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CHEN HSONG
Perfect Quality Advanced Technology

SPARK

All-Electric Machine

“From a little spark may burst a flame.”
— Dante

SPARK

THIS SPARK MAY LIGHT OFF A NEW REVOLUTION

Chen Hsong's core values say it all: “Quality is of Paramount Importance, Technology is our Core Competence.”

The SPARK series of all-electric injection moulding machines is itself a marvel of modern engineering, combining high performance, rock-solid stability and superior reliability into a remarkably affordable package.

Superior Safety
Protection via STO

Product images are for reference only and subiect change without notice.

ABC-Agile Boost Control

Marriage of a proprietary ultra-high-response servo system with very-high-speed advanced computer control, yielding no-compromise levels of responsiveness — from zero to 2000 rpm in less than 30 ms! That is ten times faster than traditional all-electric machines (300 ms) in the China market!

ALL-Adapt

“ALL-Adapt” is a package of technologies that enables an all-electric injection moulding machine to gain a wide application window, from ultra-thin-walled moulding (such as high-speed packaging) to thick-walled, high-pressure parts (such as optics).

ASRS-Auto Stress Release System

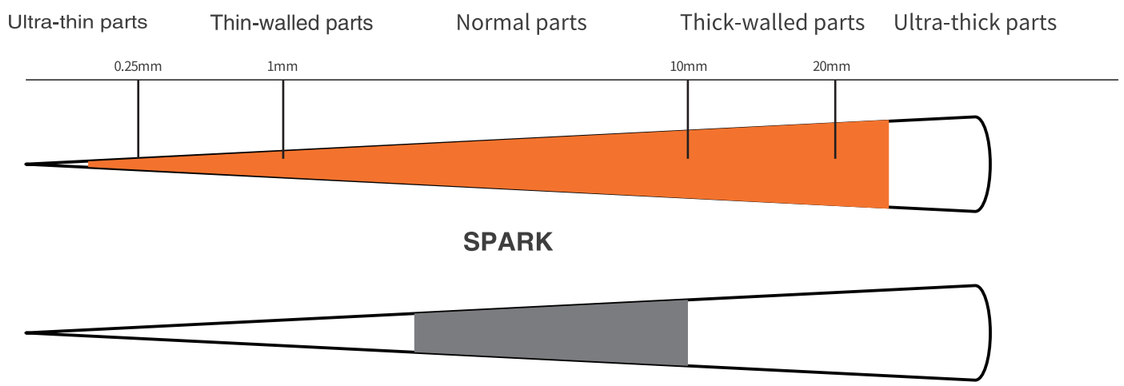
“ASRS” is a revolutionary technology that, again, employs high-speed computer algorithms that dynamically monitors, via high-speed digital pressure transducers, the actual motion of the injection screw (<1ms scan time). The computer controller makes real-time adjustments to the motion of the screw when detecting motions that may lead to accumulation of internal stresses on the part — typically the No.1 enemy of high yields and the No.1 reason for rejects.

AxP with Floating Point Toggle

“AxP” (Algorithmic Cross-Protection) is based on high-end electronics, fine-tuned mechanical design and high-speed computer algorithms. It provides total protection to the mould during high-speed clamp closing by monitoring and adjusting, in real-time, the dynamical motions of the clamping ball-screw.
The “Floating Point Toggle” design, on the other hand, adds back to the rigid ball-screw system a soft “buffer” that is inherent in a hydraulic system, eliminating mechanical shocks and vibrations and, thereby, reducing operating noise and ensuring buttery-smooth mechanical motions. Both technologies work hand-in-hand together to provide world-class protection to the mould and the machine mechanisms, smooth operations, as well as long and extended machine life.

Redefining Adaptability

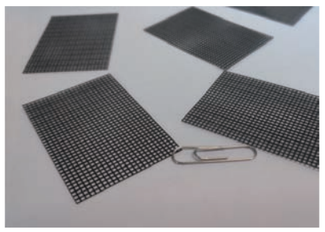
ALL-Adapt gives an all-electric machine a very wide application window. One machine to make them all – from ultra-thin parts requiring ultra-fast speed and responses, to ultra-thick parts demanding rock-solid stability under low-speed and prolonged high-pressure conditions.



Regular all-electric

Application Case 1

0.3mm ultra-thin LED panel base frame



Shot Weight: 0.27g PC
Part Dimensions: 57x38mm
Holes Dimension: 1x1mm
Injection Speed: 300mm
Injection Pressure: 170Mpa
Cycle: 1.3s
Model: SM100-SPARK

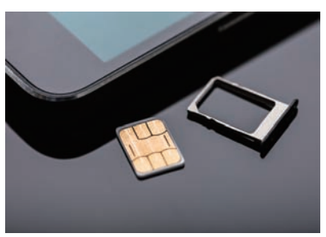
Application Case 2

25mm Ultra-Thick PMMA Lens

Injection Speed: 2mm/s
Inject Pressure: 160Mpa
Injection Time: 45s
Holding Pressure: 160Mpa
Holding Time: 58Mpa
Model: SM100-SPARK

Application Case 3

SIM card tray



Cavities: 2
Material: MIM metal powder
Weight: 34g
Cycle: 12s
Model: SM100-SPARK

Application Case 4

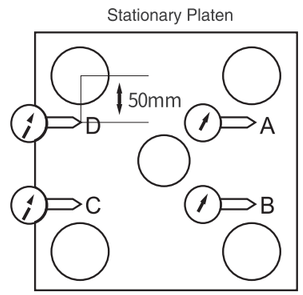
Silicone lamp

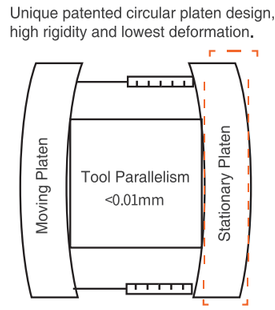
Material: Silicone +PC(PBT)
Cycle: 105s
Cavities: 2
Shot weight: 15.6g
Model: SM100-SPARK

Redefining Reliability

Platen Deformation Comparison

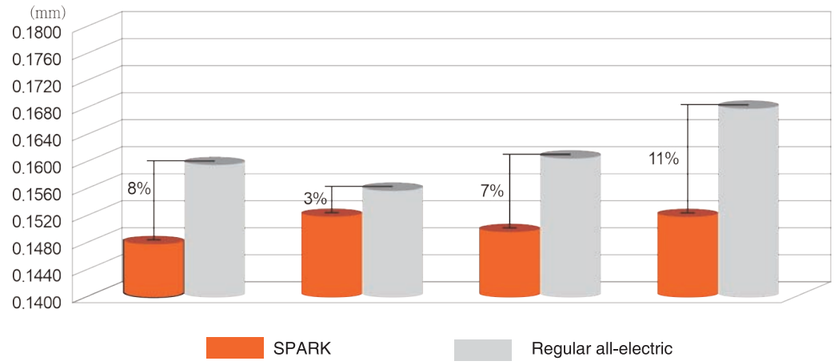
Benefits: Lowest deformation, high part dimensional stability, no flashes





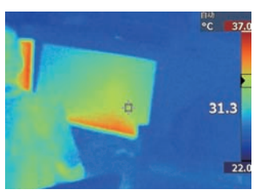
High-Strength Machine Base – Designed in Japan

Comparison between major brands on platen deformation under similar clamping conditions



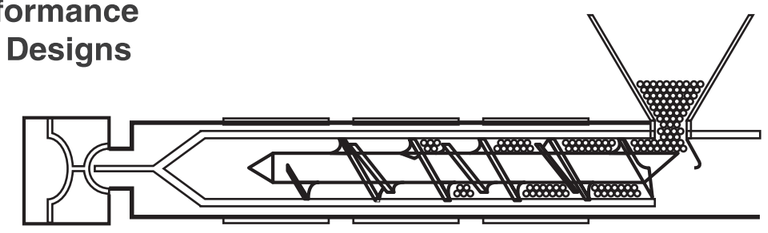
High Grade Finite-Element Analysis

Advanced FEA (finite element analysis) was performed on the entire machine with extensive motion simulation to yield a perfect, optimised combination of mechanical structure and control profile. The result is snappy-fast, silky-smooth, slick and energy-efficient motions.



Redefining Melt Quality

① Japanese High-Performance Specialised Screw Designs



② High-End Bimetallic Screw (Standard)

Perfect for high-end optic, medical and electronic applications with demanding, high-temperature engineering resins.

UPVC Screw (Optional) – Hard chrome-plated for corrosion resistance, highly polished

PC Screw (Optional) – Hard chrome-plated

③ Specialty Mixing Screws for The Best Mixing

Standard Mixing Screw (Optional)

Strong Mixing Screw (Optional)

Redefining Precision – Agile Boost Control (ABC)

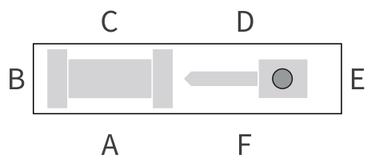
Model	Clamp Open (s)	Clamp Close (s)	Total Clamping (s)	Opening Stroke (mm)	Motion Curve	Distance	Efficiency
SM100 - SPARK	0.86	0.98	1.84	322		+10%	+64%
Regular 90T All-Electrics	1.34	1.52	2.86	294		100%	100%

Specially-developed ultra-high-response servosystem is 10x faster than regular all-electrics. 64% faster dry cycle.

Redefining Quiet Operation

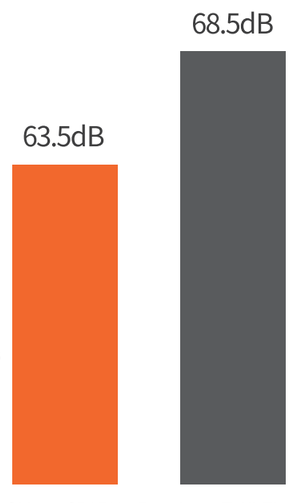
Patented Japanese Toggle Design

Low-noise servosystem together with advanced control algorithms



EUROMAP Standard

Average noise level of 6 measurement points
Ambient: 53dB



Redefining Usage Lifetime

The ball-screws in an all-electric machine are subject to extensive stresses, friction and vibrational shocks, wearing them out easily. The SPARK avoids this by combing the AxP (Algorithmic Cross-Protection) motion control algorithm with the Floating-Point toggle design (a unique Japanese technology), acting in tandem to form a “buffer” over the ball-screws, resulting in remarkably low noise level and long usage life for this critical component.

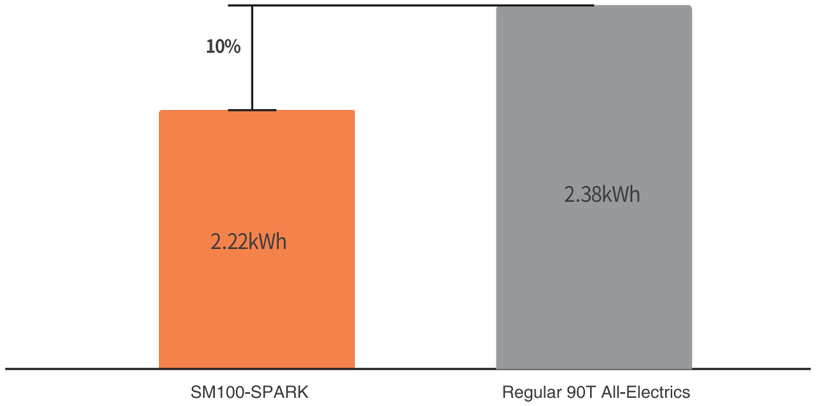
Noise Comparison

SPARK VS Regular 90T All-Electrics

7.8%

Redefining Efficiency

The SPARK redefines energy saving and environmental friendliness via its optimised, modularised control system design.The SPARK generally consumes 10% less electricity than regular all-electrics under the same production condition.



Comparison of actual electricity consumption (same tool, same settings, 1hr. run)

Redefining Smart Manufacturing

High-Response Servosystem Plus Advanced Intelligent Networking Controller

Industry-standard EtherCAT® digital bus system enables high-speed, intelligent, precise machine control as well as unparalleled interoperability.Top-of-the-line Japanese motion-control algorithms running on next-generation super-high-speed controller give the SPARK precision mechanical control and real-time fine adjustment capabilities that are over 10x better than competing offerings.

23-bit High-Precision Encoder
8M ppr ensures ultra-high positional accuracy

STO on the SPARK

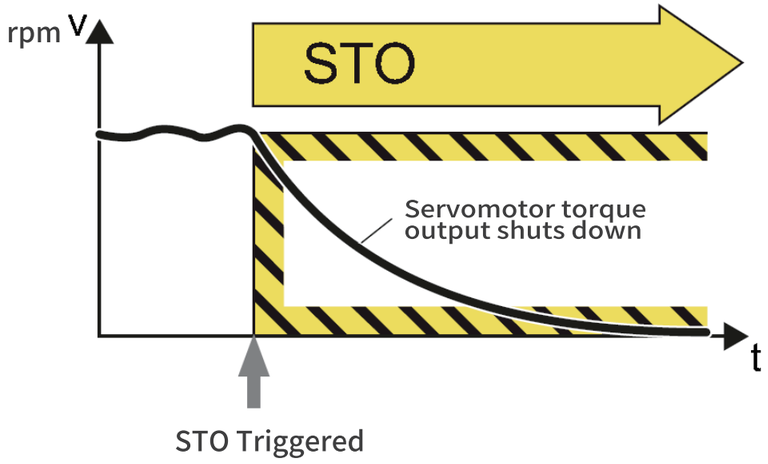
STO - Safe Torque Off

Safety built into the advanced servodrive system eliminates mechanical and electrical risks.

When a safety device is tripped (e.g. opening a guard door during operation), STO is triggered which immediately halts all torque output by servomotors, minimising any risk of injury to human operator or damage to equipment. STO is directly driven by the servodrive which makes it lightning-quick.

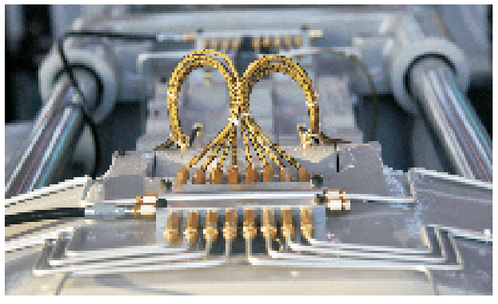
Safety tested
Production monitored
TÜV
SÜD
Functional Safety

STO on the SPARK
as certified by TÜV

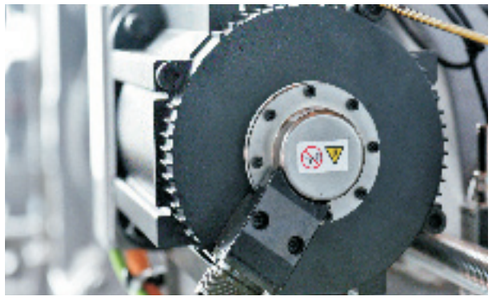


High Precision, High Performance

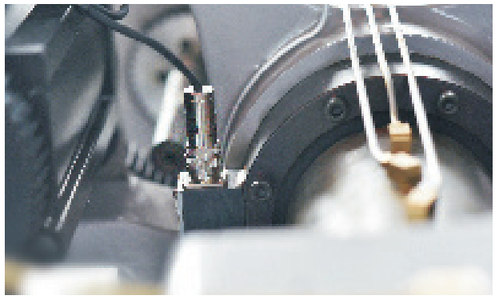
Advanced PID control algorithms ensure high-precision barrel temperature control with superior disturbance resistance.



Centralised automatic lubrication system. No manual control needed. No mistakes. No wastage. Fit for clean-room environments.



Specialty-developed IPM servomotor with fast response, large torque, low noise and mild temperature profile, 23-bit High-Precision Encoder ensures ultra-high positional accuracy.



Name-brand high-precision pressure transducers ensure the finest performance and protection levels.

Tie-bars are detached from the moving platen, eliminating friction and noise.

High-precision linear guide rails for both the injection as well as clamping units.

Standard Features

1. STO-compliant fast-dynamic-response servosystem	2. 3-color LED status lamp
3. 15”full-color touch-screen controller panel	4. Magnetic safeties for guard doors
5. Two sets of air blow (stationary and moving platens)	6. “One-touch” servo dynamic profile setting
7. Linear guide rails for injection and clamping units	8. Centralised automatic lubrication system
9. High-efficiency ceramic heater bands	10. SSR for barrel heating
11. Robot interface	12. Metric/imperial units
13. Ejector-on-fly	14. Plasticising-on-fly
15. Low-pressure injection	16. Two-stage injection
17. Compressive moulding	18. In-mould ejection
19. Two-stage ejection	20. Stainless-steel hopper
21. Floating-Point Toggle design	

Optional Features

1. Screws and nozzles for specialised applications	2. High-pressure tight-seal nozzle flange
3. Core pulls (hydraulic, pneumatic and/or electric)	4. Air blows
5. Customised platen layout	6. Connection for gas-assist
7. EU18 robot interface	8. EU12 robot interface
9. EU67 robot interface	10. Broken heating wire detection
11. Independent hydraulic station	12. Closed-loop clamping force control
13. Connection for magnetic/hydraulic tool fastening system	14. Power-efficient barrel heating alternatives
15. Connection for micro foaming	