

# Vacuum CLAMPING SYSTEMS

## Innovative Clamping Systems

- MANUFACTURING • DEVELOPMENT
- RESEARCH • MEASURING TECHNOLOGY



MAIN CATALOGUE  
2017 E 08



Projected storage building  
completion in 2017



## Witte Barskamp

Witte was founded in 1969 and initially manufactured complex, high-precision parts for the aerospace industry. Today Witte has developed into a leading manufacturer of fixturing systems and gauges for all kinds of applications.

Almost all leading companies from automotive and aircraft industries now rely on Witte technology in order to maintain high quality in their production process.







**Certification**

Witte Baskamp KG is certified acc. to

- DIN EN ISO 9001
- DIN EN ISO 9100
- QSF-A (Aerospace suppliers)



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# Business activities of Witte Barskamp GmbH & Co. KG

## Why should you choose Witte Vacuum Systems?

Deciding on Witte systems solutions is a decision for the future and reduces investment for every further project for pumps and fixtures.

Established and proven in many different applications and industries

Full coverage for clamping suitable parts from 10mm<sup>2</sup> to 100mm<sup>2</sup>

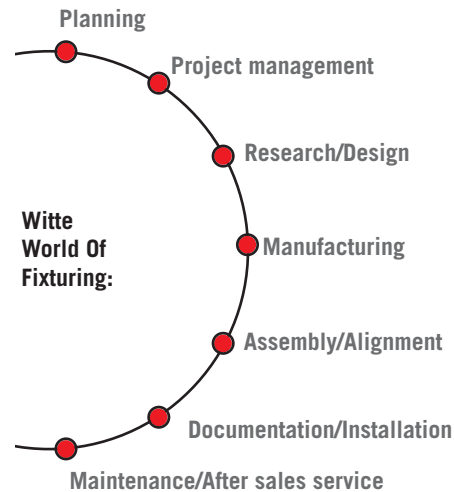
All kinds of chuck surfaces  
(T-slots, slots, macro and micro bores etc.)

Wide range of pumps and units available  
(Venturi, vane pumps, compressors)

From short term delivery catalogue items to semi-standards to complex individual custom-built clamping systems

Continuous new and further developments

No matter what demand and individual application you have, Witte offers you the correct technical and cost-effective solution.



- As everything is done under one roof, time consuming interfaces and inevitable cost arising from overlapping are dispensed with.
- International sales and service network through own subsidiaries and regional solution partners.
- Experienced project teams with sound knowledge in almost all standards of the automotive industry and their related partners.

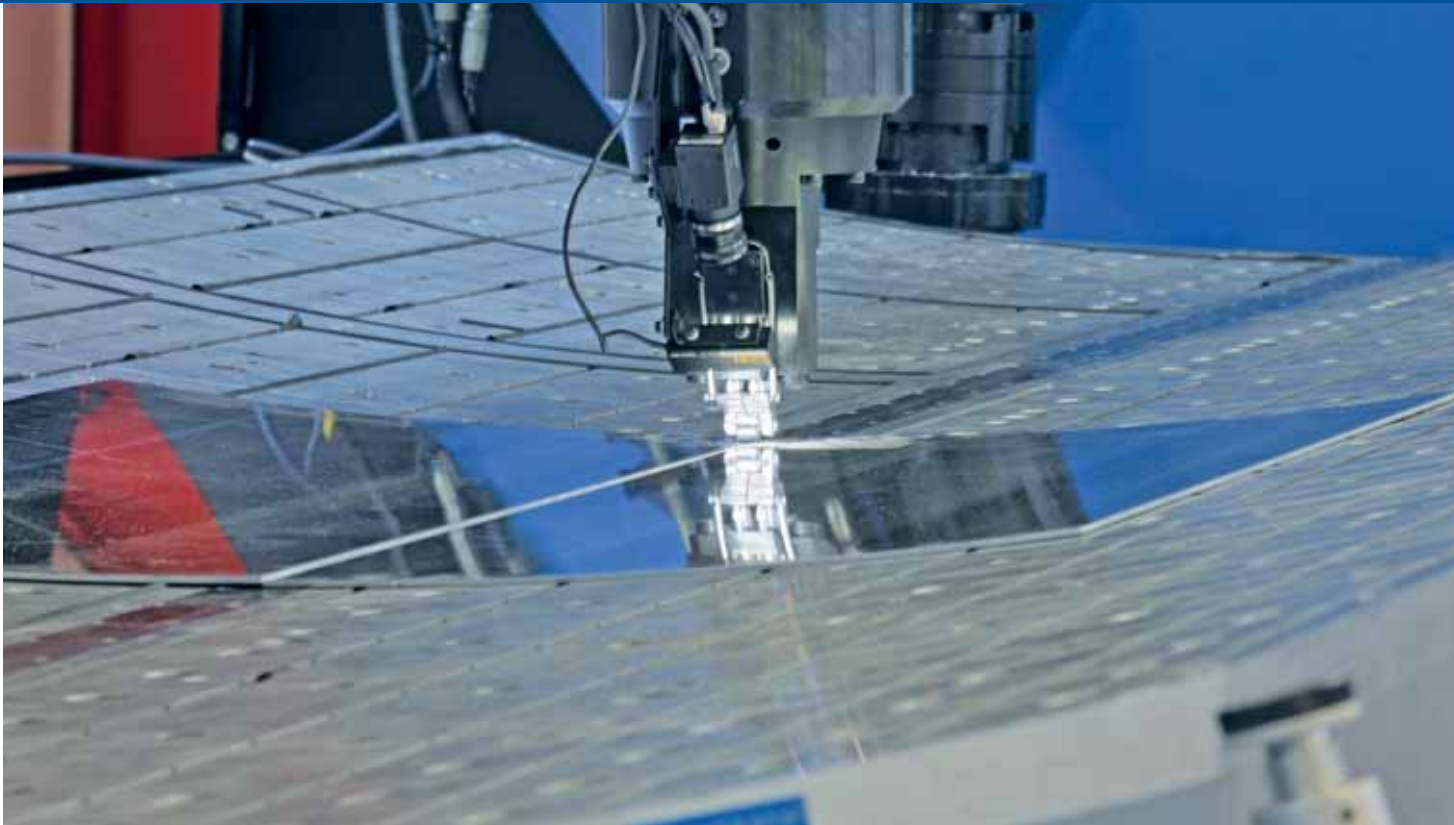
## www - Witte worldwide

We meet the challenges of our customers wherever they occur. Our sales and service network guarantees support worldwide. Witte companies and subsidiaries in Singapore, Mexico and USA as well as long term partners in all major industrial nations ensure the same high service level all over the World.



## www - Witte worldwide:

[www.witte-barskamp.de](http://www.witte-barskamp.de)  
[www.alufix.de](http://www.alufix.de)  
[www.witteasia.com](http://www.witteasia.com)  
[www.witteamerica.com](http://www.witteamerica.com)



## Vacuum clamping systems from Witte

- Machining (milling, turning, drilling, grinding)
- Engraving
- Polishing
- Deburring
- Coating
- Printing
- Irradiation
- Measuring (tactile, optical)
- Testing, simulating
- Moving and positioning
- Friction-stir welding
- Laser welding processes
- Visual analysis

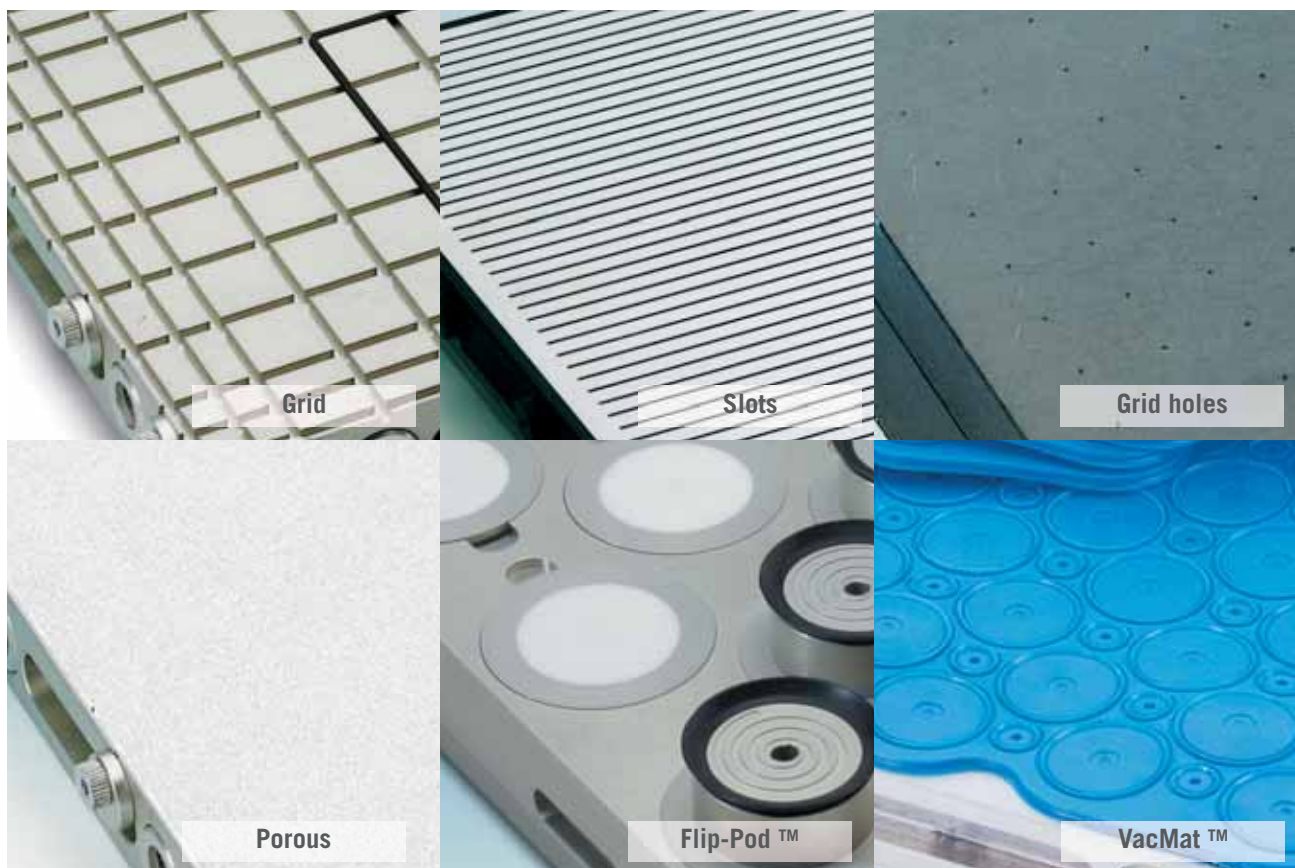
Vacuum supply for Witte vacuum clamping systems is created using either oil lubricated rotary vane pumps or the proven liquid ring pumps. There are more than 27 variations and sizes available as pumps or units. Venturi valves are obtainable. On turning machines vacuum is catered for via rotating joints directly through the hollow spindle of the machine. Vacuum clamping systems with integrated pumps, tanks, energy modules can be operated completely independently and free

from any external supply lines. Complex vacuum fixtures can be equipped with mechanical, pneumatic, hydraulic or electrical clamping, positioning and /or handling units.





## System solutions in detail



### Possible material of vacuum chucks

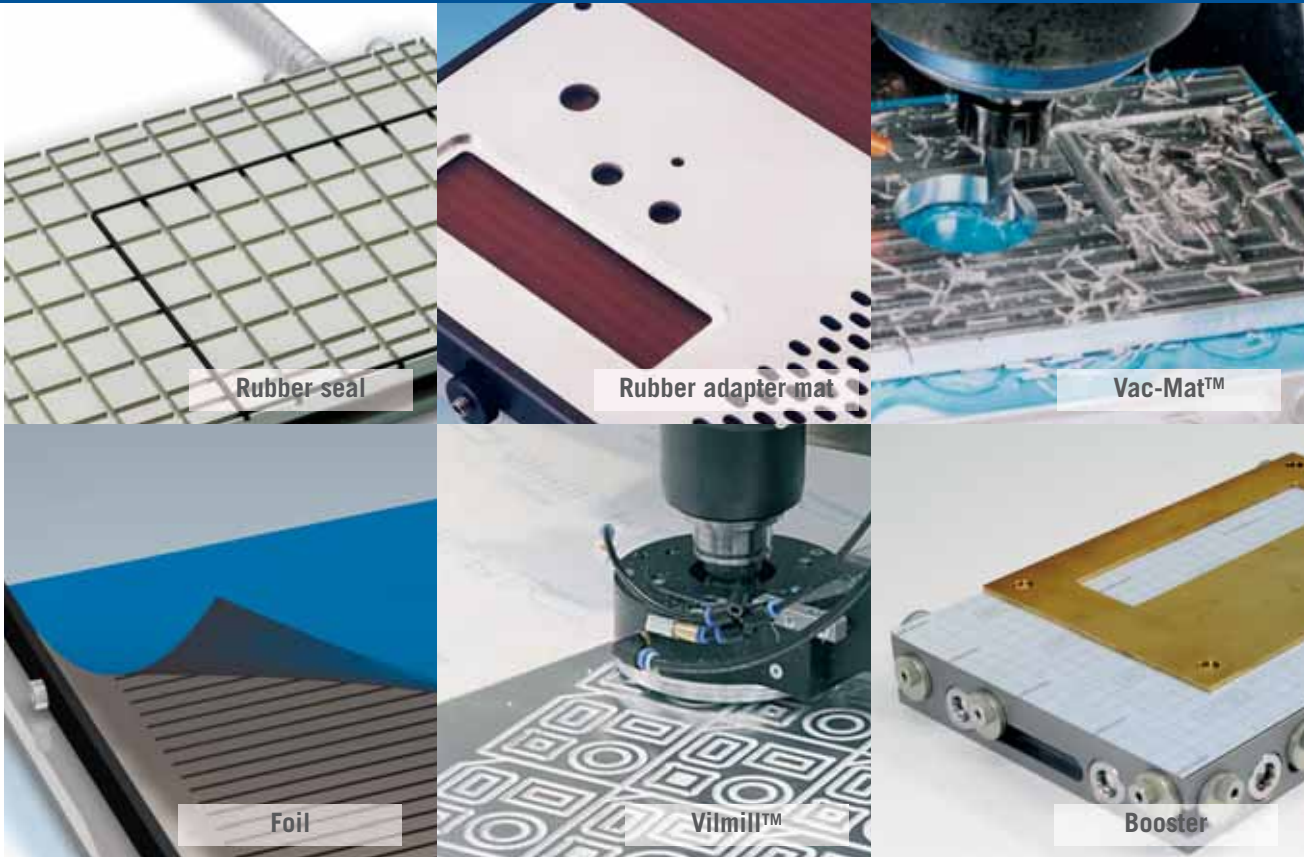
- Steel\*
- Aluminium
- Plastic\*
- Ceramic\*
- Sinterbronze

\*) Available only on request

### Chuck types

- Grid chuck
- Slot chuck
- Grid hole chuck
- Vac-Mat chuck
- Microporous chuck
- Macroporous chuck
- Flip-Pod chuck
- Grid slot chuck

- Heatable clamping chucks
- Coolable clamping chucks
- Light transmitting clamping chucks



**Replacement materials:**

Rubber seal, rubber adapter mat, Vac-Mat™, Foil, Booster, Vilmill™

**System complements**



Freeze clamping technology

**Witte IceVice freeze clamping technology:**

Witte Weiguß mould clamping technology ideal for manufacturing of parts, which are almost impossible to clamp conventionally due to lack of suitable clamping surfaces.

**Witte Weiguß mould clamping technology:**

Ideal for manufacturing of parts, which are almost impossible to clamp conventionally due to lack of suitable clamping surfaces.



Mould clamping technology



## Vacuum supply, overview



Vacuum units



Modular vacuum units



Compact vacuum units



Compact vacuum systems



Vacuum pumps



Liquid ring pumps



# Vacuum Supply

## Pumps

## Units

## Workstations

### Application

We have vacuum pumps available of different types to meet each individual need.

Sizes and capacities vary from 5m<sup>3</sup>/h up to 500m<sup>3</sup>/h and more to guarantee optimal vacuum clamping whatever the circumstances

### Advantages

- Reliable in continuous operation
- Easy to maintain
- Modular unit has integrated liquid separator
- Space saving assembly for easy access
- Integrated air filter, safety valve
- Witte repair service with spare parts in stock
- Pumps from 5m<sup>3</sup>/h to over 500m<sup>3</sup>/h, also on request dry running pumps
- Liquid ring pumps run on regular machining coolant, pump temperature is regulated by an integrated radiator

### Handling

- Small light pumps available according to individual need
- Integrated vacuum storage tank
- Different voltages available
- Castors available for mobility in workshop area
- Easy access for emptying liquid separator



## Choosing a vacuum unit or pump

Depending on your operation Witte offers different vacuum supply systems:

### Handheld pumps / Pumps

are standard, almost all of which can be used together with our liquid separators if fluids are involved and sucked in during machining process  
▶ page 10

### Vacuum units

In addition to the pumps mentioned above the vacuum units also have an **additional vacuum tank** as well as various safety devices.  
▶ page 12

### Modular vacuum unit

In addition to the pump and tank the modular vacuum units also have an **integrated liquid separator** and various safety devices  
▶ page 16

### Liquid ring pumps

These pumps are highly recommended when **large amounts of cooling fluids** are sucked in during the machining process  
▶ page 14

Selection of vacuum supply depending on dimension of clamping surface :

| Area                 | Suction-capacity     | Type                 | No.          |
|----------------------|----------------------|----------------------|--------------|
| <1200cm <sup>2</sup> | 5m <sup>3</sup> /h   | Vacuum pump          | <b>99170</b> |
| <1500cm <sup>2</sup> | 10m <sup>3</sup> /h  | Vacuum pump          | <b>95969</b> |
|                      | 10m <sup>3</sup> /h  | Vacuum unit          | <b>81010</b> |
|                      | 10m <sup>3</sup> /h  | Vacuum unit          | <b>81011</b> |
|                      | 10m <sup>3</sup> /h  | Modular unit         | <b>80172</b> |
|                      | 10m <sup>3</sup> /h  | Modular unit         | <b>80173</b> |
| <5000cm <sup>2</sup> | 16m <sup>3</sup> /h  | Vacuum pump          | <b>82116</b> |
|                      | 16m <sup>3</sup> /h  | Modular unit         | <b>82146</b> |
| <1m <sup>2</sup>     | 21m <sup>3</sup> /h  | Vacuum pump          | <b>80078</b> |
|                      | 21m <sup>3</sup> /h  | Vacuum unit          | <b>80000</b> |
|                      | 21m <sup>3</sup> /h  | Modular unit         | <b>80175</b> |
|                      | 25m <sup>3</sup> /h  | Liquid ring pump     | <b>93801</b> |
| <2m <sup>2</sup>     | 63m <sup>3</sup> /h  | Vacuum pump          | <b>80126</b> |
|                      | 63m <sup>3</sup> /h  | Modular unit, mobile | <b>82150</b> |
|                      | 65m <sup>3</sup> /h  | Liquid ring pump     | <b>93803</b> |
| <3m <sup>2</sup>     | 100m <sup>3</sup> /h | Vacuum pump          | <b>84410</b> |
|                      | 100m <sup>3</sup> /h | Liquid ring pump     | <b>93804</b> |
| <4,5m <sup>2</sup>   | 160m <sup>3</sup> /h | Vacuum pump          | <b>84412</b> |
|                      | 160m <sup>3</sup> /h | Vacuum unit, mobile  | <b>84414</b> |
|                      | 232m <sup>3</sup> /h | Liquid ring pump     | <b>93807</b> |
|                      | 250m <sup>3</sup> /h | Vacuum pump          | <b>84413</b> |
|                      | 250m <sup>3</sup> /h | Vacuum unit, mobile  | <b>84208</b> |











### FLIP-POD™


Each m<sup>2</sup> of FLIP-POD™ surface requires 60-100m<sup>3</sup>/h vacuum suction capacity

### Witte VAC-MAT™

| No. of Mats | Required suction capacity  |
|-------------|----------------------------|
| 1           | 3 - 6m <sup>3</sup> /h     |
| ≥ 8         | 16 - 21m <sup>3</sup> /h   |
| ≥ 20        | 40 - 63m <sup>3</sup> /h   |
| ≥ 50        | 100 - 160m <sup>3</sup> /h |

## Choosing vacuum supply according to working conditions

| Working conditions   | Dry machining  | Working with fluids  |
|--|--|--|
| Small clamping area,<br>Small loss of vacuum<br>Low machining forces<br>▼            | <br>Handheld pump                     | <br>Handheld pump with liquid separator                       |
| Larger clamping area,<br>Higher loss of vacuum,<br>Higher machining forces<br>▼      | <br>Vacuum Unit                       | <br>Vacuum unit with liquid separator                         |
| Large clamping area<br>High loss of vacuum<br>High machining forces<br>▼             | <br>Modular vacuum unit              | <br>Liquid ring pump   |
| Very large clamping area<br>Very high vacuum loss<br>Very high machining forces<br>▼ | <br>Liquid ring pump                | <br>Vacuum unit,<br>mobile, with automatic liquid separator |
| Very large clamping area<br>Very high vacuum loss<br>Very high machining forces      | <br>Customized solutions on request | <br>Customized solutions on request                         |

 Modular vacuum units and workstations are available with or without liquid separator





## Vacuum pumps

Oil lubricated vacuum pumps offer the following advantages:

- Air-cooled, therefore do not require coolant
- Highly reliable
- Low operating costs
- Good resistance to condensation
- Integrated oil mist separator, oil filter, check valve on suction side with sieve



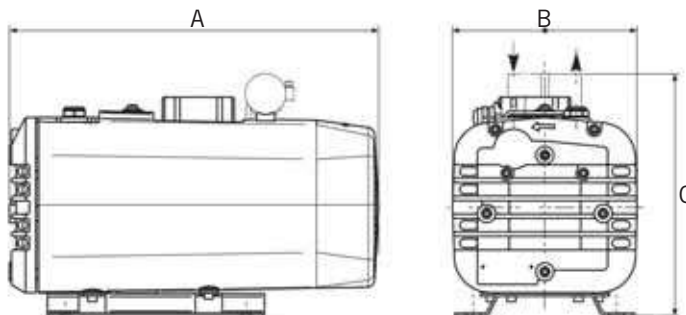
## Vacuum pump

220-240V working voltage, dry lubricated

| Nr.    | m <sup>3</sup> /h | Volt | Hz | End press. | Kw   | DB | A   | B   | C   | kg   |
|--------|-------------------|------|----|------------|------|----|-----|-----|-----|------|
| 99170  | 5                 | 230  | 50 | 150 mbar   | 0,14 | 63 | 272 | 153 | 200 | 8    |
| 288808 | 15                | 230  | 50 | 120 mbar   | 0,66 | 63 | 412 | 206 | 271 | 29,5 |
| 288809 | 15                | 400  | 50 | 120 mbar   | 0,55 | 63 | 412 | 206 | 271 | 27,5 |
| 288810 | 25                | 230  | 50 | 120 mbar   | 0,75 | 65 | 412 | 206 | 271 | 29   |
| 288811 | 25                | 400  | 50 | 120 mbar   | 0,75 | 65 | 412 | 206 | 271 | 28   |
| 288812 | 40                | 230  | 50 | 120 mbar   | 1,5  | 68 | 484 | 308 | 308 | 40   |
| 288813 | 40                | 400  | 50 | 120 mbar   | 1,5  | 68 | 484 | 308 | 308 | 39   |
| 288814 | 60                | 400  | 50 | 120 mbar   | 1,5  | 70 | 710 | 363 | 383 | 66   |



99170  
Vacuum pump 5m<sup>3</sup>/h



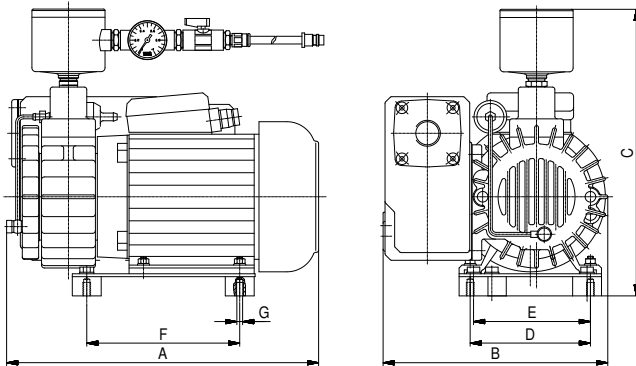
- i** Supply includes
- 1 pce connection unit comprising:
  - 3m vacuum hose
  - 3/2 way aerated valve
  - 1 vacuummeter

**i** All vacuum pumps can be used with 60 Hz

## Vacuum pump

230/400 V working voltage, oil lubricated

| Nr.    | m <sup>3</sup> /h | Volt | Hz | End press. | Kw   | RPM                     | DB | Oil  | A   | B   | C   | D   | E   | F   | G  |      |
|--------|-------------------|------|----|------------|------|-------------------------|----|------|-----|-----|-----|-----|-----|-----|----|------|
| 95969  | 10                | 230  | 50 | 20 mbar    | 0,37 | 1350 1/2 <sub>min</sub> | 59 | 0,3l | 301 | 234 | 297 | 100 | 83  | 150 | M8 | 20,5 |
| 281548 | 10                | 400  | 50 | 20 mbar    | 0,37 | 1350 1/2 <sub>min</sub> | 59 | 0,3l | 301 | 234 | 297 | 100 | 83  | 150 | M8 | 20,5 |
| 82115  | 16                | 230  | 50 | 20 mbar    | 0,55 | 2650 1/2 <sub>min</sub> | 60 | 0,3l | 301 | 234 | 297 | 100 | 83  | 150 | M8 | 19   |
| 82116  | 16                | 400  | 50 | 20 mbar    | 0,55 | 2650 1/2 <sub>min</sub> | 60 | 0,3l | 301 | 234 | 297 | 100 | 83  | 150 | M8 | 19   |
| 80156  | 20                | 230  | 50 | 20 mbar    | 0,75 | 2720 1/2 <sub>min</sub> | 62 | 0,5l | 401 | 223 | 254 | 131 | 127 | 210 | M8 | 22   |
| 80078  | 20                | 400  | 50 | 20 mbar    | 0,75 | 2720 1/2 <sub>min</sub> | 62 | 0,5l | 401 | 223 | 254 | 131 | 127 | 210 | M8 | 22   |

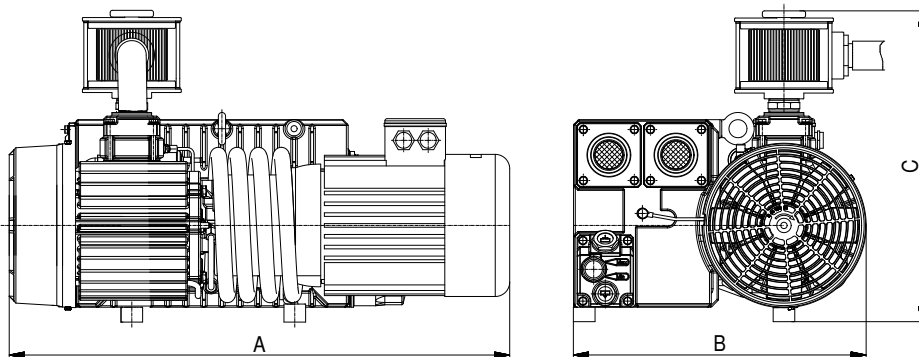


82115  
Vacuum pump 16m<sup>3</sup>/h

## Vacuum pump

400V working voltage, oil lubricated

| Nr.   | m <sup>3</sup> /h | Volt | Hz | End press. | Kw  | RPM                     | DB | Oil  | A    | B   | C   |     |
|-------|-------------------|------|----|------------|-----|-------------------------|----|------|------|-----|-----|-----|
| 80126 | 63                | 400  | 50 | 2 mbar     | 2,0 | 1500 1/2 <sub>min</sub> | 64 | 2l   | 640  | 406 | 435 | 62  |
| 84410 | 100               | 400  | 50 | 2 mbar     | 2,7 | 1500 1/2 <sub>min</sub> | 65 | 2l   | 699  | 406 | 435 | 80  |
| 84412 | 160               | 400  | 50 | 2 mbar     | 5,5 | 1500 1/2 <sub>min</sub> | 70 | 3l   | 920  | 536 | 555 | 150 |
| 84413 | 250               | 400  | 50 | 2 mbar     | 7,5 | 1500 1/2 <sub>min</sub> | 72 | 6,5l | 1000 | 581 | 555 | 200 |



84413  
Vacuum pump 250m<sup>3</sup>/h



- Supply includes
- 1 pce connection unit comprising:
  - 3m vacuum hose
  - 3/2 way aerated valve
  - 1 vacuummeter

- All vacuum pumps  
can be used with 60 Hz



## Vacuum units

Operating vacuum required can be produced in many ways.

Witte vacuum units feature the following:

- Oil lubricated vacuum pumps with an end vacuum rate of 20mbar absolute at full suction capability of i.e. 10m<sup>3</sup> upto 250m<sup>3</sup> per hour
- Integrated pressure difference switch, which automatically switches the vacuum pump on or off thereby ensuring vacuum during machining but avoiding unnecessary idle running
- Protection switch which protects electric motor from overheating
- Air filter which protects pump from dirt (made of acrylic glass with exchangeable air filter cartridge)
- Careful assembly of compatible components guarantee trouble-free and almost maintenance-free operation of Witte vacuum units in many applications
- Drainage screw for coolants which have been sucked in
- 3m connecting cable with CEE or Schuko plug

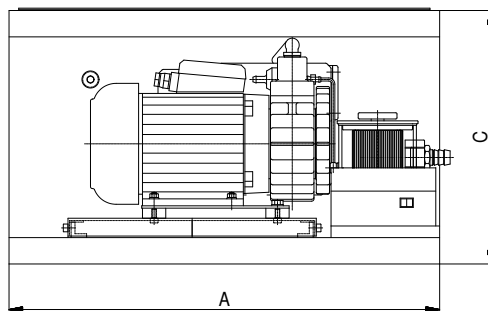
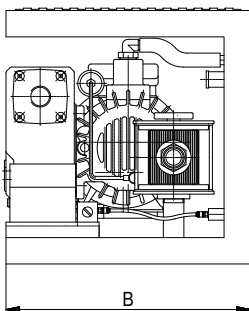


85323  
Vacuum unit 16m<sup>3</sup>/h

## Witte vacuum unit with U tank

230/400 V working voltage

| Nr.   | m <sup>3</sup> /h | Volt | Hz | End press. | Kw   | RPM                     | DB | Oil  | A   | B   | C   | kg  |
|-------|-------------------|------|----|------------|------|-------------------------|----|------|-----|-----|-----|-----|
| 81010 | 10                | 230  | 50 | 20mbar     | 0,37 | 1350 1/2 <sub>min</sub> | 59 | 0,3l | 555 | 315 | 327 | 45  |
| 81011 | 10                | 400  | 50 | 20mbar     | 0,37 | 1350 1/2 <sub>min</sub> | 59 | 0,3l | 555 | 315 | 327 | 45  |
| 85323 | 16                | 230  | 50 | 20mbar     | 0,55 | 2650 1/2 <sub>min</sub> | 60 | 0,3l | 555 | 315 | 327 | 42  |
| 85324 | 16                | 400  | 50 | 20mbar     | 0,55 | 2650 1/2 <sub>min</sub> | 64 | 0,3l | 555 | 315 | 327 | 42  |
| 80165 | 20                | 230  | 50 | 20mbar     | 0,75 | 2720 1/2 <sub>min</sub> | 62 | 0,5l | 555 | 315 | 327 | 47  |
| 80000 | 20                | 400  | 50 | 20mbar     | 0,75 | 2720 1/2 <sub>min</sub> | 62 | 0,5l | 555 | 315 | 327 | 47  |
| 80001 | 63                | 400  | 50 | 20mbar     | 2,0  | 1500 1/2 <sub>min</sub> | 65 | 2l   | 800 | 500 | 500 | 105 |



- i** Supply includes
- 1 pce connection unit comprising:
    - 3m vacuum hose
    - 3/2 way aerated valve
    - 1 vacuummeter

**i** All vacuum pumps can be used with 60 Hz



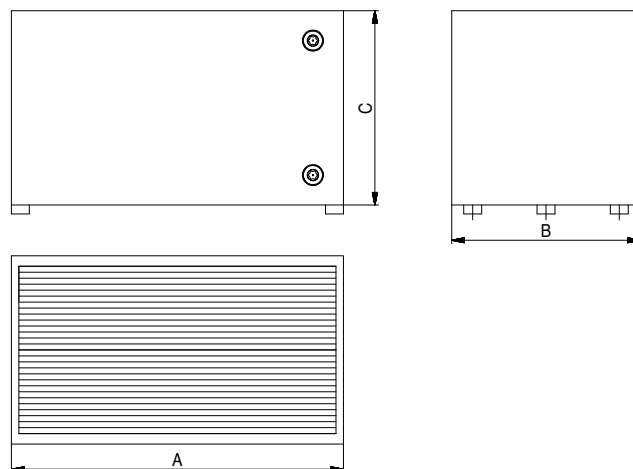
## Additional vacuum tank

| Nr.          | A   | B   | C   | Connection        | V    | kg   |
|--------------|-----|-----|-----|-------------------|------|------|
| <b>80410</b> | 555 | 315 | 325 | Inner thread G ¾" | 54l  | 25,6 |
| <b>80379</b> | 800 | 500 | 530 | Inner thread G ¾" | 210l | 65   |

- for increasing vacuum storage volume of units
- acts as additional filter and separator for dirt or fluid
- reduces actual running time of vacuum pump



The tank is equipped with two viewing glasses. Dirt and fluid can be seen and drained immediately.



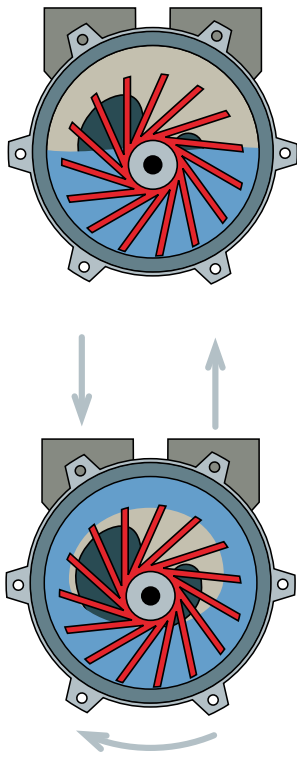
## Maintenance and service kits

Maintenance and service kits for regular care of vacuum units and pumps

| For pump/unit with suction capacity        | Wear parts kit         | Service kit                      | Gasket kit    |
|--|------------------------|----------------------------------|---------------|
| 10m <sup>3</sup> /h - 16m <sup>3</sup> /h  | <b>280711</b>          | <b>82151</b>                     | <b>280721</b> |
| 20m <sup>3</sup> /h                        | <b>280712</b>          | <b>80416</b>                     | <b>280722</b> |
| 63m <sup>3</sup> /h - 100m <sup>3</sup> /h | <b>280713</b>          | <b>80417</b>                     | <b>280723</b> |
| 160m <sup>3</sup> /h                       | <b>280714</b>          | <b>280698</b>                    | <b>15202</b>  |
| 250m <sup>3</sup> /h                       | <b>280715</b>          | <b>280699</b>                    | <b>15205</b>  |
| Comprising of:                             | Wear parts,<br>Gaskets | Filter elements,<br>gaskets, oil | Gaskets       |

Maintenance and service can be carried out on site with these kits.





- a Liquid ring vacuum pump
- b Suction filter
- c Condenser
- d Motor
- e Chiller
- f Fluid reservoir
- g Level indicator
- h Operation selection
- i Drain plug
- k Valve
- m Air release valve
- n Shockproof plug

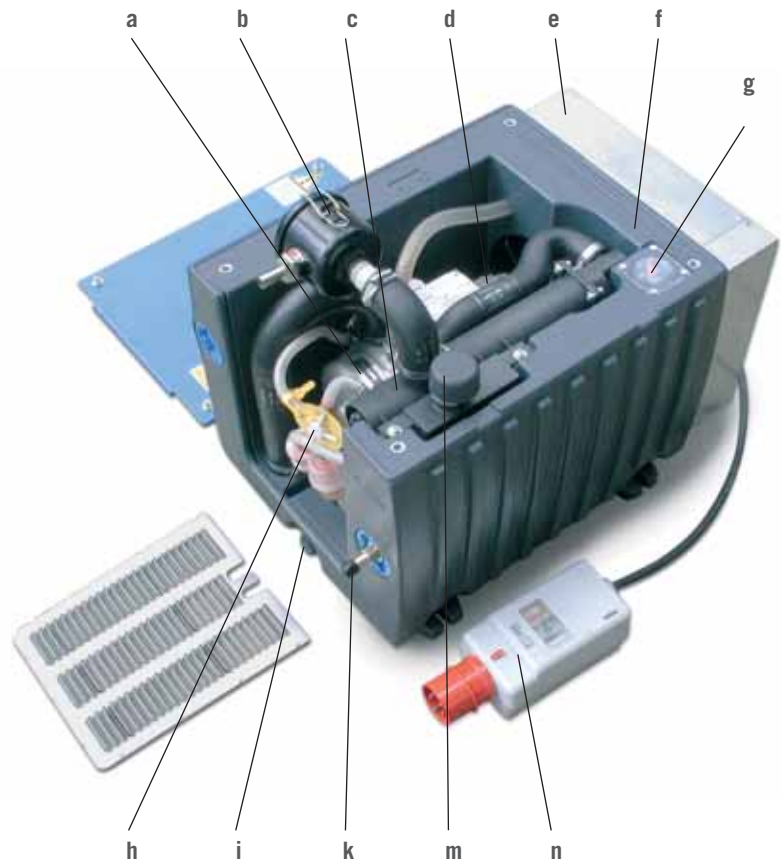
## Liquid ring vacuum pumps

### Only one unit for vacuum supply and liquid separation

These robust pumps, are low on wear-and-tear and maintenance, work at up to 50 mbar vacuum and do not need an additional liquid separator.

A fast turning impeller causes water in the pump to rotate (see picture on left) simultaneously sealing itself off the impeller. A washable filter and a patented condenser clean the air being sucked in before it enters the pump. Cooling lubricant is integrated into pump's operating cycle and a valve allows removal of excess fluid which can be returned to tool machine whilst in operation.

An air chiller protects the unit from overheating.



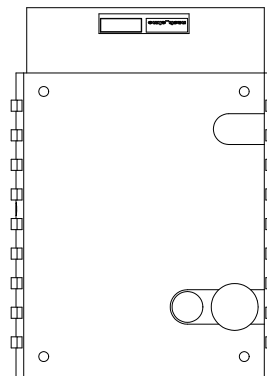
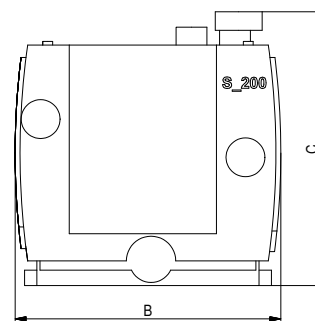
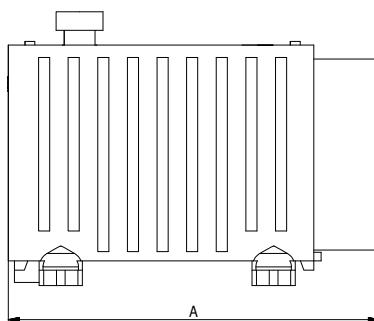
## Liquid ring vacuum pump

| Nr.   | m³/h | Volt | End press. | Kw   | DB | Hz | A   | B   | C    | kg  |
|-------|------|------|------------|------|----|----|-----|-----|------|-----|
| 93801 | 25   | 400  | 150-50mbar | 0,83 | 66 | 50 | 463 | 432 | 602  | 38  |
| 93802 | 48   | 400  | 150-50mbar | 1,2  | 70 | 50 | 515 | 572 | 743  | 58  |
| 93803 | 68   | 400  | 150-50mbar | 2,4  | 74 | 50 | 515 | 572 | 743  | 71  |
| 93804 | 105  | 400  | 150-50mbar | 3,85 | 77 | 50 | 525 | 620 | 920  | 95  |
| 93805 | 150  | 400  | 150-50mbar | 4    | 74 | 50 | 710 | 845 | 1100 | 188 |
| 93806 | 198  | 400  | 150-50mbar | 5,5  | 76 | 50 | 710 | 845 | 1100 | 198 |
| 93807 | 232  | 400  | 150-50mbar | 7,5  | 73 | 50 | 710 | 845 | 1100 | 275 |



### Supply includes

- 1 pce connection unit comprising:
- 3m vacuum hose
- 3/2 way aerated valve
- 1 vacuummeter



## Liquid ring vacuum pump – Accessories

| Nr.   | Description                       | for pump    | Version  | kg  |
|-------|-----------------------------------|-------------|----------|-----|
| 13468 | Air filter element 3µm, polyester | Type 22     | Washable | 79  |
| 13469 | Air filter element 3µm, polyester | Type 45-100 | Washable | 330 |
| 13471 | Air filter element 3µm, polyester | Type 232    | Washable | 480 |
| 13534 | Water filter (exchange in pairs)  | all         | Washable | 40  |



Preference item:  
Articles with green diamond  
are available ex stock!



All vacuum pumps can be used with 60 Hz





## Modular vacuum units

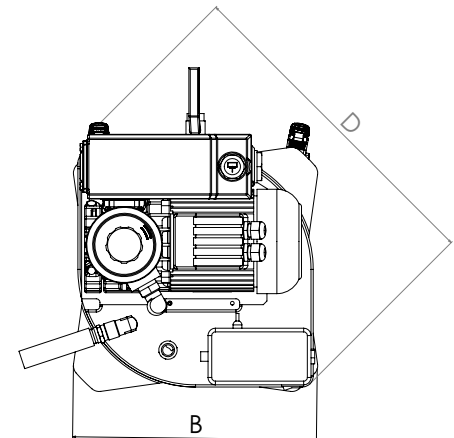
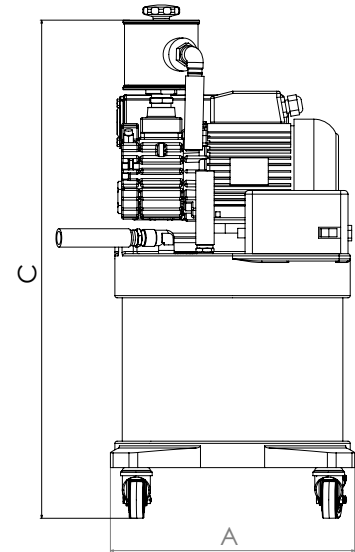
### Advantages:

- Vacuum storage unit and liquid separator are integrated - an additional liquid separator is not required
- Space saving assembly of all components
- See-through unit for liquid separator and vacuum storage unit all in one means safety "at a glance"
- Different storage volumes possible simply by changing acrylic glass cylinder
- Integrated air filter, drain separator, overvoltage relay, pressure difference switch
- Available with different pump types from 10m<sup>3</sup> to 100m<sup>3</sup>, on request also available with dry running pumps



### Supply includes

- 1 pce connection unit comprising:
  - 3m vacuum hose
  - 3/2 way aerated valve
  - 1 vacuummeter



## Modular vacuum unit

230/400 V working voltage

| Nr.   | m <sup>3</sup> /h | Volt | Hz | End press. | Kw   | RPM                     | DB | Oil  | A    | B   | C   | D   |      |
|-------|-------------------|------|----|------------|------|-------------------------|----|------|------|-----|-----|-----|------|
| 80172 | 10                | 230  | 50 | 20 mbar    | 0,37 | 1350 1/2 <sub>min</sub> | 60 | 0,3l | ø320 | 360 | 650 | 460 | 32,5 |
| 80173 | 10                | 400  | 50 | 20 mbar    | 0,37 | 1350 1/2 <sub>min</sub> | 60 | 0,3l | ø320 | 360 | 650 | 460 | 32,5 |
| 82147 | 16                | 230  | 50 | 20 mbar    | 0,55 | 2650 1/2 <sub>min</sub> | 60 | 0,3l | ø320 | 360 | 620 | 460 | 30,5 |
| 82146 | 16                | 400  | 50 | 20 mbar    | 0,55 | 2650 1/2 <sub>min</sub> | 60 | 0,3l | ø320 | 360 | 620 | 460 | 30,5 |
| 80174 | 20                | 230  | 50 | 20 mbar    | 0,75 | 2720 1/2 <sub>min</sub> | 62 | 0,5l | ø320 | 420 | 620 | 460 | 33,5 |
| 80175 | 20                | 400  | 50 | 20 mbar    | 0,75 | 2720 1/2 <sub>min</sub> | 62 | 0,5l | ø320 | 420 | 620 | 460 | 33,5 |




Preference item:  
Articles with green diamond  
are available ex stock!



All vacuum pumps can be used with 60 Hz

## Modular vacuum unit

400V working voltage

| Nr.   | m <sup>3</sup> /h | Volt | Hz | End press. | Kw  | RPM                     | DB | Oil | A   | B   | C    | kg  |
|---|-------------------|------|----|------------|-----|-------------------------|----|-----|-----|-----|------|-----|
|  82150 | 63                | 400  | 50 | 2mbar      | 2,0 | 1500 1/2 <sub>min</sub> | 64 | 2l  | 640 | 640 | 1055 | 118 |
| 83467   | 100               | 400  | 50 | 2mbar      | 2,7 | 1500 1/2 <sub>min</sub> | 65 | 2l  | 640 | 640 | 1055 | 132 |

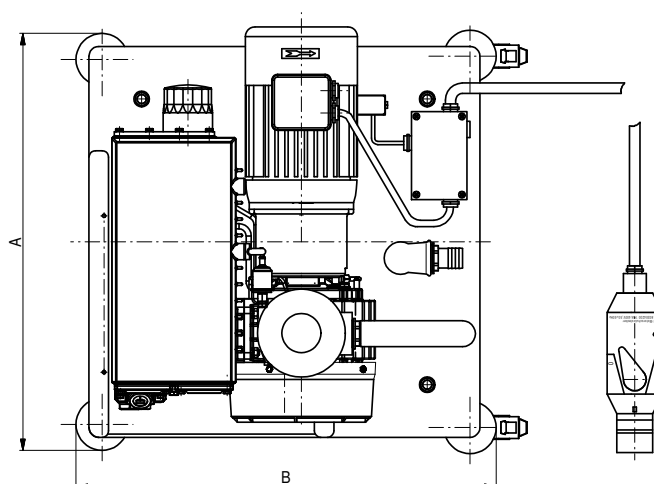
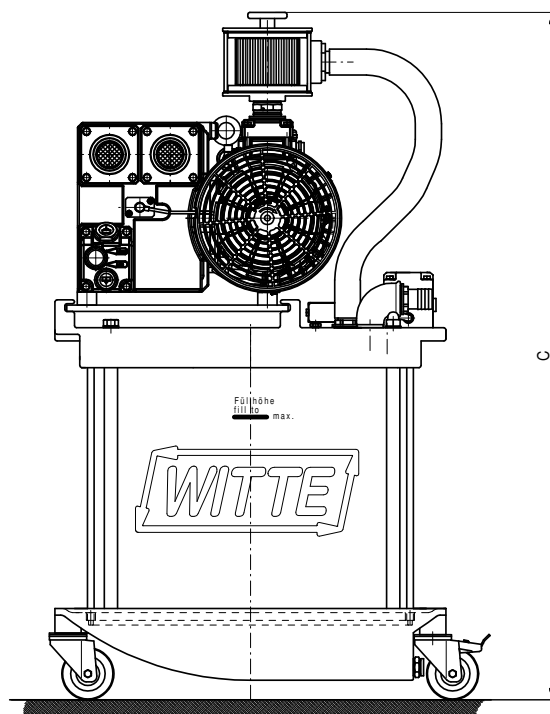


### Supply includes

- 1 pce connection unit comprising:
- 3m vacuum hose
- 3/2 way aerated valve
- 1 vacuummeter



83467 Modular vacuum unit, 100m<sup>3</sup>/h



All pumps in modular units have oil lubrication. Dry running vacuum pumps for modular units are available on request



Preference item:  
Articles with green diamond  
are available ex stock!



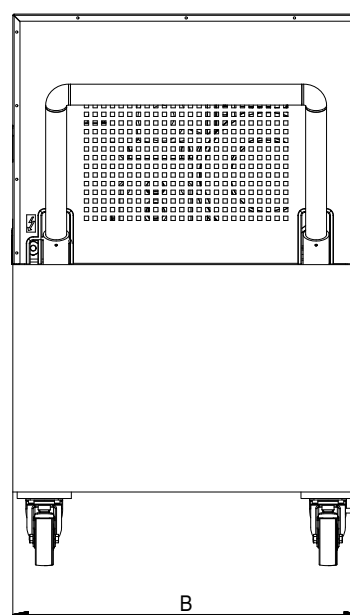
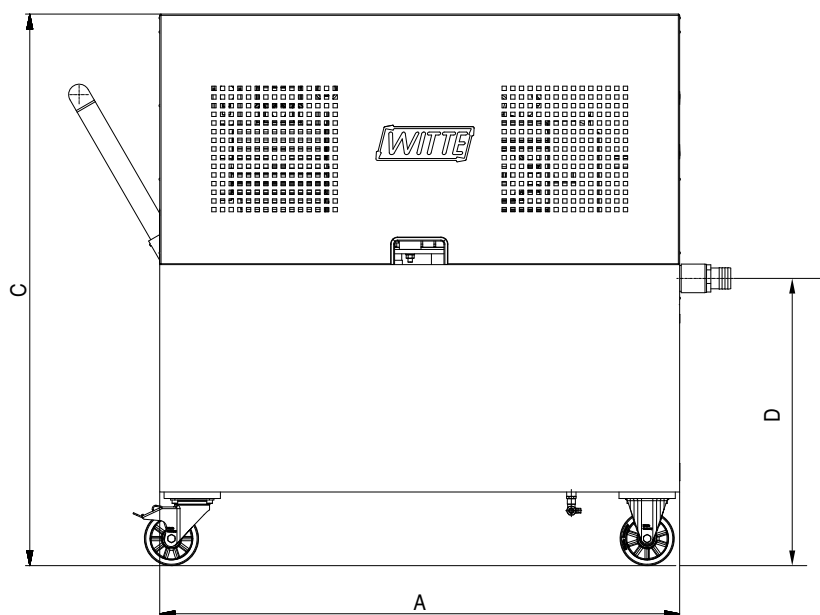
All vacuum pumps  
can be used with 60 Hz



## Witte vacuum unit

400V working voltage, mobile

| Nr.   | m <sup>3</sup> /h | Volt | Hz    | End press. | Kw   | RPM  | DB   | Oil  | A    | B    | C    | D   | kg  |
|-------|-------------------|------|-------|------------|------|------|------|------|------|------|------|-----|-----|
| 92302 | 100               | 400  | 50    | 2mbar      | 2,7  | 1500 | 65   | 2l   | 1000 | 800  | 1274 | 525 | 210 |
| 84414 | 160               | 400  | 50    | 2mbar      | 5,5  | 1500 | 70   | 5l   | 1000 | 800  | 1274 | 525 | 337 |
| 84208 | 250               | 50   | 2mbar | 7,5        | 1500 | 72   | 6,5l | 1000 | 800  | 1274 | 525  | 337 |     |



- i** Supply includes
- 1 pce connection unit comprising:
    - 3m vacuum hose
    - 3/2 way aerated valve
    - 1 vacuummeter

**i** All vacuum pumps can be used with 60 Hz

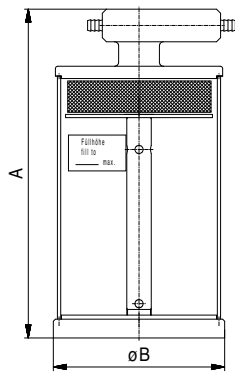
## Witte Compact Systems

### Vacuum generation for large scale vacuum chucks or multiple operations

For process-safe vacuum clamping on a large scale corresponding powerful vacuum generation is required. These vacuum generators comprise of several vacuum pumps connected together and arranged one above the other in a space-saving rack. An integrated controller assumes fully automatic operation of the equipment thereby achieving a high degree of process reliability. Continuous stand-by operation and a large vacuum tank enable set up at a distance from the actual vacuum clamping system. They are particularly well suited as a central power generation system, for example for the supply of complete machine halls and / or several manufacturing centers equipped with vacuum chucks. The wide range of these central vacuum systems varies from  $100\text{m}^3 / \text{h}$  to more than  $1000\text{m}^3 / \text{h}$  suction capacity with a maximum ultimate vacuum of up to 0,5 mbar. Versions in special arrangements available on request.

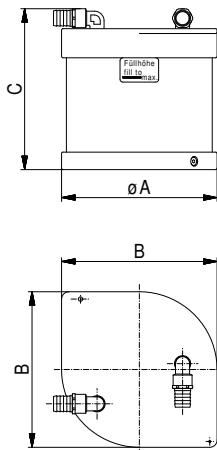






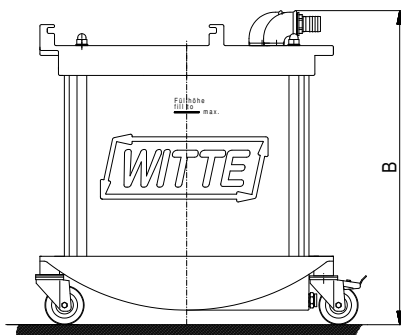
### Liquid separator, small

| Nr.   | A   | B   | Vol./Capacity | Connection | kg  |
|-------|-----|-----|---------------|------------|-----|
| 80200 | 403 | 210 | 9/5l          | ø 12       | 4,5 |



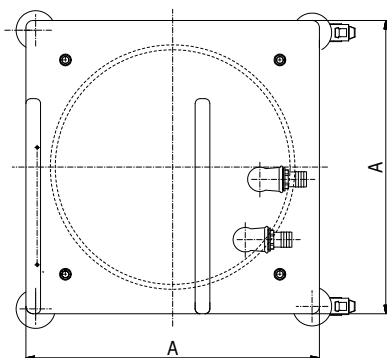
### Liquid separator, medium

| Nr.   | A   | B   | C   | Vol./Capacity | Connection | kg  |
|-------|-----|-----|-----|---------------|------------|-----|
| 82392 | 320 | 320 | 340 | 13/9l         | ø 32       | 8,9 |



### Liquid separator, large

| Nr.   | A   | B   | Vol./Capacity | Connection | kg |
|-------|-----|-----|---------------|------------|----|
| 94953 | 600 | 645 | 72/50l        | LW32       | 40 |



Preference item:  
Articles with green diamond  
are available ex stock!

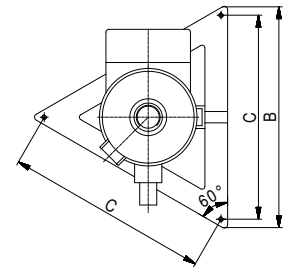
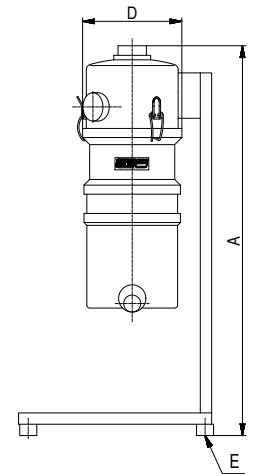
## Automatic liquid separator

| Nr.    | V(l) | l/h | m <sup>3</sup> /h | LW in | LW out | A   | B   | C   | D   | kg   |
|--------|------|-----|-------------------|-------|--------|-----|-----|-----|-----|------|
| 80155  | 3,5  | 100 | bis 100           | G 1¼" | G 1¼"  | 685 | 400 | 360 | 175 | 8,5  |
| 82782  | 9,5  | 100 | 160-250           | G 2"  | G 2"   | 950 | 410 | 340 | 290 | 15   |
| 288327 | 20   | 250 | 250-800           | DN 50 | DN 50  | 830 | 382 | 282 | -   | 24,8 |

Fully automatic operation is guaranteed with an integrated magnetic valve and 2-chamber system. The separator is set up between vacuum chuck and pump, thereby protecting vacuum pump from the large amounts of fluid, which are absorbed and Fluids, which are sucked in, are transported back to the machine by means of a hose system.

**Clamping of the workpiece is not interrupted at any time. Electricity supply of 230V is necessary for operation. Also available in 110V/60 Hz version.**

We advise using the reducer connections (page 81) and hose nozzles (page 82) suitable for your vacuum hose diameter. Two are required for each part, one in and one out of the automatic liquid separator. These parts are not included and need to be ordered separately!

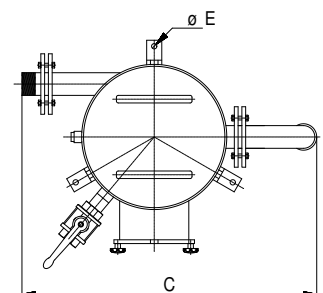
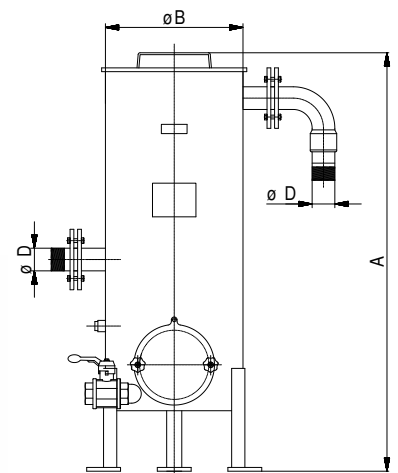


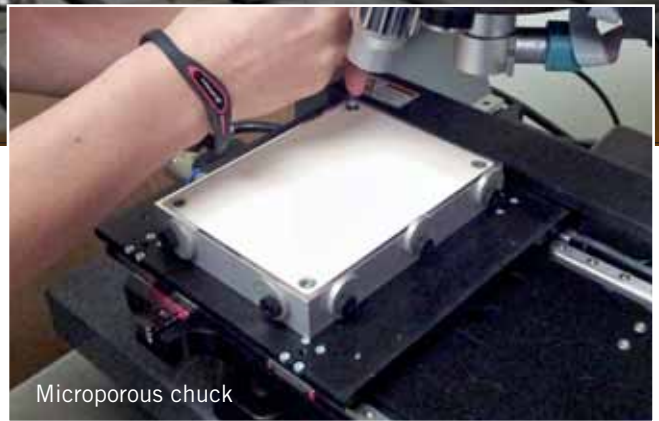
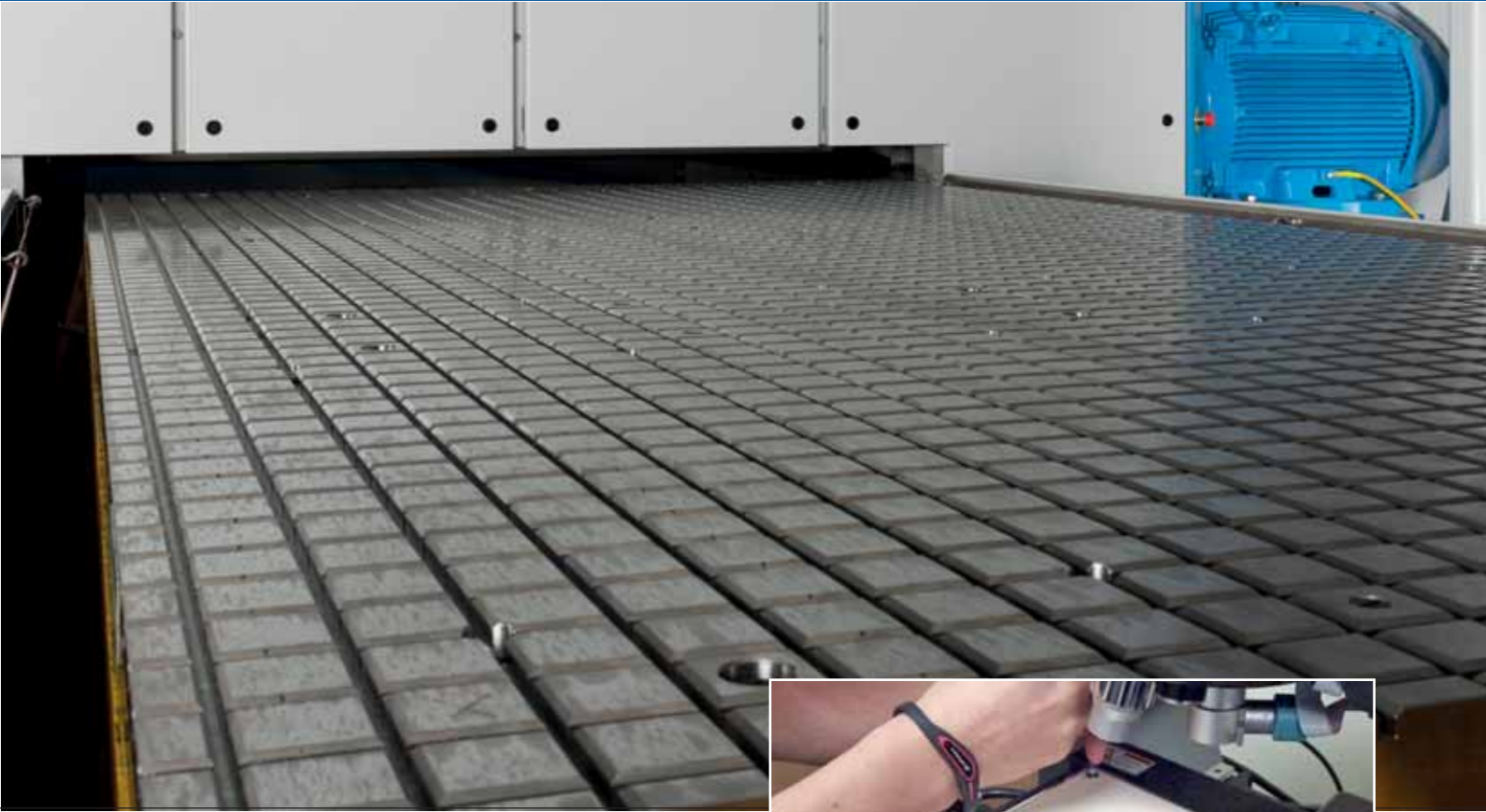
## Stand filter

| Nr.   | V(l) | l/h | m <sup>3</sup> /h | LW in | LW out | A   | B   | C   | D   | E  | kg  |
|-------|------|-----|-------------------|-------|--------|-----|-----|-----|-----|----|-----|
| 15039 | 25   | 100 | bis 100           | 59,6  | G 1½"  | 685 | 400 | 360 | 175 | M8 | 8,5 |
| 15285 | 25   | 100 | 160-250           | 59,6  | G 2"   | 950 | 410 | 340 | 290 | M8 | 15  |

15039 Filter STF 0250 with fleece insert  
For separation of fluids and solids out of suction medium incl. quick clean flap and fluid drainage tap

15285 Stand filter STA 250 with automatic fluid separation  
24 Volt DC





Microporous chuck

## Vacuum chucks



Vac-Mat™



Flip-Pod™

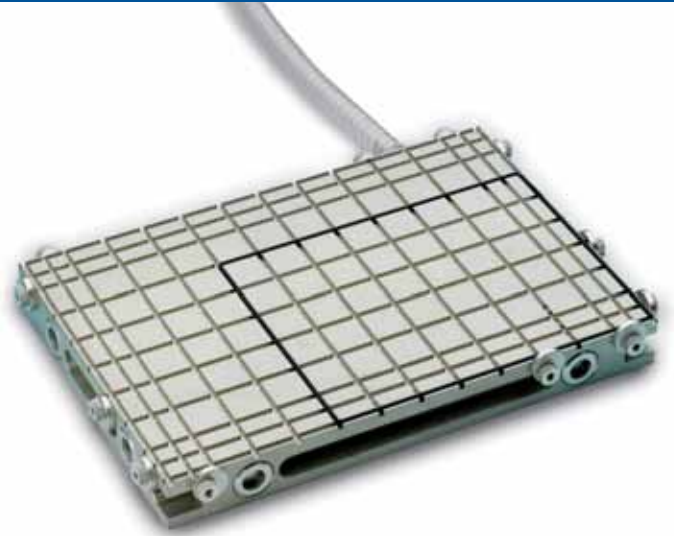


Slot chuck





VAC - Mat™ Sets



Grid vacuum chuck



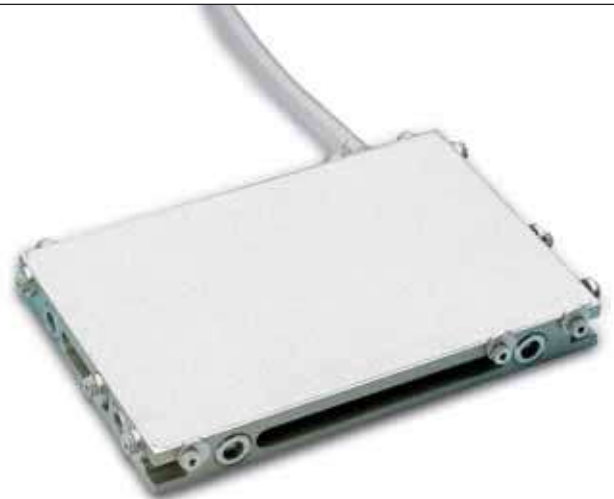
Slot vacuum chuck



Grid hole vacuum chuck



FLIP-POD™ vacuum-system



Microporous vacuum system





## Clamping with vacuum



Square or rectangular part



Part with cutout



Round parts



Slot chuck with perforated rubber adapter mat



Slot chuck with perforated rubber adapter mat



Slot chuck with perforated rubber adapter mat



Grid chuck with O-shaped seal



Grid chuck with O-shaped seal



Circular grid chuck



Witte VAC-MAT™



Witte VAC-MAT™



Chuck specially designed for workpieces

## Setting up a vacuum system



Workpieces with small surfaces

### Vacuum supply:

A modular vacuum unit with integrated liquid separator, storage tank and pressure control. Altogether almost 50 different variations of vacuum pumps and unit are available



### Vacuum distributor, connection unit or safety appliance:

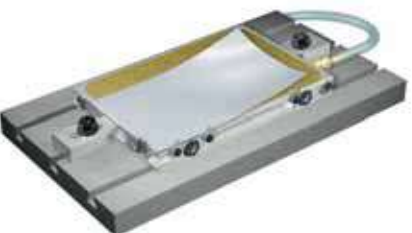
Distribution of operating vacuum to the chucks. Gauges, choice of manual or magnetic valves and pressure controls for watching over operating vacuum level. All these variations are available.



Slot chuck with perforated rubber adapter mat



Witte VAC-MAT™



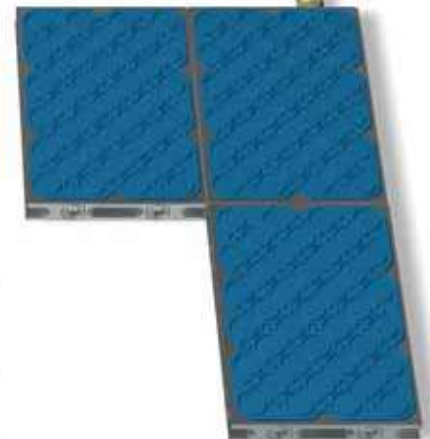
Chuck with insert made out of sintered metal or Witte Metapor® for foils and skins



Grid vacuum chuck



Microporous vacuum system



VAC-Mat™ Chucks

### Vacuum chucks:

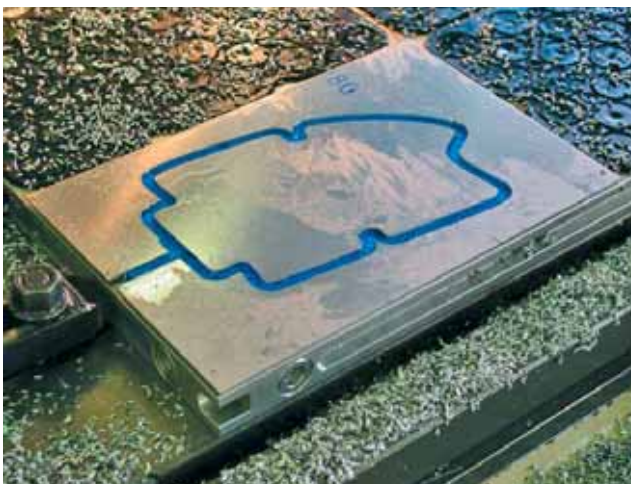
Chucks to accommodate your requirements and clamping operations.





## Witte VAC-MAT™

The vacuum system  
you can cut right into!



### Application

Wide spectrum of different  
workpiece forms can be clamped

- Grinding
- Milling
- Drilling
- Five sided treatment including milling  
into the Vac-Mat

### Advantages

- Strong hold down force
- Clamping surface with a high friction value
- Milling through of outer and inner contours
- Precise and exact cut outs due to the fact that  
the workpiece can be milled through into the  
VacMat leaving a clean cut edge

### Handling

- Set up time reduced to seconds as fitting  
of single rubber seals become obsolete
- Surface friendly material which avoids  
scratching of workpiece surface area
- No extra clamping fixture needed



## Witte VAC-MAT™ Application

### What is VAC-MAT™ ?

It is a thin soft polymer mat with many spaced out vacuum points, suckers in different sizes with a fine hole in each centre and a raised lip. On the underside there are six lugs which locate in the special VAC-MAT™ chuck. On the mat under surface there are grid shaped grooves which distribute the vacuum to each of the small holes. A lip right around the outside edge ensures no leakage.

### What size is VAC-MAT™?

All VAC-MAT™s are 2,5 x 200 x 300 mm. The tolerance lies at +/- 0,04mm and concave upto 0,1mm. To increase the size of the working area, the modular VAC-MAT™ chucks are connected to one another and VAC-MAT™ s are simply placed on as described.

### What is the minimum work piece dimension for VAC-MAT™?

Minimum 50% of each mat **must** be covered by the workpiece.

### Is VAC-MAT™ reusable?

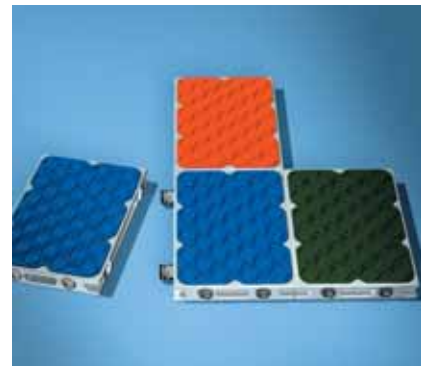
The working life of a VAC-MAT™ depends on the number and size of cuts made into the mat during machining.

### Operating temperature for VAC-MAT™

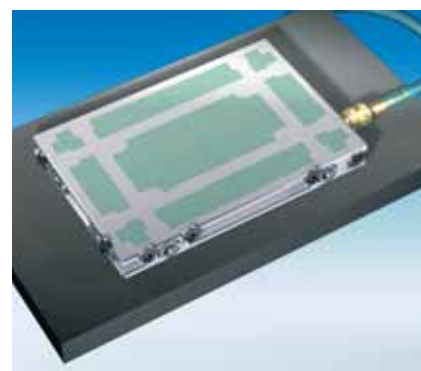
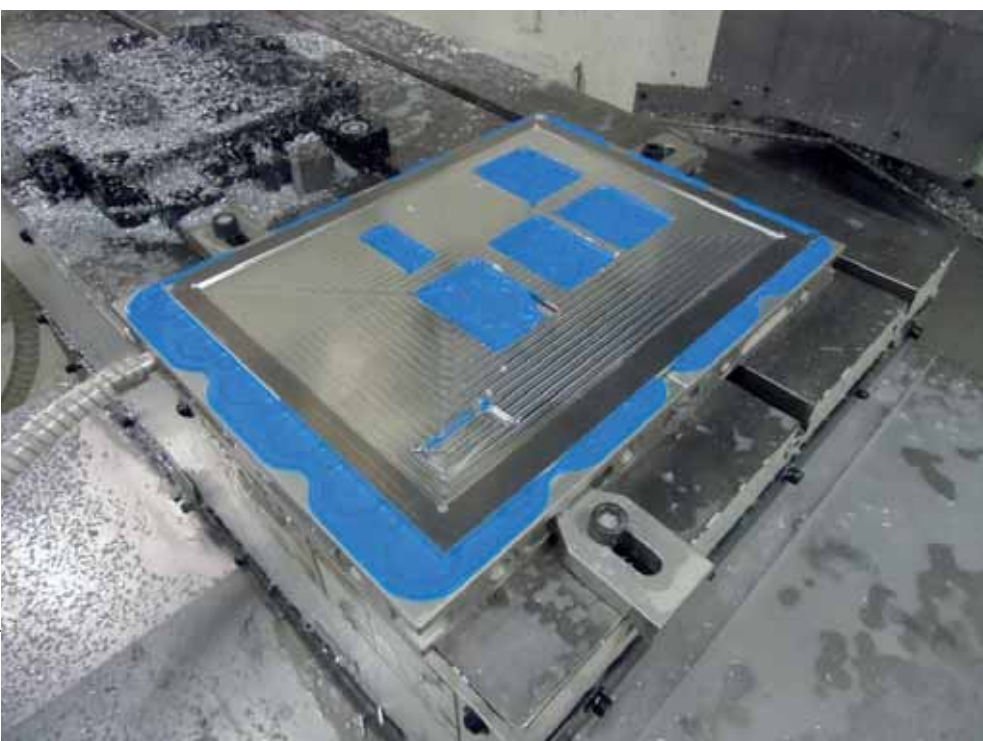
Vac-Mat™, available in RED, BLUE and GREEN versions can be used at 40°C without any limitations



The lugs underneath the mat guarantee fast and accurate positioning of the VAC-MAT™ on the special modular vacuum chuck



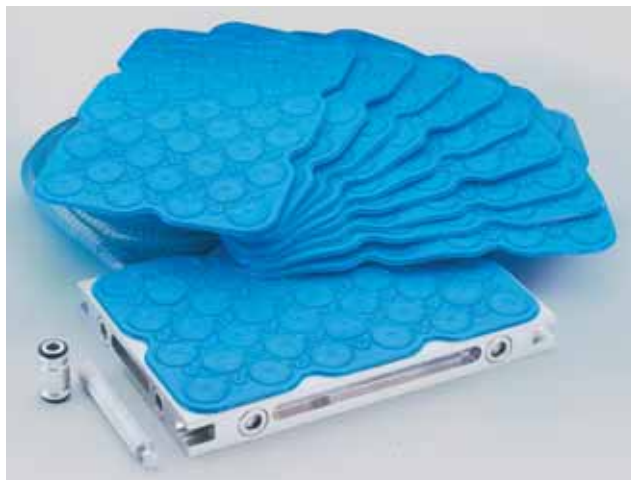
The modular concept allows connection of several vacuum chucks. The vacuum supply to each chuck continues through the connection elements.



In modular chucks additional holes can be drilled in the green areas to allow insertion of pins for positioning. Further information on page 104.







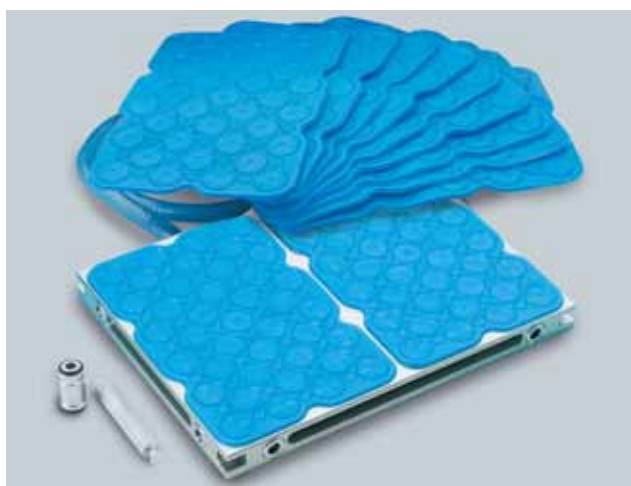
### VAC-MAT™

modular chuck, single

| Nr.   | Pcs | Dim        | kg  |
|-------|-----|------------|-----|
| 81759 | 1   | 30x200x300 | 6,4 |

**Supply includes:**

- 10 VAC-MAT/blue
- Vacuum chuck adapter plate
- Vacuum suction hose 1m incl. connector
- 2 clamps for mounting chuck
- Assembly tool



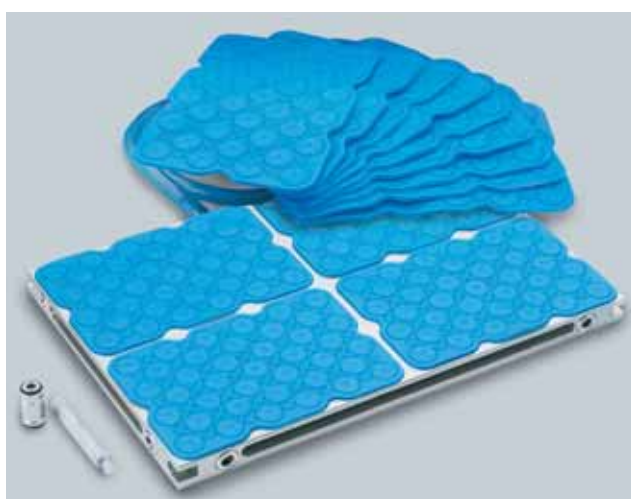
### 82837 VAC-MAT™ double

modular chuck, double

| Nr.   | Pcs | Dim        | kg   |
|-------|-----|------------|------|
| 82837 | 1   | 30x300x400 | 10,8 |

**Supply includes:**

- 10 VAC-MAT/blue
- Vacuum chuck adapter plate
- Vacuum suction hose 1m incl. connector
- 2 clamps for mounting chuck
- Assembly tool



### 82825 VAC-MAT™

modular chuck, four times

| Nr.   | Pcs | Dim        | kg |
|-------|-----|------------|----|
| 82825 | 1   | 30x400x600 | 20 |

**Supply includes:**

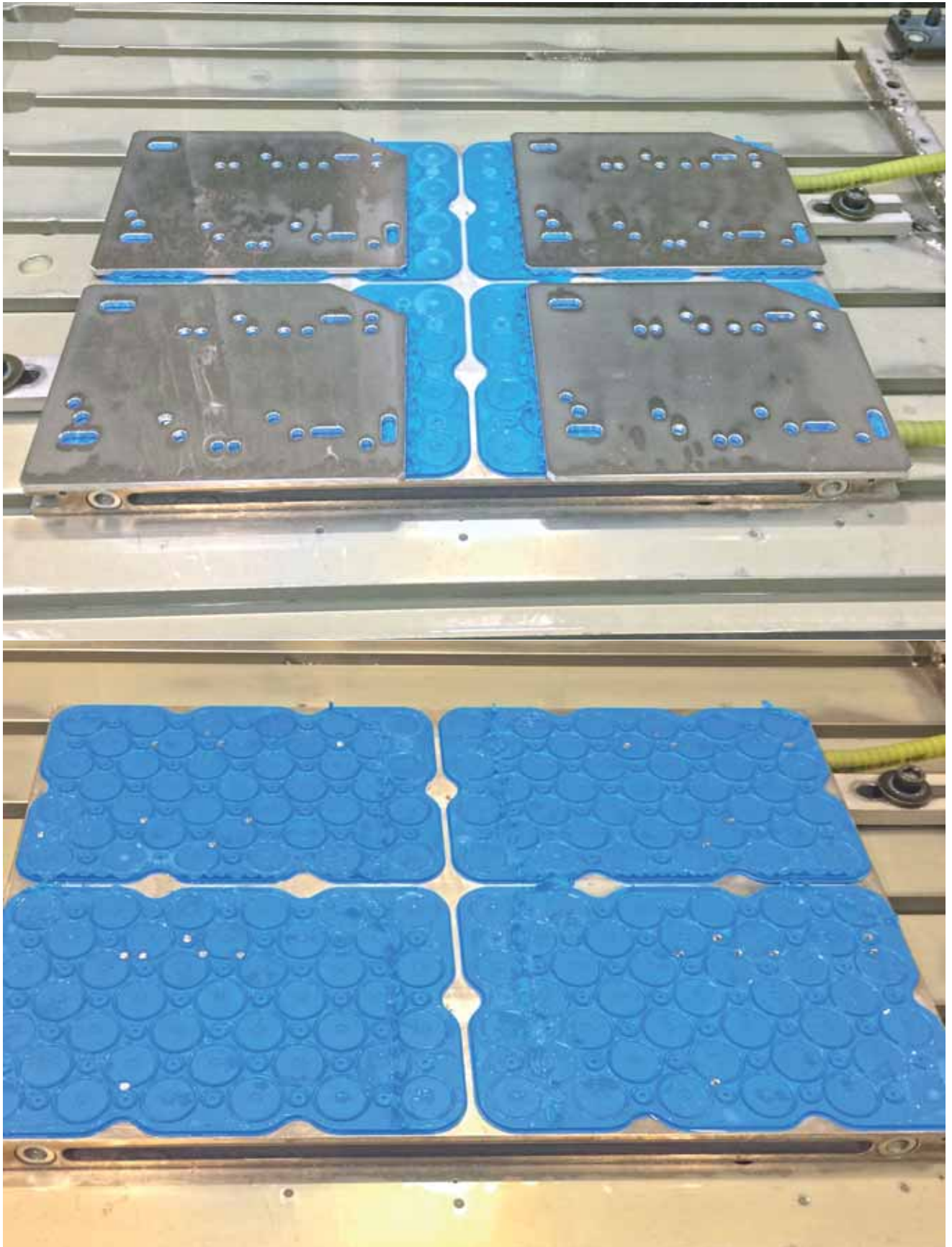
- 10 VAC-MAT/blue
- Vacuum chuck adapter plate
- Vacuum suction hose 1m incl. connector
- 2 clamps for mounting chuck
- Assembly tool

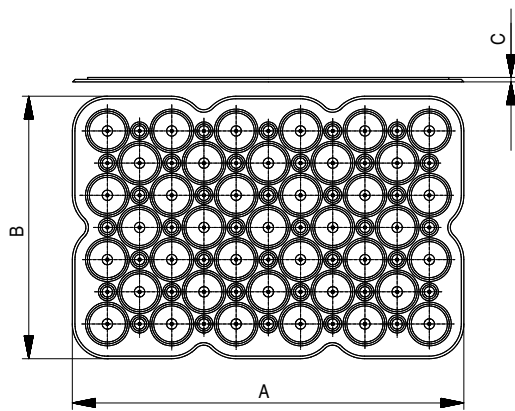


Preference item:  
Articles with green diamond  
are available ex stock!

**Other dimensions on request.**

Dedicated chucks are also available but Vac-Mats™ are 200x300 mm, any larger surface area must be a multiple of 200x300 mm.



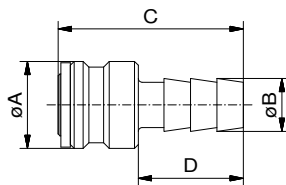


Minimum order quantity 10 pcs per colour

## Witte VAC-MAT™

in different versions

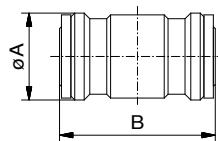
| Nr.   | Color  | A   | B   | C   | g   |
|-------|--|-----|-----|-----|-----|
| 11030 | blue, standard   | 300 | 200 | 2,5 | 102 |
| 11053 | green, hard  | 300 | 200 | 2,5 | 102 |
| 11548 | red, soft  | 300 | 200 | 2,5 | 102 |
| 11029 | black, for covering areas<br>not required during machining | 300 | 200 | 2,5 | 102 |



## Hose connector

incl. O-Ring

| Nr.   | A  | B  | C  | D  | for hose $\phi$ | g  |
|-------|----|----|----|----|-----------------|----|
| 81761 | 23 | 14 | 49 | 31 | $\phi 18/12$    | 20 |



## Vacuum chuck adapter

incl. O-Ring

| Nr.   | A  | B    | g  |
|-------|----|------|----|
| 81762 | 23 | 41,6 | 32 |

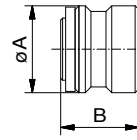


Preference item:  
Articles with green diamond  
are available ex stock!

## Plug

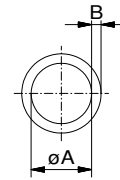
incl. O-Ring

| Nr.   | A    | B    |    |
|-------|------|------|----|
| 81774 | 22,3 | 20,7 | 18 |



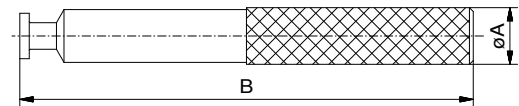
## Sealing

| Nr.   | A  | B   |   |
|-------|----|-----|---|
| 34798 | 16 | 2,5 | 1 |



## Tool for setting up

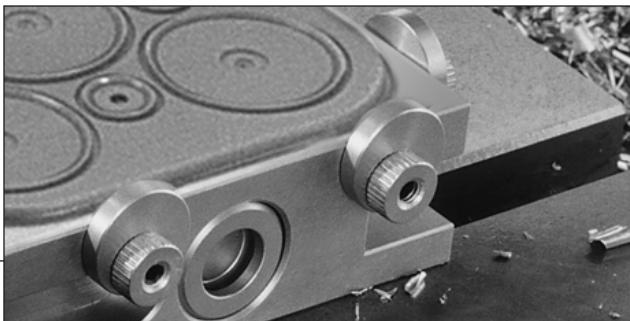
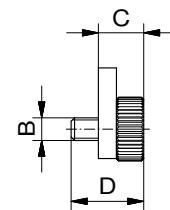
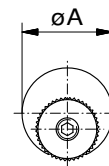
| Nr.   | A  | B   |    |
|-------|----|-----|----|
| 28331 | 15 | 120 | 60 |



## Height adjustable end stops

in form of excentric washers:

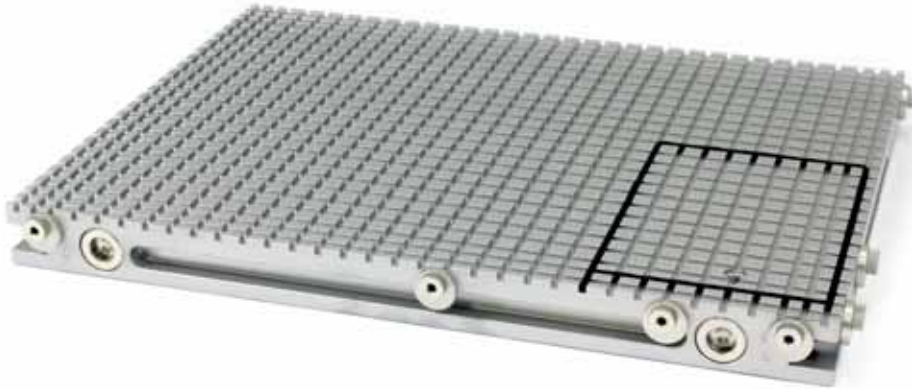
| Nr.   | for height of plate | A  | B  | C  | D  | Pcs |     |
|-------|---------------------|----|----|----|----|-----|-----|
| 85405 | 32,5                | 20 | M5 | 9  | 16 | 6   | 38  |
| 85409 | 38,0                | 27 | M6 | 11 | 20 | 9   | 90  |
| 85410 | 48,0                | 30 | M6 | 12 | 20 | 12  | 132 |



For fixing end stops, threaded holes have to be drilled into the plate by the customer.







Custom built tombstone  
with integrated storage tank,  
magnetic Valve and 6 pc grid type chucks.



## Grid chucks

**Modular version**  
**Standard sizes**  
**Special design**

### Applications

For simple shaped workpieces  
with a rough surface and heavy duty milling

- Grinding
- Milling
- Turning

### Advantages

- Strong hold down force
- For universal applications
- Secure clamping of rough workpiece surfaces due to high friction properties
- The O-shaped seal evens out any irregularities between workpiece and chuck surface

### Handling

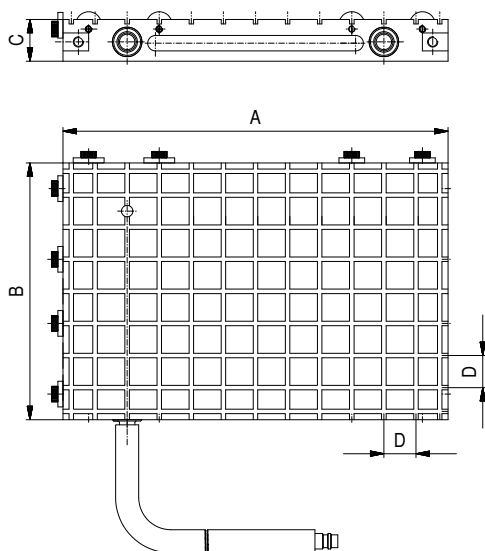
- Any shape or size of chuck made to measure
- Recommended grid size depends on workpiece contour and dimensions
- Clamping area defined by O-shaped seal
- Finely gridded vacuum chucks for extremely small parts
- Ideal as a base for many solutions together with special vacuum adapter plates





Vacuum fixture with cylindrical geometry for clamping aircraft fuselage segments (#94651)





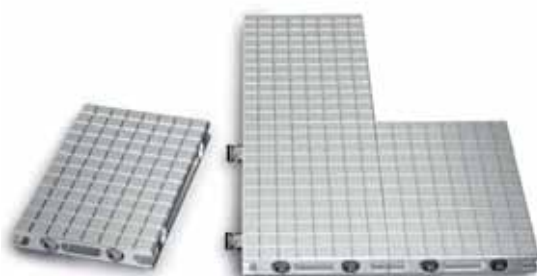
## Grid chucks modular type

| Nr.   | A   | B   | C    | D    | kg  |
|-------|-----|-----|------|------|-----|
| 89676 | 300 | 200 | 32,5 | 12,5 | 5,6 |
| 90249 | 400 | 300 | 32,5 | 12,5 | 10  |
| 92289 | 600 | 400 | 32,5 | 12,5 | 20  |



### Supply includes:

- Modular chuck
- 10m O-shaped seal,  $\varnothing$  4 mm
- Vacuum adapter plate
- 1m wire spiral hose
- 2 clamps for mounting chuck
- Assembly tool



Grid 12,5 type

The modular concept allows connection of several vacuum chucks. The vacuum supply to each chuck maintained by connecting sleeves.

## O-shaped seal

| Nr.   | Dia.                | Length |
|-------|---------------------|--------|
| 00070 | $\varnothing$ 4,0mm | 1m     |

Used for sealing grid chucks or workpiece specific contours. This high quality seal is placed into the slots of a vacuum grid type chuck to define the clamping area.

**Minimum order quantity 50m**



Preference item:  
Articles with green diamond  
are available ex stock!

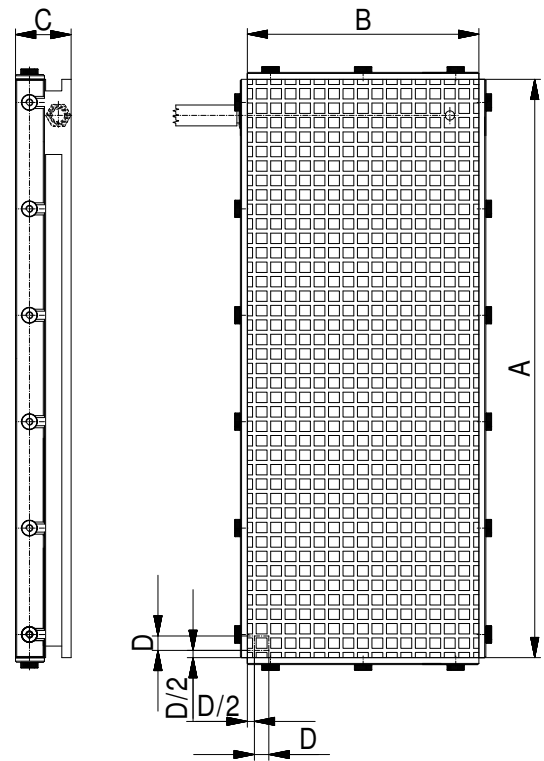


Witte vacuum chucks are available in other versions and dimensions on request

## Grid chucks

standard type, grid 12,5 mm

| Nr.    | A    | B   | C  | D    | kg   |
|--------|------|-----|----|------|------|
| 285709 | 300  | 200 | 38 | 12,5 | 6,4  |
| 80807  | 400  | 200 | 38 | 12,5 | 8,5  |
| 80808  | 500  | 200 | 48 | 12,5 | 19,4 |
| 80809  | 600  | 200 | 48 | 12,5 | 16,2 |
| 80810  | 400  | 250 | 48 | 12,5 | 13,5 |
| 80811  | 500  | 250 | 48 | 12,5 | 16,8 |
| 80812  | 400  | 300 | 48 | 12,5 | 16,2 |
| 80813  | 500  | 300 | 48 | 12,5 | 20,2 |
| 80814  | 400  | 400 | 48 | 12,5 | 21,5 |
| 80815  | 600  | 300 | 48 | 12,5 | 24,2 |
| 80816  | 600  | 400 | 48 | 12,5 | 32,3 |
| 80817  | 800  | 400 | 48 | 12,5 | 43   |
| 80818  | 1000 | 500 | 48 | 12,5 | 67   |



## Vac-Mat adapter plate

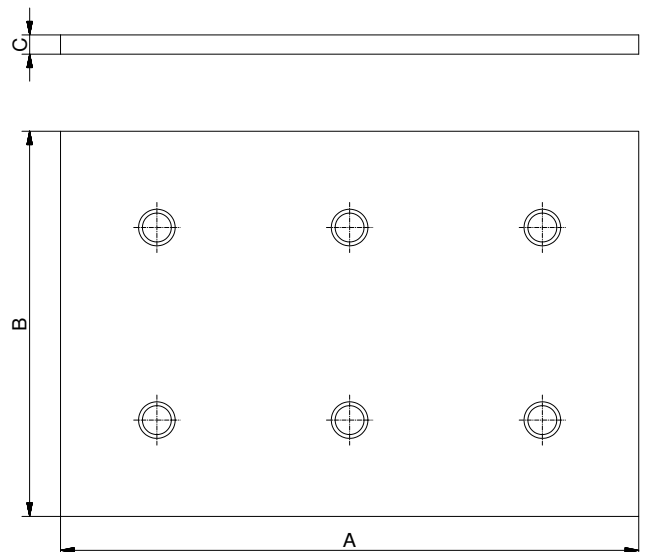
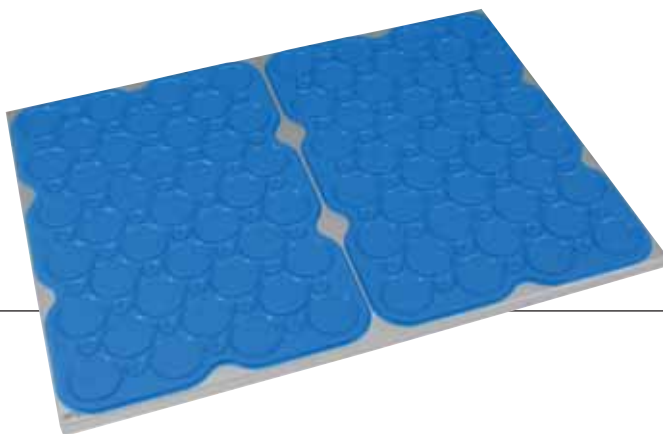
for Grid chucks

| Nr.   | A   | B   | C  | Vac-Mats | kg  |
|-------|-----|-----|----|----------|-----|
| 81995 | 300 | 200 | 10 | 10       | 2,7 |
| 84748 | 400 | 300 | 10 | 11       | 4,5 |
| 81994 | 600 | 400 | 10 | 12       | 8,1 |

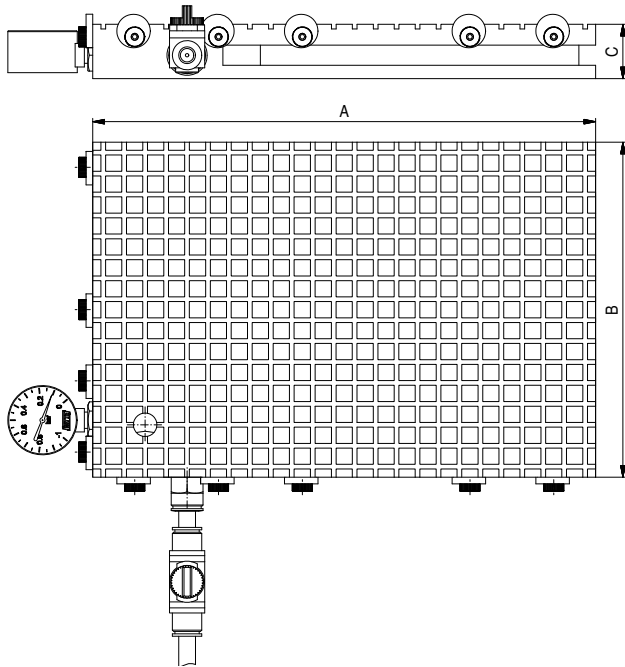


### Supply includes:

- Aluminium adapter plate
- 10 Vac-Mats







## Grid vacuum chuck Starter Sets

### Grid vacuum chuck with vacuum supply via Venturi valve

| Nr.    | A   | B   | C    | kg   |
|--------|-----|-----|------|------|
| 282126 | 300 | 200 | 32,5 | 5,3  |
| 282127 | 400 | 300 | 32,5 | 10,6 |
| 282128 | 600 | 400 | 32,5 | 21,2 |

#### Supply includes:

- Grid vacuum chuck
- Vacuum supply (Venturi valve integrated in chuck)
- O-shaped seal  $\varnothing 4\text{mm}$
- pressure hose with plug connection
- 2 clamps for mounting chuck
- Tool for changeover from Venturi valve to vacuum pump

These tried and tested standard grid type vacuum chucks as described on page 34 are made of medium tensile aluminium.

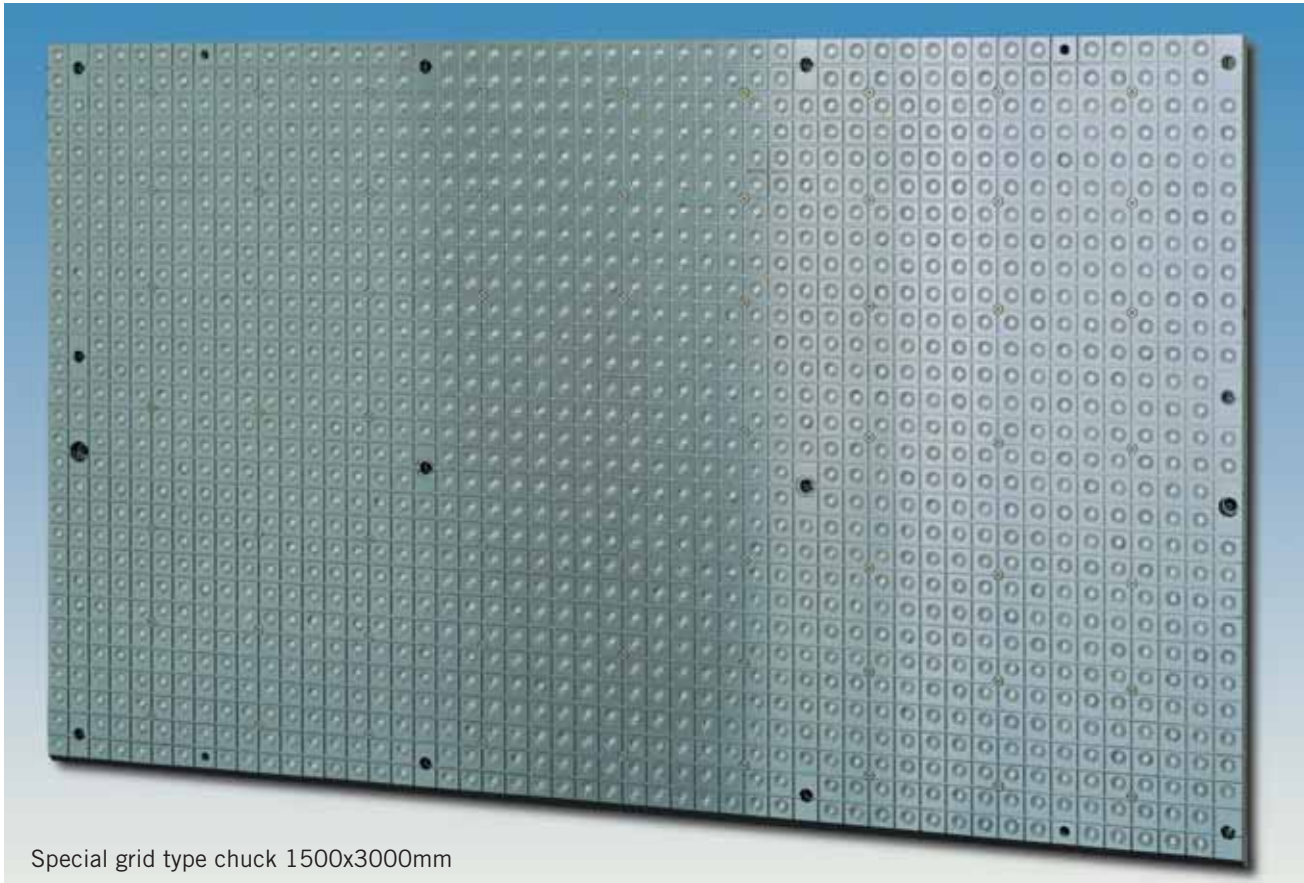
The grid size is 12,5mm. The height adjustable excentre stops enables fast, accurate positioning of parts and restricts sideways movement

Vacuum supply made easy via compressed air (ISO 8573-1:2010) as operating medium. The integrated vacuum pump (Venturi System) requires operating pressure of 3,5-6 bar. End vacuum is 80mbar absolute (92% vacuum). The chuck has an integrated silencer to reduce noise. Chuck can be used with integrated Venturi valve or with a vacuum pump. Tools for changeover are included.



Preference item:  
Articles with green diamond  
are available ex stock!

## Grid chucks – Special design

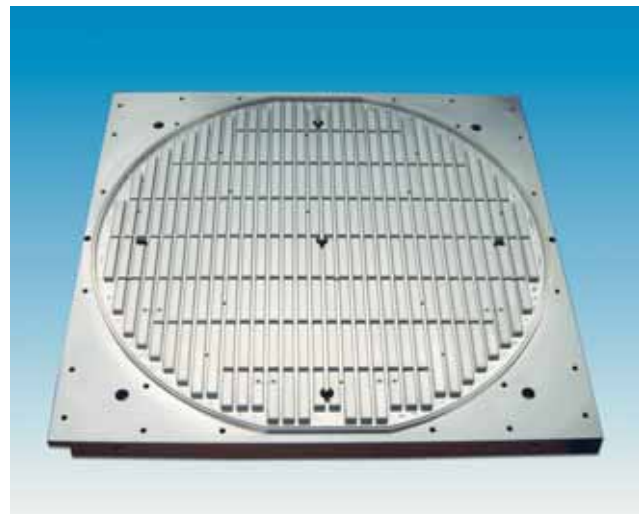


Special grid type chuck 1500x3000mm

In addition to standard sizes shown in the catalogue Witte grid type chucks are also custom built to suit your requirements up to dimensions of more than 40m<sup>2</sup>.

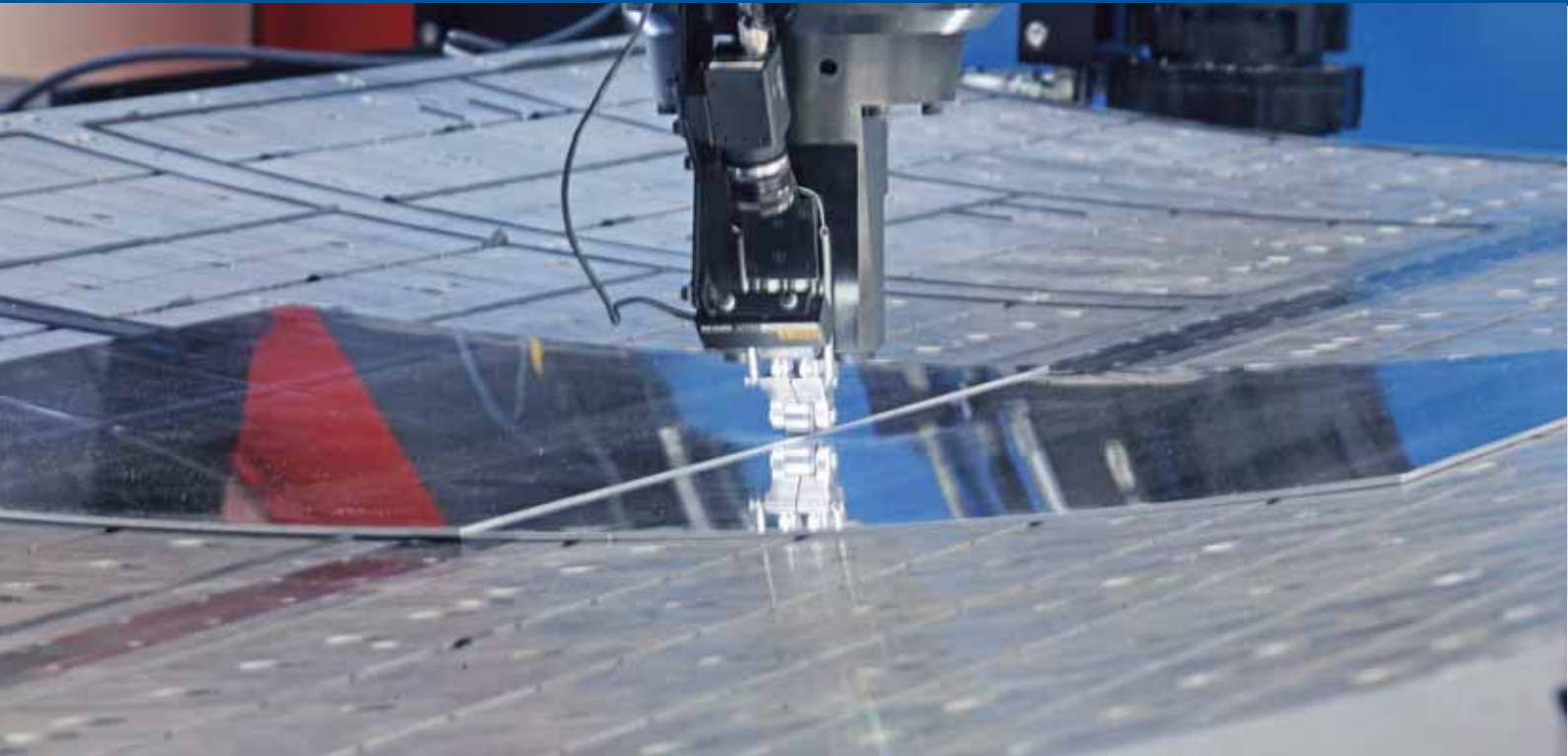
Dimensions of chuck and clamping area, grid size, slot width, downforce and best type of clamping surface are all details taken into account to supply a chuck which gives optimal results for the application in question.

Chucks can be made according to a customer's workpiece design drawing, let us help you find the best way to clamp your workpiece.



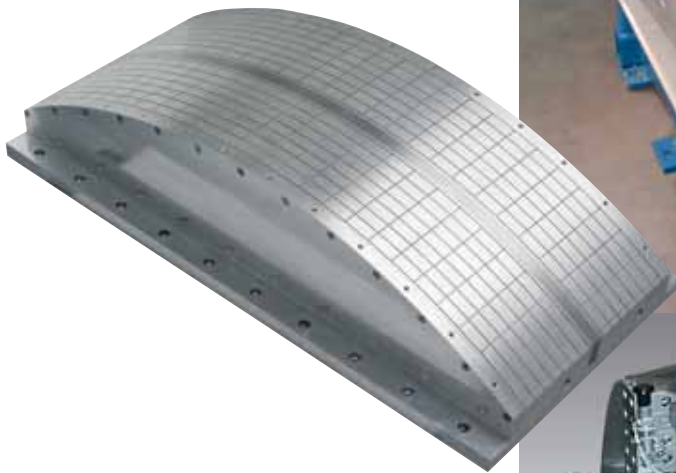
Customized vacuum chuck for the aircraft industry, similar chucks have also been supplied for the spacecraft industry



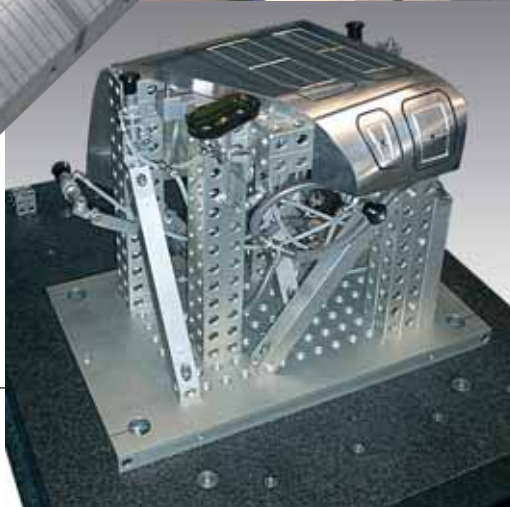


3D Vacuum chuck with several movable segments for clamping aircraft fuselage parts during milling and friction stir welding processes

Convex vacuum fixture with a backing along the length for clamping aircraft wing parts during friction-stir welding

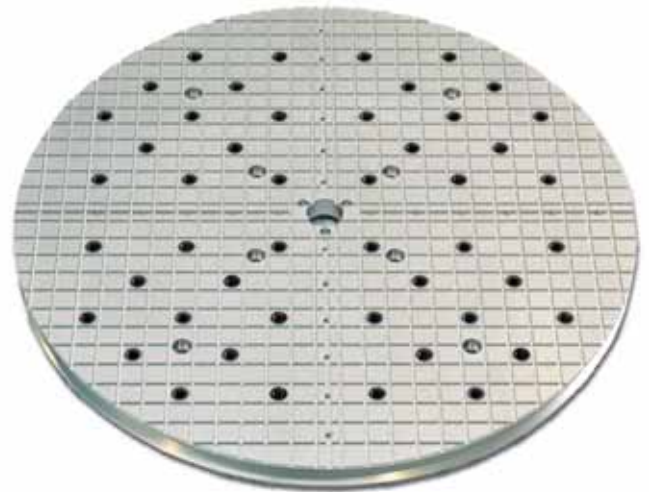
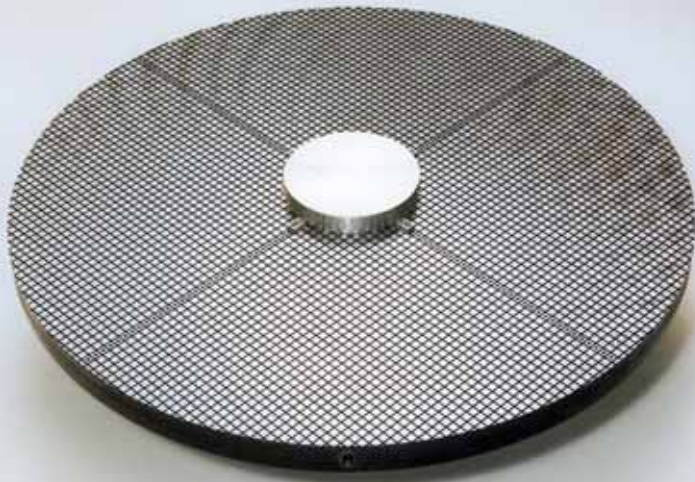


Vacuum fixture for clamping aircraft wing parts during friction-stir welding



3D vacuum fixture for fixation of pre-formed aluminium parts. Complex contours are milled and cutouts held securely while under the influence of vacuum downforce.





## Circular chucks

Suitable for circular type workpieces

### Applications

For simple shaped workpieces with a rough surface and heavy duty milling

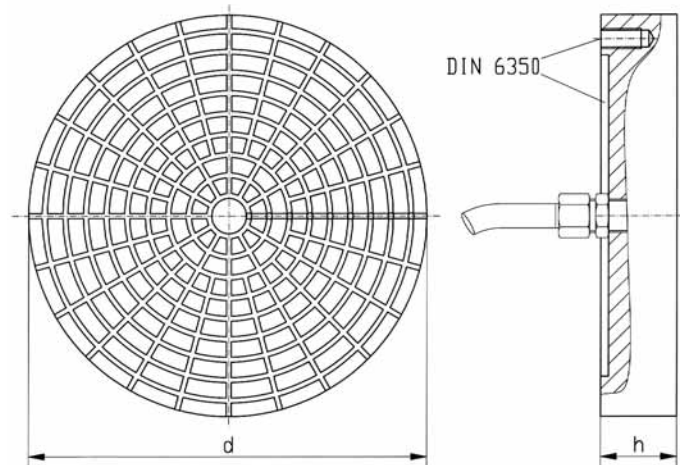
- Grinding
- Milling
- Turning

### Advantages

- Strong hold down force
- For universal applications
- Secure clamping of rough workpiece surfaces due to high friction properties
- The O-shaped seal evens out any irregularities between workpiece and chuck surface

### Handling

- Any shape or size of chuck made to measure
- Recommended grid size depends on workpiece contour and dimensions
- Clamping area defined by O-shaped seal
- Finely gridded vacuum chucks for extremely small parts
- Ideal as a base for many solutions together with special vacuum adapter plates



## Circular Grid Vacuum Chucks

aluminium

| Nr.   | Grid | Ø x h    | kg |
|-------|------|----------|----|
| 80836 | 10,0 | 100 x 38 | 1  |
| 80837 | 10,0 | 125 x 38 | 1  |
| 80838 | 10,0 | 160 x 38 | 2  |
| 80839 | 10,0 | 200 x 38 | 3  |
| 80840 | 10,0 | 250 x 38 | 5  |
| 80841 | 12,5 | 315 x 48 | 5  |
| 80842 | 12,5 | 400 x 48 | 16 |
| 80843 | 12,5 | 500 x 58 | 31 |
| 80844 | 12,5 | 630 x 58 | 49 |

Witte circular grid chucks are not standard and available only on request







## Slot vacuum chucks

### Standard sizes

### Adapter mats

### Custom made chucks

The chuck surfaces feature slots depending on application. For clamping of work pieces, which do not cover the entire surface, rubber adapter mats are required.

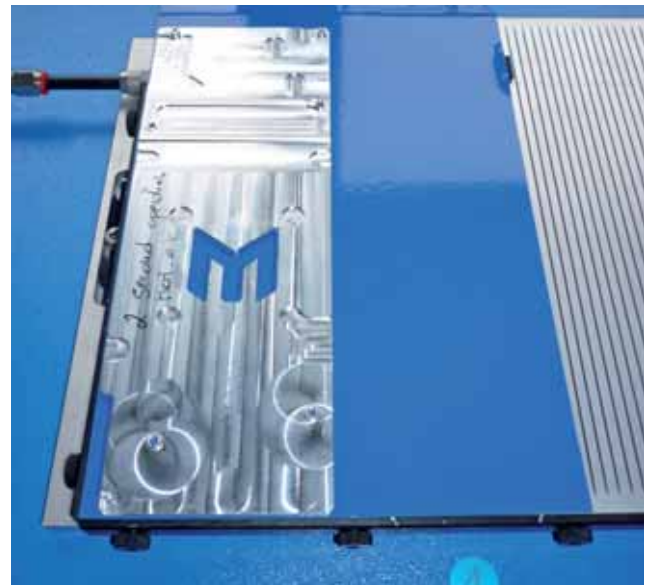
#### Applications

For light machining operations such as

- Milling
- Drilling (e.g. printed circuit boards, electronic components)
- Engraving
- Machining of complicated work piece shapes with cutouts etc.

#### Special advantages

- Low height
- Wide range of applications through the use of rubber adapter mats
- Ideal for HSC (High Speed Cutting) initial milling together with plane-parallel pre-machined rubber adapter mats
- Clamping very small work pieces is possible



#### Handling

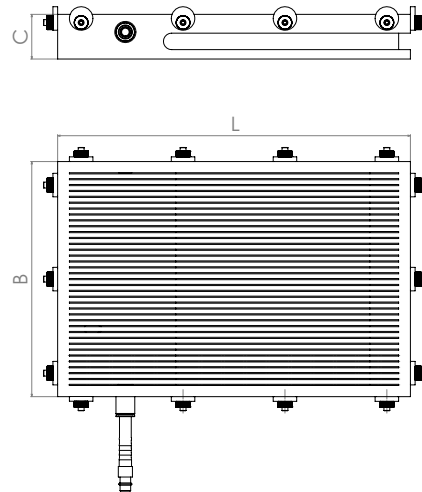
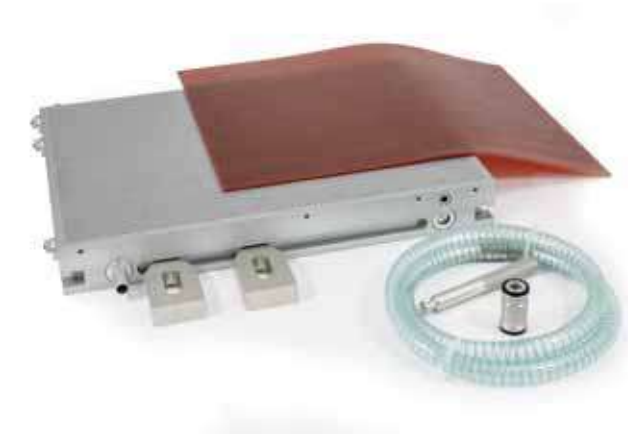
- Simplifies part positioning using height adjustable stop bars
- Defining of active vacuum area using vacuum stopper and rubber adapter mats (Example see picture above)

## Modular Slot Vacuum Chucks

suitable for combined use

| Nr.    | B   | L   | C  | kg   |
|--------|-----|-----|----|------|
| 287960 | 200 | 300 | 48 | 7,7  |
| 289470 | 300 | 400 | 48 | 15,3 |
| 289471 | 400 | 600 | 48 | 31,1 |

Prepared for Zero Clamp system  
(Not for No. 287960)



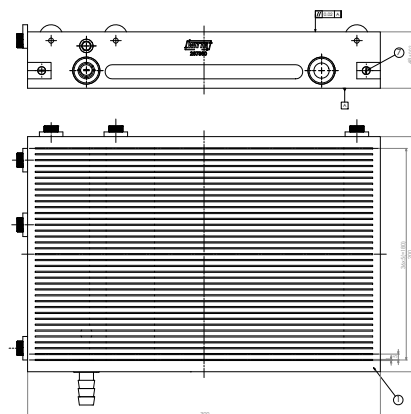
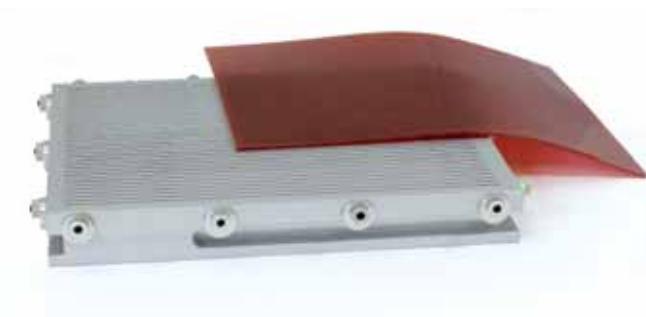
**Supply includes:**

- Modular slot chuck
- Adjustable stops on all sides
- 1m hose with connector
- Fitting rubber adapter mat, red
- 2 clamping claws
- vacuum chuck adapter
- Tools

## Compact Slot Vacuum Chucks

| Nr.    | B   | L   | C  | kg   |
|--------|-----|-----|----|------|
| 286641 | 200 | 300 | 38 | 5,5  |
| 286642 | 300 | 400 | 38 | 11,2 |
| 286643 | 400 | 600 | 38 | 23   |

Prepared for Zero Clamp system  
(Not for No. 286641)



**Supply includes:**

- Compact slot chuck
- Adjustable stops on all sides
- 1m hose with connector
- Fitting rubber adapter mat, red
- 2 clamping claws



Preference item:  
Articles with green diamond  
are available ex stock!

Other dimensions  
are available on request.





4 slot chucks on a machine used for manufacturing aluminium carriers. Machining of inner and outer contours is done in one process thanks to rubber adapter mats.



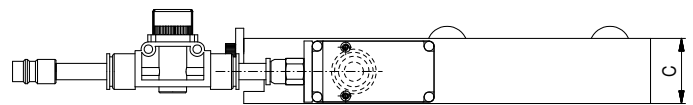
Slot vacuum chuck with three vacuum areas which can be used individually.



## Slot vacuum chuck Starter Set

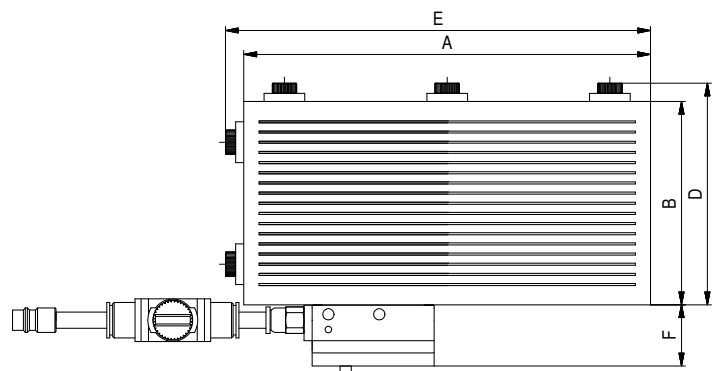
Slot - Vacuum chuck with Venturi vacuum generator

| Nr.    | A   | B   | C  | D   | E   | F  | kg   |
|--------|-----|-----|----|-----|-----|----|------|
| 95167  | 300 | 200 | 32 | 209 | 309 | 30 | 5,3  |
| 284555 | 400 | 300 | 32 | 409 | 309 | 30 | 10,6 |
| 284556 | 600 | 400 | 32 | 409 | 609 | 30 | 21,2 |



### Supply includes:

- 1 Vacuum supply (venturi - nozzle)
- 2 Clamps for mounting chuck
- 1 Vacuum stopper
- 1 Rubber adapter mat
- 1 Pressure hose with quick connector for compressed air connection



1. Vacuum generation simply by using compressed air on site: The built-in vacuum pump (Venturi system) requires operating pressure of 4-6 bar.

Ultimate vacuum is 150mbar absolute (85% vacuum). Air consumption is 30-42 l/min. An integrated silencer reduces the noise of the escaping air.

2. Slot vacuum chuck made of aluminum alloy: In this chuck, vacuum generation is already integrated and ready for immediate use. For work piece positioning there are exentric stops located on two sides of the vacuum chuck. The rubber adapter

mat is perforated by user as required and enables clamping of smaller components.

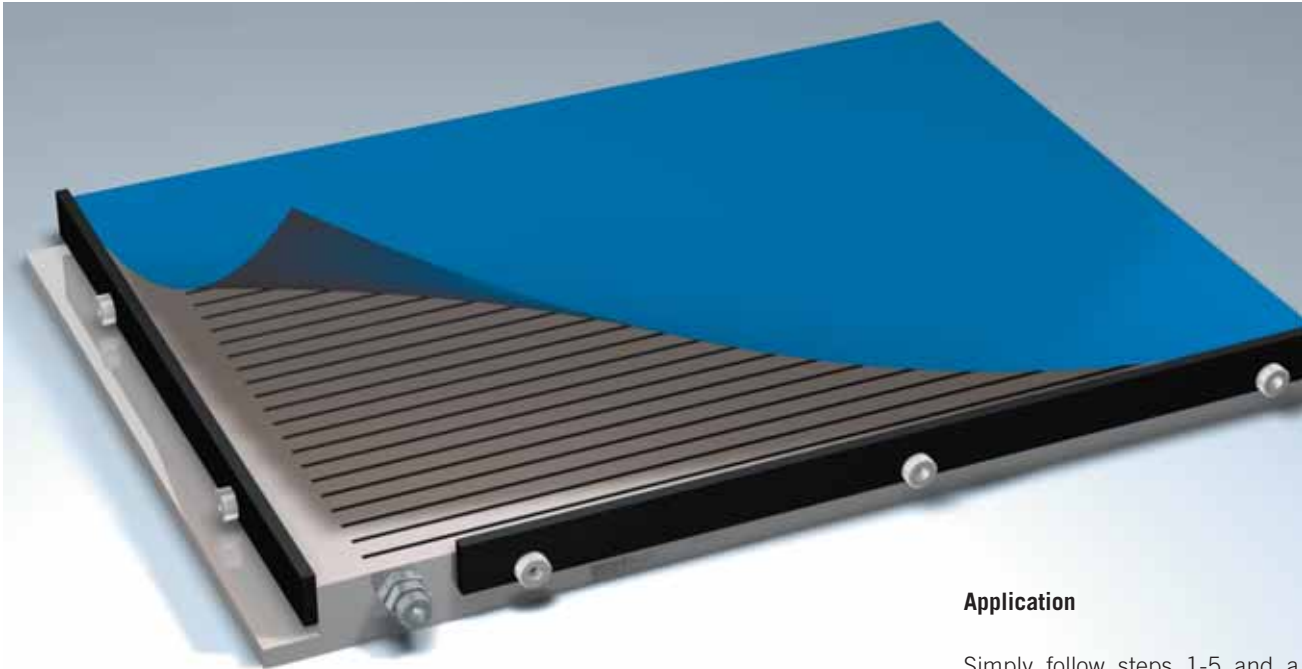
A vacuum stopper defines active vacuum area. The connection is made via a pressure hose and a plug for standard pneumatic connections.

The plates can be operated with the integrated venturi pump or a vacuum pump.





## Slot vacuum chucks and rubber adapter mat

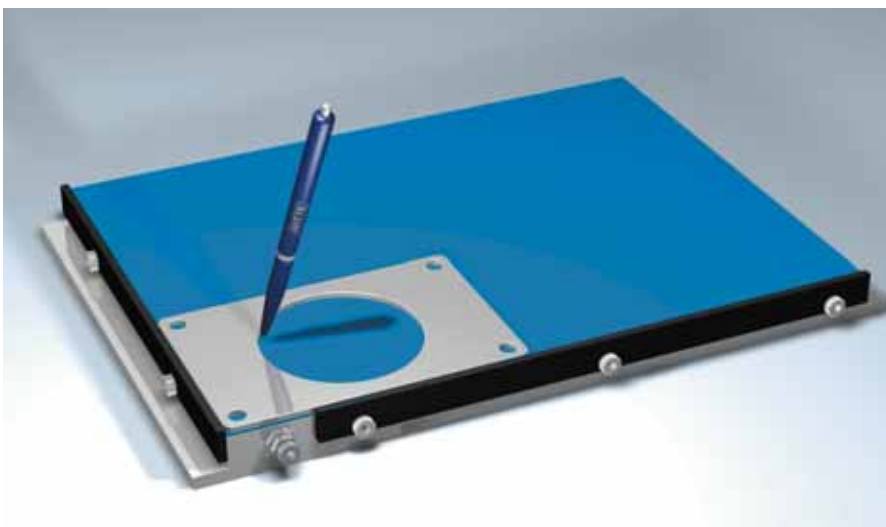


1

Lay the rubber adapter mat onto the chuck covering all the slots.

2

Position workpiece with the help of adjustable end stops. Then draw round the contour using an ordinary pen



### Application

Simply follow steps 1-5 and a custom built fixture is ready in seconds. When vacuum is switched on mat and workpiece are sucked down together. The excellent friction values offer especially good resistance to displacement forces during machining.

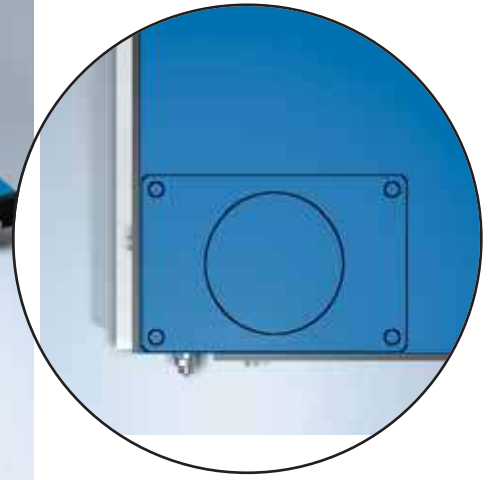
Using the slot chuck with the rubber adapter mat allows drilling of holes and milling or cutting of pockets and cutouts into the mat to a depth of 1,5mm without losing vacuum. As the mat suffers hardly any wear and tear it can be used often for workpieces with the same contour.

Certain applications allow the tool to work to depths of 1,5mm into the mat.

Height tolerance of the mats lies in a range of +/- 0,3mm (DIN 7715, part Kl. P2)


**3**

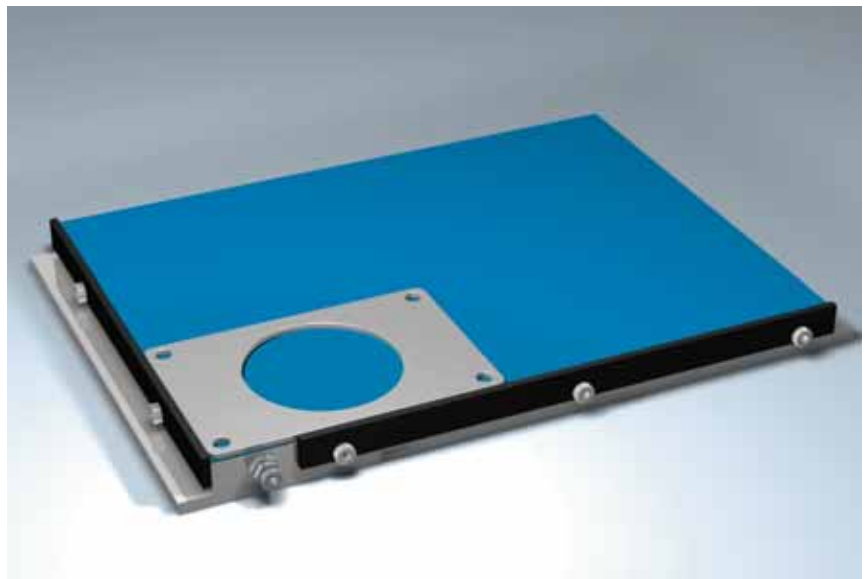
Here you can see the workpiece contour

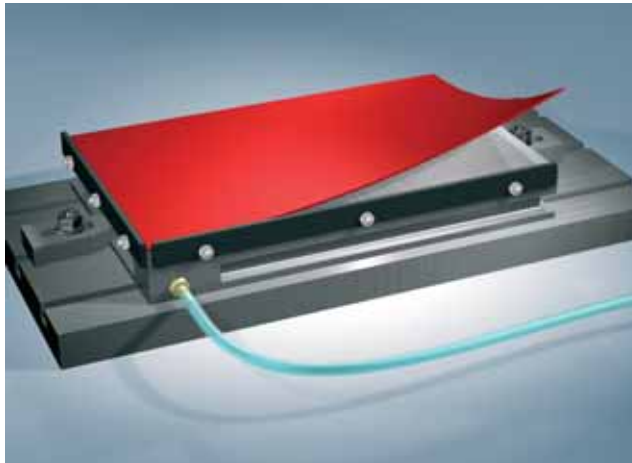

**4**

Remove the mat and punch holes into the area corresponding to the actual clamping surface of the workpiece. The holes should be approx. 3-8 mm Dia. in a 10mm grid and lie on slots of the chuck

**5**

Replace workpiece onto the mat. The excellent friction of the rubber material counteracts high-displacement forces better than any other vacuum system





**Rubber adapter mats, brown**, for use on slot type vacuum chucks (see also page 40)



Preference item:  
Articles with green diamond  
are available ex stock!

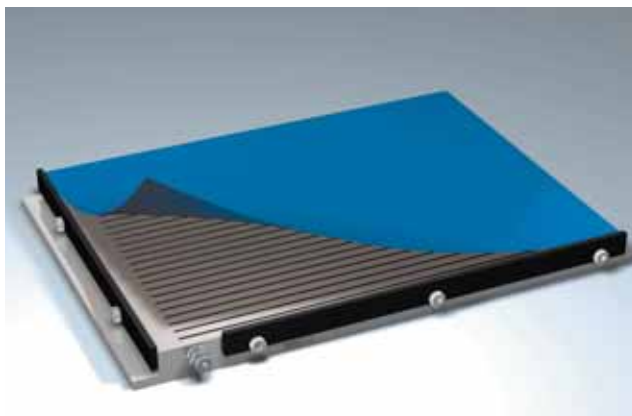


Other dimensions available on request

## Rubber adapter mats

for slot vacuum chucks

| Nr.          | A          | B          | C        | kg         |
|--------------|------------|------------|----------|------------|
| <b>00416</b> | <b>200</b> | <b>300</b> | <b>3</b> | <b>226</b> |
| 00609        | 200        | 500        | 3        | 378        |
| 00564        | 200        | 600        | 3        | 453        |
| 00009        | 300        | 150        | 3        | 170        |
| 00010        | 350        | 150        | 3        | 200        |
| 00011        | 400        | 200        | 3        | 300        |
| 00013        | 350        | 250        | 3        | 330        |
| 00014        | 300        | 300        | 3        | 340        |
| 00015        | 250        | 400        | 3        | 370        |
| <b>00016</b> | <b>400</b> | <b>300</b> | <b>3</b> | <b>460</b> |
| 00017        | 400        | 400        | 3        | 602        |
| 00415        | 500        | 300        | 3        | 560        |
| 00164        | 500        | 500        | 3        | 941        |
| 00418        | 500        | 1000       | 3        | 1890       |
| 00437        | 600        | 300        | 3        | 678        |
| <b>00414</b> | <b>600</b> | <b>400</b> | <b>3</b> | <b>904</b> |
| 00409        | 1000       | 1000       | 3        | 3766       |
| 00682        | 1000       | 2000       | 3        | 7550       |
| 00732        | 1000       | 2000       | 1        | 2500       |
| 00733        | 1000       | 2000       | 1,5      | 3980       |



## Rubber adapter mats

blue

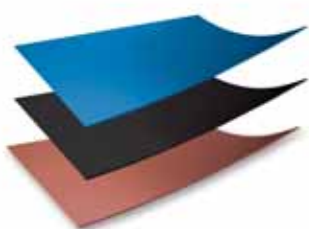
| Nr.          | l x w      | Thickness | kg  |
|--------------|------------|-----------|-----|
| <b>14927</b> | 2000 x 400 | 1         | 1   |
| <b>17302</b> | 9100 x 400 | 1         | 4,5 |

The blue rubber adapter mat is placed between part and chuck. It covers areas of the chuck not in use and secures part against slipping due to high friction value.

Areas covered by part, must be punched with holes or cut with slits.

Rubber adapter mat - blue.

Only available as a complete roll.



**Blue mat** (meterwise from roll): Most accurate product, highest friction, ideal for parts with small clamping areas, reusable

**Black mat** (cut to order): Can be milled over, low friction, reusable

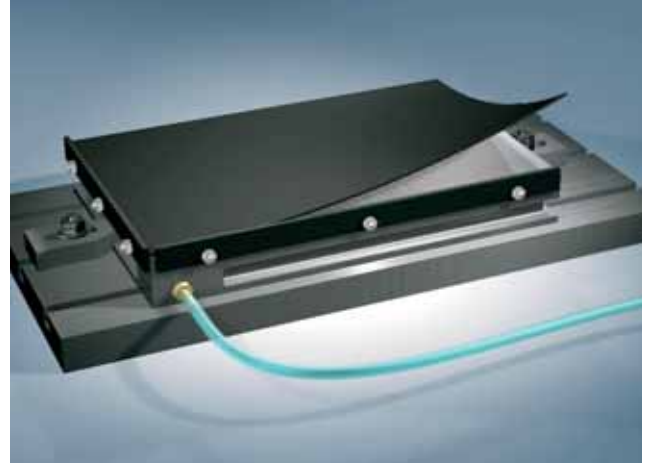
**Red mat** (cut to order): Cannot be milled over, medium friction, ideal for drilling holes through parts, reusable

## Rubber adapter mats

for slot vacuum chucks

| Nr.   | A    | B    | C |      |
|-------|------|------|---|------|
| 00280 | 200  | 300  | 3 | 260  |
| 00849 | 200  | 500  | 3 | 378  |
| 00850 | 200  | 600  | 3 | 453  |
| 00851 | 150  | 300  | 3 | 170  |
| 00825 | 200  | 400  | 3 | 360  |
| 00852 | 250  | 350  | 3 | 392  |
| 00853 | 300  | 300  | 3 | 410  |
| 00796 | 250  | 400  | 3 | 370  |
| 00854 | 300  | 400  | 3 | 540  |
| 00855 | 400  | 400  | 3 | 710  |
| 00856 | 400  | 500  | 3 | 880  |
| 00857 | 500  | 500  | 3 | 1100 |
| 00858 | 300  | 600  | 3 | 683  |
| 00791 | 400  | 600  | 3 | 1100 |
| 00859 | 500  | 1000 | 3 | 1900 |
| 00860 | 1000 | 1000 | 3 | 3800 |
| 00861 | 1000 | 2000 | 3 | 8000 |

Other dimensions available on request



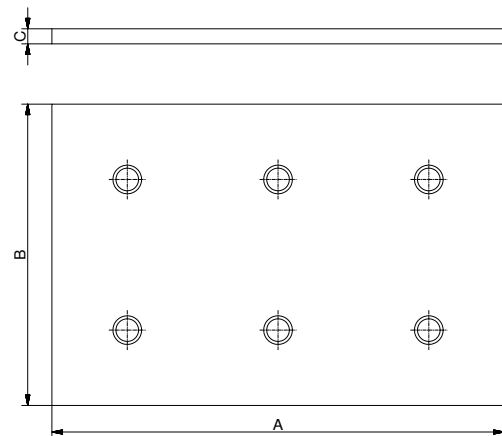
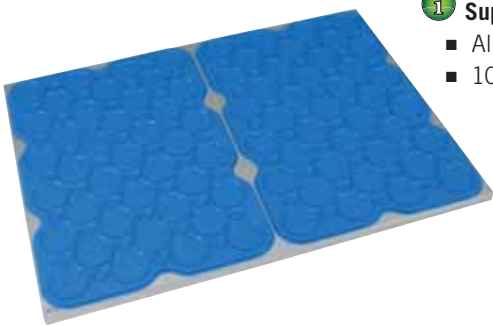
**Rubber adapter mats, black**, made of synthetic elastomer. These mats can be milled and thereby achieve much better plane-parallelism

## Vac-Mat adapter plate

suggested for modular slot type chucks

| Nr.    | A   | B   | C  | Vac-Mats |     |
|--------|-----|-----|----|----------|-----|
| 285136 | 300 | 200 | 10 | 10       | 2,7 |
| 285137 | 400 | 300 | 10 | 11       | 4,5 |
| 284497 | 600 | 400 | 10 | 12       | 8,1 |

- Supply includes:**
- Aluminium adapter plate
  - 10 Vac-Mats



Preference item:  
Articles with green diamond  
are available ex stock!







Slot vacuum chuck with 3 vacuum areas, which work combined or independently

## Slot vacuum chucks

### Examples of special designs



Slot vacuum chuck with special adapter plate

Slot vacuum chucks are particularly suitable for lighter cutting processes such as engraving, grinding, etc. parts with complex geometrical shapes, including those with cutouts (e.g. front panel).

Also working with adapter plates for multiple clamping is possible.

By using a rubber adapter mat it is possible to drill holes and to mill pockets and breakthroughs - without loss of vacuum. The adapter mat is 3mm thick, so a tool can penetrate about 2.5 mm into the adapter mat.



Circular vacuum chuck with ring slots for turning rings



Slot vacuum chuck mounted on a zero reference clamping system



Slot chuck with integrated rotation joint for use on an NC rotary table



View from below





## μ-porous Vacuum chucks

### Modular version in standard sizes or special design

These chucks have a porous surface area made out of sinterbronze, ceramic or porous aluminium depending on the application and workpiece. METAPOR® opens a whole new perspective for different clamping solutions

#### Application

Preferred workpieces:

- Thin walled (i.e. paper, foils, plate bars, metal strips)
- Fine (i.e. optical)
- Soft materials (i.e. rubbers)

for work such as:

- High precision measuring
- Precision milling
- Silicon wafer production

#### Advantages

- Due to the absence of grooves and holes workpieces are not deformed for instance on inserts in the clamping area
- Milling through the workpiece is possible with the use of our Friction booster
- METAPOR® has different quality grades and can also qualify for clean room surroundings (KI. 10)

#### Handling

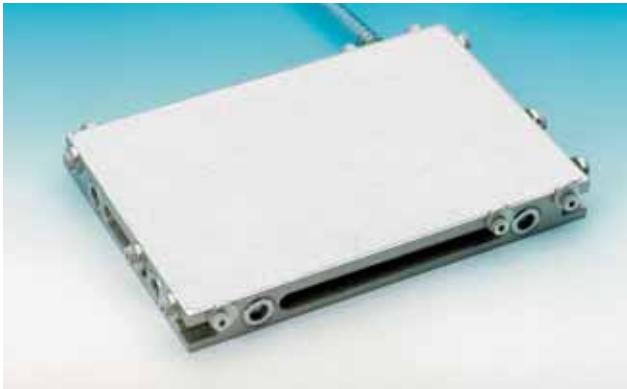
- Modular chucks can be interconnected to enlarge the surface area.
- Part specific special designs available



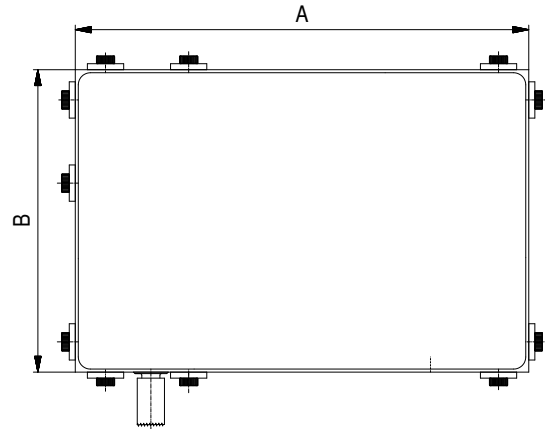
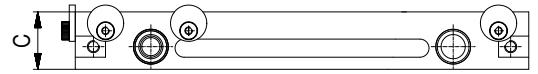
## μ-porous Vacuum chuck

with METAPOR® CE100 White

| Nr.   | A   | B   | C  | kg   |
|-------|-----|-----|----|------|
| 91488 | 300 | 200 | 38 | 5,7  |
| 92294 | 400 | 300 | 38 | 11,4 |
| 92296 | 600 | 400 | 38 | 23   |



**i** Plate inlay in Metapor CE 100 WHITE fine porous material with low pore diameter and very homogenic total porosity



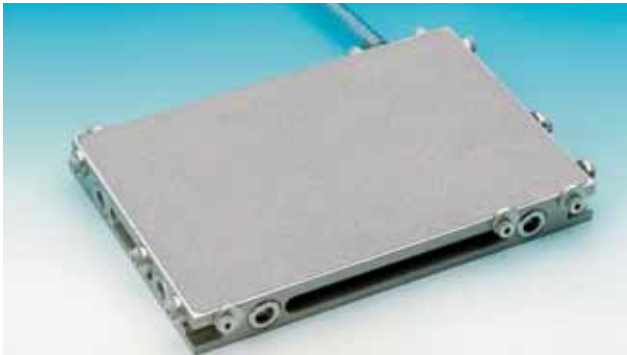
**i** **Supply includes:**

- Modular Metapor™ vacuum chuck
- 12x Height adjustable excentric end stops
- Vacuum chuck adapter
- 1m Vacuum suction hose with plug
- 2 x Step heel clamps, alu
- Tools for setting up

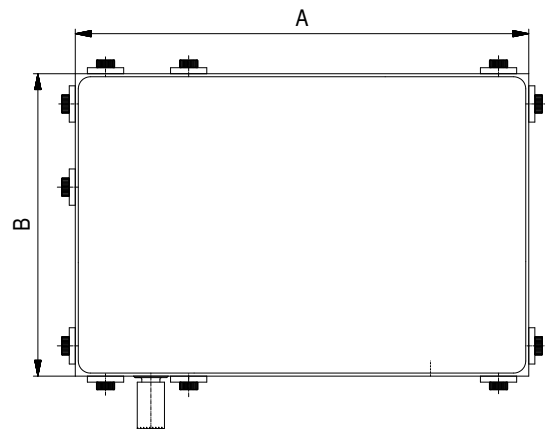
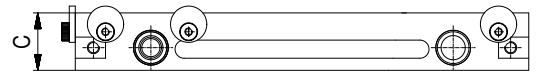
## μ-porous Vacuum chuck

with METAPOR® MC100 AL

| Nr.   | A   | B   | C  | kg   |
|-------|-----|-----|----|------|
| 91021 | 300 | 200 | 38 | 5,7  |
| 92290 | 400 | 300 | 38 | 11,4 |
| 92291 | 600 | 400 | 38 | 23   |



**i** Plate inlay in Metapor MC 100 AL fine porous material with low pore diameter and very homogenic total porosity, with larger porosity



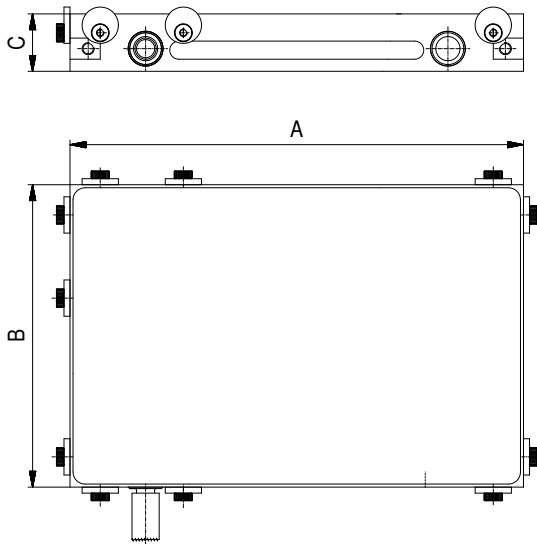
**i** **Supply includes:**

- Modular Metapor™ vacuum chuck
- 12x Height adjustable excentric end stops
- Vacuum chuck adapter
- 1m Vacuum suction hose with plug
- 2 x Step heel clamps, alu
- Tools for setting up

**i** Other Dimensions available on request.  
Further information on Metapor see page 89







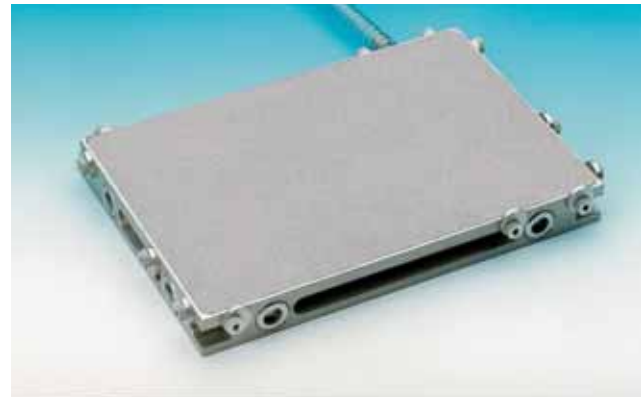
**Supply includes:**

- Modular Metapor™ vacuum chuck
- 12x Height adjustable excentric end stops
- Vacuum chuck adapter
- 1m Vacuum suction hose with plug
- 2 x Step heel clamps, alu
- Tools for setting up

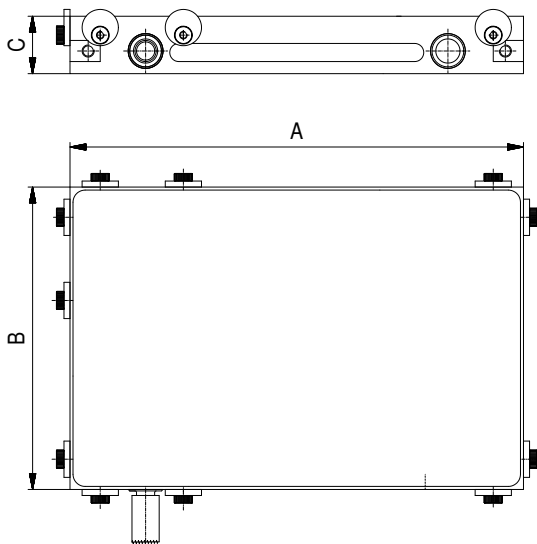
## μ-porous Vacuum chuck

with METAPOR® BF100 AI

| Nr.   | A   | B   | C  | kg   |
|-------|-----|-----|----|------|
| 83401 | 300 | 200 | 38 | 5,7  |
| 84380 | 400 | 300 | 38 | 11,4 |
| 84381 | 600 | 400 | 38 | 23   |



**i** Plate inlay in porous material Metapor BF100 AL details on page 87



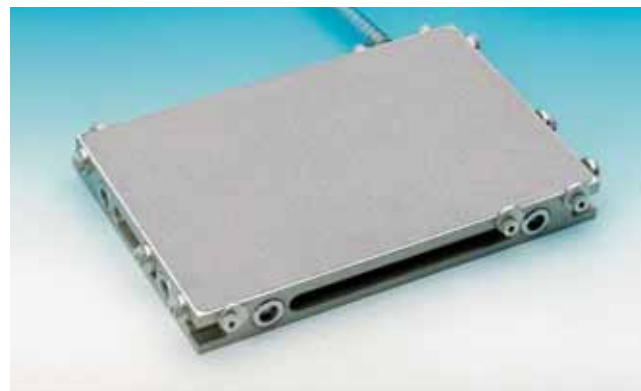
**Supply includes:**

- Modular Metapor™ vacuum chuck
- 12x Height adjustable excentric end stops
- Vacuum chuck adapter
- 1m Vacuum suction hose with plug
- 2 x Step heel clamps, alu
- Tools for setting up

## μ-porous Vacuum chuck

with METAPOR® HD 210

| Nr.   | A   | B   | C  | kg   |
|-------|-----|-----|----|------|
| 94315 | 300 | 200 | 38 | 6,1  |
| 94316 | 400 | 300 | 38 | 12,2 |
| 94317 | 600 | 400 | 38 | 25   |

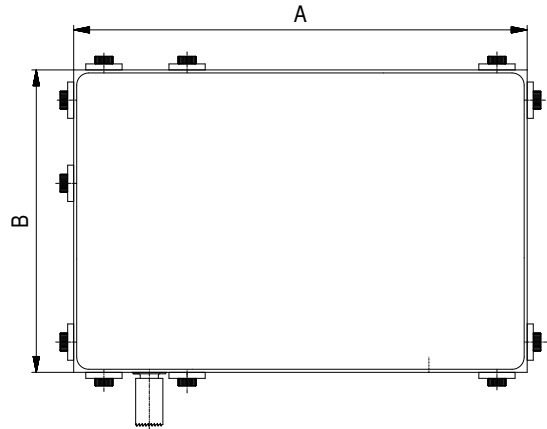
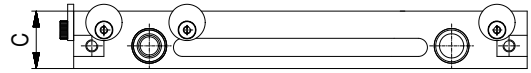
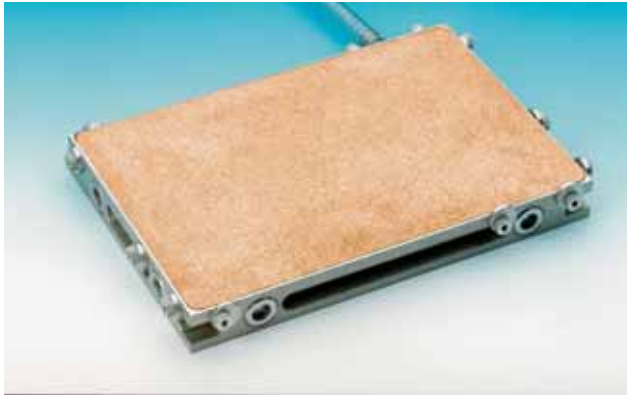


**i** Plate inlay in porous material Metapor HD210 AL for temperatures up to 210°C

### Sintermetal Vacuum chuck

Double layered, hardwearing sinterbronze inlay

| Nr.   | A   | B   | C  | kg   |
|-------|-----|-----|----|------|
| 84686 | 300 | 200 | 38 | 7,1  |
| 84687 | 400 | 300 | 38 | 14,2 |
| 84688 | 600 | 400 | 38 | 28,4 |



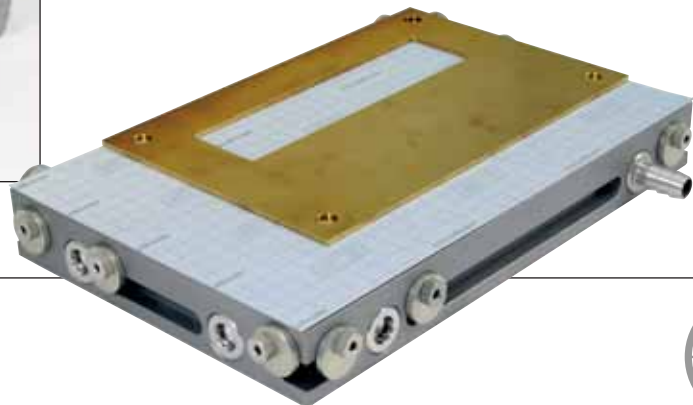
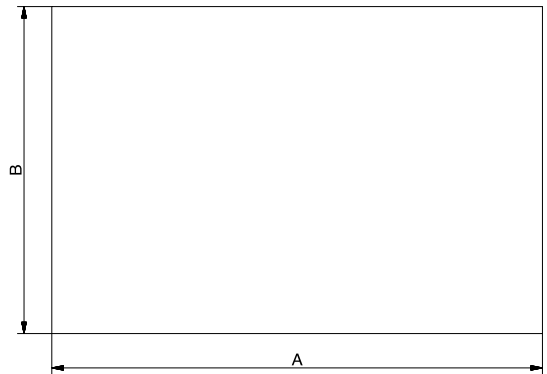
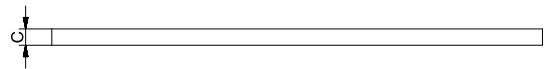
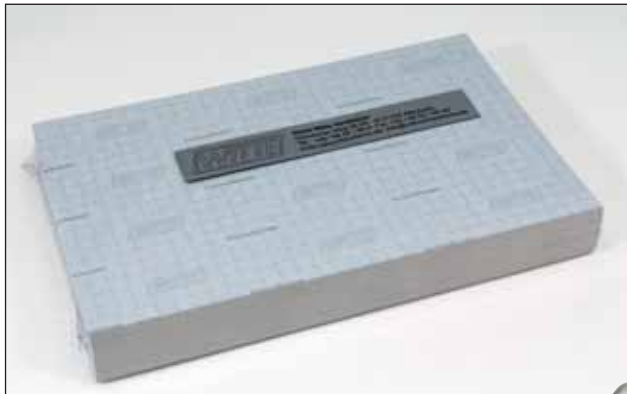
**Supply includes:**

- Modular Metapor™ vacuum chuck
- 12x Height adjustable excentric end stops
- Vacuum chuck adapter
- 1m Vacuum suction hose with plug
- 2 x Step heel clamps, alu
- Tools for setting up

### Friction Booster

Protects Metapor chucks from damage when through cutting or lasering parts

| Nr.   | A   | B   | C  | Stck | kg  |
|-------|-----|-----|----|------|-----|
| 00839 | 300 | 200 | <1 | 50   | 1,8 |
| 00840 | 400 | 300 | <1 | 25   | 1,8 |
| 00841 | 600 | 400 | <1 | 25   | 3,6 |



Other Dimensions available on request.  
Further information on Metapor see page 84



# Vacuum Clamping Technology

## for new technologies in research and development



Special version with integrated heating and electronic temperature control

### 1. Clamping with Witte vacuum chucks

Vacuum chucks from Witte have proven successful in many areas of semiconductor technology and made a name for accurate, fast and "gentle" clamping.

These lightweight, yet very accurate vacuum chucks are made of aluminum alloy and usually have a micro-porous clamping surface of Metapor material.

However, custom-built perforated-grid chucks with small holes arranged in a specific pattern can also be implemented. (See pictures)

### 2. Flexible

Besides standard versions of this vacuum chucks, Witte offers every conceivable specific design and dimension. We analyze technical requirements and environmental conditions of customers' processes, and develop a concept together with them. Various technically feasible configurations have already been manufactured.

### 3. Accurate

A modern machine shop and climatized measuring rooms with high precision measuring machines ensure excellent quality of products. Vacuum chucks are available **with flatness and / or parallelism of <math>< 5\mu\text{m}</math>** if the application profile of the customer requires it.

### 4. Reliability

A chuck surface comprising of micro-porous material guarantees completely "flat" clamping. Thin carrier foils or wafers are not deformed by suction holes, suction grooves or similar which occurs during conventional clamping methods. The low weight and accuracy of such Witte chucks is also advantageous for automated applications.

### 5. Universal

Another major advantage of micro-porous vacuum chucks is that the vacuum still works extremely effectively even when the micro-porous surface is not covered completely. This enables clamping of different sized parts on the same chuck. The porous surface may also be divided into separately operable areas with individual switches. (See example opposite) Integrated hovercraft technology, ejector and lifting pins are some of the technical ingredients of these innovative concepts.

Furthermore, vacuum chucks for certain processes can be **"heatable"** up to a temperature as high as 150°C with corresponding temperature controls (see picture above.).

Likewise, **cooling** systems or **light transparency** applications are possible.

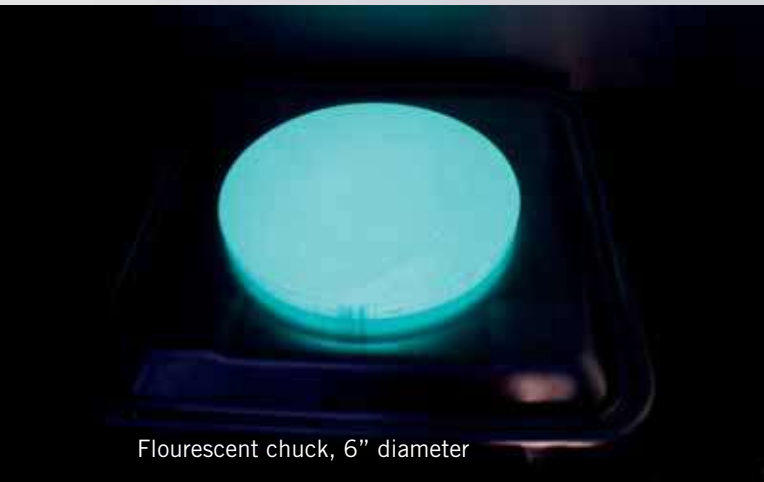
### 6. Everything from one source

In addition to standard and custom vacuum chucks Witte supplies all necessary accessories such as simple ejectors, vacuum pumps, rotary joints, hoses, solenoid valves and much more.

Our expert staff can advise you and look forward to your inquiry.



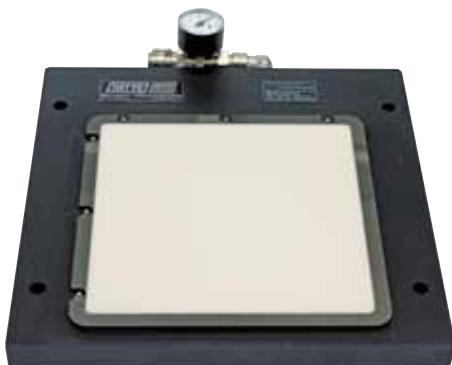
Specially designed porous chuck with three individual clamping areas, stops for part positioning and lifting pins for easy removal of wafers.



Flourescent chuck, 6" diameter

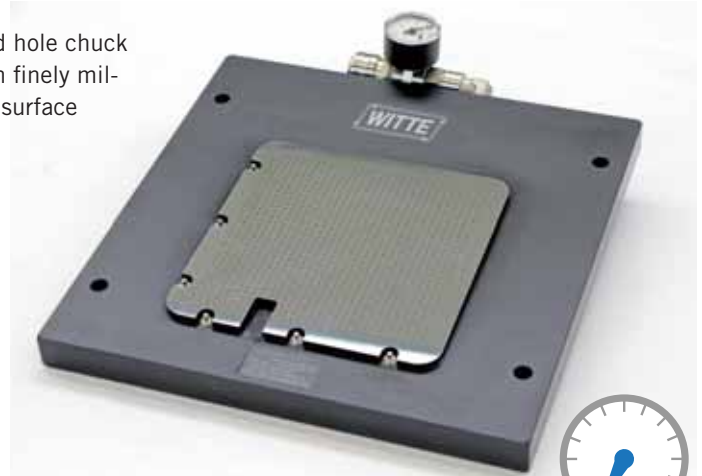


Independent vacuum chuck.  
Clamping of parts on chuck completely free of external supply lines. Battery, vacuum pump, controls, display and valves are all integrated



Finely milled vacuum chuck for clamping wafers, clamping area microporous material Witte MP CE100 WHITE flatness accuracy <0,005mm

Grid hole chuck with finely milled surface







DLC light transmitting chuck for clamping parts, views from above and below



Application in automotive industry, leather clamped on visible side for grinding predetermined breaking points in areas of airbags on reverse side

## $\mu$ -porous vacuum chucks

### Further examples



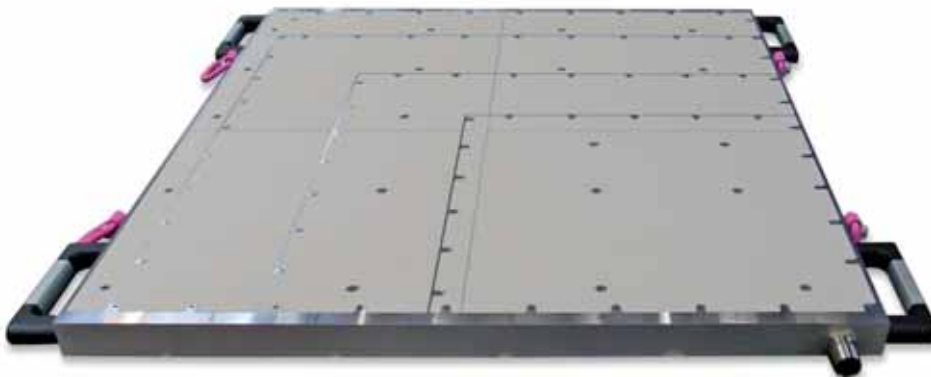
Same chuck shown without leather parts



Vacuum clamping system for laser application. Detail shows both clamping areas and cutting channels.



Small size micro finely machined chuck



Vacuum chuck with four separately usable clamping areas

Vacuum chuck with micro porous clamping surfaces and holes for applications using light transference





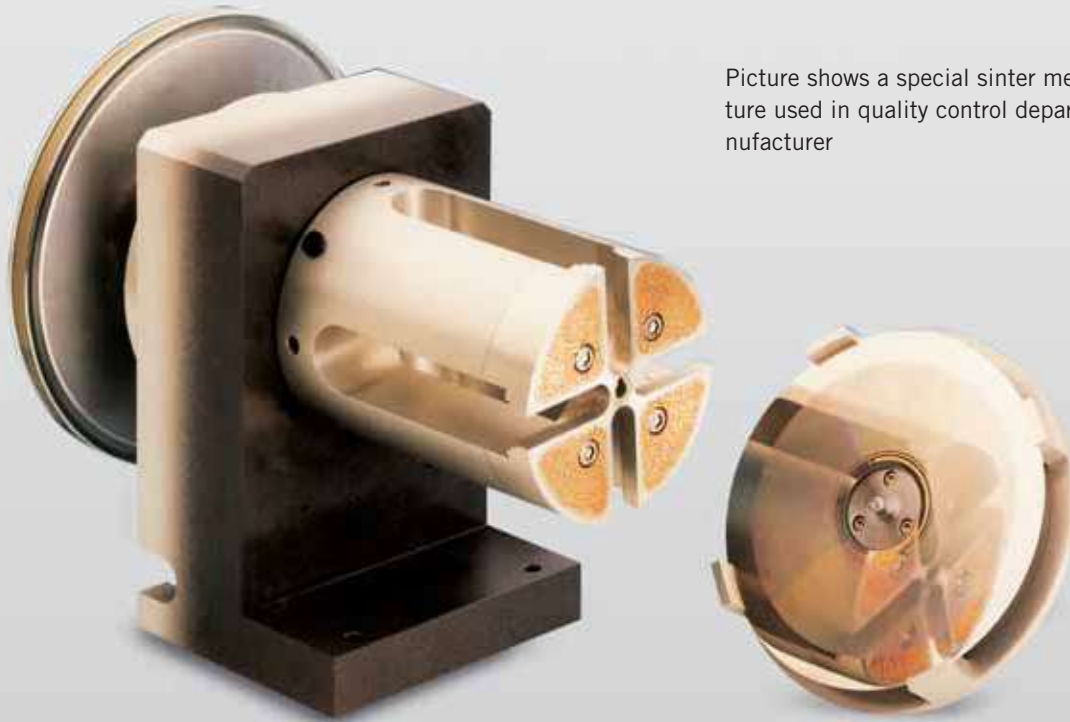
Vacuum chuck with two clamping areas and lifting pins for **automatic** controlled process



Vacuum chuck with three clamping areas and lifting pins for **manually** controlled process

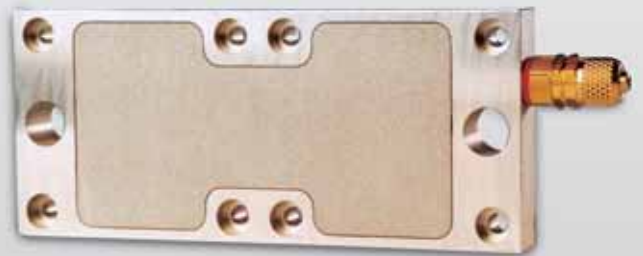


DLC (Durchlicht chuck), light transmitting chuck for gentle clamping of parts during optical analysis process



Picture shows a special sinter metal vacuum fixture used in quality control department of CD manufacturer

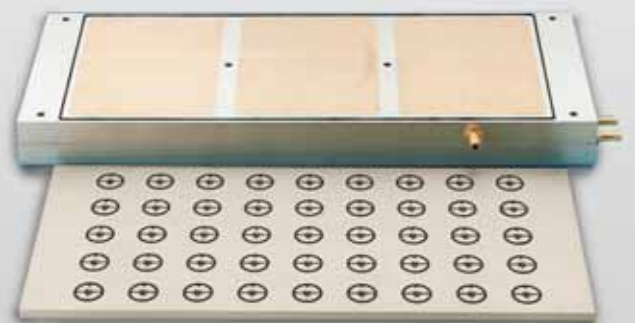
## Sintermetal vacuum fixtures



Vacuum chuck for credit cards



3D Vacuum chuck

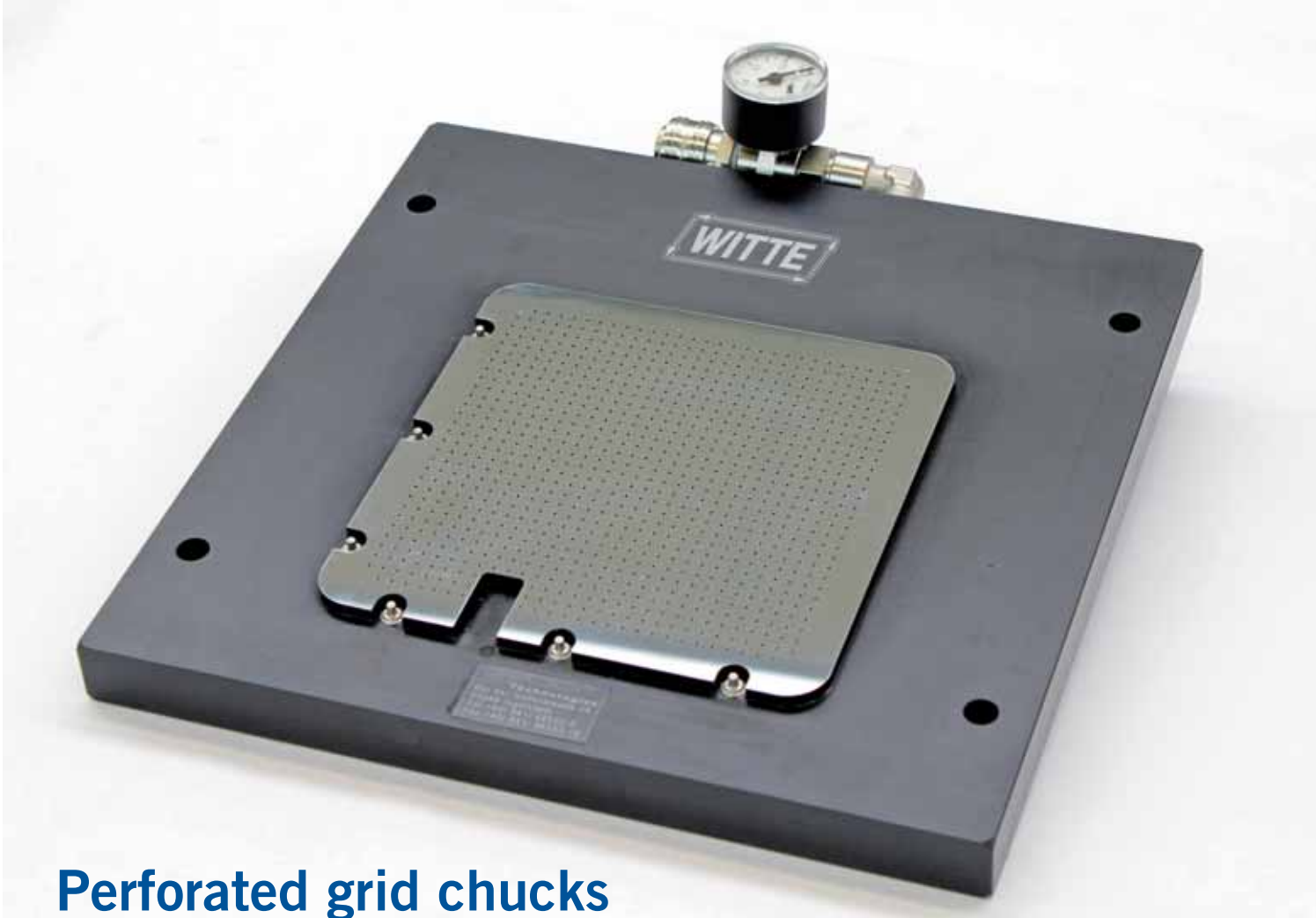


Sinter metal vacuum chuck with special adapter plate for clamping hard metal blanks during laser machining process.

It has an integrated cooling labyrinth which prevents inaccuracies, due to development of warmth which occurs during the laser machining process







## Perforated grid chucks

### Custom built

Surface area has many small bores. The large area enables secure clamping of sensitive work pieces such as foils used in printing or photographic industries.

These are only made to order according to customer data.

#### Applications

Highly accurate

- Clamping of films and foils on machines used to make printing plates during laser and UV exposure of films. Foils and conductors.

#### Advantages

- Sizes from 1.400x2.000 mm with an accuracy of 50 µm
- Vacuum clamping area need not be covered to 100%

#### Handling

- Easy positioning of workpiece with excentric end stops
- Only limited hold down force for machining purposes.



Vacuum clamping system with elevation function. On pult level valuable, sensitive prints and paintings are gently clamped using vacuum. Plate is raised automatically to vertical position and items are digitalized. Application takes place in a museum.



Grid hole type chuck with integrated Vilmill roller, surface area 1300x300mm



Vacuum clamping of carbon fibre part for accurate milling using Vilmill fleece





## Vilmill & Vacuum

### Partners for high-speed cutting of aluminium and plastics

If your job is to cut lots of small parts out of one large part the combination of vacuum and Vilmill is what you need.

Vilmill is a vacuum system comprising of a fleece-like, coated foil, a specially equipped vacuum chuck and a powerful pump system for vacuum supply.

The Vilmill foil is mounted between chuck and part. The warmth created during cutting causes the surface coating to melt and sticks the part to the chuck.

The vacuum is effective through the Vilmill foil, which at the same time acts as a puffer. The accurately balanced permeability of Vilmill foil increases the efficiency of vacuum chucks and reduces vacuum consumption.

Especially when cutting out small parts Vilmill offers additional security through the adherence effect. It greatly simplifies removal of small finished parts from the machine.

For maximum cutting speeds a thin layer of material should remain in order to use the complete part surface under vacuum until the last cut is made.

Vilmill is suitable for aluminium or plastic sheets up to 15mm thick. Only dry machining is possible and the working range in Z axis must be high enough to integrate a vacuum chuck.

#### Conditions for use of Vilmill™

- Minimum suction 250-300m<sup>3</sup>/h
- High vacuum
- Spindle rpm > 20.000 1/min
- Grid hole type chuck with 10mm grid
- Suitable adapted milling strategy; tool must go in and leave part via programmed ramp

#### Vilmill™-Foil Black

- No. **600290**
- Dim.: 0,35mm x 1000 x 100mm
- Weight per roll; 11,5kg (115g/m<sup>2</sup>)





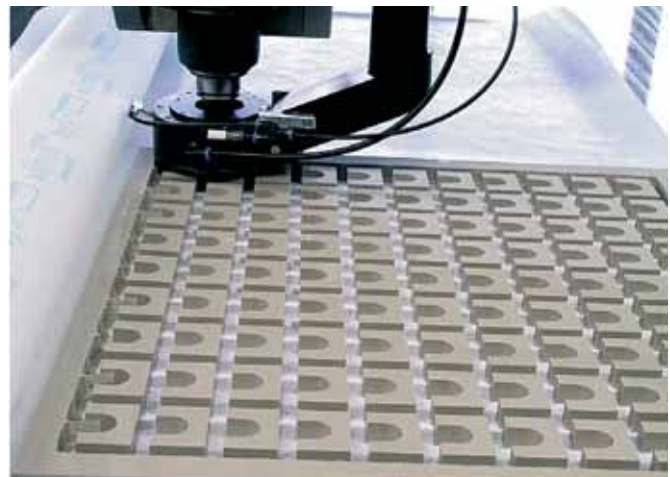
#### Machining of thin metal sheets

The heat generated at the milling burr activates the adhesive coating on the mat and keeps even small parts in place.



#### Machining of aluminum sheets of greater thickness

Only the final feeding depth (0.1- 0.3 mm) cuts in the adhesive mat and separates the parts completely.



#### Machining of plastics

The adhesive coating is also activated during the machining of plastics and fiber compounds.



#### Vilmill adhesive foil

- Increase efficiency of vacuum chucks
- Fix parts during cutting
- Provide necessary space when material is cut through
- Are ideal for removing small parts after machining







# FLIP-POD™ Vacuum System

## Alu FLIP-POD FLIP-POD

### This technology is ideal for

- Milling
- Grinding
- Drilling
- Cutting threads

Mainly for large workpieces made out of

- Wood
- Plastic
- Glass
- Cast metals

Suitable for

- Milled or rough surfaces.

### Advantages

- Strong hold down forces enable the use of large machines.
- Bevels, contours and radii can be performed on the upper and lower workpiece surfaces.
- Clamping dimensions can be changed within seconds to conform to new workpiece sizes
- Can be used on most machine tables.

### Handling

- Pods are the contact surfaces for the workpiece
- Simply activate or deactivate the pods by turning them around.
- To clamp a workpiece effectively 6-8 pods are required.
- This modular system can be extended for larger clamping surfaces.



The crosssection shows

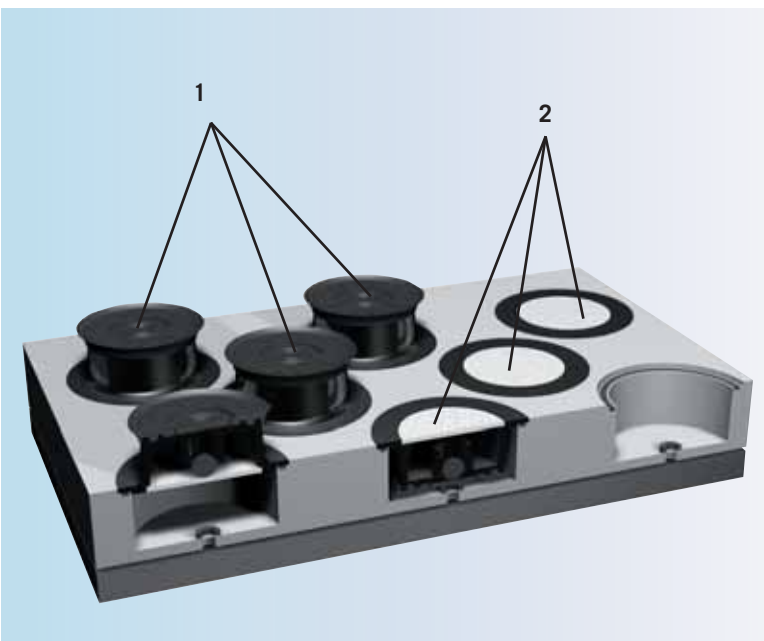
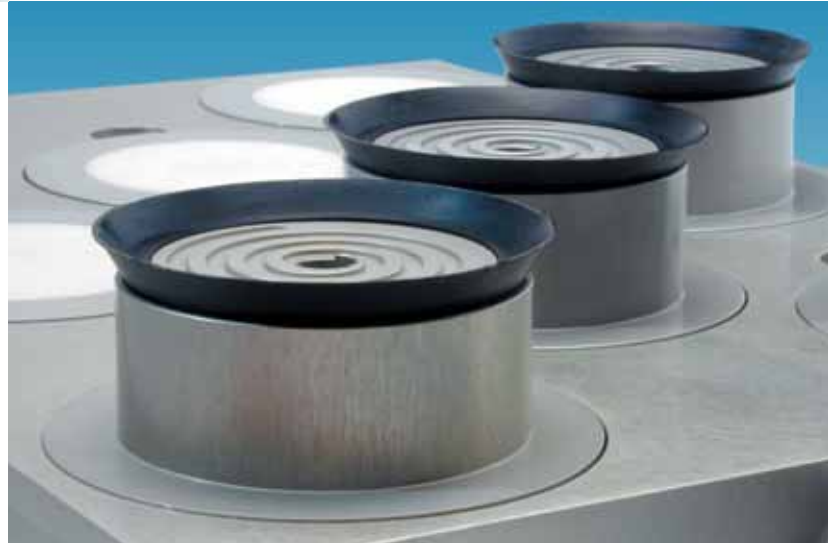
- FP Sucker
- FP Unit
- FP Polymer ball
- and
- FP Filter

In the pod plate you will find

- FP Large gasket
- FP Center hole gasket

### Alu FLIP-POD™

has an accurate, defined workpiece surface. Height tolerance is only 50µ. They are suitable for face machining on both surfaces, especially of metallic workpieces.



### Function

The round polymer pods (1) protrude out of the pod plate when in use.

The pods not required lie in a recess cavity (2) of the pod plate.

Simply flipping them over activates or deactivates the pods.

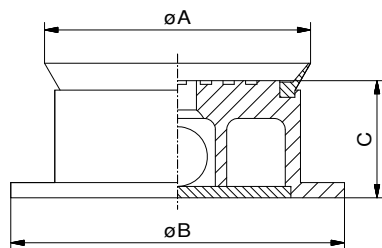
The valve ball which stops the vacuum supply when the pod is resting, opens the valve and the vacuum system is activated.

All active pods stand 27mm above the pod plate surface, allowing contour milling and recess cutting on the outer contours.



## FP Basic unit

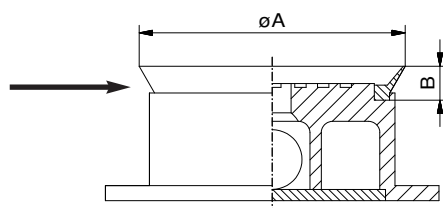
complete



### Supply includes:

- FP Seal
- FP Ball
- FP Filter

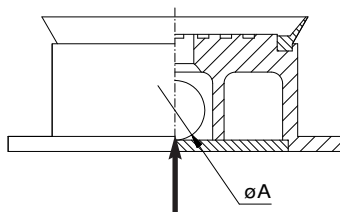
| Nr.   | A  | B  | C  | Mat       |     |
|-------|----|----|----|-----------|-----|
| 84408 | 70 | 88 | 31 | Aluminium | 170 |
| 14384 | 70 | 88 | 31 | Polymer   | 100 |



## FP Seal

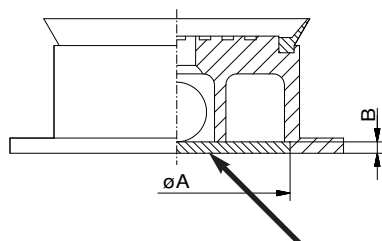
for Alu-Pod

| Nr.   | A  | B | g |   |
|-------|----|---|---|---|
| 30584 | 70 | 9 |   | 6 |



## FP Polymer Ball

| Nr.   | A    |  |  |    |
|-------|------|--|--|----|
| 12124 | 15,8 |  |  | 10 |



## FP Filter

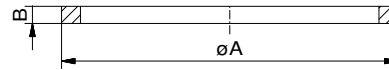
| Nr.   | A  | B |  |    |
|-------|----|---|--|----|
| 12125 | 61 | 3 |  | 14 |



### FP Large seal

for Pod Plate

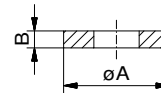
| Nr.   | A  | B   |  |    |
|-------|----|-----|--|----|
| 11395 | 88 | 4,5 |  | 65 |



### FP Center hole gasket

for pod cavity

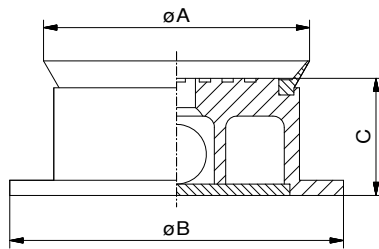
| Nr.   | A  | B |  |   |
|-------|----|---|--|---|
| 11394 | 28 | 6 |  | 1 |



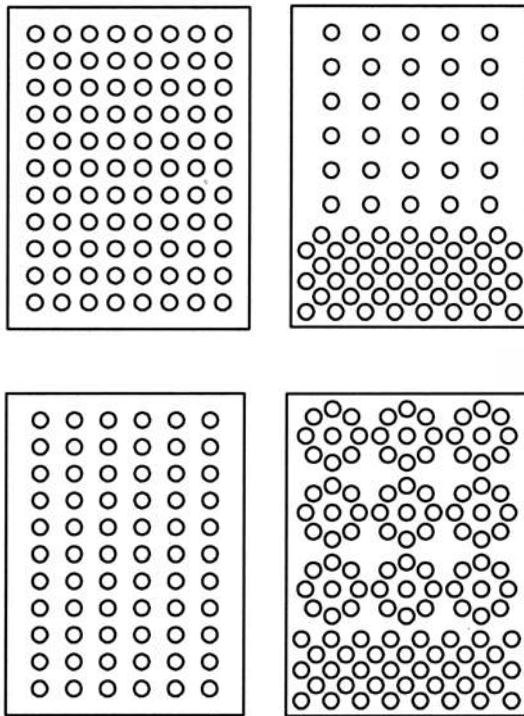
Pod -Plate, ready for use,  
with ALU FLIP-POD™s







The sketches show a range of possible pod panel designs.



The user can choose a panel design that best suits the parts being machined. The pod panel can be laid out in almost any design and combination.

## FLIP-POD™ Sets

polymer version

| Nr.   | Description       | Area/Grid              | Pods (N) | kg   |
|-------|-------------------|------------------------|----------|------|
| 83100 | FLIP-POD® Set 100 | 1m <sup>2</sup> /100mm | 100      | 10,2 |
| 83200 | FLIP-POD® Set 200 | 2m <sup>2</sup> /100mm | 200      | 20,2 |
| 83300 | FLIP-POD® Set 300 | 3m <sup>2</sup> /100mm | 300      | 30,2 |
| 83400 | FLIP-POD® Set 400 | 4m <sup>2</sup> /100mm | 400      | 40,2 |

### Supply includes:

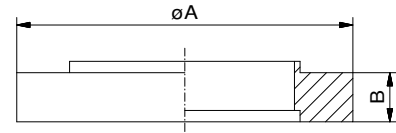
- Basic unit with lip seal
- FP Center hole gasket
- FP Large seal
- 3 Retractable locator pod
- 2 Fixed locator pods



## FP Lift ring

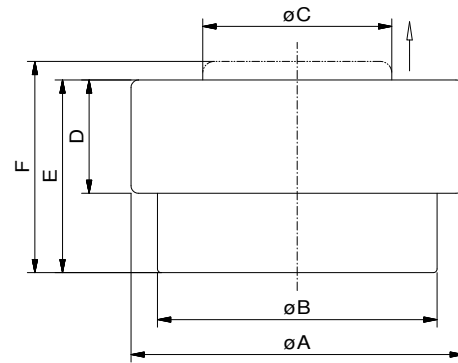
1/2"

| Nr.   | A    | B    |    |
|-------|------|------|----|
| 11396 | 88,5 | 12,7 | 65 |



## FP Transfer Pod

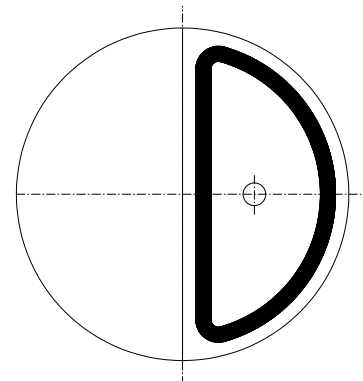
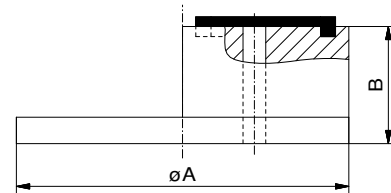
| Nr.   | A    | B    | C    | Dg | E  | F    |     |
|-------|------|------|------|----|----|------|-----|
| 85662 | 88,9 | 87,4 | 50,8 | 30 | 51 | 55,9 | 230 |

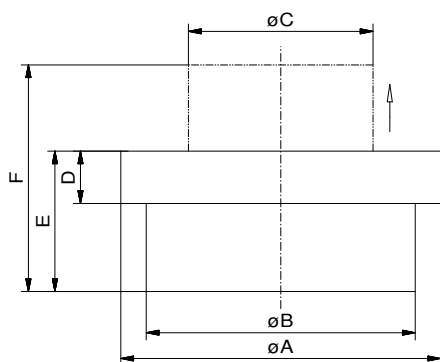


Acts as spacer when positioning large workpieces, raised ring retracts when vacuum is applied

## FP Half Pod (1/2)

| Nr.   | A  | B    | Mat       |     |
|-------|----|------|-----------|-----|
| 85328 | 88 | 30,9 | Aluminium | 150 |
| 82138 | 88 | 30,9 | Polymer   | 95  |





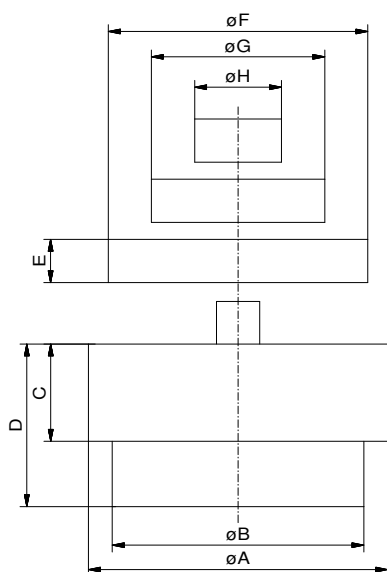
## FP Retractable locator pod

automatically retract when vacuum is applied

| Nr.   | A    | B  | C    | D    | E    | F    |     |
|-------|------|----|------|------|------|------|-----|
| 82136 | 88,9 | 74 | 50,8 | 14,4 | 38,6 | 62,3 | 252 |



Retract function of upper section when vacuum switched on



## FP Fixed locator pod

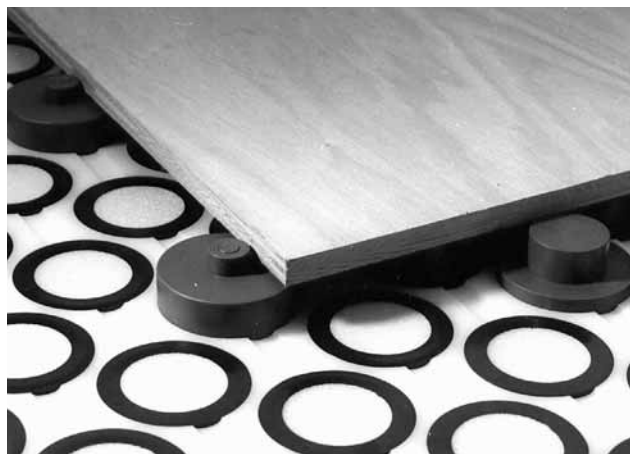
incl. unit, pins and spacer disks

| Nr.   | A    | B  | C    | D    | E    | F    | G  | H    |     |
|-------|------|----|------|------|------|------|----|------|-----|
| 82137 | 88,9 | 74 | 28,6 | 47,8 | 12,7 | 76,3 | 15 | 25,5 | 476 |



### Fixed and retractable locator pods

ensure high accuracy. Locator pods are available in both fixed and retractable versions, either of which fit in any pod cavity. After positioning the workpiece the retractable pods are drawn back into the pod plate as soon as vacuum is switched on, allowing a free path for the cutting tool.







Various Flip-Pod™ applications in different industries i.e. aircraft and carriage building







## Accessories and replacement materials



## Replacement materials



### VAC-MAT™

Page 30



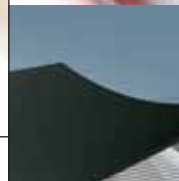
### Rubber adapter mat, blue

Page 46



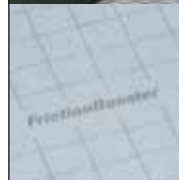
### Rubber adapter mat, red

Page 46



### Rubber adapter mat, black

Page 47



### Friction Booster

Page 53



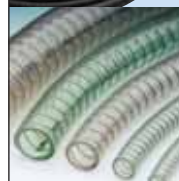
### Vilmill™

Page 62



### O-shaped seal

Page 74



### Wire spiral hose

Page 83



### Polymer hose

Page 83



### Polymer tubing

Page 83

## Vacuum Switch with LED Display

Vacuum switch, electronic, with adjustable safety values. Used as safety switch for dry working environments.

| Nr.    | Maße (mm) | U   |    |
|--------|-----------|-----|----|
| 282703 | 55x30x32  | 24V | 11 |



### Technical data:

|                                       |                                  |
|---------------------------------------|----------------------------------|
| ■ Measuring range:                    | -1 to + 10 bar                   |
| ■ Connection:                         | G1/8"                            |
| ■ Operating current (V):              | 18-32 DC                         |
| ■ Electricity load (mA):              | 100                              |
| ■ Compression resistance (bar):       | 20                               |
| ■ Readiness delay time (s):           | 0,3                              |
| ■ Min. reaction time switch off (ms): | 2,5                              |
| ■ Adjustable delay time sD, dr (s):   | 0; 0,002...5                     |
| ■ Protection:                         | IP 65                            |
| ■ Weight (kg):                        | 0,106                            |
| ■ Display:                            | Display unit<br>Switching status |
|                                       | 4 x LED green<br>2 x LED yellow  |

### Supply includes:

- Connecting cable 5m, angled
- Operation manual

## Vacuum Switch with LED Display

Vacuum switch, electronic, with comprehensive adjusting/programming possibilities. Used as safety switch for wet and explosion protected working environments.

| Nr.    | Maße (mm) | U   |    |
|--------|-----------|-----|----|
| 283126 | h=92, ø33 | 24V | 50 |



### Supply includes:

- Connecting cable 5m, angled
- Operation manual

### Technical data:

- Vacuum display, controlled electronically
- Upper and lower vacuum safety values (hysteresis) freely adjustable
- Connection: G1/4"
- Adjustable reaction time
- Programming of switching outputs  
Hno = Hysteresis /Closer  
Hnc = Hysteresis /Opener  
Fno = Hysteresis /Closer  
Fno = Hysteresis /Opener  
(Close contact/break contact)
- Maximum overload pressure 10bar





## Vacuum grease

| Nr.   | Description | Inhalt |     |
|-------|-------------|--------|-----|
| 80140 | Grease      | 250g   | 350 |

### Used from time to time for the following:

- Greasing suction hose
- Sealing off workpieces with rough or scored surface



**80103**  
Axial connection



**80100**  
Radial connection

## Vacuum gauges

| Nr.   | Connection-thread | Dia-meter | Range       |    |
|-------|-------------------|-----------|-------------|----|
| 80103 | G1/8" axial       | ø40       | 0 to -1 bar | 40 |
| 80100 | G1/8" radial      | ø40       | 0 to -1 bar | 40 |



Used for sealing grid chucks or defining active vacuum areas. This high quality seal is placed into the slot of a grid type vacuum chuck.

The seal diameter is dependant on the cross section of the slot. If a plate is milled over then a seal with a smaller diameter will be required.

**Minimum order quantity 50m/per diameter.**

## O-shaped seal

| Nr.   | Diameter | Nr.   | Diameter |
|-------|----------|-------|----------|
| 00188 | ø 2,0mm  | 00171 | ø 5,5mm  |
| 00069 | ø 3,0mm  | 00072 | ø 6,0mm  |
| 00170 | ø 3,5mm  | 00172 | ø 6,5mm  |
| 00070 | ø 4,0mm  | 00073 | ø 7,0mm  |
| 00157 | ø 4,5mm  | 00251 | ø 8,0mm  |
| 00071 | ø 5,0mm  | 00316 | ø 10,0mm |



**Tolerance class:**

DIN ISO 3302-1 Tab. 2. Class E3

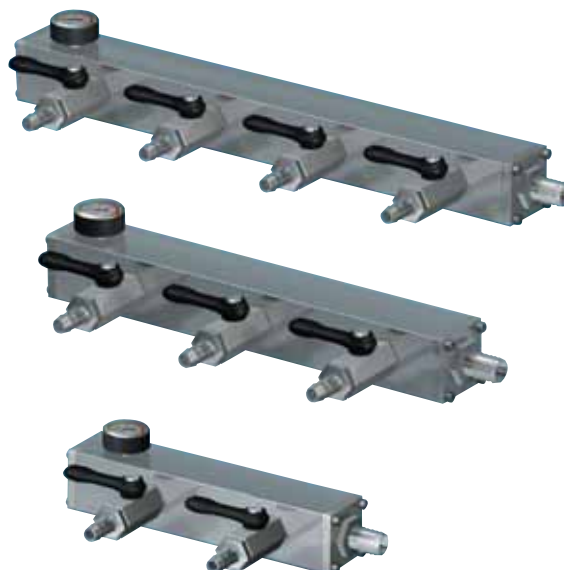


Preference item:  
Articles with green diamond  
are available ex stock!

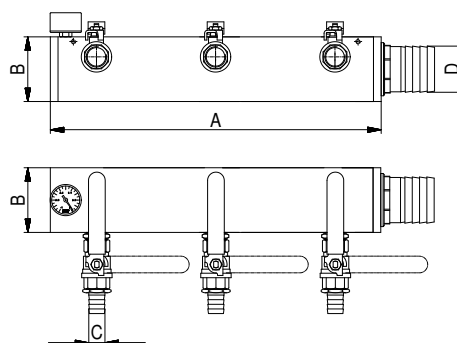
## Manifold distributors

All manifolds are supplied with corresponding hose-nozzles and on each exit there is a 3/2 way aerated vacuum valve with a vacuummeter

The manifold can be upgraded to a safety appliance when assembled together with a safety pressure switch ( 93937 or 282703, see page 85).  
Connection threads R 1/8" with blind plugs are already in place.



| Nr.   | A   | B  | C      | D      | kg  |
|-------|-----|----|--------|--------|-----|
| 94045 | 250 | 43 | 2xLW12 | 1xLW18 | 1,5 |
| 92419 | 250 | 43 | 3xLW12 | 1xLW18 | 2   |
| 84389 | 300 | 43 | 4xLW12 | 1xLW18 | 1,7 |
| 85680 | 250 | 43 | 3xLW18 | 1xLW25 | 2   |
| 84390 | 480 | 84 | 6xLW12 | 1xLW25 | 5,6 |
| 85197 | 294 | 53 | 4xLW12 | 1xLW32 | 3   |
| 84391 | 480 | 84 | 6xLW12 | 1xLW32 | 5,9 |
| 84591 | 510 | 84 | 4xLW18 | 1xLW32 | 6,5 |
| 84392 | 765 | 84 | 6xLW18 | 1xLW32 | 6,9 |
| 89052 | 510 | 84 | 2xLW25 | 1xLW32 | 6,5 |
| 90134 | 690 | 84 | 6xLW12 | 1xLW50 | 6,9 |
| 90177 | 440 | 84 | 3xLW18 | 1xLW50 | 5,5 |
| 84393 | 510 | 84 | 4xLW25 | 1xLW50 | 6,0 |
| 90562 | 650 | 84 | 5xLW25 | 1xLW50 | 6,5 |
| 90527 | 130 | 84 | 2xLW32 | 1xLW50 | 4,6 |
| 84394 | 510 | 84 | 4xLW32 | 1xLW50 | 6   |

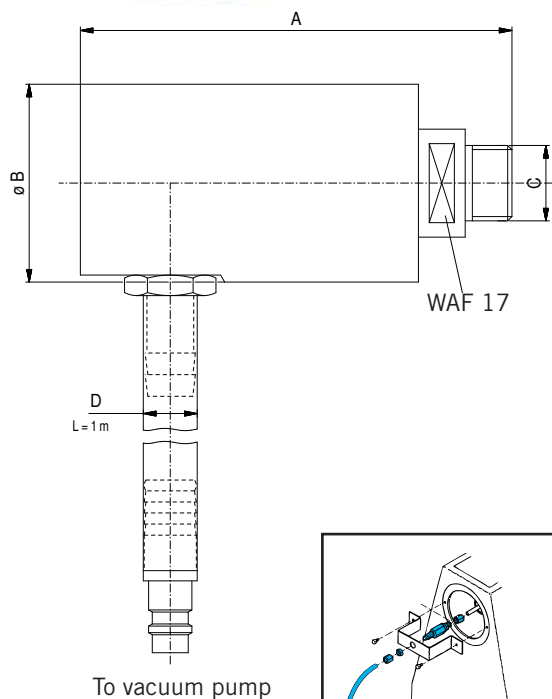


## Y distributor with female thread

| Nr.   | Thread | Hose nozzle      | kg   |
|-------|--------|------------------|------|
| 90716 | G3/8"  | 3 x ø12          | 170  |
| 90717 | G1/2"  | 3 x ø18          | 900  |
| 90718 | G1/2"  | 1 x ø18, 2 x ø12 | 1000 |







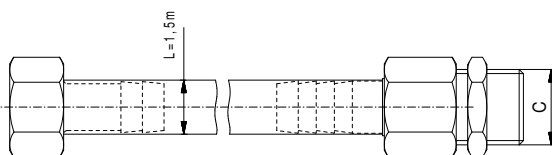
## Rotation joint

max. 3500 rpm

| Nr.   | A   | B  | C     | D     | g    |
|-------|-----|----|-------|-------|------|
| 80910 | 88  | 43 | G1/4" | 12/8  | 400  |
| 80261 | 98  | 43 | G3/8" | 12/8  | 400  |
| 80262 | 120 | 55 | G1/2" | 15/12 | 1300 |

### Supply includes:

- 2,5m pipe
- Connecting parts



### Ideal for using with

- Circular vacuum chucks on lathes with a hollow spindle
- Vacuum chucks on a rotating machine table with hollow spindle

To vacuum chuck

The Witte rotation joint allows rotary movement of circular or normal chuck but with a stationary vacuum supply without any vacuum loss.

They come complete with polymer tubing, which connects the chuck through the hollow spindle with the rotation joint. It is the tubing which takes up the torque force



### Supply includes:

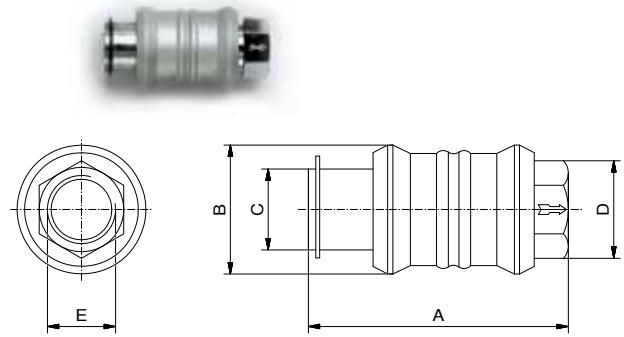
- 3/2 way aerated valve
- 3m vacuum hose
- 1 vacuummeter
- 2 hose fittings

## Connection unit

| Nr.   | Type     | For hose dia |
|-------|----------|--------------|
| 80102 | straight | 12mm         |
| 82519 | straight | 18mm         |
| 82952 | straight | 24mm         |
| 82902 | straight | 32mm         |
| 82953 | straight | 50mm         |

## Slide valve

| Nr.   | A  | B  | C  | D    | E     |     |
|-------|----|----|----|------|-------|-----|
| 81322 | 48 | 25 | 13 | SW14 | G1/8" | 50  |
| 11252 | 58 | 30 | 16 | SW17 | G1/4" | 85  |
| 81324 | 70 | 35 | 20 | SW22 | G3/8" | 180 |
| 82961 | 80 | 40 | 25 | SW26 | G1/2" | 217 |
| 19121 | 83 | 49 | 30 | SW32 | G3/4" | 380 |



## Vacuum hand valve

| Nr.   | Connection thread    | Typ  |     |
|-------|----------------------|------|-----|
| 85625 | 1/4" female/female   | -    | 70  |
| 80139 | 3/8" female/female   | -    | 99  |
| 13444 | 3/8" female/female   | mini | 69  |
| 80988 | 1/2" female/female   | -    | 149 |
| 11453 | 3/4" female/female   | -    | 500 |
| 82927 | 1" female/female     | -    | 604 |
| 80563 | 1 1/4" female/female | -    | 800 |
| 83144 | 1 1/2" female/female | -    | 900 |



## Foot switch

| Nr.   | Connection          | Operation |     |
|-------|---------------------|-----------|-----|
| 80322 | G1/4"               | pneumatic | 2,4 |
| 16420 | 250-400V AC, 24V DC | electric  | 0,7 |



- Supply includes:
- 2 hose fittings
  - 2x3m vacuum hose with wire spiral 18/12

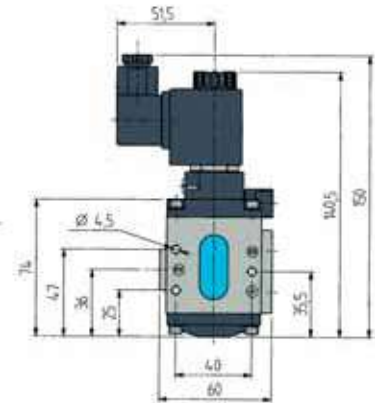
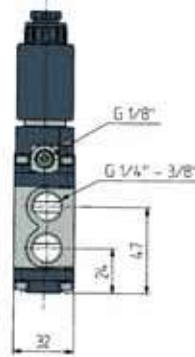


### Vacuum electro-magnetic valves

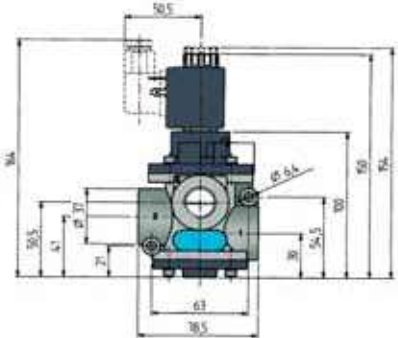
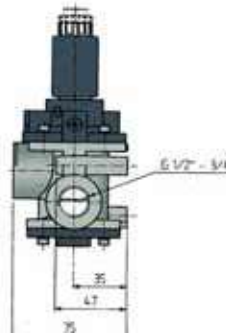


80908/90960

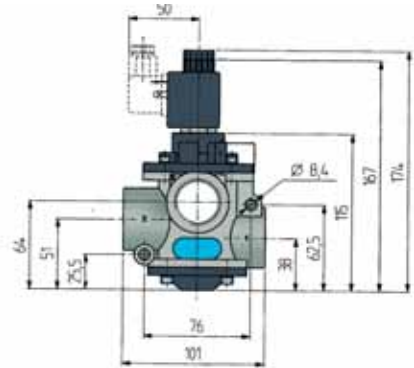
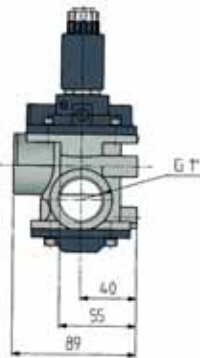
Normal open



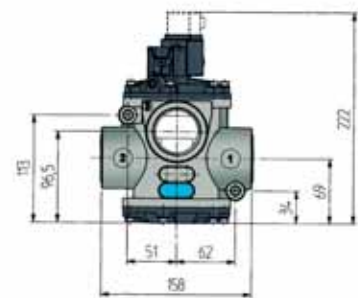
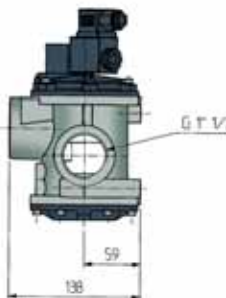
90961/84204



82997



84275



## Vacuum electro-magnetic valves

Normal open, DC 24V

| Nr.   | Connection thread    | Pump max. m <sup>3</sup> /h | Vacuum min. | kg   |
|-------|----------------------|-----------------------------|-------------|------|
| 90960 | 1/4" female/female   | 4                           | 150 mbar    | 0,58 |
| 80908 | 3/8" female/female   | 10                          | 150 mbar    | 0,8  |
| 90961 | 1/2" female/female   | 20                          | 150 mbar    | 1,19 |
| 84204 | 3/4" female/female   | 60                          | 150 mbar    | 1,13 |
| 82997 | 1" female/female     | 90                          | 150 mbar    | 1,9  |
| 84275 | 1 1/2" female/female | 180                         | 150 mbar    | 2    |

## Seals

for electromagnetic valve

| Nr.   | for valve nr. | g  |
|-------|---------------|----|
| 16328 | 90960         | 9  |
| 11108 | 80908         | 9  |
| 11178 | 90961         | 14 |
| 11178 | 84204         | 14 |
| 12210 | 82997         | 80 |
| 12365 | 84275         | 80 |

## Vacuum electro-magnetic valves

Type „ECO”, normal open (NO), AC 230v

| Nr.   | Connection thread    | Pump max. m <sup>3</sup> /h | Vacuum min. | kg |
|-------|----------------------|-----------------------------|-------------|----|
| 19191 | 1/2" female/female   | 20                          | 150 mbar    | -  |
| 19193 | 3/4" female/female   | 60                          | 150 mbar    | -  |
| 19194 | 1" female/female     | 90                          | 150 mbar    | -  |
| 19196 | 1 1/2" female/female | 180                         | 150 mbar    | -  |

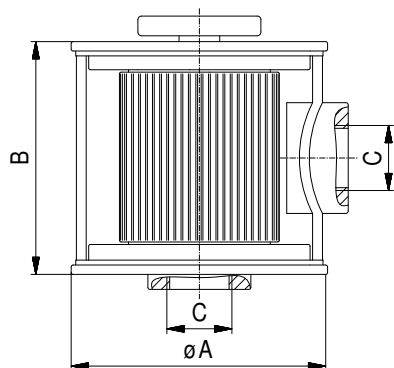
## Seals

for electromagnetic valve

| Nr.   | for valve nr. | g  |
|-------|---------------|----|
| 19192 | 19191/19193   | 20 |
| 19195 | 19194         | 35 |
| 19197 | 19196         | 70 |





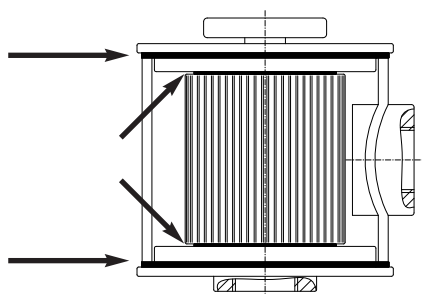


Universally used dust filter, dirt immediately visible through transparent housing. Designed to allow easy exchange of cartridge, whereby filter seals must also be changed. A fitting filter cartridge is included in package.

## Airfilter

suction filter for vacuum pumps, units etc.

| Nr.   | A   | B   | C      | Filter# |     |
|-------|-----|-----|--------|---------|-----|
| 83324 | 105 | 110 | 3/4"   | 80142   | 560 |
| 83322 | 140 | 120 | 1 1/4" | 80143   | 760 |



## Seal

for airfilter

| Nr.   | pcs | size  | for filter# |   |
|-------|-----|-------|-------------|---|
| 29482 | 1   | small | 83324       | 1 |
| 29483 | 1   | big   | 83324       | 3 |
| 21059 | 1   | small | 83322       | 1 |
| 29464 | 1   | big   | 83322       | 5 |

2 large and 2 small seals are required when exchanging one air filter

## Screw hose connection

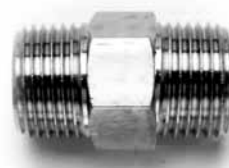


| Nr.   | Thread | for hose inner dia. |    |
|-------|--------|---------------------|----|
| 10632 | 3/8"   | 9                   | 34 |
| 83322 | 1/2"   | 12                  | 45 |

## Double nipple

detachable

| Nr.   | Thread         |     |
|-------|----------------|-----|
| 10301 | 1/8" male/male | 9   |
| 12095 | 1/4" male/male | 40  |
| 12110 | 3/8" male/male | 52  |
| 12072 | 3/4" male/male | 196 |
| 11479 | 1" male/male   | 351 |



## Bulkhead fitting

enabling feed through for machine tools

| Nr.    | Name                            |     |
|--------|---------------------------------|-----|
| 288455 | Bulkhead fitting LW19 x LW 19   | 160 |
| 288456 | Bulkhead fitting LW19 x LW 13   | 150 |
| 288457 | Bulkhead fitting LW13 x LW 13   | 140 |
| 288458 | Bulkhead fitting LW19 x SK-NW 7 | 230 |
| 288459 | Bulkhead fitting LW13 x SK-NW 7 | 210 |
| 289607 | Bulkhead fitting LW32 x LW32    | 200 |



## Reducer

male/female


| Nr.   | Thread male | Thread female |     |
|-------|-------------|---------------|-----|
| 10542 | 1/4"        | 1/8"          | 11  |
| 10681 | 3/8"        | 1/8"          | 20  |
| 12113 | 3/8"        | 1/4"          | 100 |
| 10302 | 1/2"        | 1/8"          | 40  |
| 10743 | 1/2"        | 1/4"          | 51  |
| 10299 | 1/2"        | 3/8"          | 22  |
| 11455 | 3/4"        | 1/8"          | 51  |
| 10896 | 3/4"        | 3/8"          | 66  |
| 10316 | 3/4"        | 1/2"          | 36  |
| 12107 | 1"          | 3/8"          | 11  |
| 12108 | 1"          | 1/2"          | 90  |
| 10636 | 1"          | 3/4"          | 98  |
| 12109 | 1 1/4"      | 1/2"          | 199 |
| 12359 | 1 1/2"      | 1"            | 206 |
| 10637 | 2"          | 1 1/2"        | 229 |





## Quick coupling

with male thread

| Nr.   | Thread | for plug# |  |
|-------|--------|-----------|---|
| 80104 | 3/8"   | 10271     | 77  |
|       |        | 10275     |   |
|       |        | 10519     |   |
| 80989 | 1/2"   | 10271     | 86  |
|       |        | 10275     |   |
|       |        | 10519     |   |
| 80441 | 3/4"   | 12079     | 130   |



## Plug

for quick coupling

| Nr.   | for hose inner dia. |
|-------|---------------------|
| 10271 | ø 6                 |
| 10275 | ø 8                 |
| 10519 | ø 13                |
| 12079 | ø 19                |

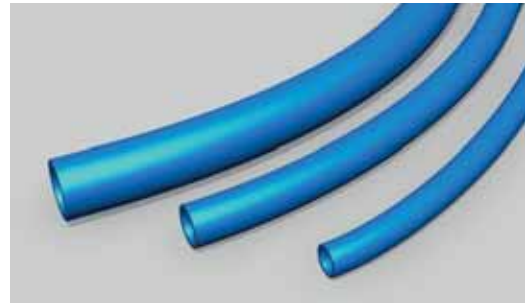


## Hose nozzles

| Nr.   | Thread | for hose inner dia. | WAF |
|-------|--------|---------------------|-----|
| 11561 | 1/8"   | ø 9                 | 14  |
| 10638 | 1/4"   | ø 9                 | 17  |
| 11768 | 1/4"   | ø 13                | 17  |
| 10354 | 3/8"   | ø 9                 | 19  |
| 10269 | 3/8"   | ø 13                | 19  |
| 10270 | 1/2"   | ø 13                | 24  |
| 11508 | 1/2"   | ø 19                | 22  |
| 11509 | 3/4"   | ø 19                | 32  |
| 11746 | 3/4"   | ø 25                | 32  |
| 11726 | 1"     | ø 25                | 37  |
| 10471 | 1"     | ø 32                | 37  |
| 10598 | 1 1/4" | ø 32                | 50  |
| 11620 | 1 1/2" | ø 50                | 53  |
| 11468 | 2"     | ø 50                | 57  |

## Vacuum polymer hose

| Nr.   | Description   | Dim    |
|-------|---------------|--------|
| 17793 | Vacuum tubing | ø 6/4  |
| 17794 | Vacuum tubing | ø 8/5  |
| 17795 | Vacuum tubing | ø 10/8 |
| 17796 | Vacuum tubing | ø 12/9 |




## Vacuum polymer tubing

| Nr.   | Description | Dim     |
|-------|-------------|---------|
| 00058 | Vacuum hose | ø 6/8   |
| 00059 | Vacuum hose | ø 12/8  |
| 00132 | Vacuum hose | ø 15/12 |
| 00057 | Vacuum hose | ø 10/6  |
| 00902 | Vacuum hose | ø 22/18 |



## Wire spiral hose

| Nr.   | Bendable radius (min., static) | outer / inner ø |
|---|--------------------------------|-----------------|
| 00717   | 20 mm                          | ø 13/8          |
| 00060   | 25 mm                          | ø 18/12         |
|  00061 | 40 mm                          | ø 25/18         |
| 00253   | 60 mm                          | ø 34/25         |
| 00184   | 75 mm                          | ø 40/32         |
| 00185   | 125 mm                         | ø 60/50         |



## Wire spiral hose HD

suitable for energy chains

| Nr.   | Bendable radius (min., dynamic) | outer / inner ø |
|-------|---------------------------------|-----------------|
| 18801 | 32 mm                           | ø 13,5/8        |
| 18805 | 45 mm                           | ø 18/12         |
| 18795 | 80 mm                           | ø 28/19         |
| 18796 | 90 mm                           | ø 35,5/25       |
| 18797 | 110 mm                          | ø 42,5/32       |
| 18798 | 170 mm                          | ø 63,5/50       |



Preference item:  
Articles with green diamond  
are available ex stock!





## WITTE-METAPOR® - Porous aluminium

Instead of bores for vacuum and air pressure - METAPOR® for vacuum and air pressure!

This unique porous aluminium compound material is suitable for die and mould, conveyance and clamping systems

- **Evacuation**

- vacuum mould-forms made of METAPOR®
  - vacuum chucks made of METAPOR® i.e. for clamping electronic workpieces and foils

- **Lifting**

- air film glide handling equipment made of METAPOR®

- **Through flow**

- for agitating bases and conveyor channels made of METAPOR®

- **Molding/Demoulding**

- deep drawn and die moulds made of METAPOR®

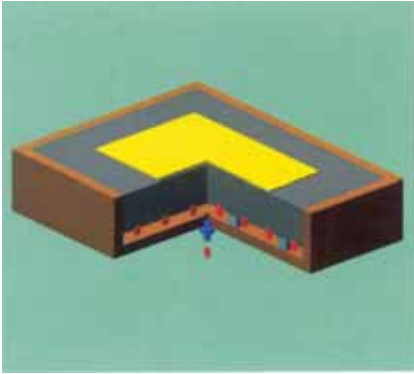
- **Ceramic and machined forms**

- made of METAPOR®



Deep drawn form,  
made of WITTE - METAPOR®

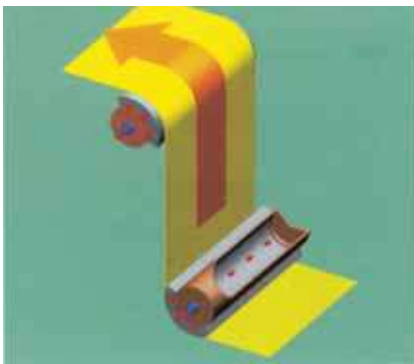
## WITTE - METAPOR<sup>®</sup> - Applications



### Vacuum clamping technology

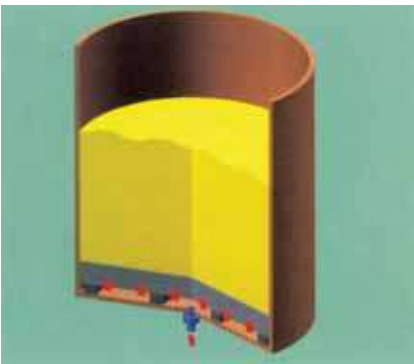
The main feature of METAPOR<sup>®</sup> vacuum clamping systems is suction over the complete surface area without suction bores.

Foils are held absolutely flat. The pressure drop, which takes place within the structure means that it is not necessary to cover areas not in use. METAPOR<sup>®</sup> is ideally suited for holding foils and electronic parts as well as for mould-forms and soft workpieces.



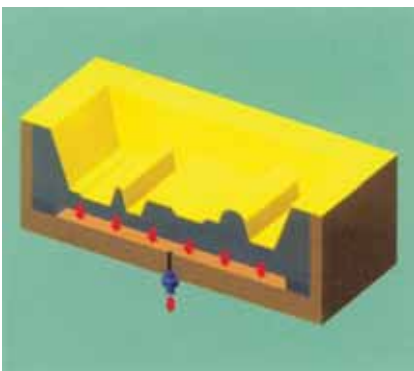
### Air film glide technology

The pressure distribution in the METAPOR<sup>®</sup> structure allows even surface airflow capacity, even if only part of the surface is covered. Air consumption and noise emission are considerably reduced. Trouble-free machining offers cost reduction on air flow components, a new perspective for rotation bearings, conveyance and extrusion beds.



### Through-flow technology

The microporous METAPOR<sup>®</sup> structure allows an even agitation of granulates and powders without bubbles occurring. Low air consumption reduces friction and mechanical load. METAPOR<sup>®</sup> ideal for mixing processes, coating, conveyance troughs and dismantling of silo bridges



### Mould technology

Deep drawn moulds made of METAPOR<sup>®</sup> do not require any bores. Bore imprints on the workpiece are avoided. Suction over the complete area allows structures to be complex without air pockets and distortions. The complete flow-through of air prevents high-temperature areas developing. Rational machining procedure and immediate usability promise a valuable technological advantage



## Witte METAPOR® - material properties

METAPOR® is made mainly out of two components: Granulate ( e.g., Aluminium, Ceramic ) and a binder e.g., epoxy, polyester, polyurethane).

These different components influence the qualities and behaviour of the material.

For example porosity, hardness, temperature consistency, and surface finish.



The machineability of METAPOR® is excellent and can be compared to easily machineable aluminium. METAPOR® is machined without coolant in order to keep the pores clean. Better surfaces are achieved with high cutting values. No noticeable warmth developing in the workpiece can be felt during machining.

METAPOR® is available in the standard sizes 500x500mm, thickness from 10 - 100mm ( ±0,3mm)



Larger plates  
(i.e. 1m<sup>2</sup> oder 2m<sup>2</sup> glued plates  
supplied on request)

### METAPOR®-Materials in comparison:

|                 | BF 100 AL    | MC 100 AL    | CE 100 White | HD 210 AL    |
|-----------------|--------------|--------------|--------------|--------------|
| Porosity        | 15%          | 17%          | 20%          | 16%          |
| Max. temp.      | 100°C        | 100°C        | 100°C        | 210°C        |
| Strength yield  | ★★           | ★            | ★★★★★        | ★★           |
| Thermo-forming  | ★★           | ★            | ★            | ★★★★         |
| Vacuum clamping | ★★★★★        | ★★★★         | ★★★★★        | ★★★★★        |
| Average pore ø  | approx. 15µm | approx. 40µm | < 10µm       | approx. 12µm |

★ -> ★★★★★ = Increase in suitability

## Witte METAPOR® materials

| Nr.    | lxbxh       | kg   |
|--------|-------------|------|
| 600839 | 500x500x10  | 4,0  |
| 600840 | 500x500x15  | 6,0  |
| 600841 | 500x500x20  | 8,0  |
| 600842 | 500x500x25  | 10,0 |
| 600843 | 500x500x30  | 12,0 |
| 600844 | 500x500x35  | 14,0 |
| 600845 | 500x500x40  | 16,0 |
| 600846 | 500x500x50  | 20,0 |
| 600847 | 500x500x60  | 24,0 |
| 600848 | 500x500x70  | 28,0 |
| 600849 | 500x500x80  | 32,0 |
| 600850 | 500x500x100 | 40,0 |

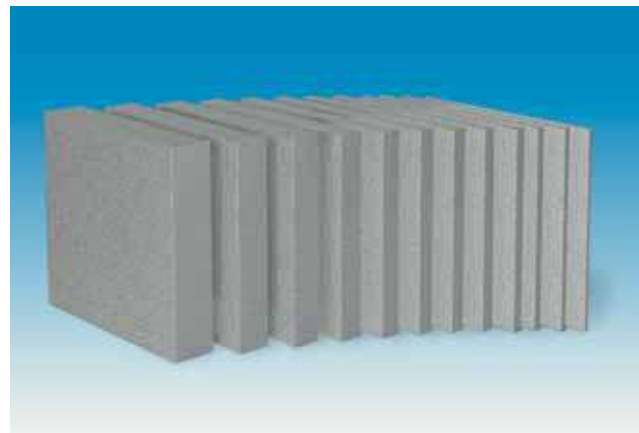


### MC 100 AL

METAPOR® material  
with maximum porosity

- Density: 1,7 g/cm<sup>3</sup>
- Strength yield: 25,0 N/mm<sup>2</sup>
- Max. Temp: 100,0 °C
- Thickness tol.: -0/+0,3 mm

| Nr.   | lxbxh       | kg   |
|-------|-------------|------|
| 00513 | 500x500x10  | 4,5  |
| 00552 | 500x500x15  | 6,8  |
| 00553 | 500x500x20  | 9,0  |
| 00554 | 500x500x25  | 11,3 |
| 00555 | 500x500x30  | 13,5 |
| 00556 | 500x500x35  | 15,8 |
| 00557 | 500x500x40  | 18,0 |
| 00558 | 500x500x50  | 22,5 |
| 00559 | 500x500x60  | 27,0 |
| 00560 | 500x500x70  | 31,5 |
| 00561 | 500x500x80  | 36,0 |
| 00562 | 500x500x100 | 45,0 |



### BF 100 AL

Standard quality  
with good allround properties

- Density: 1,78 g/cm<sup>3</sup>
- Strength yield: 56,0 N/mm<sup>2</sup>
- Max. Temp: 100,0 °C
- Thickness tol.: -0/+0,3 mm





## Witte METAPOR® materials



### HD 210 AL

METAPOR® material  
with high temperature resistance

- Density: 1,9 g/cm<sup>3</sup>
- Strength yield: 43,0 N/mm<sup>2</sup>
- Max. Temp: 210,0 °C
- Thickness tol.: -0/+0,3 mm

| Nr.   | lxbxh       | kg   |
|-------|-------------|------|
| 00244 | 500x500x10  | 4,0  |
| 00245 | 500x500x15  | 6,0  |
| 00246 | 500x500x20  | 8,0  |
| 00247 | 500x500x25  | 10,0 |
| 00248 | 500x500x30  | 12,0 |
| 00288 | 500x500x35  | 14,0 |
| 00249 | 500x500x40  | 16,0 |
| 00289 | 500x500x50  | 20,0 |
| 00250 | 500x500x60  | 24,0 |
| 00292 | 500x500x70  | 28,0 |
| 00293 | 500x500x80  | 32,0 |
| 00252 | 500x500x100 | 40,0 |



### CE 100 White

METAPOR® material with very hard surface  
properties and low porosity

- Density: 1,7 g/cm<sup>3</sup>
- Strength yield: 24,0 N/mm<sup>2</sup>
- Max. Temp: 100,0 °C
- Thickness tol.: -0/+0,3 mm

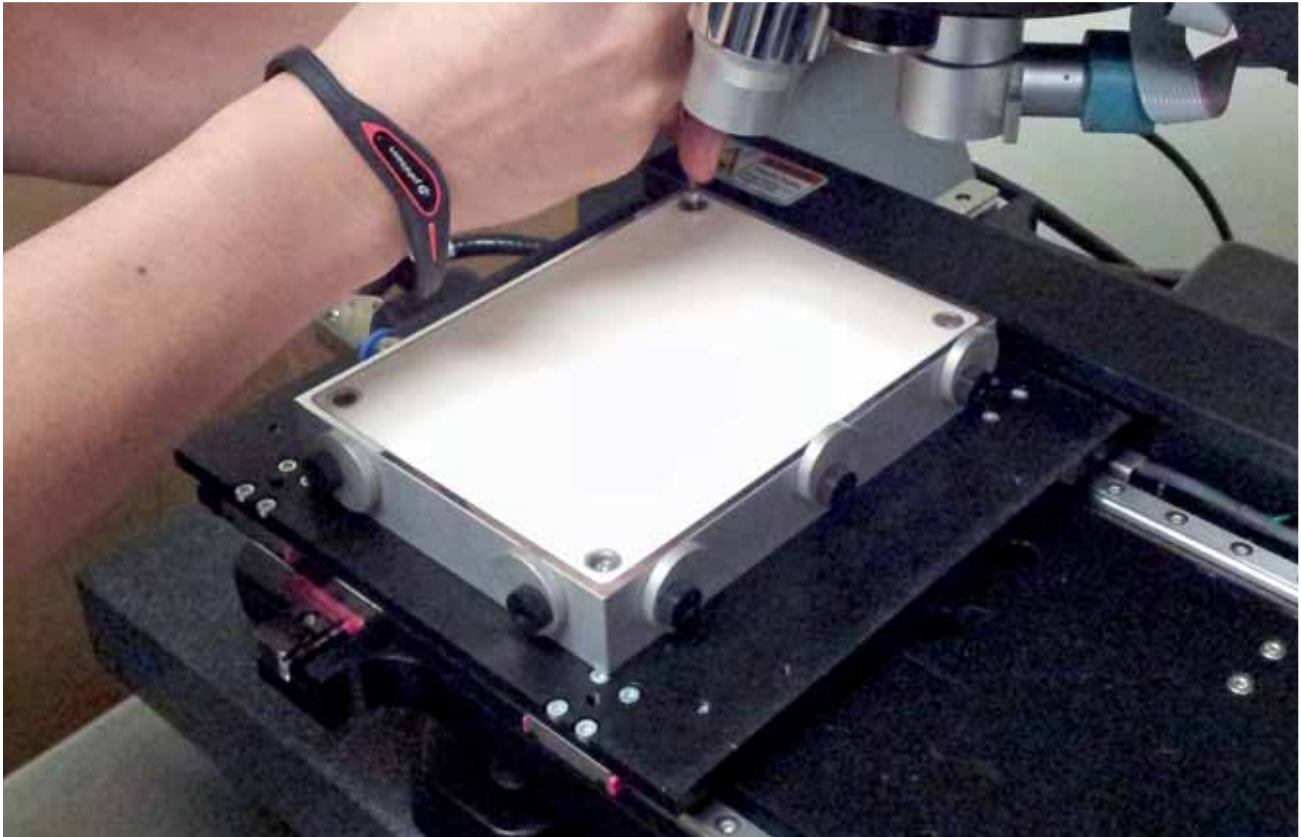
| Nr.   | lxbxh       | kg   |
|-------|-------------|------|
| 00766 | 500x500x10  | 4,0  |
| 00767 | 500x500x15  | 6,0  |
| 00768 | 500x500x20  | 8,0  |
| 00769 | 500x500x25  | 10,0 |
| 00770 | 500x500x30  | 12,0 |
| 00771 | 500x500x35  | 14,0 |
| 00772 | 500x500x40  | 16,0 |
| 00773 | 500x500x50  | 20,0 |
| 00774 | 500x500x60  | 24,0 |
| 00775 | 500x500x70  | 28,0 |
| 00776 | 500x500x80  | 32,0 |
| 00777 | 500x500x100 | 40,0 |



Preference item:  
Articles with green diamond  
are available ex stock!



All dimensions are rough cut segments.  
Other dimensions on request.



Metapor chuck in analysis application



Rotary vacuum clamping chuck with porous clamping surface



Double chuck system with two clamping surfaces which can be very accurately aligned to one another





## ICEVICE® Freeze clamp technology

### When to use this technology

This is ideal technology for clamping small or intricate workpieces without any tension yet accurately.

For machining mechanically or to separate small parts from a large unit of raw material.

Favoured by the following industries;

- Electronics / Semi-conductors
- Ceramics
- Optics, Glass / Quarz treatment
- Metals, clocks and watches
- Medical tools and laboratory equipment
- For universities and research.

### Advantages

- Very precise up to  $\pm 3\mu\text{m}$
- No tension builds up within the workpiece
- Short clamping time +/- 90 seconds.

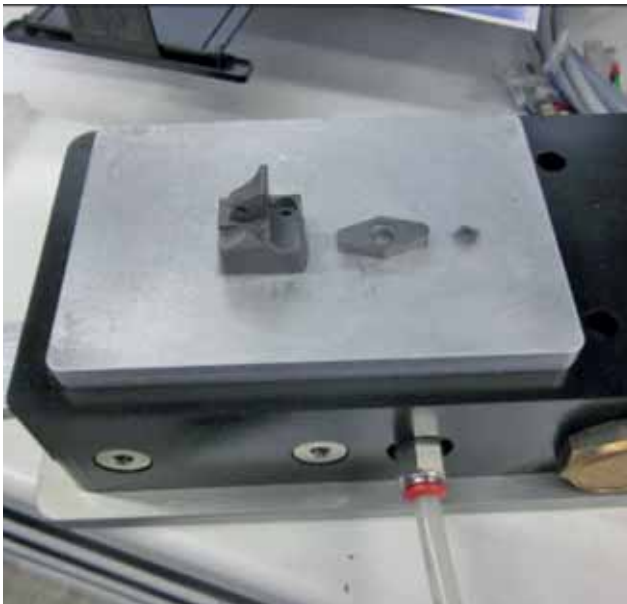
### Handling

- Easy and quick
- With the use of workpiece specific adapter plates a high degree of repeatability in positioning and clamping is achieved

### Function

- Freezing generated by compressed air
- Chuck surface in aluminium with very good warmth drawing properties
- Housing in special polymer with insulation

## Clamping by freezing on a thin water film



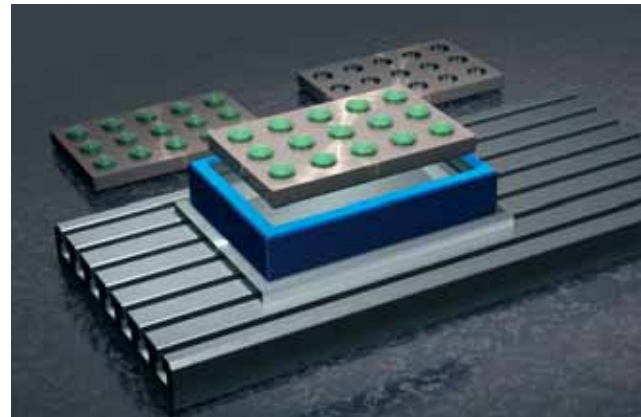
When clamping with the Ice-Vice system parts are frozen to chuck surface on a capillary film of water for machining. Even relatively uneven parts can be clamped as any gaps are filled with water. The vertical and horizontal clamping forces created are enough to hold small parts for milling, grinding, drilling or polishing.

## Ice Vice Clamping System

| Nr.    | Dim         | Clamping surf. | kg  |
|--------|-------------|----------------|-----|
| 282364 | 300x140x75  | 150x100        | 4,3 |
| 283209 | 300x200x100 | 250x150        | 9   |

### Supply includes:

- 0,5m hose inside Dia 9 with connection fittings
- Plastic case with inlay



To improve production time ICEVICE® can also be palletized where a quick exchange of Freeze plates is possible. These plates have a vacuum connection to ensure secure fixation to the Icevice base.





## Witte Weiguss mould clamping technology



**Witte Weiguss** mould clamping technology is suitable for manufacturing workpieces, which cannot be clamped conventionally because support surfaces are lacking.

**Application:** Clamp the unmachined workpiece onto i.e. a Vac-Mat™ vacuum chuck. The top surface is milled conventionally.

The milled hollows are filled with melted Weiguss alloy, which hardens into a plane parallel surface. The workpiece is then turned around 180° and clamped securely on to the vacuum chuck. Stop pins make sure the workpiece is positioned accurately.

The finished workpiece is placed into warm water at 80°C in order to melt the alloy attached to it. The alloy does not mix with water and can be collected, remelted and used again.

### Witte Weiguss LM70

| Nr.   |                      | kg |
|-------|----------------------|----|
| 94161 | Weiguss- Pack to 1kg | 1  |

**Supply includes:**

- CD Rom with video
- Technical information as a PDF file

**Special advantages:**

Witte Weiguss mould clamping method is especially suitable for complicated or spherical shaped parts. Unlimited reuse.



Left: First step is milling workpiece conventionally



Top: Finally workpiece is placed in water at 80°C to melt and remove alloy, which can be reused

Right: Filling hollow with melted Witte Weiguss alloy



Right: After hardening, workpiece is turned over and machined on reverse side



Witte Weiguss is especially suitable for complicated workpieces with curved or concave surfaces





## Vacuum Base for measuring arm

### Measuring arm secured in seconds

This universal vacuum base is the ideal partner for measuring arms.

A battery operated miniature pump creates sufficient vacuum so that the base sucks itself on to all kinds of surfaces in seconds.

Control display, lamp indicators and pressure switch ensure safe and secure mounting. Operating and control lights are integrated into the compact design. Holes in the top surface allow mounting of adapter rings (not included) for measuring arms of leading manufacturers. The Witte vacuum base requires no additional equipment. Applications away from other energy sources are possible. A special seal even allows mounting on curved surfaces, which expands application possibilities considerably.

**Description:**

Vacuum Base

**Item number:**

**282446B**

**Dimensions:**

ca. Ø 260 x 80mm

**Weight:**

5,6Kg

**Holding force:**

max. 4200Newton  
(at sea level)

**Charger:**

Voltage from 100 to 240 Volt

Operating voltage of charge 12 Volt

LEDs show loading condition of battery

Acoustic signal when vacuum drops below set level

Set end vacuum 200mb absolute  
This corresponds to relative end vacuum of 80%

Measuring arm and adapter ring are not included.





### Contents and user details.

- 1 ON / OFF switch
- 2 Indicators for battery charging levels  
Red / Yellow / Green
- 3 Vacuum indicator
- 4 Threaded bores for the different types of measuring arms
- 5 Battery charger input plug
- 6 Vacuum release screw  
(Take care to support measuring arm when screw is released)
- 7 Seal on Vacuum plate base

### Six steps on how to operate:

- 1 - Place plate on clean worksurface.
- 2 - Make sure vacuum release screw (6) is closed
- 3 - Switch on using ON/OFF switch  
(wait 5 seconds for vacuum to reach operating mode)
- 4 - Check battery status red/yellow/green LED'S
- 5 - Vacuum dial gage (3) value must show 0,7 – 0,8





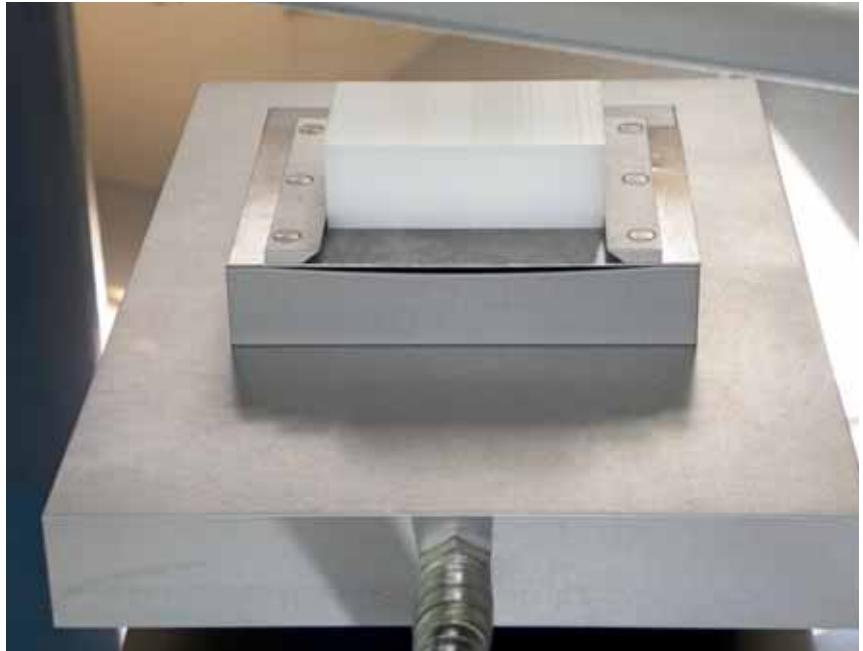
## Vacu-Vice clamping system

Vacu-Vise is a clamping method using vacuum as an alternative to conventional vises operated pneumatically, hydraulically or mechanically.

This clamping system consists of a specially designed vacuum chuck and two clamping jaws, which are mounted on a rigid, but resiliently deformable support plate. When vacuum is switched on, the support plate is drawn downwards and deformed in such a way that the clamping jaws tip towards each other and thereby clamp the work piece securely with great force.

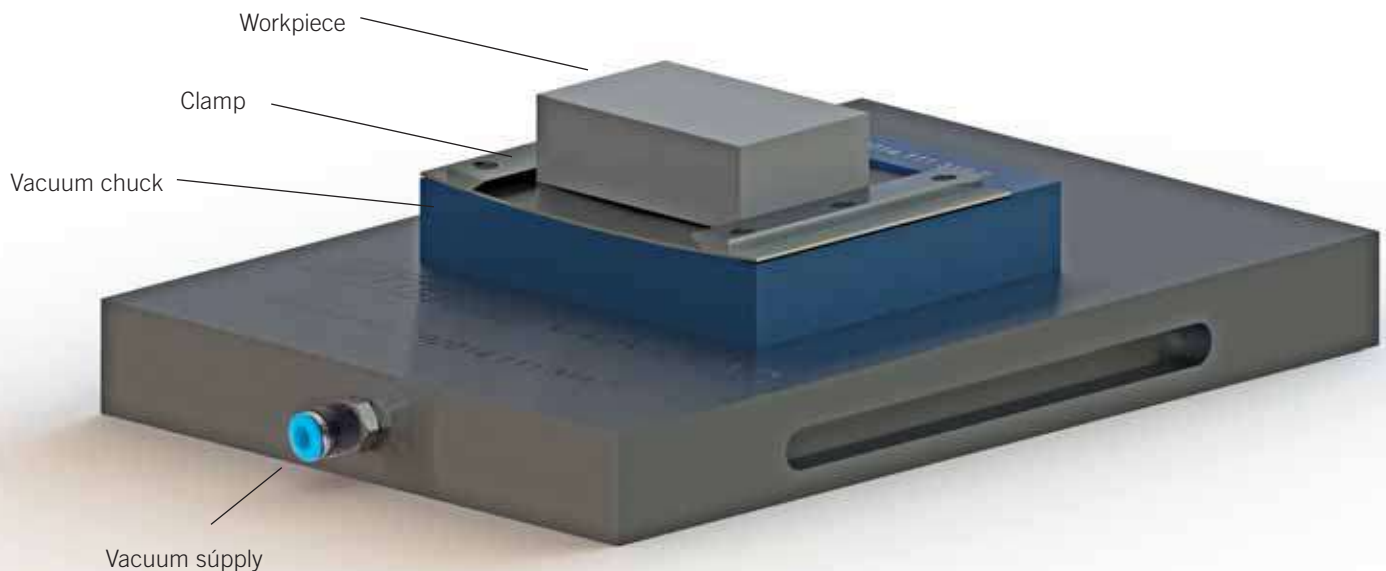
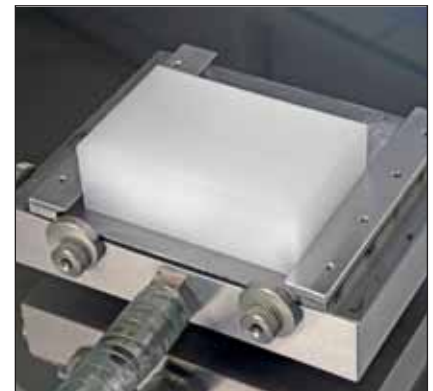
Especially advantageous - when a vacuum supply is already in use on a machine - this new clamping method offers an extended effective use of the "medium" vacuum.

Wherever dimensions of a work piece and cutting forces no longer permit conventional vacuum clamping, there is now a possibility of strong and if necessary additional form-fitting work piece clamping with this new clamping system.



For example, if on a milling center several consecutive processes require re-clamping of a part and the remaining surfaces for direct vacuum clamping are too small, this innovative clamping technology can be used.

One system has already been implemented in the medical field, and amongst other things is in use for manufacturing plastic elements for knee implants.





Machine table (3,3x11 meters) supplied with VAC-MAT™ Vacuum clamping. The photo shows the fixture at an aircraft manufacturer, where pockets are milled into a surface area covered with 468 Mats.







CNC milling machine equipped with a vacuum system used in house for precision-machining aluminium aircraft parts



Vacuum chuck for clamping bottles tops during measuring by coordinate measuring machine



2 Rotating systems (each 3500mm) with vacuum clamping areas on all four sides for machining aluminium profiles



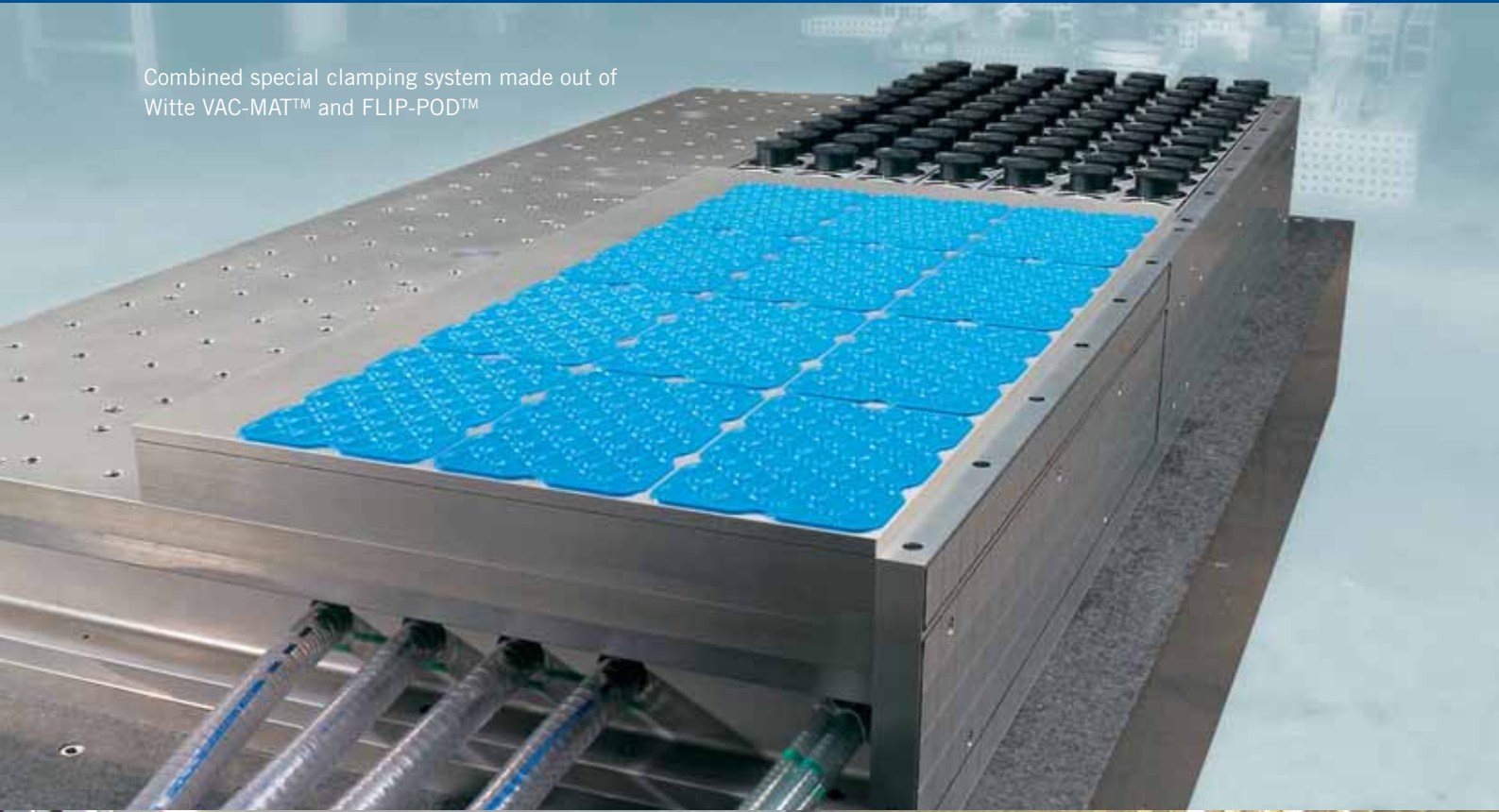


Roller bar vacuum system for precision machining pre-formed aluminium sheets



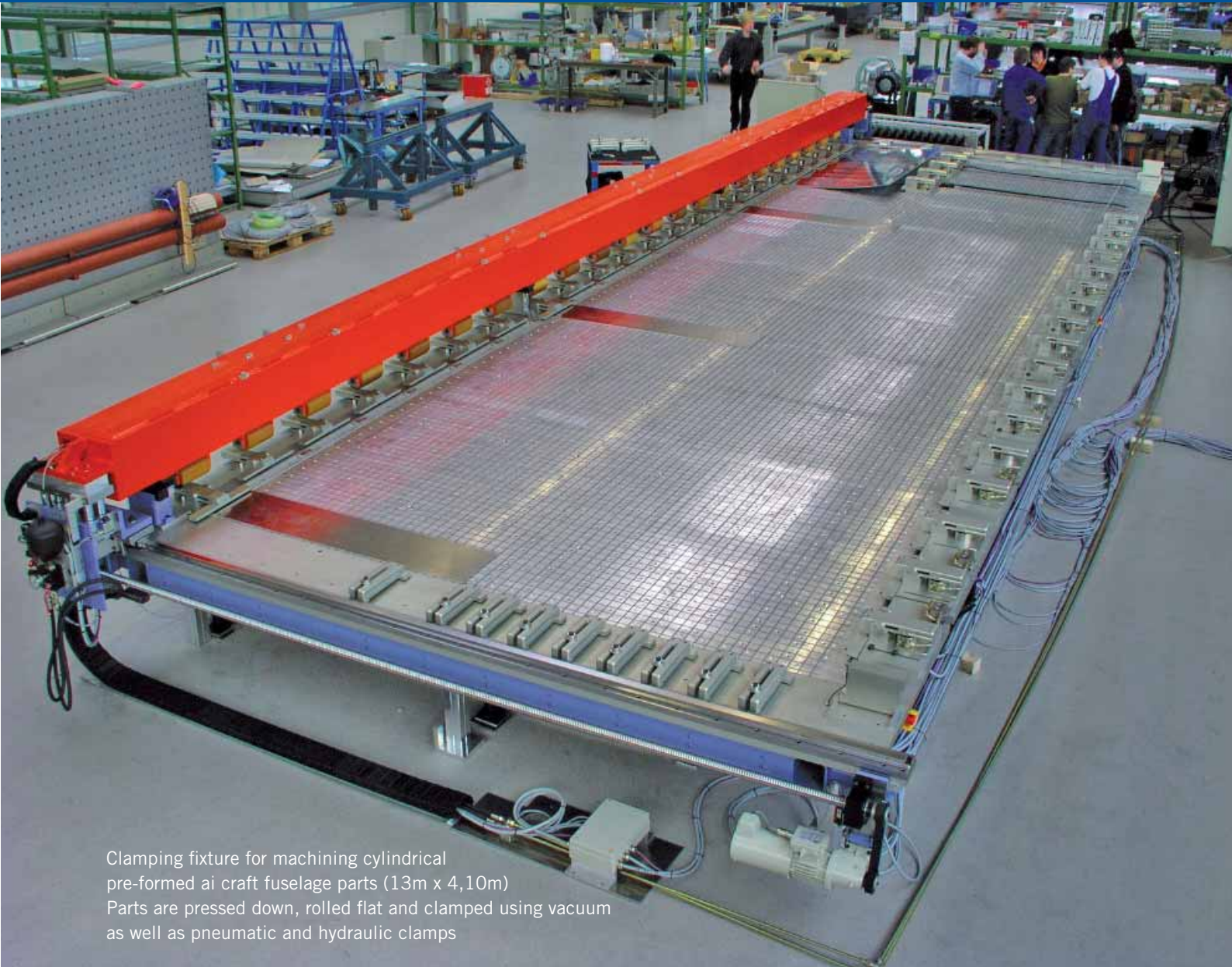


Combined special clamping system made out of Witte VAC-MAT™ and FLIP-POD™



Vacuum fixture with hydraulic components for machining steel parts

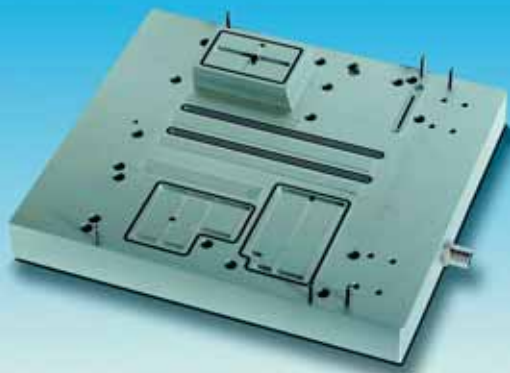




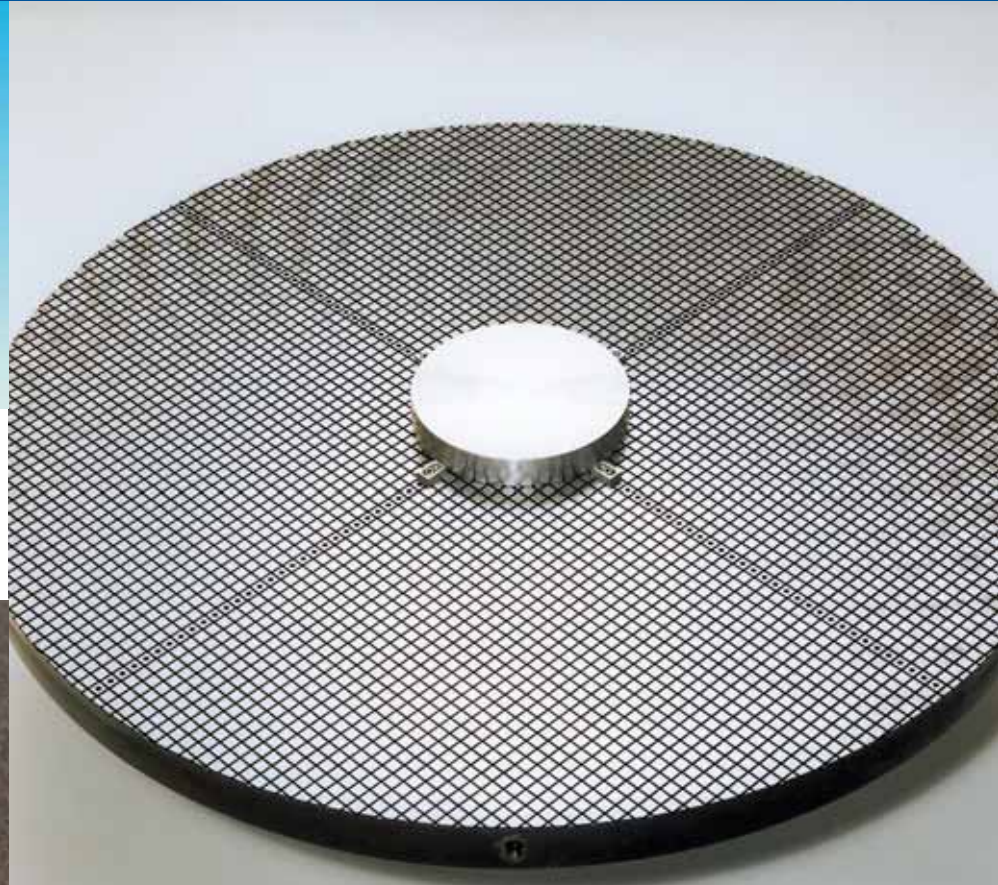
Clamping fixture for machining cylindrical pre-formed aircraft fuselage parts (13m x 4,10m)  
Parts are pressed down, rolled flat and clamped using vacuum as well as pneumatic and hydraulic clamps







Vacuum chuck for clamping  
lap-top housings



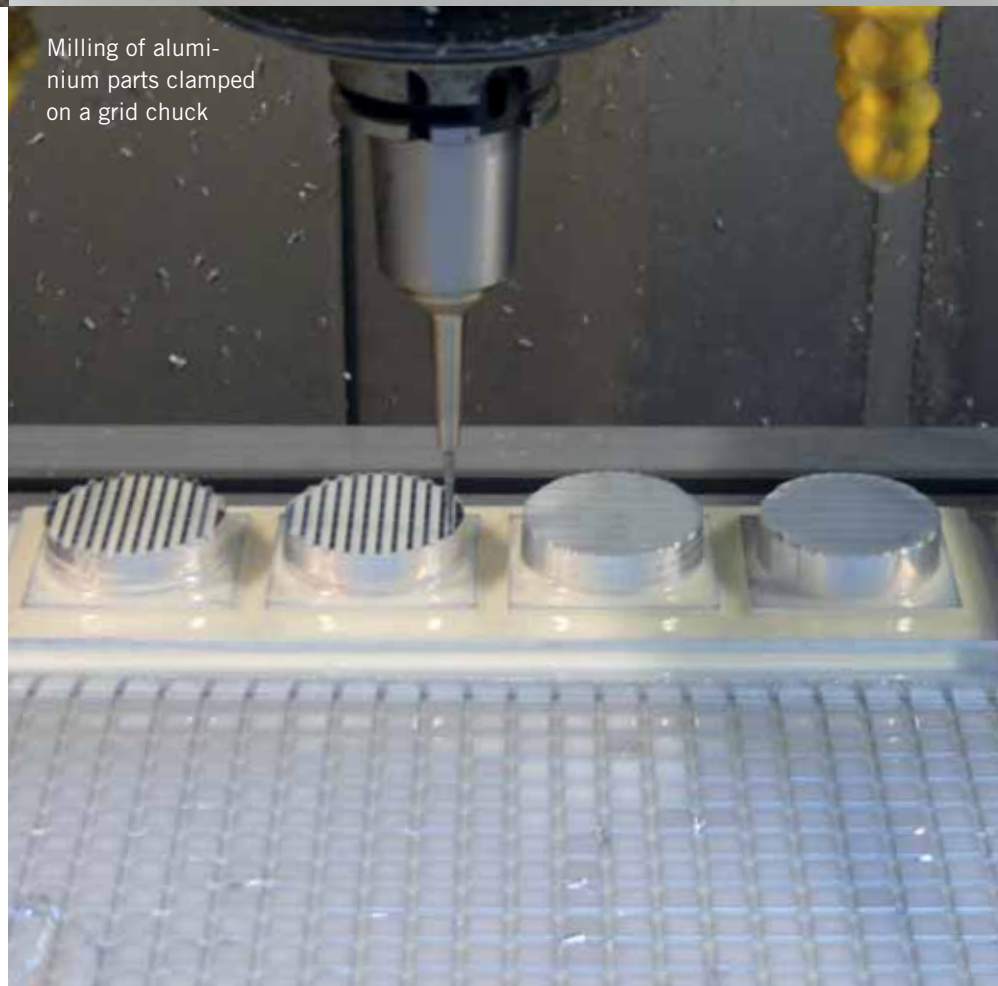
Circular chuck  $\varnothing$  1500 mm



Chuck for chip cards



Special designed automatic liquid  
separator for integration in custom built  
system

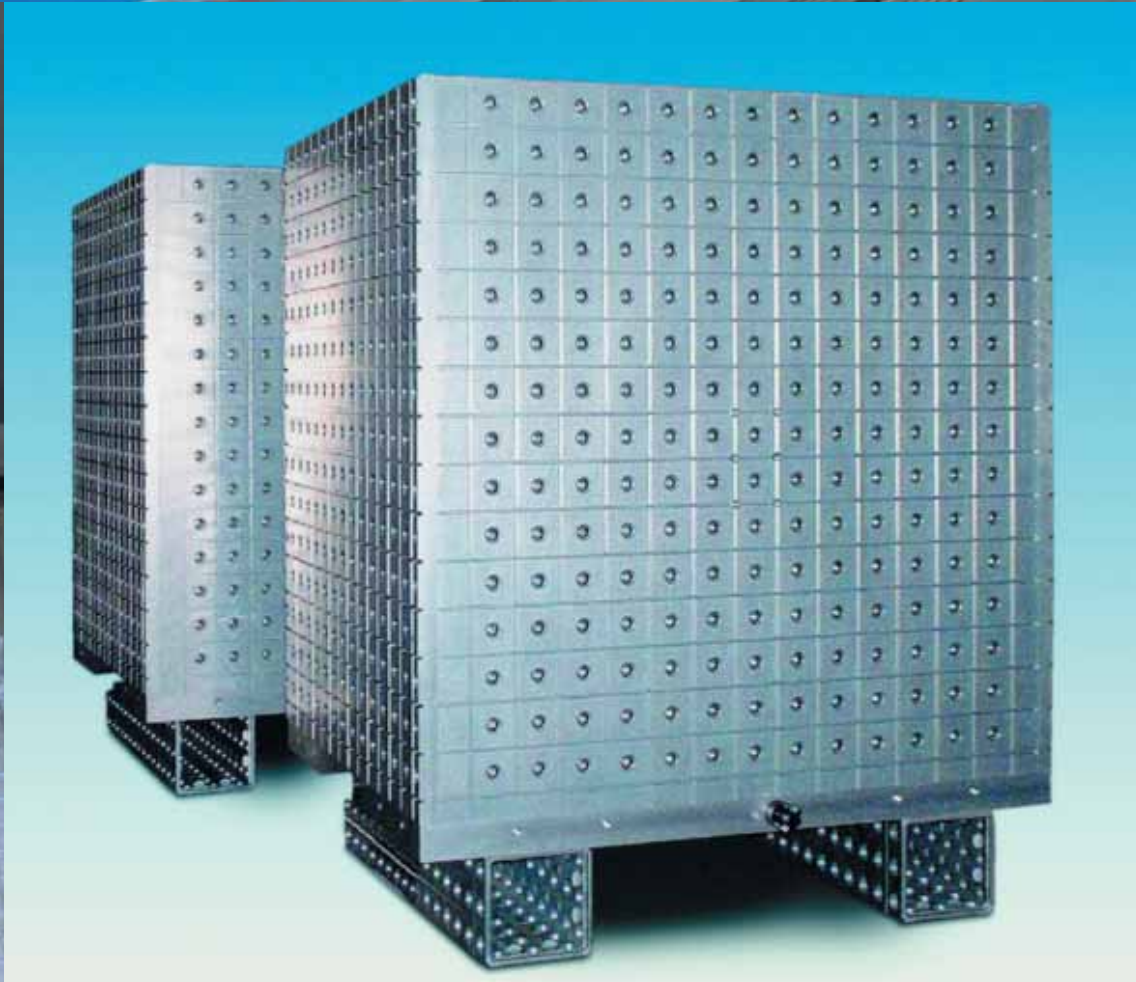


Milling of aluminium parts clamped  
on a grid chuck





Vacuum Fixture for drilling operation, approx. 4600mm long, with additional manually clamps.



Vacuum cube with integrated storage tank and distribution manifold, approx. 800 x 800 x 900 mm, used on machining centre with automatic 24 hour pallet exchange system. Parts held with vacuum during machining, transport and standing times.





## Vacuum conversion table

| %Vakuum | kPa   | mbar | Torr | -kPa  | -mmHg | -inHg |
|---------|-------|------|------|-------|-------|-------|
| 100     | 0     | 0    | 0    | 101,3 | 760   | 30    |
| 90      | 10    | 100  | 75   | 90    | 675   | 27    |
| 80      | 20    | 200  | 150  | 80    | 600   | 24    |
| 70      | 30    | 300  | 225  | 70    | 525   | 21    |
| 60      | 40    | 400  | 300  | 60    | 450   | 18    |
| 50      | 50    | 500  | 375  | 50    | 375   | 15    |
| 40      | 60    | 600  | 450  | 40    | 300   | 12    |
| 30      | 70    | 700  | 525  | 30    | 225   | 9     |
| 20      | 80    | 800  | 600  | 20    | 150   | 6     |
| 10      | 90    | 900  | 675  | 10    | 75    | 3     |
| 0       | 101,3 | 1013 | 760  | 0     | 0     | 0     |

### Atmospheric pressure

At sea level 0m 1013 mbar

On the Zugspitze 2963m 695 mbar

On Mount Everest 8848m 330 mbar

### Formula for determining holding forces

The pressure P is the result of the ratio to force F and area A

$$F = P \times A = N$$

#### Example:

Vacuum chuck 40 x 60 cm;  
Vacuum unit with under pressure of 85% vacuum.

Whereby

$$P = 0,85 \text{ bar} = 0,85 \text{ N/cm}^2$$

$$A = 40\text{cm} \times 60\text{cm} = 2400 \text{ cm}^2$$

$$F = 0,85 \text{ N/cm}^2 \times 2400 \text{ cm}^2 = 20400 \text{ N}$$

Units:

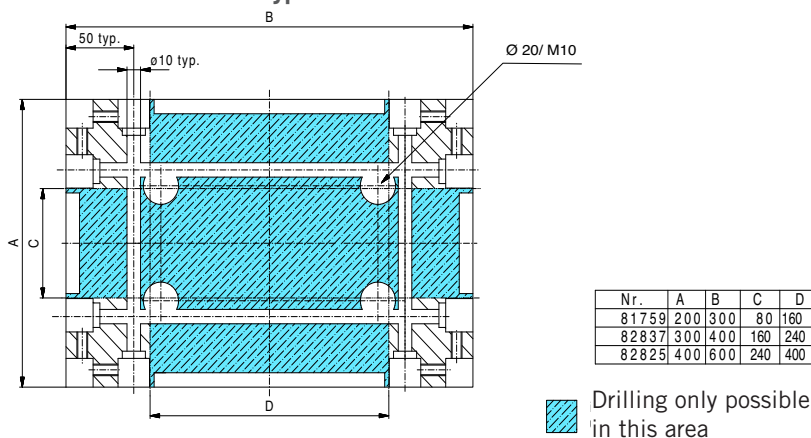
$$P = \text{N/cm}^2$$

$$F = \text{N}$$

$$A = \text{cm}^2$$

## Additional holes in modular chucks

not for modular slot type chucks



## Friction coefficients

and their influence on vacuum clamping technology

| Material        | Grip $\mu_0$      |            | Friction $\mu$ |            |
|-----------------|-------------------|------------|----------------|------------|
|                 | dry               | lubricated | dry            | lubricated |
| Steel/Steel     | 0,15              | 0,1        | 0,1            | 0,07       |
| Steel/Casting   | 0,25              | 0,1        | 0,2            | 0,08       |
| Steel/Brakepad  | –                 | –          | 0,5-0,6        | 0,2-0,5    |
| Steel/Polyamide | –                 | –          | 0,32-0,45      | 0,1        |
| Steel/Ice       | 0,027             | –          | 0,014          | –          |
| Wood/Wood       | 0,4-0,6           | 0,2        | 0,2-0,4        | 0,1        |
| Wood/Metal      | 0,6-0,7           | 0,1        | 0,4-0,5        | 0,1        |
| Rubber/Asphalt  | 0,7-1,0<br>(>1,0) | –          | 0,5-0,6        | –          |

The higher the number, the higher the resistance is against the work piece moving when clamping with vacuum. This resistance is reduced when water, coolant or oil is involved. Depending on the two materials involved up to 5 times as much. For instance steel on steel has a friction coefficient of 0,15. The value drops to 0,7 when using fluids. This shows clearly how clamping forces can be negatively affected when coolants are involved.

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## Information:

Weights mentioned in the catalogue are non-committal and approximate, and can deviate considerably i.e. through technical changes.

- We reserve the right to make technical changes.
- Where differences between photos and parts lists exist, the parts lists are decisive.
- Due to fluctuations of copper content in aluminum - alloy colour deviations may occur during anodizing.

All details on our products in this catalogue, especially illustrations, drawings, dimensions and statements on performance are to be regarded as approximate average values. We reserve the right to change design, technical data, dimensions and weights.

The indicated standards, similar technical regulations as well as technical details, descriptions and illustrations are valid at time of printing. Our general trading conditions are valid. Our quotations are decisive.





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