

## SEEV-A Advanced All-Electric Series

5 model sizes from 56 to 202 U.S. tons



# SEEV-A Series Advanced All-Electrics

5 model sizes from 56 to 202 U.S. tons

**SEEV-A**  
An SEEV-A Platform machine.



The SEEV-A Series of advanced all-electric machines redefines molding stability, precision, energy efficiency and high overall productivity in the 50 to 200 ton range.

## The Sumitomo (SHI) Demag Difference

- **Over 20 years** of R&D on all-electric injection molding machines, with thousands of AE machines sold annually around the world
- Sumitomo's advanced motor technology and the company's ability to design and build specialized motors for injection molding machines, ensuring the best combination of motors for the machine type, function and size
- An ongoing, successful track record of breakthrough technologies that improve speed, precision and production efficiency
- The three integrated systems of our unique Z-Molding technology that ensure ease of use and reduce defects, losses and faults as close to zero as possible
- Exceptional, field-proven AE machine reliability that ensures years of trouble-free operation
- Our standard-setting warranty program and highly rated training, service, technical support and U.S.-stocked spare parts availability

The SEEV-A Series, with 5 model sizes ranging from 56 to 202 U.S. tons (2200 to 5000 kN), advances our popular flagship model, the SE-EV, with new technologies, the updated NC-10 Control and enhanced Z-Molding capabilities.

Throughout this brochure you'll see the many innovations, features and advanced technologies that are new and/or exclusive to Sumitomo (SHI) Demag.

One of our newest advances is the algorithm-based S-MOVE technology which replaces multi-step mold open/close speed settings with an optimized speed pattern that is both smoother (less vibration) and **15% faster**. This, combined with the SEEV-A's exceptionally fast clamp open/close speeds, can significantly shorten cycle times.

Plus, with the SEEV-A, you can count on a rapid return on investment resulting from:

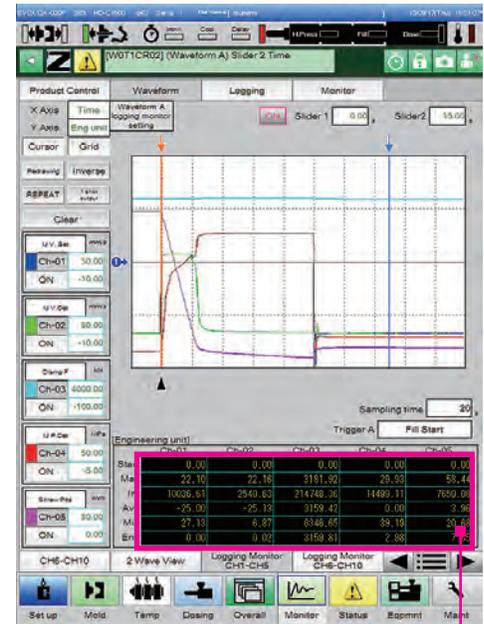
- Significant energy savings due to exceptionally energy-efficient, low-inertia motors and low-friction design improvements
- Reduced water and grease use
- Faster start-up
- Faster cycle times
- Reduced scrap
- Reduced downtime
- Quick color, resin and mold changeovers
- Minimized preventive maintenance
- The ability for unmanned and lights-out operation

## New NC-10 Control

As an SEEV-A Platform machine, the SEEV-A is equipped with the updated, PC-based NC-10 Control that is both easy to use and helps prevent molding mistakes.

In addition to the advantages of the Z-Molding Simple Process Setting System described below and the new QC features shown on the right, the NC-10 includes:

- The 15.1-inch, energy-efficient LED backlit screen has been updated with a high-sensitivity/fast response touchscreen that ensures accurate entry of settings with less pressure
- The screen unit is both swivel mounted and has a wider viewing angle for enhanced visibility
- Exceptionally fast processor speeds
- Key-lock codes to manage access to molding conditions
- Operating system support for 15 languages to meet global production requirements
- Ability to customize content
- Extensive graphing capabilities
- Excellent configurability for cores and other sequences
- Multiple USB ports for storage and peripheral devices



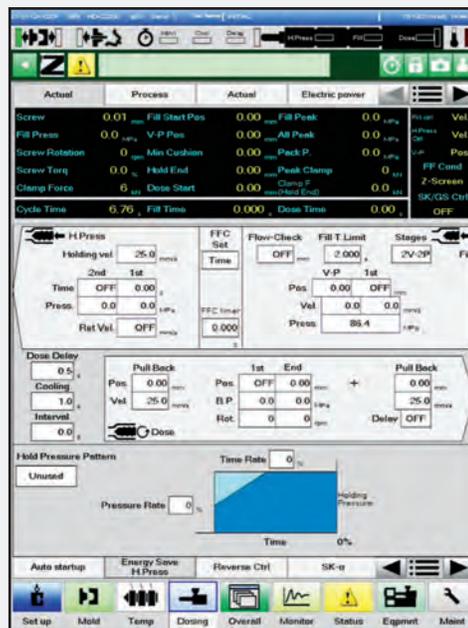
Waveform logging and statistical data calculations are other new features of the NC-10. This data can also be viewed on the logging window and used as added parameters for Quality Control monitoring and part quality assessments.

## Z-Molding

### Simple Process Setting (SPS) System

SPS allows easy setup and operation and helps the operator avoid oversights and mistakes that can cause part quality problems, scrap and mold damage. With SPS, there are about half the settings of earlier systems and the basic settings area for each process is always shown on the screen. Detailed settings can be made on easy-to-locate sub menus that are selected by using tabs, eliminating the need to page up or down.

SPS also ties together Z-Molding's MCM & FFC systems, allowing the clamp and injection to perform as a complete system.

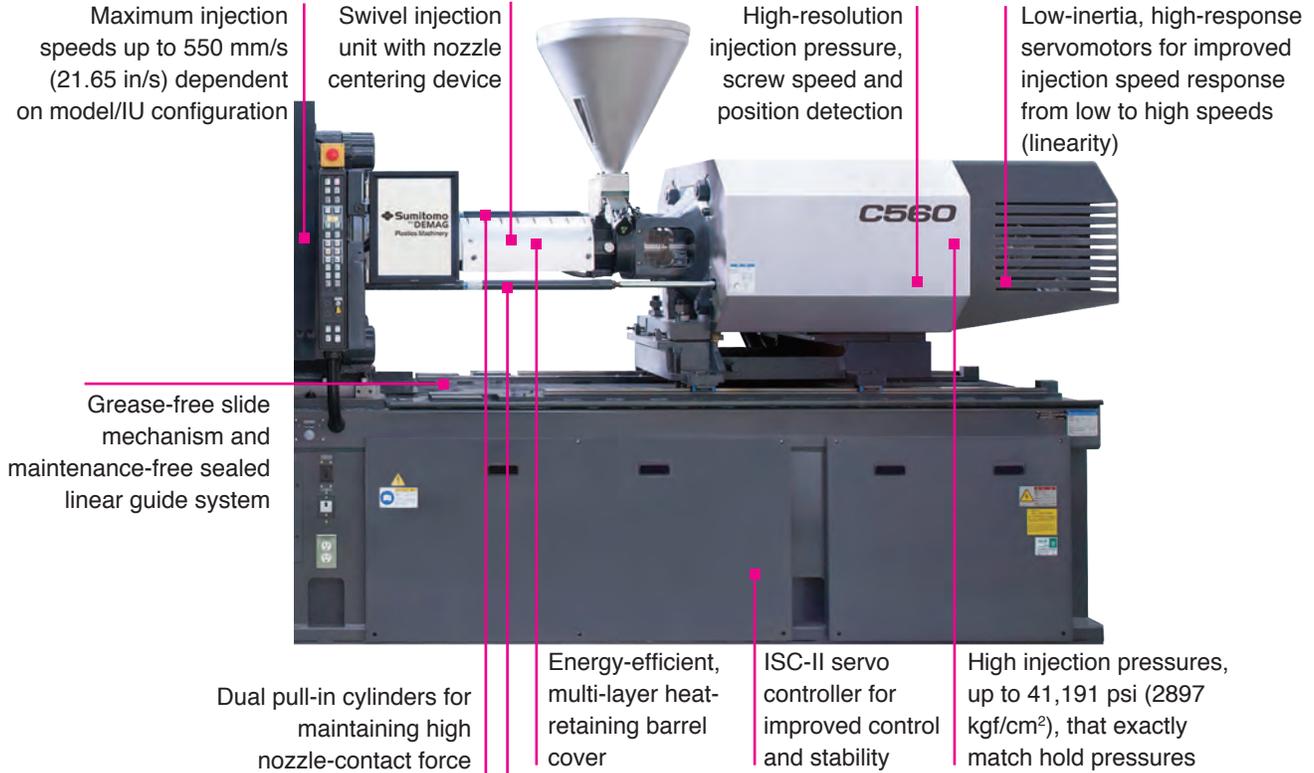


The SPS control design provides for seamless setup of new molding processes with minimal screen changes and entries.



SPS provides a simple, one-page, step-by-step guide for mold installation.

# SEEV-A Injection Unit Features



Sumitomo's extensive experience in designing and manufacturing electric motors ensures that each machine configuration has the absolute best combination of motors to achieve superior performance while keeping the machine reasonably sized and priced.

The high torque of the screw drive motor is a major advantage for high-viscosity resins. And, compared with hydraulic machines, the SEEV-A requires fewer control devices because there are no pumps, proportional or directional valves.

The SEEV-A injection unit uses two Sumitomo-built direct-drive servomotors with full closed-loop control and digital sensors. These third-generation DD motors, working together with the updated ISC II servo controller, feature lower inertia, lower friction and faster response, providing:

Ensuring flexibility for applications from fractional gram micro-molded parts to thin-wall and complex parts combining thick and thin walls, the 5 model sizes of the SEEV-A are offered with a wide selection of injection units and screw diameters.

- Higher injection power and velocity — with injection speeds up to 550 mm/sec, and injection pressures up to 41,191 psi
- Unerring velocity control from 0.1 mm/s to the maximum for improved precision on a wide range of applications
- Faster velocity response, unaffected by belt elasticity, for parts with extremely tight tolerances



The field-proven SD screw, supplied as standard on the SEEV-A, is designed to ensure the stability of the melt, contributing to consistent quality and improved yield. For applications with specialized requirements, a diverse range of optional screw types is available. This includes the

**3rd Generation Direct-Drive System**

The Sumitomo-built, 3rd generation, direct-drive motors for injection and plasticizing ensure energy efficiency, exceptionally fast-response screw control and the highest levels of precision.

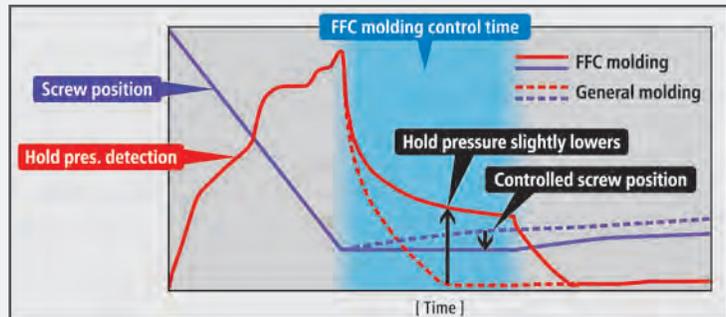
## Z-Molding

### Flow Front Control (FFC) System

FFC, working together with the ISC II (Intelligent Servo Control) and the direct-drive injection motor, achieves complete and balanced filling with **reduced injection pressure**. The system takes advantage of the energy and viscoelastic properties in the flow front of the resin to complete filling in an even fashion as opposed to forcing material into open areas and thus flashing the areas that are already filled.

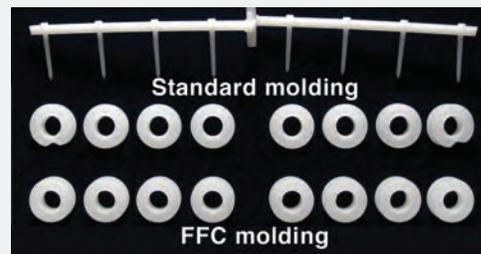
Advantages provided by FFC include:

- Precision control of screw position to ensure consistent filling
- In addition to preventing flash, maintaining low internal pressures in the cavities allows venting of gases to prevent short shots
- Improved cavity balance and consistent part weight across high cavity molds or difficult-to-fill unbalanced/family molds

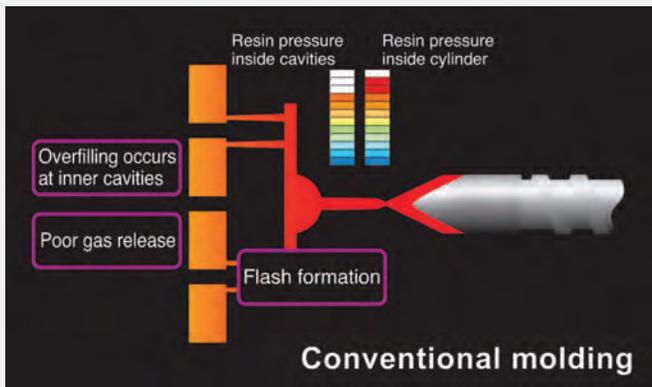


Fast response control of speed and pressure before and after VP switchover allows complete filling with low pressure.

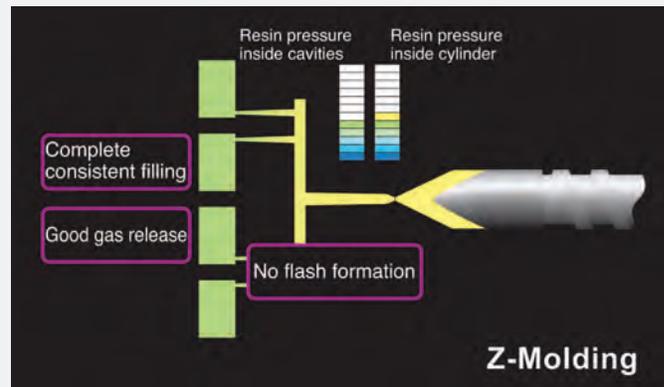
#### Filling Comparison



Compared with standard molding, FFC achieves complete filling with no flash at the same injection pressure.



In conventional molding, by forcing resin into the mold cavities, overfilling and compression occur at the inner cavities and gases are trapped.



FFC precisely controls screw position at VP switchover to balance fill speed and pressure across all cavities. Problems associated with overfilling and trapped gases do not occur.

revolutionary SL Screw Assembly which is available as a standard option. See back cover of this brochure for details.

Other injection unit features include:

- Synchro-plast control mode, for resins with low viscosity or uneven pellet size, that optimizes screw position and back pressure
- Density correction mode for consistent cycle-to-cycle part weights
- Designed for quick change of screw or complete assembly
- Automatic purging mode for fast color/material change that allows multiple purge settings to be preset for different materials and purging compounds all in the same cycle

The SEEV-A's twin-cylinder high-contact-force (nozzle touch) system, driven by a sealed Hydrostatic Transmission (HST) system, provides: high force comparable to a hybrid or hydraulic clamp machine for high-precision control under high injection pressures; selectable force settings for compatibility with various mold types (hot runner, cold runner, floating sprue bushings, etc.); and rapid pressurization/depressurization for faster cycle times.



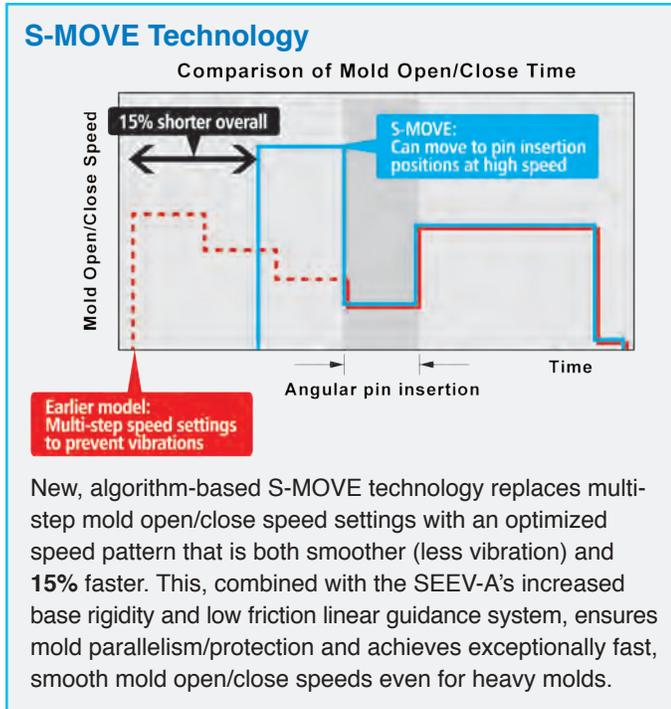
# SEEV-A Clamping Unit Features



For clamping, the SEEV-A combines advanced servomotor technology for clamping and ejection, fast clamp speeds and the new S-MOVE technology (see below), a rugged and field-proven, double-toggle clamp design and our unique Minimum Clamping Molding (MCM) System (next page) which helps avoid flash, burn spots and shorts shots, and can reduce mold wear, cycle time and power consumption.

Multi-toggle clamp force control, a standard feature that can be used to reduce cycle times, offers two modes:

- A high-cycle mode in which filling begins during clamping for improved cycle time
- A gas-release mode in which filling begins during low-pressure clamping for improved part quality

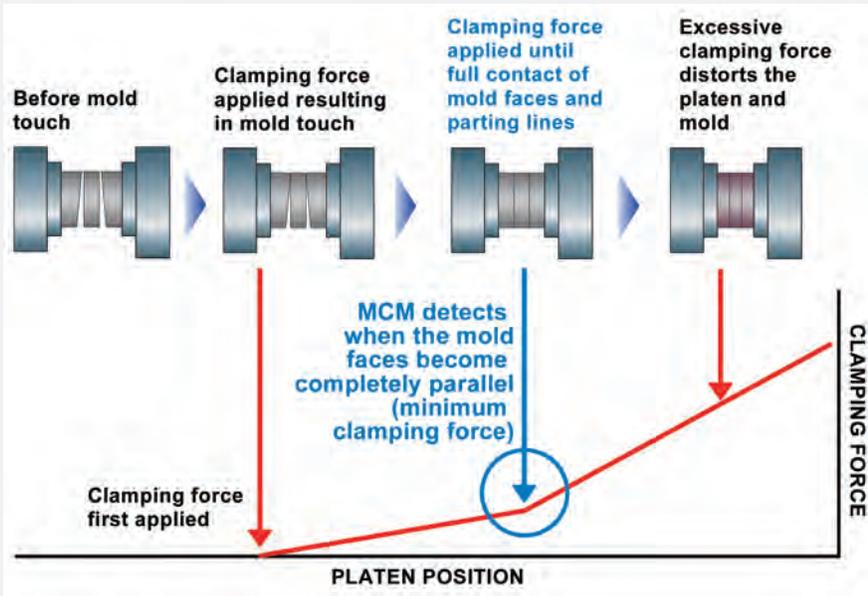


Precision mold height and tonnage adjustment is provided by a highly precise servo-driven gear system. Other features supporting fast mold changeovers include: increased distance between tie bars, digital-remote clamp force adjustment, increased space for tie-in of ejector rods and a selectable nozzle position for purging.



All SEEV-A model sizes were designed with ample tie bar space, in a square configuration, to accommodate larger side-entry molds.

## Z-Molding Minimum Clamping Molding (MCM) System

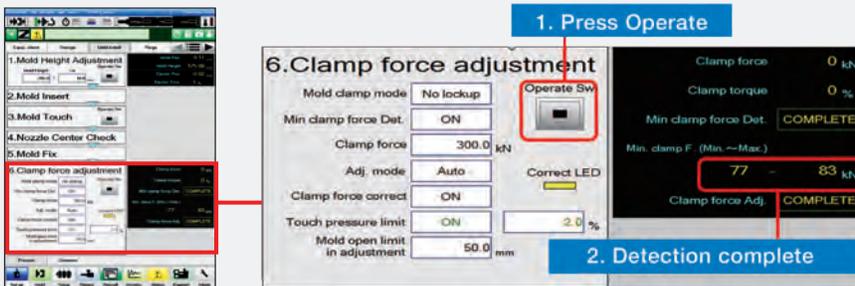


Z-Molding's Minimum Clamping Molding (MCM) system helps molders improve part quality while **reducing clamp force requirements**. When the MCM system is switched on, the machine automatically detects the minimum point at which the mold halves are completely parallel and surface pressure is evenly distributed across the mold faces.

MCM System benefits include:

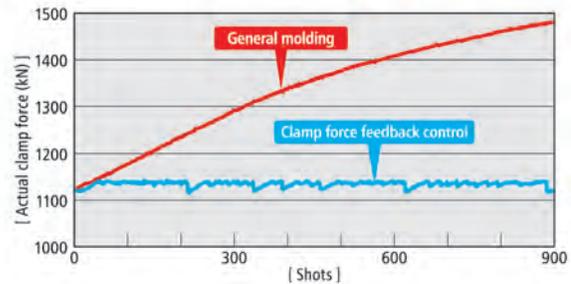
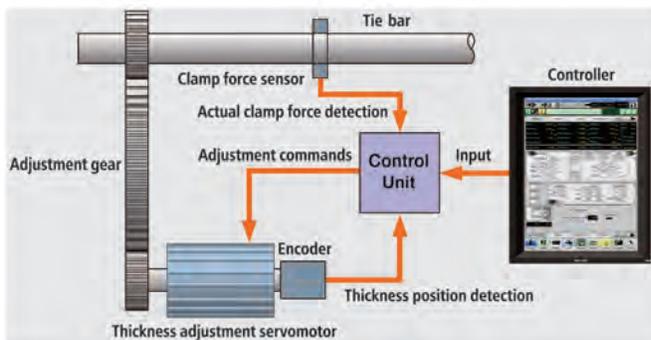
- Avoidance of burn spots and short shots
- Less trapped gases reduce mold wear/maintenance and downtime
- Lower clamp force can reduce machine wear and power consumption and improve cycle times

MCM works together with the SEEV-A's Clamp Force Feedback Control System (below). This system continually monitors clamp tonnage using a sensor on the tie bar to measure actual clamp tonnage. Unlike systems that rely solely on measurement of the mold space, this system works together with a control device, encoder and a high-performance servomotor, automatically compensating for thermal expansion of the mold and keeping clamping force constantly stable.

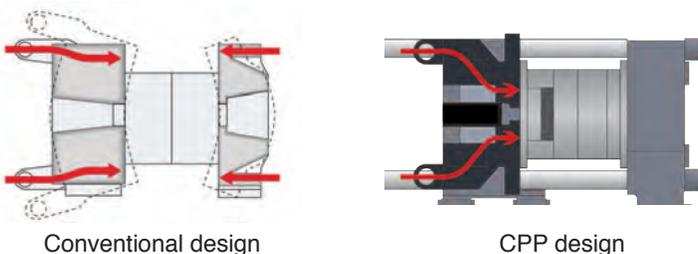


Auto MCM is selected on the one-page Mold Setup screen. Using the detected MCM values and knowledge of the molding process, the desired clamp tonnage is entered.

### Clamp Force Feedback Control System



### Center Press Platen (CPP) Design



The Center Press Platen (CPP) design, a standard feature of the SEEV-A, draws force from the moving platen to the center of the mold ensuring superior surface pressure distribution. Other benefits include: reduction of platen deflection, prevention of flash and short shots, improved protection of core pins and extended service life of molds.

## Energy Efficiency and Grease Use Improvements

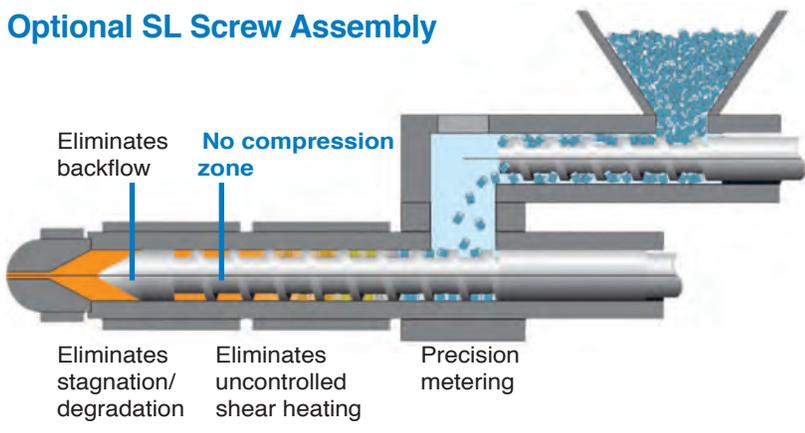
In addition to Sumitomo's advanced servomotor technology with reduced motor friction and rotational resistance, the SEEV-A has a wide range of other features that ensure energy-efficient operation and reduced grease use:

- Multi-layer heat retaining barrel cover
- New, selectable energy-saving control mode that gradually reduces holding pressure
- Reduced motor friction and rotational resistance
- Reduced sliding friction for mold open/close via use of linear guides and bush-less tie bars for the clamp
- Toggle link design (lock-up design) that eliminates power consumption during clamp hold
- Flexible purge sequences reduce color/material changeover time, saving power & material
- No grease on tie bars
- Optimized grease supply system
- Self-contained lubrication on linear rails
- Monitored distribution block that ensures proper amount of lubrication to each point



The SEEV-A's optimized grease supply system reduces the number of grease cartridges required, saving maintenance time and grease cost/use/disposal.

## Optional SL Screw Assembly



Working together with Z-Molding's capabilities for consistent and complete low-pressure filling and effective venting of gases, the industry's highest level of shot-to-shot repeatability and defect-free parts is achieved.

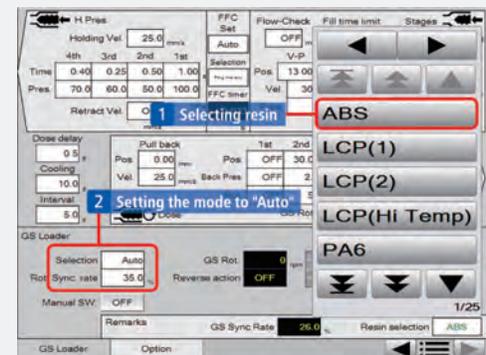
The SL Screw is well suited for a diverse range of applications, in shot sizes from a fractional gram up to 244 grams, including medical, optical, connector and other high-precision/tight-tolerance parts requiring zero-defect molding.

The optional SL (Spiral Logic) Screw Assembly (a standard option for the SEEV-A Series) works together with Z-Molding to deliver defect-free high-precision parts with unmatched shot-to-shot repeatability.

**The Principle:** The SL Screw Assembly's GS loading system precisely meters the resin into the barrel by synchronizing with the speed of the screw. The 14:1 L/D screw, which is designed with no compression zone, achieves a first-in/first-out, even movement of the resin through the barrel. Finally, a positive-locking non-return valve blocks backflow and eliminates inconsistencies associated with a conventional check ring.

**The Result:** A homogeneous melt and stable process are maintained, and uncontrolled shear heating, material stagnation/degradation, random short shots and black spots are virtually eliminated. Additionally, barrel wear, carbonization and maintenance requirements are reduced.

## New Auto Setting for the SL Screw



The NC-10 Control now includes an Auto setting for the SL Screw. The operator simply selects the resin, enters the synchronization ratio of the GS loader and selects Auto.

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