KOMET

KUB Quatron®

Ø 14 - 44 mm
now also 3 × D

KUB Quatron®

KOMET GROUP

KUB Quatron®

Drilling without compromising

**With the development of the new KUB Quatron®
KOMET has specifically extended its successful KUB® insert drill programme.**

The special design and geometry of the KUB Quatron®
offers distinct advantages:

- **High stability and economy**
  by using square inserts.
- **Free flow of chips and no wear on the tool body**
  because of the special surface treatment.
- **Can be used for difficult drilling conditions**
  such as cast angles, rolling skin or
  interrupted cut.
- **Excellent bore quality**
  with no withdrawal grooves.
- **Maximum tool life**
  with four cutting edges made up of
  specific substrates and coatings.

The Facts

- **Drilling depth and connection**
  The KUB Quatron® is supplied as standard in drilling depths up to 3 x D with combination shank DIN 6536 HE and 6595 and also with ABS 50 connection.
- **Layout design**
  A high overall rigidity and square inserts guarantee dimensional stability and accurate drilling with the KUB Quatron® at high feed speeds.
- **Coolant supply**
  This has been improved further with the KUB Quatron®, allowing chips to be ejected without problems.
- **Square inserts**
  The four cutting edges on each insert make the KUB Quatron® totally economic. The latest coatings combined with tough, strong substrates reduce friction and also ensure maximum tool life.

BK1: TiC and Al2O3-CVD coating for high cutting speeds in all cast materials.

BK69: A cutting material with a tough substrate and a CVD multi-layer coating in TiCN/TiN and Al2O3 for machining non-alloyed and alloyed steels, die steels and cast steel.

BK74: Multi-layer CVD coating with maximum wear resistance on tough substrate. Solid drilling at medium to high cutting speeds in stainless and acid-resistant steels.

BK79: A tough carbide substrate with a PVD coating in TiAlN for machining stainless and acid-resistant steels and suitable for interrupted cut.

BK84: A TiCN/TiN PVD coating which combines toughness with good resistance to wear. The multi-layer PVD coating is suitable as an all-round insert for use as an external and internal cutting edge and for interrupted cut.

KUB Quatron®

Main Body

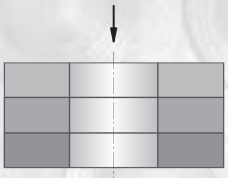
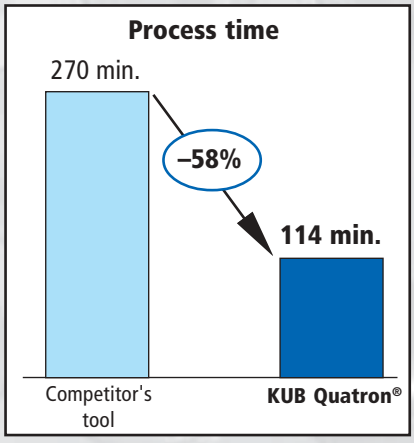
KOMET experience for high-tech machining:

- strong tool steel with an extremely high degree of toughness and special wear-protected surface
- internal coolant supply designed to meet increased coolant requirements
- large chip space for guaranteed unrestricted chip flow
- can be used for diameters of 14 to 44 and drilling depths of up to 3 x D
- designed for stepped tools with different inserts
- bore tolerance ±0.2 mm
- suitable for use with minimal lubrication.

KUB Quatron® Inserts
- square – efficient – economic
- Clamping with new TORX PLUS® clamping screws

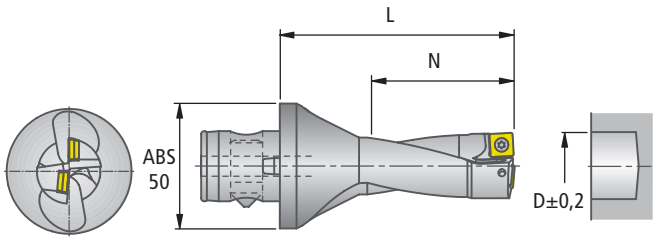
KUB Quatron® Inserts
Insert in a stepped tool
with TORX PLUS® clamping screws

KUB Quatron® Successful example of a heat exchanger plate
58% reduction in time

The task	Our solution	Advantage to customer
  **Workpiece:** **Heat exchanger plate** • Material: St 37 • Individual parts • High number of bores/part • Stack plate drilling **Existing tool** • Competitor's drill Ø 16 **Cutting data** v_c = 20 m/min f = 0,25 mm/rev	**Only possible with unique positioning of inserts** • use of KUB Quatron® Ø 16 • v_c = 226 m/min • f = 0.05 mm/rev • square insert  **Standard design 3 × D** 	**58% reduction in process time** • Competitor's tool: 270 min. • KUB Quatron®: 114 min. • Shorter process times: –156 min. • Greater machine availability • Clear cost savings for customer 

KUB Quatron® U10 Ø 14 – 27 mm

with ABS® connection
drilling depth up to 2 × D – R.H. cutting



● = Recommended
◐ = Alternative

D	Max. dia. with offset.	ABS size d	Order No.	N	L	kg	Basic recommendation: Insert Order No. ▼▼ size	Insert ISO-Code	for workpiece material A	R	F	N	S	H	Spares: Clamping screw Order No. Article	Screwdriver Order No. Article
14,0	14,5	50	**U10 71400**	28	63	0,45										
15,0	15,5	50	**U10 71500**	30	65	0,46										
15,5	16,0	50	**U10 71550**	32	67	0,46	**W83 13000.0184**	SOEX 050204-01 BK84	●			●			**N00 56041** S/M2x4,3-6IP	**L05 00810** 6IP
16,0	16,5	50	**U10 71600**	32	67	0,46	**W83 13000.0179**	SOEX 050204-01 BK79		●			●			
17,0	17,5	50	**U10 71700**	34	69	0,47	**W83 13000.0161**	SOEX 050204-01 BK1			●			◐		
17,5	18,0	50	**U10 71750**	36	71	0,47										
18,0	18,5	50	**U10 71800**	36	71	0,47										
18,5	19,0	50	**U10 71850**	38	73	0,48										
19,0	19,5	50	**U10 71900**	38	73	0,48	**W83 18000.0984**	SOEX 060306-01 BK84	●			●			**N00 57553** S/M2,2x5,5-6IP	**L05 00810** 6IP
19,5	20,0	50	**U10 71950**	40	75	0,49	**W83 18000.0979**	SOEX 060306-01 BK79		●			●			
20,0	20,5	50	**U10 72000**	40	75	0,49	**W83 18000.0961**	SOEX 060306-01 BK1			●			◐		
20,5	21,0	50	**U10 72050**	42	77	0,50										
21,0	21,5	50	**U10 72100**	42	77	0,50										
22,0	22,5	50	**U10 72200**	44	79	0,51										
22,5	23,0	50	**U10 72250**	46	81	0,52										
23,0	23,5	50	**U10 72300**	46	81	0,52										
24,0	24,5	50	**U10 72400**	48	83	0,54	**W83 23000.0184**	SOEX 07T308-01 BK84	●			●			**N00 57571** S/M2,5x6,3-8IP	**L05 00830** 8IP
24,5	25,0	50	**U10 72450**	50	85	0,54	**W83 23000.0179**	SOEX 07T308-01 BK79		●			●			
25,0	25,5	50	**U10 72500**	50	85	0,55	**W83 23000.0161**	SOEX 07T308-01 BK1			●			◐		
26,0	26,5	50	**U10 72600**	52	87	0,56										
26,5	27,0	50	**U10 72650**	54	89	0,58										
27,0	27,5	50	**U10 72700**	54	89	0,58										

For other diameters see page 6

Note:
Any intermediate dimensions from Ø 14 – 44,5 mm available on request.

Supply includes:
KUB Quatron® drill with clamping screw and screwdriver; insert not included.

Technical Notes

Guideline values for solid drilling with U10 – 2 × D

Material group		Strength Rm N/mm²	Hardness HB	Material	Material example material code/DIN	Cutting speed v_c m/min	Max. feed f (mm/rev) Ø 14-15,9	Ø 16-17,5	Ø 17,6-21,5	Ø 21,6-27
1.0	A	≤500		**non-alloy steels**	St37-2 / 1.0037, 9SMn28 /1.0715, St44-2 / 1.0044	300	0,10	0,12	0,12	0,14
2.0	A	500-900		**non-alloy / low alloy steels**	St52-2 / 1.0050, C55 / 1.0525, 16MnCr5 / 1.7131	250	0,12	0,14	0,16	0,20
2.1	A	<500		**lead alloys**	9SMnPb28 / 1.0718	300	0,14	0,16	0,18	0,25
3.0	A	>900		**non alloy / low alloy steels:** heat resostant structural, heat treated, nitride and tools steels	42CrMo4 / 1.7225, CK60 / 1.1221	200	0,14	0,16	0,18	0,20
4.0	A	>900		**high alloy steels**	X6CrMo4 / 1.2341, X165CrMoV12/1.2601	180	0,10	0,12	0,14	0,18
4.1	A			**high alloy steels**		80	0,08	0,10	0,12	0,14
5.0	S		250	**special alloys:** Inconel, Hastelloy, Nimonic,etc.	Inconel 718/2.4668, Nimonic 80A/2.4631	60	0,06	0,08	0,10	0,12
5.1	S	400		**titanium, titanium alloys**	TiAl5Sn2 / 3.7114	80	0,06	0,08	0,10	0,12
6.0	R	≤600		**stainless steels**	X2CrNi189 / 1.4306, X5CrNiMo1810/ 1.4401	180	0,08	0,10	0,12	0,14
6.1	R	<900		**stainless steels**	X8CrNb17/1.4511, X10CrNiMoTi1810/ 1.4571	160	0,08	0,08	0,12	0,16
7.0	R	>900		**stainless / fireproof steels**	X20Cr13 / 1.4021, X40Cr13 / 1.4034	160	0,06	0,08	0,10	0,12
8.0	F		180	**gray cast iron**	GG-25/0.6025, GG-35/0.6035	200	0,16	0,16	0,25	0,30
8.1	F		250	**alloy gray cast iron**	GG-NiCr202 / 0.6660	160	0,14	0,16	0,18	0,20
9.0	F	≤600	130	**spheroidal, graphite cast iron, ferritic**	GGG-40 / 0.7040	180	0,14	0,16	0,18	0,20
9.1	F		230	**spheroidal graphite cast iron, ferritic/ perlitic**	GGG-50 / 0.7050 GGG-55 / 0.7055 GTW-55 / 0.8055	160	0,14	0,16	0,18	0,22
10.0	F	>600	250	**spheroidal graph. cast iron, perlitic, malleable iron**	GGG-60 / 0.7060 GTS-65 / 0.8165	140	0,14	0,16	0,18	0,22
10.1	F		200	**alloyed spheroidal graphite cast iron**	GGG-NiCr20-2 / 0.7661	140	0,14	0,16	0,18	0,22
10.2	F		300	**vermicular cast iron**	GGV Ti < 0,2 GGV Ti > 0,2	120	0,10	0,12	0,16	0,20
12.0	N		90	**copper alloy, brass, lead-alloy bronze, lead bronze:** good cut	CuZn36Pb3 / 2.1182, G-CuPb15Sn / 2.1182	300	0,12	0,14	0,16	0,25
12.1	N		100	**copper alloy, brass, bronze:** average cut	CuZn40Al1 / 2.0550, E-Cu57 / 2.0060	400	0,08	0,08	0,10	0,12
13.0	N		60	**wrought aluminium alloys**	AlMg1 / 3.3315, AlMnCu / 3.0517	600	0,08	0,08	0,10	0,12
13.1	N		75	**cast alum. alloy:** Si-content <10% **magnesium alloy**	G-AlMg5 / 3.3561, G-AlSi9Mg / 3.2373	300	0,10	0,12	0,14	0,16
14.0	N		100	**cast alum.alloy:** Si-content >10%	G-AlSi10Mg / 3.2381	250	0,10	0,12	0,14	0,20
15.0	H	1400		**hardened steels** < 45 HRC		80	0,05	0,05	0,08	0,10
16.0	H	1800		**hardened steels** > 45 HRC		40	0,05	0,05	0,08	0,10

Alternative Inserts

for better chip control

D	Order No. ▼▼ size	ISO-Code	for workpiece material A	R	F	N	S	H
14,0 - 17,5	**W83 13000.0284**	SOEX 050204-13 BK84	◐					
	W83 13000.0279	SOEX 050204-13 BK79		◑				
18,0 - 21,5	**W83 18000.1084**	SOEX 060306-13 BK84	◐					
	W83 18000.1079	SOEX 060306-13 BK79		◑				
22,0 - 27,0	**W83 23000.0284**	SOEX 07T308-13 BK84	◐					
	W83 23000.0279	SOEX 07T308-13 BK79		◑				

for better wear resistance

D	Order No. ▼▼ size	ISO-Code	for workpiece material A	R	F	N	S	H
14,0 - 17,5	**W83 13000.0169**	SOEX 050204-01 BK69	◐					
	W83 13000.0174	SOEX 050204-01 BK74		◑				
18,0 - 21,5	**W83 18000.0969**	SOEX 060306-01 BK69	◐					
	W83 18000.0974	SOEX 060306-01 BK74		◑				
22,0 - 27,0	**W83 23000.0169**	SOEX 07T308-01 BK69	◐					
	W83 23000.0174	SOEX 07T308-01 BK74		◑				

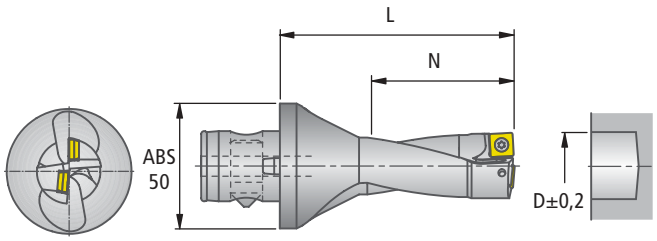
for greater strength

D	Order No. ▼▼ size	ISO-Code	for workpiece material A	R	F	N	S	H
14,0 - 17,5	**W83 13000.0179**	SOEX 050204-01 BK79	◐					
	W83 13000.0169	SOEX 050204-01 BK69			◑			
18,0 - 21,5	**W83 18000.0979**	SOEX 060306-01 BK79	◐					
	W83 18000.0969	SOEX 060306-01 BK69			◑			
22,0 - 27,0	**W83 23000.0179**	SOEX 07T308-01 BK79	◐					
	W83 23000.0169	SOEX 07T308-01 BK69			◑			

Important: See page 24 for application details and safety notes !

KUB Quatron® U10 Ø 28 – 44 mm

with ABS® connection
drilling depth up to 2 × D – R.H. cutting



● = Recommended
◐ = Alternative

D	Max. dia. with offset.	ABS size d	Order No.	N	L	kg	Basic recommendation: Insert Order No. ▼▼ size	Basic recommendation: Insert ISO-Code	Basic recommendation: for workpiece material A	R	F	N	S	H	Spares: Clamping screw Order No. Article	Spares: Screwdriver Order No. Article
28,0	28,5	50	**U10 72800**	56	91	0,60										
28,5	29,0	50	**U10 72850**	58	93	0,61										
29,0	29,5	50	**U10 72900**	58	93	0,61										
29,5	30,0	50	**U10 72950**	59	95	0,63	**W83 32000.1584**	SOEX 090408-01 BK84	●			●			**N00 57261** S3575-15IP	**L05 00860** 15IP
30,0	30,5	50	**U10 73000**	60	100	0,66	**W83 32000.1579**	SOEX 090408-01 BK79		●			●			
31,0	31,5	50	**U10 73100**	62	102	0,68	**W83 32000.1561**	SOEX 090408-01 BK1			●			○		
31,5	32,0	50	**U10 73150**	64	104	0,70										
32,0	32,5	50	**U10 73200**	64	104	0,70										
33,0	33,5	50	**U10 73300**	66	106	0,73										
34,0	34,5	50	**U10 73400**	68	108	0,75										
35,0	35,5	50	**U10 73500**	70	110	0,77										
36,0	36,5	50	**U10 73600**	72	112	0,80										
37,0	37,5	50	**U10 73700**	74	124	0,88										
37,5	38,0	50	**U10 73750**	76	126	0,90										
38,0	38,5	50	**U10 73800**	76	126	0,92	**W83 44000.1884**	SOEX 120508-01 BK84	●			●			**N00 57301** S45100-20IP	**L05 00870** 20IP
39,0	39,5	50	**U10 73900**	78	128	0,95	**W83 44000.1879**	SOEX 120508-01 BK79		●			●			
39,5	40,0	50	**U10 73950**	80	130	0,97	**W83 44000.1861**	SOEX 120508-01 BK1			●			○		
40,0	40,5	50	**U10 74000**	80	130	0,98										
41,0	41,5	50	**U10 74100**	82	132	1,02										
42,0	42,5	50	**U10 74200**	84	134	1,06										
43,0	43,5	50	**U10 74300**	86	136	1,10										
44,0	44,5	50	**U10 74400**	88	138	1,14										

For other diameters see page 4

Note:
Any intermediate dimensions from Ø 14 – 44,5 mm available on request.

Supply includes:
KUB Quatron® drill with clamping screw and screwdriver; insert not included.

Technical Notes

Guideline values for solid drilling with U10 – 2 × D

Material group		Strength Rm N/mm²	Hardness HB	Material	Material example material code/DIN	Cutting speed v_c m/min	Max. feed f (mm/rev) Ø 28-33	Ø 34-44
1.0	A	≤500		**non-alloy steels**	St37-2 / 1.0037, 9SMn28 /1.0715, St44-2 / 1.0044	300	0,12	0,14
2.0	A	500-900		**non-alloy / low alloy steels**	St52-2 / 1.0050, C55 / 1.0525, 16MnCr5 / 1.7131	250	0,20	0,25
2.1	A	<500		**lead alloys**	9SMnPb28 / 1.0718	300	0,25	0,30
3.0	A	>900		**non alloy / low alloy steels:** heat resostant structural, heat treated, nitride and tools steels	42CrMo4 / 1.7225, CK60 / 1.1221	200	0,20	0,25
4.0	A	>900		**high alloy steels**	X6CrMo4 / 1.2341, X165CrMoV12/1.2601	180	0,18	0,20
4.1	A			**high alloy steels**		80	–	–
5.0	S		250	**special alloys:** Inconel, Hastelloy, Nimonic,etc.	Inconel 718/2.4668, Nimonic 80A/2.4631	60	0,12	0,12
5.1	S	400		**titanium, titanium alloys**	TiAl5Sn2 / 3.7114	80	0,12	0,12
6.0	R	≤600		**stainless steels**	X2CrNi189 / 1.4306, X5CrNiMo1810/ 1.4401	180	0,14	0,16
6.1	R	<900		**stainless steels**	X8CrNb17/1.4511, X10CrNiMoTi1810/ 1.4571	160	0,16	0,20
7.0	R	>900		**stainless / fireproof steels**	X20Cr13 / 1.4021, X40Cr13 / 1.4034	160	0,12	0,14
8.0	F		180	**gray cast iron**	GG-25/0.6025, GG-35/0.6035	200	0,30	0,30
8.1	F		250	**alloy gray cast iron**	GG-NiCr202 / 0.6660	160	0,20	0,25
9.0	F	≤600	130	**spheroidal, graphite cast iron, ferritic**	GGG-40 / 0.7040	180	0,20	0,25
9.1	F		230	**spheroidal graphite cast iron, ferritic/ perlitic**	GGG-50 / 0.7050 GGG-55 / 0.7055 GTW-55 / 0.8055	160	0,22	0,25
10.0	F	>600	250	**spheroidal graph. cast iron, perlitic, malleable iron**	GGG-60 / 0.7060 GTS-65 / 0.8165	140	0,22	0,25
10.1	F		200	**alloyed spheroidal graphite cast iron**	GGG-NiCr20-2 / 0.7661	140	0,25	0,25
10.2	F		300	**vermicular cast iron**	GGV Ti < 0,2 GGV Ti > 0,2	120	0,20	0,25
12.0	N		90	**copper alloy, brass, lead-alloy bronze, lead bronze:** good cut	CuZn36Pb3 / 2.1182, G-CuPb15Sn / 2.1182	300	0,20	0,25
12.1	N		100	**copper alloy, brass, bronze:** average cut	CuZn40Al1 / 2.0550, E-Cu57 / 2.0060	400	0,12	0,15
13.0	N		60	**wrought aluminium alloys**	AlMg1 / 3.3315, AlMnCu / 3.0517	600	0,12	0,12
13.1	N		75	**cast alum. alloy:** Si-content <10% **magnesium alloy**	G-AlMg5 / 3.3561, G-AlSi9Mg / 3.2373	300	0,16	0,20
14.0	N		100	**cast alum.alloy:** Si-content >10%	G-AlSi10Mg / 3.2381	250	0,20	0,30
15.0	H	1400		**hardened steels** < 45 HRC		80	0,10	0,10
16.0	H	1800		**hardened steels** > 45 HRC		40	0,10	0,10

Alternative Inserts

for better chip control

D	Order No. ▼▼ size	ISO-Code	Insert -01	Insert -13	for workpiece material A	R	F	N	S	H
28,0 - 33,0	**W83 32000.1784**	SOEX 090408-13 BK84	◐							
	W83 32000.1779	SOEX 090408-13 BK79		◑						
34,0 - 44,0	**W83 44000.1984**	SOEX 120508-13 BK84	◐							
	W83 44000.1979	SOEX 120508-13 BK79		◑						

for better wear resistance

D	Order No. ▼▼ size	ISO-Code	Insert -01	Insert -13	for workpiece material A	R	F	N	S	H
28,0 - 33,0	**W83 32000.1569**	SOEX 090408-01 BK69	◐							
	W83 32000.1574	SOEX 090408-01 BK74		◑						
34,0 - 44,0	**W83 44000.1869**	SOEX 120508-01 BK69	◐							
	W83 44000.1874	SOEX 120508-01 BK74		◑						

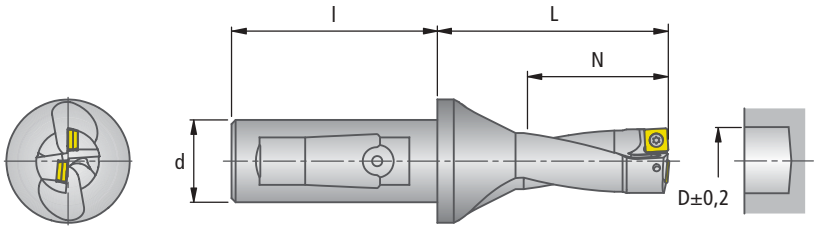
for greater strength

D	Order No. ▼▼ size	ISO-Code	Insert -01	Insert -13	for workpiece material A	R	F	N	S	H
28,0 - 33,0	**W83 32000.1579**	SOEX 090408-01 BK79	◐							
	W83 32000.1569	SOEX 090408-01 BK69		◑						
34,0 - 44,0	**W83 44000.1879**	SOEX 120508-01 BK79	◐							
	W83 44000.1869	SOEX 120508-01 BK69		◑						

Important: See page 24 for application details and safety notes !

KUB Quatron® U10 Ø 14 – 27 mm

Combination Shank DIN 6535 HE (similar to 1835 E) and 6595
drilling depth up to 2 × D – R.H. cutting



● = Recommended
◐ = Alternative

D	Cylindrical shank d x l	Order No.	N	L	kg	Basic recommendation: Insert Order No. ▼▼ size	Basic recommendation: Insert ISO-Code	Basic recommendation: for workpiece material A	R	F	N	S	H	Spares: Clamping screw Order No. Article	Spares: Screwdriver Order No. Article
14,0	20x50	**U10 01400**	28	52	0,17										
15,0	20x50	**U10 01500**	30	54	0,18										
15,5	20x50	**U10 01550**	32	56	0,18	**W83 13000.0184**	SOEX 050204-01 BK84	●			●			**N00 56041** S/M2x4,3-6IP	**L05 00810** 6IP
16,0	20x50	**U10 01600**	32	56	0,19	**W83 13000.0179**	SOEX 050204-01 BK79		●			●			
17,0	20x50	**U10 01700**	34	58	0,19	**W83 13000.0161**	SOEX 050204-01 BK1			●			○		
17,5	25x56	**U10 11750**	36	60	0,27										
18,0	25x56	**U10 11800**	36	60	0,27										
18,5	25x56	**U10 11850**	38	62	0,27										
19,0	25x56	**U10 11900**	38	62	0,28	**W83 18000.0984**	SOEX 060306-01 BK84	●			●			**N00 57553** S/M2,2x5,5-6IP	**L05 00810** 6IP
19,5	25x56	**U10 11950**	40	64	0,29	**W83 18000.0979**	SOEX 060306-01 BK79		●			●			
20,0	25x56	**U10 12000**	40	64	0,29	**W83 18000.0961**	SOEX 060306-01 BK1			●			○		
20,5	25x56	**U10 12050**	42	66	0,30										
21,0	25x56	**U10 12100**	42	66	0,30										
22,0	25x56	**U10 12200**	44	68	0,31										
22,5	25x56	**U10 12250**	46	70	0,31										
23,0	25x56	**U10 12300**	46	70	0,32										
24,0	32x60	**U10 22400**	48	72	0,51	**W83 23000.0184**	SOEX 07T308-01 BK84	●			●			**N00 57571** S/M2,5x6,3-8IP	**L05 00830** 8IP
24,5	32x60	**U10 22450**	50	74	0,52	**W83 23000.0179**	SOEX 07T308-01 BK79		●			●			
25,0	32x60	**U10 22500**	50	74	0,52	**W83 23000.0161**	SOEX 07T308-01 BK1			●			○		
26,0	32x60	**U10 22600**	52	76	0,54										
26,5	32x60	**U10 22650**	54	78	0,55										
27,0	32x60	**U10 22700**	54	78	0,56										

For other diameters see page 10

Note:
Any intermediate dimensions from Ø 14 – 44,5 mm available on request.

Supply includes:
KUB Quatron® drill with clamping screw and screwdriver; insert not included.

Technical Notes

Guideline values for solid drilling with U10 – 2 × D

Material group		Strength Rm N/mm²	Hardness HB	Material	Material example material code/DIN	Cutting speed v_c m/min	Max. feed f (mm/rev) Ø 14-15,9	Ø 16-17,5	Ø 17,6-21,5	Ø 21,6-27
1.0	A	≤500		**non-alloy steels**	St37-2 / 1.0037, 9SMn28 /1.0715, St44-2 / 1.0044	300	0,10	0,12	0,12	0,14
2.0	A	500-900		**non-alloy / low alloy steels**	St52-2 / 1.0050, C55 / 1.0525, 16MnCr5 / 1.7131	250	0,12	0,14	0,16	0,20
2.1	A	<500		**lead alloys**	9SMnPb28 / 1.0718	300	0,14	0,16	0,18	0,25
3.0	A	>900		**non alloy / low alloy steels:** heat resostant structural, heat treated, nitride and tools steels	42CrMo4 / 1.7225, CK60 / 1.1221	200	0,14	0,16	0,18	0,20
4.0	A	>900		**high alloy steels**	X6CrMo4 / 1.2341, X165CrMoV12/1.2601	180	0,10	0,12	0,14	0,18
4.1	A			**high alloy steels**		80	0,08	0,10	0,12	0,14
5.0	S		250	**special alloys:** Inconel, Hastelloy, Nimonic,etc.	Inconel 718/2.4668, Nimonic 80A/2.4631	60	0,06	0,08	0,10	0,12
5.1	S	400		**titanium, titanium alloys**	TiAl5Sn2 / 3.7114	80	0,06	0,08	0,10	0,12
6.0	R	≤600		**stainless steels**	X2CrNi189 / 1.4306, X5CrNiMo1810/ 1.4401	180	0,08	0,10	0,12	0,14
6.1	R	<900		**stainless steels**	X8CrNb17/1.4511, X10CrNiMoTi1810/ 1.4571	160	0,08	0,08	0,12	0,16
7.0	R	>900		**stainless / fireproof steels**	X20Cr13 / 1.4021, X40Cr13 / 1.4034	160	0,06	0,08	0,10	0,12
8.0	F		180	**gray cast iron**	GG-25/0.6025, GG-35/0.6035	200	0,16	0,16	0,25	0,30
8.1	F		250	**alloy gray cast iron**	GG-NiCr202 / 0.6660	160	0,14	0,16	0,18	0,20
9.0	F	≤600	130	**spheroidal, graphite cast iron, ferritic**	GGG-40 / 0.7040	180	0,14	0,16	0,18	0,20
9.1	F		230	**spheroidal graphite cast iron, ferritic/ perlitic**	GGG-50 / 0.7050 GGG-55 / 0.7055 GTW-55 / 0.8055	160	0,14	0,16	0,18	0,22
10.0	F	>600	250	**spheroidal graph. cast iron, perlitic, malleable iron**	GGG-60 / 0.7060 GTS-65 / 0.8165	140	0,14	0,16	0,18	0,22
10.1	F		200	**alloyed spheroidal graphite cast iron**	GGG-NiCr20-2 / 0.7661	140	0,14	0,16	0,18	0,22
10.2	F		300	**vermicular cast iron**	GGV Ti < 0,2 GGV Ti > 0,2	120	0,10	0,12	0,16	0,20
12.0	N		90	**copper alloy, brass, lead-alloy bronze, lead bronze:** good cut	CuZn36Pb3 / 2.1182, G-CuPb15Sn / 2.1182	300	0,12	0,14	0,16	0,25
12.1	N		100	**copper alloy, brass, bronze:** average cut	CuZn40Al1 / 2.0550, E-Cu57 / 2.0060	400	0,08	0,08	0,10	0,12
13.0	N		60	**wrought aluminium alloys**	AlMg1 / 3.3315, AlMnCu / 3.0517	600	0,08	0,08	0,10	0,12
13.1	N		75	**cast alum. alloy:** Si-content <10% **magnesium alloy**	G-AlMg5 / 3.3561, G-AlSi9Mg / 3.2373	300	0,10	0,12	0,14	0,16
14.0	N		100	**cast alum.alloy:** Si-content >10%	G-AlSi10Mg / 3.2381	250	0,10	0,12	0,14	0,20
15.0	H	1400		**hardened steels** < 45 HRC		80	0,05	0,05	0,08	0,10
16.0	H	1800		**hardened steels** > 45 HRC		40	0,05	0,05	0,08	0,10

Alternative Inserts

for better chip control

D	Order No. ▼▼ size	ISO-Code	for workpiece material A	R	F	N	S	H
14,0 - 17,5	**W83 13000.0284**	SOEX 050204-13 BK84	◐					
	W83 13000.0279	SOEX 050204-13 BK79		◑				
18,0 - 21,5	**W83 18000.1084**	SOEX 060306-13 BK84	◐					
	W83 18000.1079	SOEX 060306-13 BK79		◑				
22,0 - 27,0	**W83 23000.0284**	SOEX 07T308-13 BK84	◐					
	W83 23000.0279	SOEX 07T308-13 BK79		◑				

for better wear resistance

D	Order No. ▼▼ size	ISO-Code	for workpiece material A	R	F	N	S	H
14,0 - 17,5	**W83 13000.0169**	SOEX 050204-01 BK69	◐					
	W83 13000.0174	SOEX 050204-01 BK74		◑				
18,0 - 21,5	**W83 18000.0969**	SOEX 060306-01 BK69	◐					
	W83 18000.0974	SOEX 060306-01 BK74		◑				
22,0 - 27,0	**W83 23000.0169**	SOEX 07T308-01 BK69	◐					
	W83 23000.0174	SOEX 07T308-01 BK74		◑				

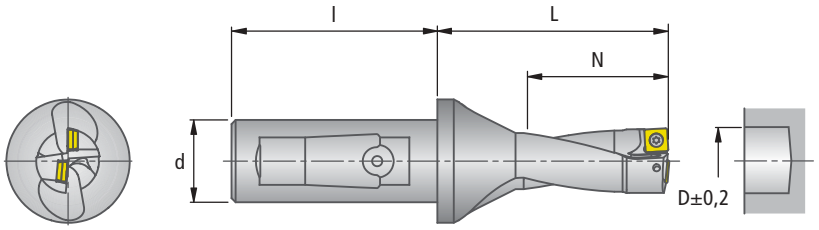
for greater strength

D	Order No. ▼▼ size	ISO-Code	for workpiece material A	R	F	N	S	H
14,0 - 17,5	**W83 13000.0179**	SOEX 050204-01 BK79	◐					
	W83 13000.0169	SOEX 050204-01 BK69			◑			
18,0 - 21,5	**W83 18000.0979**	SOEX 060306-01 BK79	◐					
	W83 18000.0969	SOEX 060306-01 BK69			◑			
22,0 - 27,0	**W83 23000.0179**	SOEX 07T308-01 BK79	◐					
	W83 23000.0169	SOEX 07T308-01 BK69			◑			

Important: See page 24 for application details and safety notes !

KUB Quatron® U10 Ø 28 – 44 mm

Combination Shank DIN 6535 HE (similar to 1835 E) and 6595 drilling depth up to 2 × D – R.H. cutting



For other diameters see page 8

Note: Any intermediate dimensions from Ø 14 – 44,5 mm available on request.

Supply includes:
KUB Quatron® drill with clamping screw and screwdriver; insert not included.

● = Recommended
◐ = Alternative

D	Cylindrical shank d x l	Order No.	N	L	kg	Basic recommendation: Insert Order No. ▼▼ size	Basic recommendation: Insert ISO-Code	for workpiece material A	R	F	N	S	H	Spares: Clamping screw Order No. Article	Spares: Screwdriver Order No. Article
28,0	32x60	**U10 22800**	56	80	0,57										
28,5	32x60	**U10 22850**	58	82	0,58										
29,0	32x60	**U10 22900**	58	82	0,59										
29,5	32x60	**U10 22950**	59	84	0,60	**W83 32000.1584**	SOEX 090408-01 BK84	●			●				
30,0	32x60	**U10 23000**	60	89	0,63	**W83 32000.1579**	SOEX 090408-01 BK79		●			●		**N00 57261** S3575-15IP	**L05 00860** 15IP
31,0	32x60	**U10 23100**	62	91	0,65	**W83 32000.1561**	SOEX 090408-01 BK1			●			●		
31,5	32x60	**U10 23150**	64	93	0,66										
32,0	32x60	**U10 23200**	64	93	0,67										
33,0	32x60	**U10 23300**	66	95	0,73										
	40x68	**U10 33300**	66	95	1,02										
34,0	32x60	**U10 23400**	68	97	0,75										
	40x68	**U10 33400**	68	97	1,04										
35,0	32x60	**U10 23500**	70	99	0,78										
	40x68	**U10 33500**	70	99	1,07										
36,0	32x60	**U10 23600**	72	101	0,80										
	40x68	**U10 33600**	72	101	1,09										
37,0	32x60	**U10 23700**	74	113	0,89										
	40x68	**U10 33700**	74	113	1,18										
37,5	32x60	**U10 23750**	76	115	0,91										
	40x68	**U10 33750**	76	115	1,20										
38,0	32x60	**U10 23800**	76	115	0,92										
	40x68	**U10 33800**	76	115	1,21	**W83 44000.1884**	SOEX 120508-01 BK84	●			●				
39,0	32x60	**U10 23900**	78	117	0,95	**W83 44000.1879**	SOEX 120508-01 BK79		●			●		**N00 57301** S45100-20IP	**L05 00870** 20IP
	40x68	**U10 33900**	78	117	1,24	**W83 44000.1861**	SOEX 120508-01 BK1			●			●		
39,5	32x60	**U10 23950**	80	119	0,97										
	40x68	**U10 33950**	80	119	1,26										
40,0	32x60	**U10 24000**	80	119	0,99										
	40x68	**U10 34000**	80	119	1,28										
41,0	32x60	**U10 24100**	82	121	1,02										
	40x68	**U10 34100**	82	121	1,31										
42,0	32x60	**U10 24200**	84	123	1,06										
	40x68	**U10 34200**	84	123	1,35										
43,0	32x60	**U10 24300**	86	125	1,10										
	40x68	**U10 34300**	86	125	1,39										
44,0	32x60	**U10 24400**	88	127	1,14										
	40x68	**U10 34400**	88	127	1,43										

Technical Notes

Guideline values for solid drilling with U10 – 2 × D

Material group		Strength Rm N/mm²	Hardness HB	Material	Material example material code/DIN	Cutting speed v_c m/min	Max. feed f (mm/rev) Ø 28-33	Max. feed f (mm/rev) Ø 34-44
1.0	A	≤500		**non-alloy steels**	St37-2 / 1.0037, 9SMn28 /1.0715, St44-2 / 1.0044	300	0,12	0,14
2.0	A	500-900		**non-alloy / low alloy steels**	St52-2 / 1.0050, C55 / 1.0525, 16MnCr5 / 1.7131	250	0,20	0,25
2.1	A	<500		**lead alloys**	9SMnPb28 / 1.0718	300	0,25	0,30
3.0	A	>900		**non alloy / low alloy steels:** heat resostant structural, heat treated, nitride and tools steels	42CrMo4 / 1.7225, CK60 / 1.1221	200	0,20	0,25
4.0	A	>900		**high alloy steels**	X6CrMo4 / 1.2341, X165CrMoV12/1.2601	180	0,18	0,20
4.1	A			**high alloy steels**		80	–	–
5.0	S		250	**special alloys:** Inconel, Hastelloy, Nimonic,etc.	Inconel 718/2.4668, Nimonic 80A/2.4631	60	0,12	0,12
5.1	S	400		**titanium, titanium alloys**	TiAl5Sn2 / 3.7114	80	0,12	0,12
6.0	R	≤600		**stainless steels**	X2CrNi189 / 1.4306, X5CrNiMo1810/ 1.4401	180	0,14	0,16
6.1	R	<900		**stainless steels**	X8CrNb17/1.4511, X10CrNiMoTi1810/ 1.4571	160	0,16	0,20
7.0	R	>900		**stainless / fireproof steels**	X20Cr13 / 1.4021, X40Cr13 / 1.4034	160	0,12	0,14
8.0	F		180	**gray cast iron**	GG-25/0.6025, GG-35/0.6035	200	0,30	0,30
8.1	F		250	**alloy gray cast iron**	GG-NiCr202 / 0.6660	160	0,20	0,25
9.0	F	≤600	130	**spheroidal, graphite cast iron, ferritic**	GGG-40 / 0.7040	180	0,20	0,25
9.1	F		230	**spheroidal graphite cast iron, ferritic/ perlitic**	GGG-50 / 0.7050 GGG-55 / 0.7055 GTW-55 / 0.8055	160	0,22	0,25
10.0	F	>600	250	**spheroidal graph. cast iron, perlitic, malleable iron**	GGG-60 / 0.7060 GTS-65 / 0.8165	140	0,22	0,25
10.1	F		200	**alloyed spheroidal graphite cast iron**	GGG-NiCr20-2 / 0.7661	140	0,25	0,25
10.2	F		300	**vermicular cast iron**	GGV Ti < 0,2 GGV Ti > 0,2	120	0,20	0,25
12.0	N		90	**copper alloy, brass, lead-alloy bronze, lead bronze:** good cut	CuZn36Pb3 / 2.1182, G-CuPb15Sn / 2.1182	300	0,20	0,25
12.1	N		100	**copper alloy, brass, bronze:** average cut	CuZn40Al1 / 2.0550, E-Cu57 / 2.0060	400	0,12	0,15
13.0	N		60	**wrought aluminium alloys**	AlMg1 / 3.3315, AlMnCu / 3.0517	600	0,12	0,12
13.1	N		75	**cast alum. alloy:** Si-content <10% **magnesium alloy**	G-AlMg5 / 3.3561, G-AlSi9Mg / 3.2373	300	0,16	0,20
14.0	N		100	**cast alum.alloy:** Si-content >10%	G-AlSi10Mg / 3.2381	250	0,20	0,30
15.0	H	1400		**hardened steels** < 45 HRC		80	0,10	0,10
16.0	H	1800		**hardened steels** > 45 HRC		40	0,10	0,10

Alternative Inserts

for better chip control

D	Order No. ▼▼ size	ISO-Code	A	R	F	N	S	H
28,0 - 33,0	**W83 32000.1784**	SOEX 090408-13 BK84	◐					
	W83 32000.1779	SOEX 090408-13 BK79		◑				
34,0 - 44,0	**W83 44000.1984**	SOEX 120508-13 BK84	◐					
	W83 44000.1979	SOEX 120508-13 BK79		◑				

for better wear resistance

D	Order No. ▼▼ size	ISO-Code	A	R	F	N	S	H
28,0 - 33,0	**W83 32000.1569**	SOEX 090408-01 BK69	◐					
	W83 32000.1574	SOEX 090408-01 BK74		◑				
34,0 - 44,0	**W83 44000.1869**	SOEX 120508-01 BK69	◐					
	W83 44000.1874	SOEX 120508-01 BK74		◑				

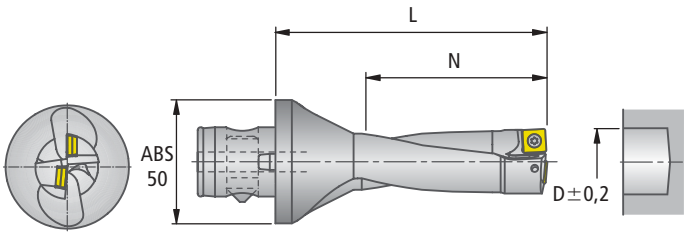
for greater strength

D	Order No. ▼▼ size	ISO-Code	A	R	F	N	S	H
28,0 - 33,0	**W83 32000.1579**	SOEX 090408-01 BK79	◐					
	W83 32000.1569	SOEX 090408-01 BK69			◑			
34,0 - 44,0	**W83 44000.1879**	SOEX 120508-01 BK79	◐					
	W83 44000.1869	SOEX 120508-01 BK69			◑			

Important: See page 24 for application details and safety notes !

KUB Quatron® U11 Ø 14 – 27 mm

with ABS® connection
drilling depth up to 3 × D – R.H. cutting



● = Recommended
◐ = Alternative

D	Max. dia. with offset.	ABS size d	Order No.	N	L	kg	Basic recommendation: Insert -01 / -13, Order No. ▼▼ size	Basic recommendation: ISO-Code	Basic recommendation: for workpiece material A R F N S H	Spares: Clamping screw Order No. Article	Spares: Screwdriver Order No. Article
14,0	14,5	50	**U11 51400**	42	77	0,47					
15,0	15,5	50	**U11 51500**	45	80	0,47					
15,5	16,0	50	**U11 51550**	48	83	0,47	**W83 13000.0284**	SOEX 050204-13 BK84	● ●	**N00 56041** S/M2x4,3-6IP	**L05 00810** 6IP
16,0	16,5	50	**U11 51600**	48	83	0,48	**W83 13000.0279**	SOEX 050204-13 BK79	● ●		
17,0	17,5	50	**U11 51700**	51	86	0,48	**W83 13000.0161**	SOEX 050204-01 BK1	● ●		
17,5	18,0	50	**U11 51750**	54	89	0,49					
18,0	18,5	50	**U11 51800**	54	89	0,49					
18,5	19,0	50	**U11 51850**	57	92	0,50					
19,0	19,5	50	**U11 51900**	57	92	0,48	**W83 18000.1084**	SOEX 060306-13 BK84	● ●	**N00 57553** S/M2,2x5,5-6IP	**L05 00810** 6IP
19,5	20,0	50	**U11 51950**	60	95	0,51	**W83 18000.1079**	SOEX 060306-13 BK79	● ●		
20,0	20,5	50	**U11 52000**	60	95	0,52	**W83 18000.0961**	SOEX 060306-01 BK1	● ●		
20,5	21,0	50	**U11 52050**	63	98	0,52					
21,0	21,5	50	**U11 52100**	63	98	0,53					
22,0	22,5	50	**U11 52200**	66	101	0,52					
22,5	23,0	50	**U11 52250**	69	104	0,56					
23,0	23,5	50	**U11 52300**	69	104	0,59					
24,0	24,5	50	**U11 52400**	72	107	0,60	**W83 23000.0284**	SOEX 07T308-13 BK84	● ●	**N00 57571** S/M2,5x6,3-8IP	**L05 00830** 8IP
24,5	25,0	50	**U11 52450**	75	110	0,60	**W83 23000.0279**	SOEX 07T308-13 BK79	● ●		
25,0	25,5	50	**U11 52500**	75	110	0,60	**W83 23000.0161**	SOEX 07T308-01 BK1	● ●		
26,0	26,5	50	**U11 52600**	78	113	0,61					
26,5	27,0	50	**U11 52650**	81	116	0,63					
27,0	27,5	50	**U11 52700**	81	116	0,63					

For other diameters see page 14

Note:
Any intermediate dimensions from Ø 14 – 44,5 mm available on request.

Supply includes:
KUB Quatron® drill with clamping screw and screwdriver; insert not included.

Technical Notes

Guideline values for solid drilling with U11 – 3 × D

Material group		Strength Rm N/mm²	Hardness HB	Material	Material example material code/DIN	Cutting speed v_c m/min	Max. feed f (mm/rev) Ø 14-15,9	Ø 16-17,5	Ø 17,6-21,5	Ø 21,6-27
1.0	A	≤500		**non-alloy steels**	St37-2 / 1.0037, 9SMn28 /1.0715, St44-2 / 1.0044	300	0,10	0,12	0,12	0,14
2.0	A	500-900		**non-alloy / low alloy steels**	St52-2 / 1.0050, C55 / 1.0525, 16MnCr5 / 1.7131	250	0,12	0,14	0,16	0,20
2.1	A	<500		**lead alloys**	9SMnPb28 / 1.0718	300	0,14	0,16	0,18	0,25
3.0	A	>900		**non alloy / low alloy steels:** heat resostant structural, heat treated, nitride and tools steels	42CrMo4 / 1.7225, CK60 / 1.1221	200	0,14	0,16	0,18	0,20
4.0	A	>900		**high alloy steels**	X6CrMo4 / 1.2341, X165CrMoV12/1.2601	180	0,10	0,12	0,14	0,18
4.1	A			**high alloy steels**		80	0,08	0,10	0,12	0,14
5.0	S		250	**special alloys:** Inconel, Hastelloy, Nimonic,etc.	Inconel 718/2.4668, Nimonic 80A/2.4631	60	0,06	0,08	0,10	0,12
5.1	S	400		**titanium, titanium alloys**	TiAl5Sn2 / 3.7114	80	0,06	0,08	0,10	0,12
6.0	R	≤600		**stainless steels**	X2CrNi189 / 1.4306, X5CrNiMo1810/ 1.4401	180	0,08	0,10	0,12	0,14
6.1	R	<900		**stainless steels**	X8CrNb17/1.4511, X10CrNiMoTi1810/ 1.4571	160	0,08	0,08	0,12	0,16
7.0	R	>900		**stainless / fireproof steels**	X20Cr13 / 1.4021, X40Cr13 / 1.4034	160	0,06	0,08	0,10	0,12
8.0	F		180	**gray cast iron**	GG-25/0.6025, GG-35/0.6035	200	0,16	0,16	0,25	0,30
8.1	F		250	**alloy gray cast iron**	GG-NiCr202 / 0.6660	160	0,14	0,16	0,18	0,20
9.0	F	≤600	130	**spheroidal, graphite cast iron, ferritic**	GGG-40 / 0.7040	180	0,14	0,16	0,18	0,20
9.1	F		230	**spheroidal graphite cast iron, ferritic/ perlitic**	GGG-50 / 0.7050 GGG-55 / 0.7055 GTW-55 / 0.8055	160	0,14	0,16	0,18	0,22
10.0	F	>600	250	**spheroidal graph. cast iron, perlitic, malleable iron**	GGG-60 / 0.7060 GTS-65 / 0.8165	140	0,14	0,16	0,18	0,22
10.1	F		200	**alloyed spheroidal graphite cast iron**	GGG-NiCr20-2 / 0.7661	140	0,14	0,16	0,18	0,22
10.2	F		300	**vermicular cast iron**	GGV Ti < 0,2 GGV Ti > 0,2	120	0,10	0,12	0,16	0,20
12.0	N		90	**copper alloy, brass, lead-alloy bronze, lead bronze:** good cut	CuZn36Pb3 / 2.1182, G-CuPb15Sn / 2.1182	300	0,12	0,14	0,16	0,25
12.1	N		100	**copper alloy, brass, bronze:** average cut	CuZn40Al1 / 2.0550, E-Cu57 / 2.0060	400	0,08	0,08	0,10	0,12
13.0	N		60	**wrought aluminium alloys**	AlMg1 / 3.3315, AlMnCu / 3.0517	600	0,08	0,08	0,10	0,12
13.1	N		75	**cast alum. alloy:** Si-content <10% **magnesium alloy**	G-AlMg5 / 3.3561, G-AlSi9Mg / 3.2373	300	0,10	0,12	0,14	0,16
14.0	N		100	**cast alum.alloy:** Si-content >10%	G-AlSi10Mg / 3.2381	250	0,10	0,12	0,14	0,20
15.0	H	1400		**hardened steels** < 45 HRC		80	0,05	0,05	0,08	0,10
16.0	H	1800		**hardened steels** > 45 HRC		40	0,05	0,05	0,08	0,10

Alternative Inserts

for better chip control

D	Order No. ▼▼ size	ISO-Code	for workpiece material A	R	F	N	S	H
14,0 - 17,5	**W83 13000.0184**	SOEX 050204-01 BK84	◐					
	W83 13000.0179	SOEX 050204-01 BK79		◑				
18,0 - 21,5	**W83 18000.0984**	SOEX 060306-01 BK84	◐					
	W83 18000.0979	SOEX 060306-01 BK79		◑				
22,0 - 27,0	**W83 23000.0184**	SOEX 07T308-01 BK84	◐					
	W83 23000.0179	SOEX 07T308-01 BK79		◑				

for better wear resistance

D	Order No. ▼▼ size	ISO-Code	for workpiece material A	R	F	N	S	H
14,0 - 17,5	**W83 13000.0269**	SOEX 050204-13 BK69	◐					
	W83 13000.0274	SOEX 050204-13 BK74		◑				
18,0 - 21,5	**W83 18000.1069**	SOEX 060306-13 BK69	◐					
	W83 18000.1074	SOEX 060306-13 BK74		◑				
22,0 - 27,0	**W83 23000.0269**	SOEX 07T308-13 BK69	◐					
	W83 23000.0274	SOEX 07T308-13 BK74		◑				

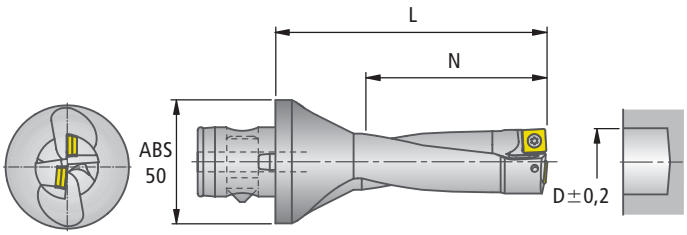
for greater strength

D	Order No. ▼▼ size	ISO-Code	for workpiece material A	R	F	N	S	H
14,0 - 17,5	**W83 13000.0279**	SOEX 050204-13 BK79	◐					
	W83 13000.0269	SOEX 050204-13 BK69			◑			
18,0 - 21,5	**W83 18000.1079**	SOEX 060306-13 BK79	◐					
	W83 18000.1069	SOEX 060306-13 BK69			◑			
22,0 - 27,0	**W83 23000.0279**	SOEX 07T308-13 BK79	◐					
	W83 23000.0269	SOEX 07T308-13 BK69			◑			

Important: See page 24 for application details and safety notes !

KUB Quatron® U11 Ø 28 – 44 mm

with ABS® connection
drilling depth up to 3 × D – R.H. cutting



● = Recommended
◐ = Alternative

D	Max. dia. with offset.	ABS size d	Order No.	N	L	kg	Basic recommendation: Insert -01 -13 Order No. ▼▼ size	Basic recommendation: Insert ISO-Code	Basic recommendation: for workpiece material A R F N S H	Spares: Clamping screw Order No. Article	Spares: Screwdriver Order No. Article
28,0	28,5	50	**U11 52800**	84	119	0,65					
28,5	29,0	50	**U11 52850**	87	122	0,67					
29,0	29,5	50	**U11 52900**	87	122	0,67					
29,5	30,0	50	**U11 52950**	88,5	125	0,69	**W83 32000.1784**	SOEX 090408-13 BK84	● ◐	**N00 57261** S3575-15IP	**L05 00860** 15IP
30,0	30,5	50	**U11 53000**	90	130	0,79	**W83 32000.1779**	SOEX 090408-13 BK79	◐ ●		
31,0	31,5	50	**U11 53100**	93	133	0,79	**W83 32000.1561**	SOEX 090408-01 BK1	◐ ●		
31,5	32,0	50	**U11 53150**	96	136	0,78					
32,0	32,5	50	**U11 53200**	96	136	0,80					
33,0	33,5	50	**U11 53300**	99	139	0,84					
34,0	34,5	50	**U11 53400**	102	142	0,85					
35,0	35,5	50	**U11 53500**	105	145	0,89					
36,0	36,5	50	**U11 53600**	108	148	0,93					
37,0	37,5	50	**U11 53700**	111	161	1,04					
37,5	38,0	50	**U11 53750**	114	164	1,02					
38,0	38,5	50	**U11 53800**	114	164	1,08	**W83 44000.1984**	SOEX 120508-13 BK84	● ◐	**N00 57301** S45100-20IP	**L05 00870** 20IP
39,0	39,5	50	**U11 53900**	117	167	1,13	**W83 44000.1979**	SOEX 120508-13 BK79	◐ ●		
39,5	40,0	50	**U11 53950**	120	170	1,14	**W83 44000.1861**	SOEX 120508-01 BK1	◐ ●		
40,0	40,5	50	**U11 54000**	120	170	1,17					
41,0	41,5	50	**U11 54100**	123	173	1,22					
42,0	42,5	50	**U11 54200**	126	176	1,27					
43,0	43,5	50	**U11 54300**	129	179	1,33					
44,0	44,5	50	**U11 54400**	132	182	1,41					

For other diameters see page 12

Note:
Any intermediate dimensions from Ø 14 – 44,5 mm available on request.

Supply includes:
KUB Quatron® drill with clamping screw and screwdriver; insert not included.

Technical Notes

Guideline values for solid drilling with U11 – 3 × D

Material group		Strength Rm N/mm²	Hardness HB	Material	Material example material code/DIN	Cutting speed v_c m/min	Max. feed f (mm/rev) Ø 28-33	Max. feed f (mm/rev) Ø 34-44
1.0	A	≤500		**non-alloy steels**	St37-2 / 1.0037, 9SMn28 /1.0715, St44-2 / 1.0044	300	0,12	0,14
2.0	A	500-900		**non-alloy / low alloy steels**	St52-2 / 1.0050, C55 / 1.0525, 16MnCr5 / 1.7131	250	0,20	0,25
2.1	A	<500		**lead alloys**	9SMnPb28 / 1.0718	300	0,25	0,30
3.0	A	>900		**non alloy / low alloy steels:** heat resostant structural, heat treated, nitride and tools steels	42CrMo4 / 1.7225, CK60 / 1.1221	200	0,20	0,25
4.0	A	>900		**high alloy steels**	X6CrMo4 / 1.2341, X165CrMoV12/1.2601	180	0,18	0,20
4.1	A			**high alloy steels**		80	–	–
5.0	S		250	**special alloys:** Inconel, Hastelloy, Nimonic,etc.	Inconel 718/2.4668, Nimonic 80A/2.4631	60	0,12	0,12
5.1	S	400		**titanium, titanium alloys**	TiAl5Sn2 / 3.7114	80	0,12	0,12
6.0	R	≤600		**stainless steels**	X2CrNi189 / 1.4306, X5CrNiMo1810/ 1.4401	180	0,14	0,16
6.1	R	<900		**stainless steels**	X8CrNb17/1.4511, X10CrNiMoTi1810/ 1.4571	160	0,16	0,20
7.0	R	>900		**stainless / fireproof steels**	X20Cr13 / 1.4021, X40Cr13 / 1.4034	160	0,12	0,14
8.0	F		180	**gray cast iron**	GG-25/0.6025, GG-35/0.6035	200	0,30	0,30
8.1	F		250	**alloy gray cast iron**	GG-NiCr202 / 0.6660	160	0,20	0,25
9.0	F	≤600	130	**spheroidal, graphite cast iron, ferritic**	GGG-40 / 0.7040	180	0,20	0,25
9.1	F		230	**spheroidal graphite cast iron, ferritic/ perlitic**	GGG-50 / 0.7050 GGG-55 / 0.7055 GTW-55 / 0.8055	160	0,22	0,25
10.0	F	>600	250	**spheroidal graph. cast iron, perlitic, malleable iron**	GGG-60 / 0.7060 GTS-65 / 0.8165	140	0,22	0,25
10.1	F		200	**alloyed spheroidal graphite cast iron**	GGG-NiCr20-2 / 0.7661	140	0,25	0,25
10.2	F		300	**vermicular cast iron**	GGV Ti < 0,2 GGV Ti > 0,2	120	0,20	0,25
12.0	N		90	**copper alloy, brass, lead-alloy bronze, lead bronze:** good cut	CuZn36Pb3 / 2.1182, G-CuPb15Sn / 2.1182	300	0,20	0,25
12.1	N		100	**copper alloy, brass, bronze:** average cut	CuZn40Al1 / 2.0550, E-Cu57 / 2.0060	400	0,12	0,15
13.0	N		60	**wrought aluminium alloys**	AlMg1 / 3.3315, AlMnCu / 3.0517	600	0,12	0,12
13.1	N		75	**cast alum. alloy:** Si-content <10% **magnesium alloy**	G-AlMg5 / 3.3561, G-AlSi9Mg / 3.2373	300	0,16	0,20
14.0	N		100	**cast alum.alloy:** Si-content >10%	G-AlSi10Mg / 3.2381	250	0,20	0,30
15.0	H	1400		**hardened steels** < 45 HRC		80	0,10	0,10
16.0	H	1800		**hardened steels** > 45 HRC		40	0,10	0,10

Alternative Inserts

for better chip control

D	Order No. ▼▼ size	ISO-Code	A	R	F	N	S	H
	Insert -01 -13		for workpiece material					
28,0 - 33,0	**W83 32000.1584**	SOEX 090408-01 BK84	◐					
	W83 32000.1579	SOEX 090408-01 BK79		◑				
34,0 - 44,0	**W83 44000.1884**	SOEX 120508-01 BK84	◐					
	W83 44000.1879	SOEX 120508-01 BK79		◑				

for better wear resistance

D	Order No. ▼▼ size	ISO-Code	A	R	F	N	S	H
	Insert -01 -13		for workpiece material					
28,0 - 33,0	**W83 32000.1769**	SOEX 090408-13 BK69	◐					
	W83 32000.1774	SOEX 090408-13 BK74		◑				
34,0 - 44,0	**W83 44000.1969**	SOEX 120508-13 BK69	◐					
	W83 44000.1974	SOEX 120508-13 BK74		◑				

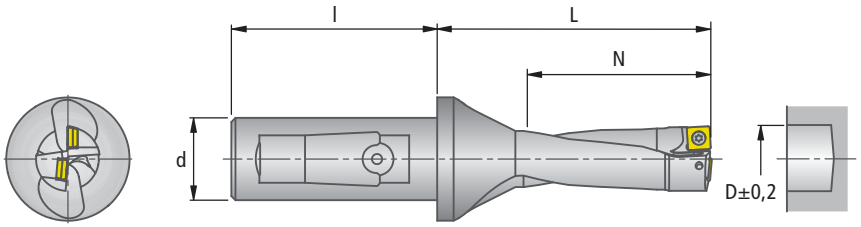
for greater strength

D	Order No. ▼▼ size	ISO-Code	A	R	F	N	S	H
	Insert -01 -13		for workpiece material					
28,0 - 33,0	**W83 32000.1779**	SOEX 090408-13 BK79	◐					
	W83 32000.1769	SOEX 090408-13 BK69			◐			
34,0 - 44,0	**W83 44000.1979**	SOEX 120508-13 BK79	◐					
	W83 44000.1969	SOEX 120508-13 BK69			◐			

Important: See page 24 for application details and safety notes !

KUB Quatron® U11 Ø 14 – 27 mm

Combination Shank DIN 6535 HE (similar to 1835 E) and 6595
drilling depth up to 3 × D – R.H. cutting



● = Recommended
◐ = Alternative

D	Cylindrical shank d x l	Order No.	N	L	kg	Basic recommendation: Insert -01 -13 Order No. ▼▼ size	Basic recommendation: Insert ISO-Code	for workpiece material A R F N S H	Spares: Clamping screw Order No. Article	Spares: Screwdriver Order No. Article
14,0	20x50	**U11 61400**	42	66	0,18					
15,0	20x50	**U11 61500**	45	69	0,19					
15,5	20x50	**U11 61550**	48	72	0,19	**W83 13000.0284**	SOEX 050204-13 BK84	● ◐	**N00 56041** S/M2x4,3-6IP	**L05 00810** 6IP
16,0	20x50	**U11 61600**	48	72	0,20	**W83 13000.0279**	SOEX 050204-13 BK79	◐ ●		
17,0	20x50	**U11 61700**	51	75	0,20	**W83 13000.0161**	SOEX 050204-01 BK1	● ◐		
17,5	25x56	**U11 71750**	54	78	0,28					
18,0	25x56	**U11 71800**	54	78	0,28					
18,5	25x56	**U11 71850**	57	81	0,29					
19,0	25x56	**U11 71900**	57	81	0,29	**W83 18000.1084**	SOEX 060306-13 BK84	● ◐	**N00 57553** S/M2,2x5,5-6IP	**L05 00810** 6IP
19,5	25x56	**U11 71950**	60	84	0,30	**W83 18000.1079**	SOEX 060306-13 BK79	◐ ●		
20,0	25x56	**U11 72000**	60	84	0,31	**W83 18000.0961**	SOEX 060306-01 BK1	● ◐		
20,5	25x56	**U11 72050**	63	87	0,31					
21,0	25x56	**U11 72100**	63	87	0,32					
22,0	25x56	**U11 72200**	66	90	0,33					
22,5	25x56	**U11 72250**	69	93	0,34					
23,0	25x56	**U11 72300**	69	93	0,35					
24,0	32x60	**U11 82400**	72	96	0,55	**W83 23000.0284**	SOEX 07T308-13 BK84	● ◐	**N00 57571** S/M2,5x6,3-8IP	**L05 00830** 8IP
24,5	32x60	**U11 82450**	75	99	0,56	**W83 23000.0279**	SOEX 07T308-13 BK79	◐ ●		
25,0	32x60	**U11 82500**	75	99	0,56	**W83 23000.0161**	SOEX 07T308-01 BK1	● ◐		
26,0	32x60	**U11 82600**	78	102	0,58					
26,5	32x60	**U11 82650**	81	105	0,60					
27,0	32x60	**U11 82700**	81	105	0,61					

For other diameters see page 18

Note:
Any intermediate dimensions from Ø 14 – 44,5 mm available on request.

Supply includes:
KUB Quatron® drill with clamping screw and screwdriver; insert not included.

Technical Notes

Guideline values for solid drilling with U11 – 3 × D

Material group		Strength Rm N/mm²	Hardness HB	Material	Material example material code/DIN	Cutting speed v_c m/min	Max. feed f (mm/rev) Ø 14-15,9	Ø 16-17,5	Ø 17,6-21,5	Ø 21,6-27
1.0	A	≤500		**non-alloy steels**	St37-2 / 1.0037, 9SMn28 /1.0715, St44-2 / 1.0044	300	0,10	0,12	0,12	0,14
2.0	A	500-900		**non-alloy / low alloy steels**	St52-2 / 1.0050, C55 / 1.0525, 16MnCr5 / 1.7131	250	0,12	0,14	0,16	0,20
2.1	A	<500		**lead alloys**	9SMnPb28 / 1.0718	300	0,14	0,16	0,18	0,25
3.0	A	>900		**non alloy / low alloy steels:** heat resostant structural, heat treated, nitride and tools steels	42CrMo4 / 1.7225, CK60 / 1.1221	200	0,14	0,16	0,18	0,20
4.0	A	>900		**high alloy steels**	X6CrMo4 / 1.2341, X165CrMoV12/1.2601	180	0,10	0,12	0,14	0,18
4.1	A			**high alloy steels**		80	0,08	0,10	0,12	0,14
5.0	S		250	**special alloys:** Inconel, Hastelloy, Nimonic,etc.	Inconel 718/2.4668, Nimonic 80A/2.4631	60	0,06	0,08	0,10	0,12
5.1	S	400		**titanium, titanium alloys**	TiAl5Sn2 / 3.7114	80	0,06	0,08	0,10	0,12
6.0	R	≤600		**stainless steels**	X2CrNi189 / 1.4306, X5CrNiMo1810/ 1.4401	180	0,08	0,10	0,12	0,14
6.1	R	<900		**stainless steels**	X8CrNb17/1.4511, X10CrNiMoTi1810/ 1.4571	160	0,08	0,08	0,12	0,16
7.0	R	>900		**stainless / fireproof steels**	X20Cr13 / 1.4021, X40Cr13 / 1.4034	160	0,06	0,08	0,10	0,12
8.0	F		180	**gray cast iron**	GG-25/0.6025, GG-35/0.6035	200	0,16	0,16	0,25	0,30
8.1	F		250	**alloy gray cast iron**	GG-NiCr202 / 0.6660	160	0,14	0,16	0,18	0,20
9.0	F	≤600	130	**spheroidal, graphite cast iron, ferritic**	GGG-40 / 0.7040	180	0,14	0,16	0,18	0,20
9.1	F		230	**spheroidal graphite cast iron, ferritic/ perlitic**	GGG-50 / 0.7050 GGG-55 / 0.7055 GTW-55 / 0.8055	160	0,14	0,16	0,18	0,22
10.0	F	>600	250	**spheroidal graph. cast iron, perlitic, malleable iron**	GGG-60 / 0.7060 GTS-65 / 0.8165	140	0,14	0,16	0,18	0,22
10.1	F		200	**alloyed spheroidal graphite cast iron**	GGG-NiCr20-2 / 0.7661	140	0,14	0,16	0,18	0,22
10.2	F		300	**vermicular cast iron**	GGV Ti < 0,2 GGV Ti > 0,2	120	0,10	0,12	0,16	0,20
12.0	N		90	**copper alloy, brass, lead-alloy bronze, lead bronze:** good cut	CuZn36Pb3 / 2.1182, G-CuPb15Sn / 2.1182	300	0,12	0,14	0,16	0,25
12.1	N		100	**copper alloy, brass, bronze:** average cut	CuZn40Al1 / 2.0550, E-Cu57 / 2.0060	400	0,08	0,08	0,10	0,12
13.0	N		60	**wrought aluminium alloys**	AlMg1 / 3.3315, AlMnCu / 3.0517	600	0,08	0,08	0,10	0,12
13.1	N		75	**cast alum. alloy:** Si-content <10% **magnesium alloy**	G-AlMg5 / 3.3561, G-AlSi9Mg / 3.2373	300	0,10	0,12	0,14	0,16
14.0	N		100	**cast alum.alloy:** Si-content >10%	G-AlSi10Mg / 3.2381	250	0,10	0,12	0,14	0,20
15.0	H	1400		**hardened steels** < 45 HRC		80	0,05	0,05	0,08	0,10
16.0	H	1800		**hardened steels** > 45 HRC		40	0,05	0,05	0,08	0,10

Alternative Inserts

for better chip control

D	Order No. ▼▼ size	ISO-Code	for workpiece material A	R	F	N	S	H
14,0 - 17,5	**W83 13000.0184**	SOEX 050204-01 BK84	◐					
	W83 13000.0179	SOEX 050204-01 BK79		◑				
18,0 - 21,5	**W83 18000.0984**	SOEX 060306-01 BK84	◐					
	W83 18000.0979	SOEX 060306-01 BK79		◑				
22,0 - 27,0	**W83 23000.0184**	SOEX 07T308-01 BK84	◐					
	W83 23000.0179	SOEX 07T308-01 BK79		◑				

for better wear resistance

D	Order No. ▼▼ size	ISO-Code	for workpiece material A	R	F	N	S	H
14,0 - 17,5	**W83 13000.0269**	SOEX 050204-13 BK69	◐					
	W83 13000.0274	SOEX 050204-13 BK74		◑				
18,0 - 21,5	**W83 18000.1069**	SOEX 060306-13 BK69	◐					
	W83 18000.1074	SOEX 060306-13 BK74		◑				
22,0 - 27,0	**W83 23000.0269**	SOEX 07T308-13 BK69	◐					
	W83 23000.0274	SOEX 07T308-13 BK74		◑				

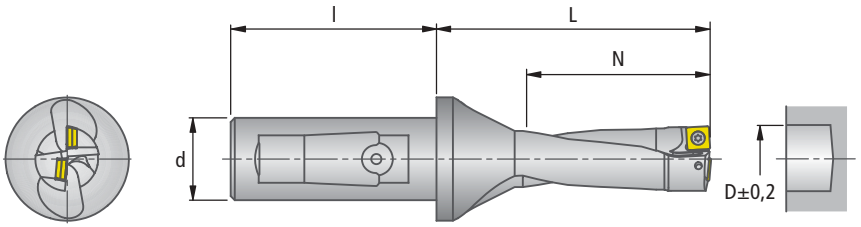
for greater strength

D	Order No. ▼▼ size	ISO-Code	for workpiece material A	R	F	N	S	H
14,0 - 17,5	**W83 13000.0279**	SOEX 050204-13 BK79	◐					
	W83 13000.0269	SOEX 050204-13 BK69			◑			
18,0 - 21,5	**W83 18000.1079**	SOEX 060306-13 BK79	◐					
	W83 18000.1069	SOEX 060306-13 BK69			◑			
22,0 - 27,0	**W83 23000.0279**	SOEX 07T308-13 BK79	◐					
	W83 23000.0269	SOEX 07T308-13 BK69			◑			

Important: See page 24 for application details and safety notes !

KUB Quatron® U11 Ø 28 – 44 mm

Combination Shank DIN 6535 HE (similar to 1835 E) and 6595
drilling depth up to 3 × D – R.H. cutting



Note: Any intermediate dimensions from Ø 14 – 44,5 mm available on request.

For other diameters see page 16

Supply includes:
KUB Quatron® drill with clamping screw and screwdriver; insert not included.

● = Recommended
◐ = Alternative

D	Cylindrical shank d x l	Order No.	N	L	kg	Basic recommendation: Insert -01 / -13 Order No. ▼▼ size	Basic recommendation: Insert ISO-Code	for workpiece material A R F N S H	Spares: Clamping screw Order No. Article	Spares: Screwdriver Order No. Article
28,0	32x60	**U11 82800**	84	108	0,63					
28,5	32x60	**U11 82850**	87	111	0,65					
29,0	32x60	**U11 82900**	87	111	0,66					
29,5	32x60	**U11 82950**	88,5	114	0,67	**W83 32000.1784**	SOEX 090408-13 BK84	● ●	**N00 57261** S3575-15IP	**L05 00860** 15IP
30,0	32x60	**U11 83000**	90	119	0,70	**W83 32000.1779**	SOEX 090408-13 BK79	◐ ◐		
31,0	32x60	**U11 83100**	93	122	0,73	**W83 32000.1561**	SOEX 090408-01 BK1	◐ ◐		
31,5	32x60	**U11 83150**	96	125	0,75					
32,0	32x60	**U11 83200**	96	125	0,76					
33,0	32x60	**U11 83300**	99	128	0,83					
	40x68	**U11 93300**	99	128	1,12					
34,0	32x60	**U11 83400**	102	131	0,86					
	40x68	**U11 93400**	102	131	1,15					
35,0	32x60	**U11 83500**	105	134	0,89					
	40x68	**U11 93500**	105	134	1,18					
36,0	32x60	**U11 83600**	108	137	0,93					
	40x68	**U11 93600**	108	137	1,22					
37,0	32x60	**U11 83700**	111	150	1,03					
	40x68	**U11 93700**	111	150	1,32					
37,5	32x60	**U11 83750**	114	153	1,06					
	40x68	**U11 93750**	114	153	1,35					
38,0	32x60	**U11 83800**	114	153	1,07					
	40x68	**U11 93800**	114	153	1,36	**W83 44000.1984**	SOEX 120508-13 BK84	● ●	**N00 57301** S45100-20IP	**L05 00870** 20IP
39,0	32x60	**U11 83900**	117	156	1,12	**W83 44000.1979**	SOEX 120508-13 BK79	◐ ◐		
	40x68	**U11 93900**	117	156	1,41	**W83 44000.1861**	SOEX 120508-01 BK1	◐ ◐		
39,5	32x60	**U11 83950**	120	159	1,15					
	40x68	**U11 93950**	120	159	1,44					
40,0	32x60	**U11 84000**	120	159	1,17					
	40x68	**U11 94000**	120	159	1,46					
41,0	32x60	**U11 84100**	123	162	1,22					
	40x68	**U11 94100**	123	162	1,51					
42,0	32x60	**U11 84200**	126	165	1,27					
	40x68	**U11 94200**	126	165	1,56					
43,0	32x60	**U11 84300**	129	168	1,33					
	40x68	**U11 94300**	129	168	1,62					
44,0	32x60	**U11 84400**	132	171	1,34					
	40x68	**U11 94400**	132	171	1,63					

Patent application

Technical Notes

Guideline values for solid drilling with U11 – 3 × D

Material group		Strength Rm N/mm²	Hardness HB	Material	Material example material code/DIN	Cutting speed v_c m/min	Max. feed f (mm/rev) Ø 28-33	Max. feed f (mm/rev) Ø 34-44
1.0	A	≤500		**non-alloy steels**	St37-2 / 1.0037, 9SMn28 /1.0715, St44-2 / 1.0044	300	0,12	0,14
2.0	A	500-900		**non-alloy / low alloy steels**	St52-2 / 1.0050, C55 / 1.0525, 16MnCr5 / 1.7131	250	0,20	0,25
2.1	A	<500		**lead alloys**	9SMnPb28 / 1.0718	300	0,25	0,30
3.0	A	>900		**non alloy / low alloy steels:** heat resostant structural, heat treated, nitride and tools steels	42CrMo4 / 1.7225, CK60 / 1.1221	200	0,20	0,25
4.0	A	>900		**high alloy steels**	X6CrMo4 / 1.2341, X165CrMoV12/1.2601	180	0,18	0,20
4.1	A			**high alloy steels**		80	–	–
5.0	S		250	**special alloys:** Inconel, Hastelloy, Nimonic,etc.	Inconel 718/2.4668, Nimonic 80A/2.4631	60	0,12	0,12
5.1	S	400		**titanium, titanium alloys**	TiAl5Sn2 / 3.7114	80	0,12	0,12
6.0	R	≤600		**stainless steels**	X2CrNi189 / 1.4306, X5CrNiMo1810/ 1.4401	180	0,14	0,16
6.1	R	<900		**stainless steels**	X8CrNb17/1.4511, X10CrNiMoTi1810/ 1.4571	160	0,16	0,20
7.0	R	>900		**stainless / fireproof steels**	X20Cr13 / 1.4021, X40Cr13 / 1.4034	160	0,12	0,14
8.0	F		180	**gray cast iron**	GG-25/0.6025, GG-35/0.6035	200	0,30	0,30
8.1	F		250	**alloy gray cast iron**	GG-NiCr202 / 0.6660	160	0,20	0,25
9.0	F	≤600	130	**spheroidal, graphite cast iron, ferritic**	GGG-40 / 0.7040	180	0,20	0,25
9.1	F		230	**spheroidal graphite cast iron, ferritic/ perlitic**	GGG-50 / 0.7050 GGG-55 / 0.7055 GTW-55 / 0.8055	160	0,22	0,25
10.0	F	>600	250	**spheroidal graph. cast iron, perlitic, malleable iron**	GGG-60 / 0.7060 GTS-65 / 0.8165	140	0,22	0,25
10.1	F		200	**alloyed spheroidal graphite cast iron**	GGG-NiCr20-2 / 0.7661	140	0,25	0,25
10.2	F		300	**vermicular cast iron**	GGV Ti < 0,2 GGV Ti > 0,2	120	0,20	0,25
12.0	N		90	**copper alloy, brass, lead-alloy bronze, lead bronze:** good cut	CuZn36Pb3 / 2.1182, G-CuPb15Sn / 2.1182	300	0,20	0,25
12.1	N		100	**copper alloy, brass, bronze:** average cut	CuZn40Al1 / 2.0550, E-Cu57 / 2.0060	400	0,12	0,15
13.0	N		60	**wrought aluminium alloys**	AlMg1 / 3.3315, AlMnCu / 3.0517	600	0,12	0,12
13.1	N		75	**cast alum. alloy:** Si-content <10% **magnesium alloy**	G-AlMg5 / 3.3561, G-AlSi9Mg / 3.2373	300	0,16	0,20
14.0	N		100	**cast alum.alloy:** Si-content >10%	G-AlSi10Mg / 3.2381	250	0,20	0,30
15.0	H	1400		**hardened steels** < 45 HRC		80	0,10	0,10
16.0	H	1800		**hardened steels** > 45 HRC		40	0,10	0,10

Alternative Inserts

for better chip control

D	Order No. ▼▼ size	ISO-Code	A	R	F	N	S	H
28,0 - 33,0	**W83 32000.1584**	SOEX 090408-01 BK84	◐					
	W83 32000.1579	SOEX 090408-01 BK79		◑				
34,0 - 44,0	**W83 44000.1884**	SOEX 120508-01 BK84	◐					
	W83 44000.1879	SOEX 120508-01 BK79		◑				

for better wear resistance

D	Order No. ▼▼ size	ISO-Code	A	R	F	N	S	H
28,0 - 33,0	**W83 32000.1769**	SOEX 090408-13 BK69	◐					
	W83 32000.1774	SOEX 090408-13 BK74		◑				
34,0 - 44,0	**W83 44000.1969**	SOEX 120508-13 BK69	◐					
	W83 44000.1974	SOEX 120508-13 BK74		◑				

for greater strength

D	Order No. ▼▼ size	ISO-Code	A	R	F	N	S	H
28,0 - 33,0	**W83 32000.1779**	SOEX 090408-13 BK79	◐					
	W83 32000.1769	SOEX 090408-13 BK69			◑			
34,0 - 44,0	**W83 44000.1979**	SOEX 120508-13 BK79	◐					
	W83 44000.1969	SOEX 120508-13 BK69			◑			

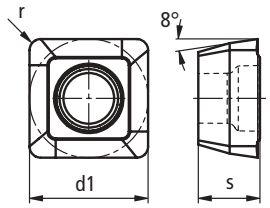
Important: See page 24 for application details and safety notes !

Inserts

KOMET® Inserts W83... (SOEX...) – effective and economic

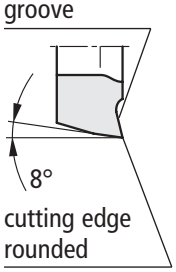
Insert W83

SOEX...-01 for KUB Quatron®
Ø 14 - 44 mm



Cutting edge geometry

sintered chip groove



Application area

- **solid drilling**
- **special tools**

Optimum solution for all roughing operations in which changeover accuracy of peripheral ground insert is not essential. Suitable for medium and strong steels and cast iron according to quality.

all-round geometry

Wear-resistant insert for universal use for internal and external cutting.

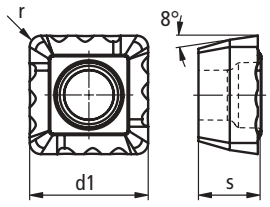
● available ex stock

Bore-Ø	ISO code	Order No.	Insert cutting material code	Cutting material: CVD coated BK1 **61**	CVD coated BK69 **69**	CVD coated BK74 **74**	PVD coated BK79 **79**	PVD coated BK84 **84**	d1	s	r
14,0-17,5	SOEX 050204-01	**W83 13000.01..**		●	●	●	●	●	5,56	2,38	0,4
> 17,5-21,5	SOEX 060306-01	**W83 18000.09..**		●	●	●	●	●	6,35	3,18	0,6
> 21,5-27,0	SOEX 07T308-01	**W83 23000.01..**		●	●	●	●	●	7,94	3,58	0,8
> 27,0-33,0	SOEX 090408-01	**W83 32000.15..**		●	●	●	●	●	9,52	4,37	0,8
> 33,0-44,0	SOEX 120508-01	**W83 44000.18..**		●	●	●	●	●	12,7	5,16	0,8

Order example: Cutting material type BK79 / Order No. W83 18000.0979

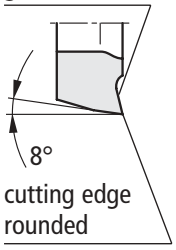
Insert W83

SOEX...-13 for KUB Quatron®
Ø 14 - 44 mm



Cutting edge geometry

sintered, highly positive chip groove



Application area

- **solid drilling**
- **special tools**

Optimum solution for steel with low carbon content and for stainless steels. Suitable for medium to high cutting speeds for internal and external cutting edge.

● available ex stock

Bore-Ø	ISO code	Order No.	Insert cutting material code	Cutting material: CVD coated BK69 **69**	CVD coated BK74 **74**	PVD coated BK79 **79**	PVD coated BK84 **84**	d1	s	r
14,0-17,5	SOEX 050204-13	**W83 13000.02..**		●	●	●	●	5,56	2,38	0,4
> 17,5-21,5	SOEX 060306-13	**W83 18000.10..**		●	●	●	●	6,35	3,18	0,6
> 21,5-27,0	SOEX 07T308-13	**W83 23000.02..**		●	●	●	●	7,94	3,58	0,8
> 27,0-33,0	SOEX 090408-13	**W83 32000.17..**		●	●	●	●	9,52	4,37	0,8
> 33,0-44,0	SOEX 120508-13	**W83 44000.19..**		●	●	●	●	12,7	5,16	0,8

Order example: Cutting material type BK84 / Order No. W83 23000.0284

The new insert

for drilling with minimum burring

Description / Advantages

- Has the advantages of our tried and tested KUB Quatron® inserts
- Minimum burrs created at bore entry and exit
- Compatible with standard tool body
- Suitable for any steel and cast iron materials
- Wear resistant cutting materials: PVD coatings BK79 and BK84

Applications

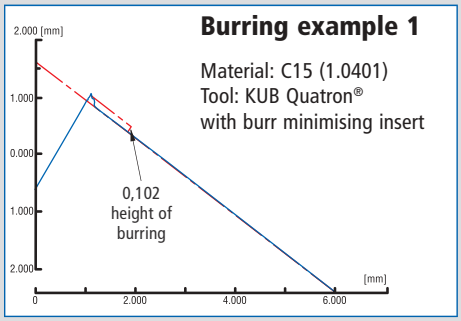
- Drive shaft machining
- Safe removal of disc produced during operation when drill is withdrawn
- Connecting rod machining C70 with minimised burring

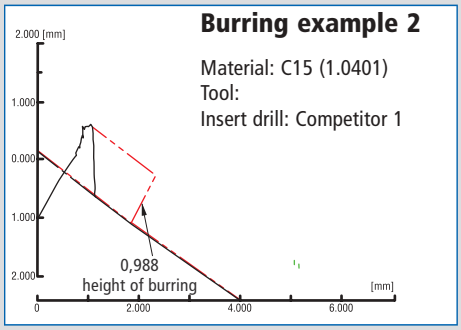
Application areas

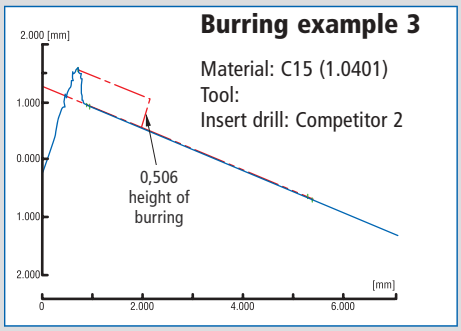
- Wherever burrs are created during drilling operations
- Can be used on KUB Quatron® U10 14–44 mm Ø
- Can be used on special tools

Important Note:

Because of design there is a nominal diameter reduction as shown in table below.



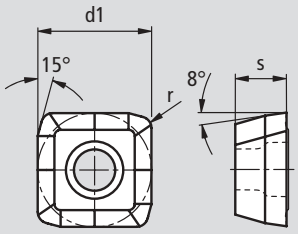




Insert W83

SOEX...-BM2

- with sintered chip guide step
- with clamping screw



▲ on request

- Cast iron, spheroidal graphite cast iron
- Non-ferrous metals
- Stainless steel
- Mild steel / tool steel

ISO code	Order No.	Carbide grade PVD coated BK79 79	Carbide grade PVD coated BK84 84	d1	s	r	Nominal Ø reduction for standard KUB Quatron Tool-Ø	Reduc.
SOEX 050204-BM2	**W83 13000.04..**	▲	▲	5,56	2,38	0,4	14,0 - 16,0	0,05
							16,1 - 17,5	0,08
SOEX 060306-BM2	**W83 18000.18..**	▲	▲	6,35	3,18	0,6	17,6 - 21,5	0,10
SOEX 07T308-BM2	**W83 23000.04..**	▲	▲	7,94	3,58	0,8	21,6 - 27,0	0,09
SOEX 090408-BM2	**W83 32000.21..**	▲	▲	9,52	4,37	0,8	27,1 - 33,0	0,11
SOEX 120508-BM2	**W83 44000.23..**	▲	▲	12,7	5,16	0,8	33,1 - 44,0	0,13

Insert cutting material code

Order example: ISO code SOEX 050204-BM2 / carbide grade BK84 / Order No.: W83 13000.0484

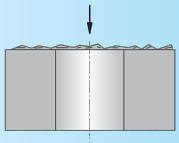
Patent application (insert)

Technical Notes
for KUB Quatron®

up to **2 × D**

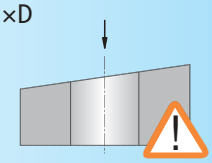
1 Starting on uneven surfaces (cast surfaces)

- subject to the surface, reduce feed as required when starting the bore



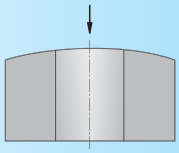
2 Starting on angled surfaces

- subject to the starting angle, the feed must be reduced when starting the bore.
  Rule of thumb:
  3° ≙ 30%
  10° ≙ 40%
  25° ≙ 60%
  } use tools max. 2×D
- use tough insert
- use stable corner radius



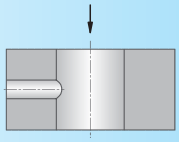
2.1 Starting on cambered surfaces

- no problems
- reduce feed rate if necessary



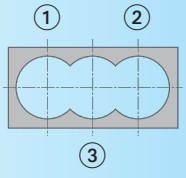
3 Drilling through a cross bore

- reduce feed rate 50% if necessary
- watch for chip jamming around tool
- use tough insert
- use stable corner radius



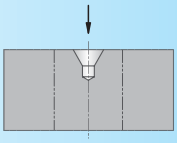
4 Drilling a chamber

- first bore Nos. ① + ②, then bore No. ③
- check distribution is symmetrical
- avoid chip jams
- if necessary reduce to approx. 1-1,5 mm in the Ø on circumference
- reduce feed rate 50% for interrupted cut
- use tough insert
- use stable corner radius



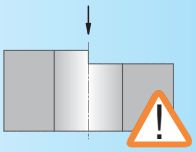
5 Starting on a groove or large centering bore

- use short tools, max. 3×D
- spot face if required
- reduce feed
- use tough insert for internal cutting edge



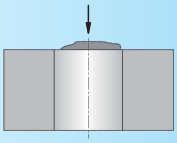
6 Starting on an edge

- reduce feed rate by 50%
- use tough insert
- use stable corner radius



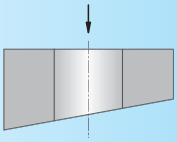
7 Starting on a welded seam

- reduce feed rate
- use max. 3×D tools



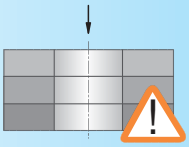
8 Angled bore exit

- from wear cut is interrupted reduce feed rate up to 50%
- use tough insert
- use stable corner radius



9 Drilling through stacked plates

- possible with KUB Quatron
- ***not possible*** with KUB / KUB Trigon
- good workpiece clamping necessary

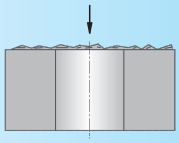


Technical Notes
for KUB Quatron®

up to **3 × D**

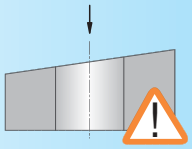
1 Starting on uneven surfaces (cast surfaces)

- subject to the surface, reduce feed as required for starting the bore



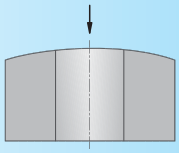
2 Starting on angled surfaces

- max. 3° angled position possible (cast angles)
- reduce feed rate when starting bore
- use stable corner radius



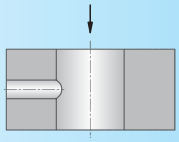
2.1 Starting on cambered surfaces

- no problems
- reduce feed rate if necessary



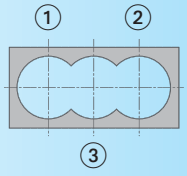
3 Drilling through a cross bore

- reduce feed rate 50% if necessary
- watch for chip jamming around tool
- use tough insert
- use stable corner radius



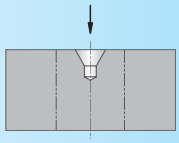
4 Drilling a chamber

- first bore Nos. ① + ②, then bore No. ③
- check distribution is symmetrical
- avoid chip jams
- if necessary reduce to approx. 1-1,5 mm in the Ø on circumference
- reduce feed rate 50% for interrupted cut
- use tough insert
- use stable corner radius



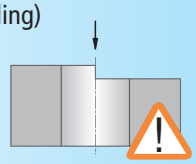
5 Starting on a groove or large centering bore

- use short tools, max. 3×D
- spot face if required
- reduce feed
- use tough insert for internal cutting edge



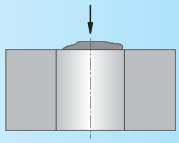
6 Starting on an edge

- ***not possible*** for 3×D tools
- because of the undefined surface for starting the bore, a pre-machining operation needs to be carried out (spot facing, face milling)
- then continue as described under Point 1



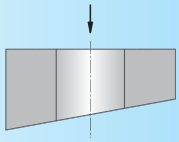
7 Starting on a welded seam

- reduce feed rate
- use max. 3×D tools



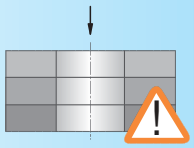
8 Angled bore exit

- from wear cut is interrupted reduce feed rate up to 50%
- use tough insert
- use stable corner radius



9 Drilling through stacked plates

- possible with KUB Quatron
- ***not possible*** with KUB / KUB Trigon
- good workpiece clamping necessary



Technical information

Application details and safety notes

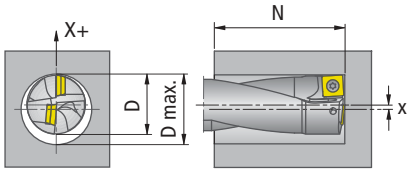
KUB Quatron®

- For stationary and rotating applications
- All KUB® drills have central coolant supply onto the cutting edge.
  Axial or radial supply for rotating tools (through coolant ring).
  Axial or radial coolant supply for stationary tools through clamping ring or NC adaptor.
  Use of coolant during drilling improves insert life, quietens the machining process and helps chip clearance. Coolant should always be used.
- Bores are larger than the nominal diameter because of axially offset drilling. Rigid machine conditions are therefore essential.

Safety Notes

- Note! On exit of the drill a disc as shown is ejected . In the case of rotating components there is an obvious risk of accidents. Please arrange suitable guarding for such applications.
- The application details shown depend on the environmental and application conditions (e.g. machine, ambient temperature, use of lubricant/coolant and the machining result required). These are subject to correct operating conditions, correct application and compliance with the spindle speed limits given for the tools.
- To avoid damage on the machine and tool, we recommend the necessary drive power be calculated beforehand. The actual stationary drive performance available can be taken from the machine manufacturer's spindle speed/performance diagram.
- Guarding should be provided to protect personnel from injury by flying chips.
- To ensure optimum tool life, change the inserts promptly.

Max. diameter for stationary application possible with offsetting toward X+



Nominal drill Ø **D**	for drilling depth N up to 3 × D **D max.**	max. adjustment **x**
14,0	14,5	0,25
15,0	15,5	0,25
15,5	16,0	0,25
16,0	16,5	0,25
17,0	17,5	0,25
17,5	18,0	0,25
18,0	18,5	0,25
18,5	19,0	0,25
19,0	19,5	0,25
19,5	20,0	0,25
20,0	20,5	0,25
20,5	21,0	0,25
21,0	21,5	0,25
22,0	22,5	0,25
22,5	23,0	0,25
23,0	23,5	0,25
24,0	24,5	0,25
24,5	25,0	0,25
25,0	25,5	0,25
26,0	26,5	0,25
26,5	27,0	0,25
27,0	27,5	0,25
28,0	28,5	0,25
28,5	29,0	0,25
29,0	29,5	0,25
29,5	30,0	0,25
30,0	30,5	0,25
31,0	31,5	0,25
31,5	32,0	0,25
32,0	32,5	0,25
33,0	33,5	0,25
34,0	34,5	0,25
35,0	35,5	0,25
36,0	36,5	0,25
37,0	37,5	0,25
37,5	38,0	0,25
38,0	38,5	0,25
39,0	39,5	0,25
39,5	40,0	0,25
40,0	40,5	0,25
41,0	41,5	0,25
42,0	42,5	0,25
43,0	43,5	0,25
44,0	44,5	0,25

Patents applied for (insert geometry)

Performance Calculation

Specific cutting force k_c for workpiece material

Material group		Strength Rm N/mm²	Hardness HB	Material	Material example material code/DIN	Specific cutting force k_c (N/mm²)
1.0	A	≤500		**non-alloy steels**	St37-2 / 1.0037, 9SMn28 /1.0715, St44-2 / 1.0044	1740
2.0	A	500-900		**non-alloy / low alloy steels**	St52-2 / 1.0050, C55 / 1.0525, 16MnCr5 / 1.7131	2060
2.1	A	<500		**lead alloys**	9SMnPb28 / 1.0718	1250
3.0	A	>900		**non alloy / low alloy steels:** heat resostant structural, heat treated, nitride and tools steels	42CrMo4 / 1.7225, CK60 / 1.1221	2450
4.0	A	>900		**high alloy steels**	X6CrMo4 / 1.2341, X165CrMoV12/1.2601	1820
4.1	A			**high alloy steels**		1860
5.0	S		250	**special alloys:** Inconel, Hastelloy, Nimonic,etc.	Inconel 718/2.4668, Nimonic 80A/2.4631	2090
5.1	S	400		**titanium, titanium alloys**	TiAl5Sn2 / 3.7114	1370
6.0	R	≤600		**stainless steels**	X2CrNi189 / 1.4306, X5CrNiMo1810/ 1.4401	2400
6.1	R	<900		**stainless steels**	X8CrNb17/1.4511, X10CrNiMoTi1810/ 1.4571	2530
7.0	R	>900		**stainless / fireproof steels**	X20Cr13 / 1.4021, X40Cr13 / 1.4034	2580
8.0	F		180	**gray cast iron**	GG-25/0.6025, GG-35/0.6035	1140
8.1	F		250	**alloy gray cast iron**	GG-NiCr202 / 0.6660	1280
9.0	F	≤600	130	**spheroidal, graphite cast iron, ferritic**	GGG-40 / 0.7040	1080
9.1	F		230	**spheroidal graphite cast iron, ferritic/ perlitic**	GGG-50 / 0.7050 GGG-55 / 0.7055 GTW-55 / 0.8055	1135
10.0	F	>600	250	**spheroidal graph. cast iron, perlitic, malleable iron**	GGG-60 / 0.7060 GTS-65 / 0.8165	1050
10.1	F		200	**alloyed spheroidal graphite cast iron**	GGG-NiCr20-2 / 0.7661	1180
10.2	F		300	**vermicular cast iron**	GGV Ti < 0,2 GGV Ti > 0,2	1050
12.0	N		90	**copper alloy, brass, lead-alloy bronze, lead bronze:** good cut	CuZn36Pb3 / 2.1182, G-CuPb15Sn / 2.1182	780
12.1	N		100	**copper alloy, brass, bronze:** average cut	CuZn40Al1 / 2.0550, E-Cu57 / 2.0060	780
13.0	N		60	**wrought aluminium alloys**	AlMg1 / 3.3315, AlMnCu / 3.0517	650
13.1	N		75	**cast alum. alloy:** Si-content <10% **magnesium alloy**	G-AlMg5 / 3.3561, G-AlSi9Mg / 3.2373	780
14.0	N		100	**cast alum.alloy:** Si-content >10%	G-AlSi10Mg / 3.2381	830
15.0	H	1400		**hardened steels** < 45 HRC		2880
16.0	H	1800		**hardened steels** > 45 HRC		3300

The machine power in kW

for the KUB drills is calculated by:

$$P = \frac{v_c \times f \times D \times k_c}{1000 \times 60 \times 4 \times \eta}$$

f = Feed in mm/rev.
k_c = Special cutting force in N/mm²
D = Diameter in mm
v_c = Cutting speed in m/min
η = Machine output 0,7 – 0,85 (0,8)

Example:
Material 42CrMo4
Bore 40 mm diameter
f = 0,15 mm/rev.
k_c = 2450 N/mm²
D = 40 mm
v_c = 180 m/min
η = 0,8

$$P = \frac{180 \times 0{,}15 \times 40 \times 2450}{1000 \times 60 \times 4 \times 0{,}8} = 13{,}8 \text{ kW}$$

The feed F_f required is approx.:

$$F_f \approx 0{,}7 \times \frac{D}{2} \times f \times k_c$$

f = 0,15 mm/rev.
k_c = 2450 N/mm²
D = 40 mm

$$F_f \approx 0{,}7 \times \frac{40}{2} \times 0{,}15 \times 2450 = 5145 \text{ N}$$

Note! The k_c values depend on the feed and its upper limiting values are shown in the table. Due to this it is possible that the calculated production performance is somewhat higher (~ 10 – 20%) than the actual production required. This is intended, due to the fluctuating efficiency as a safeguard against failure.

Important: See page 24 for application details and safety notes !

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