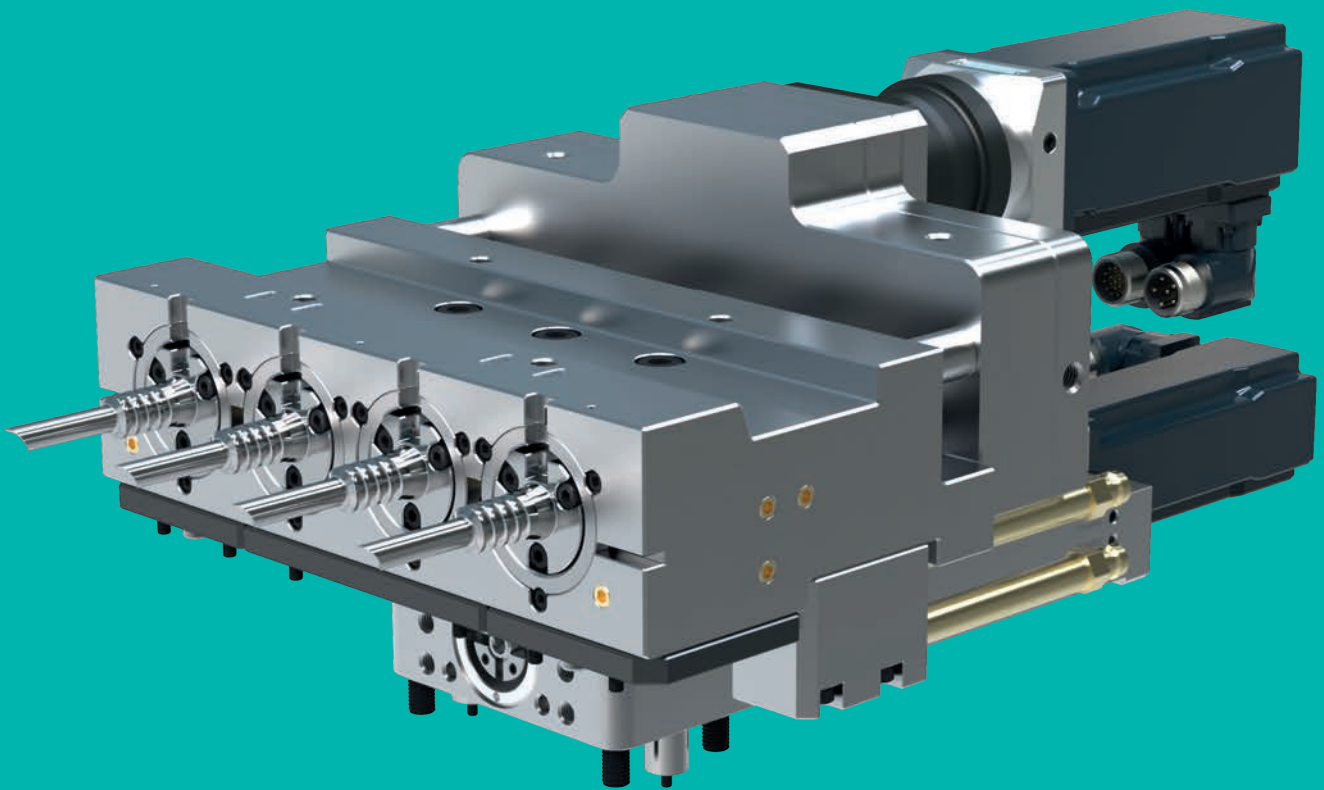


servomold®



Servo-electric linear unscrewing unit

SLU

For controlled demoulding sequences with sleeve-shaped parts
and demanding thread contours



Motion
for
creation

Servomold

Experienced partners and innovators supplying the medical & pharma manufacturing industry.

- **Over 25 years of experience**
Demonstrating a proven track record in the industry.
- **Privately owned**
Flexibility in decision-making, fast responses to market changes, strong focus on long-term customer relationships.
- **Collaborative partnerships**
Building long-term relationships with clients and partners for mutual growth and success.
- **Full commitment**
To efficient, application-oriented solutions.



Bianca and Thomas Meister, Management

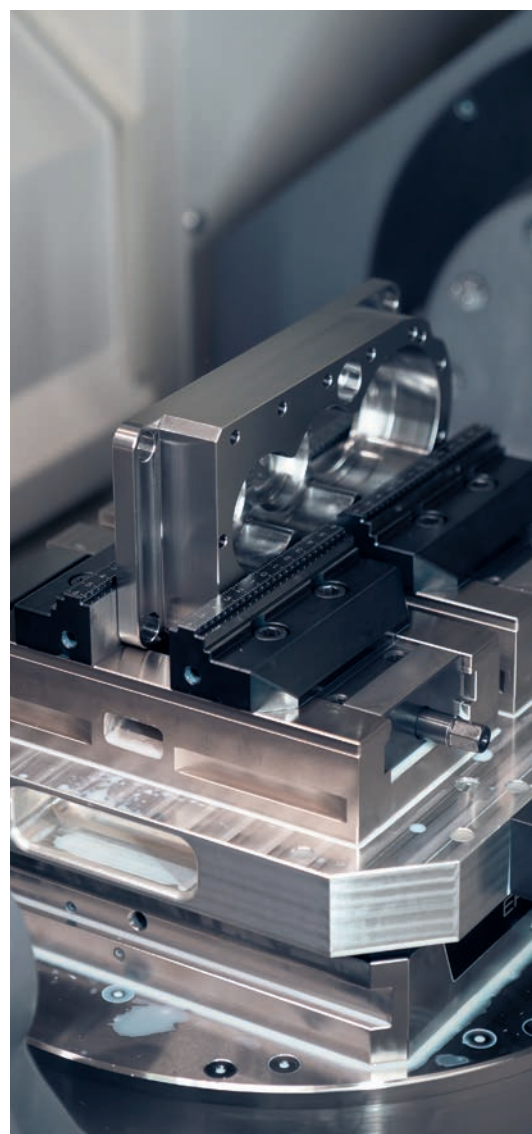
Precision begins with process understanding

Servo-electric solutions for demanding movements in the injection mould.

Servomold has been developing solutions for mould making for over 25 years. Since 2011, there has been a particular focus on servo-electric drive and control systems for injection moulds. In 2012, Servomold pioneered the first turnkey, standardised servo system solutions for this field of application.

The starting point is always the process: part geometry, mould mechanics, forces, movements and cycle time must be considered as a complete system. At Servomold, design, manufacturing, drive technology and control are therefore consistently matched to one another.

The result: solutions that allow even complex motion sequences to be mastered precisely, reproducibly and safely.



The SLU consistently takes this approach further.

Precision

Defined and reproducible movements

System expertise

Mechanics, drive and control matched to one another.

Process control

Targeted control and monitoring of position, speed and forces.

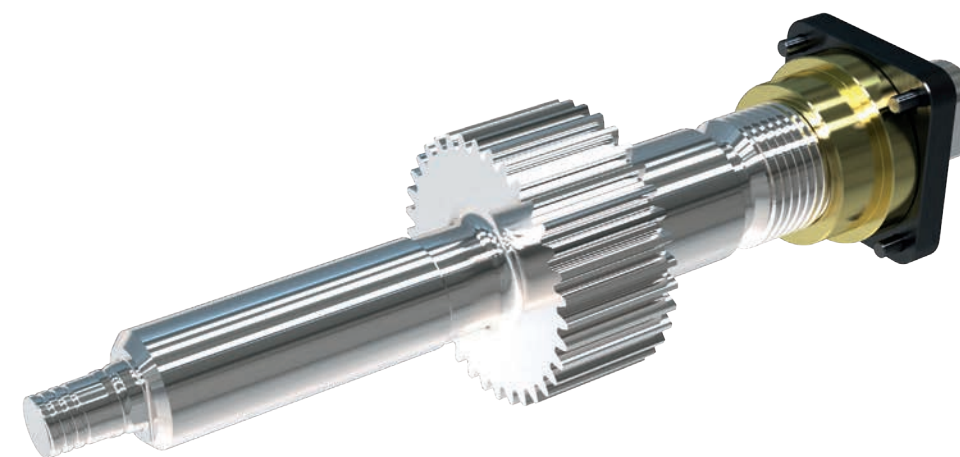
Application focus

Designed around the part, the mould and the production process.

Proven. And fixed.

Conventional lead nut systems mechanically couple rotary and linear movement. Thread pitch and motion sequence are therefore fixed by design.

Lead nut systems have been a proven principle for demoulding thread contours for many years. Today, however, increasing requirements for precision, process reliability, flexibility and mould availability are placing new demands on drive technology.



Mechanically fixed thread pitch

Moulded thread, lead thread and lead nut must be matched to one another. Changing the pitch requires corresponding mechanical modifications. Self-locking and force requirements also rise as the pitch increases.

Backlash, friction and wear

Lead thread and lead nut require design clearance and lubrication. Friction and wear affect precision, maintenance effort and long-term reproducibility.

Axial position under injection pressure

Under high injection pressure, backlash and elastic deformation add up along the entire force chain. As a result, the axial core position can shift by several hundredths of a millimetre, promoting flash formation.

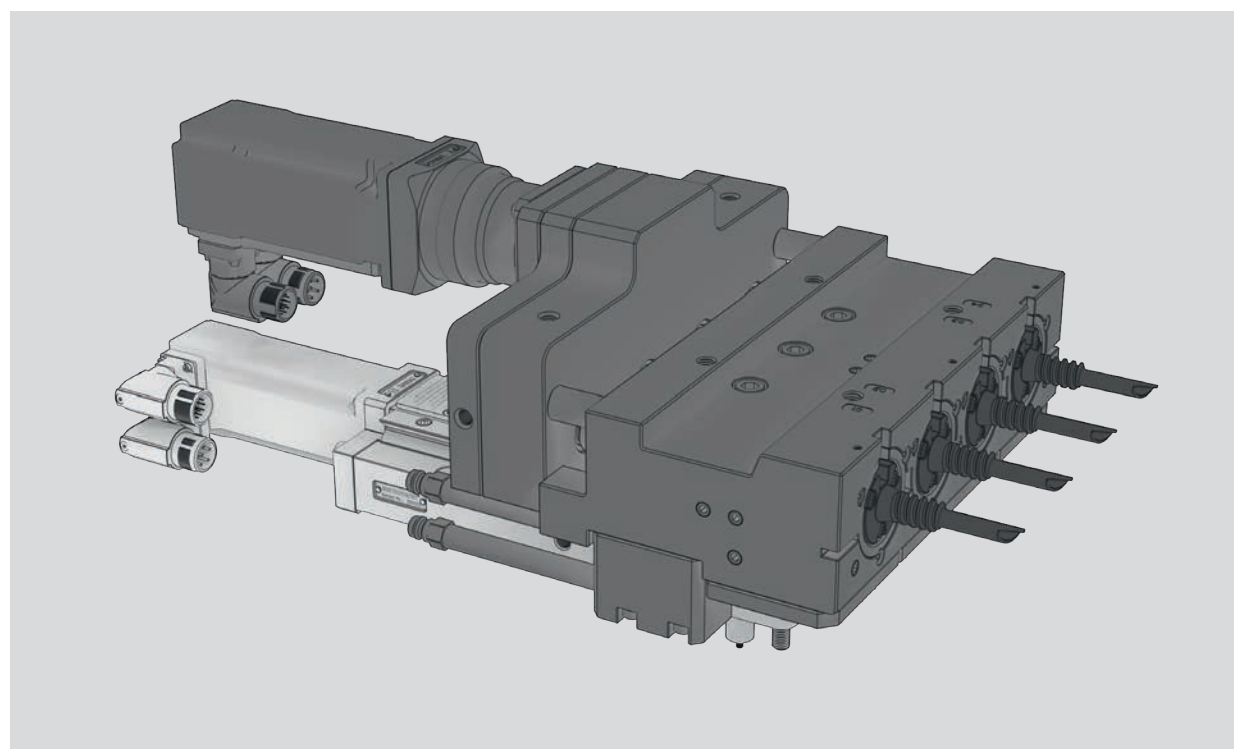
Rigidly coupled movements

Rotary and linear movement are directly linked by the lead thread and cannot be used independently of one another.

Two axes. One process.

Rotary and linear movement are generated independently and combined to suit the part geometry.

The SLU generates rotary and linear movement with two independent servo-electric axes. During thread demoulding, both movements are synchronised according to the thread pitch. Once the thread contour has been released, the linear stroke can continue independently.



Thread pitch defined electronically

The ratio of rotation angle to linear travel determines the thread pitch. It is specified in the control unit and is no longer mechanically fixed by a lead thread and lead nut.

Movements can be used independently

Rotation and linear stroke can be positioned independently of one another and combined as required within the demoulding sequence.

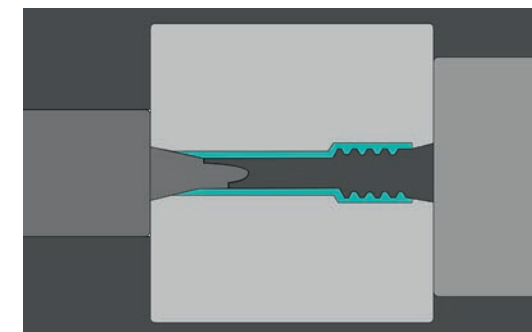
Product benefits at a glance

- › High precision and process reliability
- › Excellent cleanroom suitability
- › Flexible demoulding sequences and part variants
- › Short, stable cycle times
- › Low wear and maintenance effort
- › High mould availability

The demoulding sequence

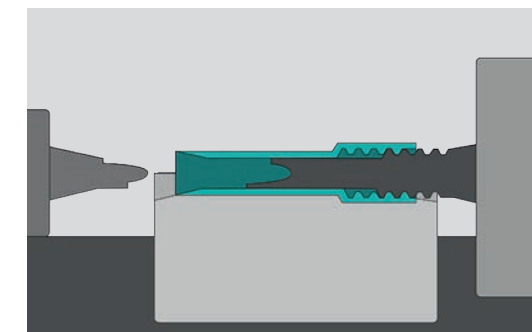
Several phases, one continuous motion sequence. The control unit executes them without any switchover at the mould.

1. Injection position



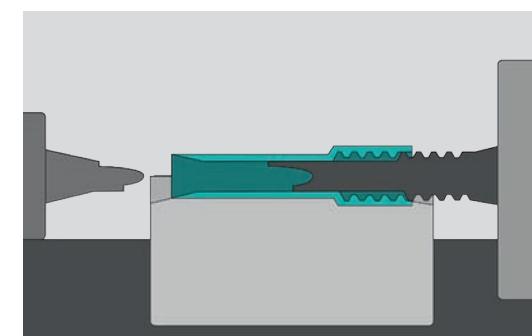
› The threaded core is in the injection position.

2. Mould open, synchronised unscrewing



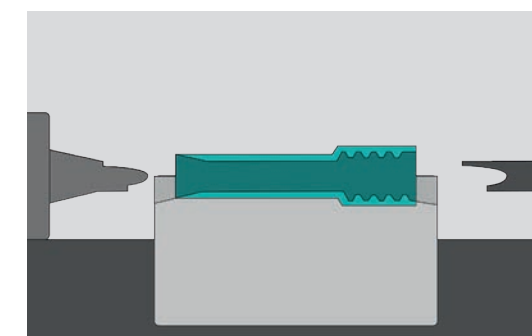
› Rotation and linear stroke in the ratio of the thread pitch.

3. Thread released



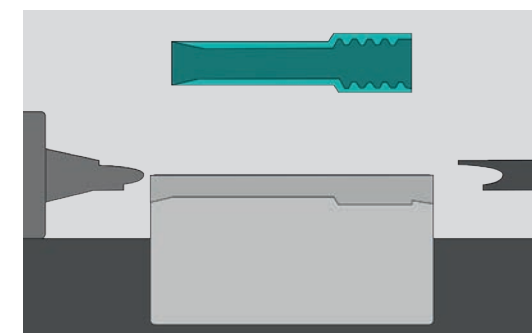
› The thread contour is fully demoulded.

4. Continued linear demoulding



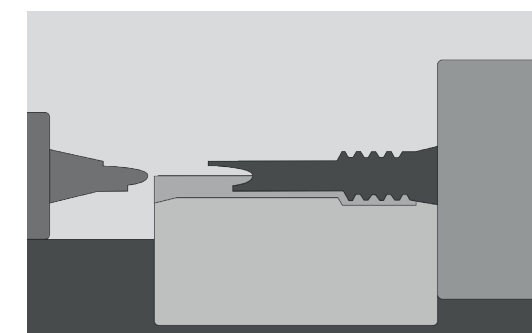
› Rotation stops; the linear stroke frees the part.

5. Eject plastic part



› The part is ejected or removed automatically.

6. Linear return

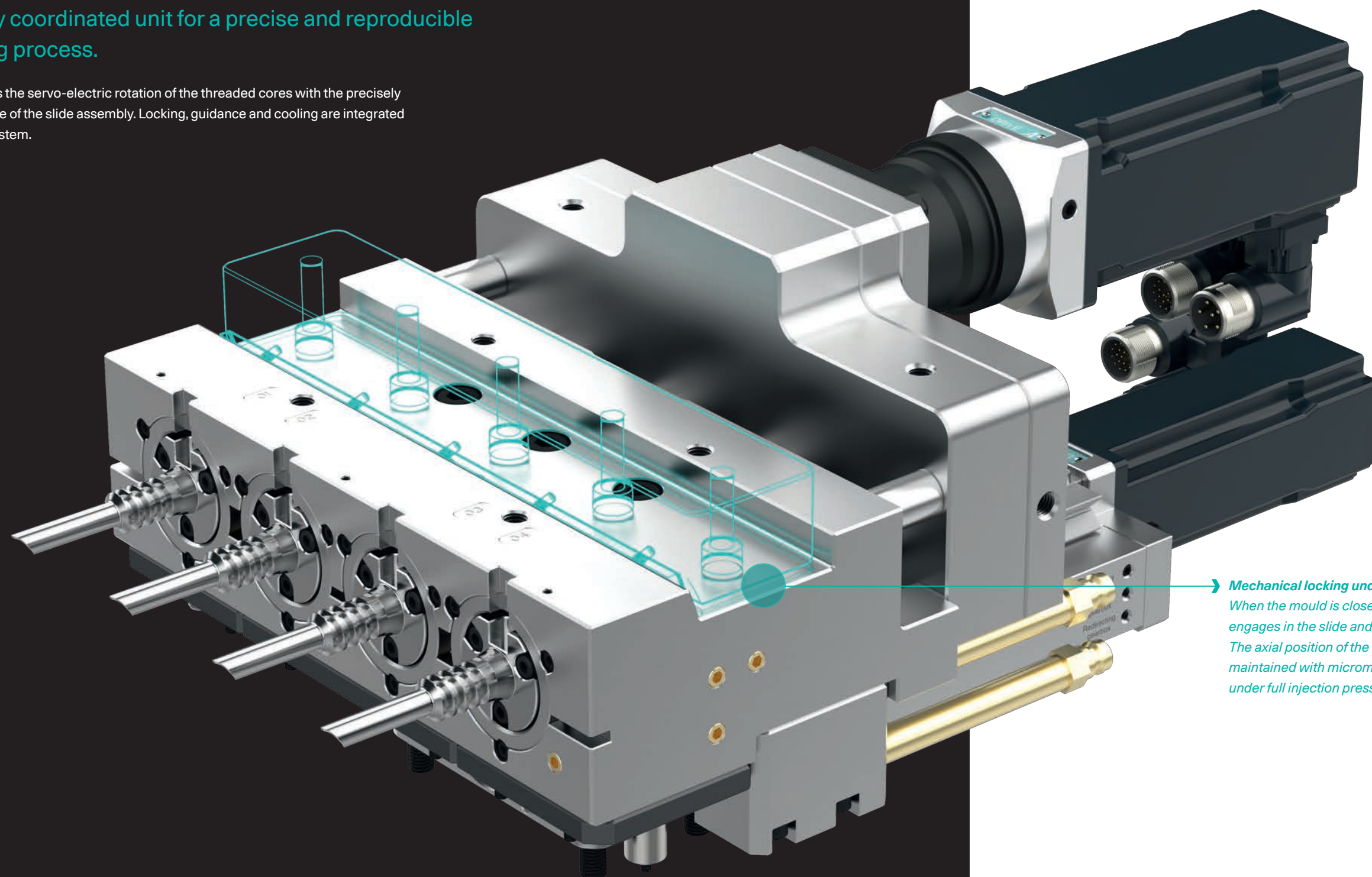


› Linear movement is carried out without rotation.

Precision through synchronisation

Unscrewing system and linear system together form a functionally coordinated unit for a precise and reproducible demoulding process.

The SLU combines the servo-electric rotation of the threaded cores with the precisely guided linear stroke of the slide assembly. Locking, guidance and cooling are integrated directly into the system.

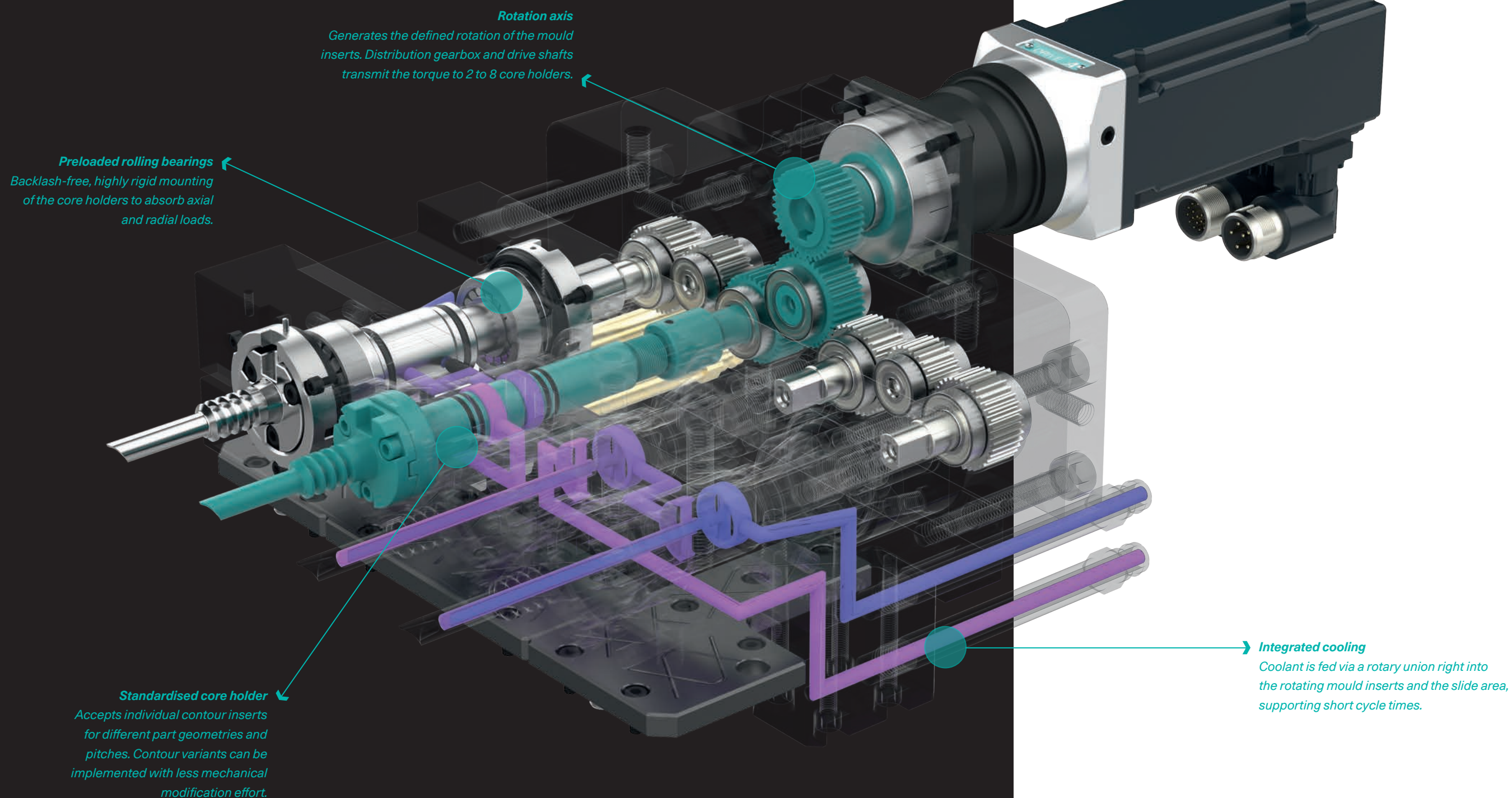


➤ **Mechanical locking under injection pressure**
When the mould is closed, a locking wedge engages in the slide and locks it mechanically. The axial position of the threaded core is maintained with micrometre accuracy, even under full injection pressure.

The unscrewing system

Precise rotation for multiple threaded cores.

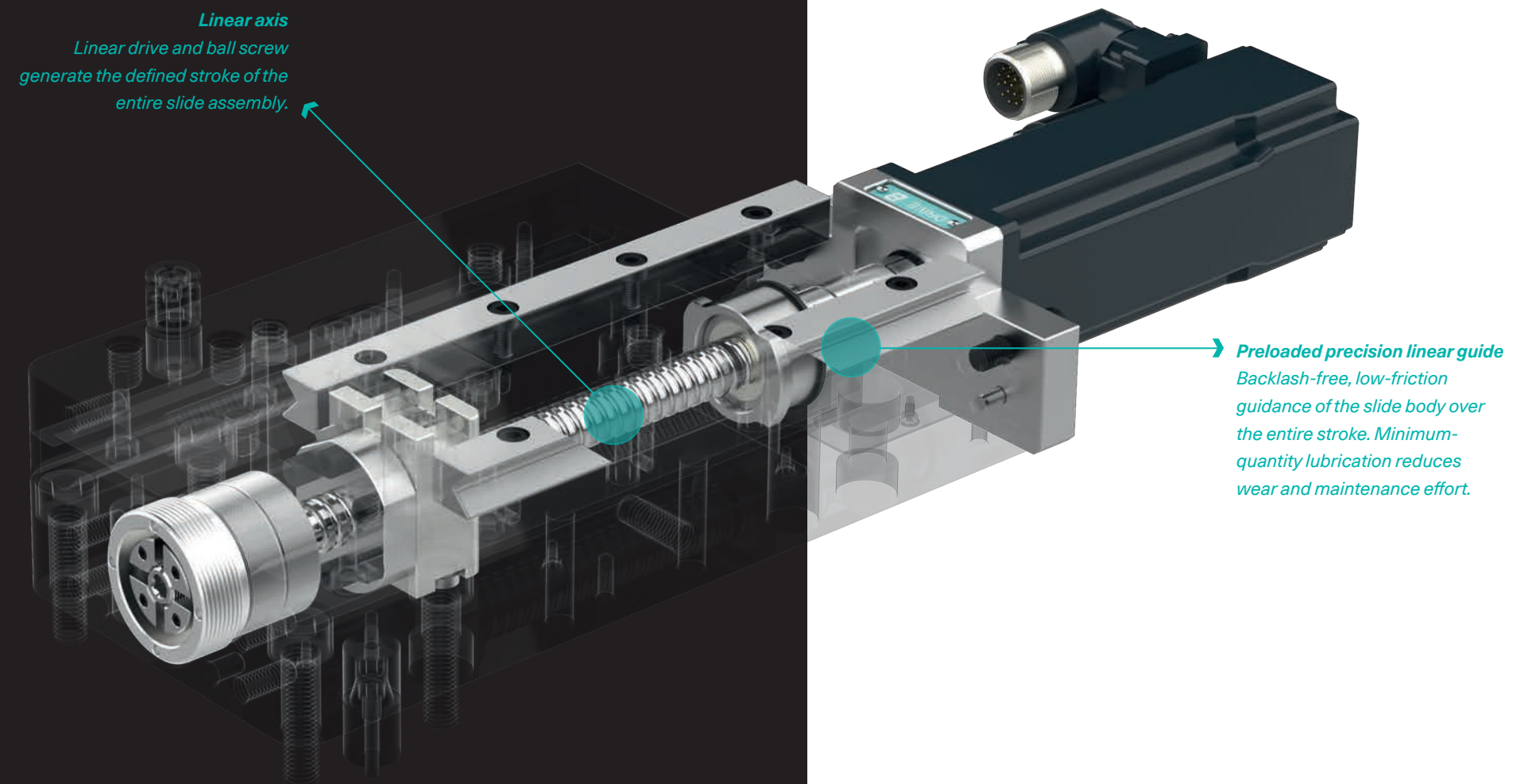
The upper functional unit handles rotary demoulding and distributes the torque of the servo drive to between two and eight threaded cores. All components are designed for a precise, backlash-free and compact unscrewing movement.



The linear system

Precisely guided over the entire demoulding stroke.

The lower functional unit generates and guides the linear movement of the entire slide assembly. The preloaded linear guide ensures high precision over the entire demoulding stroke.



For complex part geometries

The SLU is particularly suitable for parts in which thread contours and additional, non-rotating contours are released within a single demoulding sequence.



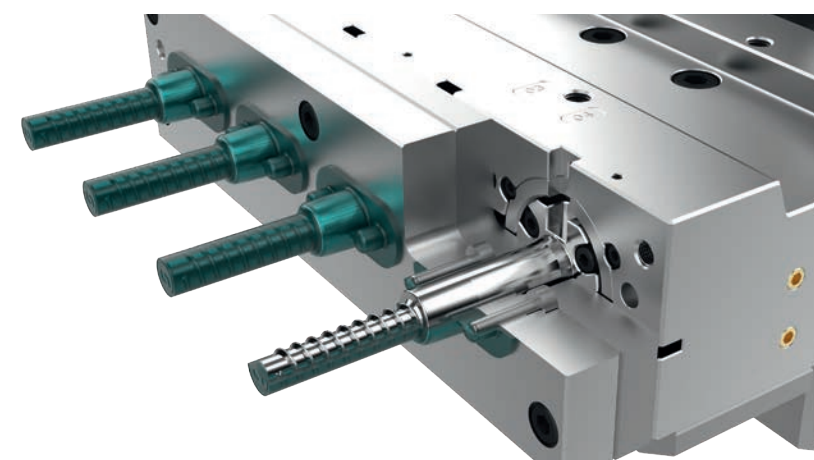
Long sleeve-shaped parts

For long sleeves with a thread in only one section, rotary and linear movement are synchronised at first. Once the thread contour has been released, the linear stroke can continue beyond the thread length.

Typical applications

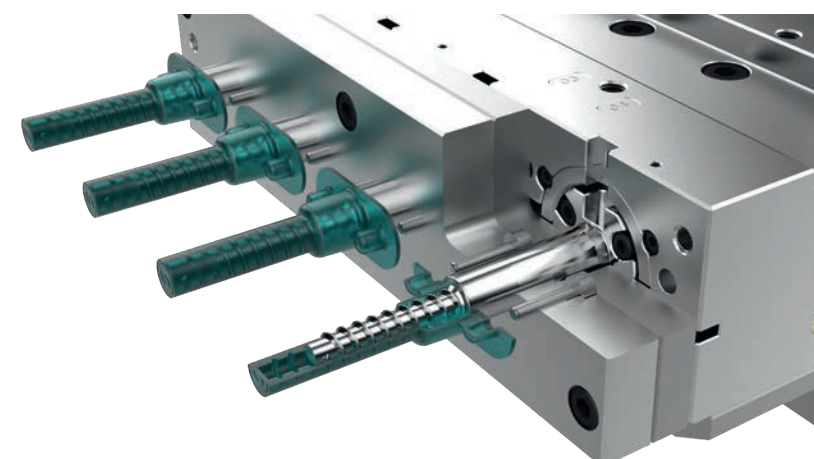
Autoinjectors, pens, inhalers, dosing systems and comparable sleeve-shaped plastic components – particularly suited to cleanroom applications in medical technology and pharmaceutical manufacturing.

One movement. Several functions.



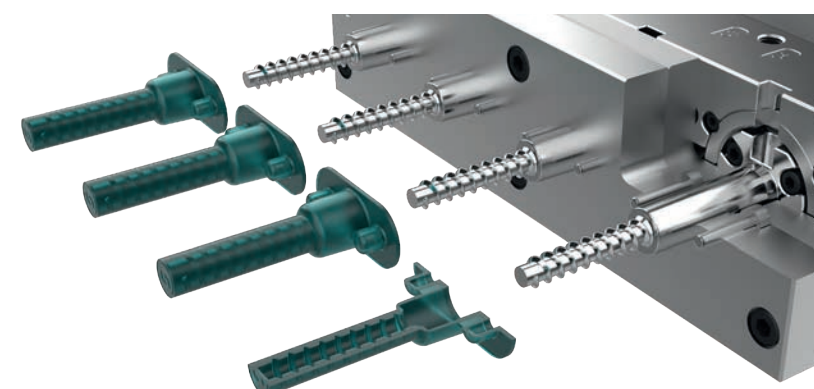
Starting position

Threaded cores and additional mould contours are inside the part. As demoulding begins, the joint linear stroke starts and the threaded cores simultaneously begin to rotate.



Parallel demoulding

The non-rotating contours are demoulded linearly with the slide body. At the same time, the threaded cores are unscrewed synchronously.

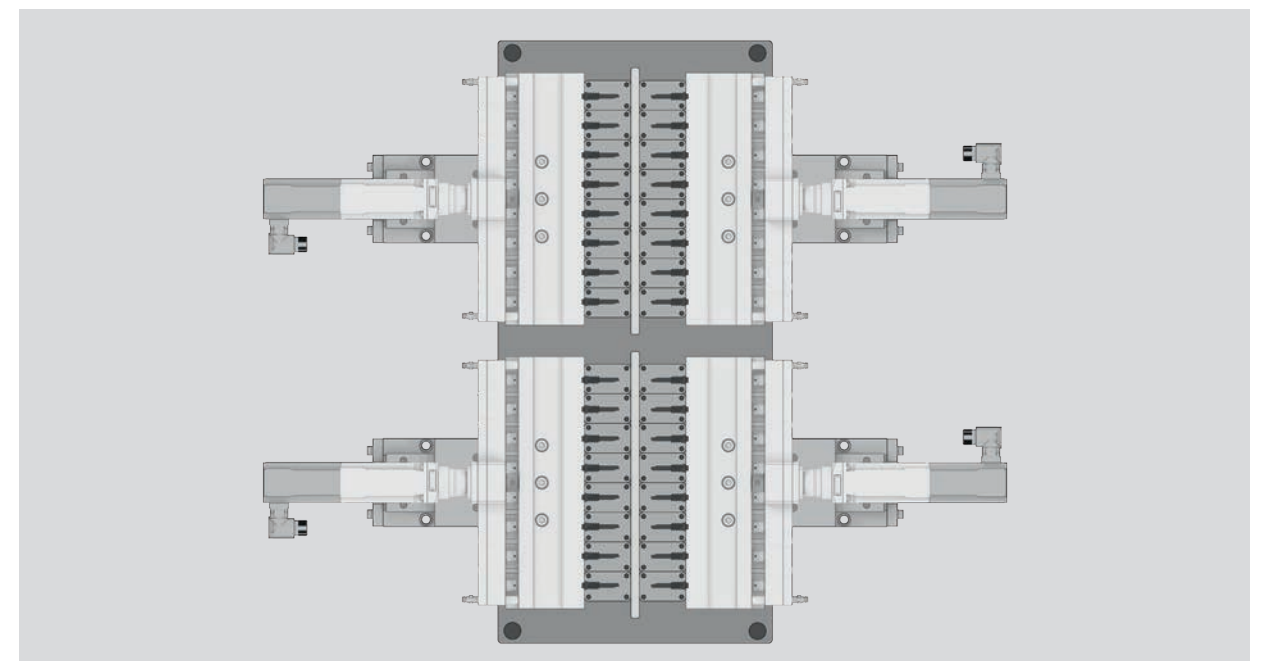
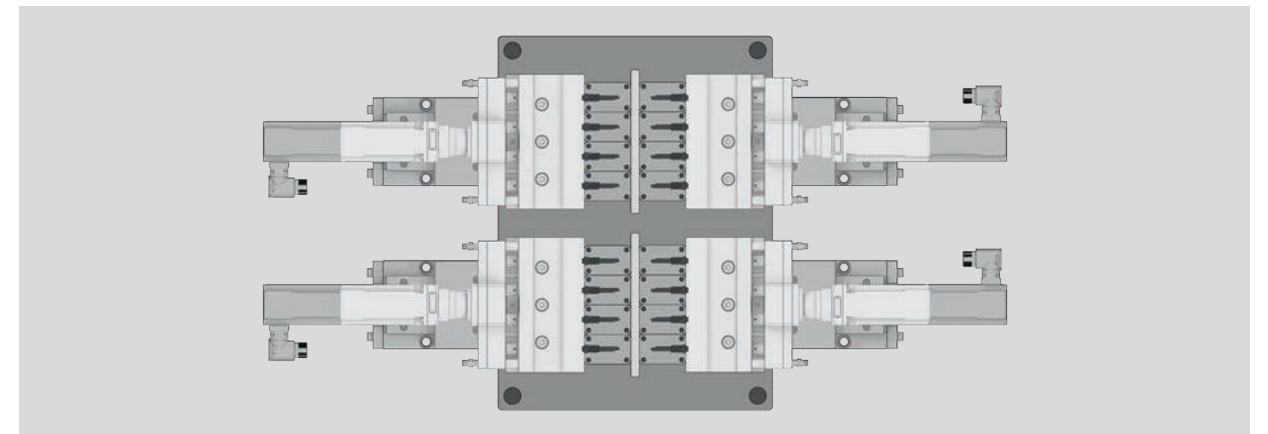
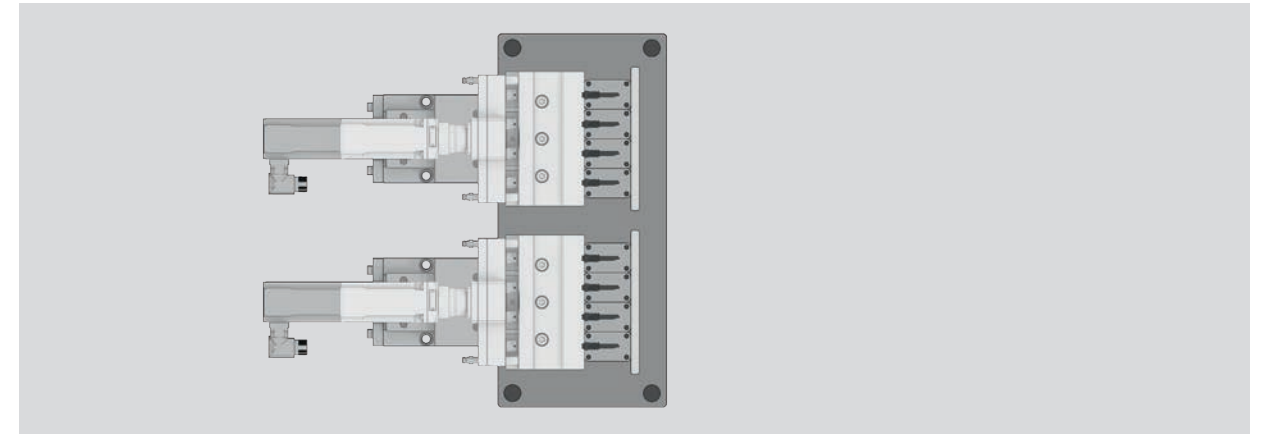
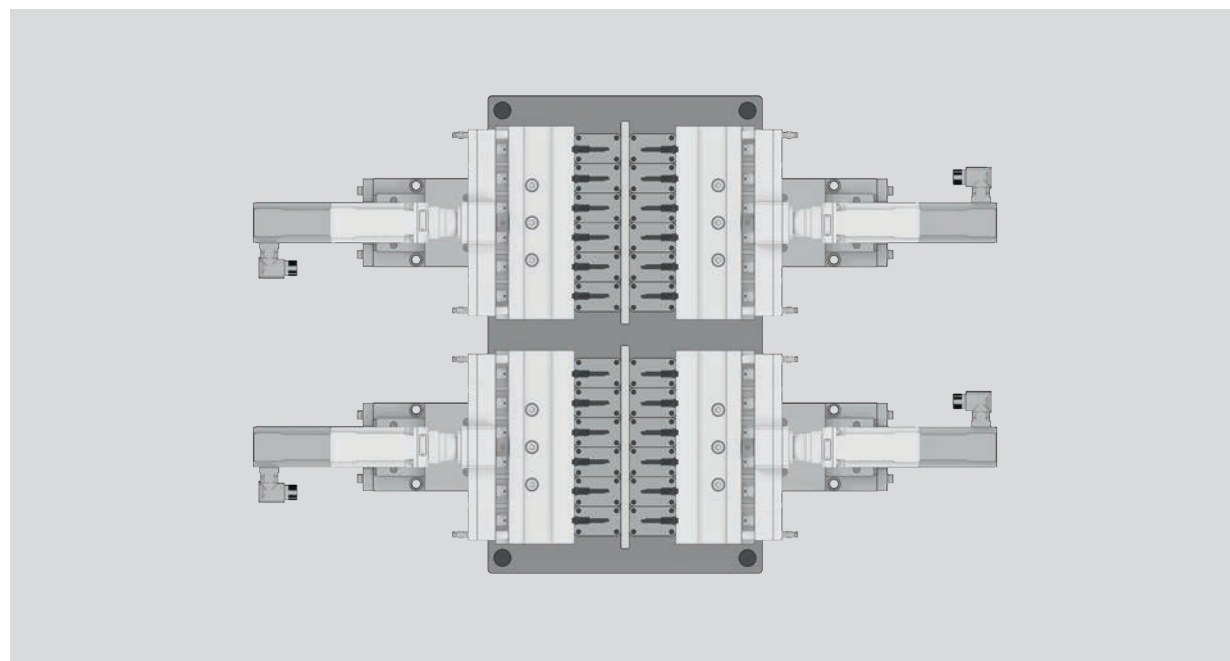
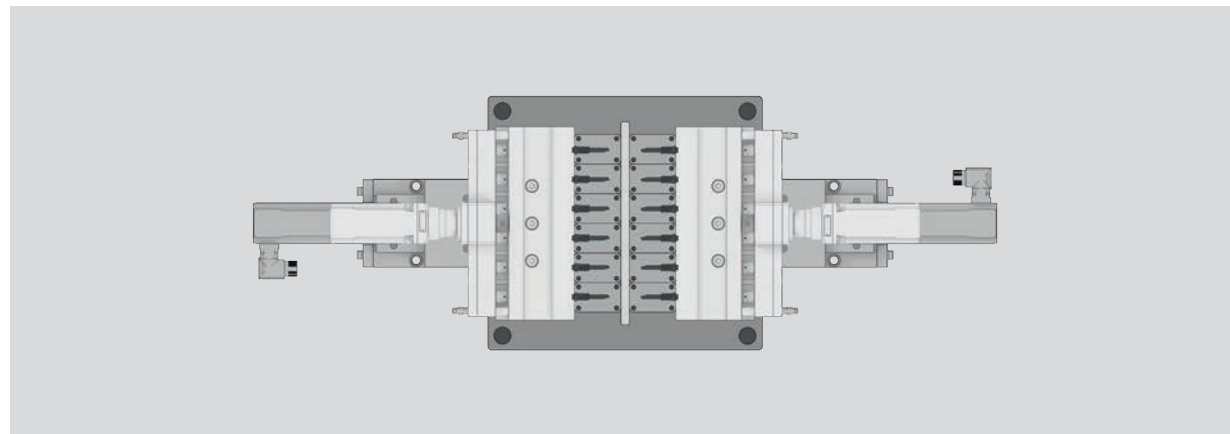
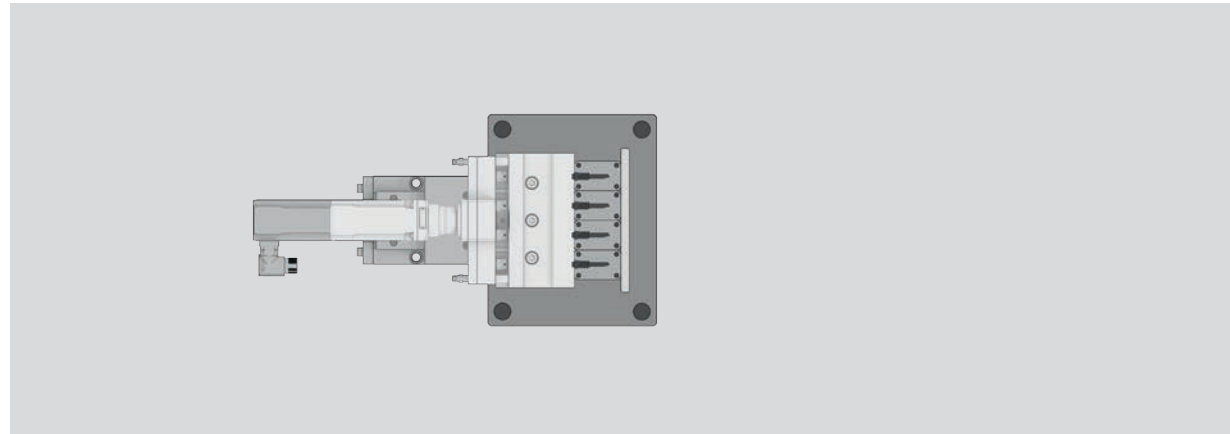


Complete demoulding

Once the thread contour has been released, rotation can stop. The linear stroke continues until all contours are fully demoulded.

Installation examples

Depending on the mould layout and number of cavities, one or more SLU units can be arranged flexibly in the mould.

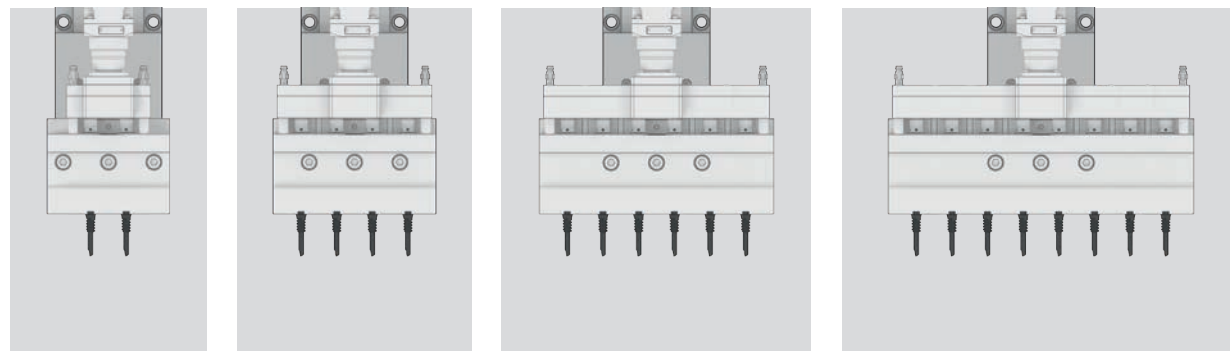


Two sizes. Versatile configurations.

The sizes differ in the size of the core holder and the minimum possible spacing of the threaded cores.

SLU 40

Minimum core spacing 40 mm, freely selectable above that. Configurations with 2, 4, 6 or 8 threaded cores.



SLU 40-2

2 threaded cores

SLU 40-4

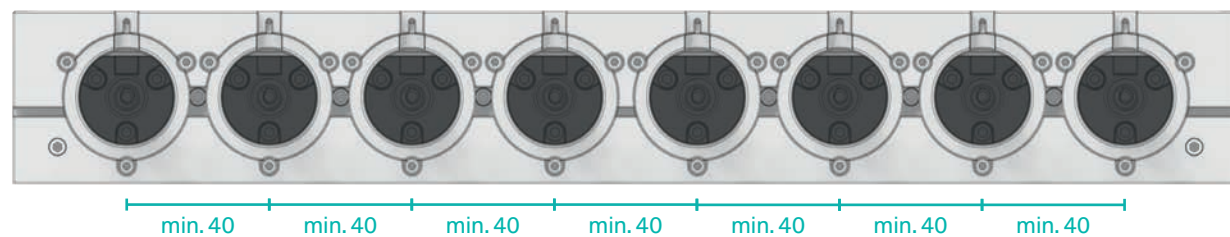
4 threaded cores

SLU 40-6

6 threaded cores

SLU 40-8

8 threaded cores



Force, torque and stroke are designed for the specific application and documented for each project.

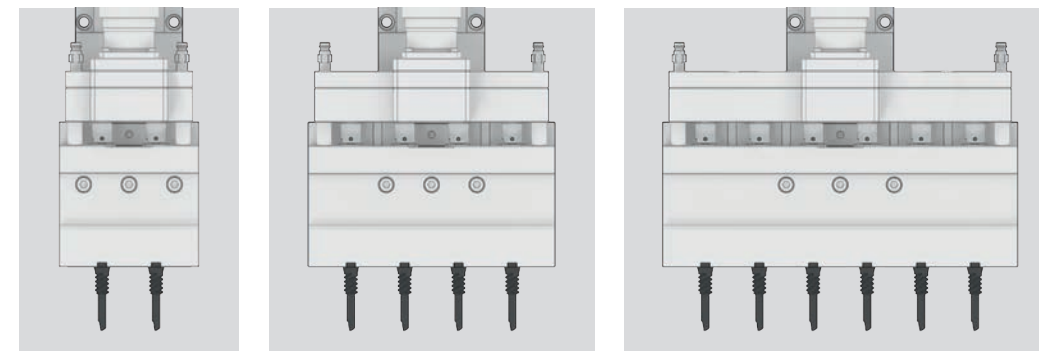
Can be combined for higher cavity counts

One SLU 40 drives up to eight threaded cores, one SLU 60 up to six. By using several units, mould concepts with higher numbers of cavities can also be realised.

Depending on the mould layout, configurations with two to eight threaded cores per unit are available.

SLU 60

Minimum core spacing 60 mm, freely selectable above that. Configurations with 2, 4 or 6 threaded cores.



SLU 60-2

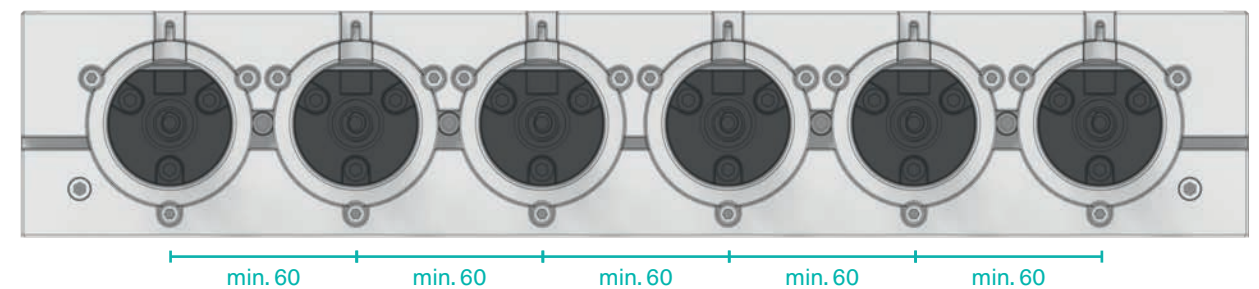
2 threaded cores

SLU 60-4

4 threaded cores

SLU 60-6

6 threaded cores



Application-specific design

The choice of configuration depends on the part geometry, the number and spacing of the threaded cores and the required demoulding sequence.

Demoulding processes precisely controlled

The Servo MoldControl controls and monitors both axes of the SLU. Motion profiles and process limits are defined on the control unit and saved for the respective application.

Position encoders and axis logic

The rotation axis operates with an absolute encoder and acts as the master. The linear axis follows as the slave with a resolver. The absolute position information is retained even after a power interruption and supports a safe restart.

Process monitoring

Position, speed, torque and force are monitored during the cycle.

Synchronisation and motion profiles

Rotary and linear axes are synchronised according to the thread pitch and controlled within a defined motion sequence.

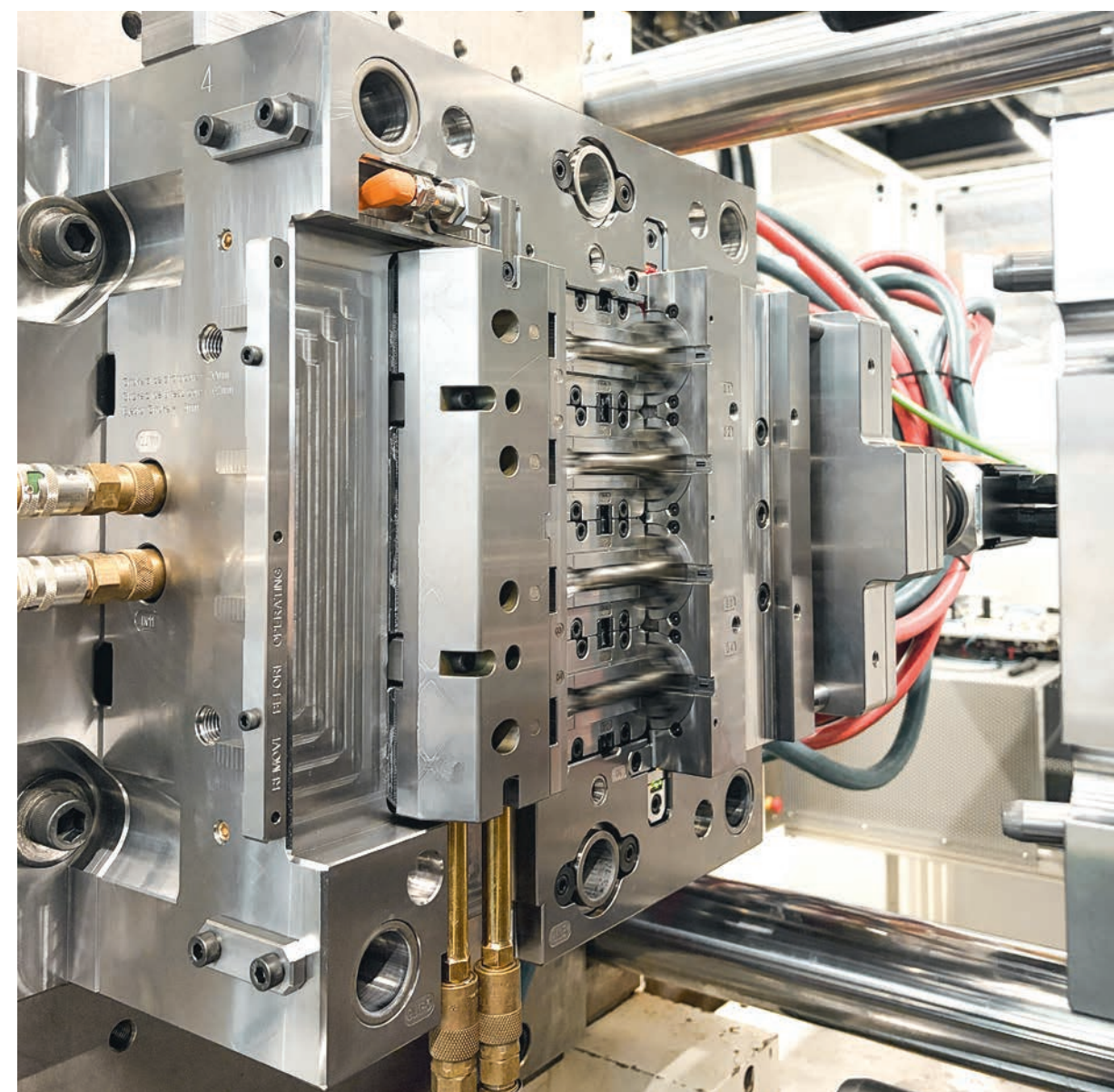
Control configurations

- 1 SLU – SMC-4.2
- 2 SLU – SMC-4.4
- Multiple applications – SMC-8.8



SLU in the injection mould

Pilot application in cooperation with IGS GeboJagama



Pilot mould

1 × SLU 60

Series concept

4 × SLU · 4 threaded cores each · 16 cavities

The pilot mould from IGS GeboJagama demonstrates the integration of the SLU into an injection mould and serves to prepare the subsequent series concept. One SLU 60 handles both the synchronised thread demoulding and the precise linear guidance of the slide movement. Four SLU units with four threaded cores each are planned for the series mould – for a total of 16 cavities.

WILD & KÜPFER

» At our state-of-the-art facility in Schmerikon, we continuously invest in cutting-edge technology and top performance – that's why we were early adopters and have relied on Servomold technology since then. «

*Daniel Wild, CTO
Wild & Küpfer, Schmerikon – Switzerland*



» Our strong focus on injection mould tools for the medical industry requires the use of clean and sustainable technologies, such as those made possible by servo systems. With Servomold as a partner, we are consciously relying on an ownermanaged company with clear focus, strong team spirit and the courage to innovate. This matches the core DNA of IGS GeboJagema. «

*Rob Doorakkers, CIO
IGS GeboJagema – Netherlands*



» We are committed to helping our customers increase their production efficiency and implement more sustainable production processes. That is why we have strategically relied on Servomold system components and control units in more than 25 projects since 2014. «

*ppa. Volker Dreher, Head of Process Technology
Braunform – Bahlingen*



» With Servomold system components, we realize durable, low-maintenance and highly efficient moulds. In addition, the professional support of a highly motivated team for us the main reasons for the long-standing, cooperative partnership. «

*Volker Kiene, Teamlead Project Management Industrialization Moulds
Aptar – Radolfzell*



» The key factors for us are the ease of operation, safety and the individual adaptability of Servomold control units to our processes. With its unique technology and extensive support, Servomold offers the best concept currently available for the use of servo motors in injection mould tools. «

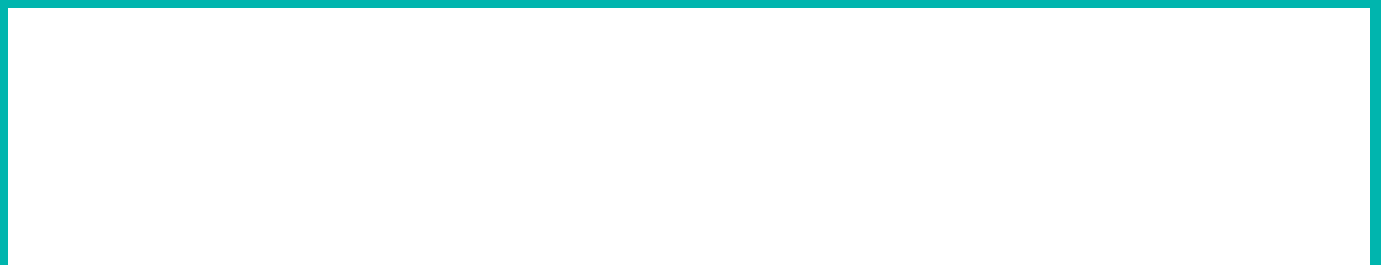
*Thomas Rübsam, Senior Director Technology, Plant Manager, Mihla Competence
Center Injection Molding, Pharmaceuticals and Devices Division
Fresenius Kabi – Mihla*



» For us, Servomold is the de facto standard in the servo automation of injection mould tools. Maximum production reliability and performance, sophisticated technology and outstanding service speak for themselves. «

*Christopher Heyd, Manager Tool Shop
Röchling Medical – Brensbach*

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