simple. gripping. future.

Engineering: As varied as the application tasks in the engineering industry are, as broad are the possible applications of our workholding products. The high reliability and innovation power combined with the simplicity and universal applicability provide not only advantages for large engineering companies, but also increase the efficiency of each supplier.

lang-technik.de
Makro·Grip®
Stamping Unit

Benefits
- HIGHEST PROCESS RELIABILITY
- INCREASED MILLING QUALITY
- ENORMOUS MATERIAL SAVINGS

Applications

At a glance
- Patented form-closure technology
- External stamping of workpieces with up to 20t hydraulic pressure
- Minimal preparatory work required
- Tremendous material savings due to minimal clamping edge requirements
The patented Form-Closure Technology by LANG

The Original! Form-Closure Technology makes LANG clamping the very best in 5-axis machining. Form-Closure Technology guarantees maximum holding power with minimal clamping force. The following pages explain the stamping technique in detail and how it affects 5-face machining with the Makro-Grip® vice.

The cause and effect principle of Stamping and Form-Closure Technology:

Form-Closure Technology

- Exceptional holding power
- High cutting rate
- Reduced vibrations on workpiece
- High accuracy
- Minimal clamping edge requirement
- Enormous material savings
- Minimal material removal
- Shortened machining times
- High tool life
- Improved surface quality
- Increased milling quality
- Reduced vibrations on workpiece
- Lower clamping pressure
- No material deformation
- Reduced wear on the vice
- Compact design
- Higher longevity
- Lower weight
- Better accessibility
- Shortened machining time
- Ergonomic handling
- More options within the work envelope
- Increased milling quality
- Reduction of purchasing costs
- Increased milling quality
- Reduction of costs per piece
- Relief strain on employees
- Better usage of capacity

Makro-Grip® – The compact 5-axis vice with Form-Closure Technology

The external stamping of the workpiece relieves the 5-axis vice. While traditional machining vices with serrated teeth have to work double duty (1. indent the material, 2. hold the workpiece), the Makro-Grip® 5-axis vice’s function is limited to only holding the workpiece.

The compact build of the Makro-Grip® 5-axis vice is possible due to the requirement of much lower clamping forces. The advantages are shown over the following pages.
A reliable wear-free clamping process for high-tensile materials!

In contrast to traditional machining vices, which clamp a workpiece with a maximum of 6 tons, Form-Closure Technology with external stamping adds the form-closure contour indents to the workpiece with up to 20 tons of hydraulic pressure. This allows you to clamp even high-tensile materials up to 1500 N/mm² tensile strength (e.g. Titanium and Inconel) reliably and virtually wear-free. Different material hardness requires different stamping jaws to extend longevity and guarantee safe clamping. Our standard jaws allow you to stamp workpieces up to 35 HRC while high-tensile materials up to 45 HRC require High-End stamping jaws.

Adjusting the stamping pressure and depth properly

Making a precise statement about the correct stamping pressure is relatively difficult due to various alloys (compositions of the material). The two major parameters are the workpiece width and its material. Basically we recommend to start always with low stamping pressure and then to slowly increase it incrementally until the right stamping depth is achieved.

With standard stamping jaws the correct stamping depth is reached when the control marks between the holding teeth have a depth of approx. 0.1 mm.

To increase longevity of the High-End stamping jaws for high-tensile materials, we recommend lower stamping pressure and accordingly less deep control marks than in materials with a tensile strength < 1.000 N/mm².

The following table should provide a rough orientation regarding the applied stamping pressure. Depending on the material and surface condition the pressure may vary substantially from this data!

<table>
<thead>
<tr>
<th>Tensile strength - stamping pressure ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength Rm</td>
</tr>
<tr>
<td>Length of blank (stamping width) ≤ 50 mm</td>
</tr>
<tr>
<td>Length of blank (stamping width) ≥ 126 mm</td>
</tr>
<tr>
<td>200 N/mm²</td>
</tr>
<tr>
<td>400 N/mm²</td>
</tr>
<tr>
<td>600 N/mm²</td>
</tr>
<tr>
<td>800 N/mm²</td>
</tr>
<tr>
<td>1000 N/mm²</td>
</tr>
<tr>
<td>25 bar</td>
</tr>
<tr>
<td>50 bar</td>
</tr>
<tr>
<td>75 bar</td>
</tr>
<tr>
<td>100 bar</td>
</tr>
<tr>
<td>125 bar</td>
</tr>
<tr>
<td>50 bar</td>
</tr>
<tr>
<td>100 bar</td>
</tr>
<tr>
<td>150 bar</td>
</tr>
<tr>
<td>200 bar</td>
</tr>
<tr>
<td>250 bar</td>
</tr>
</tbody>
</table>

Functional principle of the Stamping Technology: 5 seconds that revolutionise your machining processes!

1. Sawing of blank with minimum addition of clamping depth.
2. Stamping realised within 3–5 seconds.
3. Correct stamping depth is reached when the control marks between indentations have a max. depth of 0.1 mm.
4. Secure holding power with low clamping force and a minimum clamping depth of only 3 mm.
Makro-Grip® Stamping Unit –
the ideal introduction to the Stamping Technology

The centre-marking tool enables an exact and
centric positioning of blanks in 5-Axis Vices -
even without endstops. See on page 76.

1. Convenient adjustment of the
   stamping pressure
2. Robust steel hydraulic housing with
   integrated T-slot key
3. Operated pneumatically by hand or
   foot
4. Scaled endstop for quick positioning
   of blanks
5. Pneumatic-hydraulic power multiplier
   with visible oil-level display
6. Easily readable hydraulic pressure
   gauge
7. Quick adjustment of stamping width
   for different part sizes
8. Stamping jaws for all materials up to
   35 HRC (45 HRC). Stamping force up to
   20 tons

Stamping trolley with
Makro-Grip® Stamping Unit, standard

NEW

1. Makro-Grip® Standard Stamping Unit
   with a stamping range up to 245 mm
2. T-slot plate can be retrofitted
3. Practical, rigid trolley for a flexible and
   mobile use
4. Broad space on the plastic tray that
   can be used e.g. for preparing vices or
   for depositing tools, etc.

Stamping trolley with Makro-Grip® Stamping Unit, standard

Scope of delivery:
- Stamping vice
- Stamping jaws with parallels, 3 mm
- Workbench trolley
- Pneumatic-hydraulic power multiplier (1 - 360 bar)
- Pneumatic switch for hand or foot operation
- Gauging blocks for measuring wear of stamping teeth
- Scaled workpiece endstop
- Protection shield

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Type</th>
<th>Max. stamping range</th>
<th>Type of stamping jaws for materials up to 35 HRC/45 HRC</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>41200</td>
<td>Standard</td>
<td>245 mm</td>
<td>Standard stamping jaws</td>
<td>76 kg</td>
<td></td>
</tr>
<tr>
<td>41350</td>
<td>Extended</td>
<td>355 mm</td>
<td>Standard stamping jaws</td>
<td>84 kg</td>
<td></td>
</tr>
<tr>
<td>41200-HE</td>
<td>Standard</td>
<td>245 mm</td>
<td>High-End stamping jaws</td>
<td>76 kg</td>
<td></td>
</tr>
<tr>
<td>41350-HE</td>
<td>Extended</td>
<td>355 mm</td>
<td>High-End stamping jaws</td>
<td>84 kg</td>
<td></td>
</tr>
</tbody>
</table>
Stamping trolley with Makro-Grip® Stamping Unit, extended, on T-slot plate

Scope of delivery:
- 2 stamping vices
- T-slot plate 596 x 496 mm
- 2 pairs of stamping jaws with parallels, 3 mm
- Workshop trolley
- Pneumatic-hydraulic power multiplier (1 - 360 bar)
- Pneumatic switch for hand or foot operation
- Gauging blocks for measuring wear of stamping teeth
- 2 Scaled workpiece endstop
- 2 Protection shields

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Type</th>
<th>Max. stamping range</th>
<th>Type of stamping jaws</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>41402</td>
<td>Extended</td>
<td>2 x 355 mm</td>
<td>Standard stamping jaws for materials up to 35 HRC</td>
<td>300 kg</td>
<td></td>
</tr>
<tr>
<td>41402-HE</td>
<td></td>
<td></td>
<td>High-End stamping jaws for materials up to 45 HRC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stamping trolley with Makro-Grip® Dual Stamping Unit, extended, on T-slot plate

Scope of delivery:
- 2 stamping vices
- T-slot plate 596 x 496 mm
- 2 pairs of stamping jaws with parallels, 3 mm
- Workshop trolley
- Pneumatic-hydraulic power multiplier (1 - 360 bar)
- Pneumatic switch for hand or foot operation
- Gauging blocks for measuring wear of stamping teeth
- 2 Scaled workpiece endstop
- 2 Protection shields

The dual stamping unit is ideal for preparing long blanks with two stamping vices simultaneously and clamping these stamped parts accordingly in two 5-Axis Vices on the machine-tool table.

The distance of the two units can be adjusted individually using the T-slots or via a 25 mm pitch of marking bores.

Additionally there are marking bores to match the distance of Quick-Point® Grid Plates as well as the Makro-Grip® workholding devices.
Centre Marking Tool for Stamping Unit

The centre marking tool plunges a notch above the stamping contour at the centre of the part. This marking allows the exact and centric positioning of parts in Makro-Grip® 5-Axis Vices without any endstops.

<table>
<thead>
<tr>
<th>Centre Marking Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item no.</td>
</tr>
<tr>
<td>41010</td>
</tr>
<tr>
<td>41010-01</td>
</tr>
</tbody>
</table>

The centre marking tool will be mounted to moveable jaw of the stamping unit with two M 6 x 14 screws (included).

Gauging Blocks for measuring wear of Stamping Jaws

Position one gauging block with slots on each side of the stamping jaws. Tighten the jaws by hand only, do not actuate the switch!

Make sure that the stamping teeth are placed in the grooves of the gauging blocks.

When the indicator block fits between the stamping contour, the jaws need to be sent in for reconditioning.

<table>
<thead>
<tr>
<th>Gauging Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item no.</td>
</tr>
<tr>
<td>41020</td>
</tr>
</tbody>
</table>

Creating trust! Always the same clamping quality. To ensure consistent holding power in the clamping device, it is necessary to check the wear of the stamping teeth regularly.

Stamping Jaws - Standard and High-End version

**Standard Stamping Jaws with parallels**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>For material</th>
<th>Clamping depth of workpiece</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>41111</td>
<td>up to 35 HRC</td>
<td>3 mm</td>
<td></td>
</tr>
</tbody>
</table>

Standard stamping jaws for all materials up to 35 HRC.

**High-End Stamping Jaws with parallels**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>For material</th>
<th>Clamping depth of workpiece</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>41112</td>
<td>up to 45 HRC</td>
<td>3 mm</td>
<td></td>
</tr>
</tbody>
</table>

High-End stamping jaws for all high-tensile materials up to 45 HRC.

Reconditioning Stamping Jaws

<table>
<thead>
<tr>
<th>Reconditioning Stamping Jaws</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item No.</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>41111-01</td>
</tr>
<tr>
<td>41112-01</td>
</tr>
</tbody>
</table>

When the stamping teeth are worn out the jaws can be reconditioned up to 6 times. During every reconditioning process the total thickness will be reduced about 0.5 mm (allowed minimum thickness of jaw: 15 mm). In order to maintain the original thickness of 18 mm we will supply suitable shims when returning the jaws.

In order to bridge the time of the reconditioning process we suggest keeping a second pair of stamping jaws in reserve!