simple.
reliable.
gripping.

ORIGINAL
MAKRO·GRIP

„The Original“ – Stamping Technology

The Makro·Grip® Stamping Technology allows for:

SECURE AND RELIABLE CLAMPING PROCESSES

WEAR- AND DISTORTION-FREE CLAMPING

ENORMOUS MATERIAL SAVINGS

The stamping technology that has become popular was invented by LANG and can be regarded as the heart of the Makro·Grip® workholding system. It guarantees highest holding forces and ideal accessibility in 5-axis machining of blanks. The pre-stamping of workpiece blanks favors a variety of factors that have a positive effect on process reliability and cost-efficient production, which is why the Makro·Grip® technology is considered the benchmark in today's workholding. During the pre-stamping process workpieces are prepared with a defined contour at an external stamping unit under high pressure, which generates a form-fit between serrated jaws of the Makro·Grip® 5-Axis Vise and the stamping contour on the workpiece. As pre-stamping is conducted externally, no additional machine capacities have to be spent in order to prepare the workpiece. The process only takes about 5 seconds – but these 5 seconds will forever change your manufacturing processes and the way you clamp your workpieces.

Benefits of the Makro·Grip® Stamping Technology:

- Highest holding forces due to form-fit clamping
- Maximum process reliability
- Increased milling quality
- Minimum wear on the clamping device
- Effortless pre-stamping of high-tensile material
- High repeatability thanks to defined stamping contour

Different types of Stamping Units

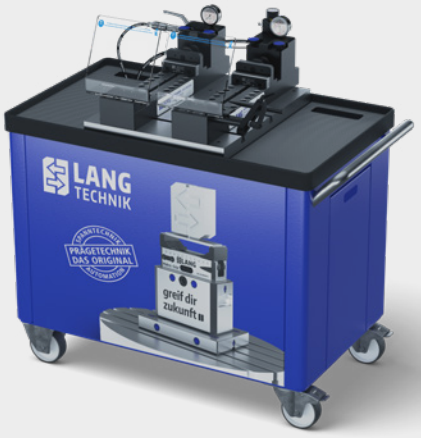
Stamping Units are available in a stationary version for workbenches as well as mobile on a trolley. The actual stamping unit is available in two different lengths with either Standard Stamping Jaws for materials up to 35 HRC or with High-End Stamping Jaws for materials up to 45 HRC.

The Dual Stamping Unit is suitable for extremely long workpieces. The mobile Stamping Unit offers great flexibility, allowing workpieces to be pre-stamped wherever they are needed. Pre-stamping is conducted conveniently via foot pedal, so both hands remain free to hold and insert heavy workpieces.

Makro·Grip® Stamping Unit for workbenches

Trolley with Makro·Grip® Stamping Unit

Trolley with Makro·Grip® Stamping Unit,
extended version, on T-slot plate



Trolley with Makro·Grip® Dual Stamping Unit,
extended version, on T-slot plate

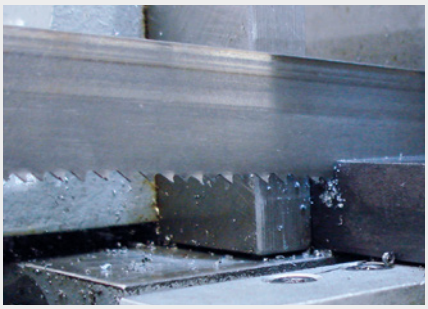
Makro•4Grip Stamping Technology for round parts

With the Makro•4Grip clamping system there are completely new possibilities and applications for the stamping technology. By retrofitting the Makro•Grip® stamping unit and a LANG centering vise the form-fit clamping principle can be applied for round parts now easily and cost-efficiently. Makro•4Grip jaws are available for all LANG vise sizes and cover a clamping range of Ø 36 to Ø 300 depending on their type and the vise's base length.

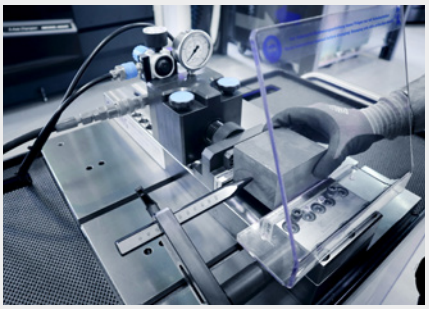
Makro•Grip® Ultra Stamping Technology for flat and large components

The Stamping Technology is also available for large parts. The form-fit effect which is made possible by pre-stamping guarantees highest holding forces at low tightening torque. Especially with large or deformation-sensitive components, holding forces and process reliability are without question among the most important attributes when clamping large components – two factors that are clearly associated with the Stamping Technology. Pre-stamped plate material on the other hand can be held extremely gently, but yet securely. The low actuation torque virtually eliminates distortion and deformation on the material.

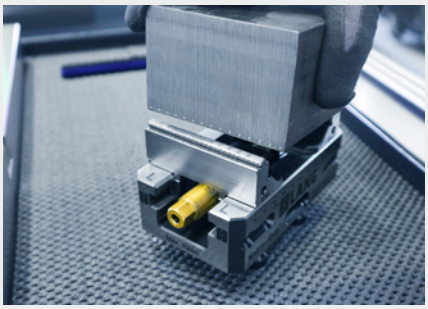
Functional principle of the Stamping Technology



1 – Sawing



2 – Stamping

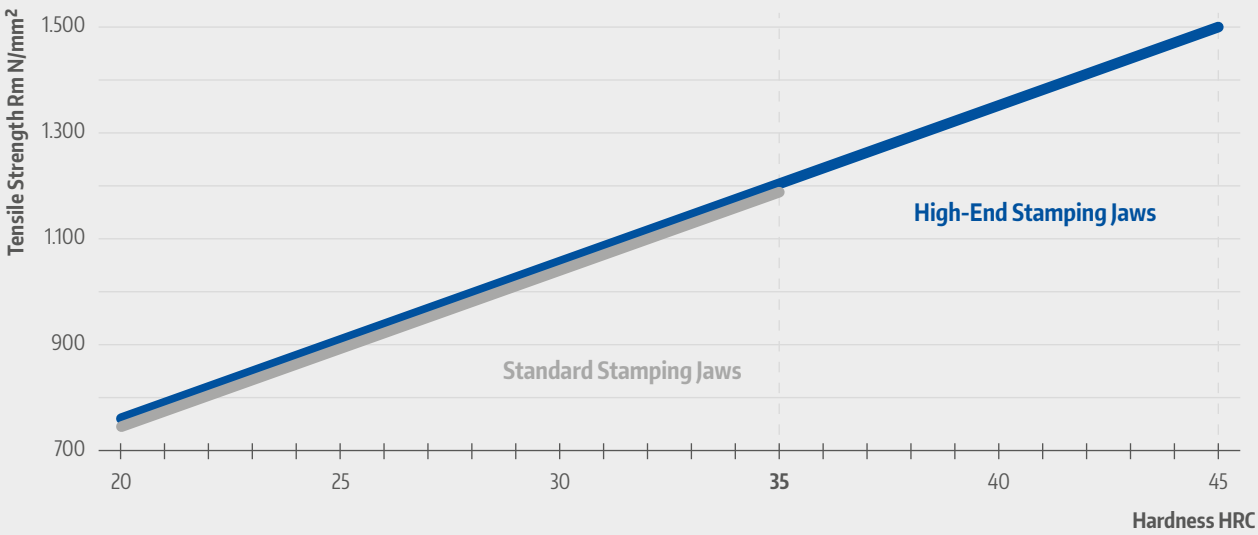


3 – Clamping

5 seconds that revolutionize your machining processes!
The workpiece is stamped directly on the saw cut or cinder layer of the blank. Additional preparatory work is generally not necessary. Stamping is realized within less than 5 seconds. The form-fit effect between the stamping contour in the workpiece (truncated pyramid indents) and the holding teeth of the 5-Axis Vise allows for an accurate repeatability even without endstops.

A reliable wear-free clamping process for high-tensile materials

The stamping unit adds the form-fit contour to the workpiece with up to 20 tons of pressure. This allows you to clamp even high-tensile materials up to 1.500 N/mm² tensile strength 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, whereas high-tensile materials up to 45 HRC require High-End stamping jaws.



Setting the stamping depth and pressure correctly

The large number of alloys makes it difficult to make an exact statement about the stamping pressure to be set. The two main parameters are workpiece width and material. In general, we recommend always starting with a low stamping pressure and slowly increasing it until the desired stamping depth in the workpiece is achieved.

For the material type 1.7131 (16MnCr5) we have made a measurement in this regard and set rough guide values for setting the stamping pressure.

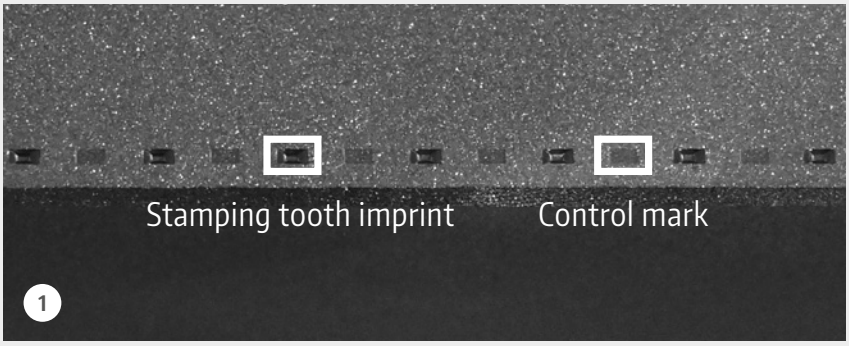
Material type 1.7131 (16MnCr5)

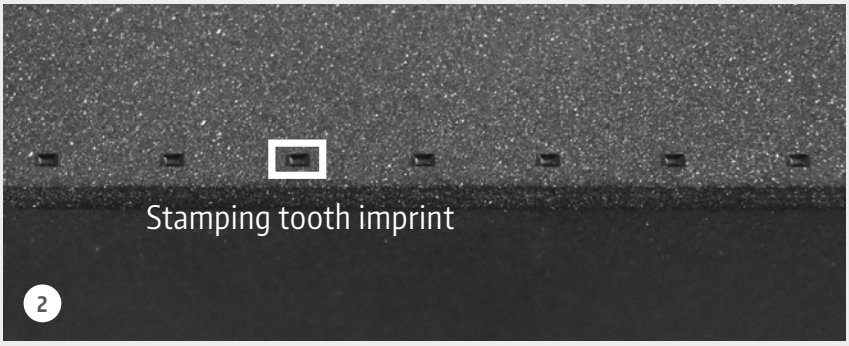
MATERIAL WIDTH	STAMPING PRESSURE
76 mm	100 bar
126 mm	140 bar

Please note: Depending on the surface quality, the required inlet pressure may deviate from these values. Therefore, carry out a test stamping and check the stamping contour with a visual inspection before each stamping series.

Stamping tooth imprint with correct stamping

The visual inspection gives the user reliable feedback as to whether the inlet pressure has been selected correctly or whether readjustment is required. Depending on the material hardness, there are two different stamping tooth imprints. Soft material needs a bit more "holding surface" due to the higher toughness. Therefore, it must be stamped in such a way that control marks between the stamping tooth imprints are visible. With harder materials, it is not necessary to stamp as deeply because of the higher resistance.





1 Material < 35 HRC with Standard Stamping Jaws

The stamping contour with alternating stamping tooth imprints and control marks is clearly visible. The depth of the control marks should be about 0.1 mm. The depth of the imprints should be about 0.25 mm.

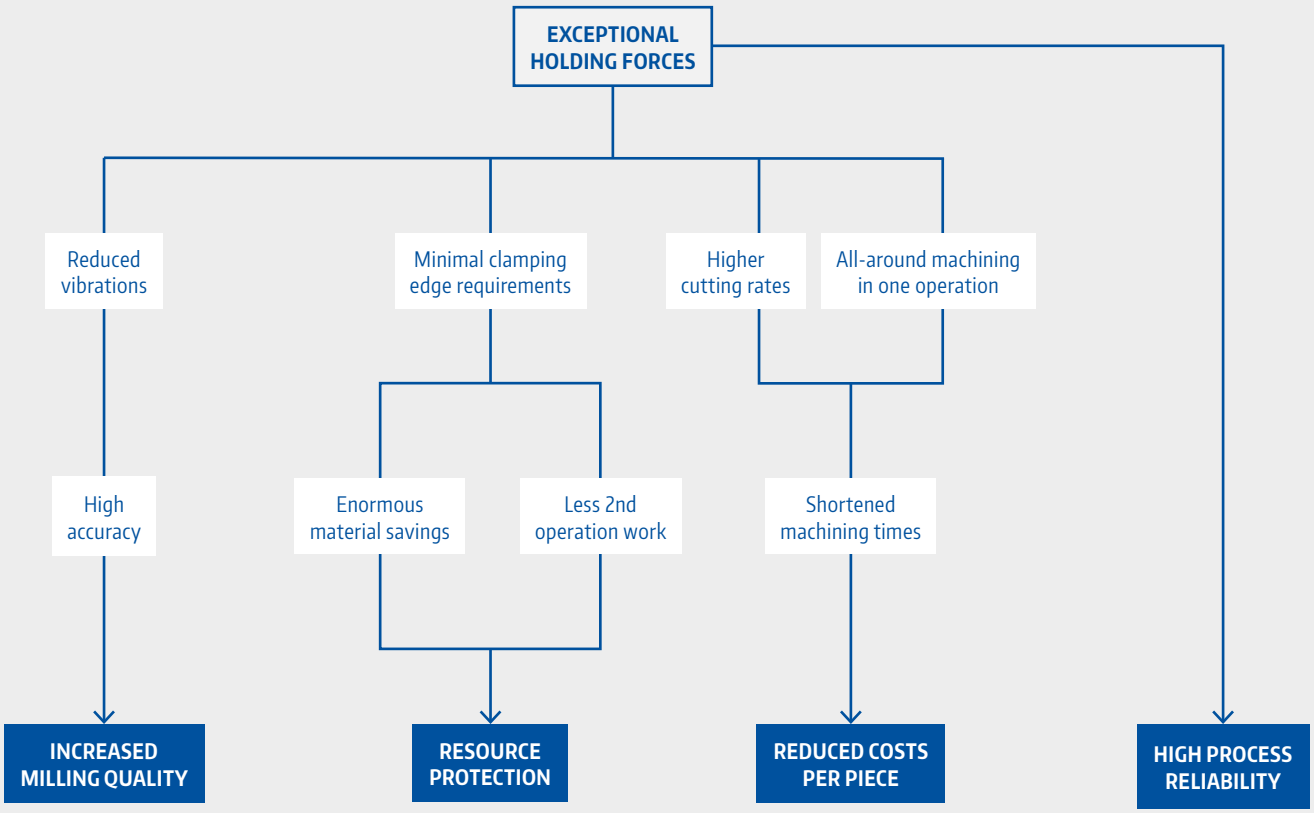
2 Materials > 35 HRC with High-End Stamping Jaws

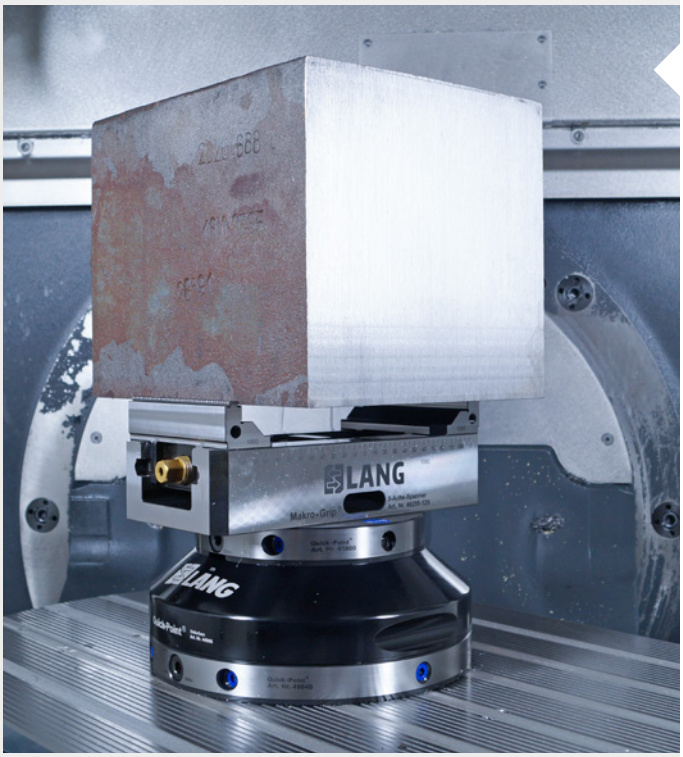
For material with a hardness between 35 and 45 HRC, the control marks should not be visible. The depth of the imprints is about 0.15 mm.

Highest holding forces and process reliability thanks to clamping by form-fit

Conventional vises penetrate the workpiece blank with high forces exposing both, the vise and the workpiece to high strains. The Makro·Grip® technology however uses a different approach. By pre-stamping the workpiece blank with up to 20 tons of pressure and preparing it with a defined contour, the forces are already applied before the actual clamping process. Once it is prepared with the contour (pyramid-shaped truncated indents), the Makro·Grip® 5-Axis Vise can hold the workpiece by form-fit, absolutely gently and securely with low clamping pressure – always with the same clamping jaws, regardless of the material and the hardness. Due to the low clamping pressure, distortion on the workpiece as well as wear on the vise can virtually be ruled out. Even with high-tensile material an always consistent clamping quality is guaranteed, which is crucial to achieving the desired quality of the machined workpiece.

The benefits of the stamping technology:





Clamping large workpieces with compact vises

Stamping Technology allows the Makro·Grip® 5-Axis Vise to clamp workpieces which substantially exceed its volume. Despite a clamping depth of only 3 mm the Makro·Grip® Stamping Technology guarantees highest process reliability. The compact design in relation to the maximum allowed workpiece size ensures ideal accessibility and thus allows for short tools which results in reduced vibrations and higher cutting rates.

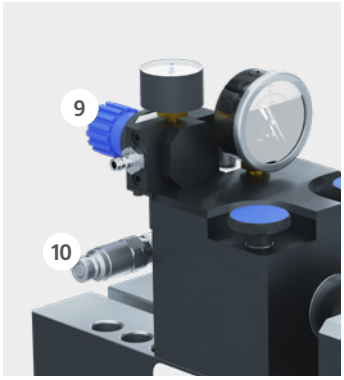
As a guideline, the Makro·Grip® 5-Axis Vise is able to clamp parts of following size:

Width of workpiece:
3 × jaw width of vise
Height of workpiece:
2 × jaw width of vise

"One and done" - finishing parts in one operation

The form-fit between clamping jaw serration and stamping contour makes it possible to safely pick up the workpiece at its smallest cross-section and clamp it edgewise with ideal accessibility. This strategy allows a lot of parts to be finished in one operation. For automated, lights-out machining it means that complete batches can be produced without the presence of an operator.

Makro·Grip® **Stamping Unit**



Side view

1. Operated pneumatically by hand or foot
2. Pneumatic-hydraulic power multiplier with visible oil-level display
3. Makrolon protection shield
4. Easily readable hydraulic pressure gauge
5. Quick adjustment of stamping width for different part sizes
6. Robust steel hydraulic housing with integrated T-slot key
7. Scaled endstop for quick positioning of blanks
8. Stamping jaws for all materials up to 35 HRC / 45 HRC
9. Conventient adjustment of the stamping pressure
10. Quick connection system consisting of quick connector and quick connector socket

MAKRO·GRIP® STAMPING UNIT FOR WORKBENCHES

ITEM NO.	TYPE	MAX. STAMPING RANGE	TYPE OF STAMPING JAWS	WEIGHT
41200	Standard	245 mm	Standard stamping jaws for materials up to 35 HRC	72 kg
41350	Extended	355 mm	Standard stamping jaws for materials up to 35 HRC	77 kg
41200-HE	Standard	245 mm	High-End stamping jaws for materials up to 45 HRC	72 kg
41350-HE	Extended	355 mm	High-End stamping jaws for materials up to 45 HRC	77 kg

Scope of delivery:
- Stamping vise
- Stamping jaws with parallels, 3 mm
- Pneumatic-hydraulic power multiplier (1 – 360 bar)
- Gauging blocks for measuring wear of stamping teeth
- Scaled workpiece endstop
- Protection shield

Stamping trolley with Makro·Grip®
Stamping Unit, Standard

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 for preparing vises or for depositing tools, etc.

STAMPING TROLLEY WITH MAKRO·GRIP® STAMPING UNIT, STANDARD

ITEM NO.	TYPE	MAX. STAMPING RANGE	TYPE OF STAMPING JAWS	WEIGHT
41521	Standard	245 mm	Standard stamping jaws for material up to 35 HRC	215 kg
41521-HE	Standard	245 mm	High-End stamping jaws for material up to 45 HRC	215 kg

Scope of delivery:
- Stamping vise
- Stamping jaws with parallels, 3 mm
- Workshop trolley
- Protection shield
- Pneumatic-hydraulic power multiplier (1 - 360 bar)
- Gauging blocks for measuring wear of stamping teeth
- Scaled workpiece endstop

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

1. Large stamping range up to 355 mm
2. Practical, rigid trolley for a flexible and mobile use
3. T-slot plate included allowing a second stamping unit to be retrofitted easily with marking bores or T-slot

STAMPING TROLLEY WITH MAKRO·GRIP® STAMPING UNIT, EXTENDED, ON T-SLOT PLATE

ITEM NO.	TYPE	MAX. STAMPING RANGE	TYPE OF STAMPING JAWS	WEIGHT
41400	Extended	355 mm	Standard stamping jaws for material up to 35 HRC	310 kg
41400-HE	Extended	355 mm	High-End stamping jaws for material up to 45 HRC	310 kg
41140	Additional extended stamping vise for dual stamping	355 mm	Standard stamping jaws for material up to 35 HRC	50 kg
41140-HE	Additional extended stamping vise for dual stamping	355 mm	High-End stamping jaws for material up to 45 HRC	50 kg

Scope of delivery Item No. 41400 und 41400-HE:

- Stamping vise
- T-slot plate 596 × 496 mm
- Stamping jaws with parallels, 3mm
- Pneumatic-hydraulic power multiplier (1 - 360 bar)
- Workshop trolley
- Gauging blocks for measuring wear of stamping teeth
- Scaled workpiece endstop
- Protection shield

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

STAMPING TROLLEY WITH MAKRO·GRIP® DUAL STAMPING UNIT, EXTENDED, ON T-SLOT PLATE

ITEM NO.	TYPE	MAX. STAMPING RANGE	TYPE OF STAMPING JAWS	WEIGHT
41402	Extended	2 × 355 mm	Standard stamping jaws for material up to 35 HRC	360 kg
41402-HE	Extended	2 × 355 mm	High-End stamping jaws for material up to 45 HRC	360 kg

Scope of delivery:

- 2 stamping vises
- T-slot plate 596 × 496 mm
- 2 pairs of stamping jaws with parallels, 3 mm
- Pneumatic-hydraulic power multiplier (1 - 360 bar)
- Workshop trolley
- Gauging blocks for measuring wear of stamping teeth
- 2 scaled workpiece endstop
- 2 protection shield

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

The distance of the two units can be adjusted individually using the T-slots or marking bores, in order to match the distance of Quick·Point® pitch and thus the position of the Makro·Grip® vises' serration.

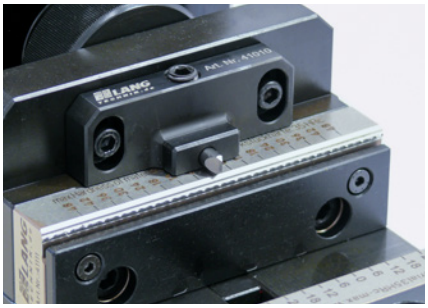
Center Marking Tool for Stamping Unit

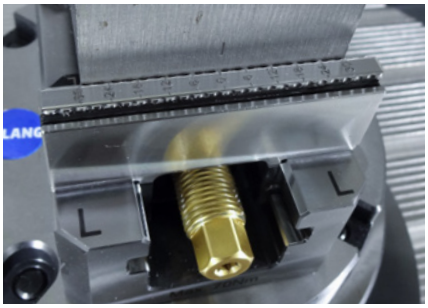
The center marking tool plunges a notch above the stamping contour at the center of the part.
This marking allows the exact and centric positioning of parts in Makro·Grip® 5-Axis Vises without any endstops.

CENTER MARKING TOOL

ITEM NO.	DESCRIPTION
41010	Center marking tool
41010-01	Spare marking stud

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





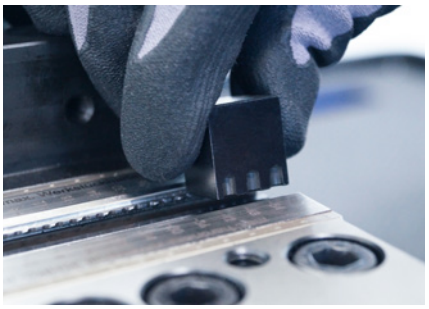
Gauging Blocks for measuring wear of Stamping Jaws

GAUGING BLOCKS FOR MEASURING WEAR OF STAMPING JAWS

ITEM NO.	UNIT
41020	1 set (3 pcs.)

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.

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.

Stamping Jaws
Standard and High-End version

STANDARD STAMPING JAWS WITH 3 MM PARALLELS

ITEM NO.	FOR MATERIALS	UNIT
41111	up to 35 HRC	1 pair

Standard stamping jaws for all materials up to 35 HRC.

HIGH-END STAMPING JAWS WITH 3 MM PARALLELS

ITEM NO.	FOR MATERIALS	UNIT
41112	up to 45 HRC	1 pair

Standard stamping jaws for all materials up to 45 HRC.

Reconditioning Stamping Jaws

RECONDITIONING STAMPING JAWS

ITEM NO.	VERSION
41111-01	Standard stamping jaws
41112-01	High-End stamping jaws

When the stamping teeth are worn out the jaws can be reconditioned up to 6 times per pair. The original thickness of a stamping jaw is 18 mm. With every reconditioning process the thickness is reduced by 0.5 mm until it has reached 15 mm (measured at the highest stamping tooth tip). If a stamping tooth is broken off more than the regular 0.5 mm per reconditioning is required. The total amount of possible reconditioning processes is reduced accordingly.

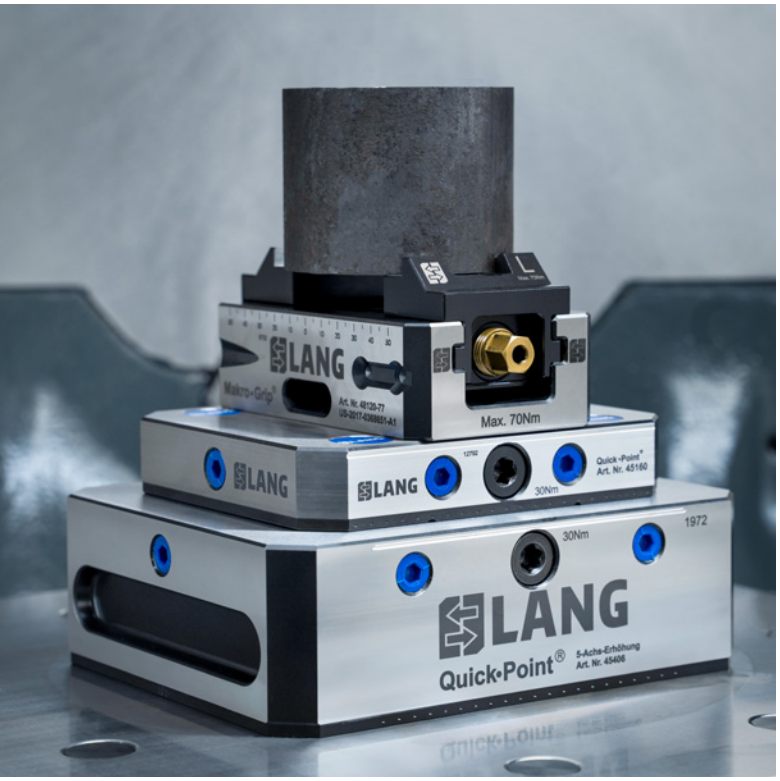
Note for dual stamping: With every reconditioning process we generally supply shims. The thickness of these shims is determined by the remaining thickness of the stamping jaw. Thickness of stamping jaw and shim will always amount to 18 mm. This guarantees that stamping jaws which have been reconditioned at different intervals can be used together, applying the same pressure on the workpiece.

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

Makro·4Grip
Round Part Clamping

PATENT PENDING

Stamping Technology for round parts



Due to its efficiency and the beneficial characteristics for workholding the LANG stamping technology still is the benchmark when it comes to processing raw parts in 5-axis machining. With the Makro·4Grip Clamping System there are completely new possibilities and applications for the stamping technology. **By retrofitting the Makro·Grip® stamping unit and LANG centering vises the form-fit clamping technology can be applied for round parts now easily and cost efficiently.**

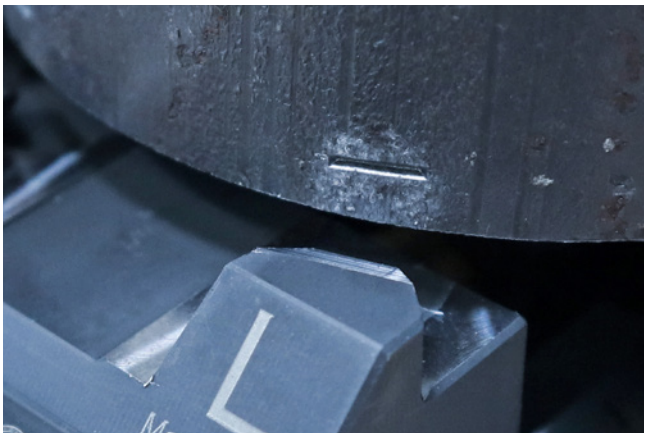
The jaws grip the pre-stamped part in four indentations at a clamping depth of 6.5 mm with up to 20 kN and therefore realize the same form-fit effect as for the well-proven system for prismatic parts. Makro·4Grip covers a clamping range of Ø 36 mm to Ø 300 mm and thus provides a seamless transition from the maximum range of the Preci·Point Collet Chuck.

The Makro·4Grip system consists of universal stamping jaws including stamping inserts for individual positioning as well as matching clamping jaws for all sizes of LANG centering vises. The clamping jaws are available as a separate set of jaws for all 77 and 125 vises.

Stamping imprint

Opposed to stamping prismatic parts where control marks give an indication about the correct stamping depth, the Makro·4Grip technology relies on a visual examination. Stamping round material, the correct imprint is consistently thick and deep.

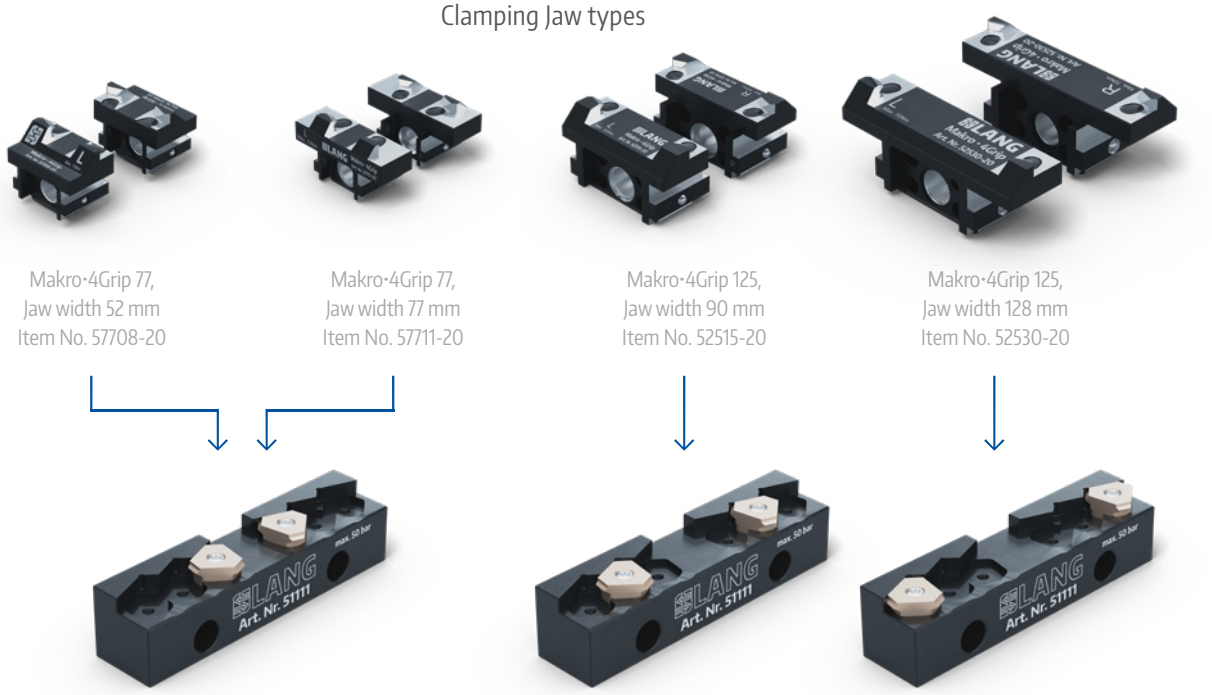
The required stamping pressure and depth depends on material and its diameter. In general, we recommend always starting with a low stamping pressure and slowly increasing it until the desired stamping depth in the workpiece is achieved.



Makro·4Grip Stamping Technology – The right setup

According to the vise and clamping jaw size used in the machining process, the four stamping inserts (2 inserts per stamping jaw) are placed differently in the respective seats. The scheme below shows how the stamping inserts need to be positioned for each clamping setup. Makro·4Grip clamping jaws and their clamping ranges can be found with the spare jaws of the Makro·Grip® 5-Axis Vise on pages 42 and 50.

Clamping Jaw types



Makro·4Grip 77,
Jaw width 52 mm
Item No. 57708-20

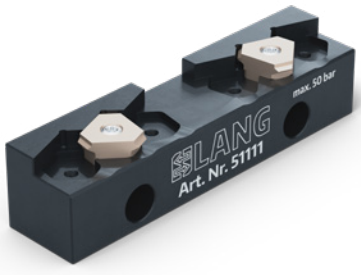
Makro·4Grip 77,
Jaw width 77 mm
Item No. 57711-20

Makro·4Grip 125,
Jaw width 90 mm
Item No. 52515-20

Makro·4Grip 125,
Jaw width 128 mm
Item No. 52530-20

Positioning of the stamping inserts

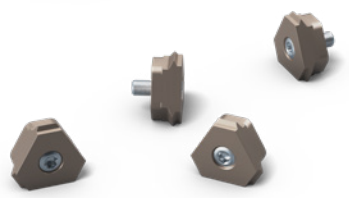
Makro·4Grip **Stamping Jaws and Inserts**



MAKRO·4GRIP STAMPING JAWS

ITEM NO.	QUANTITY
51111	1 pair

4 stamping jaw inserts are included.
Suitable for all Makro·Grip® stamping unit versions!



MAKRO·4GRIP STAMPING JAW INSERTS

ITEM NO.	QUANTITY
51111-40	4 pcs.

Each stamping jaw insert has a total of three cutting edges. If a cutting edge is worn, the stamping jaw insert can be turned two more times. For an even stamping and clamping quality, make sure that all four stamping inserts are turned / exchanged at the same time.