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01462 491919

www.floydautomatic.co.uk
sales@floydautomatic.co.uk

THE TOOLING SPECIALISTS FOR PRECISION COMPONENT MACHINING

Thread Cutting Heads

M 1.75 P $\text{\textcircled{V}}$ 1

M 1.75 P $\text{\textcircled{V}}$ 2

M 1.75 P $\text{\textcircled{V}}$

M 1.75 P $\text{\textcircled{V}}$ 3



Keeping an Eye On The Profit :

We claim :

- Only Wagner offers you all processes of producing **external threads** :
- Only the best is good enough for us!
Top quality has its origin in Pliezhausen :
- With our cutting head you **save** both time and money :
- The **regrindable chasers** will last you a long time :
- The **head sizes** are individually adjustable :
- The tapping is fit for a big range of **materials** :
- Many **types of threads** can be cut with free run-out or close to the collar :

We prove :

- Rolling - cutting - reducing diametres
- Complying with our consequent quality system, only first class materials are processed to high quality tools
- You need one cutting head only, which may remain on the machine even when the tasks change
- We deliver the Wagner chaser regrinding machine
- We build a cutting head that is custom-made to meet your individual demands
- Machining- and constructional steels, high alloyed steels, nonferrous heavy metal, gun metal, malleable cast iron and grey cast iron
- Regular type threads, fine threads, right- and left-handed threads, cylindrical or conical threads, trapezoid and knuckle threads as well as plunging operations, even complying with English and American standards.





Thread Cutting Head



Thread Rolling Head



Thread Rolling Attachment

Dear Reader,

the performance range of our company covers the development, construction and production of tool systems for the affordable production of various threads. Depending on the demands regarding the production, we can offer you three solutions:

A.) Thread Cutting Heads

chip removing shaping process, working axially

B.) Thread Rolling Heads

non-cutting technology

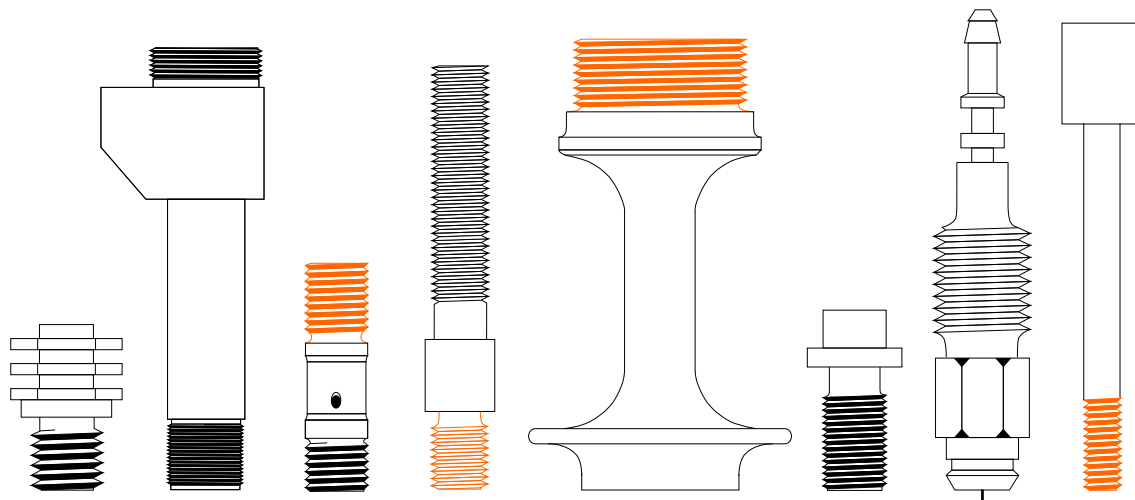
C.) Thread Rolling Attachments

non-cutting technology, working tangentially

In this catalogue, we describe the cutting technique involving our thread cutting head, which is the star in our house. Fast and adjustable, it cuts external threads of various shapes, pitches, diameters and lengths on diverse materials.

Are you interested in the other two production processes? You are welcome to order more information material.

Yours sincerely,



Tapping External Threads

Is it your daily task to produce a large number of various external threads?

If so, we would like to recommend our thread cutting head. Its chip removing processing provides you with unexcelled advantages of low tool costs and short handling periods.

Time Saving Production Process

As the thread cutting head opens independently at the thread end, the otherwise normal adjustment of the rotational direction ceases to apply and the enormously time saving fast backward movement is initiated. This brings about positive side effects: on the one hand, the tool is being preserved which extends its lifetime enormously, on the other hand the quality of the workpiece is maintained just as it has been cut.

We manufacture our thread cutting heads using high-quality steel which is completely hardened and ground. This grants a functional, highly precise mode of operation for daily use, lasting for years.

Types of Threads

Among the thread cutting head's capacities are the cutting of regular type or fine threads,

of left- and right-handed threads, of cylindrical or conical threads.

Beside these conical threads, the thread cutting head is fit to cut trapezoid and round threads as well as other special shapes, even complying with English and American standards. All types of threads can be supplied with free run-out or else be cut close to large collar diameters.

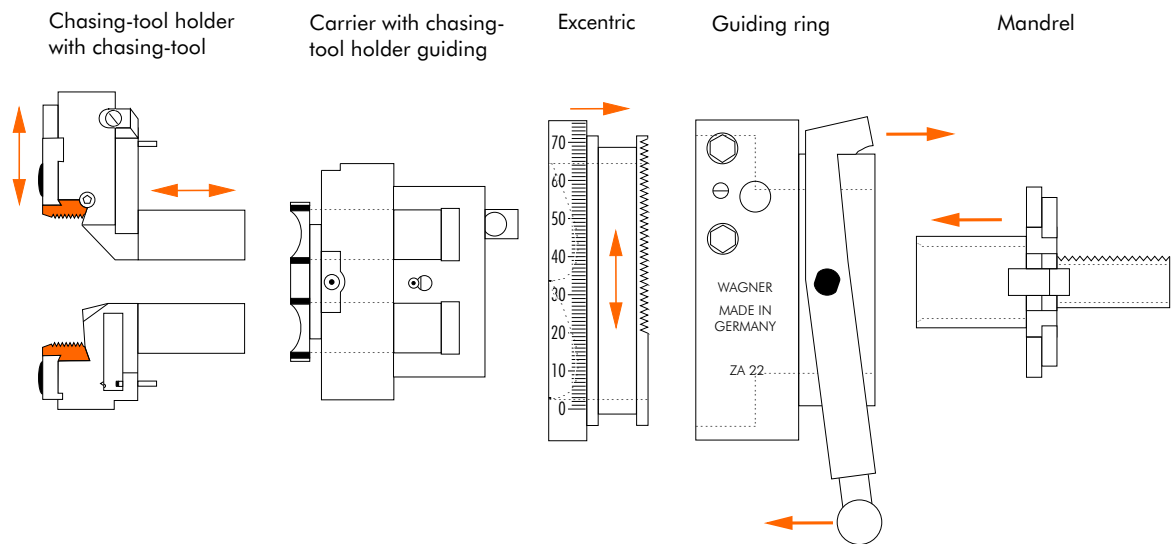
The thread cutting head can even be applied for the overwinding and skiving of bolts.

Materials

The chip removing cutting of threads can be applied to a broad range of materials: Machining and constructional steel, high alloy steel, copper and aluminium alloys, and non-ferrous metal.

Even using materials that cannot be reshaped when cool like gun metal, malleable cast iron and grey cast iron, threads can be cut at low cost.

Whether a workpiece is pre-turned or is oversized, whether it is forged, milled or cast is not relevant for the chip removing cutting process. Appropriate tooling inserts make performances fit for this variety of requirements possible.



The Concept

Our sophisticated construction consists of five elements :

The Chaser and Chaser Holder

The pitch and the basic diameter settings are inbuilt in the chaser holders. In these settings, the chasers are held and guided safely.

The Headbody

It contains the chaser holders and holds them, keeping the holder guiding in axial direction. This secures and guides the swaying when assembling and disassembling the chaser holder, while adjusting the diameter or during the opening and closing of the head.

The Excentric Ring

The chaser holders are propped up in the curves of the excentric. By smoothly rotating the excentric, the desired diameter can be adjusted just and precisely on a scale.

The Guiding Ring

It contains the excentric in the desired diameter position.

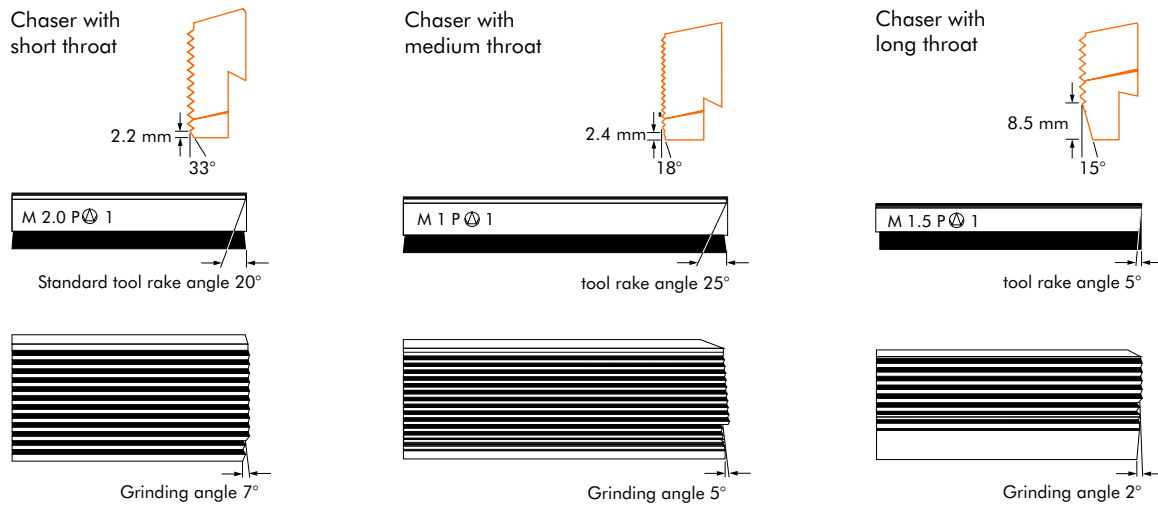
When moved axially on the carrier, both rings cause the opening and closing as well as the complete backdrive necessary for changing the chaser holders.

This modular system enables you to produce the whole range of your parts flexibly and at low costs. You only need one thread cutting head for a great variety of cutting jobs of one determined size.

The exchangeable chaser holders make it possible for the thread cutting head to remain on the machine constantly while you regrind the chasers and adjust them or insert chasers for other threads. Thus, a change of tools is accomplished within minutes and the duration of the interruption is kept to a minimum.

The Shank

If the thread cutting head is of rotary build, it can be flanged directly to the tooling machine by the carrier. If necessary, other shanks can be built in between, too. The static build demands an individual shank which we offer for all current tooling machines in a variety of builds and diameters.



The Chasers

The thread profile and the pitch are inserted into the chasers in a straight and parallel position. Therefore, threads of the same shape and pitch but with different diameters can be cut using the same chasers. There is a choice of chaser holders suiting different pitches and diameters.

We can offer you chasers with three sections: the short one for threads very close to the collar, the medium one for blank or pre-turned parts and the long one for rough materials or over-sized parts. Should these sections not fit your demands, we are happy to offer you individual solutions.

Chasers are available in steel qualities HSS or HSSE and thus cover a broad range. Utilisation of additional surfaces like plasma nitration or TiN coating makes it possible to extend the fields of use, to prolong lifetimes and to improve workpiece surfaces. We produce the chasers with a standard tool rake angle of 20°. This angle can be adjusted in order to suit the specific characteristics of a variety of materials.

As the chasers lose their sharpness after a period of use, they need to be re-sharpened. Due to its tangential position, the chaser can

be re-sharpened to about 20% of its original size. This makes the chaser unsurpassably economical. You have the choice of re-sharpening the chasers yourself or having them re-sharpened by us.

Chaser Grinding Fixture

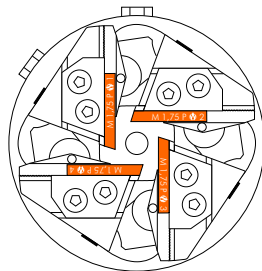
To optimally regrind the chasers you should use our chaser grinding fixture. It guarantees that the chasers can be precisely adjusted and reground. The fixture we offer can be easily attached to your standard grinding machine.

Wagner®-Chaser Grinding Machine

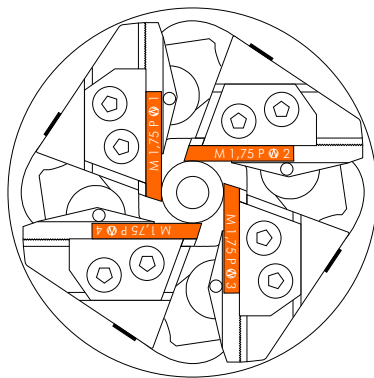
Alternatively we offer the Wagner chaser grinding machine. It is additionally equipped with a grinding disk and a workpiece support for the sharpening of any tools.

Setting Device

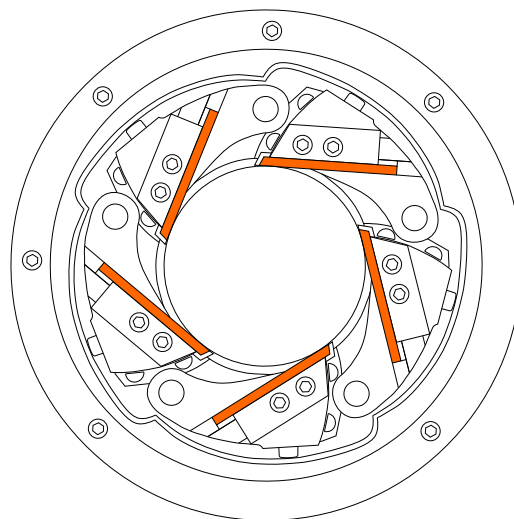
You can easily insert the chasers into the chaser holders yourself. We supply the necessary setting device which is fitted with a setting gauge. With it you can easily and precisely determine the optimal position of the four chasers to the workpiece.



Miniature Head
ZA 12 - 27
ZR 12 - 27



Standard Head
Z 16 - 76



Large Head
WDK - WKK S 2

The Head Sizes

We distinguish 3 head types according to their size :

The Miniature Head

Fast, small, light, space saving, compact, simply smart that's our miniature head. The little one is extraordinarily pliable. By four sizes and thread diametres of 1,6 - 50mm it covers a broad range of uses. It is available in static or rotary build.

It shows its fitness on single- or multi-mandrel machines, on automatic lathes, transfer- and round stroke machines.

The Standard Head

Do you like to have energy in spare? If you have got strong machines and if space is not an issue, our standard head is just the right choice. It is available in five sizes in rotary build, however, it can also be build in statically.

Its uses vary. Transfer machines, machining units as well as thread- and special machines can be fitted with it. The Standard head cuts threads of 4 - 120 mm diametres. Its variations are described on pages 6 and 7.

The Large Head

The most potent among our cutting heads is the large head. It is used for hardest machining tasks in machining units and cutting machines. Using this head (which usually is used statically), trapezoid and knuckle threads can be cut, too. It is available in three sizes and nine types suitable for threads of diametres of 9 - 175 mm. We have fitted the largest of our large heads with five chasers.

There is a special model of the large head which is described on page 6.

Do your individual demands and desires exceed these conventional head sizes? We offer the possibility to outfit our cutting heads to adapt them to your specific demands.

The Technical Data Of Our Thread Cutting Heads

Miniature Heads ZA 12 - 27 and ZR 12 - 27

| Type | Build | Regular Thread Nominal-Ø; mm | Fine Thread ▲ Nominal-Ø; mm | Pipe Thread ■ Nominal-Ø; inches | Head Ø, mm | Lengths, mm | Shank Ø, mm; inches | Weight in kg | Length of Thread ● | |
|-------|------------|------------------------------|-----------------------------|---------------------------------|------------|-------------|---------------------|--------------|--------------------|-------------|
| | | | | | | | | | Ø, mm | Max. Length |
| ZA 12 | stationary | 1.6 - 12 | 2 - 16 | 1/16 - 1/4" | 58 | 58 | 20; 3/4" | 0.8 | Up to 10 | 43 |
| | | | | | | | | | < 10 - 12 | 30 |
| | | | | | | | | | < 12 - 16 | 13 |
| ZA 16 | stationary | 2.5 - 16 | 3 - 24 | 1/8 - 3/8" | 72 | 70 | 20; 30; 3/4" | 1.8 | Up to 11 | 51 |
| | | | | | | | | | < 11 - 16 | 30 |
| | | | | | | | | | < 16 - 24 | 15 |
| ZA 22 | stationary | 4 - 22 | 4 - 38 | 1/8 - 3/4" | 88 | 82 | 25; 30; 1" | 2.8 | Up to 16 | 59 |
| | | | | | | | | | < 16 - 22 | 40 |
| | | | | | | | | | < 22 - 28 | 18 |
| ZA 27 | stationary | 5 - 24 | 6 - 50 | 1/8 - 1" | 110 | 109 | 32; 40; 1 1/4" | 6.8 | Up to 27 | 65 |
| | | | | | | | | | < 27 - 50 | 28 |

| Type | Build | Regular Thread Nominal-Ø; mm | Fine Thread ▲ Nominal-Ø; mm | Pipe Thread ■ Nominal-Ø; inches | Head Ø, mm | Lengths, mm | - | Weight in kg | Length of Thread ● | |
|-------|--------|------------------------------|-----------------------------|---------------------------------|------------|-------------|---|--------------|--------------------|-------------|
| | | | | | | | | | Ø, mm | Max. Length |
| ZR 12 | rotary | 1.6 - 12 | 2 - 16 | 1/16 - 1/4" | 58 | 51 | - | 0.6 | Up to 12 | Any |
| | | | | | | | | | < 12 - 16 | 13 |
| ZR 16 | rotary | 2.5 - 16 | 3 - 24 | 1/8 - 3/8" | 72 | 62 | - | 1.7 | Up to 16 | Any |
| | | | | | | | | | < 16 - 24 | 15 |
| ZR 22 | rotary | 4 - 22 | 4 - 38 | 1/8 - 3/4" | 88 | 70 | - | 2.8 | Up to 22 | Any |
| | | | | | | | | | < 22 - 38 | 18 |
| ZR 27 | rotary | 5 - 24 | 6 - 50 | 1/8 - 1" | 110 | 99 | - | 6.2 | Up to 27 | Any |
| | | | | | | | | | < 27 - 50 | 28 |

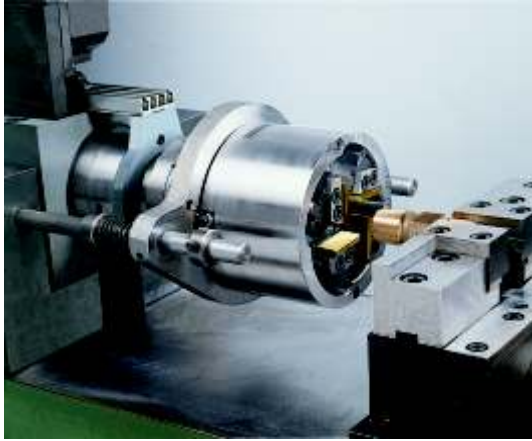
Standard Heads Z 16 - 76

| Type | Build | Regular Thread Nominal-Ø; mm | Fine Thread ▲ Nominal-Ø; mm | Pipe Thread ■ Nominal-Ø; inches | Head Ø, mm | Lengths, mm | - | Weight in kg | Length of Thread ● | |
|------|--------|------------------------------|-----------------------------|---------------------------------|------------|-------------|---|--------------|--------------------|-------------|
| | | | | | | | | | Ø, mm | Max. Length |
| Z 16 | rotary | 4 - 16 | 6 - 45 | 1/8 - 3/8" | 123 | 134 | - | 10 | Up to 16 | Any |
| | | | | | | | | | < 16 - 45 | 30 |
| Z 27 | rotary | 6 - 27 | 6 - 60 | 1/8 - 1" | 160 | 145 | - | 15 | Up to 30 | Any |
| | | | | | | | | | < 30 - 60 | 30 |
| Z 39 | rotary | 8 - 39 | 10 - 80 | 1/8 - 2" | 180 | 157 | - | 23 | Up to 45 | Any |
| | | | | | | | | | < 45 - 80 | 30 |
| Z 52 | rotary | 8 - 52 | 10 - 100 | 1/8 - 2 3/4" | 200 | 181 | - | 31 | Up to 55 | Any |
| | | | | | | | | | < 55 - 100 | 34 |
| Z 64 | rotary | 8 - 64 | 10 - 100 | 1/8 - 2 3/4" | 200 | 166 | - | 27 | Up to 70 | Any |
| | | | | | | | | | < 70 - 100 | 48 |
| Z 76 | rotary | - | 30 - 120 | 1 - 4" | 250 | 216 | - | 50 | Up to 95 | Any |
| | | | | | | | | | < 95 - 120 | 48 |

Large Heads WDK - WKK

| Type | Build | Regular Thread Nominal-Ø; mm | Fine Thread ▲ Nominal-Ø; mm | Pipe Thread ■ Nominal-Ø; inches | Head Ø, mm | Lengths, mm | - | Weight in kg | Length of Thread ● | |
|------|--------|------------------------------|-----------------------------|---------------------------------|------------|-------------|---|--------------|--------------------|-------------|
| | | | | | | | | | Ø, mm | Max. Length |
| WDK | rotary | 8 - 52 | - 65 | R 1/4 - 2" | 310 | 252 | - | 54 | Up to 65 | Any |
| | | | | | | | | | < 65 | 77 |
| WEK | rotary | 8 - 52 | - 95 | R 1/4 - 3" | 310 | 252 | - | 54 | Up to 95 | Any |
| | | | | | | | | | < 95 | 74 |
| WGK | rotary | 12 - 76 | - 95 | R 1/2 - 3" | 370 | 290 | - | 94 | Up to 95 | Any |
| | | | | | | | | | < 95 | 90 |
| WHK | rotary | 12 - 76 | - 120 | R 1/2 - 4" | 370 | 282 | - | 94 | Up to 120 | Any |
| | | | | | | | | | < 120 | 74 |
| WJK | rotary | 24 - 100 | - 120 | R 1 - 4" | 410 | 294 | - | 145 | Up to 120 | Any |
| | | | | | | | | | < 120 | 80 |
| WKK | rotary | 24 - 100 | - 175 | R 1 - 6" | 410 | 300 | - | 145 | Up to 175 | Any |
| | | | | | | | | | < 175 | 77 |

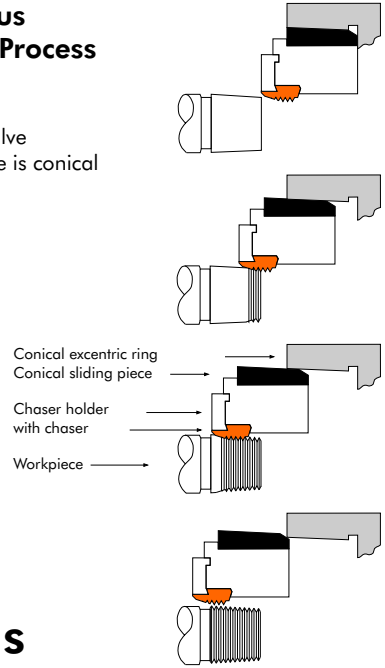
- ▲ larger diametres might be possible for fine threads, limited thread length provided. Please ask us about that.
Thread shapes such as buttres-, knuckle or trapezoid threads can be realized if using matching chaser holders and chasers. Please ask us about that.
- With tapered pipe threads the thread length is limited to the chaser's width.
- Larger thread lengths are possible with special chaser holders. Please ask us about that.



Centresleeve unit with cutting head Z 27 GK

Continuous Opening Process

Example :
A gas cylin valve
The workpiece is conical pre-turned.



Conical Threads

If you have specialised on the production of conical threads, it is time to introduce our special models K, GK and S.

The features they all have in common are :

A conical excentric ring and the conical sliding pieces effect a continuous opening process during the cutting process. This process helps you to accomplish a highly precise taper angle, you can cut longer threads, you will achieve exquisite surfaces due to the easier machining process aswell as it allows for a higher cutting speed.

The differences and uses :

The K-Head

Here, an indirect steering initiates the continuous opening process in a corresponding leverage relation.

It is especially suited to cut conical threads on pipes, rohrnippel and fittings. The K 1:16 taper is standard here, however, you can get special taper angles by applying exchangeable excentric rings, if desired.

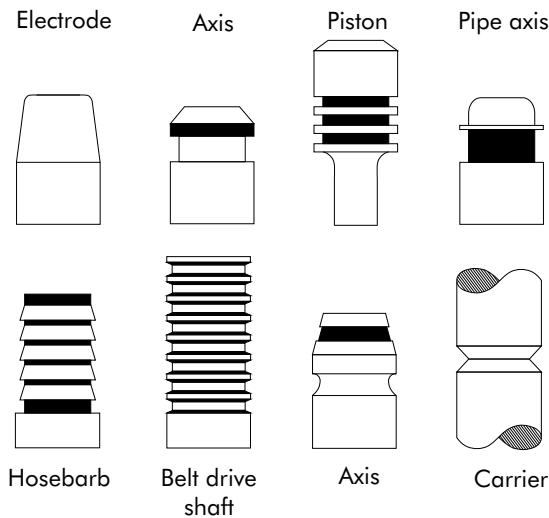
The GK-Head

Is controlled simply and directly. The taper angles K 1:16, K 1:10 and K 1:8 are possible when using exchangeable excentric rings. Its areas of use are the cutting of conical pipe threads on fittings and especially on gas cylin valves.

The S-Head

Was concipiated for larger thread diametres. It is controlled simply and directly. An inbuilt ball-bearing allows cutting speeds of up to 40 m/minute on steel pipes. It is used to cutconical threads on water- and gas pipes.

| Type | Build | Areas of use | | Head Ø, mm | Lengths mm | Weight in kg | Conical thread lengths, mm | Specially suited for the following types of machines |
|---------|--------|--------------------------------|---|------------|------------|--------------|----------------------------|--|
| | | Pipe threads | Gas cylin valve | | | | | |
| Z 16 GK | rotary | R 1/8 - 3/4" NPT 1/4 - 3/4" | W 10,43 - W 28,8 x 1/14 K 3:25 (K 3:26, K 1:8) | 115 | 114 | 8 | 26 | Round stroke machines with rotating mandrel- or centresleeve units |
| Z 27 GK | rotary | R 1/8 - 1" NPT 1/4 - 1" | W 19,8 - W 35,37 x 1/14 K 3:25 (K 3:26, K1:8) | 155 | 168 | 15 | 32 | |
| Z 27 K | rotary | R 1/8 - 1" NPT 1/4 - 1" | - | 155 | 155 | 15 | 34 | End Facing Machines |
| Z 39 K | rotary | R 1/8 - 2" NPT 1/4 - 2" | - | 175 | 167 | 23 | 40 | |
| Z 52 K | rotary | R 1/4 - 2 3/4" NPT 1/4 - 2" | - | 195 | 181 | 31 | 47 | |
| WEK-S 8 | rotary | R 1/4 - 3" NPT 1/4 - 3" | - | 310 | 257 | 84 | 44 | Transfer Machines |
| WHK-S 3 | rotary | R 1/2 - 4" NPT 1/2 - 4" | - | 370 | 306 | 112 | 63 | |
| WKK-S 2 | rotary | R 1 - 6" NPT 1 - 6" | - | 410 | 322 | 140 | 57 | |



Cutting head ZR 27 with HM plunging plates

Plunge Cutting Processes

The thread cutting head was originally designed for the cutting of threads, however, it has brought with it a positive side effect. The chaser holders' swaying process taking place during the head's closing is optimally suited to plunge cut parallel profiles. We provide the necessary plunging knives or cutting inserts which are fitted instead of the chasers. The shape of the cutting inserts is determined by your workpiece. In this case, the chaser holders do not have any pitch.

The cutting of profiles by the Wagner head holds the advantage of having the workpiece centrally welded on four sides which rules out its deforming under the cutting pressure. Thus, the unclamping length is secondary.

A variety of plunging jobs is possible in order to meet a number of demands:

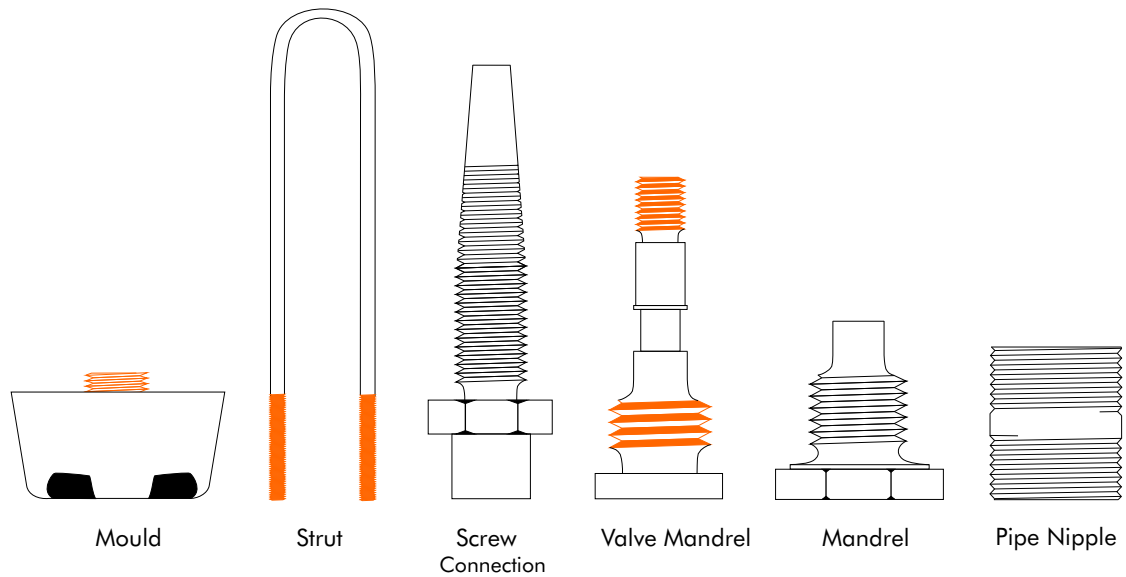
Shaft grooves, o-ring plunges or several grooves in line there is hardly anything which cannot be done.

Would you like to combine the bevelling with the plunging? Even that is possible.

The tolerances lie at about +/- 0,05 mm. For this operation, the ring and the sliding block are fitted with a flat chamfer which yields a controlled, slow swaying of the plunging knives. To achieve this, the ring is simply moved axially over the carrier and the chaser holders.

The forces are safely transferred via a

| Type | Build | Plunging Section Holder-Core Ø in mm | Sliding Piece Chamfer | Max. radial Plunging Depth (deviation) in mm | Plunging Knife Size in mm | Usage on Following Types of Machines |
|-------|--------|--------------------------------------|-----------------------|--|--|--|
| ZR 16 | rotary | 0 - 6.5 5 - 11.5 10 - 16.8 | 25 ° | 1.60 1.55 1.75 | 14.6 x 6.5 x 32 | End Facing Machine |
| ZR 22 | rotary | 4 - 13 4 - 20 4 - 26 | 25 ° | 2.30 2.20 2.00 | 14.6 x 6.5 x 32 | Interlinked Units |
| ZR 27 | rotary | 3.1 - 19 3.1 - 26 3.1 - 35 | 18 ° | 3.00 2.80 2.60 | 22 x 10 x 40 | Multi-Use Machines Special Purpose Machines |
| Z 27 | rotary | 4 - 16 4 - 31 4 - 36 | 18 ° | 3.50 3.20 3.20 | 22 x 10 x 68 or 25 x 12 x 75 or 40 x 16 x 75 | Bending Automat |



Examples Regarding Production and Efficiency

Mould

| | |
|---------------|--------------------------------------|
| Material | GG 18 |
| Screw Thread | M 40 X 1.5 ; 17 mm |
| Cutting Speed | 25 m/minute |
| Cutting Time | 15 s |
| Service Life | 1 600 pieces per re-grinding |
| Machine | Programme controlled turning machine |
| Head | ZA 27 with special holder |

Strut

| | |
|---------------|----------------------------|
| Material | 34 Cr 4 |
| Screw Thread | M 20 x 1.5 ; 7.5 mm |
| Cutting Speed | 8 m/minute |
| Cutting Time | 32 s |
| Service Life | 200 pieces per re-grinding |
| Machine | Double-Ended Machine |
| Head | Z 27 |

Screw Connection

| | |
|---------------|-----------------------------------|
| Material | 9 S Pb 23 K |
| Screw Thread | UNEF $\frac{1}{16}$ "-24" ; 35 mm |
| Cutting Speed | 14 m/minute |
| Cutting Time | 8 s |
| Service Life | 3 000 pieces per re-grinding |
| Machine | Multi-mandrel turning machine |
| Head | ZR 27 |

Valve Mandrel

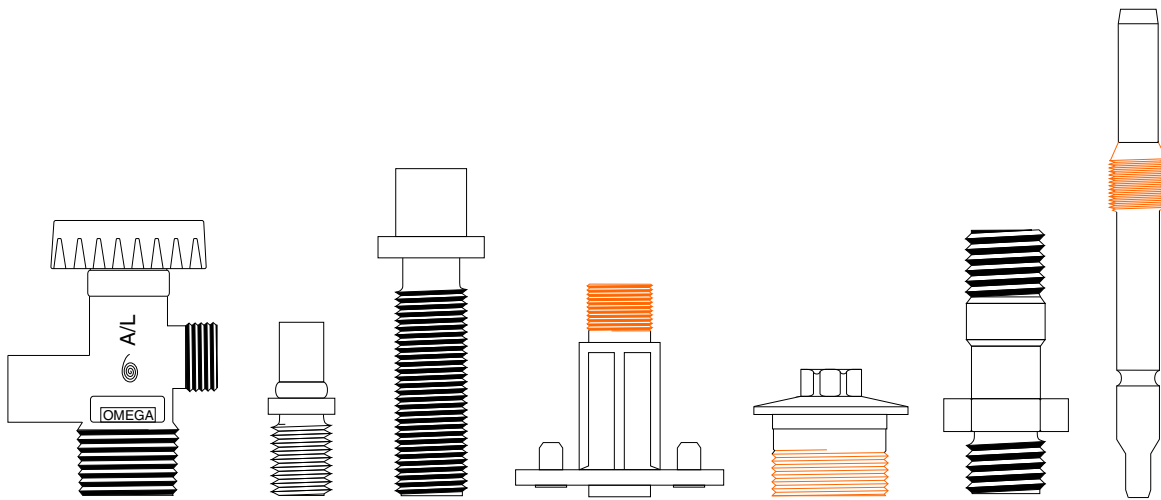
| | |
|---------------|-------------------------------|
| Material | MS 58 |
| Filet | $\frac{3}{8}$ "-24 NF ; 8 mm |
| Cutting Speed | 25 m/minute |
| Cutting Time | 0.6 s |
| Service Life | 60 000 pieces per re-grinding |
| Machine | Revolverautomat |
| Head | ZA 16 |

Mandrel

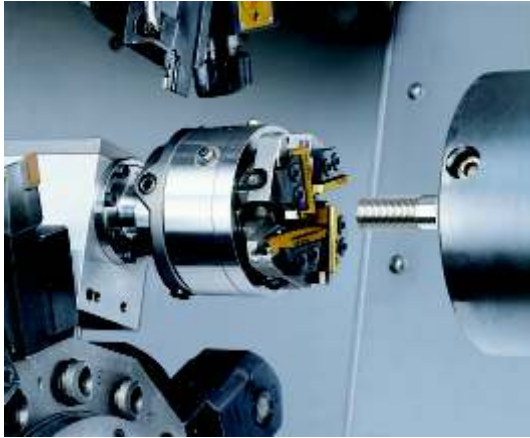
| | |
|---------------|------------------------------|
| Material | C 15 K |
| Screw Thread | M 16 x 1.5 ; 6 mm |
| Cutting Speed | 8 m/minute |
| Cutting Time | 1.5 s |
| Service Life | 1 500 pieces per re-grinding |
| Machine | Multi-mandrel machine |
| Head | ZR 22 |

Pipe Nipple

| | |
|---------------|--|
| Material | St 37 |
| Screw Thread | R 1 $\frac{1}{4}$ " K 1 : 16 ; 22 cm bilateral |
| Cutting Speed | 24 m/minute |
| Cutting Time | 7 s |
| Service Life | 2 500 pieces per re-grinding |
| Machine | Thread Cutting Machine |
| Head | ZA 39 K |



Machine Controlling and Addition



Head ZA 22 on CNC lathe with star turret



Head ZA 22 on CNC lathe with disk revolver



Head Z 27 GK on special machine with centresleeve unit



Head Z 39 on thread cutting machine

Answers to Frequently Asked Questions

The Client Asks :

- What are the **modular components** of the thread cutting head ?
- Are there **different models of components** ?
- How does the **controlling** of the thread cutting head work ?
- Can the head be used in **continuous duty** ?
- Are there different **chaser qualities** ?
- Is there a Wagner **on-site service** ?

The Producer Answers :

The whole concept is described on page 2 of this prospectus.

Yes, chaser holders and chasers are produced to match the set screw threads. The die holders are made to meet the machine's demands.

It is simple and direct. Please find suggestions and samples of usage in the user's manual.

Yes, we guarantee a very long service life for your thread cutting head. The construction was developed by Wagner in 1896 and has ever since been adapted to the demands of the time.

Yes, we offer optimal quality, depending on the material you would like to work with. We are awaiting your enquiries.

Yes, there is an area-wide field organisation.





Driven Axial Tools



Driven Radial Tools



Multi-Turning Head

WAGNER[®] Tooling Systems Offer Even More!

A fourth tooling system is the multi-turning head. With its four carbide tipped cutting tools it is able to turn more than common tools.

Furthermore, we offer a whole range of driven tools which find their use on your CNC lathe. They have various cutting edges in axial and radial positions to drill, mill and thread cut.

With our additional equipment, we recommend ourselves as your competent partner within every area of metal machining.



Gutenbergstraße 4/1
D - 72124 Pliezhausen

Telefon (0 71 27) 97 33 00
Telefax (0 71 27) 97 33 90

info@wagner-werkzeug.de
www.wagner-werkzeug.de