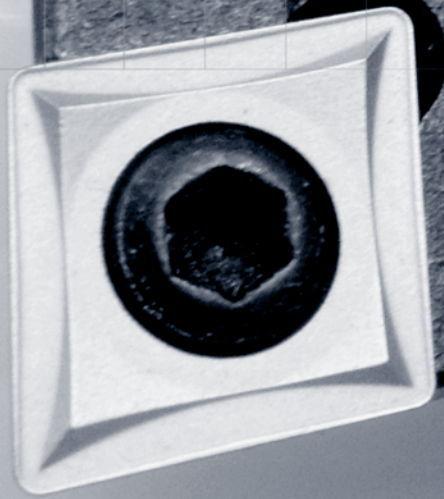
Boring heads

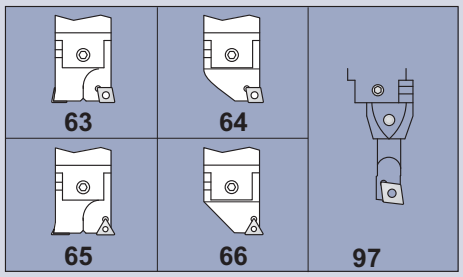


Boring heads

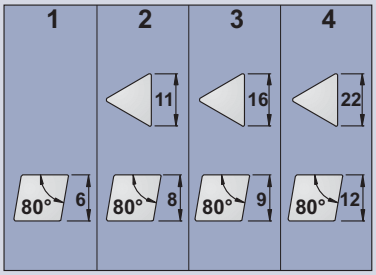
Boring heads

6 3	4	4	76	100 125
1	2	3	4	5

1



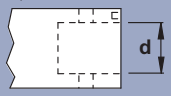
2



3

4

Diameter d, mm.



70	12	**74**	28
71	15	**75**	36
72	20	**76**	50
73	24	**77**	60

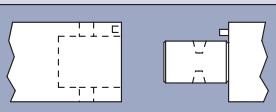
5

Cutting diameter (Min.-Max.), mm.

Arbors for Boring heads

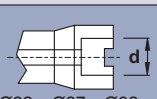
60	43	70	35
1	2	3	4

1



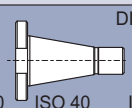
60

2



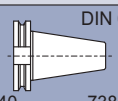
Ø16	Ø22	Ø27	Ø32	Ø40
16	**22**	**27**	**32**	**40**

ISO — DIN 2080



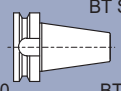
ISO 30	ISO 40	ISO 50
43	**44**	**45**

ISO 7388 — DIN 69871 A

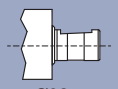


7388 40	7388 50
47	**48**

ISO — BT System



BT 40	BT 50
49	**50**

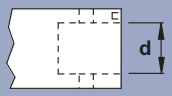


Ø25	Ø32	Ø40
62	**63**	**64**

Ø22	Ø27	Ø32	Ø42
70	**71**	**72**	**73**

3

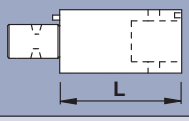
Diameter d, mm



70	12	**74**	28
71	15	**75**	36
72	20	**76**	50
73	24	**77**	60

4

Depth distance L, mm



Tools for Boring heads

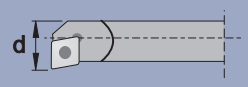
S	08	16	F	S	C	L	C	R	06
1	2	3	4	5	6	7	8	9	10

1

Type of bar
A Steel shank with coolant hole
H Heavy metal
J Heavy metal with coolant hole
S Steel shank

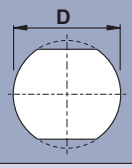
2

Minimum diameter, mm



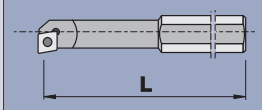
3

Shank diameter, mm



4

Bar length, mm



E	70	**I**	110
F	80	**J**	115
G	90	**X**	Special
H	100		

5

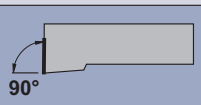
S

6

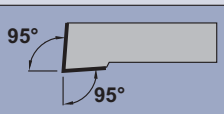
C

T

7



F



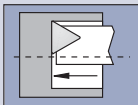
L

8

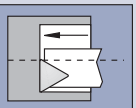
C

P

9



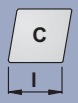
L



R

10

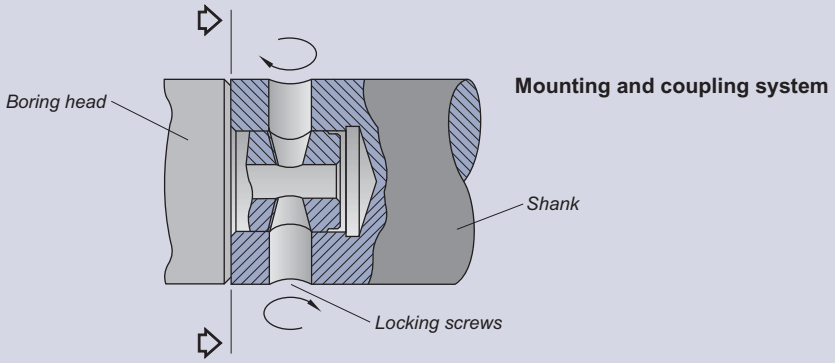
Cutting edge length, mm.



Inserts
Face milling cutters
Square shoulder cutters
Slot cutters
Porcupine cutters
Specific applications and Sets
Profile milling
Solid carbide
Drills
Boring heads

Boring heads

The boring heads are made of Nickel-Chrome alloy steel, with a core toughness of 113,786 to 128,000 lbs/in².
All the component parts of the head are heat treated to prolong life and minimise wear on moving parts.
The slides are precision ground and close tolerances are maintained in order that the heads provide and maintain accuracy of adjustment throughout their working life.
The micrometer adjusting screw of the "finishing heads" has a ground precision thread.



Adjustable boring bar

6114.07
Adjustable boring bar

CC.. 0602..
TC.. 1102..
TC.. 16T3..

Page J.06

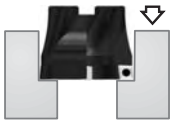
Special boring heads

4334.07
Special boring head

CC.. 09T3..

Page J.08

4334.90
Special boring head



CC.. 09T3..
CC.. 1204..

Page J.09

Boring heads

97.$^{71}_{73}$
Boring head

Page J.10

SCLC
Tools for boring heads

CC.. 0602..
CC.. 09T3..

Page J.11

STFC
Tools for boring heads

TC.. 0602..
TC.. 09T3..
TC.. 1604..

Page J.11

63$^{1}_{4}$4.$^{70}_{74}$
Roughing boring heads

CC.. 0602..
CC.. 09T3..
CC.. 1204..

Page J.12

6344.$^{75}_{77}$
Roughing boring heads

CC.. 1204..

Page J.13

64$^{1}_{4}$4.$^{70}_{74}$
Finishing boring heads

CC.. 0602..
CC.. 09T3..
CC.. 1204..

Page J.14

6444.$^{75}_{77}$
Finishing boring heads

CC.. 1204..

Page J.15

6634.$^{72}_{74}$
Finishing boring heads

TC.. 16T3..

Page J.16

6634.$^{75}_{77}$
Finishing boring heads

TC.. 16T3..

Page J.17

Arbors for boring heads

60.$^{43}_{45}$ DIN 2080
Arbors for boring heads

Page J.18

60.$^{47}_{48}$ DIN 69871/A
Arbors for boring heads

Page J.18

60.$^{49}_{50}$ MAS BT
Arbors for boring heads

Page J.19

60.$^{62}_{64}$
Arbors for boring heads

Page J.20

60.$^{70}_{73}$
Arbors for boring heads

Page J.20

Sets

SET 97

Page J.21

SET 7072

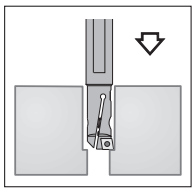
Page J.22

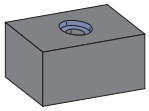
SET 7074

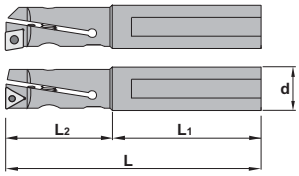
Page J.22

Inserts
Face milling cutters
Square shoulder cutters
Slot cutters
Porcupine cutters
Specific applications and Sets
Profile milling
Solid carbide
Drills
Boring heads

Characteristics:
Adjustable boring bars.







6114.07

Ref.	L	L1	L2	d	Dmin	Dmax	Insert size	Kg
6114.07.012	105	70	35	12	12	15	CC.. 0602..	0,800
6114.07.015	110	60	50	16	15	20	CC.. 0602..	1,100
6114.07.020	120	60	60	20	20	25	TC.. 1102..	1,600
6114.07.025	140	70	70	25	25	30	TC.. 16T3..	2,800
6114.07.030	160	70	90	25	30	35	TC.. 16T3..	3,600

Ref.							
6114.07.012	1550	1503	1425	-	5015	5520	5507
6114.07.015	1261	1504	1425	-	5002	5525	5507
6114.07.020	1182	1505	1225	1505	5025	5525	5507
6114.07.025	1182	1515	1240	1515	5025	5525	5515
6114.07.030	1182	1515	1240	1515	5025	5525	5515

Ref.	CC.. / TC..	l	s	d
	CC.. 0602..	6,45	2,38	6,35
	TC.. 1102..	11,00	2,38	6,35
	TC.. 16T3..	16,50	3,97	9,52

Positive 7° clearance - 80° rhombic inserts.

Positive 7° clearance - Triangular inserts

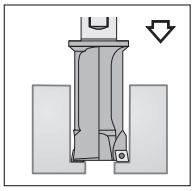
For more information see page: A.12 / A.19

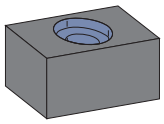
CCGT-AL	CCMT-03	CCMW	TCGT-AL	TCMT-03	TCMT-39	TCMW

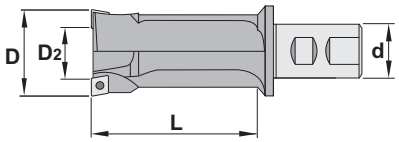
6114.07

Inserts
Face milling cutters
Square shoulder cutters
Slot cutters
Porcupine cutters
Specific applications and Sets
Profile milling
Solid carbide
Drills
Boring heads

Characteristics:
Roughing boring heads.



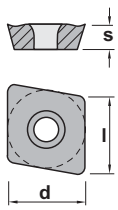




4334.07

Ref.		D	D2	d	L	Insert size	Kg
	4334.07.040	3	40	20	25	105	CC.. 09T3..	2,700
	4334.07.045	3	45	25	25	105	CC.. 09T3..	3,000
	4334.07.050	3	50	30	25	105	CC.. 09T3..	3,400
	4334.07.055	3	55	35	25	105	CC.. 09T3..	3,700

Ref.			
	4334.07.040	1240	5615
	4334.07.045	1240	5615
	4334.07.050	1240	5615
	4334.07.055	1240	5615



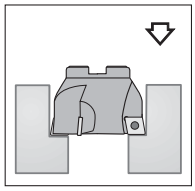
Ref.	CC..	l	s	d
	CC.. 09T3..	9,65	3,97	9,52

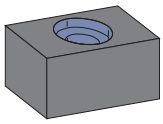
Positive 7° clearance - 80° rhombic inserts.

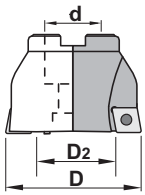
For more information see page: A.12

CCGT-AL	CCKT	CCMW				
						

Characteristics:
Roughing boring heads.



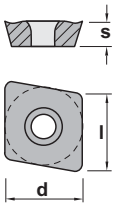




4334.90

Ref.		D	D2	d	Insert size	Kg
	4334.90.060	3	60	40	16	CC.. 09T3..	0,000
	4334.90.065	3	65	45	22	CC.. 09T3..	
	4334.90.070	3	70	50	22	CC.. 09T3..	
	4334.90.075	3	75	55	27	CC.. 1204..	
	4334.90.080	3	80	60	27	CC.. 1204..	
	4334.90.085	3	85	65	32	CC.. 1204..	
	4334.90.090	3	90	70	32	CC.. 1204..	
	4334.90.095	3	95	75	32	CC.. 1204..	
	4334.90.100	3	100	80	32	CC.. 1204..	
	4334.90.105	3	105	85	40	CC.. 1204..	
	4334.90.110	3	110	90	40	CC.. 1204..	
	4334.90.115	3	115	95	40	CC.. 1204..	
	4334.90.120	3	120	100	40	CC.. 1204..	
	4334.90.125	3	125	105	40	CC.. 1204..	
	4334.90.130	3	130	110	40	CC.. 1204..	
	4334.90.135	3	135	115	40	CC.. 1204..	
	4334.90.140	3	140	120	40	CC.. 1204..	
	4334.90.145	3	145	125	40	CC.. 1204..	
	4334.90.150	3	150	130	40	CC.. 1204..	
	4334.90.155	3	155	135	40	CC.. 1204..	

Ref.			
	4334.90.060	1240	5615
	4334.90.065	1240	5615
	4334.90.070	1240	5615
	4334.90.075	1250	5620
	4334.90.080	1250	5620
	4334.90.085	1250	5620
	4334.90.090	1250	5620
	4334.90.095	1250	5620
	4334.90.100	1250	5620
	4334.90.105	1250	5620
	4334.90.110	1250	5620
	4334.90.115	1250	5620
	4334.90.120	1250	5620
	4334.90.125	1250	5620
	4334.90.130	1250	5620
	4334.90.135	1250	5620
	4334.90.140	1250	5620
	4334.90.145	1250	5620
	4334.90.150	1250	5620
	4334.90.155	1250	5620



	CC..	l	s	d
Ref.	CC.. 09T3..	9,65	3,97	9,52
	CC.. 1204..	12,90	4,76	12,70

Positive 7° clearance - 80° rhombic inserts.

For more information see page: A.12

CCGT-AL	CCKT	CCMW				
						

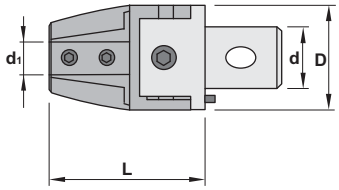
For more information see page:

Technical information: J.02
Applications: J.05
Cutting data: J.23
Adjustable boring bars: J.06
Special boring heads: J.08
Boring heads: J.10
Arbors for boring heads: J.18
Sets: J.21

Boring heads

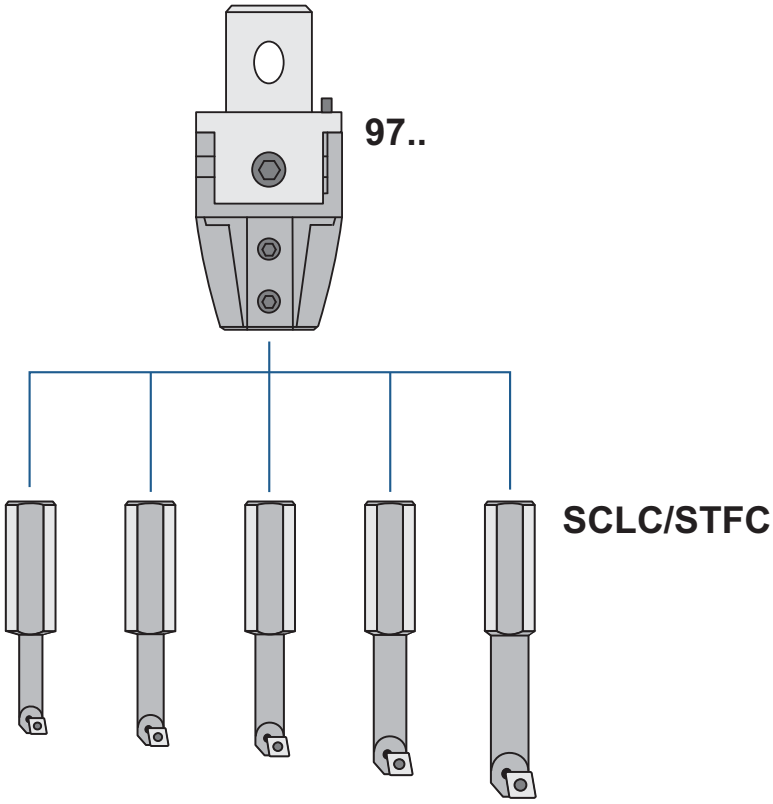
Characteristics:
Graduated dial, read-out precision 0,01 mm. Ø

Applications:
Finishing boring heads.



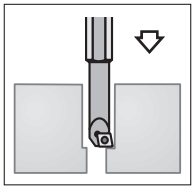
97.71 / 73

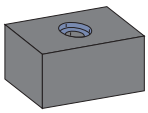
Ref.		D	L	d	d1	Dmin	Dmax	Kg
	97.71.08	27	50	15	8	10	21	0,170
	97.72.08	32	58	20	8	10	21	0,280
	97.72.10	32	58	20	10	13	25	0,290
	97.73.10	42	70	24	10	13	29	0,650
	97.73.12	42	70	24	12	16	34	0,620
	97.73.16	42	70	24	16	20	38	0,600

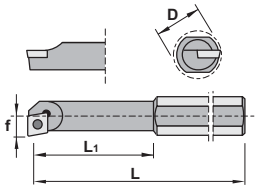


Boring heads

Characteristics:
Tool equipped with rhombic positive insert (angle 80º).
The center screw ensures good rigidity and chip flow.
Applications:
Tool for boring heads.

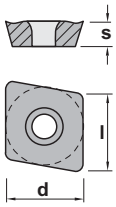






SCLC

Ref.		D	L	L1	f	Bore Range min	Bore Range max	Inserts	Kg		
	S0816F SCLC R 06	16	80	35	4	10	28	CC.. 0602..	0,070	1425	5507
	S1016G SCLC R 06	16	90	45	6	13	31	CC.. 0602..	0,100	1425	5507
	S1216H SCLC R 06	16	100	57	7	16	34	CC.. 0602..	0,100	1425	5507
	S1616I SCLC R 09	16	110	73	9	20	38	CC.. 09T3..	0,150	1440	5515



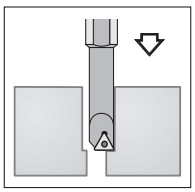
Ref.	CC..	l	s	d
	CC.. 0602..	6,45	2,38	6,35
	CC.. 09T3..	9,65	3,97	9,52

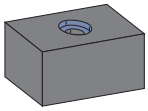
Positive 7° clearance - 80° rhombic inserts.

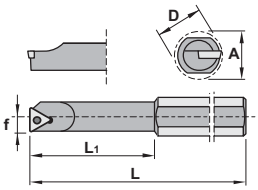
For more information see page: A.12

CCGT-AL	CCMT-03	CCMW				
						

Characteristics:
Tool equipped with triangular positive insert.
The center screw ensures good rigidity and chip flow.
Applications:
Tool for boring heads.

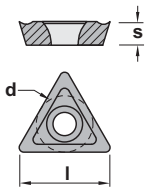






STFC

Ref.		D	L	L1	f	Bore Range min	Bore Range max	Inserts	Kg		
	S0816F STFC R 09	16	80	35	5	10	28	TC.. 0902..	0,090	1222	5506
	S1016G STFC R 09	16	90	45	6	13	31	TC.. 0902..	0,100	1222	5506
	S1216H STFC R 09	16	100	57	7	16	34	TC.. 0902..	0,100	1222	5506
	S1616I STFC R 09	16	110	73	9	20	38	TC.. 0902..	0,100	1222	5506
	S1616I STFC R 16	16	110	73	11	20	38	TC.. 16T3..	0,150	1425	5515



Ref.	TC..	l	s	d
	TC.. 0902..	9,62	2,38	5,55
	TC.. 16T3..	16,50	3,97	9,52

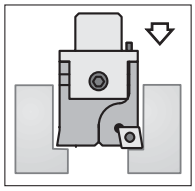
Positive 7° clearance - Triangular inserts

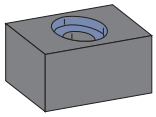
For more information see page: A.20

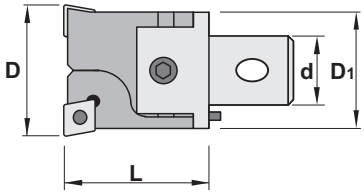
TCGT-AL	TCMT-03	TCMT-39	TCMW			
						

Inserts
Face milling cutters
Square shoulder cutters
Slot cutters
Porcupine cutters
Specific applications and Sets
Profile milling
Solid carbide
Drills
Boring heads

Characteristics:
Roughing boring heads.



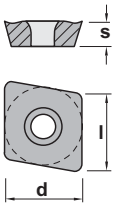




63 1/4 4. 70/74

		D1	L	d	Dmin	Dmax	Insert size	Kg
Ref.	6314.70.2430	22	34	12	24	30	CC.. 0602..	0,075
	6334.71.2940	27	42	15	29	40	CC.. 09T3..	0,150
	6334.72.3950	32	45	20	39	50	CC.. 09T3..	0,250
	6344.73.4965	42	56	24	49	65	CC.. 1204..	0,500
	6344.74.6382	54	56	28	63	82	CC.. 1204..	1,000

					
Ref.	6314.70.2430	1425	5607	5003	5002
	6334.71.2940	1240	5615	5004	5002
	6334.72.3950	1240	5615	5004	5025
	6344.73.4965	1250	5620	5005	5003
	6344.74.6382	1250	5620	5006	5003



	CC..	l	s	d
Ref.	CC.. 0602..	6,45	2,38	6,35
	CC.. 09T3..	9,65	3,97	9,52
	CC.. 1204..	12,90	4,76	12,70

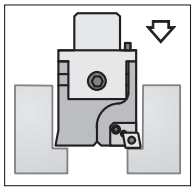
Positive 7° clearance - 80° rhombic inserts.

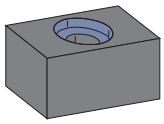
For more information see page: A.12

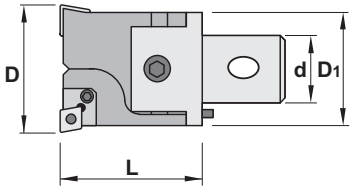
CCGT-AL	CCMT-03	CCMW				
						

Boring heads

Characteristics:
Roughing boring heads.



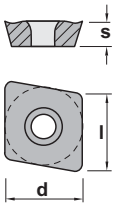




6344.75 / 77

Ref.		D1	L	d	Dmin	Dmax	Insert size	Kg
	6344.75.080102	68	86	36	80	102	CC.. 1204..	2,200
	6344.76.100125	85	100	50	100	125	CC.. 1204..	4,000
	6344.77.125160	110	100	60	125	160	CC.. 1204..	6,550
	6344.77.160220	145	100	60	160	220	CC.. 1204..	8,700

Ref.						
	6344.75.080102	1250	5620	5508	5004	6412
	6344.76.100125	1250	5620	5508	5005	6412
	6344.77.125160	1250	5620	5508	5005	6412
	6344.77.160220	1250	5620	5508	5005	6412



	CC..	l	s	d
Ref.	CC.. 1204..	12,90	4,76	12,70

Positive 7° clearance - 80° rhombic inserts.

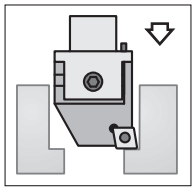
For more information see page: A.12

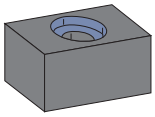
CCGT-AL	CCMT-03	CCMW				
						

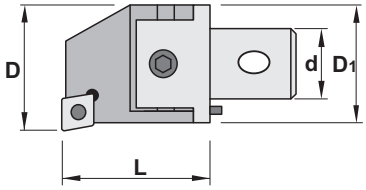
Inserts
Face milling cutters
Square shoulder cutters
Slot cutters
Porcupine cutters
Specific applications and Sets
Profile milling
Solid carbide
Drills
Boring heads

Characteristics:
Graduated dial, read-out precision 0,01 mm. Ø

Applications:
Finishing boring heads.



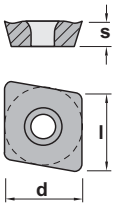




64 1/4 4. 70/74

		D1	L	d	Dmin	Dmax	Insert size	Kg
Ref.	6414.70.2430	22	34	12	24	30	CC.. 0602..	0,075
	6434.71.2940	27	42	15	29	40	CC.. 09T3..	0,150
	6434.72.3950	32	45	20	39	50	CC.. 09T3..	0,250
	6444.73.4965	42	56	24	49	65	CC.. 1204..	0,450
	6444.74.6382	54	66	28	63	82	CC.. 1204..	0,900

					
Ref.	6414.70.2430	1425	5607	5003	5002
	6434.71.2940	1240	5615	5004	5002
	6434.72.3950	1240	5615	5004	5025
	6444.73.4965	1250	5620	5005	5003
	6444.74.6382	1250	5620	5006	5003



	CC..	l	s	d
Ref.	CC.. 0602..	6,45	2,38	6,35
	CC.. 09T3..	9,65	3,97	9,52
	CC.. 1204..	12,90	4,76	12,70

Positive 7° clearance - 80° rhombic inserts.

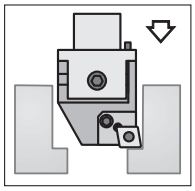
For more information see page: A.12

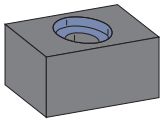
CCGT-AL	CCMT-03	CCMW				
						

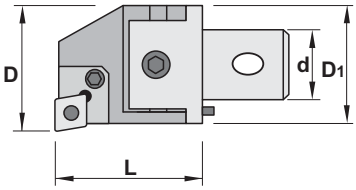
Boring heads

Characteristics:
Graduated dial, read-out precision 0,01 mm. Ø

Applications:
Finishing boring heads.



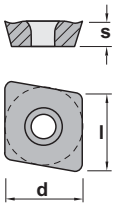




6444.75 / 77

Ref.		D1	L	d	Dmin	Dmax	Insert size	Kg
	6444.75.080102	68	86	36	80	102	CC.. 1204..	2,050
	6444.76.100125	85	100	50	100	125	CC.. 1204..	3,700
	6444.77.125160	110	100	60	125	160	CC.. 1204..	6,150
	6444.77.160220	145	100	60	160	220	CC.. 1204..	8,050

Ref.						
	6444.75.080102	1250	5620	5508	5004	6412
	6444.76.100125	1250	5620	5508	5005	6412
	6444.77.125160	1250	5620	5508	5005	6412
	6444.77.160220	1250	5620	5508	5005	6412



	CC..	l	s	d
Ref.	CC.. 1204..	12,90	4,76	12,70

Positive 7° clearance - 80° rhombic inserts.

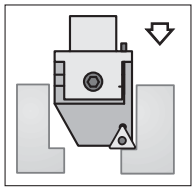
For more information see page: A.12

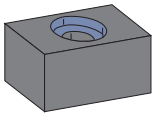
CCGT-AL	CCMT-03	CCMW				
						

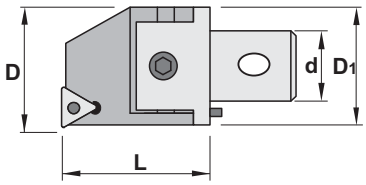
Inserts
Face milling cutters
Square shoulder cutters
Slot cutters
Porcupine cutters
Specific applications and Sets
Profile milling
Solid carbide
Drills
Boring heads

Characteristics:
Graduated dial, read-out precision 0,01 mm. Ø

Applications:
Finishing boring heads.



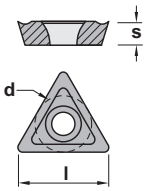




6634.72/74

		D1	L	d	Dmin	Dmax	Insert size	Kg
Ref.	6634.72.3950	32	45	20	39	50	TC.. 16T3..	0,250
	6634.73.4965	42	56	24	49	65	TC.. 16T3..	0,450
	6634.74.6382	54	66	28	63	82	TC.. 16T3..	0,900

					
Ref.	6634.72.3950	1240	5615	5004	5025
	6634.73.4965	1250	5620	5005	5003
	6634.74.6382	1250	5620	5006	5003



TC..	l	s	d
Ref. TC.. 16T3..	16,50	3,97	9,52

Positive 7° clearance - Triangular inserts

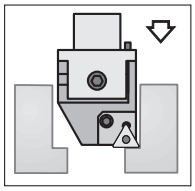
For more information see page: A.20

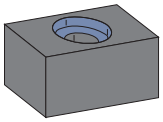
TCGT-AL	TCMT-03	TCMT-39	TCMW			
						

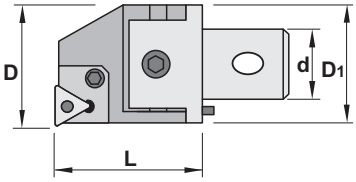
Boring heads

Characteristics:
Graduated dial, read-out precision 0,01 mm. Ø

Applications:
Finishing boring heads.



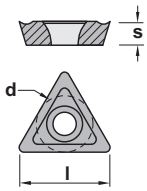




6634.75 77

Ref.		D1	L	d	Dmin	Dmax	Insert size	Kg
	6634.75.080102	68	86	36	80	102	TC.. 16T3..	2,050
	6634.76.100125	85	100	50	100	125	TC.. 16T3..	3,700
	6634.77.125160	110	100	60	125	160	TC.. 16T3..	6,150
	6634.77.160220	145	100	60	160	220	TC.. 16T3..	8,050

Ref.						
	6634.75.080102	1250	5620	5508	5004	6416
	6634.76.100125	1250	5620	5508	5005	6416
	6634.77.125160	1250	5620	5508	5005	6416
	6634.77.160220	1250	5620	5508	5005	6416



	TC..	l	s	d
Ref.	TC.. 16T3..	16,50	3,97	9,52

Positive 7° clearance - Triangular inserts

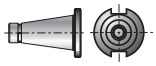
For more information see page: A.20

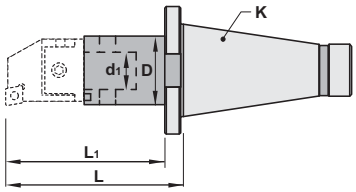
TCGT-AL	TCMT-03	TCMT-39	TCMW			
						

Inserts
Face milling cutters
Square shoulder cutters
Slot cutters
Porcupine cutters
Specific applications and Sets
Profile milling
Solid carbide
Drills
Boring heads

Characteristics:
Arbors for boring heads.

DIN 2080



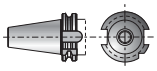


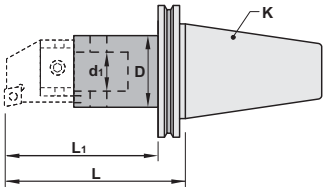
60.43 45

Ref.	K	D	L	L1	d1	Kg
60.43.70.100	30	22	115	100	12	0,450
60.43.71.100	30	27	115	100	15	0,550
60.43.72.100	30	32	115	100	20	0,600
60.44.70.100	40	22	115	100	12	0,950
60.44.71.100	40	27	115	100	15	1,050
60.44.72.100	40	32	115	100	20	1,100
60.44.73.160	40	42	175	160	24	1,850
60.44.74.160	40	54	175	160	28	2,300
60.44.75.160	40	68	176	160	36	2,500
60.45.70.100	50	22	119	100	12	2,850
60.45.71.100	50	27	119	100	15	2,900
60.45.72.130	50	32	149	130	20	3,150
60.45.73.160	50	42	179	160	24	3,700
60.45.74.160	50	54	179	160	28	4,250
60.45.75.200	50	68	220	200	36	5,650
60.45.76.200	50	85	221	200	50	6,350
60.45.77.260	50	100	281	260	60	11,000

Characteristics:
Arbors for boring heads.

DIN 69871/A



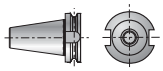


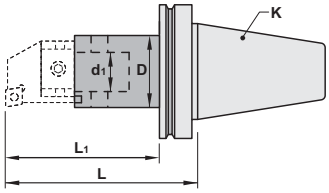
60.47 48

Ref.	K	D	L	L1	d1	Kg
60.47.70.100	40	22	115	100	12	1,200
60.47.71.100	40	27	115	100	15	1,250
60.47.72.100	40	32	115	100	20	1,500
60.47.73.160	40	42	175	160	24	1,900
60.47.74.160	40	54	175	160	28	2,300
60.47.75.160	40	68	176	160	36	2,600
60.48.70.100	50	22	119	100	12	3,350
60.48.71.100	50	27	119	100	15	3,400
60.48.72.130	50	32	149	130	20	3,600
60.48.73.160	50	42	179	160	24	4,200
60.48.74.160	50	54	179	160	28	4,700
60.48.75.200	50	68	220	200	36	5,650
60.48.76.200	50	85	221	200	50	6,200
60.48.77.260	50	100	281	260	60	10,850

Characteristics:
Arbors for boring heads.

MAS BT

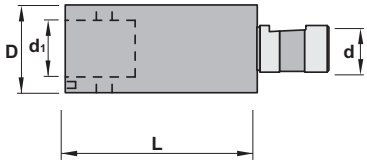




60. 49 50		K	D	L	L1	d1	Kg
Ref.	**60.49.70.100**	40	22	115	100	12	1,200
	60.49.71.100	40	27	115	100	15	1,250
	60.49.72.100	40	32	115	100	20	1,600
	60.49.73.160	40	42	175	160	24	2,050
	60.49.74.160	40	54	175	160	28	2,550
	60.49.75.160	40	68	176	160	36	2,550
	60.50.70.100	50	22	119	100	12	3,850
	60.50.71.100	50	27	119	100	15	3,950
	60.50.72.130	50	32	149	130	20	4,200
	60.50.73.160	50	42	179	160	24	5,200
	60.50.74.160	50	54	179	160	28	5,800
	60.50.75.200	50	68	220	200	36	6,650
	60.50.76.200	50	85	221	200	50	7,400
	60.50.77.260	50	100	281	260	60	12,300

Inserts
Face milling cutters
Square shoulder cutters
Slot cutters
Porcupine cutters
Specific applications and Sets
Profile milling
Solid carbide
Drills
Boring heads

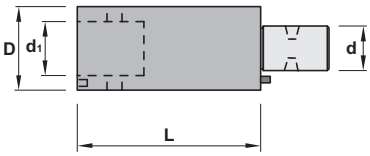
Characteristics:
Arbors for boring heads.



60. 62 64

Ref.	D	d	L	d1	Kg
60.62.70	22	20	20	12	0,050
60.62.71	27	20	30	15	0,100
60.63.70	22	20	30	12	0,120
60.63.71	27	20	45	15	0,230
60.63.72	32	25	35	20	0,320
60.64.70	22	20	52	12	0,210
60.64.71	27	20	52	15	0,290
60.64.72	32	20	52	20	0,400
60.64.73	42	25	60	24	0,500

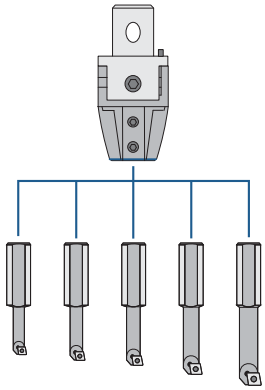
Characteristics:
Arbors for boring heads.



60. 70 73

Ref.	D	d	L	d1	Kg
60.70.70.20	22	12	20	12	0,050
60.70.70.30	22	12	30	12	0,100
60.71.71.30	27	15	30	15	0,130
60.71.71.45	27	15	45	15	0,190
60.72.72.35	32	20	35	20	0,200
60.72.72.52	32	20	52	20	0,270
60.73.73.40	42	24	40	24	0,400
60.73.73.60	42	24	60	24	0,600

Applications:
Roughing boring heads.



SET 97

Ref.		Boring head	Boring bars	Bore Range min	Bore Range max
	97.SCLC	97.73.16	S0816F SCLC R 06	10	28
			S1016G SCLC R 06	13	31
			S1216H SCLC R 06	16	34
			S1616I SCLC R 09	20	38
	97.STFC	97.73.16	S0816F STFC R 09	10	28
			S1016G STFC R 09	13	31
			S1216H STFC R 09	16	34
			S1616I STFC R 09	20	38
			S1616I STFC R 16	20	38

Inserts
Face milling cutters
Square shoulder cutters
Slot cutters
Porcupine cutters
Specific applications and Sets
Profile milling
Solid carbide
Drills
Boring heads

Applications:
Roughing and finishing boring heads.

SET 7072

Ref.		Roughing boring head	Finishing boring head	Boring head	Boring bars	Bore Range min	Bore Range max
	SET 7072	6314.70.2430	6414.70.2430	97.73.16	S0816F SCLC R 06	10	28
		6334.71.2940	6434.71.2940		S1016G SCLC R 06	13	31
		6334.72.3950	6434.72.3950		S1216H SCLC R 06	16	34
					S1616I SCLC R 09	20	38

Applications:
Roughing and finishing boring heads.

SET 7074

Ref.		Roughing boring head	Finishing boring head	Boring head	Boring bars	Bore Range min	Bore Range max
	SET 7074	6314.70.2430	6414.70.2430	97.73.16	S0816F SCLC R 06	10	28
		6334.71.2940	6434.71.2940		S1016G SCLC R 06	13	31
		6334.72.3950	6434.72.3950		S1216H SCLC R 06	16	34
		6344.73.4965	6444.73.4965				
		6344.74.6382	6444.74.6382		S1616I SCLC R 09	20	38

Cutting data for boring heads

Material	Head size	Diameter	Finishing heads			Roughing heads		
			Cutting Speed	Feed	Cutting Depth	Cutting Speed	Feed	Cutting Depth (max)
Plain carbon steel	22	24 ÷ 30	110 - 140	0,05 - 0,15	0,05 - 0,30	100 - 130	0,15 - 0,25	4,2
	27	29 ÷ 40	115 - 150	0,05 - 0,15	0,05 - 0,30	105 - 140	0,15 - 0,30	5,7
	32	39 ÷ 50	115 - 150	0,05 - 0,15	0,06 - 0,35	105 - 150	0,20 - 0,30	5,7
	42 - 54 - 68	49 ÷ 102	115 - 150	0,10 - 0,20	0,06 - 0,35	105 - 150	0,25 - 0,35	6,3
	85 - 110 - 145	100 ÷ 220	115 - 150	0,10 - 0,20	0,07 - 0,50	105 - 150	0,30 - 0,40	6,3
Alloy steels	22	24 ÷ 30	100 - 130	0,05 - 0,15	0,05 - 0,30	90 - 120	0,15 - 0,25	4,2
	27	29 ÷ 40	110 - 140	0,05 - 0,15	0,05 - 0,30	100 -130	0,15 - 0,30	5,7
	32	39 ÷ 50	110 - 150	0,05 - 0,15	0,06 - 0,35	100 -130	0,20 - 0,30	5,7
	42 - 54 - 68	49 ÷ 102	110 - 150	0,10 - 0,20	0,06 - 0,35	100 -130	0,25 - 0,35	6,3
	85 - 110 - 145	100 ÷ 220	110 - 150	0,10 - 0,20	0,07 - 0,50	100 - 130	0,30 - 0,40	6,3
Stainless steels	22	24 ÷ 30	70 - 100	0,07 - 0,15	0,12 - 0,35	60 - 90	0,12 - 0,20	4,2
	27	29 ÷ 40	80 - 110	0,07 - 0,15	0,12 - 0,35	70 - 100	0,15 - 0,25	5,7
	32	39 ÷ 50	80 - 110	0,07 - 0,15	0,20 - 0,50	70 - 100	0,15 - 0,25	5,7
	42 - 54 - 68	49 ÷ 102	80 - 110	0,10 - 0,20	0,20 - 0,50	70 - 100	0,20 - 0,30	6,3
	85 - 110 - 145	100 ÷ 220	80 - 110	0,12 - 0,20	0,25 - 0,75	70 - 100	0,25 - 0,35	6,3
Cast iron	22	24 ÷ 30	70 - 110	0,07 - 0,15	0,12 - 0,35	60 - 110	0,20 - 0,30	4,2
	27	29 ÷ 40	80 - 115	0,07 - 0,15	0,12 - 0,35	60 - 110	0,25 - 0,35	5,7
	32	39 ÷ 50	80 - 115	0,07 - 0,15	0,20 - 0,50	60 - 110	0,25 - 0,35	5,7
	42 - 54 - 68	49 ÷ 102	80 - 115	0,12 - 0,20	0,20 - 0,50	60 - 110	0,30 - 0,45	6,3
	85 - 110 - 145	100 ÷ 220	80 - 115	0,12 - 0,20	0,25 - 0,75	60 - 110	0,30 - 0,45	6,3
Aluminium and aluminium alloys	22	24 ÷ 30	150 - 300	0,05 - 0,15	0,12 - 0,35	120 - 300	0,20 - 0,30	4,2
	27	29 ÷ 40	150 - 360	0,10 - 0,20	0,12 - 0,35	150 - 370	0,25 - 0,35	5,7
	32	39 ÷ 50	150 - 360	0,10 - 0,20	0,20 - 0,50	150 - 370	0,25 - 0,35	5,7
	42 - 54 - 68	49 ÷ 102	150 - 360	0,10 - 0,20	0,20 - 0,50	150 - 370	0,30 - 0,45	6,3
	85 - 110 - 145	100 ÷ 220	150 - 360	0,10 - 0,25	0,25 - 0,75	150 - 370	0,30 - 0,45	6,3
Titanium	22	24 ÷ 30	30 - 40	0,07 - 0,15	0,12 - 0,35	25 - 35	0,12 - 0,20	4,2
	27	29 ÷ 40	30 - 45	0,07 - 0,15	0,12 - 0,35	30 - 40	0,15 - 0,25	5,7
	32	39 ÷ 50	30 - 45	0,07 - 0,15	0,20 - 0,50	30 - 40	0,15 - 0,25	5,7
	42 - 54 - 68	49 ÷ 102	30 - 45	0,10 - 0,20	0,20 - 0,50	30 - 40	0,20 - 0,30	6,3
	85 - 110 - 145	100 ÷ 220	30 - 45	0,10 - 0,20	0,25 - 0,75	30 - 40	0,20 - 0,35	6,3
High tempered alloys	22	24 ÷ 30	30 - 40	0,07 - 0,15	0,12 - 0,35	25 - 35	0,12 - 0,20	4,2
	27	29 ÷ 40	30 - 45	0,07 - 0,15	0,12 - 0,35	30 - 40	0,15 - 0,25	5,7
	32	39 ÷ 50	30 - 45	0,07 - 0,15	0,20 - 0,50	30 - 40	0,15 - 0,25	5,7
	42 - 54 - 68	49 ÷ 102	30 - 45	0,10 - 0,20	0,20 - 0,50	30 - 40	0,20 - 0,30	6,3
	85 - 110 - 145	100 ÷ 220	30 - 45	0,10 - 0,20	0,25 - 0,75	30 - 40	0,20 - 0,35	6,3