STRACK®
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# Z142 Ejector vibrator
# Operating and assembly instructions

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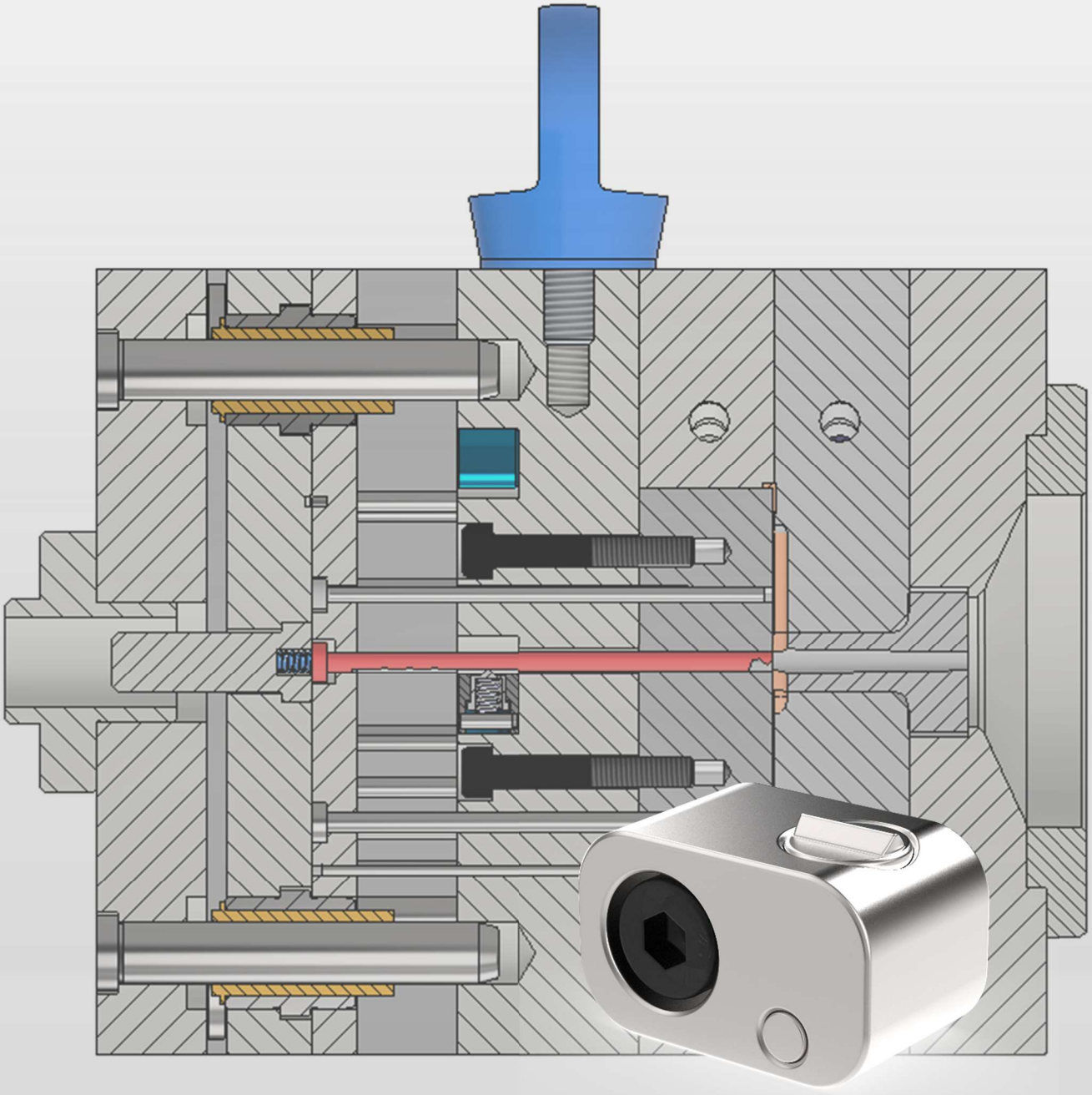


# Ejector vibration unit Z142

Inhalt: Seite

# Ejector vibrator Z142

**Foreword**

Thank you for your trust in the product from **STRACK NORMA GmbH & Co. KG**.

We are delighted that you have chosen a STRACK product. We have compiled these operating instructions to help you use the product.

The operating instructions are an important document for the Z142 ejector vibrator unit and ensure safe and efficient operation. It is intended for all persons who handle this ejector vibrator or are responsible for its safe operation.

For reasons of production safety, a copy of these operating instructions must be kept in the tool file to ensure that operating personnel have direct access to them.

The safety instructions in the operating instructions must be observed in particular in order to identify and avoid possible hazards. Read the operating instructions carefully and in full before assembling and commissioning the ejector vibrator.

Proper handling is necessary to ensure safe and economical use.

If the regulations and instructions in these operating instructions are not observed, we accept no liability for any resulting damage or loss of performance.

# Ejector vibrator Z142

## 1. General Information

**Intended Use**
The ejector vibrator is a mechanical auxiliary module for injection-molding tools. It generates a vibrating impact motion to ensure reliable release of the molded part from the tool.

**Target Group**
This manual is intended for toolmakers, setup technicians, designers, and maintenance personnel.

**Safety Instructions:**

Important – Please Read Carefully!

Please read and observe the following safety instructions before installation, commissioning, or performing any work on the STRACK ejector vibrator.

The ejector vibrator must be used in accordance with this operating manual. When a new version of the operating manual is issued, this version becomes invalid.

Both the injection-molding machine and the tool must be suitable, prepared, and properly configured for use with the STRACK ejector vibrator.

**Warning:**

The spring is under preload. Disassembly must only be carried out by qualified personnel. Before and during any service or maintenance work on the tool or the STRACK ejector vibrator, there is a risk of crushing due to the spring preload. Therefore, always observe the safety precautions applicable to preloaded springs.

Damaged ejector vibrators must not be used.

**Operating Principle:**

The ejector vibrator operates using a form-fitting ratchet mechanism:

- Recesses engage with corresponding lugs.
- The stroke movement is briefly delayed.
- The spring accelerates the ejector pin abruptly.
- The vibrating impact motion releases the moulded part.
- The number and positioning are defined by the tool designer.

# Ejector vibrator Z142

## 2. Upon Receipt of Delivery

Inspect the delivery for any external damage before opening the package. In the event of visible damage, please report it immediately to the transport company that delivered the consignment.

Compare the contents of your shipment with the delivery note or the enclosed parts list (see appendix). Ensure that all parts are present and have been unpacked.

**Only dispose of the transport and packaging materials once this has been confirmed.**

If the contents are damaged without any visible external damage to the packaging, do not return the shipment for repair or replacement.
Instead, please contact STRACK NORMA GmbH & Co. KG in Lüdenscheid for further instructions.

Telephone: +49 2351 / 8701-0 (switchboard)
+49 2351-8701-999 (team special)

Email: special@strack.de

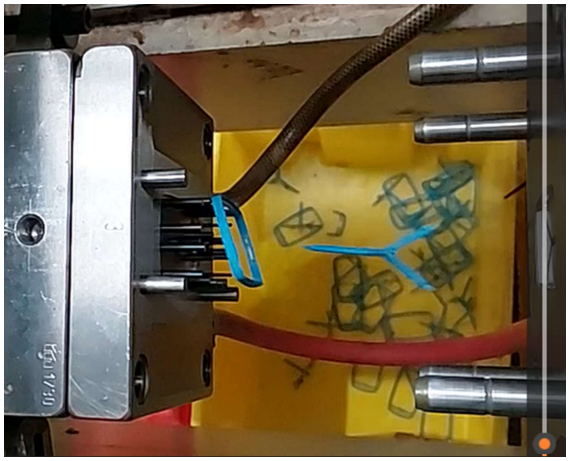
# Ejector vibrator Z142

## 3. Features

**Efficiency reimagined: the Z142 ejector vibrator for maximum process reliability in injection moulding.**

The Z142 ejector vibrator is the innovative solution to one of the most common problems in injection moulding: moulded parts sticking to the ejector, leading to unnecessary downtime, quality losses and operator intervention. With a precisely designed spring-loaded locking element that releases impulsively during demoulding and generates a targeted vibration, the ejector vibrator ensures safe and reliable demoulding – every cycle.

✗ **Problem:** moulded part sticking to the ejectors during the ejection process.



✓ **Solution:** secure ejection with ejector vibrator unit Z142 during the ejection process.

### 3.1 How does the ejector vibrator work?

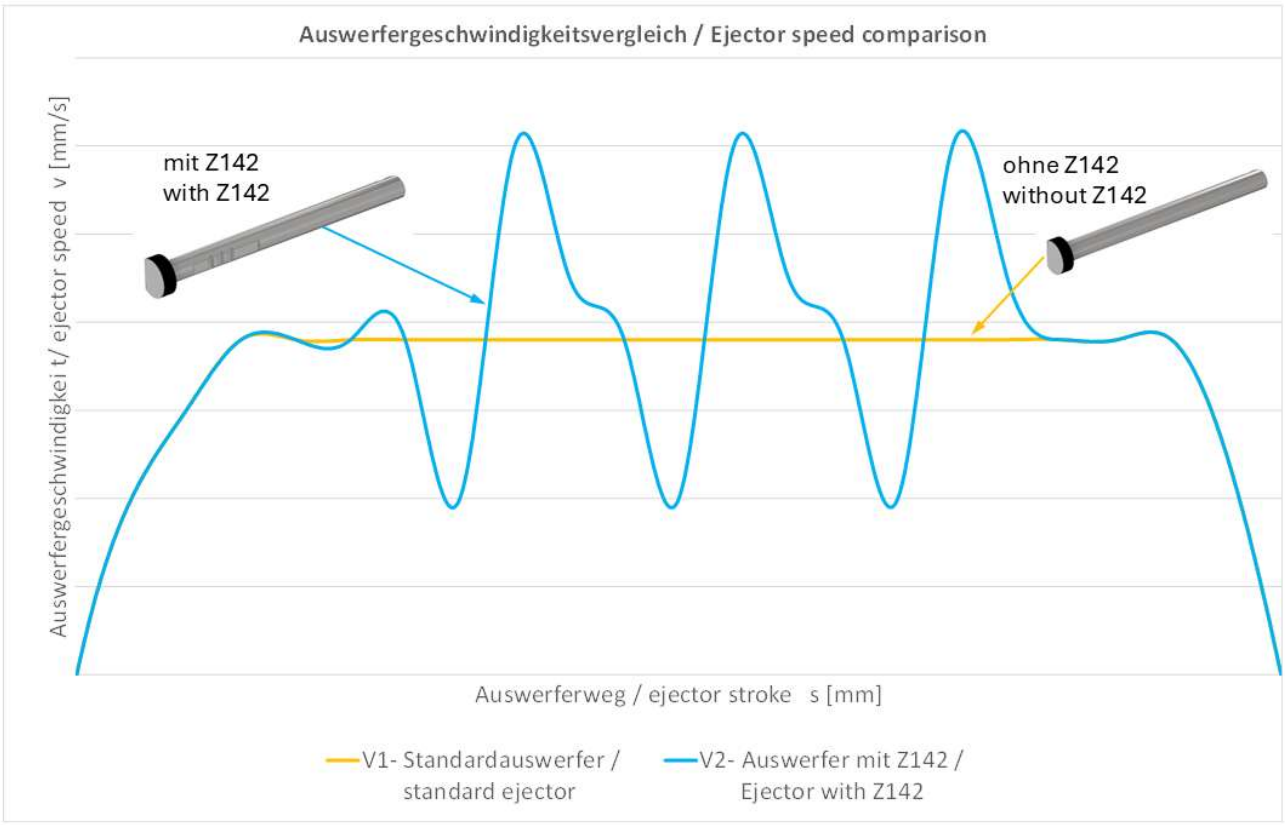
The compact module is attached directly to the ejector and locks into a notch during the cycle. When the mould is opened, the locking element is released by a spring and generates a controlled impulse.

This vibration reliably releases the moulded part, even in the case of difficult components, unfavourable geometries or highly adhesive materials.
The result: stable, reproducible demoulding without additional energy sources, without electronics, without pneumatics.

The notches attached to the ejector allow the ejector vibrator to snap into the designated lugs. When engaging, the continuous stroke movement of the ejector is briefly interrupted. The ejector is delayed for a moment.
As soon as the engagement is released again, the screw pressure spring located under the ejector accelerates it abruptly. This results in a vibrating or jerky movement of the ejector. This additional movement helps to ensure that the component is released safely from the ejectors and prevents the moulded part from sticking or being carried away.

It is not necessary to equip all ejectors with an ejector vibrator for effective operation. Depending on the component geometry and size, the designer can freely determine the number and position of the vibrators and adapt them to the respective application.

# Ejector vibrator Z142




Schematic representation of the different ejector speeds with and without the Z142 ejector vibrator.

The component is released from the adhering ejector by deceleration followed by acceleration.

# Ejector vibrator Z142

### 3.2 Your advantages at a glance

- **Maximum process reliability**
- Effectively prevents the moulded part from sticking to the ejector
- Reliable demoulding regardless of the material
- Significantly fewer machine stoppages and rejects

- **Significant improvement in quality**
- Less damage to components
- More stable series quality
- Clean demoulding without additional measures

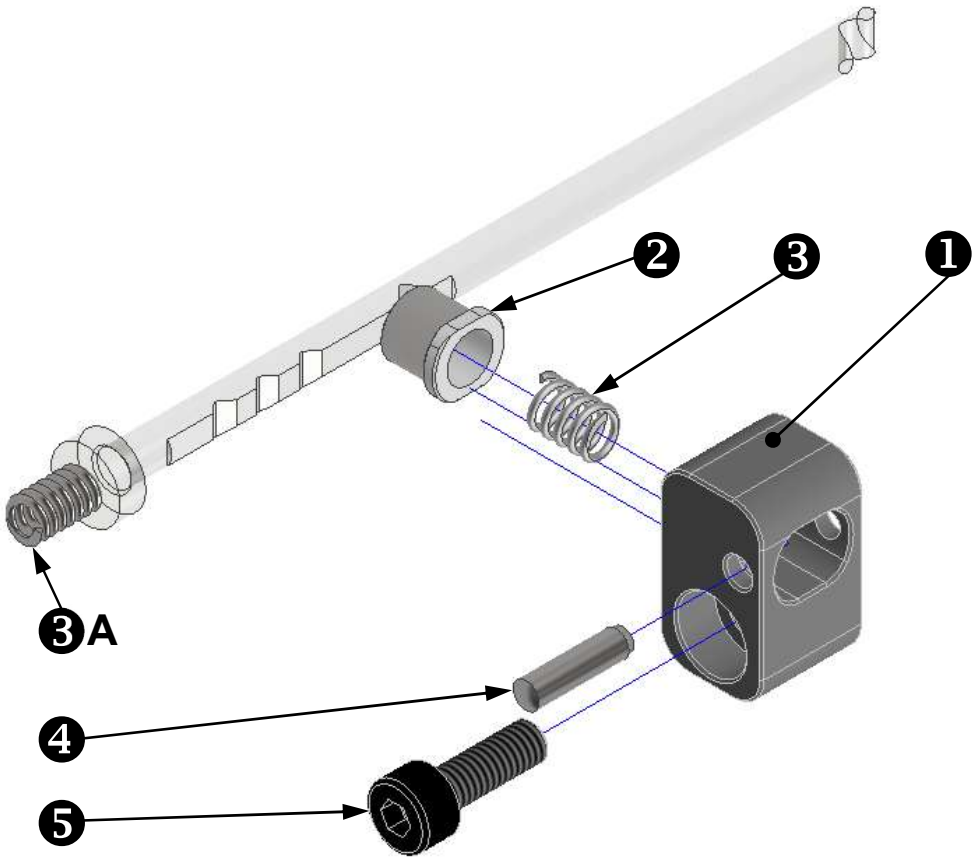
- **Cost advantages during operation**
- Reduced reject rate
- Minimised operator intervention
- Less tool stress due to uncontrolled movements

- **Easy integration**
- Compatible with common ejector systems
- No intervention in the machine or control system
- Extremely low maintenance and durable

# Ejector vibrator Z142

## 4. Scope of delivery

The Z142 ejector vibrators are delivered pre-assembled. The delivery also includes an additional spring (3A) which must be installed under the ejector.




| Nr. / No. | Menge / quantity | Benennung / Designation | STRACK Norm |
|---|---|---|---|
| 1 | 1 | Gehäuse / Housing | - |
| 2 | 1 | Raste / Catch | Z5134 |
| 3 / 3A | 1 | Schraubendruckfeder / Compression spring | SN2500-5-12 |
| 4 | 1 | Zylinderstift / dowel pin | SN1973-3-12 |
| 5 | 1 | Zylinderkopfschraube / Cylinder head cap screw | SN3500-M4-12 |

# Ejector vibrator Z142

## 5. Design of the Z142 ejector vibrator

The ejector vibrator can be installed in two versions. This depends on the component quality and the ejector function.

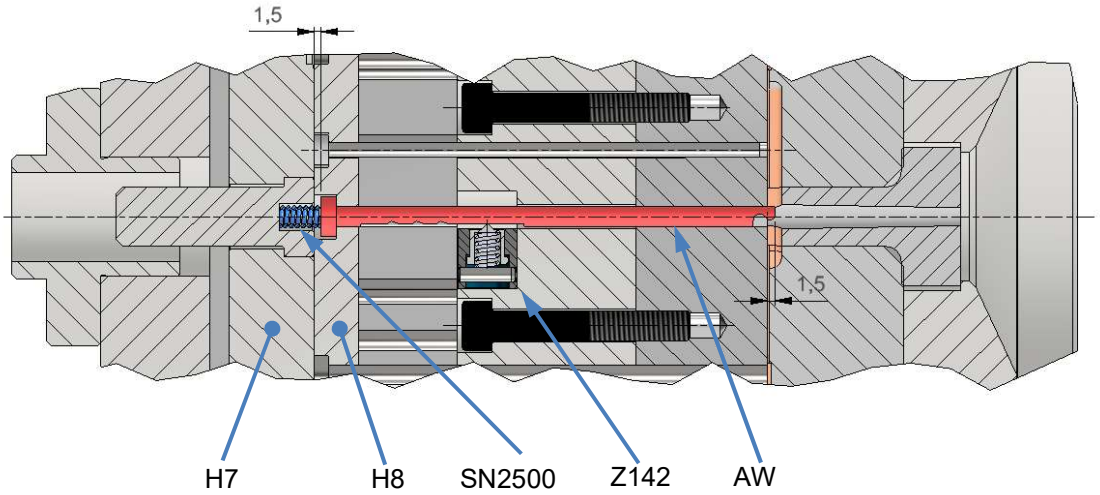
### 5.1 Installation variant: Protruding ejector with return stroke due to injection pressure (installation in the sprue area)

In this variant, the ejector is pushed slightly forward by a spring when unloaded and thus protrudes by a defined amount. During the injection process, the ejector is automatically pushed back by the applied injection pressure. This design is the simplest and most commonly used version.

Functional description

A cylindrical coil spring (included in set Z142) is inserted into the Ø5 x 7 mm hole in the H7 ejector base plate of the ejector package.
The spring acts directly on the relevant ejector pin (AW).
When unloaded, the spring pushes the ejector forward by approx. 1.5 mm so that it protrudes slightly from the cavity.
During injection, the injection pressure builds up in the cavity and pushes the protruding ejector back in a controlled manner.
After cooling and opening the mould, the spring returns the ejector to its original position.

Ejector position in closed idle state before injection. Installation in the sprue area




**Caution:**

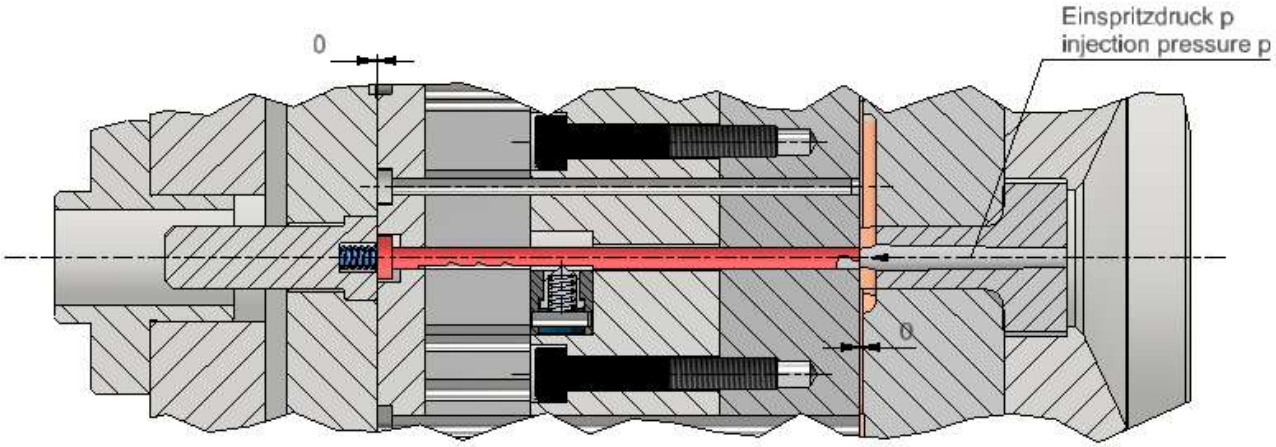
The coil spring is constantly under tension. Assembly and disassembly may only be carried out by trained specialists.

The ejector moves independently during the injection and ejection process.

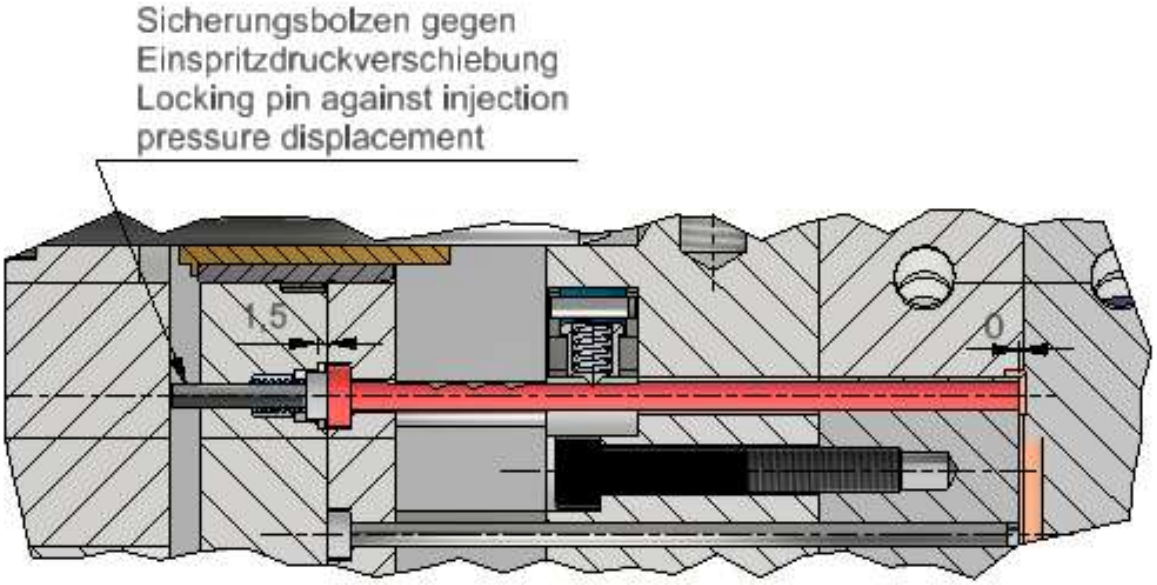
02.2026

# Ejector vibrator Z142

Au Ejector position in closed state under injection pressure. Installation in the sprue area




**5.2 Installation variant: Ejector without projection – secured by additional bolts (Installation variant in the cavity area)**

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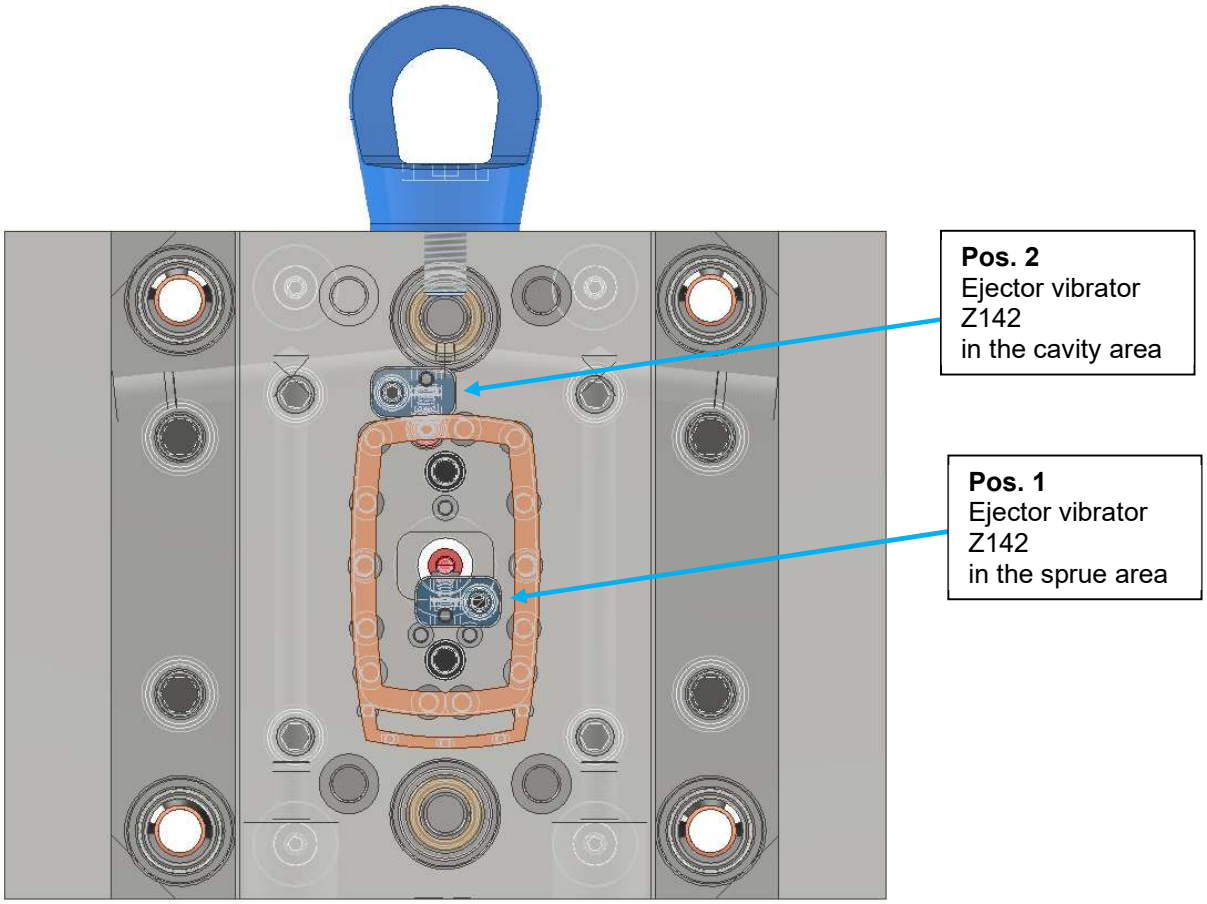
# Ejector vibrator Z142

Example of positioning the Z142 vibrator ejectors




Selected position 1 on manifold ejector pin and
position 2 component ejector pin

## 5.3 Preparing the mould for installation of the Z142 ejector vibrator

The injection mould must be prepared accordingly for installation of the ejector vibrator. The vibrator is positioned in a precisely manufactured pocket so that the vibration forces generated during latching are reliably absorbed by the intermediate plate/mould plate and conducted into the mould.

**Pocket geometry and tolerances**
The ejector vibrator is manufactured with a production tolerance of –0.01 mm to –0.03 mm.
The tool pocket must be designed so that the vibrator can be accommodated without play but can still be mounted.

**Specifications for the pocket:**

- Fit: 0 to +0.02 mm mounting tolerance
- Geometry: according to the sketch provided (see drawing reference)
- Position: fully integrated into the intermediate plate/mould plate
- Seat: flat and even to ensure positive force transmission
- No protrusion of the ejector vibrator so that the ejector package does not collide here

# Ejector vibrator Z142

This combination of component and pocket tolerance creates a defined functional clearance that allows the locking tab to move without jamming.

Additional clearance to the ejector
An additional clearance of 0.5 mm must be provided for the distance between the ejector pin and the first contact surface of the vibrator.
This clearance ensures that the vibrator can work freely and that the locking function is not impaired by friction or jamming.
The required minimum clearance is calculated as follows:

**Calculation formula for the ejector clearance**

Ejector clearance = (ejector diameter / 2) + 6 mm + 0.5 mm clearance

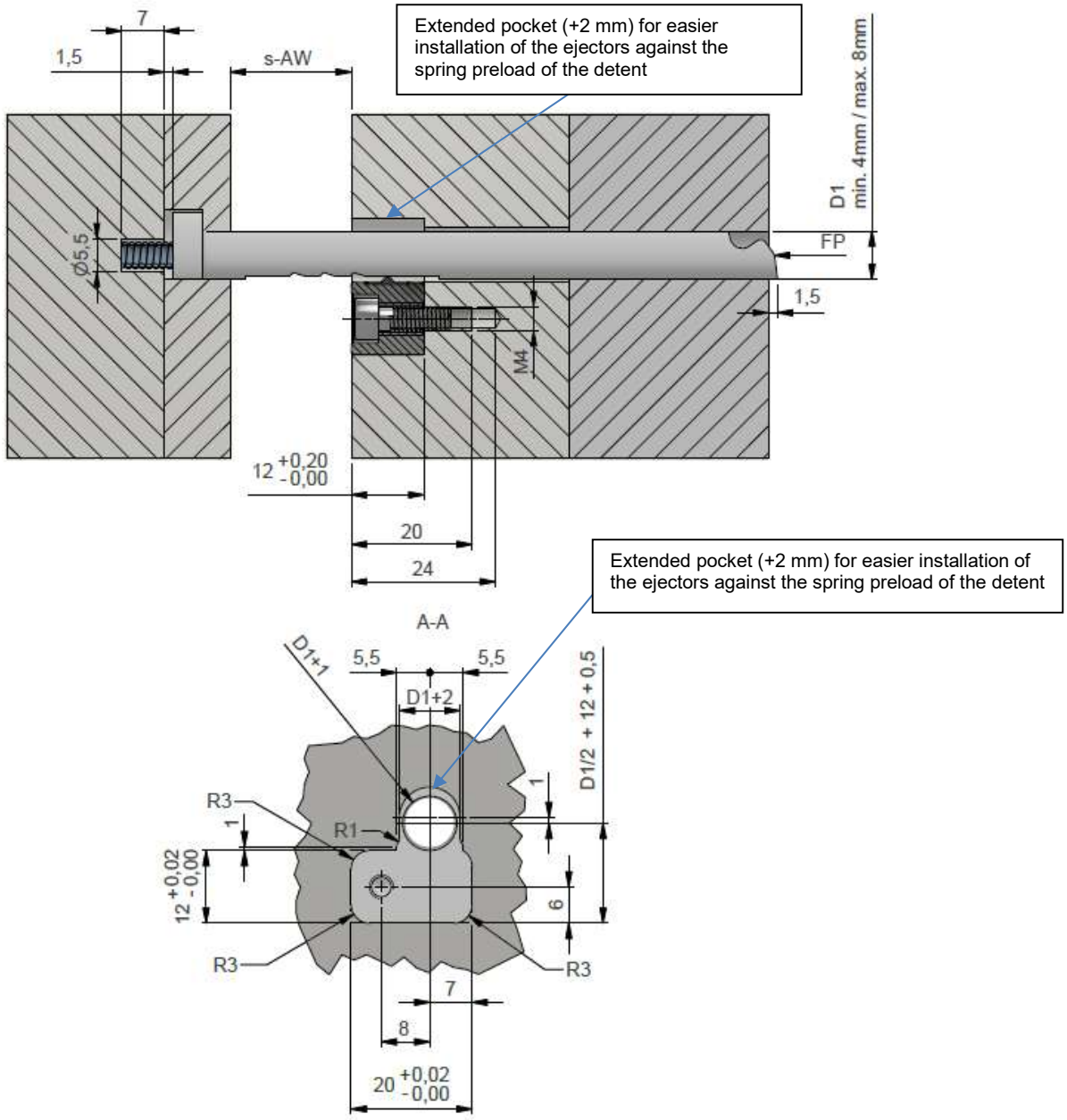
This value defines the radial distance between the centre axis of the ejector and the first contact surface of the locking mechanism.
It is crucial for ensuring trouble-free vibration.

**Functional significance of the pocket**
The precisely manufactured pocket fulfils several tasks:

- Holding and fixing the Z142 ejector vibrator
- Ensuring correct force transmission in the intermediate/mould plate
- Limiting and guiding the vibration movement
- Reducing wear through defined contact surfaces
- Preventing tilting moments under load from latching impulses

An inaccurate or oversized pocket can lead to malfunctions, increased tool wear or blockages in the latching mechanism.

# Ejector vibrator Z142




### 5.4 Preparing the ejector for use with the Z142 ejector vibrator

To use the ejector in combination with the Z142 ejector vibrator, the ejector pin must be prepared in accordance with the design specifications. For this purpose, the ejector is provided with special locking contours that enable defined engagement and disengagement and generate the vibrating motion.

**Attaching the detents**

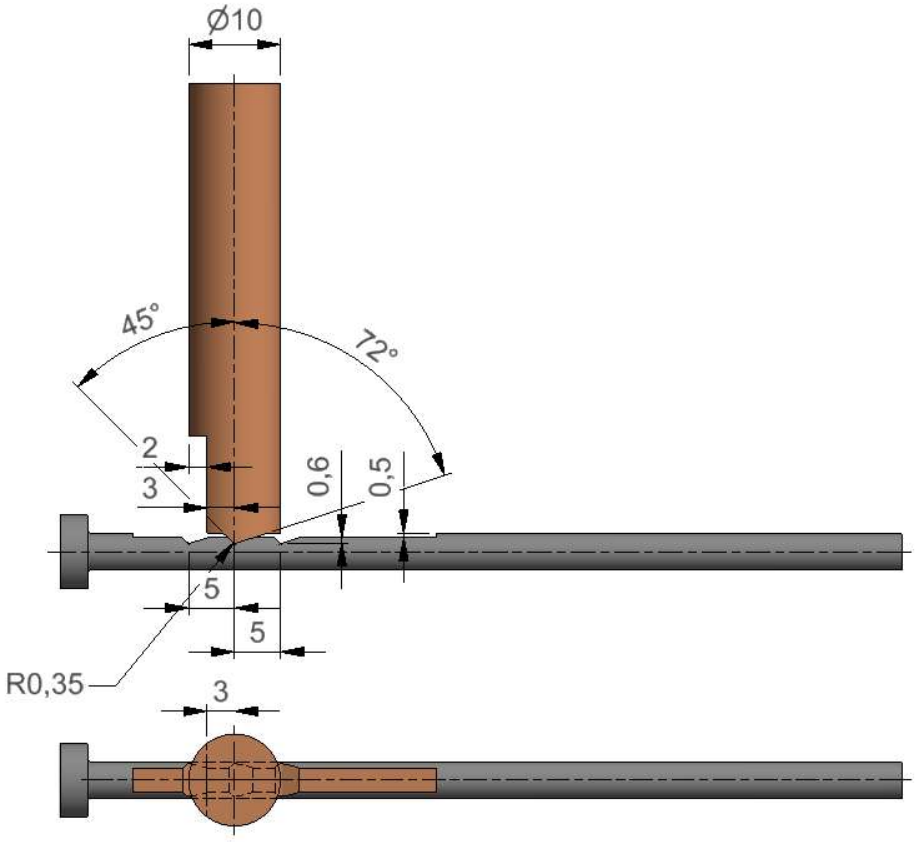
Depending on the ejector diameter and component geometry, 2 to 4 detents should be provided.
These detent contours are incorporated into the ejector in accordance with the positioning specified by the designer.

# Ejector vibrator Z142

The use of the pre-machined Z5183 electrode is recommended for producing the detent geometry, as it:

- replicates the required contour precisely
- ensures consistently high repeat accuracy
- significantly simplifies and speeds up machining

The distance between the individual detents depends on the design.
A distance of 5 mm has proven effective in practice.




**Design of the locking contour**

The locking mechanism is designed to minimise wear and tear and features different designs for:

- Engagement angle (locking angle)
- Release angle (release angle)

This differentiation ensures:

- secure and defined engagement
- controlled release without jerking or jamming
- long-term stable function over many tool cycles

02.2026

# Ejector vibrator Z142

### Offset sliding surface

To further reduce wear, the sliding surface over which the detent moves must be offset by 0.5 mm relative to the ejector surface.
This recess fulfils the following functions:

- Reduction of friction forces between the detent and the ejector
- Significant extension of service life
- Improved running smoothness and reduced material attack

The 0.5 mm recess must be designed in such a way that the detent cannot collide with the ejector in either the front or rear ejector position.

### Surface coating

To further optimise the sliding properties and minimise wear, it is recommended to polish the recess and the sliding surface and to additionally coat the ejector with a DLC (diamond-like carbon) coating.
Advantages of DLC coating:

- Very low coefficient of friction
- High wear protection
- High thermal and mechanical stress resistance
- Significantly extended ejector service life

These measures ensure that the ejector interacts reliably with the ejector vibrator and guarantee a high level of process and functional reliability.

## 6. Assembly

No special precautions need to be taken during assembly. Secure the supplied screw with medium-strength Loctite screw locking adhesive to prevent the ejector vibrator from loosening due to vibrations.

When installing the ejector pins, a 2 mm clearance has been milled into the pocket. This allows the ejector to be easily bent to the side and inserted more easily.

## 7. Production

No special precautions need to be taken during production beyond those specified in the applicable Industrial Safety Regulation, Section 3.

**Attention:**
For optimum performance, set the ejector package feed rate to **50 to 100 mm/s**.

**Tip:**
Regularly check the lubrication on the ejector.

# Ejector vibrator Z142

## 8. Maintenance

Clean and check regularly. Check spring and functional surfaces. Lubricate sliding surfaces.
Replace wear parts as necessary.

## 9. Troubleshooting

Examples:

- Component stuck → Spring fatigued.
- Vibration too weak → Locking mechanism worn.
- Noise → Contamination.
- No engagement → Incorrect position.

## 10. Technical data

Material: Tool steel
Temperature range: 20 – max: 180 °C
Ejector service life: max. 250,000 cycles

## 11. Disposal

Recycle metal parts, dispose of lubricants in accordance with regulations.

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02.2026