining costs are very considerably reduced.



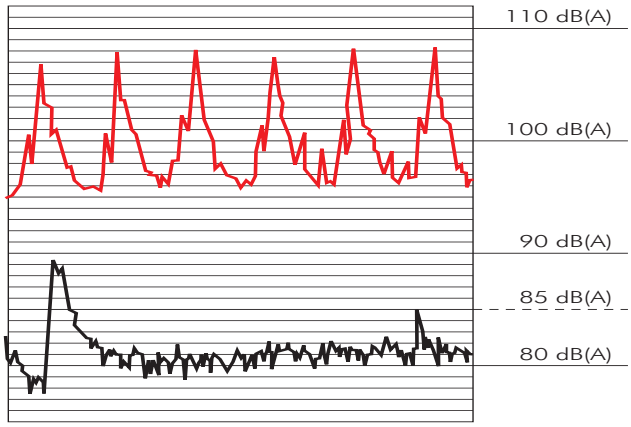


1. Using pressure alone
porosity 29,2 %

2. Using air flow and pressure
porosity 32,9 %

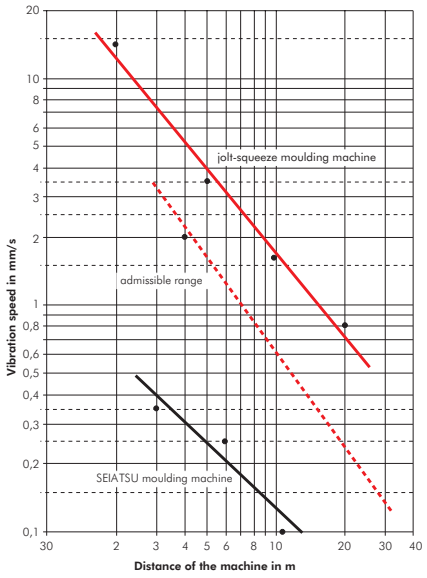
Comparison of the noise emission
between jolting and SEIATSU

level time signal of a
jolt moulding machine
(ram jolter)



level time signal of a
air flow squeeze moulding machine
(open valve)

Dynamic load in the surroundings of moulding machines



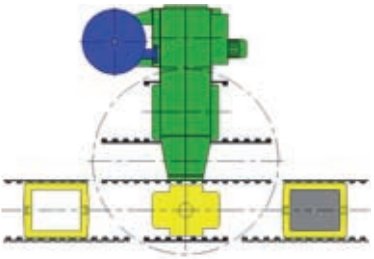
Environmental advantages.

Where the jolt squeeze process is replaced by the air flow system noise levels are brought down to 85 dB(A). This brings a major improvement in the working conditions in a foundry. The SEIATSU process does not produce shock loads so that the foundation requirements are simplified, the impact on the surroundings is reduced and there is less need for maintenance.

There is a **SEIATSU** moulding machine to suit every moulding plant requirement

HSP

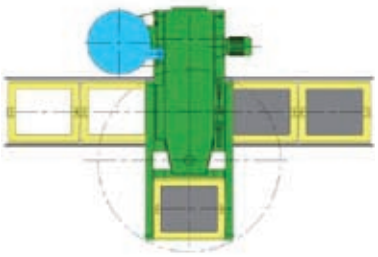
Pattern-draw moulding machine (pin- or roller lifting) with pattern turntable for the production of cope and drag moulds, equipped with flat squeeze plate or water cushion. Sand filling by hopper discharge belt. Moulding box handling manually on roller conveyors or with lifting appliance. Turnkey machine with integrated hydraulic system and electronic control.



Moulding box Inside sizes mm	Output approx. compl. m/h
500 x 400 ⌄ 1000 x 800	40 ⌃ 15

HSP-D

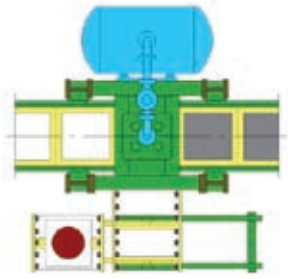
Lowering moulding machine with pattern turntable for the production of cope and drag moulds, equipped with flat squeeze plate or elastic squeeze plate. Sand filling by hopper discharge belt or batch hopper. Moulding box handling by hydraulic cylinders on roller conveyors. Turnkey machine with integrated hydraulic system and electronic control.



Moulding box Inside sizes mm	Output approx. compl. m/h
500 x 400 ⌄ 1250 x 1000	70 ⌃ 20

DAFM-SD

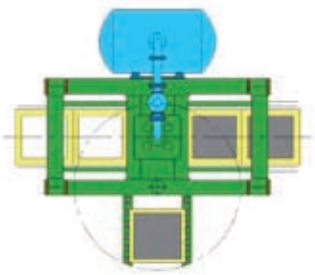
Lowering moulding machine with pattern roller conveyor for the production of one mould-half each, equipped with flat squeeze plate or multi-ram press. Sand filling by hopper discharge belt or batch hopper in front of the machine with possibility of manual intervention. Moulding box handling by means of hydraulic cylinder on roller conveyors.



Moulding box Inside sizes mm	Output approx. compl. m/h
1000 x 800 ⌄ 2500 x 2000	50 ⌃ 10

DAFM-SD

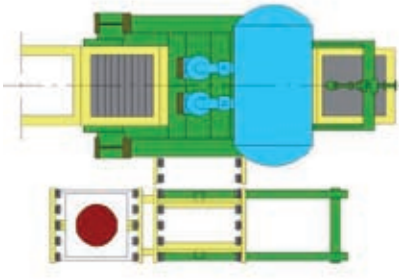
Lowering moulding machine with pattern turntable for the production of cope and drag moulds, equipped with flat squeeze plate, elastic squeeze plate or multi-ram press. Sand filling by hopper discharge belt or batch hopper in front of the machine with possibility of manual intervention. Moulding box handling by means of hydraulic cylinder on roller conveyors.



Moulding box Inside sizes mm	Output approx. compl. m/h
500 x 400 ⌄ 1250 x 1000	100 ⌃ 50

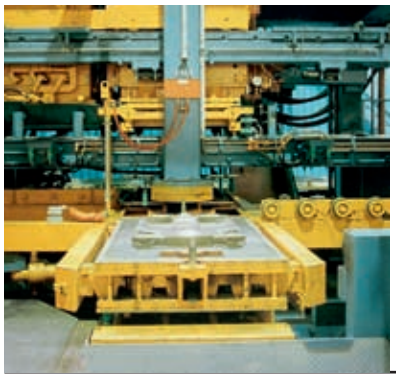
EFA-S

Fully automatic lowering moulding machine with pattern roller conveyor and pattern shuttle truck for the production of cope and drag moulds, equipped with multi-ram press as standard equipment. Sand filling by batch hopper. Moulding box handling by means of hydraulic cylinder on roller conveyors.

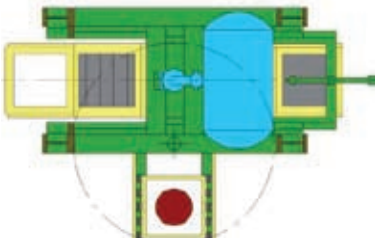


Moulding box Inside sizes mm	Output approx. compl. m/h
1000 x 800 ⌄ 2500 x 2000	60 ⌃ 20

EFA-SD



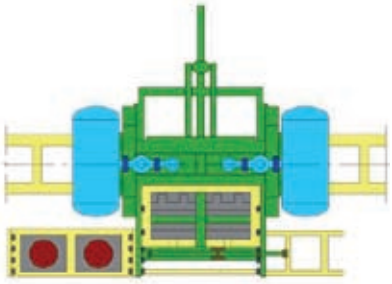
Fully automatic lowering moulding machine with pattern turntable for the production of cope and drag moulds, equipped with multi-ram press as standard equipment. Sand filling by batch hopper. Moulding box handling by means of hydraulic cylinder on roller conveyors.



Moulding box Inside sizes mm	Output approx. compl. m/h
500 x 400 ⌄ 1600 x 1250	140 ⌃ 80

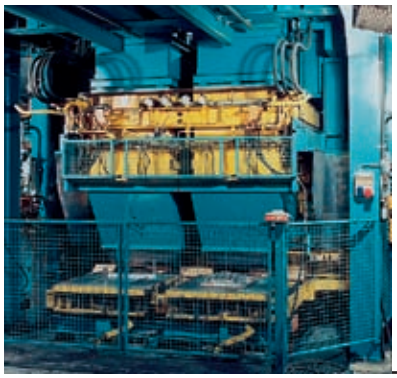
ZFA-S

Fully automatic twin-type moulding machine for simultaneous production of one cope and one drag mould, with pattern roller conveyor and pattern shuttle truck, equipped with flat squeeze plates, elastic squeeze plates or multi-ram presses. Sand filling by batch hoppers. Moulding box handling by means of hydraulic cylinder on roller conveyors.

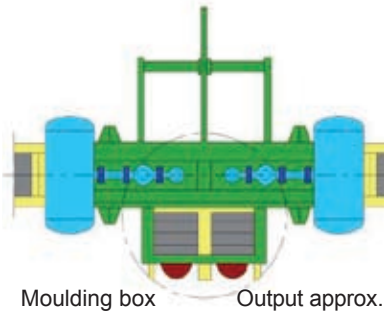


Moulding box Inside sizes mm	Output approx. compl. m/h
500 x 400 ⌄ 1250 x 1000	250 ⌃ 160

ZFA-SD



Fully automatic twin-type moulding machine with pattern turntable for the production of two cope or two drag moulds or one moulding box pair, equipped with flat squeeze plates, elastic squeeze plates or multi-ram presses. Sand filling by batch hoppers. Moulding box handling by means of hydraulic cylinder on roller conveyors.



Moulding box Inside sizes mm	Output approx. compl. m/h
500 x 400 ⌄ 1250 x 1000	250 ⌃ 160

SEIATSU examples of grey iron casting

■ *Electric motor housings*
material: EN-GJL, mass: 280 kg, 26 kg, 3,8 kg

■ *Engine block*
material: EN-GJL, mass: 150 kg

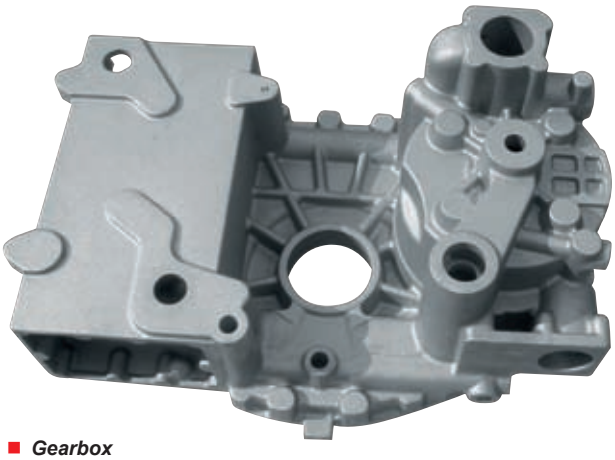
■ *Axle*
material: EN-GJL, mass: 680 kg

■ *Oil cooler*
material: EN-GJL, mass: 28 kg

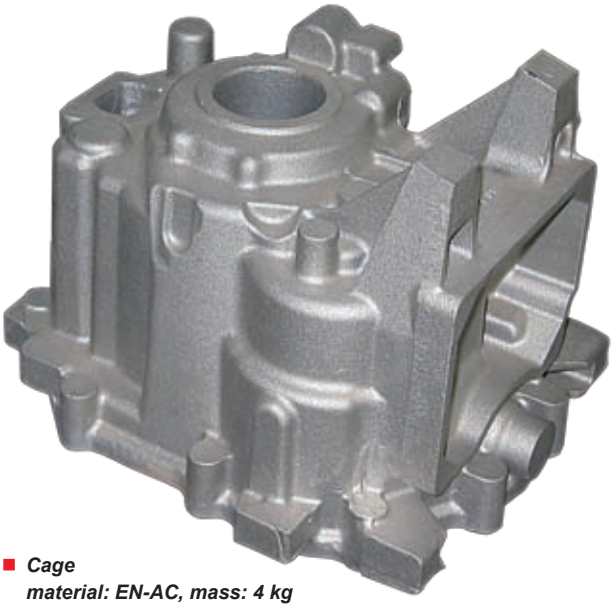
■ *Engine block*
material: EN-GJL, mass: 300 kg

SEIATSU examples of aluminium casting

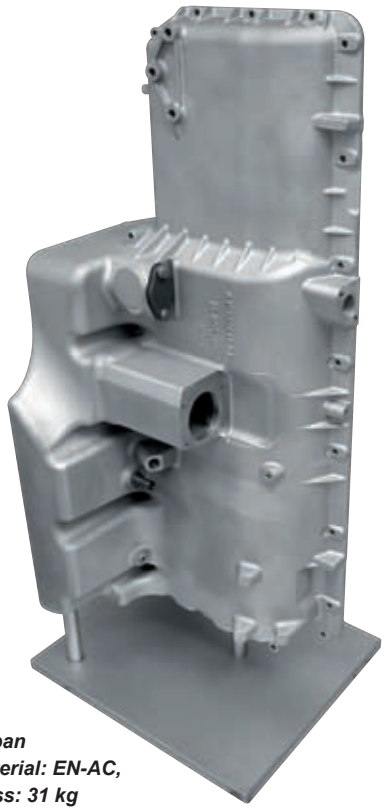
■ *Oilpan*
material: EN-AC, mass: 33 kg



■ *Gearbox*
material: EN-AC, mass: 24 kg



■ *Cage*
material: EN-AC, mass: 4 kg



■ *Oilpan*
material: EN-AC,
mass: 31 kg

■ *Valve cage*
material: EN-AC, mass: 0,5 kg

SEIATSU a perfect casting

- *Hitch cage*
  material: EN-AC, mass: 12 kg

- *Exhaust cage*
  material: EN-AC, mass: 4 kg

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