Tooling News No.529

SUMITOMO
CARBIDE - CBN - DIAMOND
Global Support, Global Solutions.

High-Efficiency Milling Cutter for Aluminum Alloy

ALNEX ANX Series

Ultra-High Efficiency Machining Excellent Chip Control

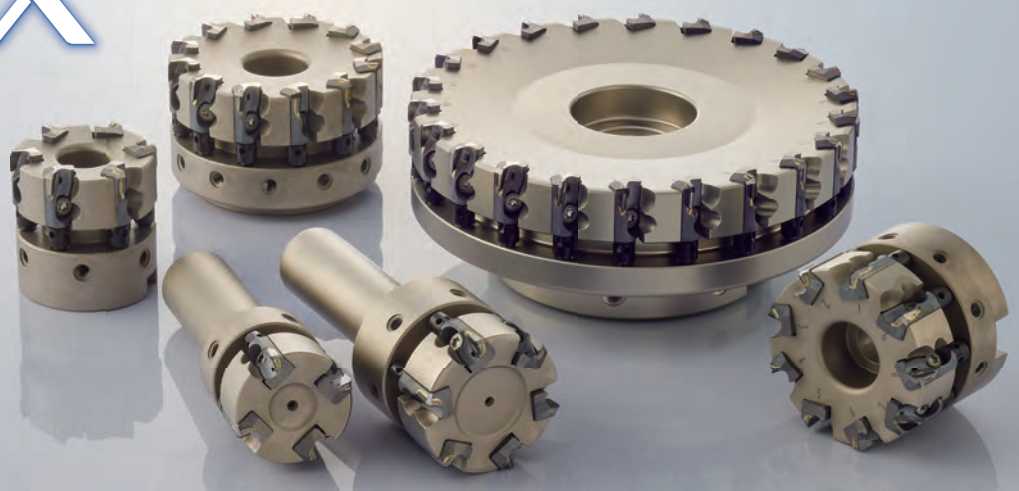
Blade Through Coolant

P M K N S H

SUMITOMO ELECTRIC GROUP

ALNEX

VIDEO OF CUTTING



Features

Drastically Reduced Runout Adjustment Time

Simple screw-fastening structure enables fine adjustments to be made easily

Blade Through Coolant

Secures a supply of coolant to the cutting edge and breaks chips thoroughly

Lightweight Aluminum Alloy Body

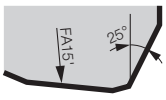
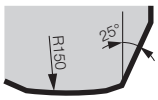
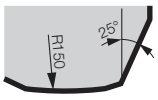
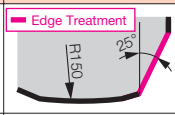
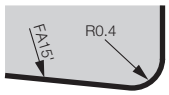
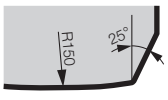
Utilising aluminum alloy to achieve a total weight of less than 1.3kg for a ø125mm cutter with 22 teeth.

Series

Number in ● is the number of teeth Inch Inch Bore

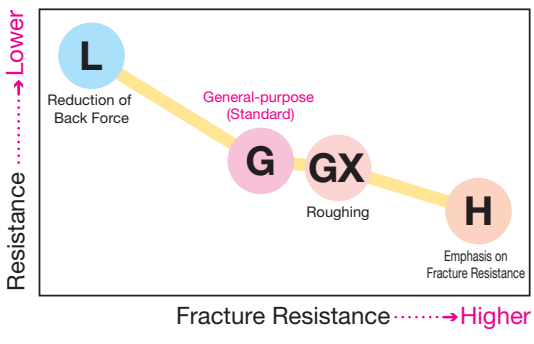
Type	Cat. No.	Body Material	Diameter Range (mm)							
			ø32	ø40	ø50	ø63	ø80	ø100	ø125	ø160
Shell type	**ANXA 16000RS**	Aluminum Alloy					10 14	12 18	14 22	20 28
Shell type	**ANXA 16000R** Inch	Aluminum Alloy					10 14	12 18	14 22	20 28
Shell type	**ANXS 16000RS**	Steel		6	6 9	8 12	10 14	12 18	14 22	
Shell type	**ANXS 16000R** Inch	Steel				8 12	10 14	12 18	14 22	
Shank type	**ANXS 16000E**	Steel	4	6						

Blade Selection Guide

Work Materials	N					
Type	L	G	GX	H	—	W
Cutting Edge Shape						
Features	Low Resistance	Standard	Long Edge	High Strength		
Applications	Finishing/Light Cutting	General-purpose	Roughing		Corner Radius Milling	Wiper
Edge Length (*)	6.0mm	6.0mm	9.0mm	6.0mm		

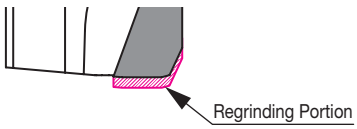
*Edge Length
GX Type only 9.0mm

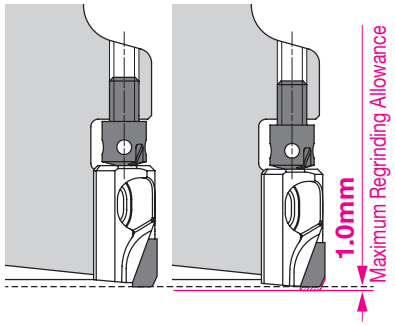
Edge Selection Guide



● Reduces running costs by drastically increasing insert regrinding allowance (to 1.0mm)

Assuming 0.2mm of regrinding each time, an edge can be used up to 6 times.
(*Peripheral edge cannot be reground.)



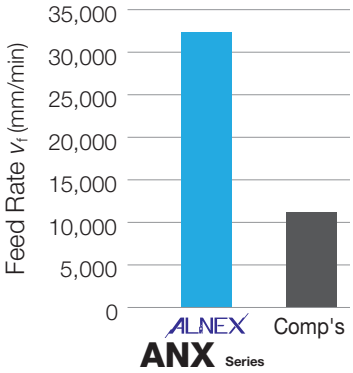


High-speed/High-efficiency Cutting

Realizes ultra-high efficiency machining with v_f = 30,000mm/min

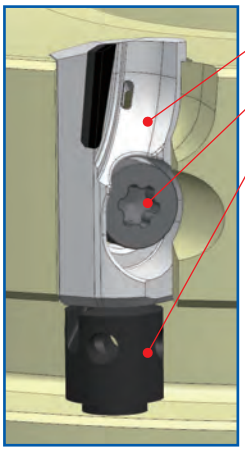
Cutter diameter ø100mm comparison

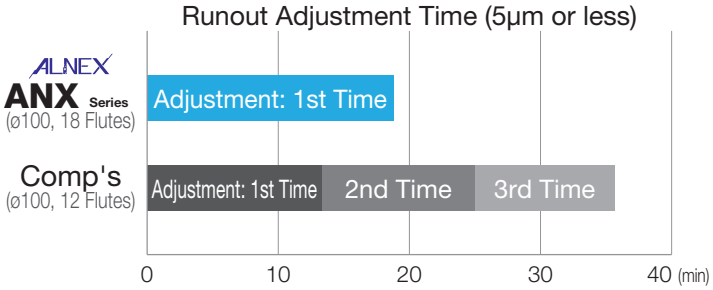
	Spindle Speed min^{-1}	Number of Teeth	Feed Rate v_f(mm/min)
ALNEX ANX Series	18,000	18	32,400
Comp's	9,500	12	11,400



Drastically Reduced Runout Adjustment Time

● Simple screw-fastening structure ● Enables fine adjustments to be made easily ● High-rigidity body





1st Time Completed, Adjustment Time Reduced

Chip Control

Blade-Through Coolant Chip Breaking

ALNEX ANX Series

Competitor's

Work material: ADC12
Cutting conditions: v_c = 2,500m/min, f_z = 0.05mm/t, a_p = 0.5mm Wet

ANXS 16000R(S) Type

New

Rake Angle		
	Radial	+5°
	Axial	+5°

3mm 90°

N Non-Ferrous Metal N Aluminum Alloy

Fig 1

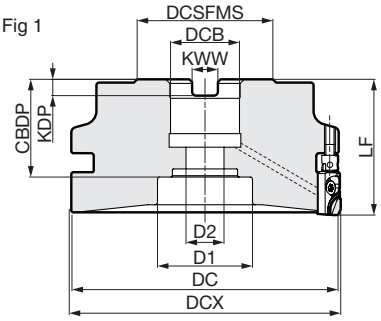
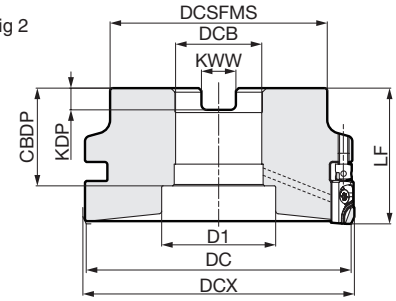


Fig 2



Body (Steel)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss Dia. DCSFMS	Overall Length LF	Bore Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**ANXS 16040RS06**	●	**38**	40	38.5	40	**16**	8.4	5.6	26	14	9	6	0.3	1
	16050RS06	●	**48**	50	48.5	40	**22**	10.4	6.3	26	18	11	6	0.4	1
	16050RS09	●	**48**	50	48.5	40	**22**	10.4	6.3	26	18	11	9	0.5	1
	16063RS08	●	**61**	63	50	40	**22**	10.4	6.3	26	18	11	8	0.7	1
	16063RS12	●	**61**	63	50	40	**22**	10.4	6.3	26	18	11	12	0.7	1
	16080RS10	●	**78**	80	50	50	**27**	12.4	7	34	35	14	10	1.2	1
	16080RS14	●	**78**	80	50	50	**27**	12.4	7	34	35	14	14	1.2	1
	16100RS12	●	**98**	100	80	50	**32**	14.4	8	32	46	—	12	2.0	2
	16100RS18	●	**98**	100	80	50	**32**	14.4	8	32	46	—	18	2.0	2
	16125RS14	●	**123**	125	80	63	**40**	16.4	9	35	52	—	14	3.9	2
	16125RS22	●	**123**	125	80	63	**40**	16.4	9	35	52	—	22	3.9	2
Inch	**ANXS 16063R08**	●	**61**	63	50	50	**25.4**	9.5	6	31	20	14	8	0.9	1
	16063R12	●	**61**	63	50	50	**25.4**	9.5	6	31	20	14	12	0.9	1
	16080R10	●	**78**	80	50	50	**25.4**	9.5	6	34	35	14	10	1.2	1
	16080R14	●	**78**	80	50	50	**25.4**	9.5	6	34	35	14	14	1.2	1
	16100R12	●	**98**	100	80	50	**31.75**	12.7	8	36	42	—	12	2.0	2
	16100R18	●	**98**	100	80	50	**31.75**	12.7	8	36	42	—	18	2.0	2
	16125R14	●	**123**	125	80	63	**38.1**	15.9	10	42.5	52	—	14	3.9	2
	16125R22	●	**123**	125	80	63	**38.1**	15.9	10	42.5	52	—	22	3.9	2

Blades are sold separately.
If using a blade for corner radius machining (ANB1604R), DC = DCX.

Identification Code

ANX S 16 100 R S 18

ANX	S	16	100	R	S	18
Cutter Series	Steel Body	Blade Size	Cutter Dia.	Feed Direction	Metric Bore	Number of Teeth

Parts

(Sold Separately)

Applicable Cutter	Clamp Screw	(N·m)	Adjustment Screw	Wrench	Adjustment Wrench	Centre Bolt	Assembly Wrench
ANXS 16040RS06	BXA0310IP	2.0	HFJ	TRXW10IP	ANT	BXH0825-D13	HFVT
ANXS 16050RS○○						BXH1030-D16	
ANXS 16063RS○○							
ANXS 16080RS○○						BXH1235-D33	
ANXS 16100RS○○						BXH1635-D40	
ANXS 16125RS○○						BXH2036-D50	
ANXS 16063R○○						BXH1235-D18	
ANXS 16080R○○						BXH1235-D33	
ANXS 16100R○○						BXH1635-D40	
ANXS 16125R○○						BXH2036-D50	

(N·m) Recommended Tightening Torque (N·m)

Maximum Allowable Spindle Speed

Cat. No.	n max(min^{-1})
ANXS 16040RS06	25,000
ANXS 16050RS06	25,000
ANXS 16050RS09	25,000
ANXS 16063RS08	22,000
ANXS 16063RS12	22,000
ANXS 16080RS10	20,000
ANXS 16080RS14	20,000
ANXS 16100RS12	18,000
ANXS 16100RS18	18,000
ANXS 16125RS14	16,000
ANXS 16125RS22	16,000
ANXS 16063R08	22,000
ANXS 16063R12	22,000
ANXS 16080R10	20,000
ANXS 16080R14	20,000
ANXS 16100R12	18,000
ANXS 16100R18	18,000
ANXS 16125R14	16,000
ANXS 16125R22	16,000

● mark: Standard stocked item

ANXS 16000R(S) Type

Blade

Dimensions (mm)

Grade		SUMIDIA
Process	High-speed/Light	N
	General-purpose	N
	Roughing	N

Cat. No.	DA1000	Cutting Edge Length	Wiper Edge Shape	Applications	Fig
ANB 1600R-L	●	6.0	Linear	Low Resistance	1
ANB 1600R-G	●	6.0	Arc-Shaped	General-purpose	1
ANB 1600R-H	●	6.0	Arc-Shaped	Strong Edge	1
ANB 1600R-GX	●	9.0	Arc-Shaped	Long Edge	2
ANB 1604R	●	6.0	Linear	Corner Radius	3
ANB 1600R-W	●	—	Arc-Shaped	Wiper	4

Fig 1

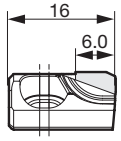


Fig 2

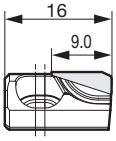


Fig 3

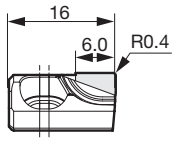
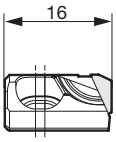


Fig 4



Wiper Blade

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	2,000 - **2,500** - 3,000	0.05 - **0.13** - 0.20	DA1000

Si content of over 12.6%

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	400 - **600** - 800	0.05 - **0.13** - 0.20	DA1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

● mark: Standard stocked item

ANXA 16000R(S) Type

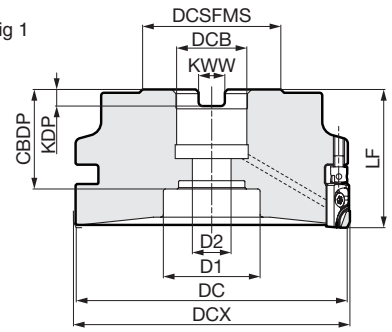
New

Rake Angle		
	Radial	+5°
	Axial	+5°

3mm 90°

N Non-Ferrous Metal N Aluminum Alloy

Fig 1



Body (Aluminum Alloy)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss Dia. DCSFMS	Overall Length LF	Bore Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)
Metric	**ANXA 16080RS10**	●	**78**	80	50	50	**27**	12.4	7	34	35	14	10	0.5
	ANXA 16080RS14	●	**78**	80	50	50	**27**	12.4	7	34	35	14	14	0.5
	ANXA 16100RS12	●	**98**	100	50	50	**27**	12.4	7	34	35	14	12	0.8
	ANXA 16100RS18	●	**98**	100	50	50	**27**	12.4	7	34	35	14	18	0.9
	ANXA 16125RS14	●	**123**	125	50	50	**27**	12.4	7	34	35	14	14	1.2
	ANXA 16125RS22	●	**123**	125	50	50	**27**	12.4	7	34	35	14	22	1.3
	ANXA 16160RS20	●	**158**	160	80	63	**40**	16.4	9	35	52	29	20	2.6
	ANXA 16160RS28	●	**158**	160	80	63	**40**	16.4	9	35	52	29	28	2.6
Inch	**ANXA 16080R10**	●	**78**	80	50	50	**25.4**	9.5	6	34	35	14	10	0.5
	ANXA 16080R14	●	**78**	80	50	50	**25.4**	9.5	6	34	35	14	14	0.5
	ANXA 16100R12	●	**98**	100	50	50	**25.4**	9.5	6	34	35	14	12	0.9
	ANXA 16100R18	●	**98**	100	50	50	**25.4**	9.5	6	34	35	14	18	0.9
	ANXA 16125R14	●	**123**	125	50	50	**25.4**	9.5	6	34	35	14	14	1.2
	ANXA 16125R22	●	**123**	125	50	50	**25.4**	9.5	6	34	35	14	22	1.3
	ANXA 16160R20	●	**158**	160	80	63	**38.1**	15.9	10	42.5	55	30	20	2.4
	ANXA 16160R28	●	**158**	160	80	63	**38.1**	15.9	10	42.5	55	30	28	2.6

Blades are sold separately.
If using a blade for corner radius machining (ANB1604R), DC = DCX.

Identification Code

ANX A 16 100 R S 18

ANX	A	16	100	R	S	18
Cutter Series	Aluminum Alloy Body	Blade Size	Cutter Dia.	Feed Direction	Metric Bore	Number of Teeth

Maximum Allowable Spindle Speed

Cat. No.	n max(min^{-1})
ANXA 16080RS10	20,000
ANXA 16080RS14	20,000
ANXA 16100RS12	18,000
ANXA 16100RS18	18,000
ANXA 16125RS14	16,000
ANXA 16125RS22	16,000
ANXA 16160RS20	14,000
ANXA 16160RS28	14,000
ANXA 16080R10	20,000
ANXA 16080R14	20,000
ANXA 16100R12	18,000
ANXA 16100R18	18,000
ANXA 16125R14	16,000
ANXA 16125R22	16,000
ANXA 16160R20	14,000
ANXA 16160R28	14,000

Parts

(Sold Separately)

Applicable Cutter	Clamp Screw	N·m	Adjustment Screw	Wrench	Adjustment Wrench	Centre Bolt	Assembly Wrench
ANXA 16080RS○○	BXA0310IP	2.0	HFJ	TRXW10IP	ANT	BXH1235-D33	HFVT
ANXA 16100RS○○							
ANXA 16125RS○○							
ANXA 16160RS○○						BXH2036-D50	
ANXA 16080R○○						BXH1235-D33	
ANXA 16100R○○							
ANXA 16125R○○							
ANXA 16160R○○						BXH2036-D50	

N·m Recommended Tightening Torque (N·m)

● mark: Standard stocked item

ANXA 16000R(S) Type

Blade

Dimensions (mm)

Grade		SUMIDIA
Process	High-speed/Light	N
	General-purpose	N
	Roughing	N

Cat. No.	DA1000	Cutting Edge Length	Wiper Edge Shape	Applications	Fig
ANB 1600R-L	●	6.0	Linear	Low Resistance	1
ANB 1600R-G	●	6.0	Arc-Shaped	General-purpose	1
ANB 1600R-H	●	6.0	Arc-Shaped	Strong Edge	1
ANB 1600R-GX	●	9.0	Arc-Shaped	Long Edge	2
ANB 1604R	●	6.0	Linear	Corner Radius	3
ANB 1600R-W	●	—	Arc-Shaped	Wiper	4

Fig 1

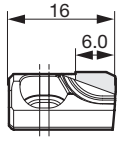


Fig 2

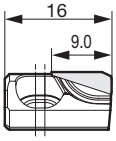


Fig 3

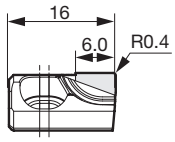
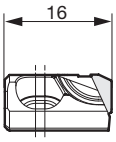


Fig 4



Wiper Blade

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	2,000 - **2,500** - 3,000	0.05 - **0.13** - 0.20	DA1000

Si content of over 12.6%

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	400 - **600** - 800	0.05 - **0.13** - 0.20	DA1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

● mark: Standard stocked item

ANXS 16000E Type

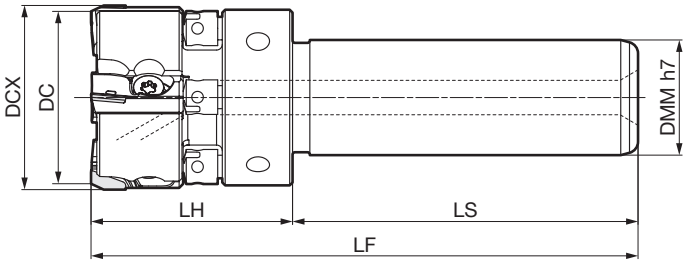
New

Rake Angle		
	Radial	-2 to 0°
	Axial	+5°

3mm 90°

Non-Ferrous Metal | Aluminum Alloy

Fig 1



Body (Steel)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Shank Dia. DMM	Head LH	Shank Length LS	Overall Length LF	Number of Teeth	Weight (kg)
ANXS 16032E04	●	**30**	32	20	35	60	95	4	0.3
16040E06	●	**38**	40	20	40	60	100	6	0.5

Blades are sold separately.
If using a blade for corner radius machining (ANB1604R), DC = DCX.

Identification Code

ANX S 16 032 E 04

Cutter Series	Steel Body	Blade Size	Cutter Dia.	With Shank	Number of Teeth

Maximum Allowable Spindle Speed

Cat. No.	*n* max(min^{-1})
ANXS 16032E04	10,000
ANXS 16040E06	10,000

Parts

(Sold Separately)

Applicable Cutter	Clamp Screw		Adjustment Screw	Wrench	Adjustment Wrench	Assembly Wrench
ANXS 16032E04	BXA0310IP	2.0	HFJ	TRXW10IP	ANT	HFVT
ANXS 16040E06						

N·m Recommended Tightening Torque (N·m)

● mark: Standard stocked item

ANXS 16000E Type

Blade

Dimensions (mm)

Grade		SUMIDIA
Process	High-speed/Light	N
	General-purpose	N
	Roughing	N

Cat. No.	DA1000	Cutting Edge Length	Wiper Edge Shape	Applications	Fig
ANB 1600R-L	●	6.0	Linear	Low Resistance	1
ANB 1600R-G	●	6.0	Arc-Shaped	General-purpose	1
ANB 1600R-H	●	6.0	Arc-Shaped	Strong Edge	1
ANB 1600R-GX	●	9.0	Arc-Shaped	Long Edge	2
ANB 1604R	●	6.0	Linear	Corner Radius	3
ANB 1600R-W	●	—	Arc-Shaped	Wiper	4

Fig 1

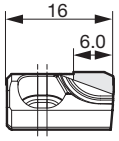


Fig 2

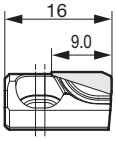


Fig 3

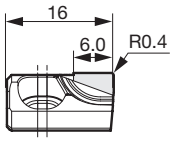
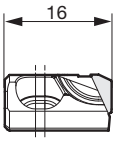


Fig 4



Wiper Blade

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	2,000 - **2,500** - 3,000	0.05 - **0.13** - 0.20	DA1000

Si content of over 12.6%

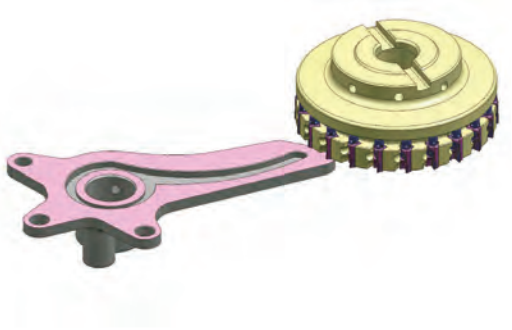
ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	400 - **600** - 800	0.05 - **0.13** - 0.20	DA1000

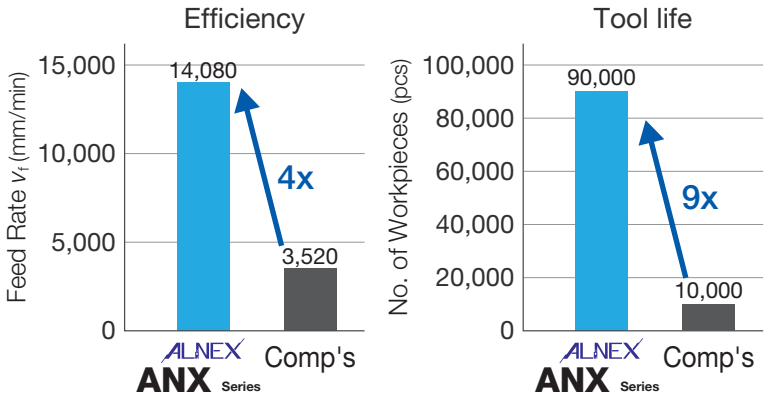
Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

● mark: Standard stocked item

Application Examples

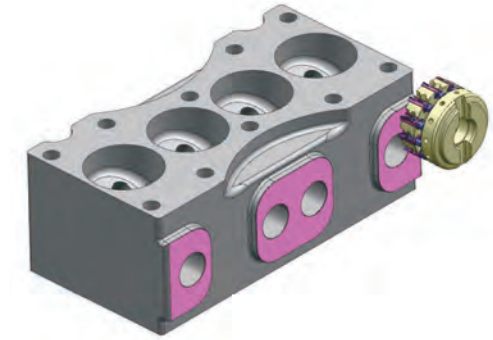
Achieves 4 times the efficiency and 9 times the tool life

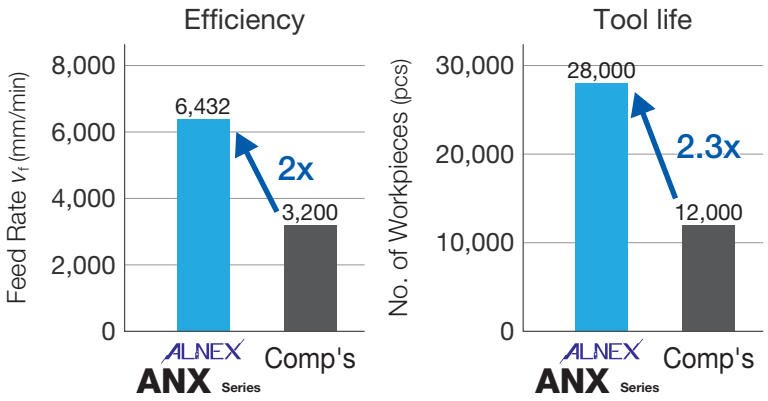




Machine: Vertical Machining Centre BT30 Work material: ADC12 Automotive Component Tool: ANXA 16125R22 (ø125, 22-flute, aluminum alloy body *Total weight with arbor 1.75kg)
Blade: ANB 1600R-G (DA1000) Cutting conditions: v_c = 3,142m/min, v_f = 14,080mm/min, a_p = 0.8mm Wet

Achieves 2 times the efficiency and 2.3 times the tool life





Machine: Vertical Machining Centre HSK63 Work material: ADC12 Cylinder Head Tool: ANXS 16063RS12 (ø63, 12-flute, steel body)
Blade: ANB 1600R-G (DA1000) Cutting conditions: v_c = 1,583m/min, v_f = 6,432mm/min, a_p = 0.5mm Wet

M E M O

< SAFETY NOTES >

- Very hot or lengthy chips may be discharged while the machine is in operation. Therefore, machine guards, safety goggles or other protective covers must be used. Fire safety precautions must also be considered.
- Please handle with care as this product has sharp edges.
- Improper cutting conditions or mis-handling of the tool may result in breakages or projectiles. Therefore, please use the tool within its recommended conditions.
- When using non-water soluble cutting oil, precautions against fire must be taken and please ensure that a fire extinguisher is placed near the machine.

Sumitomo Electric Industries, Ltd.

Hardmetal Division

Global Marketing Department : 1-1-1, Koyakita, Itami, Hyogo 664-0016, Japan

Tel: +81-72-772-4535 Fax: +81-72-771-0088

https://www.sumitool.com/global

(2019.5)I TP/AK