ZMAC BORING HEAD

NIKKEN

A WORLD LEADING BORING HEAD

HIGH SPEED PRECISION

HIGH RIGIDITY

EASY OPERATION

Innovative new feature of Double-Contact Support (PAT.P)

NIKKEN KOSAKUSHO WORKS,LTD

CAT.NO.9800

NIKKEN

A WORLD LEADING BORING HEAD

HIGH RIGIDITY | HIGH PRECISION | HIGH SPEED | HIGH DURABILITY

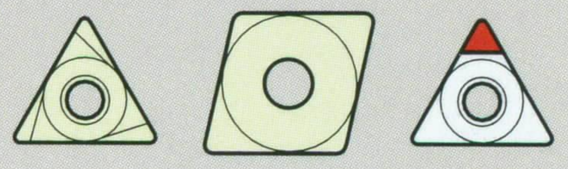
No need to exchange insert due to NIKKEN ZMAC innovative technology

FOR STEEL	150～400m/min.	coated insert
FOR CAST IRON	150～250m/min.	
FOR HARDENED STEEL	100～150m/min.	CBN insert
FOR ULTRA HIGH SPEED BORING OF CAST IRON	400～1000m/min.	

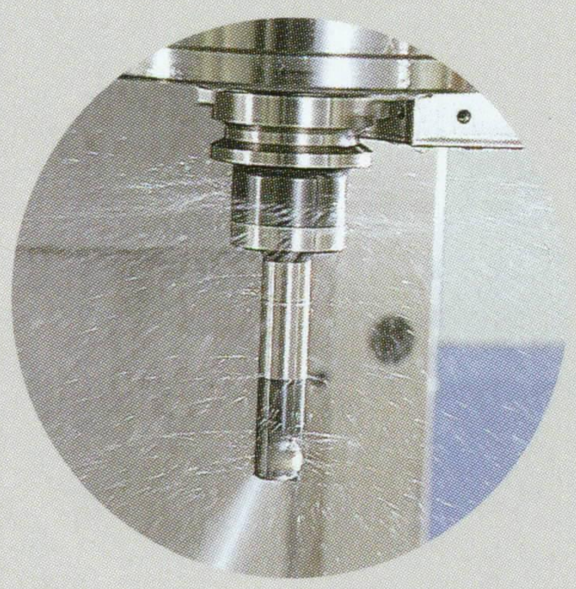
EASY OPERATION

NIKKEN recommend the ideal boring of steel,stainless and cast iron with Identical coated Insert.

Various styles of insert



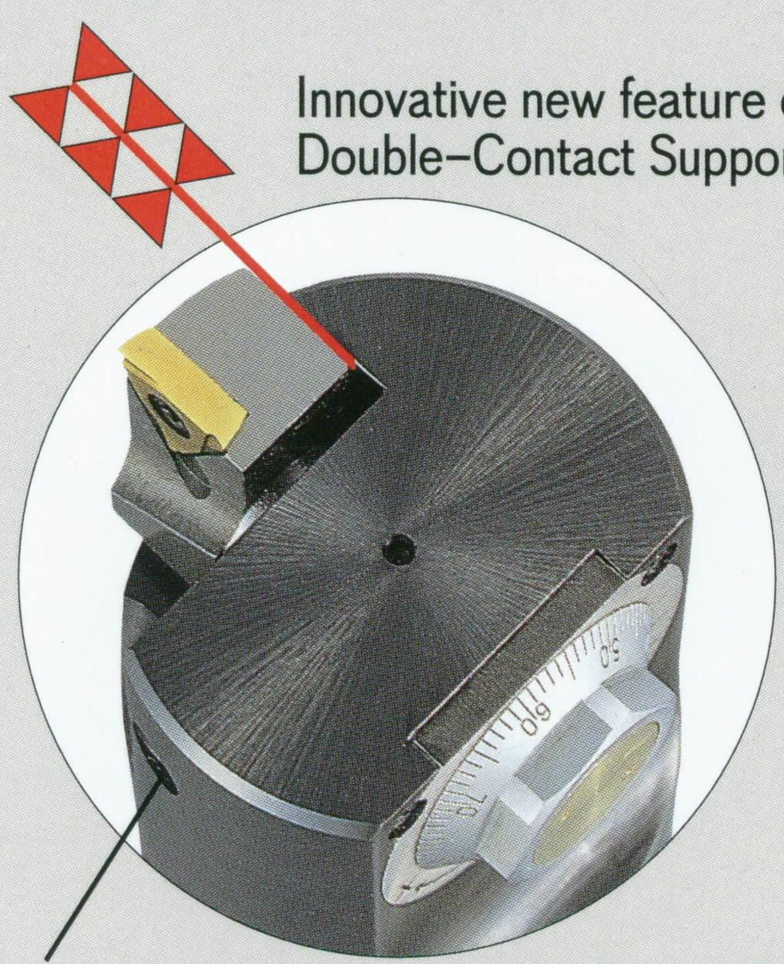
P.10 for Insert Specification Table



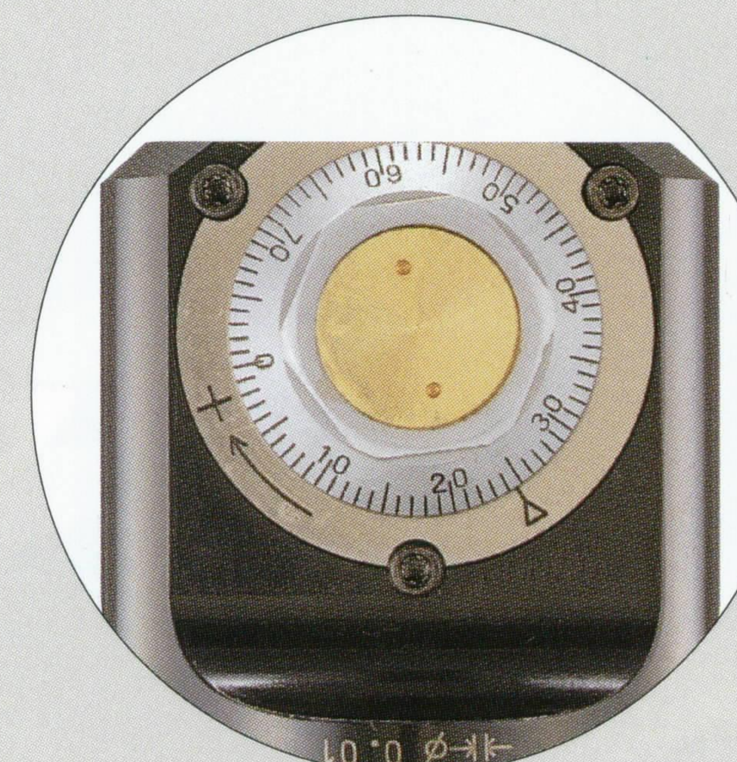
High-pressure through-tool coolant available on all heads

Available for Multi-Stage Boring Bar

Innovative new feature of Double-Contact Support



New Locking screw closer to Cutting Edge



Precision hardened & ground master screw thread for high precision & rigidity. Design ensures easy adjustment of 3-5 microns on diameter.

SPECIAL HEAT-TREATMENT HV800

High rigidity

Double-contact support

New Locking screw & support gives higher rigidity

High-precision/Easy micro-adjustment /High durability

Thread on Cartridge:
Hardness of HRC50-55 & precision ground
Internal thread of dial ring:
Special heat-treated to HV800

SPECIAL HEAT-TREATMENT HV800

Rigidity on thread of Dial Ring

-Heart of Fine Boring

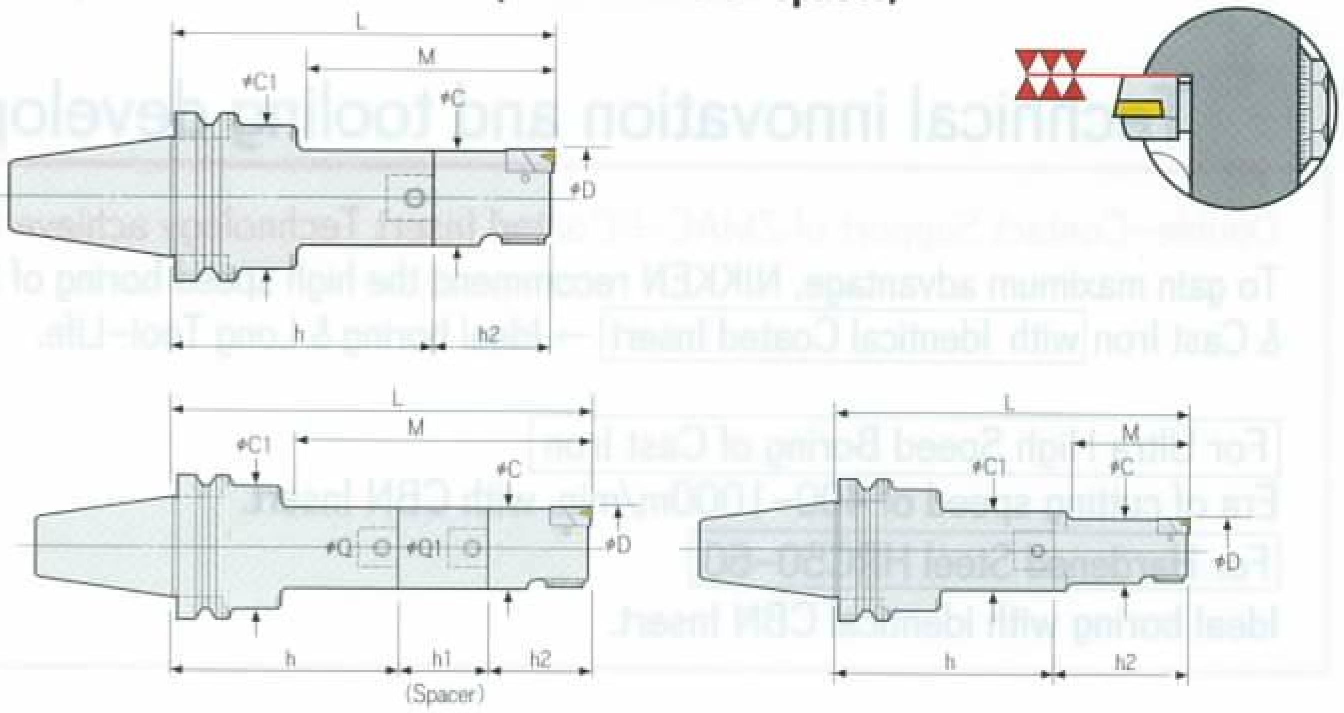
i.e. The Same concept as for NIKKEN CNC Rotary Table Rigidity due to hardened worm gear makes
:Transmission efficiency better
:Gear size smaller

ZMAC BORING ARBOR SOLID TYPE

NIKKEN

(With Extension Spacer)

BT-ZMAC



All codes shown are for heads with triangular inserts. For heads with rhomboid inserts please add the letter "R" to code No. e.g.BT40-ZMAC32 R -150

Taper	Code No. BTNo.–Min.D –L	Boring Range D	Boring Depth M	C	C1	h	Extension Spacer Code No. Q –Q1–h1	Triangular Insert (P.10): Head No. Min.D –h2	Triangular Insert (P.10): Insert No.	Rhomboid Insert (P.10): Head No. Min.D –h2	Rhomboid Insert (P.10): Insert No.	Weight (kg)
No.40	BT40 -ZMAC 16 -125 (IT40)	15.9～ 20.2	38	15	24	80	–	ZMAC 16– 45	3MP–C,B	–	–	1.9
	-135		48				–	ZMAC 16– 55		–	–	1.9
	-ZMAC 20 -120	19.8～ 25.2	45	19	30	80	–	ZMAC 20– 40		–	–	1.9
	-135		67			95	–			–	–	1.9
	-150		75			80	SP 9– 9–30			–	–	2.0
	-ZMAC 25 -120	24.8～ 32.2	52	24	35	80	–	ZMAC 25– 40		–	–	2.0
	-150		90			110	–			–	–	2.1
	-165		97			80	SP12–12–45			–	–	2.1
	-ZMAC 32 -150	31.8～ 42.2	77	31	42	95	–	ZMAC 32– 55	4MP–C,B	ZMAC 32R– 55	CC06–C	2.5
	-180		110			125	–					2.7
	-195		122			95	SP16–16–45					2.7
	-ZMAC 42 -150	41.8～ 55.2	97	40	50	80	–	ZMAC 42– 70	6MP–C,B	ZMAC 42R– 70		3.0
	-180		130			110	–					3.2
	-210		157			80	SP20–20–60					3.5
	-ZMAC 55 -165	54.8～ 70.2	135	53	50	95	–	ZMAC 55– 70		ZMAC 55R– 70		3.9
	-210		180			140	–					4.6
	-225		195			95	SP26–26–60					4.6
	-ZMAC 70 -165	69.8～ 85.2	165	67	64	95	–	ZMAC 70– 70		ZMAC 70R– 70	CC08–C	5.4
	-180		180			110	–					5.8
	-225		225			95	SP34–34–60					6.8
	-ZMAC 85 -195	84.8～ 100.2	195	83	62	95	–	ZMAC 85–100		ZMAC 85R–100		9.0

★MIN. dial readout :ZMAC 32 & above is 0.01mm on diameter.
:ZMAC 25 & below is 0.02mm on diameter. Sub scale:0.005mm. Easy adjustment of 3–5microns on diameter using our precision screw mechanism.

★**"C"grade (coated) insert for Steel, Stainless & Cast Iron is supplied as Standard with the head (Smooth boring & Long tool–life).**
We would recommend **"B"**grade (CBN) insert for Handened Steel & High Speed boring of Cast Iron.

★Please see P.6 for Shank & Spacer, and P.7 for Head.

★For Centre Through–tool Coolant heads, add the letter **"C"** to end of ordering code e.g. **BT40–ZMAC55–165C**.

★In case of BT30, BT35 and BT45, modular connection type of Q26, Q34 and Q42 are used. Please see P.6 for Base Holder of BT30, BT35 & BT45.

■Boring Arbor with Extension Spacer

■ZMAC for Muiti–Stage Boring Bar

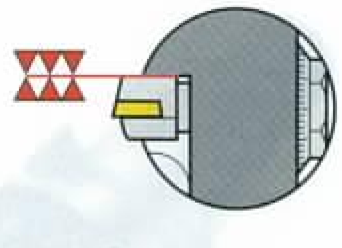
The photo is NC5 taper shank.
Please see NC5 Tooling System Catalogue.

ZMAC BORING ARBOR

SOLID TYPE
(With Extension Spacer)

NIKKEN

Technical innovation and tooling development



Double–Contact Support of ZMAC ⊕Coated Insert Technology achieve ideal boring.
To gain maximum advantage, NIKKEN recommend the high speed boring of Steel, Stainless & Cast Iron with Identical Coated Insert → Ideal boring & Long Tool–Life.

For Ultra High Speed Boring of Cast Iron
Era of cutting speed of 400–1000m/min. with CBN Insert.
For Hardened Steel HRC50–60
Ideal boring with identical CBN Insert.

No Micro Vibration due to Double–Contact Support of Cartridge. Long Tool–Life & High Accurcy.

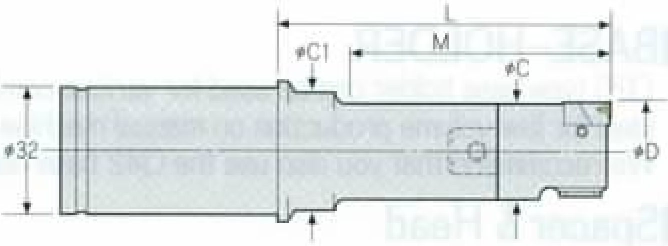
All codes shown are for heads with triangular inserts. For heads with rhomboid inserts please add the letter "R" to code No. e.g.BT50–ZMAC32 R –180

Taper	Code No. BTNo.-Min.D -L	Boring Range D	Boring Depth M	C	C1	h	Extension Spacer Code No. Q -Q1-h1	Head No. Min.D -h2 (P.10 for triangular Insert)	Insert No.	Head No. Min.D -h2 (P.10 for Rhomboid Insert)	Insert No.	Weight (kg)
No.50	BT50 -ZMAC 16 -140 (IT50)	15.9~ 20.2	38	15	24	95	–	ZMAC 16- 45	3MP–C,B	–	–	4.7
	-150		48				–	ZMAC 16- 55		–	–	4.7
	-ZMAC 20 -150	19.8~ 25.2	45	19	40	110	–	ZMAC 20- 40		–	–	4.8
	-165		67			125	–			–	–	4.8
	-180		75			110	SP 9- 9-30			–	–	4.9
	-ZMAC 25 -135	24.8~ 32.2	52	24	44	95	–	ZMAC 25- 40		–	–	4.8
	-165		90			125	–			–	–	4.8
	-180		97			95	SP12-12-45			–	–	4.9
	-ZMAC 32 -180	31.8~ 42.2	77	31	50	125	–	ZMAC 32- 55	4MP–C,B	ZMAC 32R- 55	CC06–C	5.5
	-210		110			155	–					5.6
	-225		122			125	SP16-16-45					5.7
	-ZMAC 42 -180	41.8~ 55.2	97	40	60	110	–	ZMAC 42- 70		ZMAC 42R- 70		6.0
	-195		130			125	–					6.0
	-225		142			110	SP20-20-45					6.4
	-240		157				SP20-20-60					6.5
	-ZMAC 55 -210	54.8~ 70.2	117	53	65	140	–	ZMAC 55-70		ZMAC 55R- 70		7.5
	-240		182			170	–					7.6
	-270		177			140	SP26-26-60					8.1
	-ZMAC 70 -240	69.8~ 85.2	190	67	80	170	–	ZMAC 70- 70	6MP–C,B	ZMAC 70R- 70	CC08–C	10.0
	-270		220			200	–					10.6
	-300		250			170	SP34-34-60					11.5
	-ZMAC 85 -225	84.8~100.2	187			125	–	ZMAC 85-100		ZMAC 85R-100		12.5
	-290		252			190	–					15.0
	-315		277			125	SP42-42-90					16.0
	-ZMAC100-225	99.5~140.5	225	83	83	125	–	ZMAC100-100		ZMAC100R-100	CC12–C	13.8
	-290		290			190	–					16.5
	-315		315			125	SP42-42-90					17.2
	-ZMAC140-225	139.5~180.5	225			125	–	ZMAC140-100		ZMAC140R-100		14.6
	-290		290			190	–					17.3
	-315		315			125	SP42-42-90					18.0

★MIN. dial readout :ZMAC32 & above is 0.01mm on diameter.
:ZMAC25 & below is 0.02mm on diameter. Sub scale:0.005mm. Easy adjustment of 3–5microns on diameter using our precision screw mechanism.
★**"C" grade (coated) insert for Steel, Stainless & Cast Iron is supplied as Standard with the head (Smooth boring & Long tool–life).**
We would recommend **"B"** grade (CBN) insert for Handened Steel & High Speed boring of Cast Iron.
★Please see P.6 for Shank & Spacer, and P.7 for Head.
★For Centre Through–tool coolant heads, add the letter "C" to end of ordering code e.g. **BT50–ZMAC55–210C.**
★In case of BT30, BT35 and BT45, moderlar connection type of Q26, Q34 and Q42 are used. Please see P.6 for Base Holder of BT30, BT35 & BT45.

ZMAC BORING BAR for Straight Shank

NIKKEN



For use in combination with your existing C32 Multi-Lock milling chuck.(Ideal for Low-Volume Production with Wide Variety of Boring Sizes)

Code No. KNo.-Min.D-L	Boring Range D	Boring Depth M	C	C1	Head No. (P.10 for triangurlar Insert)	Insert No. (P.10 for triangurlar Insert)	Head No. (P.10 for rhomboid Insert)	Insert No. (P.10 for rhomboid Insert)	Weight (kg)
K32-ZMAC16- 65	15.9~ 20.2	38	15	-	ZMAC 16- 45	3MP-C,B	-	-	0.5
- 75		48		-	ZMAC 16- 55		-	-	0.5
-ZMAC20- 60	19.8~ 25.2	55	19	-	ZMAC 20- 40		-	-	0.6
- 80		63		30			-	-	0.7
-ZMAC25- 60	24.8~ 32.2	55	24	-	ZMAC 25- 40		-	-	0.6
-100		83		30			-	-	0.7
-ZMAC32- 75	31.8~ 42.2	70	31	-	ZMAC 32- 55	4MP-C,B	ZMAC 32R- 55	CC06-C	0.9
-110		105		-					1.1
-ZMAC42-110	41.8~ 55.2	105	40	-	ZMAC 42- 70	6MP-C,B	ZMAC 42R- 70		1.5
-ZMAC55-110	54.8~ 70.2	105	53	-	ZMAC 55- 70		ZMAC 55R- 70		1.6

★**All codes shown are for heads with triangular inserts. For heads with rhomboid inserts please add the letter "R" to code No. e.g. BT40-ZMAC32 R -75**

★MIN. dial readout : ZMAC32 & above is 0.01mm on diameter.
: ZMAC25 & below is 0.02mm on diameter. Sub scale:0.005mm. Easy adjustment of 3-5microns on diameter using our precision screw mechanism.

★**"C" grade (coated) insert for Steel, Stainless & Cast Iron is supplied as Standard with the head (Smooth boring & Long tool-life).**
We would recommend **"B"** grade (CBN) insert for Handened Steel & High Speed boring of Cast Iron.

★For Centre Through-tool coolant heads, add the letter "C" to end of ordering code e.g. **K32-ZMAC42-110C.**

HIGH SPEED BORING with ZMAC BORING HEAD

NIKKEN

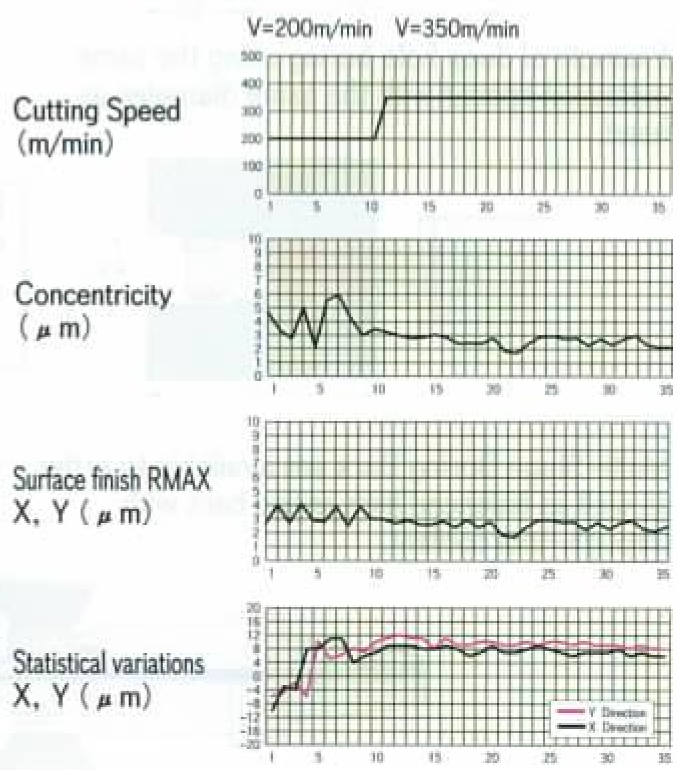
Current developments in inserts (coated TiAlN & CBN) and their improved capability for high speed cutting is remarkable. However, the results are based on using these inserts with high-speed cutting conditions(their performance is reduced when used for medium or low cutting speeds). The ZMAC Boring Head has been designed to optimise this new high-speed cutting technology.

■Cutting data

Machine :VC8
Holder :NC5-63-Q26-50
Spacer :SP26-12-30
Head :12-ZMAC16-65
Insert :3MP-C (Coated TiAlN)
Nose/R :0.2mm

Cutting Speed:V=200m/min. & 350m/min.
Feed :F=0.05mm/rev. for both
Removal :0.5mm on dia.
V=350m/min. gave better finish & accuracy

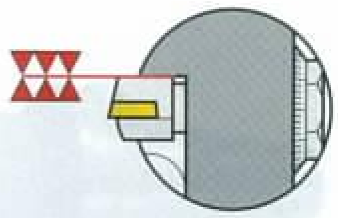
Material:S53C
Thermal refined carbon steel



measurement of 35 bores on end

■BASE-HOLDER

Q26 type base holder can be used for various combinations of boring applications.
Ideal for low volume production on manual machine with wide variety of boring sizes.
We recommend that you also use the Q42 base holder on 50 taper machining centres.



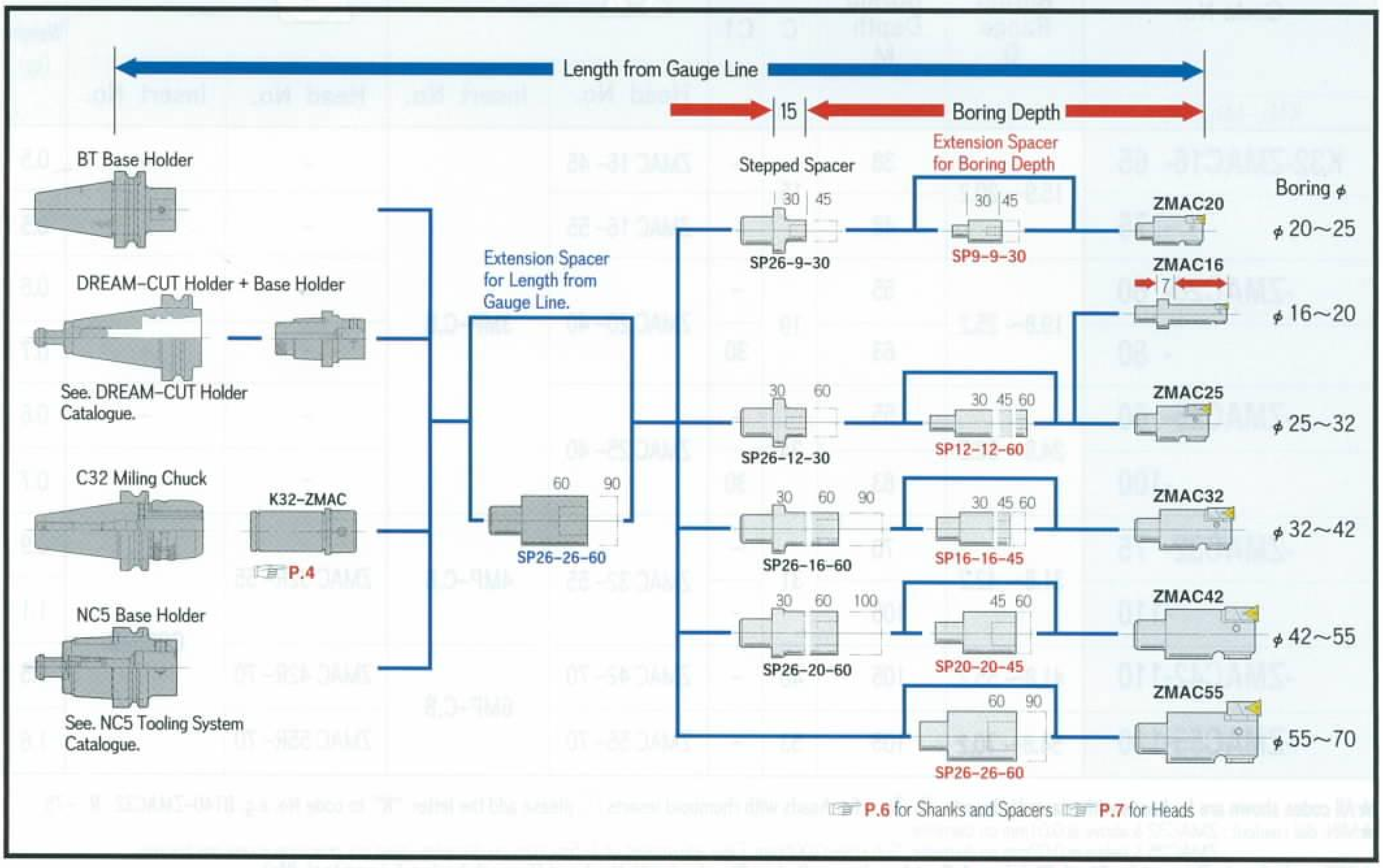
No Micro Vibration due to Double-Contact Support of Cartridge. Long Tool-Life & High Accuracy.

■Spacer & Head

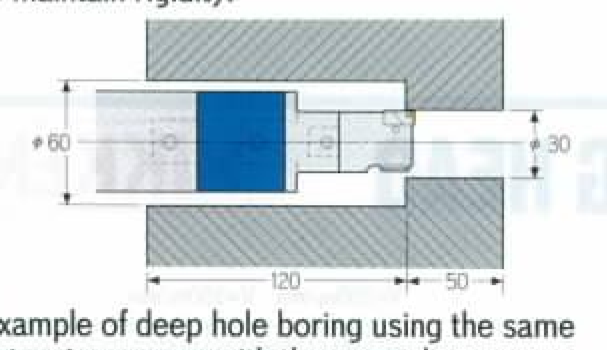
The extensive range of heads & spacers allow the correct selection to suit your boring applications without the lost of rigidity.

■Method of Selection for Modular ZMAC Boring Arbors

First select head,**spacer and stepped spacer** from boring diameter and length.
Then select base holder and **SP26 extension spacer** by the length from gauge line.



Example of small diameter boring in a deep recess using the largest diameter extension spacer in order to maintain rigidity.

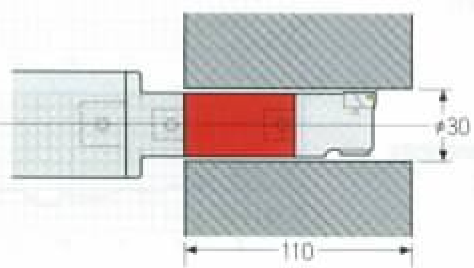


BT40-Q26-95
SP26-26-60
SP26-12-30
12-ZMAC25-40

Example of precision boring at high-speed using DREAM-CUT Holder

Combination of high accuracy and long tool-life can ba achieved by the use of the **DREAM-CUT System Damping Effect.**

Example of deep hole boring using the same extension spacer with the same diameter as head.



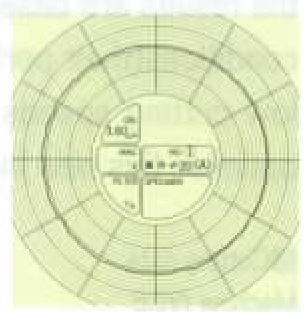
BT40-Q26-95
SP26-12-30
SP12-12-60
12-ZMAC25-40

Example of hardened steel boring with CBN insert.

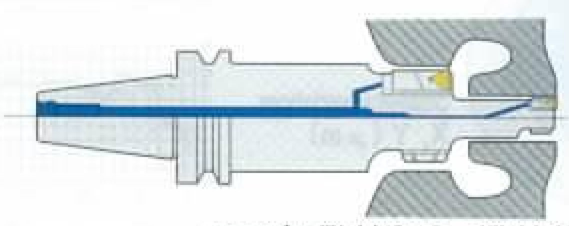
Reduce L/D to as small as possible:Max.3times.
16 to 180mm diameter ZMAC+CBN insert.

Example of interrupted boring of hardened steel(HRC60) ϕ 20mm

Results on 24pieces were:concentricity all within 3.6 microns.



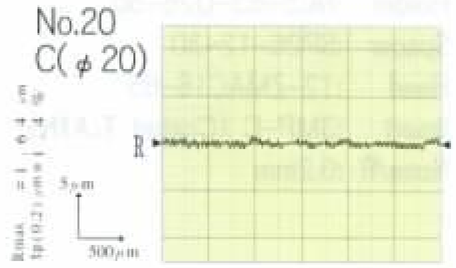
Multi-Stage Boring Bars are available to order, as well as balanced high speed bars with through-tool coolant.



example ZMAC42 ZMAC20

No.20
C(ϕ 20)

Results of surface finish on the 24 pieces were RMAX of 2.8 microns.



BASE-HOLDER BT SHANK for MODULAR TYPE

NIKKEN

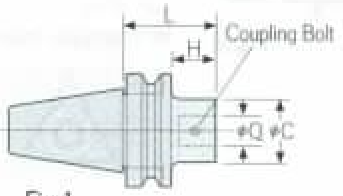


Fig.1

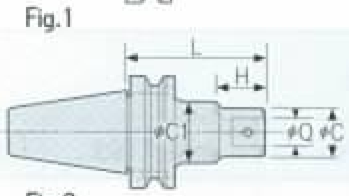


Fig.2

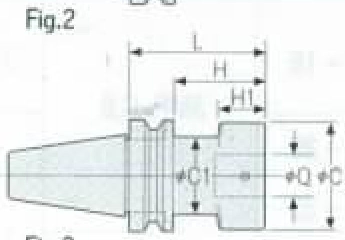


Fig.3

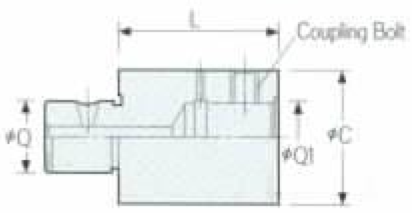
Taper	Code No.	Coupling Dia Q	L	C	C1	H	H1	Coupling Bolt No.	Fig.	Weight (kg)
BT30	BT30-Q26- 40	26	40	50	-	18	-	B26	1	0.5
BT35	BT35-Q26- 45	26	45	50	-	23	-	B26	1	0.8
BT40 (IT40)	BT40-Q 9- 80, 95N (IT40)	9	80, 95	19	30	5,27	-	B19	2	1.8,1.9
	-Q12- 80,110	12	80,110	24	35	12,50	-	B12		1.8,1.9
	-Q16- 95,125	16	95,125	31	42	22,55	-	B16		2.1,2.3
	-Q20- 80,110	20	80,110	40	50	27,60	-	B20		2.2,2.4
	-Q26- 50, 95,140	26	50, 95,140	50	-	20,65,110	-	B26	1	1.1,1.7,2.5
	-Q34- 95,110	34	95,110	64	62	68,83	55,55	B34	3	3.2,3.6
	-Q42- 95	42	95	83	62	68	55	B42		3.8
BT45	BT45-Q26- 55,155	26	55,155	50	50, 70	22,65	-	B26	2	4.0,5.5
	-Q34-140	34	140	64	67	107	-	B34		6.3
	-Q42-125	42	125	83	-	92	-	B42	1	6.8
BT50 (IT50)	BT50-Q 9-110,125N (IT50)	9	110,125	19	40	5,27	-	B19	2	4.4,4.6
	-Q12- 95,125	12	95,125	24	44	12,50	-	B12		4.5,4.7
	-Q16-125N,155	16	125,155	31	50	22,55	-	B16		5.1,5.3
	-Q20-110,125	20	110,125	40	60	27,60	-	B20		5.2,5.3
	-Q26- 65,140,170N	26	65,140,170	50	65	27,47,112	-	B26	1,2,2	4.0,6.1,6.2
	-Q34-140,170,200	34	140,170,200	64	80	102,57,147	-	B34	1,2,2	6.0,7.9,8.3
	-Q42-125,190	42	125,190	83	-	87,157	-	B42	1	9.5

★ φC of Q26 base holder has been increased from 45mm to 50mm due to improvement of it's rigidity.
★All base holder have a centre through-tool coolant hole.
★The Coupling screw & wrench are included as standard.

SPACER for MODULAR TYPE

NIKKEN

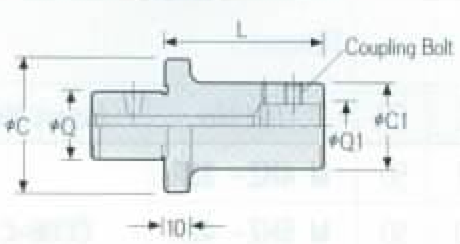
Extension Spacer



Extension Spacer

Code No. Q-Q1-L	Coupling Dia Q	Coupling Dia Q1	C	Coupling Bolt No.
SP 9- 9-30,45	9	9	19	B19
SP 12-12-30,45,60	12	12	24	B12
SP 16-16-30,45,60	16	16	31	B16
SP 20-20-45,60	20	20	40	B20
SP 26-26-60,90	26	26	50	B26
SP 34-34-60,90	34	34	64	B34
SP 42-42-60,90	42	42	83	B42

Stepped Spacer

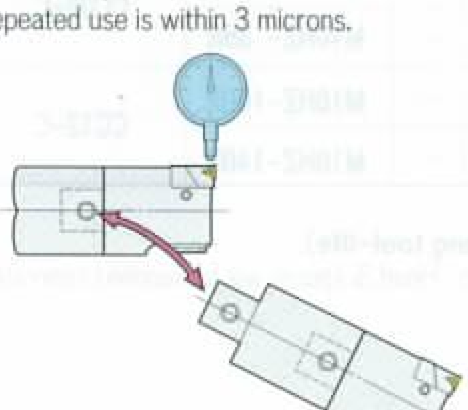


Stepped Spacer

Code No. Q-Q1-L	Coupling Dia Q	Coupling Dia Q1	C	C1	Coupling Bolt No.
SP 12- 9-45	12	9	24	19	B19
SP 16- 9-45	16	9	31	19	B19
-12-60		12		24	B12
SP 20- 9-45	20	9	40	19	B19
-12-60		12		24	B12
-16-60,90		16		31	B16
SP 26- 9-30,45	26	9	50	19	B19
-12-30,60		12		24	B12
-16-30,60,90		16		31	B16
-20-30,60,100		20		40	B20
SP 34-16-60,90	34	16	64	31	B16
-20-60,100		20		40	B20
-26-60,100		26		50	B26
SP 42-20-60,100	42	20	83	40	B20
-26-60,100		26		50	B26
-34-60,100		34		64	B34

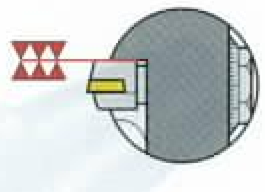
★Q26 spacer diameter has been increased from 45mm to 50mm due to improvement of it's rigidity.
★All spacers have a centre through-tool coolant hole.
★The Coupling screw is included as standard.

Repeatability of modular coupling
Maximum T.I.R. positional error
after repeated use is within 3 microns.



MODULAR TYPE ZMAC BORING HEAD

NIKKEN



ZMAC Triangular Insert type head

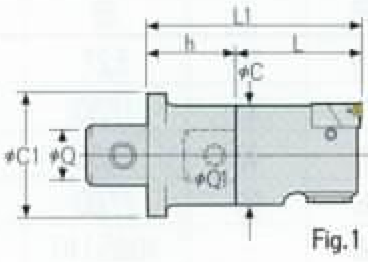


Fig.1

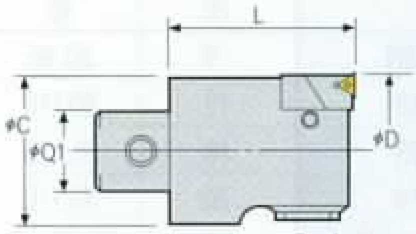


Fig.2

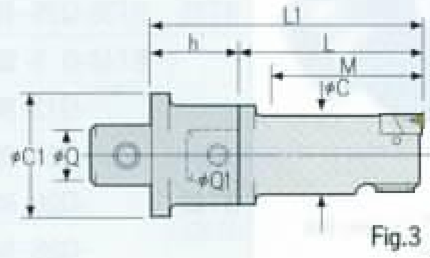
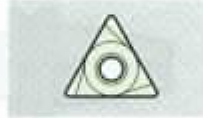


Fig.3

P.10 for triangular Insert



For Modular type / For Solid type

Set/Head Code No. (Q-)Q1-Min.D -L1/L	Boring Range D	Boring Depth M	Cupling Dia. Q	Spacer No. Q -Q1-h	Head No. Q1-Min.D-L	h	L1	Q1	C	C1	Unit No.	Insert No.	Fig.
Q26-12 -ZMAC 16- 75	15.9~20.2	38	26	SP26-12-30	12-ZMAC 16- 45	30	75	12	15	50	M 2HZ - 16	3MP-C,B	3
Q26-12 -ZMAC 16- 85		48		SP26-12-30	12-ZMAC 16- 55		85						
Q26- 9 -ZMAC 20- 70	19.8~25.2	55		SP26- 9 -30	9-ZMAC 20- 40	30	70	9	19	50	M 2HZ - 20		1
Q26-12 -ZMAC 25- 70	24.8~32.2	55		SP26-12-30	12-ZMAC 25- 40	30	70	12	24	50	M 3HZ - 25	4MP-C,B	
Q26-16 -ZMAC 32- 85	31.8~42.2	70		SP26-16-30	16-ZMAC 32- 55	30	85	16	31	50	M 4HZ - 32		
Q26-20 -ZMAC 42-100	41.8~55.2	85		SP26-20-30	20-ZMAC 42- 70	30	100	20	40	50	M 5HZ - 42		
26 -ZMAC 55- 70	54.8~70.2	70		–	26-ZMAC 55- 70	–	–	–	53	–	M 5HZ - 55	6MP-C,B	2
34 -ZMAC 70- 70	69.8~85.2	70	34	–	34-ZMAC 70- 70	–	–	–	67	–	M 7HZ - 70		
42 -ZMAC 85-100	84.8~100.2	100	42	–	42-ZMAC 85-100	–	–	–	83	–	M10HZ - 85		
42 -ZMAC100-100	99.5~140.5	100		–	42-ZMAC100-100	–	–	–	95	–	M10HZ -100		
42 -ZMAC140-100	139.5~180.5	100		–	42-ZMAC140-100	–	–	–	135	–	M10HZ -140		

★MIN. dial readout :ZMAC32 & above is 0.01mm on diameter.
:ZMAC25 & below is 0.02mm on diameter. Sub scale:0.005mm. Easy adjustment of 3-5microns on diameter using our precision screw mechanism.
★The above boring ranges are based on heads with Nose/R 0.2 insert.
★"C" grade (coated) insert for Steel, Stainless & Cast Iron is supplied as Standard with the head (Smooth boring & Long tool-life).
We would recommend **"B"** grade (CBN) insert for Handened Steel & High Speed boring of Cast Iron.
★The above set code No.(Fig.1 & 3) includes 30mm long stepped spacer to suit Q26 size base holder, please see P.5, P.6 for more information. Head & spacer will be supplied seperate boxes. For head-only orders, please use head No.
★For Centre Through-tool Coolant heads, add the letter **" C "** to end of ordering code **e.g. 26-ZMAC55-70C**

ZMAC- R Rhomboid Insert type head

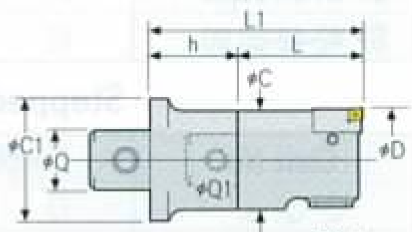


Fig.1

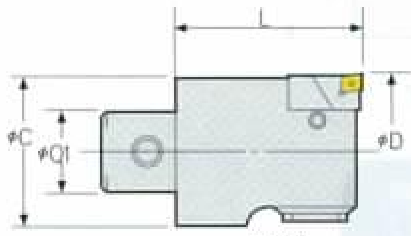


Fig.2

P.10 for Rhomboid Insert

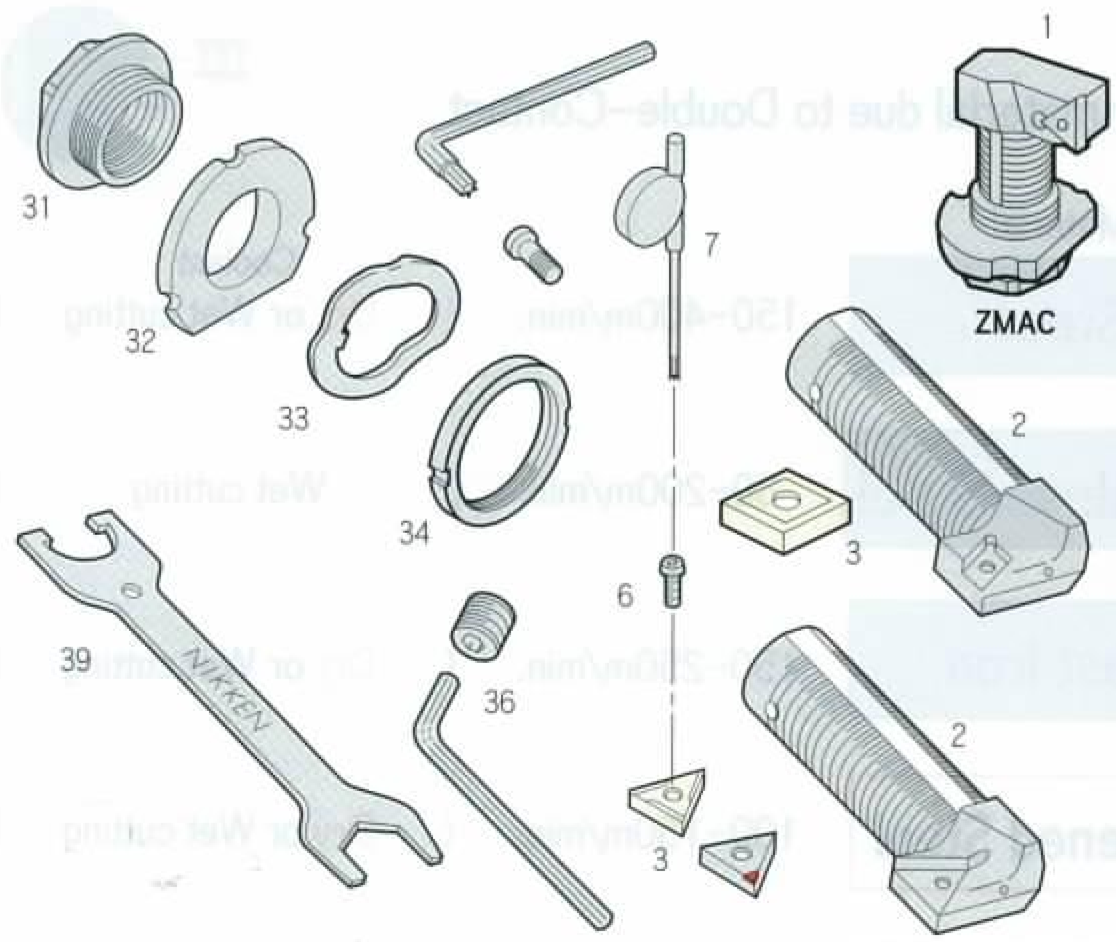
For Modular type / For Solid type

Set/Head Code No. (Q-)Q1-Min.D -L1/L	Boring Range D	Boring Depth M	Cupling Dia. Q	Spacer No. Q -Q1-h	Head No. Q1-Min.D-L	h	L1	Q1	C	C1	Unit No.	Insert No.	Fig.
Q26-16ZMAC 32R- 85	31.8~42.2	70	26	SP26-16-30	16-ZMAC 32R- 55	30	85	16	31	50	M 4HZ- 32R	CC06-C	1
Q26-20ZMAC 42R-100	41.8~55.2	85		SP26-20-30	20-ZMAC 42R- 70	30	100	20	40	50	M 5HZ- 42R		
26 -ZMAC 55R- 70	54.8~70.2	70		–	26-ZMAC 55R- 70	–	–	–	53	–	M 5HZ- 55R		2
34 -ZMAC 70R- 70	69.8~85.2	70	34	–	34-ZMAC 70R- 70	–	–	–	67	–	M 7HZ- 70R	CC08-C	
42 -ZMAC 85R-100	84.8~100.2	100	42	–	42-ZMAC 85R-100	–	–	–	83	–	M10HZ- 85R		
42 -ZMAC 100R-100	99.5~140.5	100		–	42-ZMAC 100R-100	–	–	–	95	–	M10HZ-100R	CC12-C	
42 -ZMAC 140R-100	139.5~180.5	100		–	42-ZMAC 140R-100	–	–	–	135	–	M10HZ-140R		

★MIN. dial readout : 0.01mm on diameter. Easy adjustment of 3-5microns on diameter using our precision screw mechanism.
★"C" grade (coated) insert for Steel, Stainless & Cast Iron is supplied as Standard with the head (Smooth boring & Long tool-life).
★The above set code No.(Fig.1) includes 30mm long stepped spacer to suit Q26 size base holder, please see P.5, P.6 for more information. Head & spacer will be supplied seperate boxes. For head-only orders, please use head No.
★For Centre Through-tool Coolant heads, add the letter **" C "** to end of ordering code **e.g. 26-ZMAC55R-70C.**

ZMAC UNIT PARTS LIST

NIKKEN



NIKKEN ZMAC Boring Heads come complete with ZMAC Boring Unit. See below part No. for spares.
Different codes for the Triangular Insert unit & Rhomboid Insert unit are shown below : column 1: Boring unit, column 2: Cartridge, column 3: Insert, column 6: Insert clamp screw, column 7: Insert clamp handle, but all other parts(column 31 to 34,36,39) are common to both.
N.B. Other manufacturers ISO standard insert tip may have different centre hole diameters.

Boring Range	1 ZMAC Unit	2 Cartridge	3 Triangular Insert	6 Insert Clamp Screw	7 Insert Clamp Handle	31 Dial Ring	32 Lock Flange	33 Wave Spring	34 Preload Nut	36 Lock Screw	39 Adjustment Handle
15.9~ 20.2	M 2HZ- 16	M 2HZ- 16C	3MP-C,B	M2045	T6	9M216D	9M216L	9M216W	9M216P	M361	M392
19.8~ 25.2	M 2HZ- 20	M 2HZ- 20C				9M220D	9M220L			M362	
24.8~ 32.2	M 3HZ- 25	M 3HZ- 25C				9M325D	9M325L	M333	9M325P	M363	M393
31.8~ 42.2	M 4HZ- 32	M 4HZ- 32C	4MP-C,B	M2070		9M432D	9M432L	M334	M344	M365	M394
41.8~ 55.2	M 5HZ- 42	M 5HZ- 42C	6MP-C,B	M2580	T8	9M542D	9M542L	M335	9M542P	M366	ZM395
54.8~ 70.2	M 5HZ- 55	M 5HZ- 55C									
69.8~ 85.2	M 7HZ- 70	M 7HZ- 70C				9M770D	9M770L	M337	9M770P	M360	M397
84.8~100.2	M10HZ- 85	M10HZ- 85C									
99.5~140.5	M10HZ-100	M10HZ-100C				9M108D	9M108L	M330	9M108P	M368	M390
139.5~180.5	M10HZ-140	M10HZ-140C									

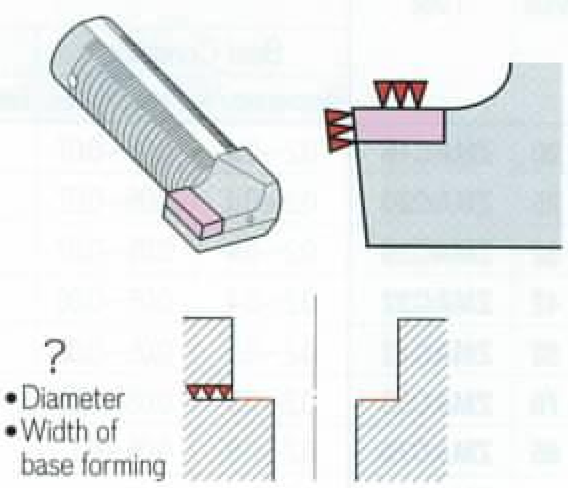
★The each Unit and Cartridge is without Insert tip.

Boring Range	1 ZMAC Unit	2 Cartridge	3 Rhomboid Insert	6 Insert Clamp Screw	7 Insert Clamp Handle
31.8~ 42.2	M 4HZ- 32R	M 4HZ- 32RC	CC06-C	M2577	T8
41.8~ 55.2	M 5HZ- 42R	M 5HZ- 42RC			
54.8~ 70.2	M 5HZ- 55R	M 5HZ- 55RC			
69.8~ 85.2	M 7HZ- 70R	M 7HZ- 70RC	CC08-C	M4012	T15
84.8~100.2	M10HZ- 85R	M10HZ- 85RC			
99.5~140.5	M10HZ-100R	M10HZ-100RC	CC12-C	M5010	T15
139.5~180.5	M10HZ-140R	M10HZ-140RC			

★The each Unit and Cartridge is without Insert tip.

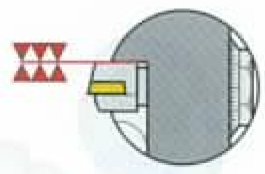
Cartridge for base forming of bore (Special)

The brazed 'K' grade type cartridge is recommended for forming the base of bore. (Whole ground finish)
Please specify i.e. ZMAC55 for base forming at your purchase.



ZMAC BORING SYSTEM CUTTING DATA

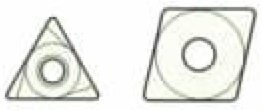
NIKKEN

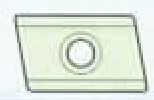


Selection of Insert Tip for each material.

Very easy to select a proper insert tip for your material due to Double-Contact Support of ZMAC boring head.

Insert	Material	Cutting speed	Coolant
Coated TiAlN	Steel	150~400m/min.	(Dry or Wet cutting)
Coated TiAlN	Stainless Steel	80~200m/min.	(Wet cutting)
Coated TiAlN	Cast Iron	150~250m/min.	(Dry or Wet cutting)
CBN	Hardened Steel	100~150m/min.	(Dry or Wet cutting)
CBN	High Speed finish for Cast Iron	400~1000m/min.	(Dry or Wet cutting)
K grade Carbide / Diamond (Wet Cutting)	Alminum, Non-ferrous metal	Wet cutting → K grade carbide	





K grade carbide

Please use RAC Head for Alminum. Prease see P.82 of NC Total Tooling System Catalogue.

More information available on request.

Suitable cutting Speed

◎…Best ○…Good —…unsuitable

Insert	Code No.	Grade	SS41	S55C	SCM	SKD	SC	FC, FCD	SUS	AL, ALC	Hardened Steel SCM	Hardened Steel SKD	Hardened Steel SUJ	Inter-rupted Cutting
	C	**Coated**	◎ 150~400	◎ 150~400	◎ 150~400	◎ 80~150	◎ 80~150	◎ 150~250	◎ 80~200	-	-	-	-	◎
	E	P10	○ 60~100	○ 60~100	○ 80~120	○ 40~100	◎ 60~100	-	○ 40~80	-	-	-	-	◎
	F	K10	-	-	-	-	-	◎ 60~100	-	○ 400~1000	-	-	-	◎
	T	Cermet	◎ 200~400	◎ 200~400	◎ 200~400	◎ 80~150	◎ 80~150	-	◎ 120~180	-	-	-	-	○
	B	**CBN**	-	-	-	-	-	◎ 300~800	-	-	◎ 100~150	◎ 70~100	◎ 120~150	○
	C	**Coated**	◎ 150~400	◎ 150~400	◎ 150~400	◎ 80~150	◎ 80~150	◎ 150~250	◎ 80~150	-	-	-	-	◎

★Existing Inserts (Cermet,P grade Carbide & K grade Carbide)are available.
★When interrupted cutting reduce speed by 50%.

Cutting Condition (removal,feed)

Boring Range	Type	 Best Condition Removal mm/φ	Best Condition Feed mm/rev.	Max. Condition Removal mm/φ	Max. Condition Feed mm/rev.	 Best Condition Removal mm/φ	Best Condition Feed mm/rev.	Max. Condition Removal mm/φ	Max. Condition Feed mm/rev.
φ 16~ 20	**ZMAC16**	0.2~0.4	0.05~0.07	1.0	0.1				
φ 20~ 25	**ZMAC20**	0.2~0.4	0.05~0.07	1.5	0.1				
φ 25~ 32	**ZMAC25**	0.2~0.4	0.05~0.07	2.0	0.1				
φ 32~ 42	**ZMAC32**	0.2~0.4	0.05~0.08	2.0	0.2	1.0~3.0	0.1~0.15	5.0	0.2
φ 42~ 55	**ZMAC42**	0.2~0.5	0.05~0.08	4.0	0.2	1.0~3.0	0.1~0.15	5.0	0.2
φ 55~ 70	**ZMAC55**	0.2~0.5	0.05~0.08	4.0	0.2	1.0~3.0	0.1~0.15	5.0	0.2
φ 70~ 85	**ZMAC70**	0.2~0.8	0.05~0.1	4.0	0.25	1.0~4.0	0.1~0.2	8.0	0.25
φ 85~	**ZMAC85~**	0.2~0.8	0.05~0.1	4.0	0.25	1.0~4.0	0.1~0.2	8.0	0.25

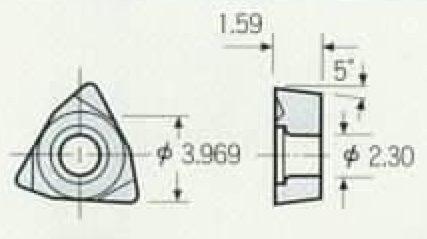
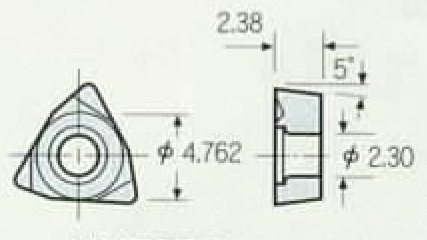
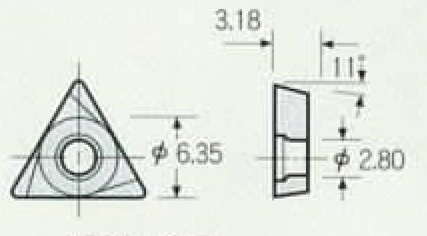
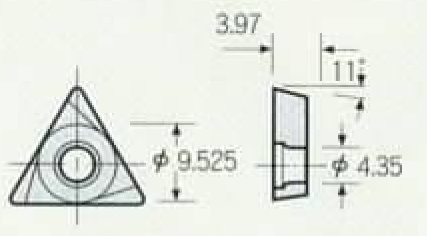
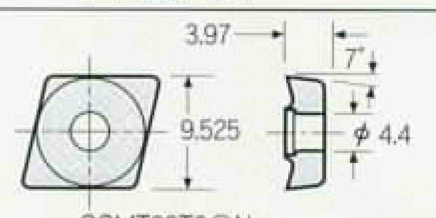
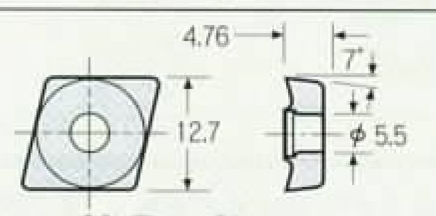
In case of CBN insert, reduce L/D as small as possible : Max. 3 times.
Stock removal on diameter.
D<32mm : less than 0.25mm
D>32mm : less than 0.3mm

Feed per rev. is dependent on Nose/R and accuracy required.

Logical Surface Finish : $\frac{(\text{Feed per rev.})^2}{8 \times \text{Nose/R}}$

NIKKEN INSERT SPECIFICATION TABLE

NIKKEN

Insert tip Code No.			Dimension	Grade	Material	Applicable Arbor
R0.2	R0.4	R0.8				
3MP-C	3MP-C4		 WBGT0601○L	Coated	Alloy Steel, Stainless, Cast Iron	ZMAC16,ZMAC20,ZMAC25
-T				cermet	Alloy Steel, Stainless Steel	
-E				P10	Alloy Steel	
-F				K10	Cast Iron, Alminum	
	-B4			CBN	Hardened Steel	
4MP-C	4MP-C4		 WBGT0802○L	Coated	Alloy Steel, Stainless, Cast Iron	ZMAC32
-T				cermet	Alloy Steel, Stainless Steel	
-E				P10	Alloy Steel	
-F				K10	Cast Iron,Alminum	
-B	-B4			CBN	Hardened Steel	
6MP-C	6MP-C4	6MP-C8	 TPGT1103○L	Coated	Alloy Steel, Stainless, Cast Iron	ZMAC42,ZMAC55,ZMAC70, ZMAC85,ZMAC100, ZMAC140
-T	-T4	-T8		cermet	Alloy Steel, Stainless Steel	
-E	-E4	-E8		P10	Alloy Steel	
	-F	-F8		K10	Cast Iron, Alminum	
	-B4	-B8		CBN	Hardened Steel	
10MP-C	10MP-C4	10MP-C8	 TPGT16T3○L	Coated	Alloy Steel, Stainless, Cast Iron	MAC80,MAC100
-T	-T4	-T8		cermet	Alloy Steel, Stainless Steel	
-E	-E4	-E8		P10	Alloy Steel	
	-F	-F8		K10	Cast Iron, Alminum	
		-B8		CBN	Hardened Steel	
	CC06-C4	CC06-C8	 CCMT0602○N	Coated	Cast Iron, Alloy Steel, Stainless Steel	ZMAC32R,ZMAC42R, ZMAC55R
	CC08-C4	CC08-C8	 CCMT09T3○N	Coated	Cast Iron, Alloy Steel, Stainless Steel	ZMAC70R,ZMAC85R
	CC12-C4	CC12-C8	 CCMT1204○N	Coated	Cast Iron, Alloy Steel, Stainless Steel	ZMAC100R,ZMAC140R

★Minium order quantity of CBN:1pcs. All other inserts:10 pcs. ★Code No. of Coated CCMT type inserts have been unified to "C".

★Insert with large nose radius have a stronger cutting edge,and are therefore ideal for large diameter boring of short holes. Small nose radius insert is ideal for smaller diameter boring or finisihing.

★T (cermet) insert is TiN-coated as standerd, please specify uncoated insert, if required for deep-hole boring applications.

★For NIKKEN special-nose geometries inserts for deep-hole boring applications, please specify code No. adding letter "-SR".

Code No. of ISO standard Insert Tip

T P G T 1 1 0 3 0 4 L

Cutting Edge Length / Thickness / Corner Radius / Cutting Direction (L : Left, N : Either)

Insert Shape T : △, W : 80°, C : 80°, M : 86°

Normal Clearance B : 5°, C : 7°, P : 11°

Tolerance Class G : Ground, M : Pressed

Chip Breaker & Hole Configuration W : , T :

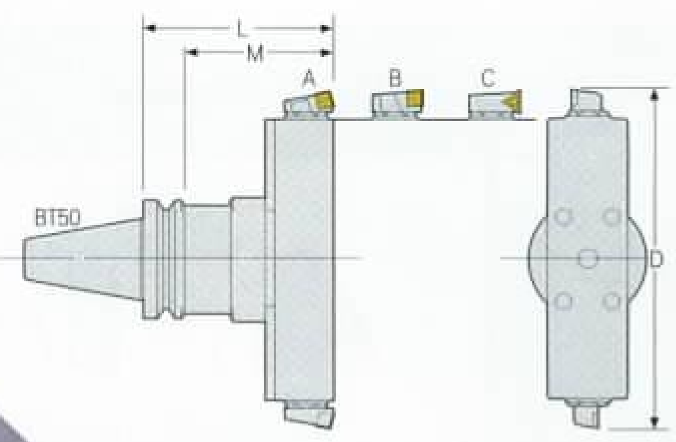
The majority of ISO inserts available are designed for turning where the workpiece rotates and are not recommended for use in boring as it's the tool which is rotating,however these inserts can be fitted on to the cartridge if the size is the same. Diameters of centre holes on ISO standard insert can vary and you may, therefore have to change the clamp screw to suit the insert.

DOUBLE CUT BORING ARBOR for LARGE DIA.

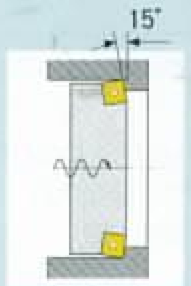
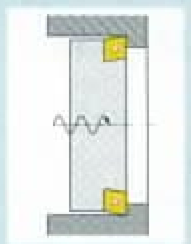
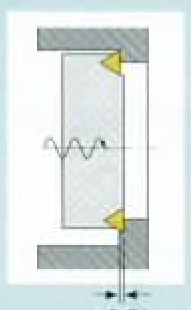
NIKKEN

Flexible for both Rough & Finish
Selection of A, B, C

ϕ130～ϕ586



Easy to change Cartridge Units according to your application.

Type	Code No. BTNo.-D -L	Boring Range	Boring Depth	BT Shank No.	Plate No.	Unit Type No.	Insert No.	Weight (kg)
Type A for Through Hole Rough & Finish  15°	BT50-DAC130-170A	ϕ130～ϕ151	160	BT50-DPK-110	DPC-130	M10A-100S	9CMT12 	11.5
	(IT50) -DAC150-170A	ϕ150～ϕ186			DPC-150	M10A-100M		12.0
	-DAC185-170A	ϕ185～ϕ236			DPC-185	M10A-100L		13.1
	-DAC235-170A	ϕ235～ϕ286			DPC-235			14.7
	-DAC285-170A	ϕ285～ϕ336			DPC-285			16.2
	-DAC335-185A	ϕ335～ϕ386	175	BT50-DPK-125	DPC-335			22.0
	-DAC385-185A	ϕ385～ϕ436			DPC-385			23.5
	-DAC435-185A	ϕ435～ϕ486			DPC-435			25.0
	-DAC485-185A	ϕ485～ϕ536			DPC-485			26.7
	-DAC535-185A	ϕ535～ϕ586			DPC-535			28.2
Type B for Base Forming of Hole Rough & Finish 	BT50-DAC130-170B	ϕ130～ϕ151	160	BT50-DPK-110	DPC-130	M10B-100S		11.5
	(IT50) -DAC150-170B	ϕ150～ϕ186			DPC-150	M10B-100M		12.0
	-DAC185-170B	ϕ185～ϕ236			DPC-185	M10B-100L		13.1
	-DAC235-170B	ϕ235～ϕ286			DPC-235			14.7
	-DAC285-170B	ϕ285～ϕ336			DPC-285			16.2
	-DAC335-185B	ϕ335～ϕ386	175	BT50-DPK-125	DPC-335			22.0
	-DAC385-185B	ϕ385～ϕ436			DPC-385			23.5
	-DAC435-185B	ϕ435～ϕ486			DPC-435			25.0
	-DAC485-185B	ϕ485～ϕ536			DPC-485			26.7
	-DAC535-185B	ϕ535～ϕ586			DPC-535			28.2
Type C for Stepped Hole Rough & Finish  +0.2	BT50-DAC130-170C	ϕ130～ϕ151	160	BT50-DPK-110	DPC-130	M10C-100S, M10CX-100S	10MP-C,B 	11.5
	(IT50) -DAC150-170C	ϕ150～ϕ186			DPC-150	M10C-100M,M10CX-100M		12.0
	-DAC185-170C	ϕ185～ϕ236			DPC-185	M10C-100L,M10CX-100L		13.1
	-DAC235-170C	ϕ235～ϕ286			DPC-235			14.7
	-DAC285-170C	ϕ285～ϕ336			DPC-285			16.2
	-DAC335-185C	ϕ335～ϕ386	175	BT50-DPK-125	DPC-335			22.0
	-DAC385-185C	ϕ385～ϕ436			DPC-385			23.5
	-DAC435-185C	ϕ435～ϕ486			DPC-435			25.0
	-DAC485-185C	ϕ485～ϕ536			DPC-485			26.7
	-DAC535-185C	ϕ535～ϕ586			DPC-535			28.2

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