



**Applications**  
**Applications**  
**Anwendungen**

**F02**

**Toolholders**  
**Porte-outils**  
**Klemmhalter**

**F03**

**Boring bars**  
**Barres d'alésage**  
**Bohrstangen**

**F07**

**Tool blocks**  
**Blocs porte-lames**  
**Trägerwerkzeuge**

**F08**

**Blades**  
**Lames**  
**Stechschwerter**

**F08**

**Top Notch Tools**  
**Outils Notch**  
**Notch-Werkzeuge**

**F10**


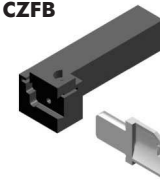
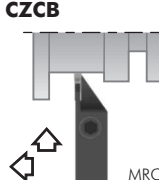
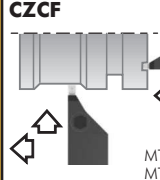
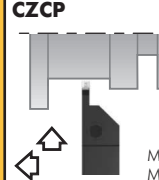
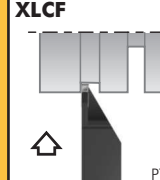
**Cutting cata**  
**Conditions de coupe**  
**Schnittbedingungen**

**F12**

Toolholders - Porte-outils - Klemmhalter

Inserts

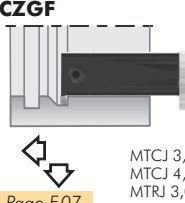
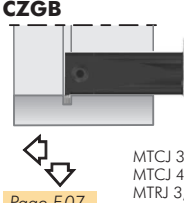
Turning

<p><b>CZGB</b></p>  <p>Page F.03 MTE 03/04 MRCN 03/04</p>	<p><b>CZFB</b></p>  <p>Page F.03 MTE 03/04 MRCN 03/04</p>	<p><b>CZCB</b></p>  <p>Page F.05 MRCN 1,6 ... MRCN 6,0</p>	<p><b>CZCF</b></p>  <p>Page F.05 MTC 3,0 MTC 4,0 MTR 3,0 MTR 3,8</p>	<p><b>CZCP</b></p>  <p>Page F.05 MTC 3,0 MTC 4,0 MTR 3,0 MTR 3,8</p>	<p><b>XLCF</b></p>  <p>Page F.06 PTNT 02 PTNT 03 PTNT 04</p>
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Automatic lathes

Boring bars - Barres d'alésage - Bohrstangen

Ceramic tools



<p><b>CZGF</b></p>  <p>Page F.07 MTCJ 3,0 MTCJ 4,0 MTRJ 3,0 MTRJ 3,8</p>	<p><b>CZGB</b></p>  <p>Page F.07 MTCJ 3,0 MTCJ 4,0 MTRJ 3,0 MTRJ 3,8</p>				
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Parting & grooving

Tool blocks - Blocs porte-lames - Trägerwerkzeuge

Threading

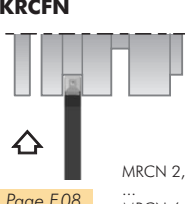
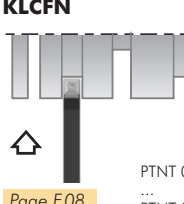
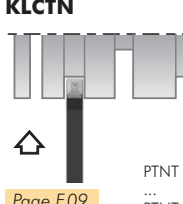
Drills

<p><b>KPTS</b></p>  <p>Page F.08</p>	<p><b>DPTS</b></p>  <p>Page F.08</p>				
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Blades- Lames - Stechschwerter

Cartridges

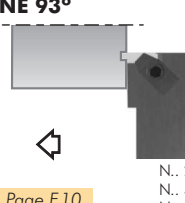
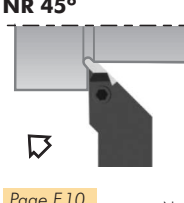
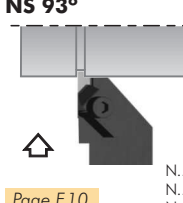
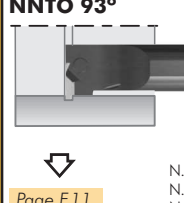
Brazed tools

<p><b>KRCFN</b></p>  <p>Page F.08 MRCN 2,2 ... MRCN 6,0</p>	<p><b>KLCFN</b></p>  <p>Page F.08 PTNT 02 ... PTNT 09</p>	<p><b>KLCTN</b></p>  <p>Page F.09 PTNT 02 ... PTNT 06</p>			
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Top Notch Tools - Outils Notch - Notch-Werkzeuge

Milling cutters

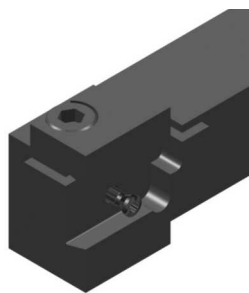
Solid carbide



<p><b>NE 93°</b></p>  <p>Page F.10 N.. 2 N.. 3 N.. 4</p>	<p><b>NR 45°</b></p>  <p>Page F.10 N.. 3</p>	<p><b>NS 93°</b></p>  <p>Page F.10 N.. 2 N.. 3 N.. 4</p>	<p><b>NNTO 93°</b></p>  <p>Page F.11 N.. 2 N.. 3 N.. 4</p>		
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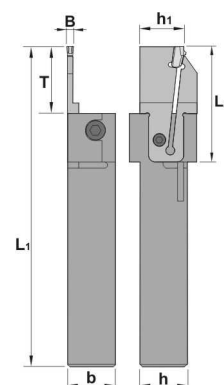
Boring heads

Arbors & adaptors

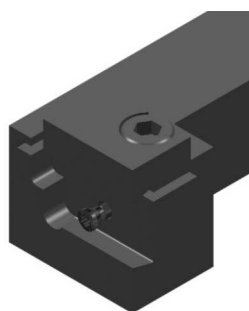
**CZGB**





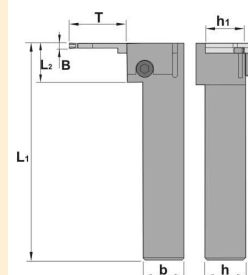
REF.	h	b	L1	L2	h1	B	T		
<b>CZGB R/L 2020 M34</b>	20	20	150	53	20	3-4	25-30	466	505
<b>CZGB R/L 2525 M34</b>	25	25	150	53	25	3-4	25-30	466	505
<b>CZGB R/L 3232 P34</b>	32	32	170	53	32	3-4	25-30	466	505



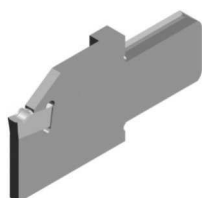
**CZFB**



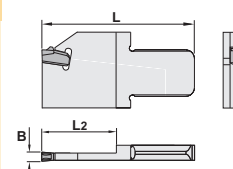
REF.	h	b	L1	L2	h1	B	T		
<b>CZFB R/L 2525 M34</b>	25	25	150	25	25	3-4	25-30	466	505
<b>CZFB R/L 3232 P34</b>	32	32	170	25	32	3-4	25-30	466	505



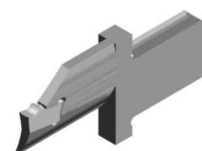
**CZXB 00**



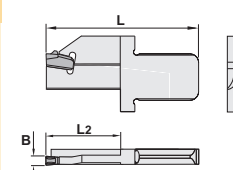
REF.	L	L2	B	Insert size
<b>CZXB R/L 00X03</b>	53	25	3	MRCN 03
<b>CZXB R/L 00X04</b>	53	25	4	MRCN 04



**CZXB 40-50**



REF.	L	L2	B	Ø Range	Insert size
<b>CZXB R/L 4050X03</b>	53	20	3	40-50	MTE 03
<b>CZXB R/L 4050X04</b>	53	20	4	40-50	MTE 04



Inserts

Turning

Automatic lathes

Ceramic tools

Parting & grooving

Threading

Drills

Cartridges

Brazed tools

Milling cutters

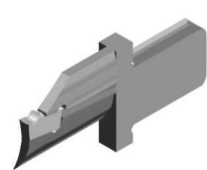
Solid carbide

Boring heads

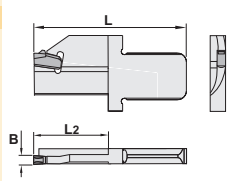
Arbors & adaptors

Inserts

**CZXB 50-65**



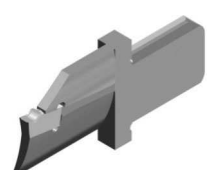
REF.	L	L2	B	Ø Range	Insert size
<b>CZXB R/L 5065X03</b>	53	20	3	50-65	MTE 03
<b>CZXB R/L 5065X04</b>	53	20	4	50-65	MTE 04



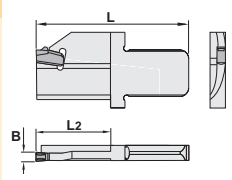
Turning

Automatic lathes

**CZXB 65-92**



REF.	L	L2	B	Ø Range	Insert size
<b>CZXB R/L 6592X03</b>	53	20	3	65-92	MTE 03
<b>CZXB R/L 6592X04</b>	53	20	4	65-92	MTE 04



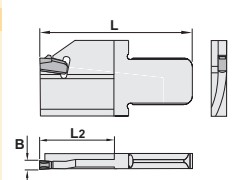
Ceramic tools

Parting & grooving

**CZXB 90-122**



REF.	L	L2	B	Ø Range	Insert size
<b>CZXB R/L 90122X03</b>	53	25	3	90-122	MTE 03
<b>CZXB R/L 90122X04</b>	53	25	4	90-122	MTE 04



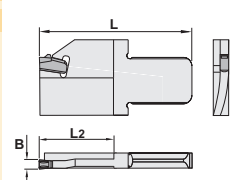
Threading

Drills

**CZXB 120-160**



REF.	L	L2	B	Ø Range	Insert size
<b>CZXB R/L 120160X03</b>	53	25	3	120-160	MTE 03
<b>CZXB R/L 120160X04</b>	53	25	4	120-160	MTE 04



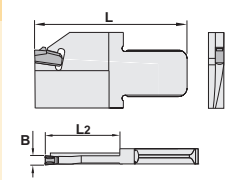
Cartridges

Brazed tools

**CZXB 150-500**



REF.	L	L2	B	Ø Range	Insert size
<b>CZXB R/L 150500X03</b>	53	25	3	150-500	MTE 03
<b>CZXB R/L 150500X04</b>	53	25	4	150-500	MTE 04



Milling cutters

Solid carbide

Boring heads

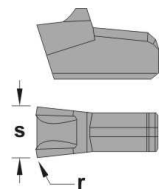


MTE



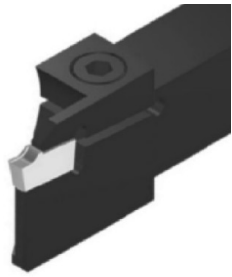
MRCN

REF.	s	r
<b>MTE/MRCN 03</b>	3,0	0,20
<b>MTE/MRCN 04</b>	4,0	0,20

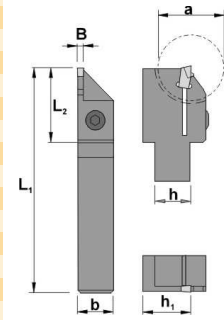


Arbors & adaptors

**CZCB**

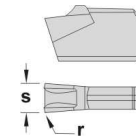


REF.	h	b	L1	L2	h1	B	α	MRCN		
CZCB R/L 1010 J01	10	10	110	25	21	1,6	22	1,6	107	504
CZCB R/L 1010 J02	10	10	110	25	21	2,2	22	2,2	107	504
CZCB R/L 1212 J01	12	12	110	25	21	1,6	22	1,6	107	504
CZCB R/L 1212 J02	12	12	110	25	21	2,2	22	2,2	107	504
CZCB R/L 1612 J02	16	12	110	29	21	2,2	32	2,2	199	505
CZCB R/L 1612 J03	16	12	110	29	21	3,0	32	3,0	199	505
CZCB R/L 2016 K03	20	16	125	35	30	3,0	42	3,0	109	505
CZCB R/L 2016 K04	20	16	125	35	30	4,0	42	4,0	109	505
CZCB R/L 2016 K05	20	16	125	35	30	5,0	42	5,0	109	505
CZCB R/L 2016 K06	20	16	125	35	30	6,0	42	6,0	109	505
CZCB R/L 2520 M03	25	20	150	50	30	3,0	60	3,0	109	505
CZCB R/L 2520 M04	25	20	150	50	30	4,0	60	4,0	109	505
CZCB R/L 2520 M05	25	20	150	50	30	5,0	60	5,0	109	505
CZCB R/L 2520 M06	25	20	150	50	30	6,0	60	6,0	109	505

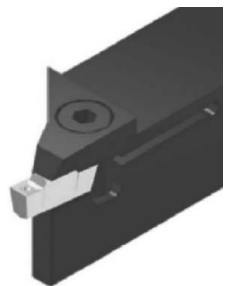


REF.	s	r
MRCN 1,6	1,6	0,15
MRCN 2,2	2,2	0,20
MRCN 3,0	3,0	0,20
MRCN 4,0	4,0	0,20
MRCN 5,0	5,0	0,30
MRCN 6,0	6,0	0,40

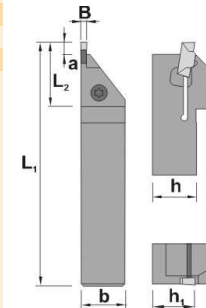
For more information see page: A.67



**CZCF**

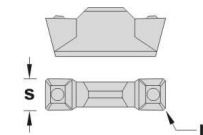


REF.	h	b	L1	L2	B	α	MT.		
CZCF R/L 1616 H34	16	16	100	24	3-4	4,5	3,0-4,0	199	505
CZCF R/L 2020 K34	20	20	125	24	3-4	4,5	3,0-4,0	109	505
CZCF R/L 2525 M34	25	25	150	24	3-4	4,5	3,0-4,0	109	505

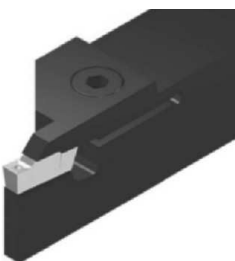


REF.	s	r
MT. 3,0	3,0	0,15
MT. 4,0	4,0	0,20
MT. 3,0	3,0	1,50
MT. 3,8	3,8	1,90

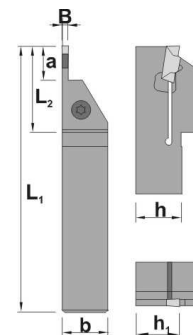
For more information see page: A.67



**CZCP**

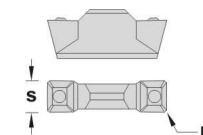


REF.	h	b	L1	L2	B	α	MT.		
CZCP R/L 1616 H34	16	16	100	30	3-4	12	3,0-4,0	199	505
CZCP R/L 2020 K34	20	20	125	30	3-4	12	3,0-4,0	109	505
CZCP R/L 2525 M34	25	25	150	30	3-4	12	3,0-4,0	109	505



REF.	s	r
MT. 3,0	3,0	0,15
MT. 4,0	4,0	0,20
MT. 3,0	3,0	1,50
MT. 3,8	3,8	1,90

For more information see page: A.67



Inserts

Turning

Automatic lathes

Ceramic tools

Parting & grooving

Threading

Drills

Cartridges

Brazed tools

Milling cutters

Solid carbide

Boring heads

Arbors & adaptors

Inserts

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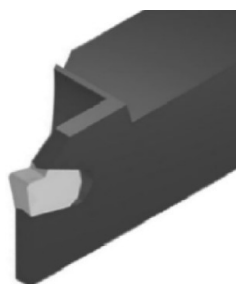
Milling cutters

Solid carbide

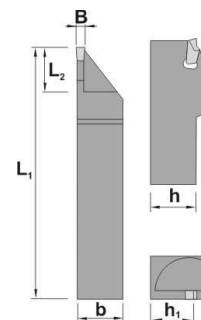
Boring heads

Arbors & adaptors

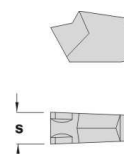
**XLCF**



REF.	h=h1	b	L1	L2	B	PTNT	
<b>XLCF R/L 1010 J02</b>	10	10	110	18	2	02	532
<b>XLCF R/L 1210 J02</b>	12	10	110	18	2	02	532
<b>XLCF R/L 1212 J02</b>	12	12	110	18	2	02	532
<b>XLCF R/L 1612 J03</b>	16	12	110	20	3	03	532
<b>XLCF R/L 1612 J04</b>	16	12	110	20	4	04	532
<b>XLCF R/L 2012 K03</b>	20	12	125	20	3	03	532
<b>XLCF R/L 2012 K04</b>	20	12	125	20	4	04	532
<b>XLCF R/L 2020 K03</b>	20	20	125	20	3	03	532
<b>XLCF R/L 2020 K04</b>	20	20	125	20	4	04	532
<b>XLCF R/L 2525 M03</b>	25	25	150	20	3	03	532
<b>XLCF R/L 2525 M04</b>	25	25	150	20	4	04	532



REF.	s
<b>PTNT 02</b>	2,10
<b>PTNT 03</b>	3,10
<b>PTNT 04</b>	4,10

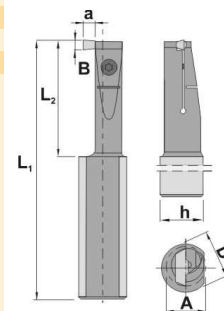


For more information see page: A.68

**CZGF**



REF.	D	A	h	L1	L2	B	$\alpha$	MT..				
<b>S20R CZGF R/L 34</b>	20	16,5	18	200	40	3-4	5	3,0-4,0	150	520	-	-
<b>S25R CZGF R/L 34</b>	25	25,0	23	200	50	3-4	5	3,0-4,0	-	-	179	504
<b>S32S CZGF R/L 34</b>	32	30,0	30	250	60	3-4	5	3,0-4,0	-	-	179	504



Inserts

Turning

Automatic lathes

Ceramic tools

Parting & grooving

Threading

Drills

Cartridges

Brazed tools

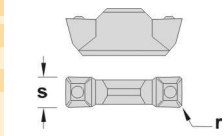
Milling cutters

Solid carbide

Boring heads

Arbors & adaptors

REF.	s	r
<b>MT.. 3,0</b>	3,0	0,15
<b>MT.. 4,0</b>	4,0	0,20
<b>MT.. 3,0</b>	3,0	1,50
<b>MT.. 3,8</b>	3,8	1,90

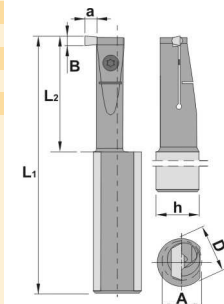


For more information see page: A.67,68

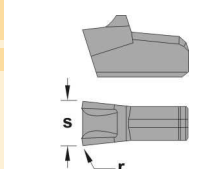
**CZGB**



REF.	D	A	h	L1	B	$\alpha$	MCRN				
<b>S16M CZGB R/L 03</b>	16	16	15	150	3	4	3,0	150	520	-	-
<b>S20R CZGB R/L 03</b>	20	20	18	200	3	6	3,0	150	520	-	-
<b>S25S CZGB R/L 03</b>	25	25	23	250	3	8	3,0	-	-	179	504
<b>S20R CZGB R/L 04</b>	20	20	18	200	4	6	4,0	-	-	179	504
<b>S25S CZGB R/L 04</b>	25	25	23	250	4	8	4,0	-	-	179	504



REF.	s	r
<b>MRCN 3,0</b>	3,0	0,20
<b>MRCN 4,0</b>	4,0	0,20



For more information see page: A.67

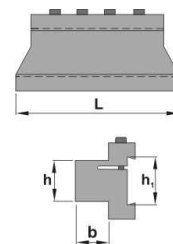


Inserts

**KPTS**



REF.	h <sub>1</sub>	L	h	b		
KPTS 1916	19	76	16	16	100	504
KPTS 2616	26	87	16	16	101	505
KPTS 2620	26	87	20	20	101	505
KPTS 2625	26	87	25	25	101	505
KPTS 3220	32	100	20	20	101	505
KPTS 3225	32	110	25	25	101	505
KPTS 3232	32	120	32	32	101	505
KPTS 5250	52	135	50	50	102	506



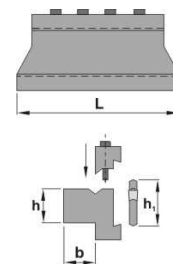
Turning

Automatic lathes

**DPTS**



REF.	h <sub>1</sub>	L	h	b			
DPTS 1916	19	76	16	16	100	292	504
DPTS 2620	26	87	20	20	101	295	505
DPTS 2625	26	87	25	25	101	295	505
DPTS 3220	32	100	20	20	101	296	505
DPTS 3225	32	110	25	25	101	297	505
DPTS 3232	32	120	32	32	101	298	505
DPTS 5250	52	135	50	50	102	299	506



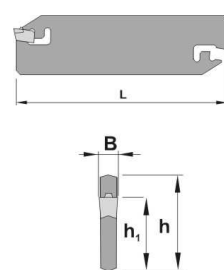
Ceramic tools

Parting & grooving

**KRCFN**

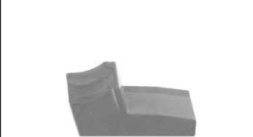


REF.	h	L	h <sub>1</sub>	B	MRCN	
KRCF N 1901 X02	19	86	15,4	2,2	2,2	533
KRCF N 2601 J02	26	110	21,4	2,2	2,2	533
KRCF N 2602 J03	26	110	21,4	3,0	3,0	533
KRCF N 2603 J04	26	110	21,4	4,0	4,0	533
KRCF N 2604 J05	26	110	21,4	5,0	5,0	533
KRCF N 2605 J06	26	110	21,4	6,0	6,0	533
KRCF N 3202 M03	32	150	25,0	3,0	3,0	533
KRCF N 3203 M04	32	150	25,0	4,0	4,0	533
KRCF N 3204 M05	32	150	25,0	5,0	5,0	533
KRCF N 3205 M06	32	150	25,0	6,0	6,0	533

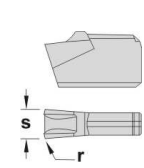


Threading

Drills



REF.	s	r
MRCN 2,2	2,2	0,2
MRCN 3,0	3,0	0,2
MRCN 4,0	4,0	0,2
MRCN 5,0	5,0	0,3
MRCN 6,0	6,0	0,4

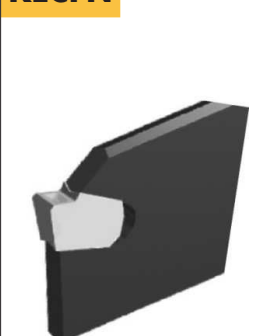


For more information see page: A.67

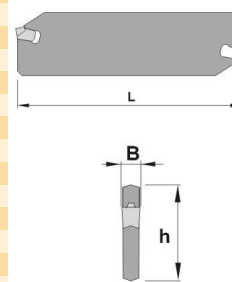
Cartridges

Brazed tools

**KLCFN**



REF.	h	L	B	PTNT	
KLCF N 1901 X02	19	86	2,1	02	532
KLCF N 2601 J02	26	110	2,1	02	532
KLCF N 2602 J03	26	110	3,1	03	532
KLCF N 2603 J04	26	110	4,1	04	532
KLCF N 2604 J05	26	110	5,1	05	532
KLCF N 2605 J06	26	110	6,1	06	532
KLCF N 3201 M02	32	150	2,1	02	532
KLCF N 3202 M03	32	150	3,1	03	532
KLCF N 3203 M04	32	150	4,1	04	532
KLCF N 3204 M05	32	150	5,1	05	532
KLCF N 3205 M06	32	150	6,1	06	532
KLCF N 3207 M08	32	150	8,1	08	532
KLCF N 3208 M09	32	150	9,1	09	532
KLCF N 5207 X08	53	190	8,1	08	532
KLCF N 5208 X09	53	190	9,1	09	532
KLCF N 5307 X08	53	260	8,1	08	532
KLCF N 5308 X09	53	260	9,1	09	532



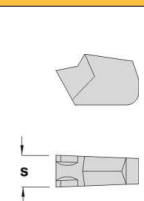
Milling cutters

Solid carbide

Boring heads



REF.	s
PTNT 02	2,10
PTNT 03	3,10
PTNT 04	4,10
PTNT 05	5,10
PTNT 06	6,10
PTNT 08	8,10
PTNT 09	9,10



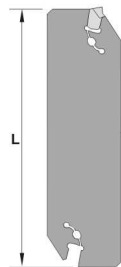
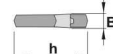
For more information see page: A.68

Arbors & adaptors

**KLCTN**



REF.	h	L	B	PTNT	
KLCT N 1901 X02	19	86	2,1	02	532
KLCT N 2601 J02	26	110	2,1	02	532
KLCT N 2602 J03	26	110	3,1	03	532
KLCT N 2603 J04	26	110	4,1	04	532
KLCT N 2604 J05	26	110	5,1	05	532
KLCT N 2605 J06	26	110	6,1	06	532
KLCT N 3201 M02	32	150	2,1	02	532
KLCT N 3202 M03	32	150	3,1	03	532
KLCT N 3203 M04	32	150	4,1	04	532
KLCT N 3204 M05	32	150	5,1	05	532
KLCT N 3205 M06	32	150	6,1	06	532



Inserts

Turning

Automatic lathes

Ceramic tools

Parting & grooving

Threading

Drills

Cartridges

Brazed tools

Milling cutters

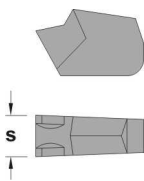
Solid carbide

Boring heads

Arbors & adaptors



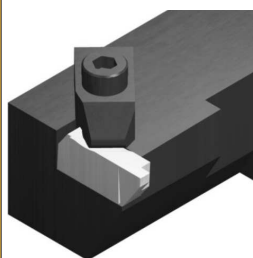
REF.	s
PTNT 02	2,10
PTNT 03	3,10
PTNT 04	4,10
PTNT 05	5,10
PTNT 06	6,10



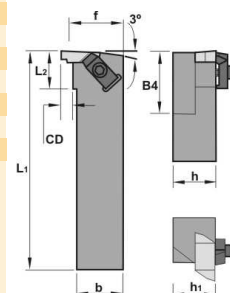
For more information see page: A.68

Inserts

**NE 93°**



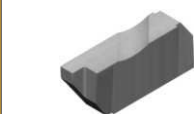
REF.	h-h1	b	L1	L2	f	N..			
NE R/L 1616 H02	16	16	100	25,40	20	2	TF-75	TF-74	474
NE R/L 2020 K02	20	20	125	25,40	25	2	TF-75	TF-74	474
NE R/L 2525 M02	25	25	150	25,40	32	2	TF-75	TF-74	474
NE R/L 2525 M03	25	25	150	50,80	32	3	TF-73	TF-72	475
NE R/L 3225 P03	32	25	170	50,80	32	3	TF-73	TF-72	475
NE R/L 2525 M04	25	25	150	50,80	35	4	TF-73	TF-72	475
NE R/L 3225 P04	32	25	170	50,80	35	4	TF-73	TF-72	475
NE R/L 3232 P04	32	32	170	50,80	40	4	TF-73	TF-72	475



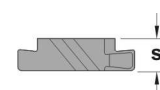
Turning

Automatic lathes

Ceramic tools



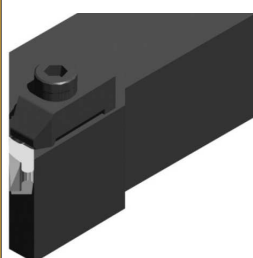
REF.	D	A	T
N.. 2	4,76	5,56	3,81
N.. 3	9,53	8,74	4,95
N.. 4	9,53	11,51	6,48



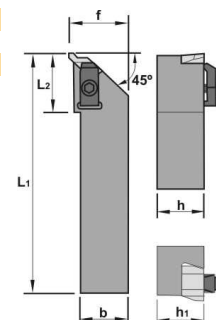
For more information see page: A.68,69

Parting & grooving

**NR 45°**



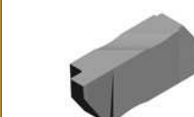
REF.	h-h1	b	L1	L2	f	N..			
NR R/L 2020 K03	20	20	125	32	25	3	TF-73	TF-72	475
NR R/L 2525 M03	25	25	150	32	32	3	TF-73	TF-72	475
NR R/L 3225 P03	32	25	170	32	32	3	TF-73	TF-72	475



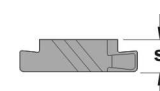
Threading

Drills

Cartridges



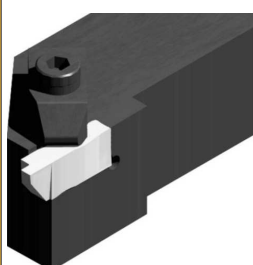
REF.	D	A	T
N.. 3	9,53	8,74	4,95



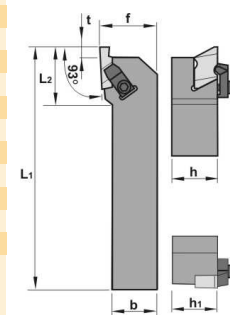
For more information see page: A.68,69

Brazed tools

**NS 93°**



REF.	h-h1	b	L1	L2	f	N..					
NS R/L 1010 E02	10	10	70	6,35	14	2	TF-74	TF-75	-	-	474
NS R/L 1212 F02	12	12	80	6,35	16	2	TF-74	TF-75	-	-	474
NS R/L 1616 H02	16	16	100	6,35	20	2	TF-74	TF-75	-	-	474
NS R/L 2020 K02	20	20	125	6,35	25	2	TF-74	TF-75	-	-	474
NS R/L 2525 M02	25	25	150	6,35	32	2	TF-74	TF-75	-	-	474
NS R/L 2020 K03	20	20	125	9,65	25	3	TF-72	TF-73	-	-	474
NS R/L 2525 M03	25	25	150	9,65	32	3	TF-72	TF-73	-	-	474
NS R/L 3225 P03	32	25	170	9,65	32	3	TF-72	TF-73	-	-	474
NS R/L 3232 P03	32	32	170	9,65	40	3	TF-72	TF-73	-	-	474
NS R/L 2525 M04	25	25	150	9,65	32	4	TF-72	TF-73	321	185	475
NS R/L 3225 P04	32	25	170	9,65	32	4	TF-72	TF-73	321	185	475
NS R/L 3232 P04	32	32	170	9,65	40	4	TF-72	TF-73	321	185	475

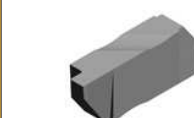


Milling cutters

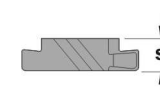
Solid carbide

Boring heads

Arbors & adaptors

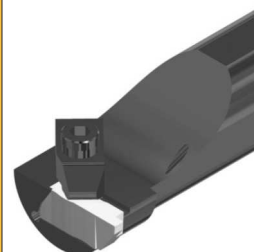





REF.	D	A	T
N.. 2	4,76	5,56	3,81
N.. 3	9,53	8,74	4,95
N.. 4	9,53	11,51	6,48

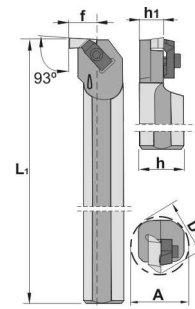


For more information see page: A.68,69

**NNTO 93°**



REF.	D	h	h1	L1	f	A	N..			
<b>A12M-NNTO R/L 02</b>	12	11	5,5	150	11	18,5	2	TF-147	TF-146	474
<b>A16M-NNTO R/L 02</b>	16	15	7,5	150	11	22,0	2	TF-75	TF-74	474
<b>A20Q-NNTO R/L 02</b>	20	18	9,0	180	13	26,0	2	TF-75	TF-74	474
<b>A25R-NNTO R/L 02</b>	25	23	11,5	200	17	34,0	2	TF-75	TF-74	474
<b>A25R-NNTO R/L 03</b>	25	23	11,5	200	17	34,0	3	TF-73	TF-72	475
<b>A32S-NNTO R/L 03</b>	32	30	15,0	250	22	44,0	3	TF-73	TF-72	475
<b>A40T-NNTO R/L 03</b>	40	37	18,5	300	27	54,0	3	TF-73	TF-72	475
<b>A40T-NNTO R/L 04</b>	40	37	18,5	300	27	54,0	4	TF-73	TF-72	475
<b>A50U-NNTO R/L 04</b>	50	47	23,5	350	35	70,0	4	TF-73	TF-72	475



Inserts

Turning

Automatic lathes

Ceramic tools

Parting & grooving

Threading

Drills

Cartridges

Brazed tools

Milling cutters

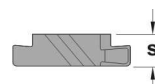
Solid carbide

Boring heads

Arbors & adaptors



REF.	D	A	T
<b>N.. 2</b>	4,76	5,56	3,81
<b>N.. 3</b>	9,53	8,74	4,95
<b>N.. 4</b>	9,53	11,51	6,48



For more information see page: A.68,69

Inserts

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Brazed tools

Milling cutters

Solid carbide

Boring heads

Arbors & adaptors

## Nominal cutting speed for parting

Material	HB	Condition	Basic qualities			Specific cutting force N/mm <sup>2</sup>	
			TIC30	P25K	K15K		
			Cutting speed m/min.				
<b>Unalloyed steel</b>	P 125 150 200	C=0.15%	200-150	160-120		1900	
		C=0.35%	190-140	150-110		2100	
		C=0.60%	170-120	130-90		2250	
<b>Low alloyed steel</b>	180	Annealed	180-130	140-100		2100	
	275	Hardened	160-110	120-80		2600	
	300	Hardened	150-100	110-70		2700	
	350	Hardened	140-90	90-60		2850	
<b>High alloyed steel</b>	200	Annealed	110-90	70-60		2600	
	325	Hardened	70-50	45-30		3900	
<b>Stainless steel</b>	200	Martensitic/Ferritic	170-120	130-90		2300	
<b>Steel</b>	180	Unalloyed	130-90	100-60		2000	
	200	Low alloyed	115-75	90-50		2500	
	225	High alloyed	100-60	80-40		2700	
<b>Stainless steel annealed</b>	M 180		170-120	130-90	100-60	2450	
<b>Heat resistant alloys</b>	200	Annealed			50-30	3000	
	280	Aged				40-20	3050
	250	Annealed	Ni or Co base		20-10	3500	
	350	Aged				20-10	4150
	320	Cast				20-10	4150
<b>Titanium alloys</b>	400	Ti				1520	
	950	Cast $\alpha$ , almost $\alpha$ and $\alpha + \beta$				1675	
	1050	Aged cast $\alpha + \beta$				1690	
<b>Hardened steel</b>	K 220 250	Hardened steel				4500	
		Manganese steel 12%					
<b>Malleable cast iron</b>	130	Ferritic	140-110		100-80	1100	
	230	Pearlitic	100-70		70-50	1100	
<b>Cast iron</b>	180	Low tensile strength	110-85		80-60	1100	
	260	High tensile strength	100-70		70-50	1500	
<b>Nodular SG iron</b>	160	Ferritic	100-70		70-50	1100	
	250	Pearlitic	85-60		60-40	1800	
<b>Aluminium alloys</b>	60	Non heat treatable	1500	1500	1000	500	
	100	Heat treatable	500	500	420	800	
<b>Aluminium alloys (cast)</b>	75	Non heat treatable	1500	1500	1000	750	
	90	Heat treatable	750	750	650	900	
<b>Bronze-Brass alloys</b>	110	Lead alloys, Pb > 1%	300	300	300	700	
	90	Brass, red brass	200	200	200	750	
	100	Bronze and lead-free copper	150	150	150	1750	

## Nominal cutting speed for grooving

Material	HB	Condition	External			Internal / Axial			Specific cutting force N/mm <sup>2</sup>
			TIC30	P25K	K15K	TIC30	P25K	K15K	
			Cutting speed m/min.						
<b>Unalloyed steel</b> <b>P</b>	125	C=0.15%	200-150	160-120		140-105	110-85		1900
	150	C=0.35%	190-140	150-110		135-100	105-80		2100
	200	C=0.60%	170-120	130-90		120-85	90-60		2250
<b>Low alloyed steel</b>	180	Annealed	180-130	140-100		125-90	100-70		2100
	275	Hardened	160-110	120-80		110-80	85-55		2600
	300	Hardened	150-100	110-70		105-70	80-50		2700
	350	Hardened	140-90	90-60		100-60	60-45		2850
<b>High alloyed steel</b>	200	Annealed	110-90	70-60		80-60	50-45		2600
	325	Hardened	70-50	45-30		80-35	32-20		3900
<b>Stainless steel</b>	200	Martensitic/Ferritic	170-120	130-90		120-85	90-60		2300
<b>Steel</b>	180	Unalloyed	130-90	100-60		90-60	70-45		2000
	200	Low alloyed	115-75	90-50		80-50	60-35		2500
	225	High alloyed	100-60	80-40		70-45	55-30		2700
<b>Stainless steel annealed</b> <b>M</b>	180		170-120	130-90	100-60	120-85	90-60	70-45	2450
<b>Heat resistant alloys</b>	200	Annealed			50-30			50-30	3000
	280	Aged			40-20			40-20	3050
	250	Annealed			30-20			30-20	3500
	350	Aged			20-10			20-10	4150
	320	Cast			20-10			20-10	4150
<b>Titanium alloys</b>	400	Ti			175				1520
	950	Cast $\alpha$ , almost $\alpha$ and $\alpha + \beta$			72				1675
	1050	Aged cast $\alpha + \beta$			65				1690
<b>Hardened steel</b> <b>K</b>	220	Hardened steel							4500
	250	Manganese steel 12%							
<b>Malleable cast iron</b>	130	Ferritic	140-110		100-80	100-80		100-80	1100
	230	Pearlitic	100-70		70-50	70-50		70-50	1100
<b>Cast iron</b>	180	Low tensile strength	110-85		80-60	80-60		80-60	1100
	260	High tensile strength	100-70		70-50	70-50		70-50	1500
<b>Nodular SG iron</b>	160	Ferritic	100-70		70-50	70-50		70-50	1100
	250	Pearlitic	85-60		60-40	60-45		60-40	1800
<b>Aluminium alloys</b>	60	Non heat treatable	1500	1500	1000	1050	1050	700	500
	100	Heat treatable	500	500	420	350	350	300	800
<b>Aluminium alloys (cast)</b>	75	Non heat treatable	1500	1500	1000	1050	1050	700	750
	90	Heat treatable	750	750	650	525	525	460	900
<b>Bronze-Brass alloys</b>	110	Lead alloys, Pb > 1%	300	300	300	210	210	210	700
	90	Brass, red brass	200	200	200	140	140	140	750
	100	Bronze and lead-free copper	150	150	150	105	105	105	1750

Inserts

Turning

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Parting &amp; grooving

Threading

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Arbors &amp; adaptors

Inserts

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Automatic lathes

Ceramic tools

Parting & grooving

Threading

Drills

Cartridges

Brazed tools

Milling cutters

Solid carbide

Boring heads

Arbors & adaptors

## Nominal cutting speed for profiling

Material	HB	Condition	Basic qualities			Specific cutting force N/mm <sup>2</sup>
			TIC30	P25K	K15K	
			Cutting speed m/min.			
<b>Unalloyed steel</b> <b>P</b>	125	C=0.15%	200	160		1900
	150	C=0.35%	190	150		2100
	200	C=0.60%	170	130		2250
<b>Low alloyed steel</b>	180	Annealed	180	140		2100
	275	Hardened	160	120		2600
	300	Hardened	150	110		2700
	350	Hardened	140	90		2850
<b>High alloyed steel</b>	200	Annealed	130	100		2600
	325	Hardened	100	60		3900
<b>Stainless steel</b>	200	Martensitic/Ferritic	170	130		2300
<b>Steel</b>	180	Unalloyed	130	100		2000
	200	Low alloyed	115	90		2500
	225	High alloyed	100	70		2700
<b>Stainless steel annealed</b> <b>M</b>	180		170	120	100	2450
<b>Heat resistant alloys</b>	200	Annealed		60	3000	
	280	Aged				50
	250	Annealed	Ni or Co base	30	3500	
	350	Aged		20	4150	
	320	Cast		20	4150	
<b>Titanium alloys</b>	400	Ti		175	1520	
	950	Cast $\alpha$ , almost $\alpha$ and $\alpha + \beta$		72	1675	
	1050	Aged cast $\alpha + \beta$		65	1690	
<b>Hardened steel</b> <b>K</b>	220	Hardened steel				4500
	250	Manganese steel 12%				
<b>Malleable cast iron</b>	130	Ferritic	140		100	1100
	230	Pearlitic	110		70	1100
<b>Cast iron</b>	180	Low tensile strength	110		100	1100
	260	High tensile strength	100		70	1500
<b>Nodular SG iron</b>	160	Ferritic	100		100	1100
	250	Pearlitic	85		70	1800
<b>Aluminium alloys</b>	60	Non heat treatable	1500	1500	1000	500
	100	Heat treatable	500	500	420	800
<b>Aluminium alloys (cast)</b>	75	Non heat treatable	1500	1500	450	750
	90	Heat treatable	750	750	300	900
<b>Bronze-Brass alloys</b>	110	Lead alloys, Pb > 1%	300	300	300	700
	90	Brass, red brass	200	200	200	750
	100	Bronze and lead-free copper	150	150	150	1750

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Inserts

Turning

Automatic lathes

Ceramic tools

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Threading

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