Global Network

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Sumitomo SHI DEMAG

TECHNO-CLUB vol.44

IPF2023
INTERNATIONAL PLASTIC FAIR

act! SUSTAINABLY
Creating a Future

New SE-EV-S series for achieving sustainability—SE50EV-S NEW
Thin-walled container molding by ICM—SE180EV-S NEW
Micro-transfer molding—SE180EV-S NEW Production Quality Control System—i-Connect
Double-shot molding of long products—SE400HS-CI
LSR/PPS molding—SE75DU-CI, Collaborative robot/Autonomous mobile robot

NEW A new manufacturing building at Chiba Works

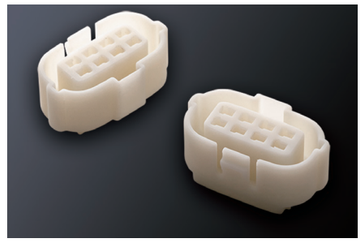
Sumitomo Heavy Industries, Ltd.

Sustainable molding, Smart management and Safety

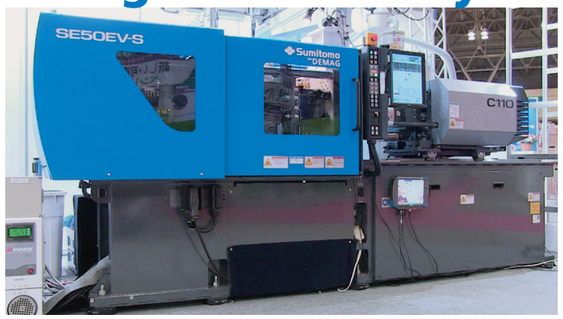
New SE-EV-S series for achieving sustainability

All-electric Small-sized Injection Molding Machine NEW

SE50EV-S



Product: Automotive connector
Number of cavities: 4
Resin: PA6T (Flame retardant V-0)
Cycle: 16 s
Product weight: 2.5 g



Clamping force (max.): 500 kN
Injection unit: C110
Screw diameter: ø25 mm
Injection speed (max.): 500 mm/s

1 Less defects and greater energy-savings molding support by simple operation

Sustainable Molding

80% filled

Capable of filling with low injection pressure

FFC Flow Front Control

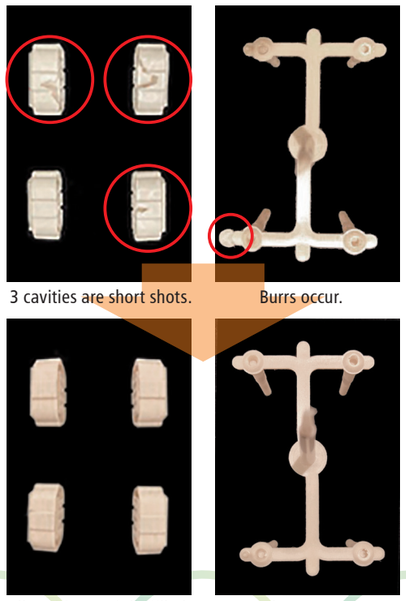
FFC molding improves cavity balance, thereby eliminating the simultaneous occurrence of short shots and burrs and enabling filling with low injection pressure. Lower filling pressure also leads to energy savings.

Conventional molding

If the screw is further advanced while the cavities are unevenly filled, burrs and short shots may occur at the same time.

FFC Molding

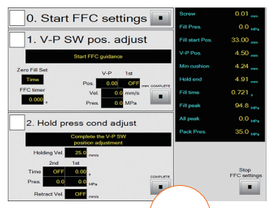
Screw control around V-P switchover enables smooth filling at low injection pressure using resin viscoelasticity and improves cavity balances.



3 cavities are short shots. Burrs occur.

All cavities are fully filled. No burrs occur.

Zero-molding



FFC Guidance NEW

Anyone can easily use FFC Molding by simply following the pop-ups that appear in order from the top.

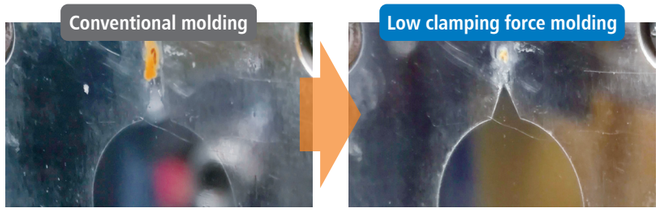
No more molding defects
Energy-savings
Reduced CO_2 emissions

The SE-EV-S series pioneers the future of sustainable injection molding with the 3 S's.

Capable of molding with low clamping force

MCM Minimum Clamping Molding

Low injection pressure filling and advanced functions such as platen support, bushless tie bars, and mold clamping force feedback control realize stable low mold clamping force molding. The mold will not be deformed, allowing the vent to work effectively, preventing gas burns and short shots. It also extends mold life and maintenance cycles and further reduces power consumption.



Mold deposits are generated by the gas.

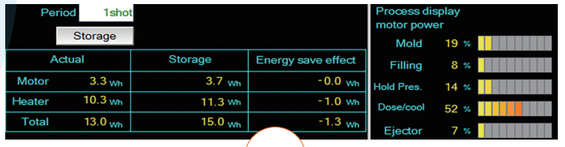
Optimal clamping force judgement Reference Exhibit

An assist function automatically determines the optimal clamping force that does not cause burrs.

Capable of simple operation

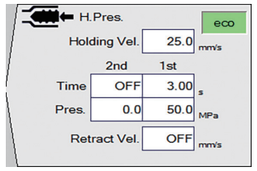
SPS Simple Process Setting

An intuitive and easy-to-understand operation screen based on HCD (Human-Centered Design) shortens operation time and reduces operational errors.



Power consumption display NEW

This function monitors and records the power consumption of motor and heater, from a single shot to long periods of time over several days. It supports energy-saving efforts.



Automatic energy-saving control NEW

The low power mode of the pressure holding stage can be set by just pressing a button.

Minimum melting time display NEW

This function displays the minimum time required for complete heating up when returning from an interruption of molding. It can reduce waste of resin and electricity.

2 System integration feature for a more efficient production environment

Smart Management

The SE-EV-S series are compliant with the international standard OPC UA as a standard feature, and has enhanced communication with MES. We also offer MES integration with i-Connect, which is our strength in data collection for our molding machines, and M2M solutions that reduce work hours and improve quality control efficiency.

3 Compliance with international safety standards contributes to improving safety

Safety

All of our models now comply with the international safety standards ISO 20430: 2020 (JIS B 6711:2021). We offer high quality safety worldwide through improved operational safety features, such as reliable safety doors and protective purging covers, and improved machine quality such as highly reliable control systems and enhanced waterproofing.

CO_2 emissions reduction by reducing resin consumption

Thin-walled container molding by ICM (Injection Compression Molding)

All-electric Small-sized Injection Molding Machine
SE180EV-S NEW

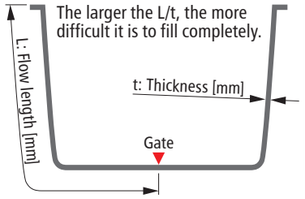
Product: 500 g Tub
Number of cavities: 2
Resin: PP
Cycle: 3.5 s
Product weight: 12.2 g

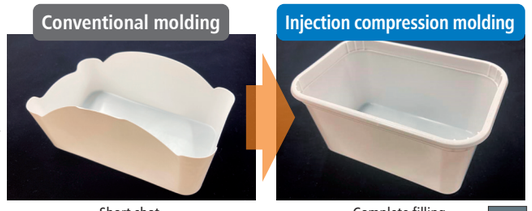
Clamping force (max.): 1800 kN
Injection unit: C560
Screw diameter: ø45 mm
Injection speed (max.): 500 mm/s (High-speed filling spec)

1 Reduced resin consumption by thinning container

High-response, heavy-duty injection compression spec

One way to reduce the amount of resin as an environmentally friendly approach is to reduce weight of products by making them thinner.

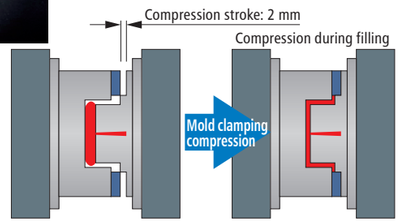




High-response, heavy-duty injection compression enables complete filling of thin-walled products with L/t=400, which is impossible with conventional molding.

Conventional molding
Injection compression molding ←–19.1 t
Annual resin reduction

● The value is based on production of the exhibited product at a cycle time of 3.3 s, 12 hrs/day and 260 days/year.



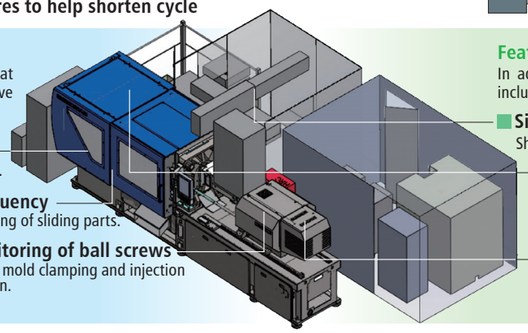
2 Increased productivity by shortening cycle time

Fast Cycle Package and features to help shorten cycle

Fast Cycle Package

Equipped with a Fast Cycle Package that integrates various functions to improve productivity by shortening cycles.

- **High durability bushing**
  Improve durability of toggle link parts.
- **Increased grease feed frequency**
  Prevents heat generation and galling of sliding parts.
- **Cooling and temp. monitoring of ball screws**
  Temperature of ball screws for mold clamping and injection is monitored, and cooled by fan.



Features to help shorten cycle

In addition to the Fast Cycle Package, we have included other features to speed up the cycle.

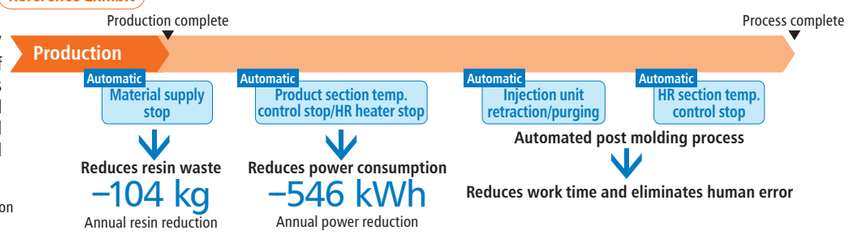
- **Side-entry type take-out robot**
  Shortens travelling distance.
- **High-response, heavy-duty injection compression spec**
  Highly responsive operation reduces mold clamping pressure boosting time.
- **Fast filling spec**
  Enables faster filling through max. injection speed of 500 mm/s

3 Improved work efficiency at the end of production

Post Molding Automation Features Reference Exhibit

The "Post Molding Automation Features" is activated according to the number of planned production remaining and sends stop commands to the peripheral equipment in sequence. This automated function reduces operator workload and prevents human error.

● The value is based on 260 days/year of production of the exhibited product.



Contribution to cutting-edge technology improves QOL

Micro-transfer molding

All-electric Small-sized Injection Molding Machine
SE180EV-S NEW

Product: Microfluidic plate
Number of cavities: 1
Resin: COP
Cycle: 20 s
Product weight: 24 g

Clamping force (max.): 1800 kN
Injection unit: C360
Screw diameter: ø36 mm
Injection speed (max.): 350 mm/s

1 Molding defects improvement by improved transferability

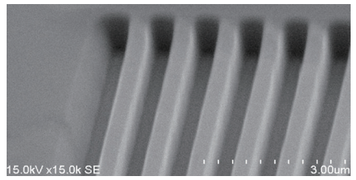
High-response, heavy-duty injection compression spec/Nozzle tip air cooling mechanism

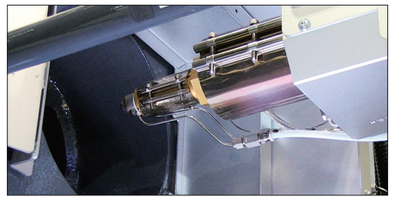
In the case of micro-transfer molding of microfluidic plates, DNA analysis chips, moth-eye lenses, etc., the resin generally solidifies before filling to the end of the micro pattern, and the pattern is not sufficiently formed. However, increasing the temperature, filling pressure, or mold clamping force carries the risks of causing various molding defects.

Twice the transferability of general molding

Micro-transfer mold and injection compression

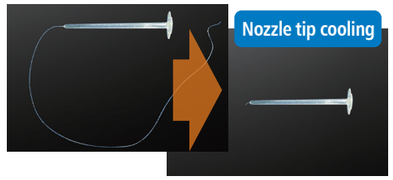
Low thermal conductivity material is used for the mold. This improves flowability without raising mold or resin temperatures, and prevents resin degradation. The mold clamping compression also has the effect of lowering the filling pressure and reducing residual stress.





Nozzle tip air cooling mechanism

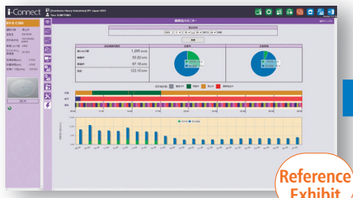
High temperature nozzle tip may cause stringing, which can damage the mold as the string get caught in the mold. Air cooling of the nozzle tip eliminates stringing.



2 CO_2 emissions control at molding cell level i-Connect

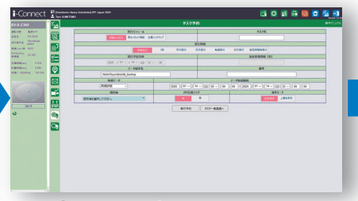
Production Quality Control System

Future trends will require management of CO_2 emissions throughout the entire supply chain, including injection molding site. The production quality management system "i-Connect" can be utilized to obtain the power consumption per molding cell and output the data to the CO_2 emissions management system.



Power Consumption Monitor

This function monitors power consumption trends and visualizes processes that require energy-saving measures. In addition, the data of power consumption is combined with the production state and the change points of the machine operating conditions to grasp the state of the molding cell.



Task Reservation

Via the task reservation function, primary data for each molding cell is automatically output to external collaborated systems.

Catena-X compliant management system

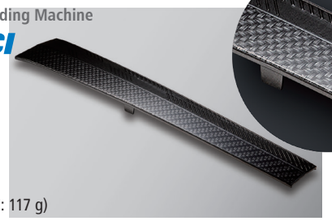
This system utilizes data converted by the data server into a common information model, AAS, to ultimately manage CO_2 emissions. (SiGREEN by Siemens)

Production efficiency improvement by shortening the processes

Double-shot molding of long products

All-electric Double-shot Injection Molding Machine

SE400HS-CI



Product: Center pillar
Number of cavities: 1
Resin: PMMA/PC
Cycle: 65 s
Product weight: 225 g (PMMA: 108 g/PC: 117 g)

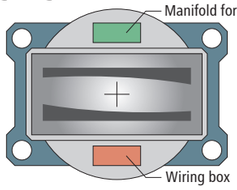
Clamping force (max.): 4000 kN
Injection unit: C900/C900

Screw diameter: ø50 mm/ø50 mm
Injection speed (max.): 350 mm/s

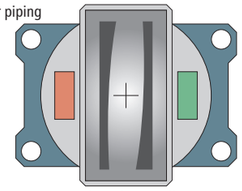
1 Highly flexible mold mounting/Improved work efficiency and safety

Unique temperature control piping design and function

Unique temperature control piping and extended tie-bar spacing enable molding of long products, which was not possible with separate molds. In addition, the 90º rotation stop feature allows piping and wiring work to be performed at lower position, increasing work efficiency and safety.



Large one-piece mold can be mounted.

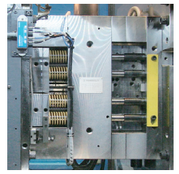


Stops at 90º for safe and efficient setup.

2 Defect reduction by in-mold pressure

V-P switchover by mold cavity pressure

The in-mold pressure sensor measures the resin pressure in the product section and switches to holding pressure when the set value is reached. This improves product accuracy and reduces defects.



Stable production with various resins

LSR/PPS molding

All-electric Double-shot Injection Molding Machine

SE75DU-CI

Product: Waterproof case with lid
Number of cavities: 1 set (Body/Lid)
Resin: PPS/LSR
Cycle: 60 s
Product weight: 16 g (PPS: 15 g/LSR: 1 g)

Clamping force (max.): 730 kN
Injection unit: C65/C65

Screw diameter: ø20 mm/ø20 mm
Injection speed (max.): 500 mm/s

1 LSR/PPS stable molding

Screw assemblies for LSR and PPS

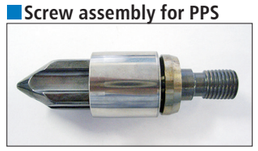
The double-shot molding of LSR and PPS, both of which have high heat resistance, enables efficient production of sealing parts that can be used in environments up to 200ºC. Both resins are difficult to mold stably, so each injection unit is quipped with a dedicated screw assembly to meet the demands.

■Screw assembly for LSR

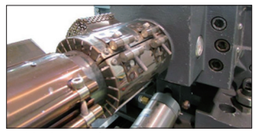
Stable precision dosing and cooling temperature

Excellent sealing performance even with low viscosity or small volume

■Screw assembly for PPS



Reduces cylinder wear even with GF-containing resins



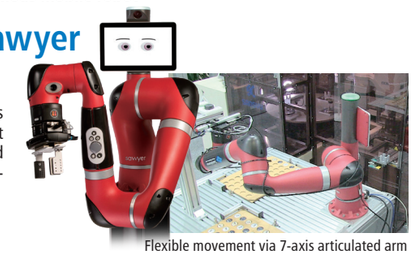
Stable dosing of PPS requiring a large amount of heat

2 Labor-shortage solution at molding sites

Collaborative robot/Autonomous mobile robot

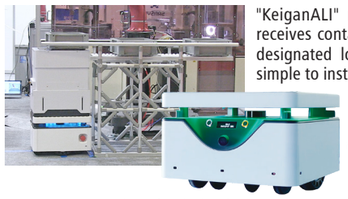
■Collaborative robot Sawyer

"Sawyer" robot automates product assembly, transport to inspection device and containerization to save man-power.



Flexible movement via 7-axis articulated arm

■Autonomous mobile robot KeiganALI (Sumitomo Heavy Industries/Keigan)



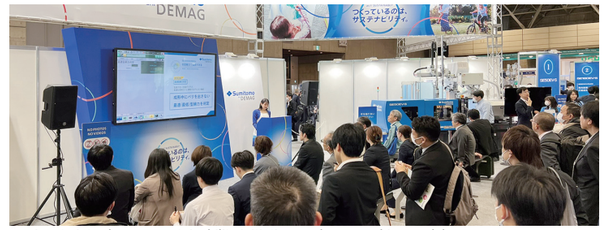
"KeiganALI" robot automatically delivers and receives containers and transports them to their designated locations. It is easy to set up and simple to install.

This robotic system is highly customizable and can be used in a variety of situations.

● "Sawyer" is a product of Rethink Robotics GmbH, "KeiganALI" is a product of Keigan Inc. These products are marketed by our group company.

Sustainable Solutions

Our theme for the IPF2023 exhibition is "act! SUSTAINABLY -- Creating a Future". In addition to molding machines, a variety of applications and systems, as well as unique products from supporting company, were presented to showcase solutions to create a sustainable world and two initiatives for a sustainable planet and for the sustainability of your business.



Seminar to introduce our sustainability initiatives and new machine model.

Visualized power consumption with the "i-Connect" system

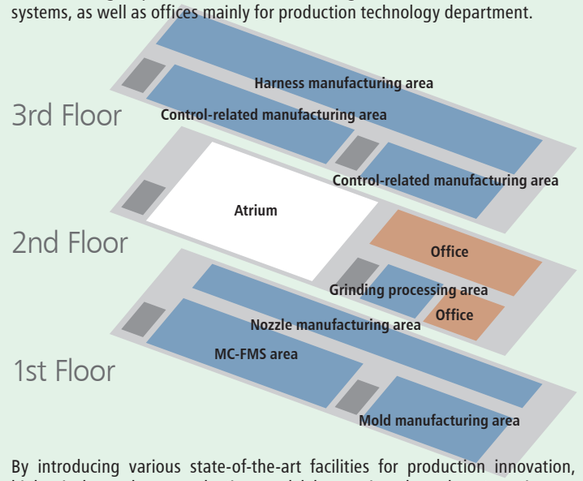
Molding consultation corner

Introduced "TomenaiService", our original molds and screws

Unique displays from various companies

A new manufacturing building at Chiba Works

A new manufacturing building was completed at the Chiba Works. The three-story building with a total floor area of 7,600 m² houses the manufacturing departments for MC machining, molds, nozzles, and control systems, as well as offices mainly for production technology department.



FMS (Flexible Manufacturing System) in the MC-FMS area

By introducing various state-of-the-art facilities for production innovation, high-mix low-volume production, and labor saving through automation, as well as ensuring an appropriate air-conditioned environment, we are able to provide precision fast cycle injection molding machines of higher quality.

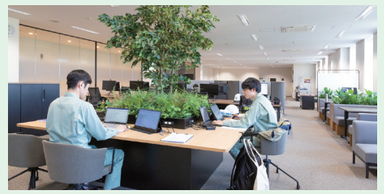
MC (Machining Center) in the MC-FMS area

Multitasking lathe in the nozzle manufacturing area

Collaborative robot "Sawyer" in the control-related manufacturing area

Automatic wire processing system

The office, with its fresh and stylish interior, was designed to be a "factory where you can feel pride in where you work," supporting efficient and comfortable operations. The new building is a future-oriented manufacturing base that promotes our vision to create a sustainable world.



Comfortable free-address office