



# A-TAP SERIES

A-SFT A-OIL-SFT A-POT



TM

A Published  
Technical Report  
BRINKE & BREUER  
inside

# A

## OSG's new premium brand "A-TAP Series"

The answer for your troubles lies here



Most of tapping troubles are caused by unstable chip evacuation.  
A-TAP Series resolve such troubles and apply to a wide range of work materials and cutting speed.

Tapping Troubles	
N°1 Breakage and chipping	26 %
N°2 dimensional error	17 %
N°3 Galling	14 %
Others	43 %



## The A-TAP can go this far !

Stabilize chip shape  
Sharp cutting edge

Accelerate chip evacuation  
Variable lead flute (PAT.)

High wear resistance  
V coating

High wear resistance  
Powder Metallurgy HSS (CPM)

### Even to mild steel and stainless steel

1- Applies to a wide variety of work materials

No galling



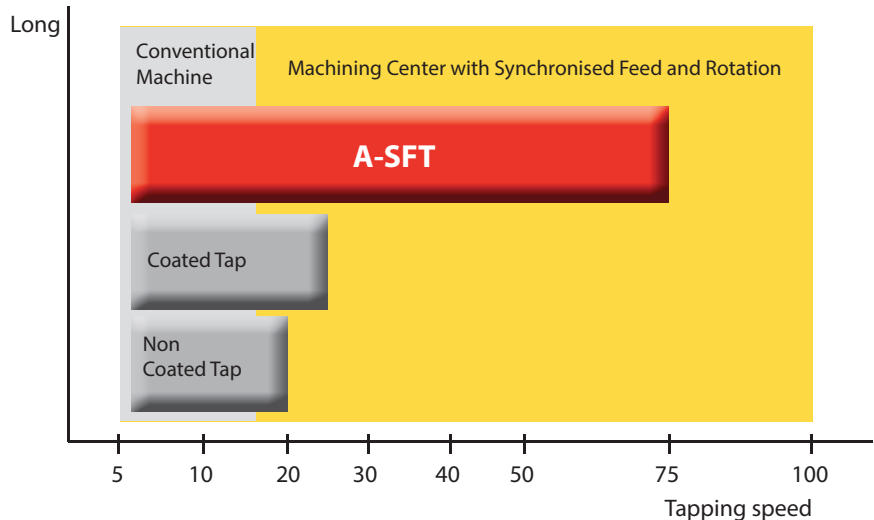
Work Material  
Mild steel



Work Material  
Stainless steel

### High performance in machining center

2- Applies to a wide cutting range



- It is a image of tapping in medium and high carbon steel with water soluble coolant.
- Machining center with synchronized feed and rotation is recommended for more than 15m/min.
- As the best speed varies by tapping condition, please find it by trials.

## The biggest advantage of A-TAP Series

### The Best chip evacuation



Conventional Tap



A-SFT

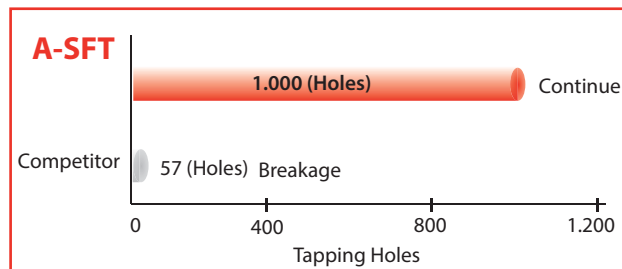
## The A-TAP can go this far !

### ■ SUS304

#### Deep Hole Tapping (2D) in stainless steel

High performance achieved in stainless steel with water soluble oil

Tool	A-SFT M8x1,25
Work Material	SUS304
Hole Size	Ø6,8x22mm (Blind)
Tapping Length	16mm (2D)
Tapping Speed	10m/min (398min <sup>-1</sup> )
Coolant	Water Soluble Chlorine-Free (10%)
Machine	Vertical Synchronized Machining Center



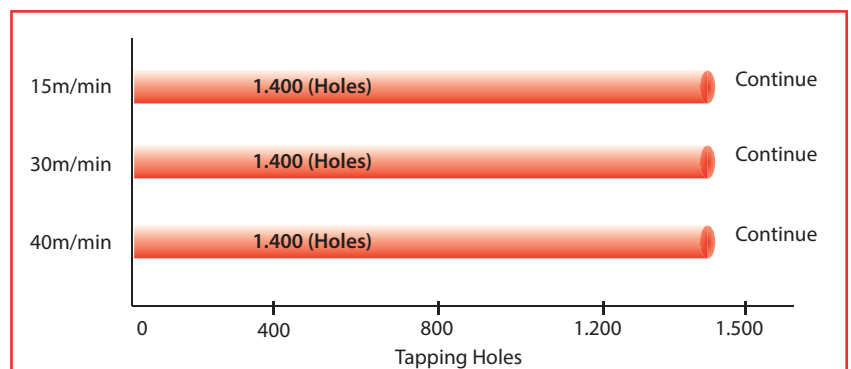
■ Cutting edge after 1.000 holes Tapping

### ■ S45C

#### High speed tapping by machining center

Tapping operation in 15,30,40m/min are all stable

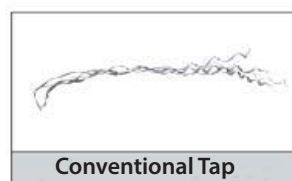
Tool	A-SFT M6x1
Work Material	S45C
Hole Size	Ø5x16mm (Blind)
Tapping Length	12mm (2D)
Coolant	Water Soluble Chlorine-Free (10%)
Machine	Vertical Synchronized Machining Center



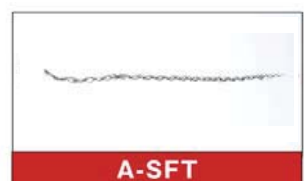
■ Cutting edge after 1.400 holes Tapping



■ Chip generated in 40m/min



Conventional Tap



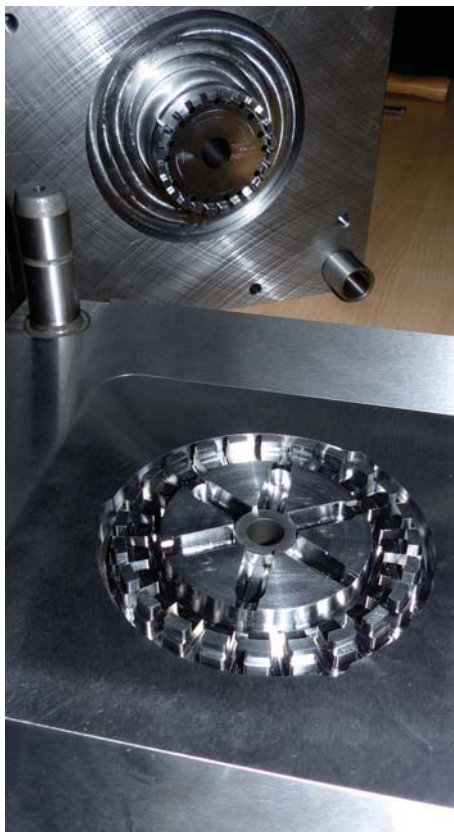
A-SFT



# A High process reliability across a wide range of material

Brinke & Breuer does profit from process reliability and cost reductions. That's why they consider taps a key tool, since the tool dictates warehousing costs, setup times as well as operating speed. On the other hand, tool failure is as expensive in time and money as it is unnerving. In December 2013, they started working with the A-SFT tap made by OSG. Even with the final quality comparisons yet to finish, one thing is for sure: The A-SFT is usable across all soft materials and demands a change of thought when it comes to cutting data.

'Multipurpose' isn't usually associated with high performance. Especially with tools, even more so with taps, tool geometry and base substrate are commonly matched with the material to be processed. Even though



Brinke & Breuer, active in tool making, mechanical engineering and fixture construction, is working with a broad range of materials such as Aluminium (soft to hardened), Copper, Brass and mild steel as well as tempered steel, no need to try new thread cutting tools was seen. The tools used until then were, apart from a few exceptions, yielding excellent results. Change came with a material often worked with in Staudt, where the company is located: Elec-trolytic copper (E-Cu). According to Jens Brinke it was this material that started the relationship with OSG:

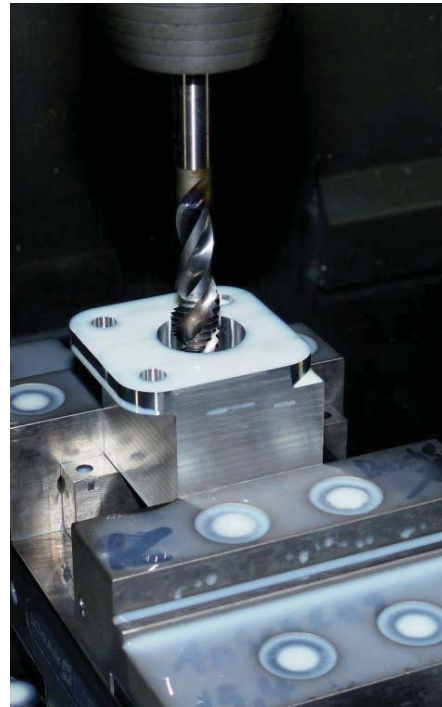


Also usable across multiple materials for tool making: In Staudt the A-SFT tap is used up to HRC 42.

„We were looking for a deep hole drill, diameter 9mm, 300mm deep, for electrolytic copper. Only OSG was able to deliver a solution to that problem. Starting with that, we made a full switch to OSG, threading tools as well. It is not important for us, whether we can cut 100,000 threads or not, we need high process reliability. We tried the A-SFT because we were promised high cutting speeds across a broad range of materials on top of long tool life.

absolute process reliability regarding chip formation and evacuation across a variety of materials with high cutting speeds. Now the switch to the A-SFT is almost complete.“ The emphasis Brinke & Breuer put on process reliability is due to thread cutting usually being the last step in the production of high value components. When producing one-of-a-kind or small batch components out of a broad variety of materials, tool life is not the most

Universal use: The A-SFT taps high process reliability and the ambitious cutting speeds are adding to its economic efficiency.



important factor. Considering the broad range of applications it would be impossible to calculate anyhow. Neither is there a need to shave down cycle. Looking at the range of materials and thread sizes from M2 to M16 warehousing becomes a serious concern. On each of the eight machines, each shift at least three to four different materials are processed.

This considered, a huge variety in threading tools would have a negative impact on set up times. Both partners of Brinke & Breuer, Jens Brinke and Michael Breuer don't care about optimized chip evacuation, the variable lead flute (patented) or the high wear resistant powder metallurgy HSS. They want the tap to be economical. And, they say, it is even if you can cut 10 threads with a M2.5 tap into a 1.2379 tool steel with ease. So far no off the shelf tool was able to cut even a single thread into that material.

## Better safe than ambitious cutting speeds

On top of ease of use and long tool life OSG does promise quite ambitious cutting speeds. Up to 70 m/min in 42CrMo are advertised, as they could be used at the Brinke & Breuer plant. Michael Breuer comments: „The first problem with a lot of different threading tools is educating the employees, when and with which application to use what tool at what speed and which feed rate.



A material range as broad as it could be. Brass, Copper, Aluminium up to highly hardened and tempered steel. And just one tap is used for all of them.

We solved that problem by using the A-SFT, which doesn't require the cutting parameter to be set individually. But apart from one employee no one is yet brave enough to approach the ambitious cutting speeds. On the other hand we know, the slower the speed, the higher the risk of failure and breaking of the tap. We traced that back to galling of the cutting edges. Fortunately, unlike other taps the A-SFT is really razor-sharp." Of course, such cutting speeds can only be reached with state of the art machines, precise synchronization is elemental. Soft Copper, high-strength aluminium or steel up to HRC42, the A-SFT seems to be paying off at Brinke & Breuer. With the two shift system tool wear/failure is down to less than one percent, findings from quality assurance are also promising. Since December 2013 development of rejects compared to before the switch has been accurately recorded, thread qualities are checked and necessary rework gets written down. According to that the A-SFT outperform the already satisfactory old tap in every aspect. If it were up to the both managing directors, the switch to the A-SFT would already be complete.

#### Spotlight Brinke & Breuer

Starting out in 1995 with metal works for construction, the focus has shifted to traditional metal and mechanical engineering. 2011 tool making for injection moulding was added to the portfolio. The manufacturing range was further broadened by acquiring two five axis machining centres and water-jet cutters due to market requirements. Nowadays customers are not limited to a specific, but stem for a variety of industry sectors (automotive, supply industry and pump manufacturing among others). The strongpoint is considered to be custom and small batch parts manufacturing up to production of complete machines, e.g. for the installation of gas springs.

#### By the way

Jens Brinke: „Our employees (apart from one, he's without hesitation) reach the specified cutting speeds only in the presence of Uli Blöcher (OSG sales engineer). I can totally relate to that, it takes some time to wrap your head around such increases.“

#### Interesting facts

For the A-SFT, OSG is using its in house developed powder metallurgy substrate. The result is extraordinary wear resistance. Trials have shown a tool life in C45 of 50m, 20 to 30 per cent more than a comparable competitor's product.



With its variable lead flute the A-SFT achieves optimized chip formation and evacuation.



Jens Brinke (left) and Michael Breuer (right): „Our Goal was to find a single supplier for our tool. We found that just two manufacturers worldwide meet our requirements, OSG is one of them.“

#### Contact

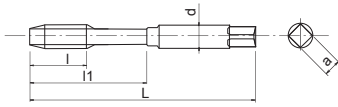
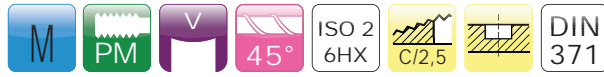
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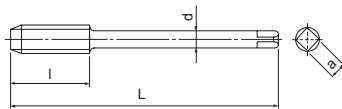


# A A-SFT

## Metric



EDP	M	P	L	l	l1	d	a	ZΔ	Price
48139125	2	0,4	45	3,2	10	2,8	2,1	2	
48139133	2,5	0,45	50	3,6	13	2,8	2,1	2	
48139138	3	0,5	56	4	18	3,5	2,7	3	
48139144	4	0,7	63	5,6	21	4,5	3,4	3	
48139149	5	0,8	70	6,4	25	6	4,9	3	
48139155	6	1	80	8	30	6	4,9	3	
48139161	8	1,25	90	10	35	8	6,2	3	
48139169	10	1,5	100	12	39	10	8	3	



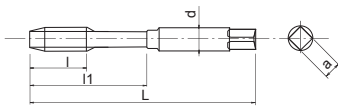
DIN 376



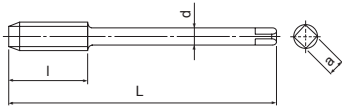
EDP	M	P	L	l	d	a	ZΔ	Price
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48139191	14	2	110	16	11	9	3	
48139202	16	2	110	16	12	9	3	
48139214	18	2,5	125	25	14	11	4	
48139228	20	2,5	140	25	16	12	4	
48139238	22	2,5	140	25	18	14,5	4	
48139247	24	3	160	30	18	14,5	4	

# A A-OIL-SFT

## Metric



EDP	M	P	L	l	l1	d	a	ZΔ	Price
48140155	6	1	80	8	30	6	4,9	3	
48140161	8	1,25	90	10	35	8	6,2	3	
48140169	10	1,5	100	12	39	10	8	3	



DIN 376



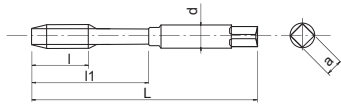
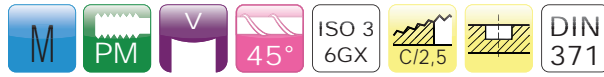
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48140191	14	2	110	16	11	9	3	
48140202	16	2	110	16	12	9	3	

Applications - Anwendungen - Applicazioni - Applications - Applikation - Applikation - Aplicaciones - Применение - Uygulama - Zastosowania

C<0.2%	0.25<C<0.4%	C≥0.45%	SCM	25-35 HRC	35-45 HRC	45-52 HRC	52-62 HRC	SUS	SKD	SC	GG	GGG
⊙ 15-60 m/min	⊙ 15-60 m/min	⊙ 10-60 m/min	⊙ 8-30 m/min	○ 8-20 m/min				⊙ 8-20 m/min				
Cu	BS	BsC	PB	Al	AC,ADC	MC	ZDC	Ti	Ni	Plast.	Vnyl	
○ 15-35 m/min		○ 15-30 m/min		○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 5-10 m/min			○ 15-20 m/min	

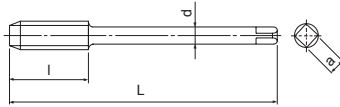
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Metric



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48201133	2,5	0,45	50	3,6	13	2,8	2,1	2	
48201138	3	0,5	56	4	18	3,5	2,7	3	
48201144	4	0,7	63	5,6	21	4,5	3,4	3	
48201149	5	0,8	70	6,4	25	6	4,9	3	
48201155	6	1	80	8	30	6	4,9	3	
48201161	8	1,25	90	10	35	8	6,2	3	
48201169	10	1,5	100	12	39	10	8	3	

**STOCK**  
Available  
in September



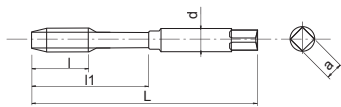
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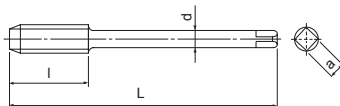
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Metric



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48202133	2,5	0,45	50	3,6	13	2,8	2,1	2	
48202138	3	0,5	56	4	18	3,5	2,7	3	
48202144	4	0,7	63	5,6	21	4,5	3,4	3	
48202149	5	0,8	70	6,4	25	6	4,9	3	
48202155	6	1	80	8	30	6	4,9	3	
48202161	8	1,25	90	10	35	8	6,2	3	
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**STOCK**  
Available  
in September



DIN 376

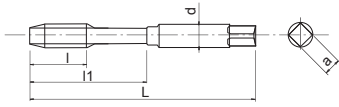


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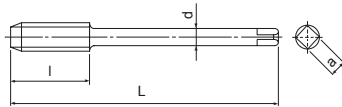
Applications - Anwendungen - Applicazioni - Applications - Applikation - Applikation - Aplicaciones - Применение - Uygulama - Zastosowania												
C≤0.2%	0.25<C≤0.4%	C≥0.45%	SCM	25-35 HRC	35-45 HRC	45-52 HRC	52-62 HRC	SUS	SKD	SC	GG	GGG
⊙ 15-60 m/min	⊙ 15-60 m/min	⊙ 10-60 m/min	⊙ 8-30 m/min	○ 8-20 m/min				⊙ 8-20 m/min				
Cu	BS	BsC	PB	Al	AC,ADC	MC	ZDC	Ti	Ni	Plast.	Vinyl	
○ 15-35 m/min		○ 15-30 m/min		○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 5-10 m/min			○ 15-20 m/min	

# A A-SC-SFT

Metric



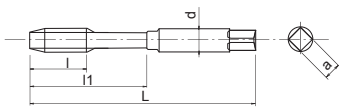
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48203144	4	0,7	63	5,6	21	4,5	3,4	3	
48203149	5	0,8	70	6,4	25	6	4,9	3	
48203155	6	1	80	8	30	6	4,9	3	
48203161	8	1,25	90	10	35	8	6,2	3	
48203169	10	1,5	100	12	39	10	8	3	



EDP	M	P	L	l	d	a	ZΔ	Price
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48203191	14	2	110	16	11	9	3	
48203202	16	2	110	16	12	9	3	

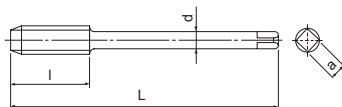
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Metric



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48204144	4	0,7	63	5,6	21	4,5	3,4	3	
48204149	5	0,8	70	6,4	25	6	4,9	3	
48204155	6	1	80	8	30	6	4,9	3	
48204161	8	1,25	90	10	35	8	6,2	3	
48204169	10	1,5	100	12	39	10	8	3	

**STOCK Available in October**



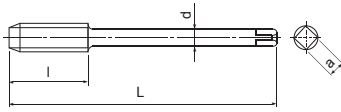
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48204202	16	2	110	16	12	9	3	

Applications - Anwendungen - Applicazioni - Applications - Applikation - Applikation - Aplicaciones - Применение - Uygulama - Zastosowania													
C≤0.2%	0.25<C≤0.4%	C≥0.45%	SCM	25-35 HRC	35-45 HRC	45-52 HRC	52-62 HRC	SUS	SKD	SC	GG	GGG	
⊙ 15-60 m/min	⊙ 15-60 m/min	⊙ 10-60 m/min	⊙ 8-30 m/min	○ 8-20 m/min				⊙ 8-20 m/min					
Cu	BS	BsC	PB	Al	AC,ADC	MC	ZDC	Ti	Ni	Plast.	Vnyl		
○ 15-35 m/min		○ 15-30 m/min		○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 5-10 m/min			○ 15-20 m/min		



# A A-SFT

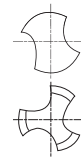
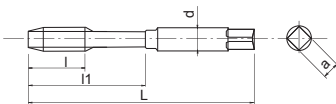
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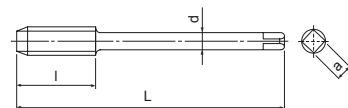
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48139162	8	1	90	10	6	4,9	3	
48139171	10	1	90	10	7	5,5	3	
48139170	10	1,25	100	12	7	5,5	3	
48139182	12	1	100	12	9	7	3	
48139181	12	1,25	100	12	9	7	3	
48139180	12	1,5	100	14	9	7	3	
48139192	14	1,5	100	16	11	9	3	
48139203	16	1,5	100	16	12	9	3	
48139216	18	1,5	110	16	14	11	4	
48139230	20	1,5	125	16	16	12	4	
48139240	22	1,5	125	16	18	14,5	4	
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# A A-SFT

## UNC



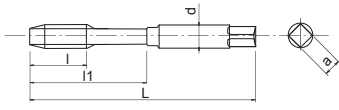
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48139461	6	32	56	6,4	20	4	3	2	
48139464	8	32	63	6,4	21	4,5	3,4	2	
48139466	10	24	70	8,5	25	6	4,9	2	
48139471	1/4	20	80	10,2	30	7	5,5	2	
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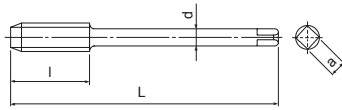
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48139515	3/4	10	125	25,4	14	11	4	
48139526	7/8	9	140	28,2	18	14,5	4	
48139538	1	8	160	31,8	18	14,5	4	

Applications - Anwendungen - Applicazioni - Applications - Applikation - Aplicaciones - Применение - Uygulama - Zastosowania												
C≤0.2%	0.25<C≤0.4%	C≥0.45%	SCM	25-35 HRC	35-45 HRC	45-52 HRC	52-62 HRC	SUS	SKD	SC	GG	GGG
⊙ 15-60 m/min	⊙ 15-60 m/min	⊙ 10-60 m/min	⊙ 8-30 m/min	○ 8-20 m/min				⊙ 8-20 m/min				
Cu	BS	BsC	PB	Al	AC,ADC	MC	ZDC	Ti	Ni	Plast.	Vinyl	
○ 15-35 m/min		○ 15-30 m/min		○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 5-10 m/min			○ 15-20 m/min	

# A A-SFT UNF

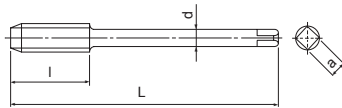


EDP	UNF	P	L	l	l1	d	a	ZΔ	Price
48139462	6	40	56	6,4	20	4	3	2	
48139467	10	32	70	8,5	25	6	4,9	2	
48139472	1/4	28	80	10,2	30	7	5,5	2	
48139476	5/16	24	90	11,3	35	8	6,2	3	
48139481	3/8	24	90	12,7	35	10	8	3	



EDP	UNF	P	L	l	d	a	ZΔ	Price
48139486	7/16	20	100	14,5	8	6,2	3	
48139491	1/2	20	100	15,6	9	7	3	
48139496	9/16	18	100	16,9	11	9	3	
48139504	5/8	18	100	18,5	12	9	3	
48139517	3/4	16	110	25,4	14	11	4	
48139528	7/8	14	125	28,2	18	14,5	4	
48139539	1	12	140	31,8	18	14,5	4	

# A A-SFT G



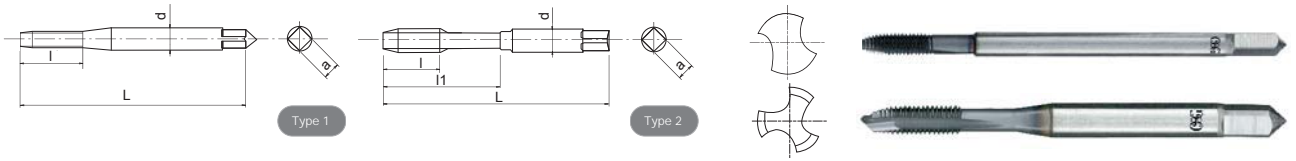
EDP	G	P	L	l	d	a	ZΔ	Stock	Price
48139900	1/8	28	90	20	7	5,5	3	●	
48139000	1/4	19	100	22	11	9	3	●	
48139100	3/8	19	100	22	12	9	4	●	
48139200	1/2	14	125	25	16	12	4	●	
48139300	5/8	14	125	25	18	14,5	4	●	
48139400	3/4	14	140	28	20	16	4	●	
48139500	7/8	14	150	28	22	18	4	●	
48139600	1	11	160	30	25	20	4	●	

Applications - Anwendungen - Applicazioni - Applications - Applikation - Applikation - Aplicaciones - Применение - Uygulama - Zastosowania

C≤0.2%	0.25<C≤0.4%	C≥0.45%	SCM	25-35 HRC	35-45 HRC	45-52 HRC	52-62 HRC	SUS	SKD	SC	GG	GGG
◎ 15-60 m/min	◎ 15-60 m/min	◎ 10-60 m/min	◎ 8-30 m/min	○ 8-20 m/min				◎ 8-20 m/min				
Cu	BS	BsC	PB	Al	AC,ADC	MC	ZDC	Ti	Ni	Plast.	Vnyl	
○ 15-35 m/min		○ 15-30 m/min		○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 5-10 m/min			○ 15-20 m/min	

# A A-POT

## Metric



EDP	M	P	L	l	l1	d	a	ZΔ	Type	Price
48145125	2	0,4	45	8	-	2,8	2,1	2	1	
48145133	2,5	0,45	50	9	-	2,8	2,1	2	1	
48145138	3	0,5	56	11	18	3,5	2,7	3	2	
48145144	4	0,7	63	13	21	4,5	3,4	3	2	
48145149	5	0,8	70	16	25	6	4,9	3	2	
48145155	6	1	80	19	30	6	4,9	3	2	
48145161	8	1,25	90	22	35	8	6,2	3	2	
48145169	10	1,5	100	24	39	10	8	3	2	



EDP	M	P	L	l	d	a	ZΔ	Price
48145179	12	1,75	110	29	9	7	3	
48145191	14	2	110	30	11	9	3	
48145202	16	2	110	32	12	9	3	
48145214	18	2,5	125	34	14	11	3	
48145228	20	2,5	140	34	16	12	3	
48145238	22	2,5	140	34	18	14,5	3	
48145247	24	3	160	38	18	14,5	3	

# A A-POT-6GX

## Metric



EDP	M	P	L	l	l1	d	a	ZΔ	Price
48205125	2	0,4	45	8	8	2,8	2,1	2	
48205133	2,5	0,45	50	9	9	2,8	2,1	2	
48205138	3	0,5	56	11	18	3,5	2,7	3	
48205144	4	0,7	63	13	21	4,5	3,4	3	
48205149	5	0,8	70	16	25	6	4,9	3	
48205155	6	1	80	19	30	6	4,9	3	
48205161	8	1,25	90	22	35	8	6,2	3	
48205169	10	1,5	100	24	39	10	8	3	



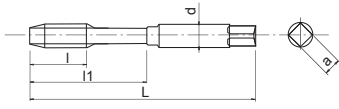
EDP	M	P	L	l	d	a	ZΔ	Price
48205179	12	1,75	110	29	9	7	3	
48205202	16	2	110	32	12	9	3	

Applications - Anwendungen - Applicazioni - Applications - Applikation - Applikation - Aplicaciones - Применение - Uygulama - Zastosowania													
C≤0.2%	0.25<C≤0.4%	C≥0.45%	SCM	25-35 HRC	35-45 HRC	45-52 HRC	52-62 HRC	SUS	SKD	SC	GG	GGG	
⊙ 15-60 m/min	⊙ 15-60 m/min	⊙ 10-60 m/min	⊙ 8-30 m/min	○ 8-20 m/min				⊙ 8-20 m/min					
Cu	BS	BsC	PB	Al	AC,ADC	MC	ZDC	Ti	Ni	Plast.	Vinyl		
○ 15-35 m/min		○ 15-30 m/min		○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 5-10 m/min			○ 15-20 m/min		



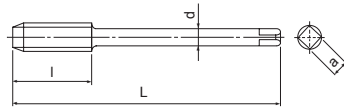
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## Metric



EDP	M	P	L	I	I1	d	a	ZΔ	Price
48206125	2	0,4	45	8	8	2,8	2,1	2	
48206133	2,5	0,45	50	9	9	2,8	2,1	2	
48206138	3	0,5	56	11	18	3,5	2,7	3	
48206144	4	0,7	63	13	21	4,5	3,4	3	
48206149	5	0,8	70	16	25	6	4,9	3	
48206155	6	1	80	19	30	6	4,9	3	
48206161	8	1,25	90	22	35	8	6,2	3	
48206169	10	1,5	100	24	39	10	8	3	

**STOCK**  
Available  
in September



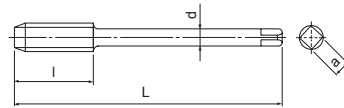
DIN 376



EDP	M	P	L	I	d	a	ZΔ	Price
48206179	12	1,75	110	14	29	7	3	
48206202	16	2	110	16	32	9	3	

# A A-POT

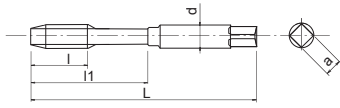
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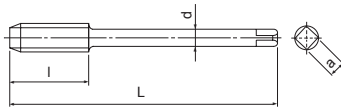
EDP	MF	P	L	I	d	a	ZΔ	Price
48145156	6	0,75	80	13	4,5	3,4	3	
48145163	8	0,75	80	19	6	4,9	3	
48145162	8	1	90	22	6	4,9	3	
48145171	10	1	90	20	7	5,5	3	
48145170	10	1,25	100	24	7	5,5	3	
48145182	12	1	100	22	9	7	3	
48145181	12	1,25	100	22	9	7	3	
48145180	12	1,5	100	22	9	7	3	
48145192	14	1,5	100	22	11	9	4	
48145203	16	1,5	100	22	12	9	4	
48145216	18	1,5	110	25	14	11	4	
48145230	20	1,5	125	25	16	12	4	
48145240	22	1,5	125	25	18	14,5	4	
48145250	24	1,5	140	28	18	14,5	4	

Applications - Anwendungen - Applicazioni - Applications - Applikation - Applikation - Aplicaciones - Применение - Uygulama - Zastosowania												
C≤0.2%	0.25<C≤0.4%	C≥0.45%	SCM	25-35 HRC	35-45 HRC	45-52 HRC	52-62 HRC	SUS	SKD	SC	GG	GGG
⊙ 15-60 m/min	⊙ 15-60 m/min	⊙ 10-60 m/min	⊙ 8-30 m/min	○ 8-20 m/min				⊙ 8-20 m/min				
Cu	BS	BsC	PB	Al	AC,ADC	MC	ZDC	Ti	Ni	Plast.	Vinyl	
○ 15-35 m/min		○ 15-30 m/min		○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 5-10 m/min			○ 15-20 m/min	

# A A-POT UNC

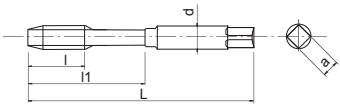


EDP	UNC	P	L	l	l1	d	a	ZΔ	Price
48145457	4	40	56	11	18	3,5	2,7	2	
48145459	5	40	56	11	18	3,5	2,7	3	
48145461	6	32	56	12	20	4	3	3	
48145464	8	32	63	13	21	4,5	3,4	3	
48145466	10	24	70	16	25	6	4,9	3	
48145471	1/4	20	80	19	30	7	5,5	3	
48145474	5/16	18	90	22	35	8	6,2	3	
48145479	3/8	16	100	24	39	10	8	3	

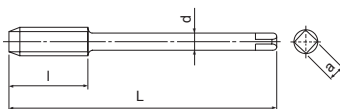


EDP	UNC	P	L	l	d	a	ZΔ	Price
48145484	7/16	14	100	24	8	6,2	3	
48145489	1/2	13	110	28	9	7	3	
48145494	9/16	12	110	30	11	9	3	
48145501	5/8	11	110	32	12	9	3	
48145515	3/4	10	125	34	14	11	3	
48145526	7/8	9	140	34	18	14,5	3	
48145538	1	8	160	38	18	14,5	3	

# A A-POT UNF



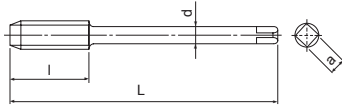
EDP	UNF	P	L	l	l1	d	a	ZΔ	Price
48145462	6	40	56	12	20	4	3	3	
48145467	10	32	70	16	25	6	4,9	3	
48145472	1/4	28	80	19	30	7	5,5	3	
48145476	5/16	24	90	22	35	8	6,2	3	
48145481	3/8	24	90	20	35	10	8	3	



EDP	UNF	P	L	l	d	a	ZΔ	Price
48145486	7/16	20	100	24	8	6,2	3	
48145491	1/2	20	100	22	9	7	3	
48145496	9/16	18	100	22	11	9	3	
48145504	5/8	18	100	22	12	9	3	
48145517	3/4	16	110	25	14	11	3	
48145528	7/8	14	125	25	18	14,5	3	
48145539	1	12	140	28	18	14,5	3	

Applications - Anwendungen - Applicazioni - Applications - Applikation - Applikation - Aplicaciones - Применение - Uygulama - Zastosowania												
C≤0.2%	0.25<C≤0.4%	C≥0.45%	SCM	25-35 HRC	35-45 HRC	45-52 HRC	52-62 HRC	SUS	SKD	SC	GG	GGG
⊙ 15-60 m/min	⊙ 15-60 m/min	⊙ 10-60 m/min	⊙ 8-30 m/min	○ 8-20 m/min				⊙ 8-20 m/min				
Cu	BS	BsC	PB	Al	AC,ADC	MC	ZDC	Ti	Ni	Plast.	Vnyl	
○ 15-35 m/min		○ 15-30 m/min		○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 5-10 m/min			○ 15-20 m/min	

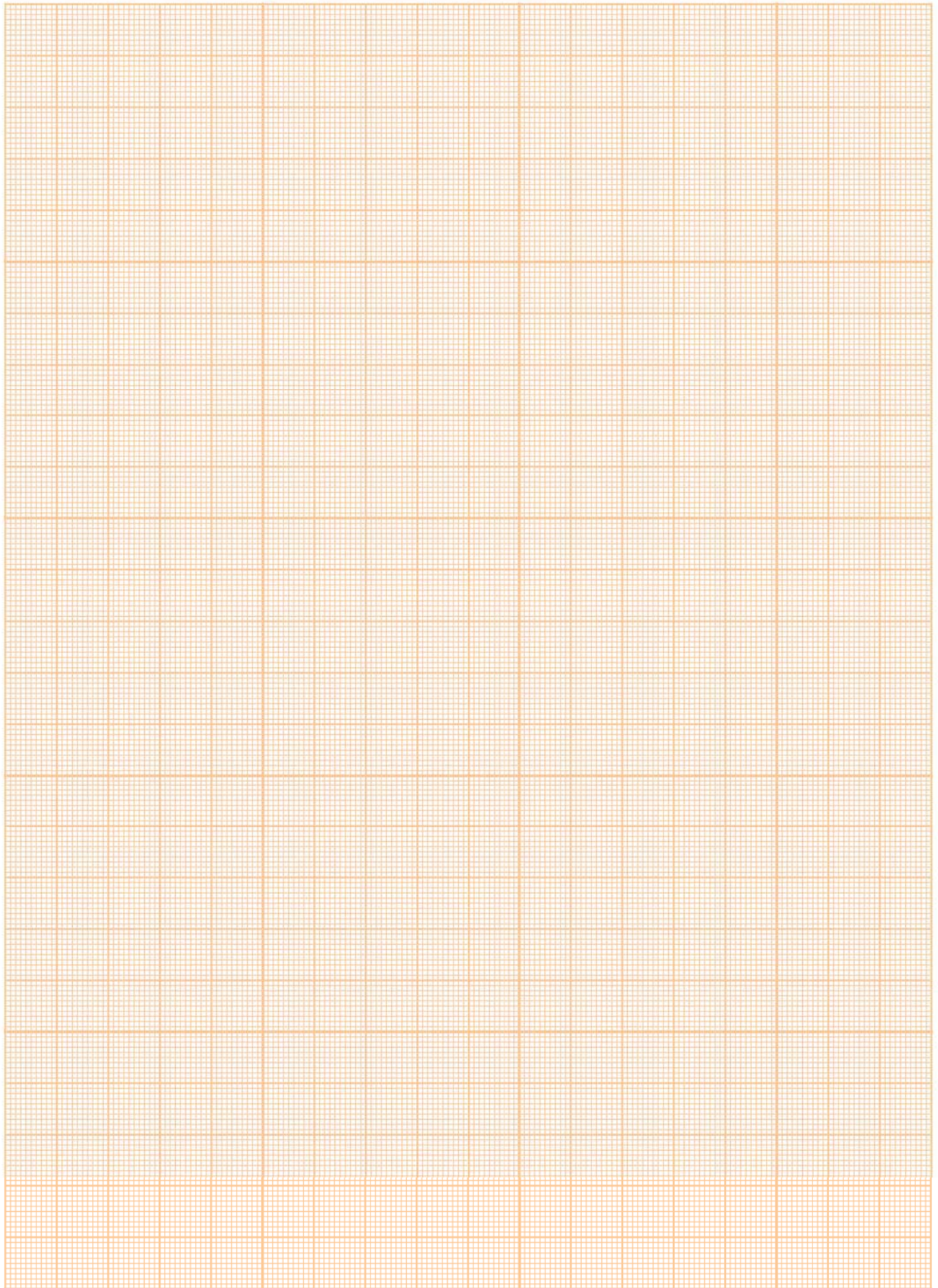
# A A-POT



EDP	G	P	L	l	d	a	ZΔ	Price
48145900	1/8	28	90	20	7	5,5	3	
48145000	1/4	19	100	22	11	9	3	
48145100	3/8	19	100	22	12	9	3	
48145200	1/2	14	125	25	16	12	3	
48145300	5/8	14	125	25	18	14,5	4	
48145400	3/4	14	140	28	20	16	4	
48145500	7/8	14	150	28	22	18	4	
48145600	1	11	160	30	25	20	4	

Applications - Anwendungen - Applicazioni - Applications - Applikation - Aplicaciones - Применение - Uygulama - Zastosowania												
C≤0.2%	0.25<C≤0.4%	C≥0.45%	SCM	25-35 HRC	35-45 HRC	45-52 HRC	52-62 HRC	SUS	SKD	SC	GG	GGG
◎ 15-60 m/min	◎ 15-60 m/min	◎ 10-60 m/min	◎ 8-30 m/min	○ 8-20 m/min				◎ 8-20 m/min				
Cu	BS	BsC	PB	Al	AC,ADC	MC	ZDC	Ti	Ni	Plast.	Vinyl	
○ 15-35 m/min		○ 15-30 m/min		○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 15-35 m/min	○ 5-10 m/min			○ 15-20 m/min	









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