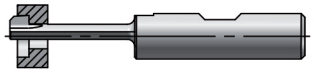
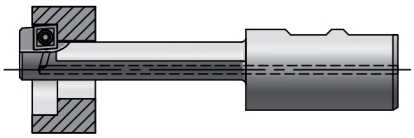
RBSM	RBSM	RBU	RBU ab / from Ø18	RFS
max. 1,9 x d_1	TiAlN	max. 1,8 x d_1		

GG(G)	ALU	NE	ST(AHL)

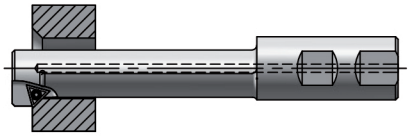
Rückwärtsbohrstange RBS-Micro RBSM
Reverse boring bar RBS-Micro RBSM



Rückwärtsbohrstange RBU
Reverse boring bar RBU



Rückwärtsfasstange RFS
Reverse chamfering bar RFS

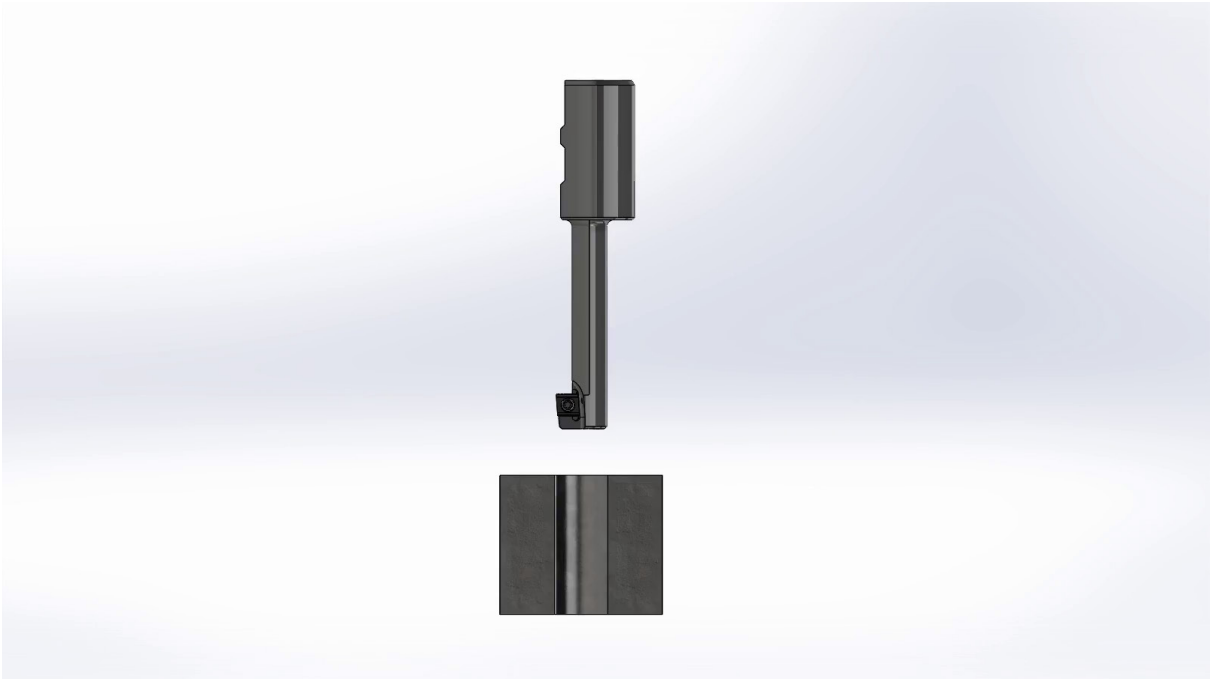


Vorteile:

- Plansenken, Aufbohren oder Anfasen schwer zugänglicher Stellen
- Für Senkungen für Zylinderkopfschrauben von M3 bis M48 in allen gängigen Werkstoffen
- Senkdurchmesser bis zum 1,9-fachen Bohrungsdurchmesser
- Hochfester, oberflächenbehandelter und FEM-optimierter RBU - und RFS-Grundkörper
- RBS-Micro aus Vollhartmetall mit max. Steifigkeit durch hohes E-Modul
- Innenkühlung bei RFS und RBU ab d=18
- Große Auswahl verschiedener PKD-, HM- und HSS-Wendeschneidplatten
- Viele Sonderausführungen auch für größere Schnittbreiten in Schwermetall- oder VHM-Ausführung, verstellbar für enge Passungen und für Radien, Rillen und mehrstufig kurzfristig lieferbar; bitte Fragebogen hier ausfüllen.

Advantages:

- For spotfacing, chamfering and deep counterboring of areas with difficult access
- For screw head counterbores M3 to M48 in all common materials
- For counterboring up to 1.9 times the bore diameter
- RBU and RFS are very stable and rigid with surface treatment and FEM-optimized geometry
- Large E-modulus of solid-carbide RBS-Micro ensure max. stability
- Internal coolant for RFS and RBU starting from d=18
- Wide choice of different PCD-, carbide- and HSS-indexable inserts
- For requests of specials e. g. for larger cutting width, in solid carbide or heavy metal, adjustable, for radiuses, grooves and chamfers please use the Technical Questionaire here.



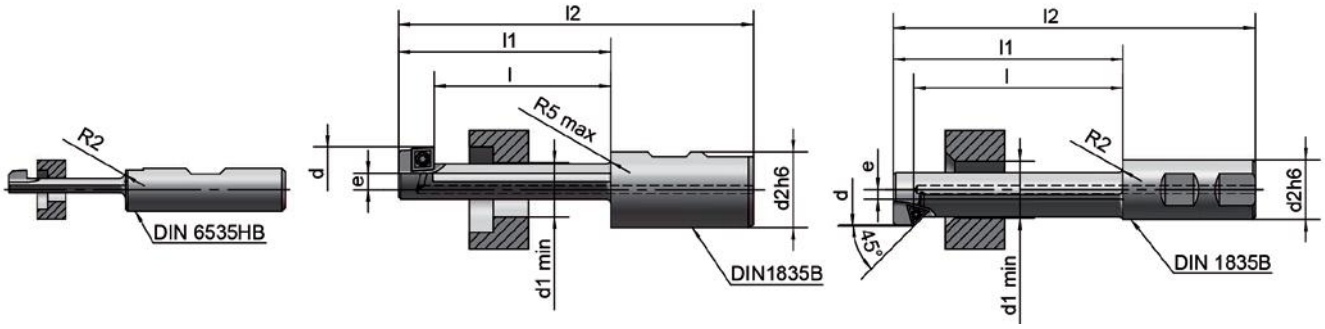
H. BILZ

RBSM	RBSM	RBU	RBU ab / from Ø18	RFS
d = 6,5 - 15	TiAlN	d = 15 - 76		
GG(G)	ALU	NE		ST(AHL)

Rückwärtsbohrstange RBS-Micro RBSM
Reverse boring bar RBS-Micro RBSM

Rückwärtsbohrstange RBU
Reverse boring bar RBU

Rückwärtsfasstange RFS
Reverse chamfering bar RFS



d	d_{1min}	l	d_2	e	l_1	l_2	Best.-Nr.* Ord.-No
RBS-Micro RBSM (Vollhartmetall, links drehend) **RBS-Micro RBSM (solid carbide, counter clockwise)**							
6,5	3,4	12	8	1,7	15,4	51,4	RBSM 34065
8	4,5	19	10	1,9	23	63	RBSM 45080
10	5,5	23	12	2,4	28	73	RBSM 55100
11	6,6	28	12	2,4	33	78	RBSM 66110
15	9,0	35	16	3,2	42	90	RBSM 90150

Eigene Maße benötigt? Jetzt hier konfigurieren / configure your own dimensions

									**	**
RBU (WSP-Ausführung, links drehend) **RBU (indexable insert version, counter clockwise)**										
15	9,0	35	20	3,2	45	95	RBU150090035	TX18045	TX 206	04
18	10,5	40	20	4,0	52	102	RBU180105040	TX 25050	TX 108-25	06
20	13,0	45	20	3,7	57	107	RBU200130045	TX 25050	TX 108-25	06
24	15,0	55	25	4,7	67	123	RBU240150055	TX 25050	TX 108-25	06
26	17,0	55	25	4,7	67	123	RBU260170055	TX 25050	TX 108-25	06
30	19,0	65	25	6,0	77	133	RBU300190065	TX 25050	TX 108-25	06
33	21,0	70	32	6,5	85	145	RBU330210070	TX 35075	TX 115-35	09
36	23,0	75	32	7,0	90	150	RBU360230075	TX 35075	TX 115-35	09
40	25,0	85	32	8,0	100	160	RBU400250085	TX 35075	TX 115-35	09
43	30,0	90	32	7,0	115	175	RBU430300090	TX 35075	TX 115-35	09
46	30,0	90	32	8,5	115	175	RBU460300090	TX 35075	TX 115-35	09
48	33,0	105	32	8,0	130	190	RBU480330105	TX 35075	TX 115-35	09
50	33,0	105	32	9,0	130	190	RBU500330105	TX 35075	TX 115-35	09

									**	**
RFS (WSP-Ausführung, rechts drehend) **RFS (indexable insert version, clockwise)**										
15	10,0	42	16	2,7	48	96	RFS 01 1015	TX 20048	TX 206	06
20	14,0	48	20	3,2	53	103	RFS 01 1420	TX 20048	TX 206	06
23	17,5	57	25	3,0	67	123	RFS 01 1723	TX 22060	TX 207	09
27	21,0	78	25	3,5	87	143	RFS 01 2127	TX 22060	TX 207	09
31	24,0	88	25	4,0	97	153	RFS 01 2431	TX 22060	TX 207	09

* inkl. / incl.

** separat bestellen / order separately

Wendeschneidplatten für RBU und RFS / Indexable inserts for RBU and RFS

RBU			Best.-Nr. ... Ord.-No. ...	Sorte / Grade							
Präzisionsgeschliffene Wendeschneidplatten Precision ground Indexable Inserts		06	MCEX060204FRH...	AK1	K1	K9		P5	P9	S6	
		09	MCEX090304FRH...	AK1	K1	K9		P5	P9	S6	
		12	MCEX120404FRH...	AK1	K1	K9		P5	P9	S6	
		16	MCEX160604FRH...	AK1	K1	K9		P5	P9	S6	
Präzisions-PKD Wechselplatten Precision PCD-Inserts		06	MCEW060204FR5...								D1
		09	MCEW090304FR5...								D1
		12	MCEW120404FR5...								D1
ISO Wendeschneidplatten ISO-Indexable Inserts		04	CPGT04T1043...				P2	P5	P9		
		06	MCMT060204EN...		K1		P2	P5	P9		
		09	MCMT090304EN...		K1	K9	P2	P5	P9		
		12	MCMT120404EN...		K1	K9	P2	P5	P9		
		16	MCMT160604EN...		K1		P2				
RFS											
Präzisionsgeschliffene Wendeschneidplatten Precision ground Indexable Inserts											
		06	TCEW060104FN...		K1	K9					
		09	TCEW090204FN...		K1	K9					
Präzisionsgeschliffene Wendeschneidplatten Precision ground Indexable Inserts											
		06	TCEX060104FL...	AK1	K1	K9					
		09	TCEX090204FL...	AK1	K1				P9	S6	
ISO Wendeschneidplatten ISO-Indexable Inserts											
		09	TCMT090204EN...			K9					

Schneidstoffsorten und Anwendungsbereiche / Grades and application areas			Stahl Steel	Nichtrostender Stahl Stainless steel	Gusseisen Cast iron	Nichteisenmetalle Nonferrous metals	Nickelbasis- und Titanlegierung Nickel- and titanium-alloys	Harte Werkstoffe Hard materials
Sorte Grade	DIN-ISO 513	Schneidstoff Cutting material	P	M	K	N	S	H
D1	DP - N20	PKD /PCD				+		
AK1	HF - N20	HM / Carbide			o	+	o	
KHX+	HC - K05	HM- / Carbide-AlTiN (6µm)		o	++			+
P2	HF - P30	HM / Carbide	+					
P5	HC - K40/P40	HM / Carbide-TiN	+	+	o			o
P9	HC - P10	HM- / Carbide-TiAlN	+	+	o		+	
PHX+	HC - P05	HM- / Carbide-AlTiN (6µm)	++	++	o			
S6		HSSE-TiN	+	+	o			

+ = **Hauptanwendung** / Main application o = **Nebenanwendung** / Minor application

Schnittdatenempfehlung / Cutting data recommendation

Senk-Ø d Counterbore-Ø d mm		Niedrig legierter Stahl Low alloy steel	Hoch legierter Stahl High alloy steel	Rostfreier Stahl Stainless steel	Grauguss Cast iron	Aluminium
		z.B. / e.g. CK 45	z.B. / e.g. 42CrMo4V	z.B. / e.g. X15Cr13	z.B. / e.g. GG26, GGG50	z.B. / e.g. G-AlSi12
HM / Carbide	Vc	90 - 120	100 - 120	50 - 90	80 - 140	100 -150
HSS	Vc	20 - 40	15 - 30	15 - 25		
6,5 - 11,0	f	0,05 - 0,1	0,05 - 0,08	0,03 - 0,05	0,04 - 0,1	0,05 - 0,15
15,0 - 30,0	f	0,03 - 0,1	0,03 - 0,08	0,03 - 0,1	0,04 - 0,12	0,05 - 0,15
33,0 - 76,0	f	0,06 - 0,12	0,05 - 0,12	0,06 - 0,12	0,08 - 0,15	0,08 - 0,18

Schnittgeschwindigkeit / Cutting speed Vc (m/min)

Vorschub / Infeed f (mm/U) / (mm/rev)

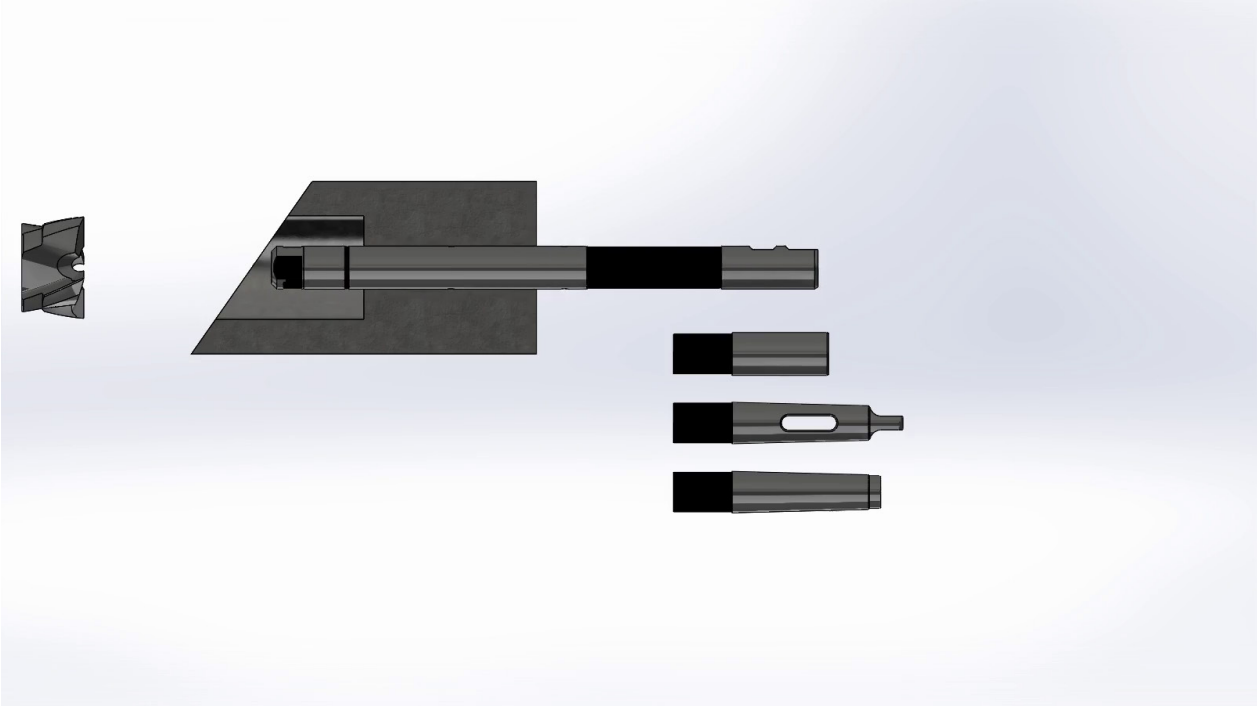
Ausreichende Kühlschmierstoff-Zufuhr erforderlich / Sufficient coolant supply needed

Rückwärtssenksystem TU
Reverse counterbore system TU

max.
2,5 x d

GG(G)	ALU	NE	ST(AHL)

für manuellen Werkzeugwechsel
manually operated



Vorteile:

- Manuelle Rückwärtsbearbeitung
- Stirnsenken, Aufbohren
- Universell auf vielen Maschinentypen einsetzbar
- Schnelles und sicheres manuelles Wechseln des Senkers durch Flachbajonett
- Große Schnittbreiten (bis 2,5 x d)
- Mehrfach nachschleifbar
- Vielfältige Kombinationsmöglichkeiten der Senk- und Führungsdurchmesser
- Verschiedene Führungsdurchmesser können mit dem gleichen Grundhalter (TUHW) und angepassten Führungsbuchsen (TUB) kostengünstig abgedeckt werden

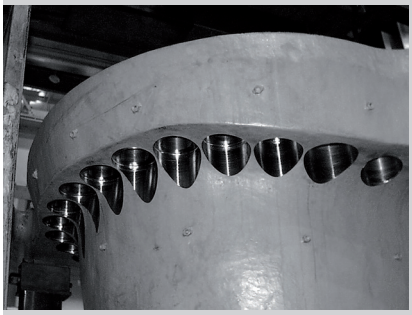
Advantages:

- Manually operated reverse machining
- Spotfacing, counterboring
- Universally applicable on all machine types
- Flat bayonet for quick and reliable manual tool changes
- Large cutting width (up to 2,5 d)
- Multiple regrinds are possible
- Several diameter combinations of counterbores and holders
- The same basic holder (TUHW) plus adjusted guide sleeves (TUB) can cover several guidance diameters

Anwendungsbeispiel / Application example:

Bearbeitungsaufgabe / The customer's problem | **Die BILZ-Lösung / The BILZ solution:**

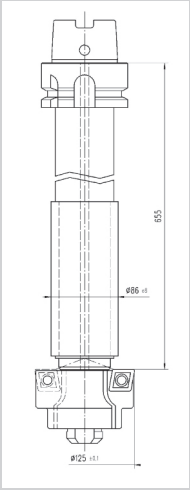
Turbinengehäuse
Turbine housing



Werkstückstoff
Workpiece material:
GS17CrMoV511

Maschine / Machine tool:
Bearbeitungszentrum
Machining Center

Bearbeitung
Cutting process:
Rückwärtssenken
Back counterboring



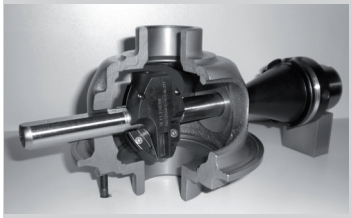
Rückwärtssenker
Back Spotfacer
HSS-WSP
HSS inserts

d = 125 x 86
Vc = 24 m/min
f = 0,2 mm/U / mm/rev

Anwendungsbeispiel / Application example:

Bearbeitungsaufgabe / The customer's problem | **Die BILZ-Lösung / The BILZ solution:**

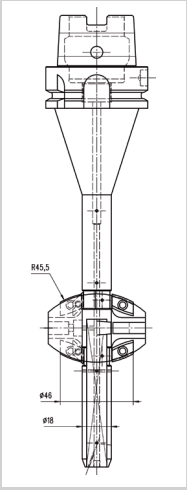
Ausgleichsgehäuse
Differential housing



Werkstückstoff
Workpiece material:
EN-GJS-600-3

Maschine / Machine tool:
Bearbeitungszentrum
Machining Center

Bearbeitung
Cutting process:
Kalotte d = 91 + 0,054
komplett bearbeiten
Spherical calotte
d = 91 + 0,054
machining completely



Aufstecksenker
mit Bajonettverschluss
Spotfacer with bayonet lock

d = 46 mm
Vc = 70 m/min
f = 0,28/0,2 mm/U / mm/rev
Rz 12 µm

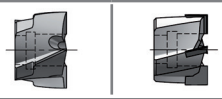
Schnittdatenempfehlung / Cutting data recommendation:

Senk-Ø d Counterbore-Ø d mm		Niedrig legierter Stahl Low alloy steel	Hoch legierter Stahl High alloy steel	Rostfreier Stahl Stainless steel	Grauguss Cast iron	Aluminium
		z.B. / e.g. CK 45	z.B. / e.g. 42CrMo4V	z.B. / e.g. X15Cr13	z.B. / e.g. GG26, GGG50	z.B. / e.g. G-AlSi12
HSS	Vc	15 - 22	15 - 22	8 - 12		20 - 70
HM / Carbide	Vc	40 - 80	30 - 70	30 - 70	50 - 90	40 - 80
10,0 - 20,0	f	0,09 - 0,20	0,09 - 0,20	0,09 - 0,20	0,10 - 0,20	0,10 - 0,25
21,0 - 36,0	f	0,15 - 0,30	0,12 - 0,25	0,10 - 0,25	0,15 - 0,30	0,15 - 0,30
37,0 - 54,0	f	0,20 - 0,35	0,15 - 0,30	0,12 - 0,30	0,25 - 0,40	0,25 - 0,40
55,0 - 115,0	f	0,20 - 0,40	0,18 - 0,35	0,15 - 0,30	0,30 - 0,60	0,30 - 0,60

Schnittgeschwindigkeit Cutting speed	Vc (m/min)	Vorschub Infeed	f (mm/U) / (mm/rev)

Ausreichende Kühlschmierstoff-Zufuhr erforderlich / Sufficient coolant supply needed

Senker / Counterbore TU



Ø 10,0 - 20,0			Best.-Nr. / Ord.-No.	
d	d_1	l	HSS	HM brazed carbide
Senker- / Counterbore-Ø 10,0 - 13,0				
10,0	5	28	TU1000501	TU1000505
10,4			TU1040501	TU1040505
11,0			TU1100501	TU1100505
12,0			TU1200501	TU1200505
13,0			TU1300501	TU1300505
Senker- / Counterbore-Ø 13,5 - 15,0				
13,5	6	30	TU1350601	TU1350605
14,0			TU1400601	TU1400605
14,5			TU1450601	TU1450605
15,0			TU1500601	TU1500605
Senker- / Counterbore-Ø 16,0 - 20,0				
16,0	8	32	TU1600801	TU1600805
16,5			TU1650801	TU1650805
17,0			TU1700801	TU1700805
17,5			TU1750801	TU1750805
18,0			TU1800801	TU1800805
19,0			TU1900801	TU1900805
20,0			TU2000801	TU2000805

Halter / Holder TUH**

mit Zylinderschaft / with Cyl. shank

d	d_1	e	d_2	l	Best.-Nr. Ord.-No.
Führungs- / Guidance-Ø 5,3 - 7,0					
5,3*	5	72	8	162	TUH0530500
5,5*					TUH0550500
6,4					TUH0640500
6,6					TUH0660500
7,0					TUH0700500
Führungs- / Guidance-Ø 8,4 - 9,5					
8,4	6	70	10	162	TUH0840600
9,0					TUH0900600
9,5					TUH0950600
Führungs- / Guidance-Ø 8,4 - 14,0					
8,4*	8	88	12	182	TUH0840800
9,0					TUH0900800
10,0					TUH1000800
10,5					TUH1050800
11,0					TUH1100800
11,5					TUH1150800
12,0					TUH1200800
13,0					TUH1300800
13,5					TUH1350800
14,0					TUH1400800

Halter / Holder TUH**

mit MK-Schaft / with MT shank

d	d_1	e	MK MT	l	Best.-Nr. Ord.-No.
Führungs- / Guidance-Ø 5,3 - 7,0					
5,3*	5	72	1	167	TUH0530501
5,5*					TUH0550501
6,4					TUH0640501
6,6					TUH0660501
7,0					TUH0700501
Führungs- / Guidance-Ø 8,4 - 9,5					
8,4	6	70	1	167	TUH0840601
9,0					TUH0900601
9,5					TUH0950601
Führungs- / Guidance-Ø 8,4 - 14,0					
8,4*	8	88	2	200	TUH0840802
9,0					TUH0900802
10,0					TUH1000802
10,5					TUH1050802
11,0					TUH1100802
11,5					TUH1150802
12,0					TUH1200802
13,0					TUH1300802
13,5					TUH1350802
14,0					TUH1400802

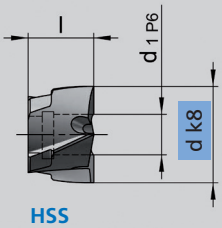
*nur mit TU/HSS verwendbar / to be used only with TU/HSS

** Zur besseren Kühlschmierung von Senker und Führung, insbesondere bei vertikaler Bearbeitung, sind alle Halter auch mit zusätzlichen Kühlschmiernuten (kurzfristig) lieferbar. Bei Bestellung „S" (=Schmiernut) an Best.-Nr. anhängen. Bestellbeispiel: TUHW212125**S**; innere Kühlmittelzufuhr auf Anfrage
All holders are also available with oil grooves for better coolant and lubrication of counterbore and pilot particularly in vertical position, on short notice. When ordering, please add "S" to Ord.-No.
Ordering example: TUHW212125**S**; internal coolant on request

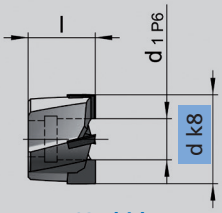
*** Zweiteilige Halter TUHW können mit TU/HSS auch ohne Buchse für Bohrungs-Ø d_3 verwendet werden / TUHW holders can be used without sleeve for guidance Ø d_3 in combination with TU/HSS only

Zwischenabmessungen auf Anfrage / Intermediate sizes on request

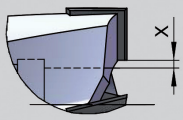
Senker / Counterbore TU



HSS



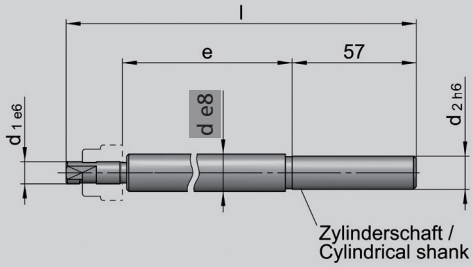
HM/Carbide

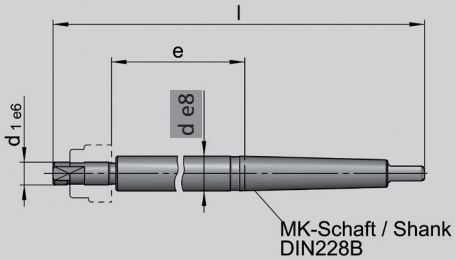


Spalt zwischen Bohrung und HM-Schneide / Gap between hole and carbide cutterblade

d	10 - 24	25 - 71	72 - 115
x	0,2	0,5	1,0

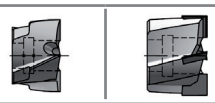
Halter / Holder TUH





Senker / Counterbore TU

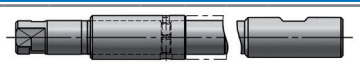
Ø 21,0 - 43,0



Best.-Nr. / Ord.-No.

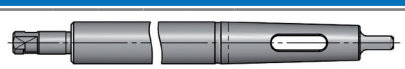
d	d_1	l	HSS	HM brazed carbide
Senker- / Counterbore-Ø 21,0 - 24,0				
21,0	9	22	TU2100901	TU2100905
22,0			TU2200901	TU2200905
23,0			TU2300901	TU2300905
24,0			TU2400901	TU2400905
Senker- / Counterbore-Ø 25,0 - 30,0				
25,0	11	24	TU2501101	TU2501105
26,0			TU2601101	TU2601105
27,0			TU2701101	TU2701105
28,0			TU2801101	TU2801105
29,0			TU2901101	TU2901105
30,0			TU3001101	TU3001105
Senker- / Counterbore-Ø 31,0 - 36,0				
31,0	13	26	TU3101301	TU3101305
32,0			TU3201301	TU3201305
33,0			TU3301301	TU3301305
34,0			TU3401301	TU3401305
35,0			TU3501301	TU3501305
36,0			TU3601301	TU3601305
Senker- / Counterbore-Ø 37,0 - 43,0				
37,0	17	28	TU3701701	TU3701705
38,0			TU3801701	TU3801705
39,0			TU3901701	TU3901705
40,0			TU4001701	TU4001705
41,0			TU4101701	TU4101705
42,0			TU4201701	TU4201705
43,0			TU4301701	TU4301705

Halter TUHW 1tlg.** 2tlg. mit Buchse***
Holder TUHW 1pc.** / 2pcs. with sleeve***



d	d_1	e	d_2	l		Best.-Nr. Ord.-No.
Führungs- / Guidance-Ø 10,5 - 11,0						**1tlg. / 1pc.**
10,5	9	110	12	185		TUHW1050912
11,0						TUHW1100912
Führungs- / Guidance-Ø ≥ 12,0						**2tlg. / 2pcs.**
9,0	9	110	12	185		TUHW090912
					d_4	l_2 / **Buchse / Sleeve**
					≥12	30 / TUB(d_4)0930
Führungs- / Guidance-Ø 12,0 - 13,5						**1tlg. / 1pc.**
12,0	11	130	12	205		TUHW1201112
13,0						TUHW1301112
13,5						TUHW1351112
Führungs- / Guidance-Ø ≥ 14,0						**2tlg. / 2pcs.**
11,0	11	130	12	205		TUHW111112
					d_4	l_2 / **Buchse / Sleeve**
					≥14	35 / TUB(d_4)1135
Führungs- / Guidance-Ø 15,0 - 15,5						**1tlg. / 1pc.**
15,0	13	150	16	230		TUHW1501316
15,5						TUHW1551316
Führungs- / Guidance-Ø ≥ 16,0						**2tlg. / 2pcs.**
13,0	13	150	16	230		TUHW131316
					d_4	l_2 / **Buchse / Sleeve**
					≥16	40 / TUB(d_4)1340
Führungs- / Guidance-Ø 19,0						**1tlg. / 1pc.**
19,0	17	167	20	252		TUHW1901720
Führungs- / Guidance-Ø ≥ 22,0						**2tlg. / 2pcs.**
17,0	17	167	20	252		TUHW171720
					d_4	l_2 / **Buchse / Sleeve**
					≥20	50 / TUB(d_4)1750

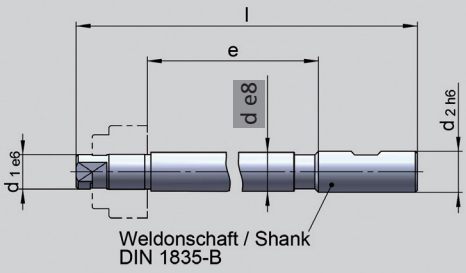
Halter / Holder TUH**



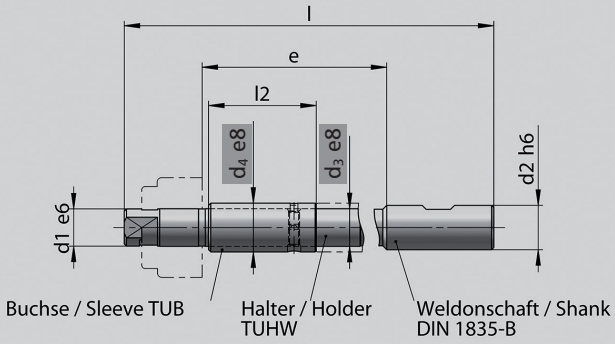
d	d_1	e	MK MT	l	Best.-Nr. Ord.-No.
Führungs- / Guidance-Ø 10,5 - 16,0					
10,5	9	118	2	220	TUH1050902
11,0					TUH1100902
12,0					TUH1200902
13,0					TUH1300902
13,5					TUH1350902
14,0					TUH1400902
15,0					TUH1500902
16,0					TUH1600902
Führungs- / Guidance-Ø 12,0 - 20,0					
12,0	11	135	3	259	TUH1201103
13,0					TUH1301103
13,5					TUH1351103
14,0					TUH1401103
15,0					TUH1501103
16,0					TUH1601103
17,0					TUH1701103
17,5					TUH1751103
18,0					TUH1801103
19,0					TUH1901103
20,0					TUH2001103
Führungs- / Guidance-Ø 15,0 - 25,0					
15,0	13	154	3	280	TUH1501303
16,0					TUH1601303
17,0					TUH1701303
17,5					TUH1751303
18,0					TUH1801303
19,0					TUH1901303
20,0					TUH2001303
21,0					TUH2101303
22,0					TUH2201303
23,0					TUH2301303
24,0					TUH2401303
25,0					TUH2501303
Führungs- / Guidance-Ø 19,0 - 30,0					
19,0	17	172	3	301	TUH1901703
20,0					TUH2001703
21,0					TUH2101703
22,0					TUH2201703
23,0					TUH2301703
24,0					TUH2401703
25,0					TUH2501703
26,0					TUH2601703
28,0					TUH2801703
30,0					TUH3001703

MK2 ohne Querkeilschlitz / MT2 without slotted shank

Halter / Holder TUHW

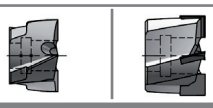


Halter / Holder TUHW zweiteilig mit Buchse / 2pcs. with sleeve



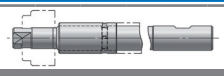
Senker / Counterbore TU

Ø 44,0 - 62,0



Halter TUHW** 2tlg. mit Buchse***
Holder TUHW** 2pcs. with sleeve***

mit Weldonschaft / with Weldon shank



Halter / Holder TUH**

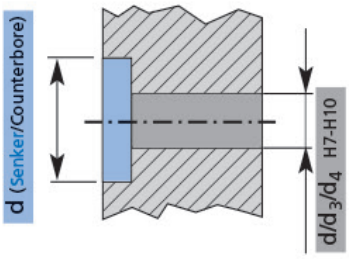
mit MK-Schaft / with MT shank

d	d_1	l	Best.-Nr. / Ord.-No. HSS	Best.-Nr. / Ord.-No. HM brazed carbide
Senker- / Counterbore-Ø 44,0 - 48,0				
44,0	19	32	TU4401901	TU4401905
45,0			TU4501901	TU4501905
46,0			TU4601901	TU4601905
47,0			TU4701901	TU4701905
48,0			TU4801901	TU4801905
Senker- / Counterbore-Ø 49,0 - 54,0				
49,0	21	34	TU4902101	TU4902105
50,0			TU5002101	TU5002105
51,0			TU5102101	TU5102105
52,0			TU5202101	TU5202105
53,0			TU5302101	TU5302105
54,0			TU5402101	TU5402105
Senker- / Counterbore-Ø 55,0 - 62,0				
55,0	25	36	TU5502501	TU5502505
56,0			TU5602501	TU5602505
57,0			TU5702501	TU5702505
58,0			TU5802501	TU5802505
59,0			TU5902501	TU5902505
60,0			TU6002501	TU6002505
61,0			TU6102501	TU6102505
62,0			TU6202501	TU6202505

d_3	d_1	e	d_2	l	d_4	l_2	Best.-Nr. Ord.-No.
Führungs- / Guidance-Ø ≥ 22,0							2tlg. / 2pcs.
19,0	19	183	20	272			TUHW191920
					≥22	55	Buchse / Sleeve TUB(d_4)1955
Führungs- / Guidance-Ø ≥ 24,0							2tlg. / 2pcs.
21,0	21	199	25	296			TUHW212125
					≥24	60	Buchse / Sleeve TUB(d_4)2160
Führungs- / Guidance-Ø ≥ 28,0							2tlg. / 2pcs.
25,0	25	218	25	317			TUHW252525
					≥28	65	Buchse / Sleeve TUB(d_4)2565

d	d_1	e	MK MT	l	Best.-Nr. Ord.-No.
Führungs- / Guidance-Ø 22,0 - 33,0					
22,0	19	188	3	321	TUH2201903
23,0					TUH2301903
24,0					TUH2401903
25,0					TUH2501903
26,0					TUH2601903
28,0					TUH2801903
30,0					TUH3001903
32,0					TUH3201903
33,0					TUH3301903
Führungs- / Guidance-Ø 24,0 - 36,0					
24,0	21	205	4	364	TUH2402104
25,0					TUH2502104
26,0					TUH2602104
28,0					TUH2802104
30,0					TUH3002104
32,0					TUH3202104
33,0					TUH3302104
35,0					TUH3502104
36,0					TUH3602104
Führungs- / Guidance-Ø 28,0 - 39,0					
28,0	25	224	4	385	TUH2802504
30,0					TUH3002504
32,0					TUH3202504
33,0					TUH3302504
35,0					TUH3502504
36,0					TUH3602504
39,0					TUH3902504

Bestellbeispiel für Senkung d = 45 und Bohrung d_4 = 25H9
Ordering example for counterbore d = 45 and through/hole d_4 = 25H9



Senker / Counterbore d = 45, HSS	TU	450	19 01
Grundhalter / Holder d3 = 19, Weldon	TUHW 19 19 20		
Buchse / Sleeve* d4 = 25	TUB	250	19 55

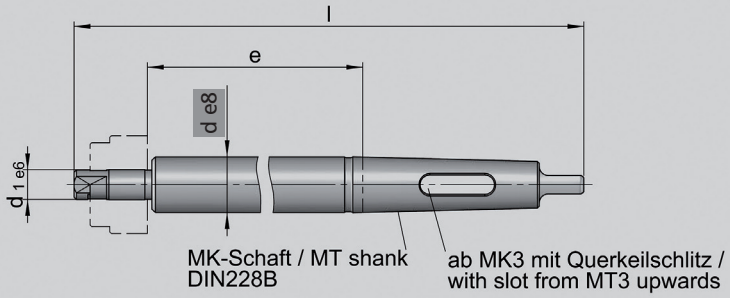
alternativ: Halter 1tlg. / alternative: one-piece-holder

Halter / Holder d = 25, MK 3	TUH	250	19 03

Lieferumfang TUHW zweiteilig: komplett mit 4 Gewindestiften zur Buchsensicherung; TUB-Buchse(n) separat bestellen. / **Scope of delivery for TUHW (2pcs.-version):** complete with 4 threaded pins to secure the sleeve; TUB sleeves must be ordered separately.

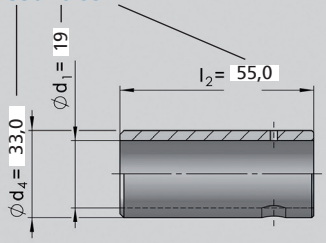
* für doppelte Führungslänge zwei Stück TUB bestellen. / for double guidance length: order 2pcs. TUB

Halter / Holder TUH



Bestellbeispiel TUB-Buchse
Sleeve ordering example

TUB 330 19 55

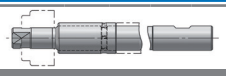


Senker / Counterbore TU

Halter TUHW** 2tlg. mit Buchse***
Holder TUHW** 2pcs. with sleeve***

Halter / Holder TUH**

Ø 63,0 - 115,0



Senker- / Counterbore-Ø 63,0 - 71,0					Führungs- / Guidance-Ø ≥ 32,0						2tlg. / 2pcs.	Führungs- / Guidance-Ø 32,0 - 45,0					
d	d_1	l	HSS	HM brazed carbide	d_3	d_1	e	d_2	l		Best.-Nr. / Ord.-No.	d	d_1	e	MK MT	l	Best.-Nr. / Ord.-No.
63,0	28	38	TU6302801	TU6302805	28,0	28	235	32	341		TUHW282832	32,0	28	241	4	405	TUH3202804
64,0			TU6402801	TU6402805						d_4 / l_2	Buchse / Sleeve	33,0					TUH3302804
65,0			TU6502801	TU6502805						≥32 / 70	TUB(d_4)2870	35,0					TUH3502804
66,0			TU6602801	TU6602805								36,0					TUH3602804
67,0			TU6702801	TU6702805								39,0					TUH3902804
68,0			TU6802801	TU6802805								40,0					TUH4002804
69,0			TU6902801	TU6902805								42,0					TUH4202804
70,0			TU7002801	TU7002805								45,0					TUH4502804
71,0			TU7102801	TU7102805													

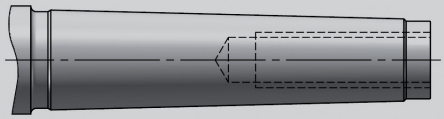
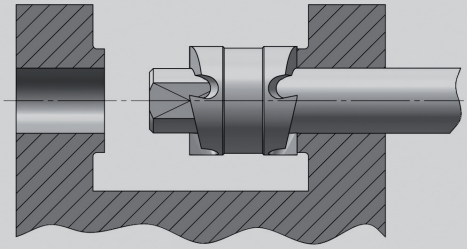
Senker- / Counterbore-Ø 74,0 - 80,0					Führungs- / Guidance-Ø ≥ 33,0						2tlg. / 2pcs.	Führungs- / Guidance-Ø 33,0 - 36,0					
74,0	30	50	TU7403001	TU7403005	30,0	30	250	32	364		TUHW303032	33,0	30	256	5	460	TUH3303005
76,0			TU7603001	TU7603005						d_4 / l_2	Buchse / Sleeve	36,0					TUH3603005
78,0			TU7803001	TU7803005						≥33 / 75	TUB(d_4)3075						
80,0			TU8003001	TU8003005													

Senker- / Counterbore-Ø 82,0 - 90,0					Führungs- / Guidance-Ø ≥ 39,0						2tlg. / 2pcs.	Führungs- / Guidance-Ø 36,0 - 48,0					
82,0	35	50	TU8203501	TU8203505	35,0	35	250	40	374		TUHW353540	36,0	35	258	5	460	TUH3603505
85,0			TU8503501	TU8503505						d_4 / l_2	Buchse / Sleeve	39,0					TUH3903505
90,0			TU9003501	TU9003505						≥39 / 80	TUB(d_4)3580	42,0					TUH4203505
												45,0					TUH4503505
												48,0					TUH4803505

Senker- / Counterbore-Ø 92,0 - 100,0					Führungs- / Guidance-Ø ≥ 45,0						2tlg. / 2pcs.	Führungs- / Guidance-Ø 42,0 - 52,0					
92,0	40	60	TU9204001	TU9204005	40,0	40	260	40	394		TUHW404040	42,0	40	266	5	480	TUH4204005
95,0			TU9504001	TU9504005						d_4 / l_2	Buchse / Sleeve	45,0					TUH4504005
98,0			TU9804001	TU9804005						≥45 / 85	TUB(d_4)4085	48,0					TUH4804005
100,0			TU10004001	TU10004005								52,0					TUH5204005

Senker- / Counterbore-Ø 105,0 - 115,0					Führungs- / Guidance-Ø ≥ 48,0						2tlg. / 2pcs	Führungs- / Guidance-Ø 48,0 - 62,0					
105,0	45	70	TU10504501	TU10504505	45,0	45	250	50	404		TUHW454550	48,0	45	256	5	480	TUH4804505
107,0			TU10704501	TU10704505						d_4 / l_2	Buchse / Sleeve	52,0					TUH5204505
110,0			TU11004501	TU11004505						≥48 / 90	TUB(d_4)4590	62,0					TUH6204505
112,0			TU11204501	TU11204505													
115,0			TU11504501	TU11504505													

Halter mit MK-Schaft und Anzugsgewinde TUG auf Anfrage
Holder with Morse-Taper shank and fastening thread on request



Stirnsenker T3 (vorwärts-rückwärts) mit zugehörigen Haltern TH auf Anfrage
Spot-Facer T3 (forward-backward) with suitable holders on request