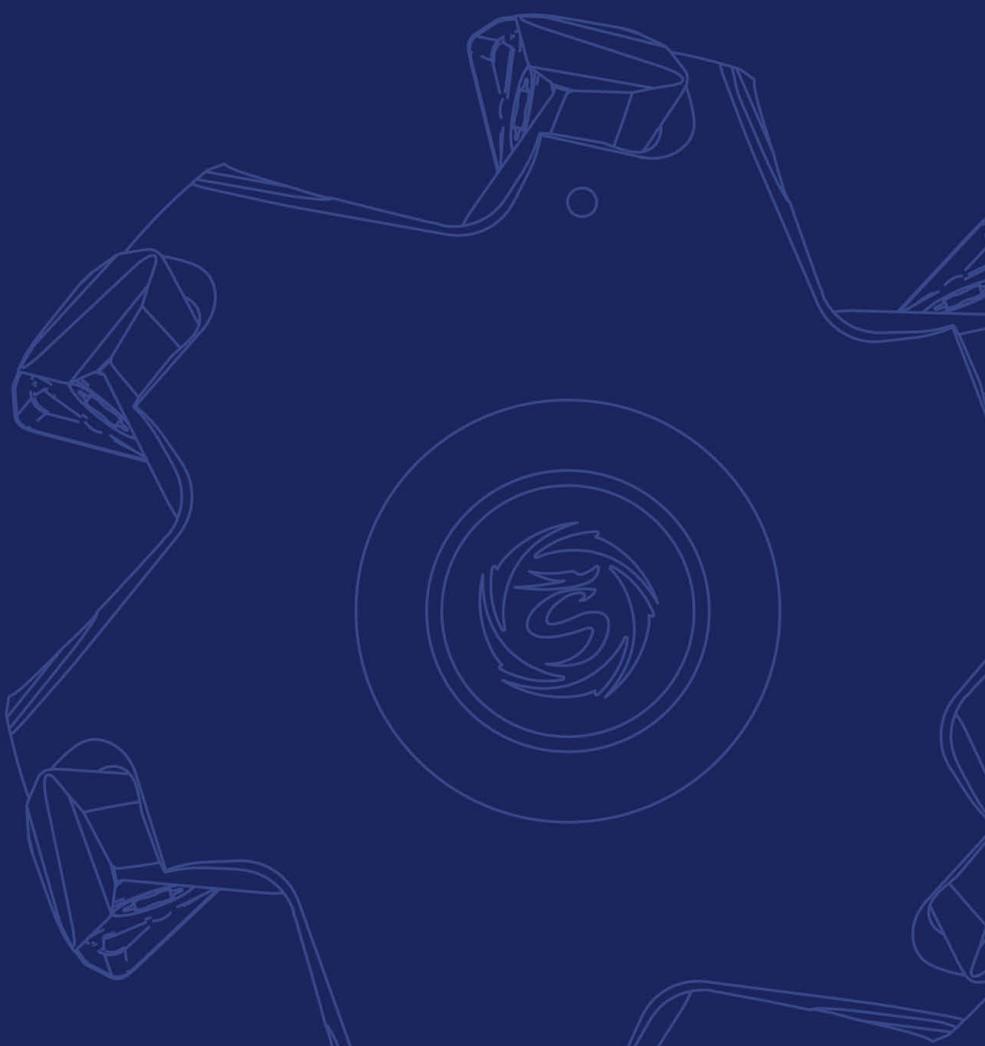


# 阿诺 -Loong 龍系列 可转位刀具



AHNO Loong Series  
Indexable Tools

2025



AHNO 阿诺

Cutting Tool Technology





**AHNO 阿诺**

Cutting Tool Technology

Customers 350+  
服务客户 **3500家+**

Factories 6+  
全国工厂 **6家+**

Annual production capacity of solid carbides cutting tools 400,000,000+  
整硬刀具年产能 **4亿+**

Regrinding Centers 12+  
全国修磨中心 **12家+**

Annual production capacity of inserts 45,000,000+  
刀片年产能 **4500万片+**

Technical Service Staffs 200+  
技术服务人员 **200+**

Patents 300+  
专利数 **300+**

Regrinding Centers 12+  
全国修磨中心 **12家+**

Factories 6+  
工厂 **6家+**

Coatings Drills End Mills Reamers CNC Inserts  
涂层 钻头 铣刀 铰刀 数控刀片

Factories 6+  
全国工厂 **6家+**

PCD Tools & Medical Tools  
PCD刀具 医疗器械

# COMPANY INTRODUCTION

## 企业简介

阿诺成立于 2002 年 1 月，由德国工学博士柯亚仕创立，总部位于中新合作的苏州工业园区。阿诺作为金属切削刀具整体解决方案服务商，提供高品质精密金属切削刀具的设计研发、制造、修磨和技术支持等一条龙服务，具体产品有硬质合金钻头、可转位刀片、立铣刀、PCD 刀具、微小径刀具、医疗刀具、刀具涂层、刀具修磨、刀具管理、提供项目加工的整体解决方案。

公司通过了由德国 TUVSUD 认证的 ISO9001 质量认证体系和 ISO13485 质量认证体系，常设江苏省工程研究中心，“中国刀协副理事长单位”，国家级专精特新“小巨人”。

2024 年 7 月，阿诺正式加入山特维克集团。

Founded by the returnee Dr. Ke Yashi, Suzhou AHNO Precision Cutting Tool Technology Co., Ltd. was established in January 2002, which headquarter is located in Suzhou Industrial Park. As an overall solution provider of metal cutting, AHNO provides a one package service including the design, R&D, manufacturing, regrinding and technical support of high-quality precision metal cutting tools. The products include solid carbide drills, indexable inserts, end mills, PCD tools, micro tools, medical tools, coatings, regrinding, tool management, and overall solutions for project processing.

AHNO has passed the ISO9001 quality certification system and ISO13485 quality certification system certified by German TUVSUD and established Jiangsu Provincial Engineering Research Center, which is also the Vice director unit of CMCTEA and National Specialty Super New Giant.

In July 2024, AHNO officially joined the Sandvik Group.





## 全国布局

National layout

6+  
家

全国工厂  
National Factories

17+  
家

全国修磨、涂层服务中心  
National Grinding and Coating  
Service Center

★ 总部  
Headquarter

▲ 工厂 X 6  
Factory

● 修磨中心 X 12  
Regrinding Center

■ 涂层中心 X 5  
Coating Center

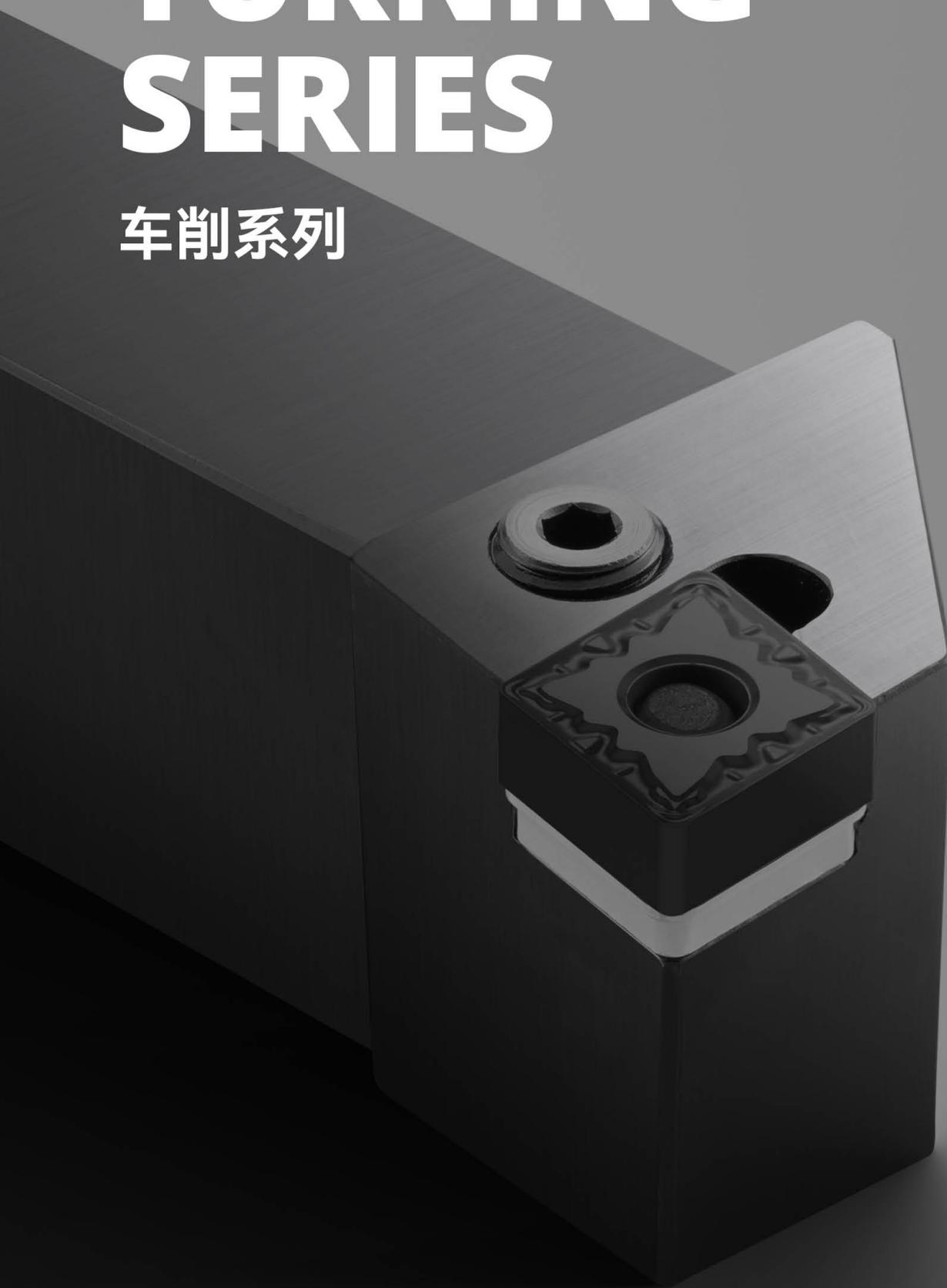


# CONTENTS

目录 Contents		页码 Page
A	<b>车削系列 Turning Series</b>	<b>5</b>
	符号说明 - ISO 车削刀片 Name Code System-ISO Turning Insert	6
	阿诺 - Loong 龍系列 - 车削材质一览 AHNO Loong Series-Turning Materials Overview	10
	阿诺 - Loong 龍系列 - 车削槽型一览 AHNO Loong Series-Turning Chipbreaker Overview	12
	阿诺 - Loong 龍系列 - ISO 车削刀片 - 负型 AHNO Loong Series-ISO Indexable Inserts-Negative	16
	阿诺 - Loong 龍系列 - ISO 车削刀片 - 正型 AHNO Loong Series-ISO Indexable Inserts-Positive	27
B	<b>铣削系列 Milling Series</b>	<b>39</b>
	符号说明 - 铣削刀片 Name Code System-Milling Inserts	40
	铣削刀体命名 Milling Body Names	44
	阿诺 - Loong 龍系列 - 铣削材质一览 AHNO Loong Series-Milling Materials Overview	46
	阿诺 - Loong 龍系列 - 铣刀目录 AHNO Loong Series-Milling Catalog	48
	阿诺 - Loong 龍系列 - 面铣刀 AHNO Loong Series-Face Millings	50
	阿诺 - Loong 龍系列 - 方肩铣刀 AHNO Loong Series-Square Millings	56
	阿诺 - Loong 龍系列 - 仿形铣刀 AHNO Loong Series-Profiling Millings	68
阿诺 - Loong 龍系列 - 切削参数 AHNO Loong Series-Cutting Parameter	76	
C	<b>技术信息 Technical Information</b>	<b>83</b>
	刀片失效形式与分析 Insert Failure Forms and Analysis	84
	计算公式 Calculation Formula	85
	铣削应用信息 Milling Application Information	89
	阿诺 - Loong 龍系列 - 铣刀附件 AHNO Loong Series-Milling Attachment	94
材料硬度信息 Material Hardness Information	96	

# TURNING SERIES

车削系列



## ISO 车削

## Insert ISO Code System

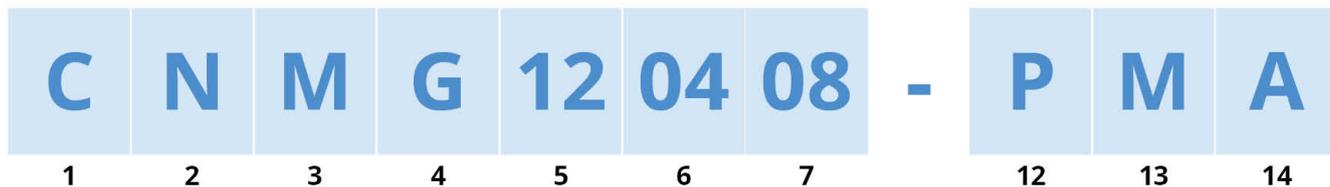
## ISO Turning

车削用可转位刀片按照 ISO 1832 标准的符号说明

Turning Inserts according to ISO 1832 Standard Code System

示例 1:

Example 1:



## 1、刀片形状

## 1. Insert shape

代号 Symbol	图形 Shape	代号 Symbol	图形 Shape
A		M	
B		O	
C		P	
D		R	
E		S	
H		T	
K		V	
L		W	

## 2、后角

## 2. Relief Angle

代号 Symbol	图形 Shape	代号 Symbol	图形 Shape
A		N	
B		P	
C			
D			
E			
F			
G			

## 3、公差

## 3. Tolerance

允许公差 (mm) Tolerance	d	m	s	
	A	± 0,025	± 0,005	± 0,025
	C	± 0,025	± 0,013	± 0,025
	E	± 0,025	± 0,025	± 0,025
	F	± 0,013	± 0,005	± 0,025
	G	± 0,025	± 0,025	± 0,130
	H	± 0,013	± 0,013	± 0,025
	J <sup>1</sup>	± 0,05-0,15 <sup>2</sup>	± 0,005	± 0,025
	K <sup>1</sup>	± 0,05-0,15 <sup>2</sup>	± 0,013	± 0,025
	L <sup>1</sup>	± 0,05-0,15 <sup>2</sup>	± 0,025	± 0,025
	M	± 0,05-0,15 <sup>2</sup>	± 0,08-0,20 <sup>2</sup>	± 0,130
	N	± 0,05-0,15 <sup>2</sup>	± 0,08-0,20 <sup>2</sup>	± 0,025
	U	± 0,08-0,25 <sup>2</sup>	± 0,13-0,38 <sup>2</sup>	± 0,130

<sup>1</sup> 刀片有精磨的副切削刃  
The insert has finishing minor cutting edge.

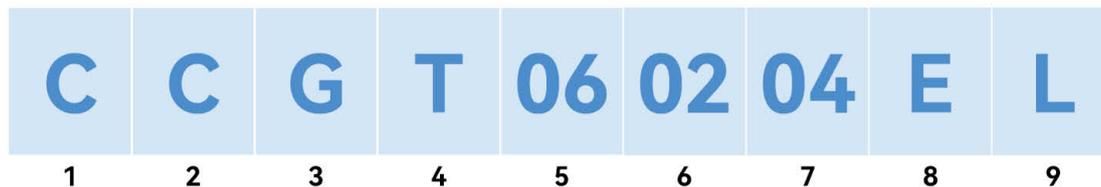
<sup>2</sup> 视刀片尺寸而定 (见 ISO 1832 标准)  
Tolerance is different by insert size. Please see ISO 1832.

## 4、刀片加工和固定特征

## 4. Insert Machining and Figure

代号 Symbol	图形 Shape	代号 Symbol	图形 Shape	代号 Symbol	图形 Shape
A		H		R	
B		J		T	
C		M		U	
F		N		W	
G		Q		X	需要可转位刀片的图纸 或准确说明 Indexable insert drawing or detailed description is needed

示例 2:  
Example 2:



### 5、切削刃长度

#### 5. Cutting Edge Length

<sup>1</sup> 英制规格 (00) Inch

内切圆直径 d IC Diameter d		刀片形状 Insert Shape													
		C		D		R		S		T		V		W	
mm	Inch	规格 Size	l	规格 Size	l	规格 Size	l	规格 Size	l	规格 Size	l	规格 Size	l	规格 Size	l
3,97	5/32									06	6,9				
5	0,197					05				09	9			03	3,8
5,56	7/32														
6	0,236					06									
6,35	2/8	06	6,4	07	7,7	06 <sup>1</sup>				11	11	11	11	04	4,3
8	0,315					08								05	5,2
9,525	3/8	09	9,6	11	11,6	09 <sup>1</sup>	09	9,5	16	16,5	16	16,5	06	6,5	
10	0,394					10									
12	0,472					12									
12,7	4/8	12	12,9	15	15,5	12 <sup>1</sup>	12	12,7	22	22	22	22,1	08	8,7	
15,875	5/8	16	16,1				15	15,8	27	27			10	10,8	
16	0,63					16									
17,46	11/16												12	11,6	
19,05	6/8	19	19,3			19 <sup>1</sup>	19	19,0							
20	0,787					20									
25	0,984					25									
25,4	8/8	25	25,8			25 <sup>1</sup>	25	25,4							
32	1,26					32									

### 6、刀片厚度

#### 6. Insert Thickness

图形 Figure	厚度 s(mm) Thickness
	01 1,59
	T1 1,98
	02 2,38
	T2 2,78
	03 3,18
	T3 3,97
	04 4,76
	05 5,56
	06 6,35
	07 7,94
	09 9,52

### 7、圆角半径

#### 7. Corner Radius

图形 Shape	半径 r(mm) Radius
	01 0,1
	02 0,2
	04 0,4
	08 0,8
	12 1,2
	16 1,6
	24 2,4
	M0 公制规格 (直径以 mm 单位) Metric (Diameter unit is mm)
	00 英制规格 (英制尺寸换算以 mm 单位) Inch (Inch converts to mm)

### 8、切削刃形状

#### 8. Cutting Shape

代号 Symbol	图形 Shape
F	
E	
T	
S	

### 9、切削方向

#### 9. Cutting Direction

图形 Figure

## ISO 车削

## Insert ISO Code System

## ISO Turning

## 硬质合金切削刀具材料符号说明

## Carbide Cutting Tool Material Name Code

槽型索引

Chipbreaker Index



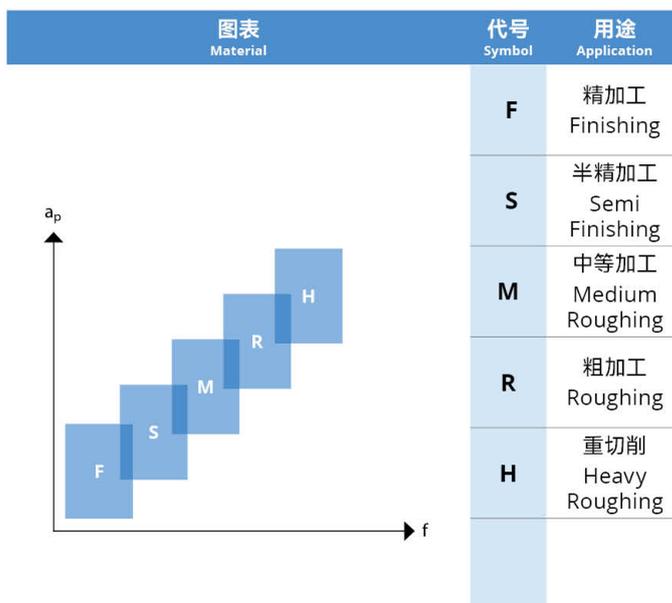
## 12、主要材料

## 12. Main Materials

代号 Symbol	材料 Material
P	钢 Steel
M	不锈钢 Stainless Steel
K	铸铁 Cast Iron
N	有色金属 Nonferrous Metals
S	难加工材料 Hard-to-machine Materials
H	硬材料 Hard Materials
U	通用 General

## 13、断屑区域

## 13. Chip Area



## 14、应用推荐

## 14. Application

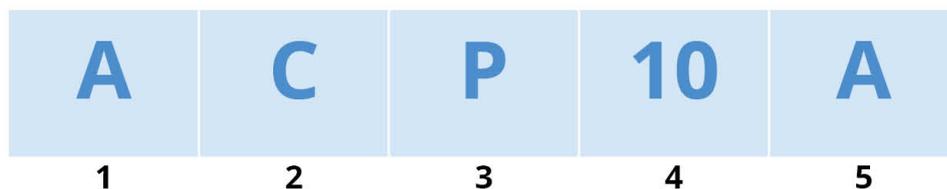
代号 Symbol	推荐 Recommendation
A	第一推荐 1 <sup>st</sup> choice
B	第二推荐 2 <sup>nd</sup> choice
C	第三推荐 3 <sup>rd</sup> choice
X	断屑优先 Chip First
W	Wiper

Insert ISO Code System

ISO 车削

ISO Turning

示例:  
Example :



功能序号 Function No.	说明 Description	详情 Details															
1	AHNO 阿诺																
2	基础材料及 涂层代码 Basic Materials & Coating Code	C	硬质合金 +CVD Carbide +CVD	V	金属陶瓷 +PVD Cermet +PVD												
		P	硬质合金 +PVD Carbide + PVD	I	塞隆陶瓷 Sialon Ceramics												
		B	CBN	W	晶须陶瓷 Whisker Ceramics												
		D	PCD	N	硬质合金 Carbide												
		T	金属陶瓷 Cermet														
3	第一推荐应用 First Recommended Application	P	钢 Steel	N	有色金属 Nonferrous Metals												
		M	不锈钢 Stainless Steel	S	难加工材料 Hard-to-machine Materials												
		K	铸铁 Cast Iron	H	硬材料 Hard Materials												
4	ISO 应用范围 ISO Application Range	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right; padding-right: 10px;">耐磨性 Wear Resistance</td> <td style="text-align: center;">01</td> <td style="text-align: center;">10</td> <td style="text-align: center;">20</td> <td style="text-align: center;">30</td> <td style="text-align: center;">40</td> </tr> <tr> <td style="text-align: right; padding-right: 10px;">韧性 Toughness</td> <td colspan="5" style="text-align: center;"> </td> </tr> </table>				耐磨性 Wear Resistance	01	10	20	30	40	韧性 Toughness					
耐磨性 Wear Resistance	01	10	20	30	40												
韧性 Toughness																	
5	代次代码 Generation Code																

## ISO 车削

## Insert ISO Code System

## ISO Turning

## 阿诺 - Loong 龍系列 - 车削材质一览

## AHNO Loong Series-Turning Materials Overview

车削材料应用 Turning Materials Application																
车削材质 Turning Materials	ISO 组别 ISO Group	涂层工艺 Coating Technology	工件材料组别 Workpiece Material Group						应用范围 Application Range							技术说明 Technology Description
			P	M	K	S	N	H	05	10	15	20	25	30	35	
ACP05A	P05~P20	CVD	●						●							高耐磨性的钢件车削材质，适用于精加工和半精加工，在系统刚性较好的场合能够应用于轻微断续加工。另外，也适用于部分铸铁和淬火材料的加工。 The high wear resistance of steel turning materials, suitable for finishing and semi-finishing, can be used for slight intermittent machining in the case of good rigidity. In addition, it is also suitable for the processing of some cast iron and quenched materials.
	K10~K20				●				●							
	H10~H20							●		●						
ACP10A	P10~P25	CVD	●						●							钢件车削的首选，出色的耐磨性和良好的韧性，是极具平衡性的通用材质。 The first choice for steel turning, with excellent wear resistance and good toughness, which is a highly balanced general material.
	K15~K25				●				●							
ACP20A	P15~P30	CVD	●						●							即使面对不利的加工条件，依然具有较高的可靠性，在钢件的连续车削或断续车削应用中，均能实现稳定加工。 It has a high level of reliability even in the face of unfavorable machining conditions, and can achieve stable machining in both continuous and intermittent turning applications of steel.
	K20~K30				●				●							
ACP30A	P25~P40	CVD	●						●							针对恶劣加工条件的首选材质，凭借良好的基体韧性，广泛应用于强断续或重载车削，尤其是钢件或马氏体不锈钢的加工。 The first choice for harsh machining conditions. With good matrix toughness, it is widely used for strong intermittent or heavy-duty turning, especially in the machining of steel or martensite stainless steel.
	M20~M30			●					●							
APS05A	S05~S15	PVD				●			●							极细颗粒的低钴含量基体，搭配均匀且光滑的超薄物理涂层，实现了极致的耐磨性，是难加工材料的优选材质，亦可覆盖不锈钢和淬火材料、以及铸铁材料的精加工。 The matrix with a low cobalt content of very fine particles and an ultra-thin physical coating that is uniform and smooth achieves extreme wear resistance, which is the preferred material for difficult-to-machine materials, as well as covering the finishing of stainless steel, quenched materials, and cast iron materials.
	M05~M15			●				●								
	K05~K15				●				●							
	H05~H15						●		●							
ACM20A	M15~M25	CVD		●					●							不锈钢加工的通用材质，尤其是高线速度的切削应用，适用于连续或断续条件的半精加工至粗加工。 A general material for stainless steel machining, especially for high linear speed cutting applications, and for semi-finishing to roughing in continuous or intermittent conditions.
	P20~P30		●					●								
	S10~S20				●			●								
ACM30A	M20~M30	CVD		●					●							不锈钢的粗加工材质，凭借良好的可靠性，在严重断续或重载车削领域有比较广泛的应用。 Stainless steel roughing material, with good reliability, has a wide range of applications in the field of severe intermittent or heavy-duty turning.
	P25~P35		●					●								
	S15~S25				●			●								

阿诺 - Loong 龍系列 - 车削材质一览

AHNO Loong Series-Turning Materials Overview

工件材料组 Workpiece Material Group	刀具材质 Tool Material	涂层类别 Coating Class	应用类别 Application Category				
			05	10	20	30	40
P 碳素钢 / 合金钢 Carbon Steel / Alloy Steel	硬质合金 Carbide	CVD		ACP05A			
	硬质合金 Carbide	CVD		ACP10A			
	硬质合金 Carbide	CVD			ACP20A		
	硬质合金 Carbide	CVD				ACP30A	
M 不锈钢 Stainless Steel	硬质合金 Carbide	PVD	APS05A				
	硬质合金 Carbide	CVD		ACM20A			
	硬质合金 Carbide	CVD			ACM30A		
K 铸铁 Cast Iron	硬质合金 Carbide	PVD	APS05A				
	硬质合金 Carbide	CVD		ACP05A			
	硬质合金 Carbide	CVD			ACP10A		
	硬质合金 Carbide	CVD				ACP20A	
N 铝合金 Aluminum Alloy	硬质合金 Carbide	-					
S 高温合金 / 钛合金 High Temperature Alloy Titanium Alloy	硬质合金 Carbide	PVD	APS05A				
	硬质合金 Carbide	CVD		ACM20A			
	硬质合金 Carbide	CVD			ACM30A		
H 硬材料 Hard Materials	硬质合金 Carbide	PVD	APS05A				

## ISO 车削

## Insert ISO Code System

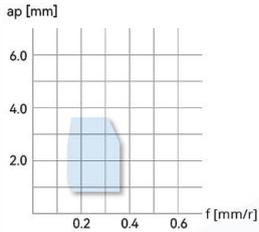
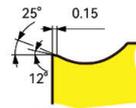
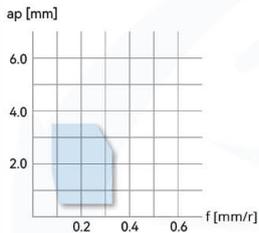
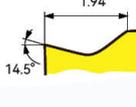
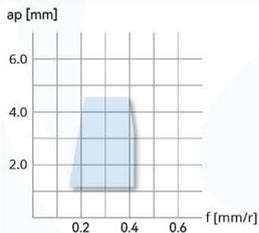
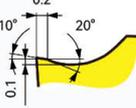
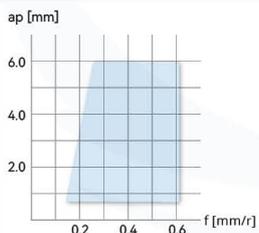
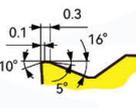
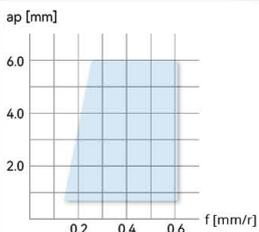
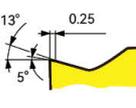
## ISO Turning

## 阿诺 - Loong 龍系列 - 负型车削刀片槽型一览

## AHNO Loong Series-Negative Turning Insert Chipbreaker Overview

## 负型压制刀片

## Negative Inserts

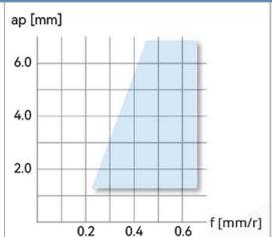
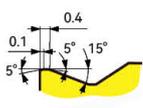
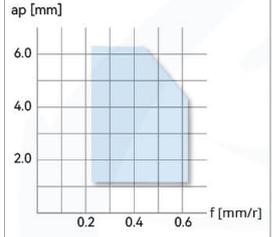
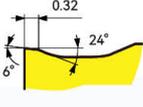
应用	槽型	断屑槽	断屑范围示意	断屑槽剖面	CN	DN	SN	TN	VN	WN	
Application	Type	Chipbreaker	Chipbreaker Range Diagram	Chipbreaker Section							
精加工槽型 Finishing	-PFA				     	P.16	P.18	P.21	P.23	P.24	P.25
	-MFA				     	P.17	P.20	P.22	P.23	P.24	P.26
半精加工槽型 Semi Finishing	-PSA				     	P.16	P.18	P.21	P.23	P.24	P.25
	-PMA				     	P.16	P.19	P.21	P.23	P.24	P.25
中等加工槽型 Medium Machining	-MMA				     	P.17	P.20	P.22	P.23	P.24	P.26

阿诺 - Loong 龍系列 - 负型车削刀片槽型一览

AHNO Loong Series-Negative Turning Insert Chipbreaker Overview

负型压制刀片

Negative Inserts

应用 Application	槽型 Type	断屑槽 Chipbreaker	断屑范围示意 Chipbreaker Range Diagram	断屑槽剖面 Chipbreaker Section	CN	DN	SN	TN	VN	WN
粗加工槽型 Roughing	-PRA									
					P.16	P.19	P.21	P.23		P.25
	-MRA									
					P.17	P.20	P.22			P.26

## ISO 车削

## Insert ISO Code System

## ISO Turning

## 阿诺 -Loong 龍系列 - 正型车削刀片槽型一览

## AHNO Loong Series-Positive Turning Insert Chipbreaker Overview

## 正型压制刀片

## Positive Inserts

应用	槽型	断屑槽	断屑范围示意	断屑槽剖面	CC	DC	SC	TC	VB/VC	RC
Application	Type	Chipbreaker	Chipbreaker Range Diagram	Chipbreaker Section						
精加工槽型 Finishing	-PFA				CCMT-PFA	DCMT-PFA	SCMT-PFA	TCMT-PFA	VBMT-PFA	
					P.27	P.29	P.32	P.33	P.35	
	-UFA				CCMT-UFA	DCMT-UFA	SCMT-UFA	TCMT-UFA	VB/VCMT-UFA	
					P.28	P.30	P.32	P.34	P.35 / P.36	
	-UFA (RCMT)									RCMT-UFA
										P.31
半精加工槽型 Semi Finishing	-USA				CCMT-USA	DCMT-USA	SCMT-USA	TCMT-USA	VB/VCMT-USA	
					P.28	P.30	P.32	P.34	P.35 / P.36	
	-USA (RCMT)									RCMT-USA
										P.31

阿诺 -Loong 龍系列 - 正型车削刀片槽型一览

AHNO Loong Series-Positive Turning Insert Chipbreaker Overview

正型压制刀片

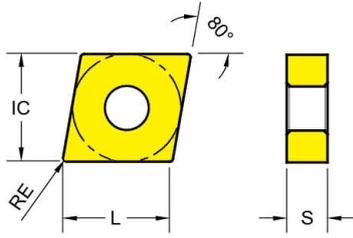
Positive Inserts

应用 Application	槽型 Type	断屑槽 Chipbreaker	断屑范围示意 Chipbreaker Range Diagram	断屑槽剖面 Chipbreaker Section	CC	DC	SC	TC	VB/VC	RC
Medium Machining 中等加工槽型	-PMA				CCMT-PMA	DCMT-PMA	SCMT-PMA	TCMT-PMA	VBMT-PMA	
Roughing 粗加工槽型	-PRA				CCMT-PRA	DCMT-PRA	SCMT-PRA	TCMT-PRA	VBMT-PRA	
	-URA				CCMT-URA	DCMT-URA	SCMT-URA	TCMT-URA	VBMT-URA	
					P.28	P.30	P.32	P.34	P.35	

## 阿诺 - Loong 龍系列 - 负型 CN 刀片

CNMG (80° Negative)

## AHNO Loong Series-Negative Insert CN Series



Series	L	IC	S
CN**1204	12.9	12.7	4.76
CN**1606	16.1	15.875	6.35
CN**1906	19.3	19.05	6.35

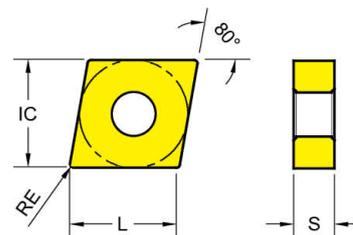
CNMG	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S
					ACP05A	ACP10A	ACP20A	ACP30A	AP505A	ACM20A	ACM30A	AP505A
-PFA	CNMG120404-PFA	0.4	0.15 - 0.30	0.4 - 3.0		●	●		●	●	●	●
	CNMG120408-PFA	0.8	0.15 - 0.30	0.8 - 3.5		●	●		●	●	●	●
	CNMG120412-PFA	1.2	0.15 - 0.35	1.2 - 4.0		●	●		●	●	●	●
-PSA	CNMG120404-PSA	0.4	0.15 - 0.30	0.5 - 3.0	●	●	●			●	●	
	CNMG120408-PSA	0.8	0.15 - 0.45	0.8 - 3.0	●	●	●			●	●	
	CNMG120412-PSA	1.2	0.15 - 0.45	1.2 - 4.0		●	●			●		
-PMA	CNMG120404-PMA	0.4	0.15 - 0.26	0.5 - 6.0	●	●	●	●				
	CNMG120408-PMA	0.8	0.17 - 0.52	0.8 - 6.0	●	●	●	●				
	CNMG120412-PMA	1.2	0.15 - 0.56	1.2 - 6.0	●	●	●	●				
	CNMG120416-PMA	1.6	0.17 - 0.80	1.6 - 6.0			●	●				
	CNMG160608-PMA	0.8	0.17 - 0.52	0.8 - 7.0	●	●	●	●				
	CNMG160612-PMA	1.2	0.17 - 0.60	1.2 - 7.0	●	●	●	●				
	CNMG160616-PMA	1.6	0.17 - 0.60	1.6 - 7.0			●	●				
	CNMG190608-PMA	0.8	0.17 - 0.52	0.8 - 8.0		●	●	●				
	CNMG190612-PMA	1.2	0.17 - 0.70	1.2 - 8.0	●	●	●	●				
-PRA	CNMG120408-PRA	0.8	0.25 - 0.60	2.0 - 6.0	●	●	●	●				
	CNMG120412-PRA	1.2	0.25 - 0.68	2.0 - 6.0	●	●	●	●				
	CNMG120416-PRA	1.6	0.30 - 0.80	2.0 - 6.0				●				
	CNMG160608-PRA	0.8	0.25 - 0.60	3.0 - 7.0		●	●					
	CNMG160612-PRA	1.2	0.25 - 0.70	3.0 - 7.0	●	●	●	●				
	CNMG190612-PRA	1.2	0.25 - 0.70	3.0 - 8.0		●	●	●				
	CNMG190616-PRA	1.6	0.25 - 0.70	2.0 - 9.0	●	●	●	●				

CNMG (80° Negative)

阿诺 - Loong 龍系列 - 负型 CN 刀片

AHNO Loong Series-Negative Insert CN Series

Series	L	IC	S
CN**1204	12.9	12.7	4.76
CN**1606	16.1	15.875	6.35
CN**1906	19.3	19.05	6.35



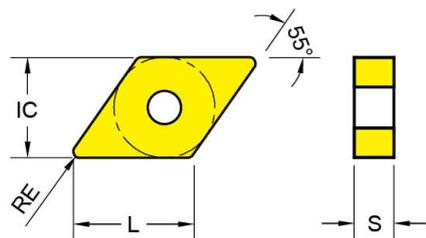
CNMG	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A
-MFA	CNMG120404-MFA	0.4	0.18 - 0.30	0.4 - 4.0		●	●	●	●	●	●	●
	CNMG120408-MFA	0.8	0.20 - 0.45	0.8 - 4.0		●	●		●	●	●	●
	CNMG120412-MFA	1.2	0.22 - 0.45	1.2 - 4.5					●	●		●
-MMA	CNMG120404-MMA	0.4	0.18 - 0.30	0.4 - 4.0		●	●		●	●	●	●
	CNMG120408-MMA	0.8	0.20 - 0.45	0.8 - 4.0		●	●		●	●	●	●
	CNMG120412-MMA	1.2	0.22 - 0.45	1.2 - 4.5		●	●		●	●	●	●
	CNMG160608-MMA	0.8	0.22 - 0.50	0.8 - 5.0			●			●	●	
-MRA	CNMG160612-MMA	1.2	0.25 - 0.55	1.2 - 5.5		●	●		●	●	●	●
	CNMG120408-MRA	0.8	0.25 - 0.47	0.8 - 7.0		●				●	●	
	CNMG120412-MRA	1.2	0.28 - 0.63	1.2 - 7.0		●				●	●	
	CNMG120416-MRA	1.6	0.33 - 0.68	1.6 - 7.0		●				●	●	
	CNMG160608-MRA	0.8	0.30 - 0.47	0.8 - 8.0		●				●	●	
	CNMG160612-MRA	1.2	0.31 - 0.63	1.2 - 8.0		●				●	●	
	CNMG160616-MRA	1.6	0.33 - 0.72	1.6 - 8.0		●				●	●	

切削参数 Cutting Parameters				Vc(m/min.)													
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm²)	布氏硬度 (HB)	ACP05A		ACP10A		ACP20A		ACP30A		APS05A		ACM20A		ACM30A	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
P	低碳钢, 碳素钢 Low Carbon Steel, Carbon Steel	<600	<180	250	500	200	450	180	400	160	360						
		<950	<280	225	360	200	320	150	300	100	240						
	低合金钢 Low-alloyed Steel	700-950	200-280	120	320	90	300	75	270	60	200						
	高合金钢 High-alloyed Steel	950-1200	280-355	120	240	100	225	75	180	50	150	80	125	60	100	50	80
		1200-1400	355-415	60	80	55	75	40	60	-	-	75	100	40	75	-	-
M	奥氏体不锈钢 Austenitic	675	200									120	240	150	240	125	225
	双相不锈钢 Duplex Stainless Steel	778	230									100	160	125	160	105	150
	沉淀硬化不锈钢 PH Stainless Steel	1013	300									80	150	120	150	100	125
K	灰口铸铁 Grey Cast Iron	700	220	270	500	240	450	225	400	200	360	180	240				
	球墨铸铁 Nodular Cast Iron	880	260	240	500	200	450	180	400	160	360	160	200				
	可锻铸铁 Malleable Cast Iron	800	250	225	360	200	320	150	300	100	240	-	-				
S	钴基合金, 镍基合金 Cobalt Base Alloy, Nickel Base Alloy	1100	250-320									45	90	40	75	-	-
	钛合金 Titanium Alloy	1260	370									40	80	30	60	-	-
N	铝 Aluminum	260	75														
	铝合金 Aluminum Alloy	447	130														
H	淬硬钢 Hardened Steel	-	50-60HRC									30	45				
	淬硬铸铁 Hardened Cast Iron	-	55HRC									30	40				

## 阿诺 - Loong 龍系列 - 负型 DN 刀片

DNMG (55° Negative)

## AHNO Loong Series-Negative Insert DN Series



Series	L	IC	S
DN**1104	11.6	9.525	4.76
DN**1504	15.5	12.7	4.76
DN**1506	15.5	12.7	6.35

DNMG	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S	
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A	
-PFA	DNMG110404-PFA	0.4	0.10 - 0.24	0.4 - 3.0		●	●			●	●	●	●
	DNMG110408-PFA	0.8	0.15 - 0.30	0.8 - 3.0		●	●			●	●	●	●
	DNMG150404-PFA	0.4	0.15 - 0.24	0.4 - 3.0		●	●			●	●	●	●
	DNMG150408-PFA	0.8	0.15 - 0.30	0.8 - 3.0		●	●			●	●	●	●
	DNMG150604-PFA	0.4	0.15 - 0.24	0.4 - 3.0		●	●			●	●	●	●
	DNMG150608-PFA	0.8	0.15 - 0.30	0.8 - 3.0	●	●	●			●	●	●	●
	DNMG150612-PFA	1.2	0.15 - 0.35	1.2 - 3.5			●			●			●
-PSA	DNMG110404-PSA	0.4	0.15 - 0.24	0.5 - 3.0	●	●	●				●		
	DNMG110408-PSA	0.8	0.15 - 0.35	0.8 - 3.0	●	●	●				●		
	DNMG150404-PSA	0.4	0.15 - 0.25	0.5 - 3.0		●	●				●		
	DNMG150408-PSA	0.8	0.15 - 0.45	0.8 - 3.0		●	●				●		
	DNMG150604-PSA	0.4	0.15 - 0.25	0.5 - 3.0	●	●	●				●	●	
	DNMG150608-PSA	0.8	0.15 - 0.45	0.8 - 3.0	●	●	●	●			●	●	
	DNMG150612-PSA	1.2	0.15 - 0.45	1.2 - 3.0	●	●	●				●		
DNMG150616-PSA	1.6	0.17 - 0.50	1.6 - 3.5		●	●							

## 切削参数 Cutting Parameters

Vc(m/min.)

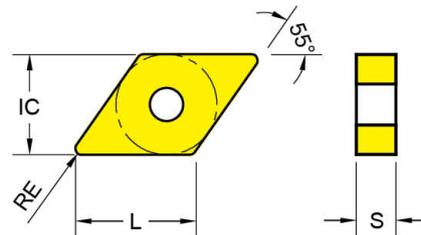
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP05A		ACP10A		ACP20A		ACP30A		APS05A		ACM20A		ACM30A	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
P	低碳钢, 碳素钢 Low Carbon Steel, Carbon Steel	<600	<180	250	500	200	450	180	400	160	360						
		<950	<280	225	360	200	320	150	300	100	240						
	低合金钢 Low-alloyed Steel	700-950	200-280	120	320	90	300	75	270	60	200						
		高合金钢 High-alloyed Steel	950-1200	280-355	120	240	100	225	75	180	50	150	80	125	60	100	50
	1200-1400		355-415	60	80	55	75	40	60	-	-	75	100	40	75	-	-
M	奥氏体不锈钢 Austenitic	675	200									120	240	150	240	125	225
	双相不锈钢 Duplex Stainless Steel	778	230									100	160	125	160	105	150
	沉淀硬化不锈钢 PH Stainless Steel	1013	300									80	150	120	150	100	125
K	灰口铸铁 Grey Cast Iron	700	220	270	500	240	450	225	400	200	360	180	240				
	球墨铸铁 Nodular Cast Iron	880	260	240	500	200	450	180	400	160	360	160	200				
	可锻铸铁 Malleable Cast Iron	800	250	225	360	200	320	150	300	100	240	-	-				
S	钴基合金, 镍基合金 Cobalt Base Alloy, Nickel Base Alloy	1100	250-320									45	90	40	75	-	-
	钛合金 Titanium Alloy	1260	370									40	80	30	60	-	-
N	铝 Aluminum	260	75														
	铝合金 Aluminum Alloy	447	130														
H	淬硬钢 Hardened Steel	-	50-60HRC									30	45				
	淬硬铸铁 Hardened Cast Iron	-	55HRC									30	40				

DNMG (55° Negative)

阿诺 - Loong 龍系列 - 负型 DN 刀片

AHNO Loong Series-Negative Insert DN Series

Series	L	IC	S
DN**1104	11.6	9.525	4.76
DN**1504	15.5	12.7	4.76
DN**1506	15.5	12.7	6.35



DNMG	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A
-PMA	DNMG110404-PMA	0.4	0.15 - 0.26	0.5 - 3.0		●	●	●				
	DNMG110408-PMA	0.8	0.17 - 0.52	0.8 - 3.0		●	●	●				
	DNMG110412-PMA	1.2	0.15 - 0.56	1.2 - 3.0		●	●	●				
	DNMG150404-PMA	0.4	0.15 - 0.26	0.5 - 3.0		●	●	●				
	DNMG150408-PMA	0.8	0.17 - 0.52	0.8 - 4.5		●	●	●				
	DNMG150412-PMA	1.2	0.15 - 0.56	1.2 - 4.5		●	●	●				
	DNMG150604-PMA	0.4	0.15 - 0.26	0.5 - 3.0		●	●	●				
	DNMG150608-PMA	0.8	0.17 - 0.52	0.8 - 4.5		●	●	●				
-PRA	DNMG150612-PMA	1.2	0.15 - 0.56	1.2 - 4.5	●	●	●	●				
	DNMG150608-PRA	0.8	0.25 - 0.48	2.0 - 4.5	●	●	●					
	DNMG150612-PRA	1.2	0.25 - 0.70	2.0 - 4.5	●	●	●					
	DNMG150616-PRA	1.6	0.30 - 0.80	2.0 - 4.5			●					

切削参数 Cutting Parameters

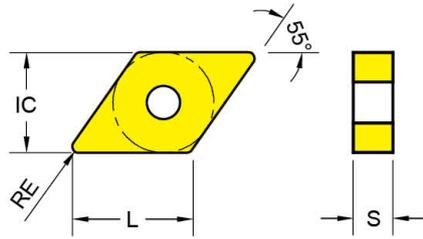
Vc(m/min.)

ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm²)	布氏硬度 (HB)	ACP05A		ACP10A		ACP20A		ACP30A		APS05A		ACM20A		ACM30A	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
P	低碳钢, 碳素钢 Low Carbon Steel, Carbon Steel	<600	<180	250	500	200	450	180	400	160	360						
		<950	<280	225	360	200	320	150	300	100	240						
	低合金钢 Low-alloyed Steel	700-950	200-280	120	320	90	300	75	270	60	200						
		高合金钢 High-alloyed Steel	950-1200	280-355	120	240	100	225	75	180	50	150	80	125	60	100	50
	1200-1400		355-415	60	80	55	75	40	60	-	-	75	100	40	75	-	-
M	奥氏体不锈钢 Austenitic	675	200									120	240	150	240	125	225
	双相不锈钢 Duplex Stainless Steel	778	230									100	160	125	160	105	150
	沉淀硬化不锈钢 PH Stainless Steel	1013	300									80	150	120	150	100	125
K	灰口铸铁 Grey Cast Iron	700	220	270	500	240	450	225	400	200	360	180	240				
	球墨铸铁 Nodular Cast Iron	880	260	240	500	200	450	180	400	160	360	160	200				
	可锻铸铁 Malleable Cast Iron	800	250	225	360	200	320	150	300	100	240	-	-				
S	钴基合金, 镍基合金 Cobalt Base Alloy, Nickel Base Alloy	1100	250-320									45	90	40	75	-	-
	钛合金 Titanium Alloy	1260	370									40	80	30	60	-	-
N	铝 Aluminum	260	75														
	铝合金 Aluminum Alloy	447	130														
H	淬硬钢 Hardened Steel	-	50-60HRC									30	45				
	淬硬铸铁 Hardened Cast Iron	-	55HRC									30	40				

## 阿诺 - Loong 龍系列 - 负型 DN 刀片

DNMG (55° Negative)

## AHNO Loong Series-Negative Insert DN Series



Series	L	IC	S
DN**1104	11.6	9.525	4.76
DN**1504	15.5	12.7	4.76
DN**1506	15.5	12.7	6.35

DNMG	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A
-MFA	DNMG110404-MFA	0.4	0.10 - 0.24	0.4 - 2.0		●	●		●	●		●
	DNMG110408-MFA	0.8	0.15 - 0.27	0.8 - 2.0			●		●	●		●
	DNMG150404-MFA	0.4	0.15 - 0.24	0.4 - 2.5			●		●			●
	DNMG150408-MFA	0.8	0.15 - 0.30	0.8 - 3.0		●	●		●			●
	DNMG150604-MFA	0.4	0.15 - 0.24	0.4 - 2.5		●	●		●	●	●	●
	DNMG150608-MFA	0.8	0.15 - 0.30	0.8 - 3.0		●	●		●	●	●	●
-MMA	DNMG110404-MMA	0.4	0.15 - 0.24	0.4 - 3.0			●		●	●	●	●
	DNMG110408-MMA	0.8	0.18 - 0.35	0.8 - 3.3			●		●	●	●	●
	DNMG150404-MMA	0.4	0.15 - 0.24	0.4 - 3.5					●			●
	DNMG150408-MMA	0.8	0.20 - 0.40	0.8 - 4.0					●			●
	DNMG150604-MMA	0.4	0.18 - 0.24	0.4 - 3.5		●	●		●	●	●	●
	DNMG150608-MMA	0.8	0.20 - 0.40	0.8 - 4.0		●	●		●	●	●	●
-MRA	DNMG150612-MMA	1.2	0.22 - 0.40	1.2 - 4.0		●	●		●	●	●	●
	DNMG150408-MRA	0.8	0.25 - 0.36	0.8 - 4.0		●				●	●	
	DNMG150604-MRA	0.4	0.17 - 0.18	0.4 - 4.0		●				●	●	
	DNMG150608-MRA	0.8	0.25 - 0.36	0.8 - 4.0		●				●	●	
DNMG150612-MRA	1.2	0.26 - 0.54	1.2 - 4.0		●				●	●		

## 切削参数 Cutting Parameters

Vc(m/min.)

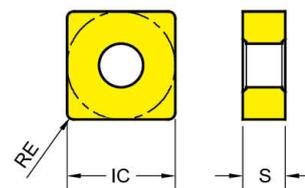
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP05A		ACP10A		ACP20A		ACP30A		APS05A		ACM20A		ACM30A	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
P	低碳钢, 碳素钢 Low Carbon Steel, Carbon Steel	<600	<180	250	500	200	450	180	400	160	360						
		<950	<280	225	360	200	320	150	300	100	240						
	低合金钢 Low-alloyed Steel	700-950	200-280	120	320	90	300	75	270	60	200						
		高合金钢 High-alloyed Steel	950-1200	280-355	120	240	100	225	75	180	50	150	80	125	60	100	50
	1200-1400		355-415	60	80	55	75	40	60	-	-	75	100	40	75	-	-
M	奥氏体不锈钢 Austenitic	675	200									120	240	150	240	125	225
	双相不锈钢 Duplex Stainless Steel	778	230									100	160	125	160	105	150
	沉淀硬化不锈钢 PH Stainless Steel	1013	300									80	150	120	150	100	125
K	灰口铸铁 Grey Cast Iron	700	220	270	500	240	450	225	400	200	360	180	240				
	球墨铸铁 Nodular Cast Iron	880	260	240	500	200	450	180	400	160	360	160	200				
	可锻铸铁 Malleable Cast Iron	800	250	225	360	200	320	150	300	100	240	-	-				
S	钴基合金, 镍基合金 Cobalt Base Alloy, Nickel Base Alloy	1100	250-320									45	90	40	75	-	-
	钛合金 Titanium Alloy	1260	370									40	80	30	60	-	-
N	铝 Aluminum	260	75														
	铝合金 Aluminum Alloy	447	130														
H	淬硬钢 Hardened Steel	-	50-60HRC									30	45				
	淬硬铸铁 Hardened Cast Iron	-	55HRC									30	40				

SNMG (90° Negative)

阿诺 - Loong 龍系列 - 负型 SN 刀片

AHNO Loong Series-Negative Insert SN Series

Series	L	IC	S
SN**1204	12.7	12.7	4.76
SN**1906	19.05	19.05	6.35



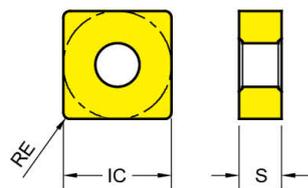
SNMG	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S	
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A	
-PFA	SNMG120404-PFA	0.4	0.15 - 0.30	0.4 - 3.0		●	●			●	●	●	●
	SNMG120408-PFA	0.8	0.15 - 0.35	0.8 - 3.5		●	●			●	●	●	●
-PSA	SNMG120404-PSA	0.4	0.15 - 0.25	0.5 - 3.0		●	●				●		
	SNMG120408-PSA	0.8	0.15 - 0.45	0.8 - 3.0	●	●	●				●		
	SNMG120412-PSA	1.2	0.15 - 0.45	1.2 - 3.0		●	●						
	SNMG120416-PSA	1.6	0.15 - 0.45	1.6 - 5.0			●						
-PMA	SNMG120408-PMA	0.8	0.17 - 0.52	0.8 - 6.0	●	●	●	●					
	SNMG120412-PMA	1.2	0.15 - 0.56	1.2 - 6.0		●	●	●					
	SNMG120416-PMA	1.6	0.17 - 0.80	1.6 - 6.0			●						
	SNMG190612-PMA	1.2	0.15 - 0.80	1.2 - 8.0		●	●	●					
	SNMG190616-PMA	1.6	0.17 - 0.80	1.6 - 8.0		●	●	●					
-PRA	SNMG120408-PRA	0.8	0.25 - 0.60	2.0 - 6.0	●	●	●	●					
	SNMG120412-PRA	1.2	0.25 - 0.68	2.0 - 6.0	●		●	●					
	SNMG120416-PRA	1.6	0.30 - 0.80	2.0 - 6.0		●	●						
	SNMG190612-PRA	1.2	0.25 - 0.70	2.0 - 9.0	●	●	●						
	SNMG190616-PRA	1.6	0.30 - 0.80	2.0 - 9.0	●	●	●	●					

切削参数 Cutting Parameters				Vc(m/min.)														
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm²)	布氏硬度 (HB)	ACP05A		ACP10A		ACP20A		ACP30A		APS05A		ACM20A		ACM30A		
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
P	低碳钢, 碳素钢 Low Carbon Steel, Carbon Steel	<600	<180	250	500	200	450	180	400	160	360							
		<950	<280	225	360	200	320	150	300	100	240							
	低合金钢 Low-alloyed Steel	700-950	200-280	120	320	90	300	75	270	60	200							
		高合金钢 High-alloyed Steel	950-1200	280-355	120	240	100	225	75	180	50	150	80	125	60	100	50	80
	1200-1400		355-415	60	80	55	75	40	60	-	-	75	100	40	75	-	-	
M	奥氏体不锈钢 Austenitic	675	200									120	240	150	240	125	225	
		双相不锈钢 Duplex Stainless Steel	778	230									100	160	125	160	105	150
			沉淀硬化不锈钢 PH Stainless Steel	1013	300									80	150	120	150	100
K	灰口铸铁 Grey Cast Iron	700	220	270	500	240	450	225	400	200	360	180	240					
		球墨铸铁 Nodular Cast Iron	880	260	240	500	200	450	180	400	160	360	160	200				
			可锻铸铁 Malleable Cast Iron	800	250	225	360	200	320	150	300	100	240	-	-			
S	钴基合金, 镍基合金 Cobalt Base Alloy, Nickel Base Alloy	1100	250-320									45	90	40	75	-	-	
		钛合金 Titanium Alloy	1260	370									40	80	30	60	-	-
N	铝 Aluminum	260	75															
		铝合金 Aluminum Alloy	447	130														
H	淬硬钢 Hardened Steel	-	50-60HRC									30	45					
		淬硬铸铁 Hardened Cast Iron	-	55HRC									30	40				

## 阿诺 - Loong 龍系列 - 负型 SN 刀片

SNMG (90° Negative)

## AHNO Loong Series-Negative Insert SN Series



Series	L	IC	S
SN**1204	12.7	12.7	4.76
SN**1906	19.05	19.05	6.35

SNMG	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S	
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A	
-MFA	SNMG120404-MFA	0.4	0.15 - 0.30	0.4 - 3.0			●				●		
	SNMG120408-MFA	0.8	0.15 - 0.30	0.8 - 3.0			●			●	●	●	●
	SNMG120412-MFA	1.2	0.15 - 0.35	1.2 - 3.0						●	●		●
-MMA	SNMG120408-MMA	0.8	0.20 - 0.45	0.8 - 4.5		●	●			●	●	●	●
	SNMG120412-MMA	1.2	0.22 - 0.50	1.2 - 5.0		●	●				●	●	
-MRA	SNMG120408-MRA	0.8	0.25 - 0.40	0.8 - 7.0		●					●	●	
	SNMG120412-MRA	1.2	0.28 - 0.59	1.2 - 7.0		●					●	●	

## 切削参数 Cutting Parameters

Vc(m/min.)

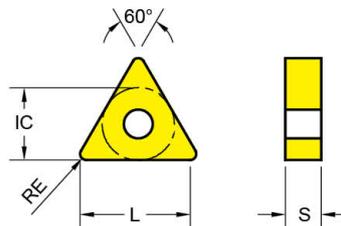
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP05A		ACP10A		ACP20A		ACP30A		APS05A		ACM20A		ACM30A	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
P	低碳钢, 碳素钢 Low Carbon Steel, Carbon Steel	<600	<180	250	500	200	450	180	400	160	360						
		<950	<280	225	360	200	320	150	300	100	240						
	低合金钢 Low-alloyed Steel	700-950	200-280	120	320	90	300	75	270	60	200						
		高合金钢 High-alloyed Steel	950-1200	280-355	120	240	100	225	75	180	50	150	80	125	60	100	50
	1200-1400		355-415	60	80	55	75	40	60	-	-	75	100	40	75	-	-
M	奥氏体不锈钢 Austenitic	675	200									120	240	150	240	125	225
	双相不锈钢 Duplex Stainless Steel	778	230									100	160	125	160	105	150
	沉淀硬化不锈钢 PH Stainless Steel	1013	300									80	150	120	150	100	125
K	灰口铸铁 Grey Cast Iron	700	220	270	500	240	450	225	400	200	360	180	240				
	球墨铸铁 Nodular Cast Iron	880	260	240	500	200	450	180	400	160	360	160	200				
	可锻铸铁 Malleable Cast Iron	800	250	225	360	200	320	150	300	100	240	-	-				
S	钴基合金, 镍基合金 Cobalt Base Alloy, Nickel Base Alloy	1100	250-320									45	90	40	75	-	-
	钛合金 Titanium Alloy	1260	370									40	80	30	60	-	-
N	铝 Aluminum	260	75														
	铝合金 Aluminum Alloy	447	130														
H	淬硬钢 Hardened Steel	-	50-60HRC									30	45				
	淬硬铸铁 Hardened Cast Iron	-	55HRC									30	40				

TNMG (60° Negative)

阿诺 - Loong 龍系列 - 负型 TN 刀片

AHNO Loong Series-Negative Insert TN Series

Series	L	IC	S
TN**1604	16.5	9.525	4.76



TNMG	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S		
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A		
-PFA	TNMG160404-PFA	0.4	0.15 - 0.24	0.4 - 3.0		●	●			●	●	●	●	
	TNMG160408-PFA	0.8	0.15 - 0.30	0.8 - 3.0		●	●			●	●	●	●	
-PSA	TNMG160404-PSA	0.4	0.15 - 0.25	0.5 - 3.0	●	●	●				●	●		
	TNMG160408-PSA	0.8	0.15 - 0.45	0.8 - 3.0	●	●	●				●	●		
	TNMG160412-PSA	1.2	0.15 - 0.45	1.2 - 3.0	●	●	●				●			
-PMA	TNMG160404-PMA	0.4	0.15 - 0.24	0.5 - 3.0		●	●	●						
	TNMG160408-PMA	0.8	0.17 - 0.52	0.8 - 5.0	●	●	●	●						
	TNMG160412-PMA	1.2	0.15 - 0.56	1.2 - 5.0		●	●	●						
-PRA	TNMG160408-PRA	0.8	0.25 - 0.48	0.8 - 5.3	●	●	●	●						
	TNMG160412-PRA	1.2	0.25 - 0.70	2.0 - 6.0	●	●	●	●						
-MFA	TNMG160404-MFA	0.4	0.18 - 0.24	0.4 - 2.5		●	●				●	●	●	●
	TNMG160408-MFA	0.8	0.12 - 0.28	0.8 - 3.0		●	●				●	●	●	●
	TNMG160412-MFA	1.2	0.15 - 0.28	1.2 - 3.0			●				●	●		●
-MMA	TNMG160404-MMA	0.4	0.18 - 0.24	0.4 - 4.0		●	●				●	●	●	●
	TNMG160408-MMA	0.8	0.20 - 0.40	0.8 - 4.0		●	●				●	●	●	●
	TNMG160412-MMA	1.2	0.20 - 0.40	1.2 - 4.0			●				●	●	●	●

切削参数 Cutting Parameters

Vc(m/min.)

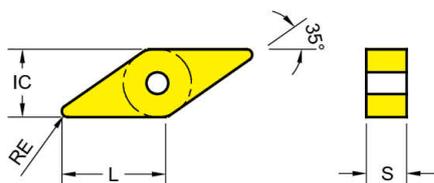
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm²)	布氏硬度 (HB)	ACP05A		ACP10A		ACP20A		ACP30A		APS05A		ACM20A		ACM30A	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
P	低碳钢, 碳素钢 Low Carbon Steel, Carbon Steel	<600	<180	250	500	200	450	180	400	160	360						
		<950	<280	225	360	200	320	150	300	100	240						
	低合金钢 Low-alloyed Steel	700-950	200-280	120	320	90	300	75	270	60	200						
		高合金钢 High-alloyed Steel	950-1200	280-355	120	240	100	225	75	180	50	150	80	125	60	100	50
	1200-1400		355-415	60	80	55	75	40	60	-	-	75	100	40	75	-	-
M	奥氏体不锈钢 Austenitic	675	200									120	240	150	240	125	225
	双相不锈钢 Duplex Stainless Steel	778	230									100	160	125	160	105	150
	沉淀硬化不锈钢 PH Stainless Steel	1013	300									80	150	120	150	100	125
K	灰口铸铁 Grey Cast Iron	700	220	270	500	240	450	225	400	200	360	180	240				
	球墨铸铁 Nodular Cast Iron	880	260	240	500	200	450	180	400	160	360	160	200				
	可锻铸铁 Malleable Cast Iron	800	250	225	360	200	320	150	300	100	240	-	-				
S	钴基合金, 镍基合金 Cobalt Base Alloy, Nickel Base Alloy	1100	250-320									45	90	40	75	-	-
	钛合金 Titanium Alloy	1260	370									40	80	30	60	-	-
N	铝 Aluminum	260	75														
	铝合金 Aluminum Alloy	447	130														
H	淬硬钢 Hardened Steel	-	50-60HRC									30	45				
	淬硬铸铁 Hardened Cast Iron	-	55HRC									30	40				

## 阿诺 - Loong 龍系列 - 负型 VN 刀片

VNMG (35° Negative)

## AHNO Loong Series-Negative Insert VN Series

Series	L	IC	S
VN**1604	16.5	9.525	4.76



VNMG	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A
-PFA	VNMG160404-PFA	0.4	0.15 - 0.20	0.4 - 2.5	●	●	●		●	●	●	●
	VNMG160408-PFA	0.8	0.15 - 0.30	0.8 - 3.0		●	●		●	●	●	●
-PSA	VNMG160404-PSA	0.4	0.15 - 0.20	0.5 - 3.0	●	●	●			●		
	VNMG160408-PSA	0.8	0.15 - 0.35	0.8 - 3.0	●	●	●			●		
	VNMG160412-PSA	1.2	0.15 - 0.45	1.2 - 3.0		●	●			●		
-PMA	VNMG160404-PMA	0.4	0.05 - 0.20	0.8 - 3.0		●	●	●				
	VNMG160408-PMA	0.8	0.15 - 0.40	0.8 - 3.0	●	●	●	●				
	VNMG160412-PMA	1.2	0.15 - 0.56	1.2 - 3.0			●					
-MFA	VNMG160404-MFA	0.4	0.15 - 0.20	0.4 - 2.0		●	●		●	●		●
	VNMG160408-MFA	0.8	0.12 - 0.25	0.8 - 2.5		●	●		●			●
	VNMG160412-MFA	1.2	0.15 - 0.28	1.2 - 3.0					●	●		●
-MMA	VNMG160404-MMA	0.4	0.15 - 0.20	0.4 - 3.0		●	●		●	●	●	●
	VNMG160408-MMA	0.8	0.20 - 0.30	0.8 - 3.5		●	●		●	●		●
	VNMG160412-MMA	1.2	0.22 - 0.40	1.2 - 3.5					●			●

## 切削参数 Cutting Parameters

Vc(m/min.)

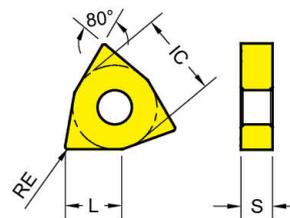
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP05A		ACP10A		ACP20A		ACP30A		APS05A		ACM20A		ACM30A	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
P	低碳钢, 碳素钢 Low Carbon Steel, Carbon Steel	<600	<180	250	500	200	450	180	400	160	360						
		<950	<280	225	360	200	320	150	300	100	240						
	低合金钢 Low-alloyed Steel	700-950	200-280	120	320	90	300	75	270	60	200						
		高合金钢 High-alloyed Steel	950-1200	280-355	120	240	100	225	75	180	50	150	80	125	60	100	50
	1200-1400		355-415	60	80	55	75	40	60	-	-	75	100	40	75	-	-
M	奥氏体不锈钢 Austenitic	675	200									120	240	150	240	125	225
	双相不锈钢 Duplex Stainless Steel	778	230									100	160	125	160	105	150
	沉淀硬化不锈钢 PH Stainless Steel	1013	300									80	150	120	150	100	125
K	灰口铸铁 Grey Cast Iron	700	220	270	500	240	450	225	400	200	360	180	240				
	球墨铸铁 Nodular Cast Iron	880	260	240	500	200	450	180	400	160	360	160	200				
	可锻铸铁 Malleable Cast Iron	800	250	225	360	200	320	150	300	100	240	-	-				
S	钴基合金, 镍基合金 Cobalt Base Alloy, Nickel Base Alloy	1100	250-320									45	90	40	75	-	-
	钛合金 Titanium Alloy	1260	370									40	80	30	60	-	-
N	铝 Aluminum	260	75														
	铝合金 Aluminum Alloy	447	130														
H	淬硬钢 Hardened Steel	-	50-60HRC									30	45				
	淬硬铸铁 Hardened Cast Iron	-	55HRC									30	40				

WNMG (80° Negative)

阿诺 - Loong 龍系列 - 负型 WN 刀片

AHNO Loong Series-Negative Insert WN Series

Series	L	IC	S
WN**06T3	6.5	9.525	3.97
WN**0604	6.5	9.525	4.76
WN**0804	8.69	12.7	4.76

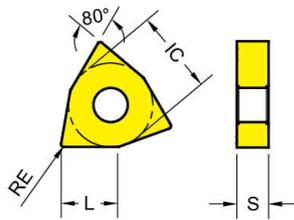


WNMG	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S
					ACP05A	ACP10A	ACP20A	ACP30A	AP505A	ACM20A	ACM30A	AP505A
-PFA	WNMG060404-PFA	0.4	0.15 - 0.30	0.4 - 3.0		●	●		●	●	●	●
	WNMG060408-PFA	0.8	0.15 - 0.30	0.8 - 3.0		●	●		●	●		●
	WNMG080404-PFA	0.4	0.15 - 0.30	0.4 - 3.0	●	●	●		●	●	●	●
	WNMG080408-PFA	0.8	0.15 - 0.35	0.8 - 3.5		●	●		●	●	●	●
	WNMG080412-PFA	1.2	0.15 - 0.35	0.8 - 3.5		●	●		●	●		●
-PSA	WNMG06T304-PSA	0.4	0.15 - 0.30	0.5 - 3.0			●			●		
	WNMG06T308-PSA	0.8	0.15 - 0.45	0.8 - 3.0			●					
	WNMG060404-PSA	0.4	0.15 - 0.30	0.5 - 3.0		●	●			●		
	WNMG060408-PSA	0.8	0.15 - 0.35	0.8 - 3.0		●	●			●		
	WNMG060412-PSA	1.2	0.15 - 0.45	1.2 - 3.0		●						
	WNMG080404-PSA	0.4	0.15 - 0.30	0.5 - 3.0	●	●	●			●	●	
	WNMG080408-PSA	0.8	0.15 - 0.45	0.8 - 3.0		●	●			●	●	
WNMG080412-PSA	1.2	0.15 - 0.45	1.2 - 3.0	●	●	●			●	●		
-PMA	WNMG060404-PMA	0.4	0.15 - 0.26	0.8 - 3.0		●	●	●				
	WNMG060408-PMA	0.8	0.17 - 0.52	0.8 - 4.0	●	●	●	●				
	WNMG080404-PMA	0.4	0.15 - 0.26	0.8 - 3.0		●	●	●				
	WNMG080408-PMA	0.8	0.17 - 0.52	0.8 - 5.6	●	●	●	●				
	WNMG080412-PMA	1.2	0.15 - 0.56	1.2 - 5.6	●	●	●	●				
-PRA	WNMG080408-PRA	0.8	0.25 - 0.60	2.0 - 5.6	●	●	●	●				
	WNMG080412-PRA	1.2	0.25 - 0.68	2.0 - 5.6	●	●	●	●				

## 阿诺 - Loong 龍系列 - 负型 WN 刀片

WNMG (80° Negative)

## AHNO Loong Series-Negative Insert WN Series



Series	L	IC	S
WN**06T3	6.5	9.525	3.97
WN**0604	6.5	9.525	4.76
WN**0804	8.69	12.7	4.76

WNUMG	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A
-MFA	WNMG060404-MFA	0.4	0.15 - 0.28	0.4 - 2.5			●		●	●	●	●
	WNMG060408-MFA	0.8	0.15 - 0.28	0.8 - 3.0		●	●		●	●	●	●
	WNMG080404-MFA	0.4	0.10 - 0.30	0.4 - 2.7		●	●		●	●	●	●
	WNMG080408-MFA	0.8	0.12 - 0.30	0.8 - 3.0		●	●		●	●	●	●
	WNMG080412-MFA	1.2	0.15 - 0.30	1.2 - 3.0					●	●	●	●
-MMA	WNMG060404-MMA	0.4	0.18 - 0.30	0.4 - 3.0		●	●		●	●	●	●
	WNMG060408-MMA	0.8	0.18 - 0.35	0.8 - 3.5			●		●	●	●	●
	WNMG060412-MMA	1.2	0.20 - 0.40	1.2 - 4.0			●		●	●	●	●
	WNMG080404-MMA	0.4	0.18 - 0.30	0.4 - 4.0		●	●		●	●	●	●
	WNMG080408-MMA	0.8	0.20 - 0.45	0.8 - 4.0		●	●		●	●	●	●
-MRA	WNMG080412-MMA	1.2	0.22 - 0.45	1.2 - 4.5		●	●		●	●	●	●
	WNMG080404-MRA	0.4	0.17 - 0.23	0.4 - 4.0		●			●	●	●	●
	WNMG080408-MRA	0.8	0.25 - 0.47	0.8 - 5.0		●			●	●	●	●
	WNMG080412-MRA	1.2	0.28 - 0.63	1.2 - 5.0		●			●	●	●	●

## 切削参数 Cutting Parameters

Vc(m/min.)

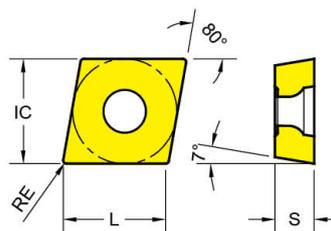
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP05A		ACP10A		ACP20A		ACP30A		APS05A		ACM20A		ACM30A	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
P	低碳钢, 碳素钢 Low Carbon Steel, Carbon Steel	<600	<180	250	500	200	450	180	400	160	360						
		<950	<280	225	360	200	320	150	300	100	240						
	低合金钢 Low-alloyed Steel	700-950	200-280	120	320	90	300	75	270	60	200						
		高合金钢 High-alloyed Steel	950-1200	280-355	120	240	100	225	75	180	50	150	80	125	60	100	50
	1200-1400		355-415	60	80	55	75	40	60	-	-	75	100	40	75	-	-
M	奥氏体不锈钢 Austenitic	675	200									120	240	150	240	125	225
	双相不锈钢 Duplex Stainless Steel	778	230									100	160	125	160	105	150
	沉淀硬化不锈钢 PH Stainless Steel	1013	300									80	150	120	150	100	125
K	灰口铸铁 Grey Cast Iron	700	220	270	500	240	450	225	400	200	360	180	240				
	球墨铸铁 Nodular Cast Iron	880	260	240	500	200	450	180	400	160	360	160	200				
	可锻铸铁 Malleable Cast Iron	800	250	225	360	200	320	150	300	100	240	-	-				
S	钴基合金, 镍基合金 Cobalt Base Alloy, Nickel Base Alloy	1100	250-320									45	90	40	75	-	-
	钛合金 Titanium Alloy	1260	370									40	80	30	60	-	-
N	铝 Aluminum	260	75														
	铝合金 Aluminum Alloy	447	130														
H	淬硬钢 Hardened Steel	-	50-60HRC									30	45				
	淬硬铸铁 Hardened Cast Iron	-	55HRC									30	40				

CCGT/CCMT (80° Positive)

阿诺 - Loong 龍系列 - 正型 CC 刀片

AHNO Loong Series-Positive Insert CC Series

Series	L	IC	S
CC**0602	6.45	6.35	2.38
CC**09T3	9.67	9.525	3.97
CC**1204	12.9	12.7	4.76



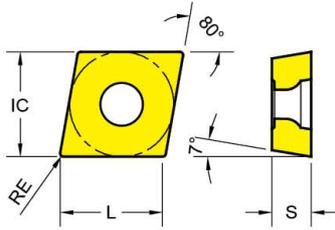
CCGT/CCMT	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S	
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A	
-PFA	CCGT09T302-PFA	0.2	0.04 - 0.15	0.2 - 2.5			●			●			
	CCMT060202-PFA	0.2	0.02 - 0.12	0.2 - 1.5		●	●			●			
	CCMT060204-PFA	0.4	0.05 - 0.20	0.3 - 2.5		●	●	●		●			
	CCMT09T304-PFA	0.4	0.06 - 0.24	0.3 - 3.0		●	●	●		●			
	CCMT09T308-PFA	0.8	0.08 - 0.28	0.6 - 3.0		●	●			●			
-PMA	CCMT09T304-PMA	0.4	0.04 - 0.25	0.4 - 3.0		●	●		●				●
	CCMT09T308-PMA	0.8	0.10 - 0.35	0.8 - 4.0		●	●	●	●	●			●
	CCMT120408-PMA	0.8	0.15 - 0.35	0.8 - 4.5		●	●	●		●			
-PRA	CCMT09T304-PRA	0.4	0.15 - 0.30	1.0 - 4.0		●	●						
	CCMT09T308-PRA	0.8	0.20 - 0.40	1.5 - 4.0		●	●	●					
	CCMT120408-PRA	0.8	0.20 - 0.40	1.5 - 4.5		●	●						
	CCMT120412-PRA	1.2	0.20 - 0.50	1.5 - 4.5		●	●	●					

切削参数 Cutting Parameters				Vc(m/min.)													
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm²)	布氏硬度 (HB)	ACP05A		ACP10A		ACP20A		ACP30A		APS05A		ACM20A		ACM30A	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
P	低碳钢, 碳素钢 Low Carbon Steel, Carbon Steel	<600	<180	250	500	200	450	180	400	160	360						
		<950	<280	225	360	200	320	150	300	100	240						
	低合金钢 Low-alloyed Steel	700-950	200-280	120	320	90	300	75	270	60	200						
		高合金钢 High-alloyed Steel	950-1200	280-355	120	240	100	225	75	180	50	150	80	125	60	100	50
	1200-1400		355-415	60	80	55	75	40	60	-	-	75	100	40	75	-	-
M	奥氏体不锈钢 Austenitic	675	200									120	240	150	240	125	225
		778	230									100	160	125	160	105	150
	双相不锈钢 Duplex Stainless Steel	1013	300									80	150	120	150	100	125
		沉淀硬化不锈钢 PH Stainless Steel															
K	灰口铸铁 Grey Cast Iron	700	220	270	500	240	450	225	400	200	360	180	240				
	球墨铸铁 Nodular Cast Iron	880	260	240	500	200	450	180	400	160	360	160	200				
	可锻铸铁 Malleable Cast Iron	800	250	225	360	200	320	150	300	100	240	-	-				
S	钴基合金, 镍基合金 Cobalt Base Alloy, Nickel Base Alloy	1100	250-320									45	90	40	75	-	-
	钛合金 Titanium Alloy	1260	370									40	80	30	60	-	-
N	铝 Aluminum	260	75														
	铝合金 Aluminum Alloy	447	130														
H	淬硬钢 Hardened Steel	-	50-60HRC									30	45				
	淬硬铸铁 Hardened Cast Iron	-	55HRC									30	40				

## 阿诺 - Loong 龍系列 - 正型 CC 刀片

CCGT/CCMT (80° Positive)

## AHNO Loong Series-Positive Insert CC Series



Series	L	IC	S
CC**0602	6.45	6.35	2.38
CC**09T3	9.67	9.525	3.97
CC**1204	12.9	12.7	4.76

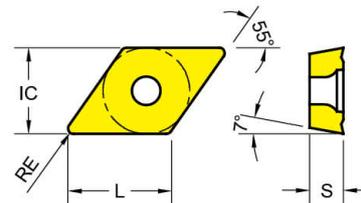
CCGT/CCMT	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S
					ACP05A	ACP10A	ACP20A	ACP30A	AP505A	ACM20A	ACM30A	AP505A
-UFA	CCMT060202-UFA	0.2	0.10 - 0.15	0.2 - 2.0		●	●			●	●	
	CCMT060204-UFA	0.4	0.15 - 0.26	0.4 - 2.0		●	●			●	●	
	CCMT060208-UFA	0.8	0.15 - 0.50	0.8 - 2.0		●	●			●	●	
	CCMT09T304-UFA	0.4	0.15 - 0.26	0.4 - 2.0	●	●	●			●	●	
	CCMT09T308-UFA	0.8	0.15 - 0.50	0.8 - 3.0	●	●	●			●	●	
	CCMT120404-UFA	0.4	0.15 - 0.26	0.4 - 3.0		●	●			●	●	
	CCMT120408-UFA	0.8	0.15 - 0.50	0.8 - 4.0		●	●			●	●	
	CCMT120412-UFA	1.2	0.15 - 0.50	1.2 - 4.0		●	●			●	●	
-USA	CCMT060202-USA	0.2	0.10 - 0.15	0.2 - 1.0		●	●			●	●	
	CCMT060204-USA	0.4	0.12 - 0.18	0.3 - 1.5		●	●			●	●	
	CCMT060208-USA	0.8	0.15 - 0.30	0.5 - 2.0		●	●	●		●	●	
	CCMT09T302-USA	0.2	0.10 - 0.15	0.2 - 3.0		●	●			●	●	
	CCMT09T304-USA	0.4	0.15 - 0.26	0.3 - 3.0		●	●			●	●	
	CCMT09T308-USA	0.8	0.15 - 0.35	0.5 - 3.0		●	●			●	●	
	CCMT120404-USA	0.4	0.15 - 0.26	0.4 - 4.0		●	●			●	●	
	CCMT120408-USA	0.8	0.15 - 0.35	0.5 - 4.0		●	●			●	●	
CCMT120412-USA	1.2	0.15 - 0.45	0.8 - 4.0			●						
-URA	CCMT09T304-URA	0.4	0.15 - 0.30	1.0 - 4.0							●	
	CCMT09T308-URA	0.8	0.20 - 0.40	1.5 - 4.0							●	
	CCMT120408-URA	0.8	0.20 - 0.40	1.5 - 4.5							●	

DCGT/DCMT (55° Positive)

阿诺 - Loong 龍系列 - 正型 DC 刀片

AHNO Loong Series-Positive Insert DC Series

Series	L	IC	S
DC**0702	7.75	6.35	2.38
DC**11T3	11.63	9.525	3.97



DCGT/DCMT	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A
-PFA	DCGT11T302-PFA	0.2	0.02 - 0.15	0.2 - 2.5			●			●		
	DCMT070202-PFA	0.2	0.02 - 0.12	0.2 - 1.5			●			●		
	DCMT070204-PFA	0.4	0.05 - 0.20	0.3 - 2.0		●	●			●		
	DCMT070208-PFA	0.8	0.06 - 0.25	0.6 - 2.0		●	●			●		
	DCMT11T304-PFA	0.4	0.05 - 0.24	0.3 - 2.5		●	●	●		●		
-PMA	DCMT11T308-PFA	0.8	0.08 - 0.25	0.6 - 3.0		●	●			●		
	DCMT070204-PMA	0.4	0.04 - 0.24	0.2 - 2.1		●	●		●	●		●
	DCMT11T304-PMA	0.4	0.04 - 0.28	0.2 - 2.8		●	●	●	●	●		●
	DCMT11T308-PMA	0.8	0.10 - 0.30	0.6 - 2.8		●	●	●	●	●		●
	DCMT11T312-PMA	1.2	0.12 - 0.30	1.0 - 2.8			●					
-PRA	DCMT150408-PMA	0.8	0.10 - 0.30	0.6 - 3.5		●						
	DCMT11T304-PRA	0.4	0.15 - 0.24	1.0 - 3.3		●	●					
	DCMT11T308-PRA	0.8	0.15 - 0.40	1.0 - 3.3		●	●					
	DCMT11T312-PRA	1.2	0.15 - 0.45	1.5 - 3.3		●	●					

切削参数 Cutting Parameters

Vc(m/min.)

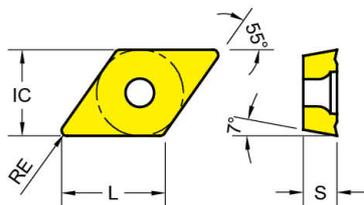
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm²)	布氏硬度 (HB)	ACP05A		ACP10A		ACP20A		ACP30A		APS05A		ACM20A		ACM30A	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
P	低碳钢, 碳素钢 Low Carbon Steel, Carbon Steel	<600	<180	250	500	200	450	180	400	160	360						
		<950	<280	225	360	200	320	150	300	100	240						
	低合金钢 Low-alloyed Steel	700-950	200-280	120	320	90	300	75	270	60	200						
		高合金钢 High-alloyed Steel	950-1200	280-355	120	240	100	225	75	180	50	150	80	125	60	100	50
	1200-1400		355-415	60	80	55	75	40	60	-	-	75	100	40	75	-	-
M	奥氏体不锈钢 Austenitic	675	200									120	240	150	240	125	225
	双相不锈钢 Duplex Stainless Steel	778	230									100	160	125	160	105	150
	沉淀硬化不锈钢 PH Stainless Steel	1013	300									80	150	120	150	100	125
K	灰口铸铁 Grey Cast Iron	700	220	270	500	240	450	225	400	200	360	180	240				
	球墨铸铁 Nodular Cast Iron	880	260	240	500	200	450	180	400	160	360	160	200				
	可锻铸铁 Malleable Cast Iron	800	250	225	360	200	320	150	300	100	240	-	-				
S	钴基合金, 镍基合金 Cobalt Base Alloy, Nickel Base Alloy	1100	250-320									45	90	40	75	-	-
	钛合金 Titanium Alloy	1260	370									40	80	30	60	-	-
N	铝 Aluminum	260	75														
	铝合金 Aluminum Alloy	447	130														
H	淬硬钢 Hardened Steel	-	50-60HRC									30	45				
	淬硬铸铁 Hardened Cast Iron	-	55HRC									30	40				

## 阿诺 - Loong 龍系列 - 正型 DC 刀片

DCGT/DCMT (55° Positive)

## AHNO Loong Series-Positive Insert DC Series

Series	L	IC	S
DC**0702	7.75	6.35	2.38
DC**11T3	11.63	9.525	3.97



DCGT/DCMT	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A
-UFA	DCMT070202-UFA	0.2	0.08 - 0.12	0.2 - 1.0		●	●			●		
	DCMT070204-UFA	0.4	0.15 - 0.24	0.4 - 2.0		●	●			●		
	DCMT11T302-UFA	0.2	0.08 - 0.12	0.2 - 2.0		●	●			●		
	DCMT11T304-UFA	0.4	0.15 - 0.24	0.4 - 2.0		●	●		●	●	●	●
	DCMT11T308-UFA	0.8	0.15 - 0.30	0.8 - 2.0		●	●			●	●	
	DCMT11T312-UFA	1.2	0.15 - 0.30	1.2 - 2.0		●	●					
-USA	DCMT070202-USA	0.2	0.08 - 0.12	0.2 - 1.0		●	●			●		
	DCMT070204-USA	0.4	0.15 - 0.24	0.2 - 2.0		●	●			●	●	
	DCMT11T302-USA	0.2	0.08 - 0.12	0.2 - 2.0		●	●			●		
	DCMT11T304-USA	0.4	0.15 - 0.24	0.3 - 3.0	●	●	●			●	●	
	DCMT11T308-USA	0.8	0.15 - 0.30	0.5 - 3.0	●	●	●			●	●	
	DCMT11T312-USA	1.2	0.20 - 0.40	0.9 - 3.3		●	●					
-URA	DCMT11T304-URA	0.4	0.15 - 0.24	1.0 - 3.3								●
	DCMT11T308-URA	0.8	0.15 - 0.40	1.0 - 3.3								●
	DCMT11T312-URA	1.2	0.15 - 0.45	1.5 - 3.3								●

## 切削参数 Cutting Parameters

Vc(m/min.)

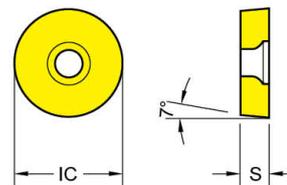
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP05A		ACP10A		ACP20A		ACP30A		APS05A		ACM20A		ACM30A	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
P	低碳钢, 碳素钢 Low Carbon Steel, Carbon Steel	<600	<180	250	500	200	450	180	400	160	360						
		<950	<280	225	360	200	320	150	300	100	240						
	低合金钢 Low-alloyed Steel	700-950	200-280	120	320	90	300	75	270	60	200						
		高合金钢 High-alloyed Steel	950-1200	280-355	120	240	100	225	75	180	50	150	80	125	60	100	50
	1200-1400		355-415	60	80	55	75	40	60	-	-	75	100	40	75	-	-
M	奥氏体不锈钢 Austenitic	675	200									120	240	150	240	125	225
	双相不锈钢 Duplex Stainless Steel	778	230									100	160	125	160	105	150
	沉淀硬化不锈钢 PH Stainless Steel	1013	300									80	150	120	150	100	125
K	灰口铸铁 Grey Cast Iron	700	220	270	500	240	450	225	400	200	360	180	240				
	球墨铸铁 Nodular Cast Iron	880	260	240	500	200	450	180	400	160	360	160	200				
	可锻铸铁 Malleable Cast Iron	800	250	225	360	200	320	150	300	100	240	-	-				
S	钴基合金, 镍基合金 Cobalt Base Alloy, Nickel Base Alloy	1100	250-320									45	90	40	75	-	-
	钛合金 Titanium Alloy	1260	370									40	80	30	60	-	-
N	铝 Aluminum	260	75														
	铝合金 Aluminum Alloy	447	130														
H	淬硬钢 Hardened Steel	-	50-60HRC									30	45				
	淬硬铸铁 Hardened Cast Iron	-	55HRC									30	40				

RCMT (Positive)

阿诺 - Loong 龍系列 - 正型 RC 刀片

AHNO Loong Series-Positive Insert RC Series

Series	IC	S
RC**0602	6.0	2.38
RC**0803	8.0	3.18
RC**10T3	10.0	3.97
RC**1204	12.0	4.76



RCMT	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A
-UFA	RCMT0602M0-UFA	-	0.15 - 0.40	0.2 - 1.5		●	●		●	●		●
	RCMT0803M0-UFA	-	0.15 - 0.50	0.3 - 3.0		●	●		●	●		●
	RCMT10T3M0-UFA	-	0.15 - 0.60	0.4 - 4.0		●	●		●	●		●
	RCMT1204M0-UFA	-	0.17 - 1.00	0.5 - 4.8		●	●		●	●		●
-USA	RCMT0602M0-USA	-	0.15 - 0.60	0.3 - 2.4		●	●			●		
	RCMT0803M0-USA	-	0.15 - 0.80	0.5 - 3.0		●	●			●		
	RCMT10T3M0-USA	-	0.30 - 1.00	0.7 - 4.0		●	●			●		
	RCMT1204M0-USA	-	0.30 - 1.00	0.7 - 4.8		●	●			●		

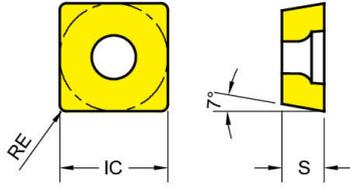
切削参数 Cutting Parameters				Vc(m/min.)													
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm²)	布氏硬度 (HB)	ACP05A		ACP10A		ACP20A		ACP30A		APS05A		ACM20A		ACM30A	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
P	低碳钢, 碳素钢 Low Carbon Steel, Carbon Steel	<600	<180	250	500	200	450	180	400	160	360						
		<950	<280	225	360	200	320	150	300	100	240						
	低合金钢 Low-alloyed Steel	700-950	200-280	120	320	90	300	75	270	60	200						
M	高合金钢 High-alloyed Steel	950-1200	280-355	120	240	100	225	75	180	50	150	80	125	60	100	50	80
		1200-1400	355-415	60	80	55	75	40	60	-	-	75	100	40	75	-	-
K	奥氏体不锈钢 Austenitic	675	200									120	240	150	240	125	225
	双相不锈钢 Duplex Stainless Steel	778	230									100	160	125	160	105	150
	沉淀硬化不锈钢 PH Stainless Steel	1013	300									80	150	120	150	100	125
S	灰口铸铁 Grey Cast Iron	700	220	270	500	240	450	225	400	200	360	180	240				
	球墨铸铁 Nodular Cast Iron	880	260	240	500	200	450	180	400	160	360	160	200				
	可锻铸铁 Malleable Cast Iron	800	250	225	360	200	320	150	300	100	240	-	-				
N	钴基合金, 镍基合金 Cobalt Base Alloy, Nickel Base Alloy	1100	250-320									45	90	40	75	-	-
	钛合金 Titanium Alloy	1260	370									40	80	30	60	-	-
H	铝 Aluminum	260	75														
	铝合金 Aluminum Alloy	447	130														
H	淬硬钢 Hardened Steel	-	50-60HRC									30	45				
	淬硬铸铁 Hardened Cast Iron	-	55HRC									30	40				

## 阿诺 - Loong 龍系列 - 正型 SC 刀片

SCMT (90° Positive)

## AHNO Loong Series-Positive Insert SC Series

Series	L	IC	S
SC**09T3	9.525	9.525	3.97
SC**1204	12.7	12.7	4.76



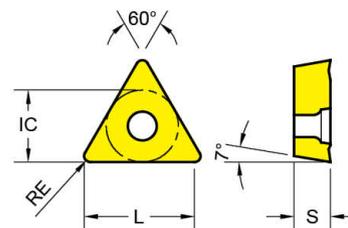
SCMT	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S
					ACP05A	ACP10A	ACP20A	ACP30A	AP505A	ACM20A	ACM30A	AP505A
-PFA	SCMT09T304-PFA	0.4	0.06 - 0.24	0.3 - 3.0			●					
	SCMT09T308-PFA	0.8	0.08 - 0.28	0.6 - 3.0			●					
-PMA	SCMT09T304-PMA	0.4	0.06 - 0.25	0.4 - 3.0			●			●		
	SCMT09T308-PMA	0.8	0.10 - 0.35	0.8 - 3.5		●	●	●		●		
-PRA	SCMT09T308-PRA	0.8	0.20 - 0.40	1.5 - 4.0		●	●					
	SCMT120408-PRA	0.8	0.20 - 0.40	1.5 - 4.5		●	●					
-UFA	SCMT09T304-UFA	0.4	0.15 - 0.30	0.4 - 3.0		●	●			●		
	SCMT09T308-UFA	0.8	0.15 - 0.50	0.8 - 3.0		●	●			●		
	SCMT120408-UFA	0.8	0.15 - 0.50	0.8 - 4.0		●	●			●		
	SCMT120412-UFA	1.2	0.15 - 0.50	1.2 - 4.0			●					
-USA	SCMT09T304-USA	0.4	0.15 - 0.30	0.3 - 3.0		●	●			●	●	
	SCMT09T308-USA	0.8	0.15 - 0.35	0.5 - 3.0		●	●			●	●	
	SCMT120404-USA	0.4	0.15 - 0.30	0.4 - 4.0		●	●			●		
	SCMT120408-USA	0.8	0.15 - 0.30	0.5 - 4.0		●	●			●	●	
	SCMT120412-USA	1.2	0.15 - 0.45	0.8 - 4.0		●	●			●		
-URA	SCMT09T308-URA	0.8	0.20 - 0.40	1.5 - 4.0							●	
	SCMT120408-URA	0.8	0.20 - 0.40	1.5 - 4.5							●	

TCMT (60° Positive)

阿诺 - Loong 龍系列 - 正型 TC 刀片

AHNO Loong Series-Positive Insert TC Series

Series	L	IC	S
TC**06T1	6.87	3.97	1.98
TC**0902	9.62	5.56	2.38
TC**1102	11.0	6.35	2.38
TC**16T3	16.5	9.525	3.97



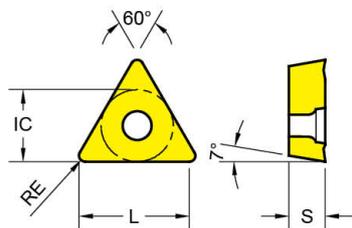
TCMT	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S	
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A	
-PFA	TCMT06T102-PFA	0.2	0.04 - 0.12	0.2 - 1.5		●							
	TCMT06T104-PFA	0.4	0.04 - 0.12	0.3 - 2.0		●	●			●			
	TCMT090204-PFA	0.4	0.06 - 0.23	0.3 - 2.5		●	●			●			
	TCMT110204-PFA	0.4	0.06 - 0.24	0.3 - 3.0		●	●	●		●			
	TCMT110208-PFA	0.8	0.08 - 0.28	0.6 - 3.0		●	●			●			
	TCMT16T304-PFA	0.4	0.06 - 0.24	0.3 - 3.0		●	●	●		●			
-PMA	TCMT16T308-PFA	0.8	0.08 - 0.28	0.6 - 3.0		●	●	●		●			
	TCMT110204-PMA	0.4	0.04 - 0.24	0.3 - 2.5			●						
	TCMT110208-PMA	0.8	0.10 - 0.30	0.6 - 3.0			●	●					
-PRA	TCMT16T308-PMA	0.8	0.10 - 0.35	0.8 - 3.5			●	●		●			
	TCMT16T308-PRA	0.8	0.15 - 0.40	1.0 - 4.0		●	●	●					
	TCMT16T312-PRA	1.2	0.15 - 0.45	1.5 - 4.5		●	●						

切削参数 Cutting Parameters				Vc(m/min.)													
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm²)	布氏硬度 (HB)	ACP05A		ACP10A		ACP20A		ACP30A		APS05A		ACM20A		ACM30A	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
P	低碳钢, 碳素钢 Low Carbon Steel, Carbon Steel	<600	<180	250	500	200	450	180	400	160	360						
		<950	<280	225	360	200	320	150	300	100	240						
	低合金钢 Low-alloyed Steel	700-950	200-280	120	320	90	300	75	270	60	200						
		高合金钢 High-alloyed Steel	950-1200	280-355	120	240	100	225	75	180	50	150	80	125	60	100	50
	1200-1400		355-415	60	80	55	75	40	60	-	-	75	100	40	75	-	-
M	奥氏体不锈钢 Austenitic	675	200									120	240	150	240	125	225
	双相不锈钢 Duplex Stainless Steel	778	230									100	160	125	160	105	150
	沉淀硬化不锈钢 PH Stainless Steel	1013	300									80	150	120	150	100	125
K	灰口铸铁 Grey Cast Iron	700	220	270	500	240	450	225	400	200	360	180	240				
	球墨铸铁 Nodular Cast Iron	880	260	240	500	200	450	180	400	160	360	160	200				
	可锻铸铁 Malleable Cast Iron	800	250	225	360	200	320	150	300	100	240	-	-				
S	钴基合金, 镍基合金 Cobalt Base Alloy, Nickel Base Alloy	1100	250-320									45	90	40	75	-	-
	钛合金 Titanium Alloy	1260	370									40	80	30	60	-	-
N	铝 Aluminum	260	75														
	铝合金 Aluminum Alloy	447	130														
H	淬硬钢 Hardened Steel	-	50-60HRC									30	45				
	淬硬铸铁 Hardened Cast Iron	-	55HRC									30	40				

## 阿诺 - Loong 龍系列 - 正型 TC 刀片

TCMT (60° Positive)

## AHNO Loong Series-Positive Insert TC Series



Series	L	IC	S
TC**06T1	6.87	3.97	1.98
TC**0902	9.62	5.56	2.38
TC**1102	11.0	6.35	2.38
TC**16T3	16.5	9.525	3.97

TCMT	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A
-UFA	TCMT110204-UFA	0.4	0.15 - 0.24	0.4 - 2.0		●	●			●		
	TCMT16T304-UFA	0.4	0.15 - 0.24	0.4 - 3.0		●	●			●		
	TCMT16T308-UFA	0.8	0.15 - 0.30	0.8 - 3.0		●	●			●		
-USA	TCMT110202-USA	0.2	0.08 - 0.12	0.2 - 2.0		●	●			●	●	
	TCMT110204-USA	0.4	0.15 - 0.24	0.2 - 2.0		●	●			●	●	
	TCMT110208-USA	0.8	0.15 - 0.30	0.5 - 2.5		●	●			●		
	TCMT16T304-USA	0.4	0.15 - 0.24	0.3 - 3.0		●	●			●	●	
-URA	TCMT16T308-USA	0.8	0.15 - 0.30	0.5 - 3.0		●	●			●	●	
	TCMT16T308-URA	0.8	0.15 - 0.40	1.0 - 4.0							●	

## 切削参数 Cutting Parameters

Vc(m/min.)

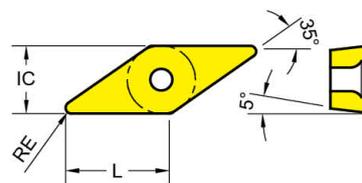
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP05A		ACP10A		ACP20A		ACP30A		APS05A		ACM20A		ACM30A	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
P	低碳钢, 碳素钢 Low Carbon Steel, Carbon Steel	<600	<180	250	500	200	450	180	400	160	360						
		<950	<280	225	360	200	320	150	300	100	240						
	低合金钢 Low-alloyed Steel	700-950	200-280	120	320	90	300	75	270	60	200						
		高合金钢 High-alloyed Steel	950-1200	280-355	120	240	100	225	75	180	50	150	80	125	60	100	50
	1200-1400		355-415	60	80	55	75	40	60	-	-	75	100	40	75	-	-
M	奥氏体不锈钢 Austenitic	675	200									120	240	150	240	125	225
	双相不锈钢 Duplex Stainless Steel	778	230									100	160	125	160	105	150
	沉淀硬化不锈钢 PH Stainless Steel	1013	300									80	150	120	150	100	125
K	灰口铸铁 Grey Cast Iron	700	220	270	500	240	450	225	400	200	360	180	240				
	球墨铸铁 Nodular Cast Iron	880	260	240	500	200	450	180	400	160	360	160	200				
	可锻铸铁 Malleable Cast Iron	800	250	225	360	200	320	150	300	100	240	-	-				
S	钴基合金, 镍基合金 Cobalt Base Alloy, Nickel Base Alloy	1100	250-320									45	90	40	75	-	-
	钛合金 Titanium Alloy	1260	370									40	80	30	60	-	-
N	铝 Aluminum	260	75														
	铝合金 Aluminum Alloy	447	130														
H	淬硬钢 Hardened Steel	-	50-60HRC									30	45				
	淬硬铸铁 Hardened Cast Iron	-	55HRC									30	40				

VBMT/VCMT (35° Positive)

阿诺 - Loong 龍系列 - 正型 VB 刀片

AHNO Loong Series-Positive Insert VB Series

Series	L	IC	S
VB**1102	11.1	6.35	2.38
VB**1103	11.1	6.35	3.18
VB**1604	16.6	9.525	4.76



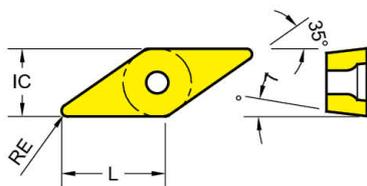
VBMT/VCMT	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A
-PFA	VBMT160404-PFA	0.4	0.06 - 0.20	0.3 - 2.5		●	●	●		●		
-PMA	VBMT160404-PMA	0.4	0.04 - 0.20	0.2 - 2.8		●	●	●	●	●		●
	VBMT160408-PMA	0.8	0.10 - 0.25	0.6 - 3.0		●	●	●	●	●		●
	VBMT160412-PMA	1.2	0.20 - 0.40	1.0 - 3.0		●	●					
-PRA	VBMT160404-PRA	0.4	0.15 - 0.20	0.8 - 3.6		●	●					
	VBMT160408-PRA	0.8	0.15 - 0.35	1.0 - 3.6		●	●					
	VBMT160412-PRA	1.2	0.15 - 0.40	1.2 - 3.6		●	●					
-UFA	VBMT110204-UFA	0.4	0.15 - 0.20	0.4 - 2.0						●		
	VBMT160404-UFA	0.4	0.15 - 0.20	0.4 - 2.0	●	●	●			●		
	VBMT160408-UFA	0.8	0.15 - 0.30	0.8 - 3.0	●	●	●		●	●		●
	VBMT160412-UFA	1.2	0.15 - 0.30	1.2 - 3.0	●	●	●			●		
-USA	VBMT110302-USA	0.2	0.07 - 0.10	0.2 - 2.0			●			●		
	VBMT110304-USA	0.4	0.15 - 0.20	0.4 - 2.0		●	●			●	●	
	VBMT110308-USA	0.8	0.15 - 0.25	0.8 - 2.5		●	●			●		
	VBMT160402-USA	0.2	0.07 - 0.10	0.2 - 2.0		●	●			●		
	VBMT160404-USA	0.4	0.15 - 0.20	0.4 - 2.0		●	●			●	●	
	VBMT160408-USA	0.8	0.15 - 0.30	0.8 - 2.5	●	●	●	●	●	●	●	●
	VBMT160412-USA	1.2	0.20 - 0.40	1.2 - 3.0		●	●			●		
-URA	VBMT160404-URA	0.4	0.15 - 0.20	0.8 - 3.6							●	
	VBMT160408-URA	0.8	0.15 - 0.35	1.0 - 3.6							●	
	VBMT160412-URA	1.2	0.15 - 0.40	1.2 - 3.6							●	

## 阿诺 - Loong 龍系列 - 正型 VC 刀片

VCMT (35° Positive)

## AHNO Loong Series-Positive Insert VC Series

Series	L	IC	S
VC**1103	11.1	6.35	3.18
VC**1604	16.6	9.525	4.76



VBMT/VCMT	型号 Type	RE	Fn (mm/rev.)	Ap (mm)	P				M			S
					ACP05A	ACP10A	ACP20A	ACP30A	APS05A	ACM20A	ACM30A	APS05A
-UFA	VCMT110304-UFA	0.4	0.15 - 0.20	0.4 - 2.0		●	●			●		
	VCMT110308-UFA	0.8	0.15 - 0.25	0.8 - 2.0		●	●			●		
	VCMT160404-UFA	0.4	0.15 - 0.20	0.4 - 2.0		●	●			●		
	VCMT160408-UFA	0.8	0.15 - 0.30	0.8 - 3.0		●	●			●		
-USA	VCMT160404-USA	0.4	0.15 - 0.20	0.4 - 2.0		●	●			●		
	VCMT160408-USA	0.8	0.15 - 0.30	0.8 - 2.5		●	●			●		

## 切削参数 Cutting Parameters

Vc(m/min.)

ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP05A		ACP10A		ACP20A		ACP30A		APS05A		ACM20A		ACM30A	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
P	低碳钢, 碳素钢 Low Carbon Steel, Carbon Steel	<600	<180	250	500	200	450	180	400	160	360						
		<950	<280	225	360	200	320	150	300	100	240						
	低合金钢 Low-alloyed Steel	700-950	200-280	120	320	90	300	75	270	60	200						
		高合金钢 High-alloyed Steel	950-1200	280-355	120	240	100	225	75	180	50	150	80	125	60	100	50
	1200-1400		355-415	60	80	55	75	40	60	-	-	75	100	40	75	-	-
M	奥氏体不锈钢 Austenitic	675	200									120	240	150	240	125	225
	双相不锈钢 Duplex Stainless Steel	778	230									100	160	125	160	105	150
	沉淀硬化不锈钢 PH Stainless Steel	1013	300									80	150	120	150	100	125
K	灰口铸铁 Grey Cast Iron	700	220	270	500	240	450	225	400	200	360	180	240				
	球墨铸铁 Nodular Cast Iron	880	260	240	500	200	450	180	400	160	360	160	200				
	可锻铸铁 Malleable Cast Iron	800	250	225	360	200	320	150	300	100	240	-	-				
S	钴基合金, 镍基合金 Cobalt Base Alloy, Nickel Base Alloy	1100	250-320									45	90	40	75	-	-
	钛合金 Titanium Alloy	1260	370									40	80	30	60	-	-
N	铝 Aluminum	260	75														
	铝合金 Aluminum Alloy	447	130														
H	淬硬钢 Hardened Steel	-	50-60HRC									30	45				
	淬硬铸铁 Hardened Cast Iron	-	55HRC									30	40				

Positive)

# 阿诺 - Loong 龍系列 - 正型刀片

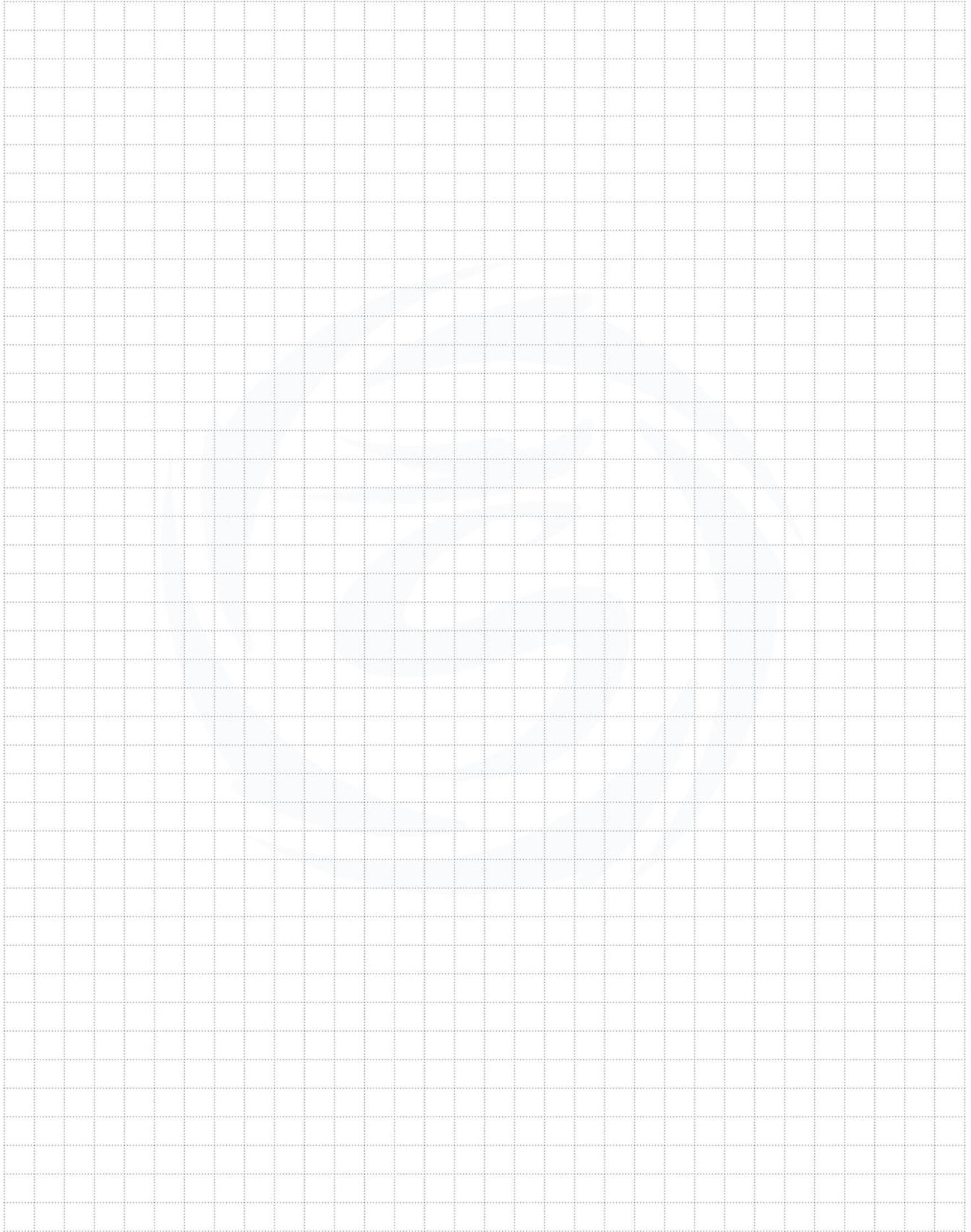
AHNO Loong Series-Positive Inserts



# 阿诺 - Loong 龍系列 - 正型刀片

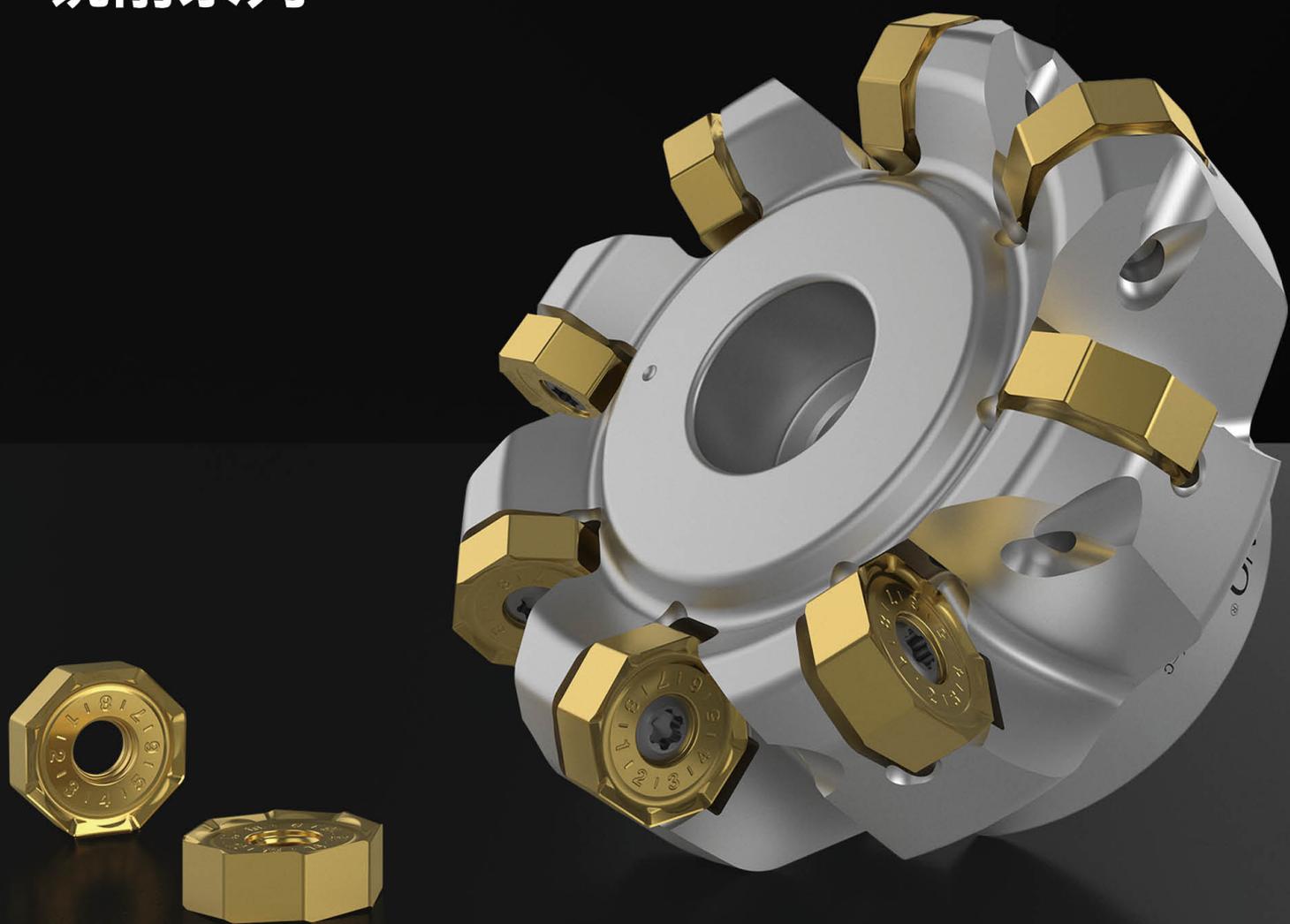
Positive

## AHNO Loong Series-Positive Inserts



# MILLING SERIES

铣削系列



# 铣削刀片命名规则

Milling-Code System

## Milling Insert Name Code

铣削用可转位刀片按照 ISO 1832 标准的符号说明

Turning Inserts according to ISO 1832 Standard Code System

示例 1:

Example 1:

H	N	G	X	09	06	ANSN
1	2	3	4	5	6	7

### 1、刀片形状

1. Insert shape

代号 Symbol	图形 Shape	代号 Symbol	图形 Shape
A		M	
B		O	
C		P	
D		R	
E		S	
H		T	
K		V	
L		W	

### 3、公差

3. Tolerance

允许公差 (mm) Tolerance	d	m	s	
	A	± 0,025	± 0,005	± 0,025
	C	± 0,025	± 0,013	± 0,025
	E	± 0,025	± 0,025	± 0,025
	F	± 0,013	± 0,005	± 0,025
	G	± 0,025	± 0,025	± 0,130
	H	± 0,013	± 0,013	± 0,025
	J <sup>1</sup>	± 0,05-0,15 <sup>2</sup>	± 0,005	± 0,025
	K <sup>1</sup>	± 0,05-0,15 <sup>2</sup>	± 0,013	± 0,025
	L <sup>1</sup>	± 0,05-0,15 <sup>2</sup>	± 0,025	± 0,025
	M	± 0,05-0,15 <sup>2</sup>	± 0,08-0,20 <sup>2</sup>	± 0,130
	N	± 0,05-0,15 <sup>2</sup>	± 0,08-0,20 <sup>2</sup>	± 0,025
	U	± 0,08-0,25 <sup>2</sup>	± 0,13-0,38 <sup>2</sup>	± 0,130

<sup>1</sup> 刀片有精磨的副切削刃  
The insert has finishing minor cutting edge

<sup>2</sup> 视刀片尺寸而定 (见 ISO 1832 标准)  
Tolerance is different by insert size. Please see ISO 1832

### 2、后角

2. Relief Angle

代号 Symbol	图形 Shape	代号 Symbol	图形 Shape
A		N	
B		P	
C			
D			
E			
F			
G			

### 4、刀片加工和固定特征

4. Insert Machining and Figure

代号 Symbol	图形 Shape	代号 Symbol	图形 Shape	代号 Symbol	图形 Shape
A		H		R	
B		J		T	
C		M		U	
F		N		W	
G		Q		X	需要可转位刀片的图纸 或准确说明 Indexable insert drawing or detailed description is needed



8

5、切削刃长度

5. Cutting Edge Length

<sup>1</sup> 英制规格 (00) Inch

刀片形状 Insert Shape															
内切圆直径 d IC Diameter d		C		D		R		S		T		V		W	
mm	英寸 Inch	规格 Size	l	规格 Size	l	规格 Size	规格 Size	l	规格 Size	l	规格 Size	l	规格 Size	l	
3,97	5/32									06	6,9				
5	0,197					05							03	3,8	
5,56	7/32									09	9				
6	0,236					06									
6,35	2/8	06	6,4	07	7,7	06 <sup>1</sup>				11	11	11	11	04	4,3
8	0,315					08								05	5,2
9,525	3/8	09	9,6	11	11,6	09 <sup>1</sup>	09	9,5	16	16,5	16	16,5	06	6,5	
10	0,394					10									
12	0,472					12									
12,7	4/8	12	12,9	15	15,5	12 <sup>1</sup>	12	12,7	22	22	22	22,1	08	8,7	
15,875	5/8	16	16,1				15	15,8	27	27			10	10,8	
16	0,63					16									
17,46	11/16												12	11,6	
19,05	6/8	19	19,3			19 <sup>1</sup>	19	19,0							
20	0,787					20									
25	0,984					25									
25,4	8/8	25	25,8			25 <sup>1</sup>	25	25,4							
32	1,26					32									

6、刀片厚度

6. Insert Thickness

图形 Figure	厚度 s(mm) Thickness
	01 1,59
	T1 1,98
	02 2,38
	T2 2,78
	03 3,18
	T3 3,97
	04 4,76
	05 5,56
	06 6,35
	07 7,94
	09 9,52

7-1、刀尖圆角半径

7-1. Corner Radius

图形 Shape	半径 r(mm) Radius
	01 0,1
	02 0,2
	04 0,4
	08 0,8
	12 1,2
	16 1,6
	24 2,4
	M0 用于公制直径尺寸 For metric diameter
	00 用于已转换为 mm 的英制直径尺寸 For inch diameter converted to mm

7-2、主偏角

7-2. Cutting Edge Angle

代号 Symbol	角度 Angle
P	90°
A	45°
D	60°
E	75°
F	85°
Z	其他主偏角 Other Cutting Edge Angles

7-3、副切削刃后角

7-3. Wiper Edge Relief Angle

代号 Symbol	角度 Angle
N	0°
P	11°
D	15°
E	20°
F	25°
Z	后角 Relief Angle

7-4、切削刃形状

7-4. Cutting Edge Shape

代号 Symbol	图形 Figure
F	
E	
T	
S	

7-5、切削方向

7-5. Feed Direction

代号 Symbol	图形 Figure
R	
L	
N	

# 铣削刀片命名规则

## Milling-Code System

### Milling Insert Name Code

#### 槽型介绍

#### Chipbreaker Introduction

示例 1:

Example 1:



### 8、槽型索引

#### 8. Type Index

铣削槽型 Milling Chipbreaker	刃口示意 Edge Geometry	槽型说明 Chipbreaker Description	铣削槽型 Milling Chipbreaker	刃口示意 Edge Geometry	槽型说明 Chipbreaker Description
-F2		轻切削加工槽型 Light Cutting Chipbreaker	-M6		刃口倒圆槽型 Cutting Edge Rounding Chipbreaker
-F5		粗糙度优先型 Roughness First	-R5		通用高强度加工槽型 Universal High Strength Machining Chipbreaker
-M4		低阻力型 Low Resistance	-R6		刃口负倒棱槽型 Cutting Edge Negative Chamfered Chipbreaker
-M5		通用中等加工 General Medium Machining	-M7		通用中高强度加工 General Medium & High Strength Machining

#### 8-1、槽型代号

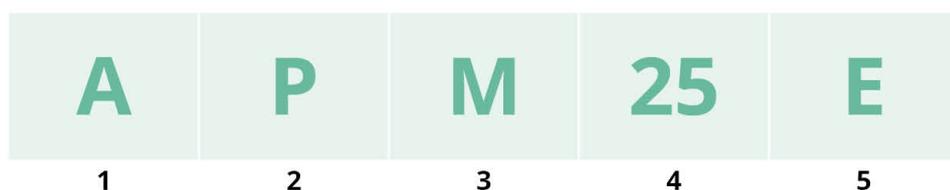
##### 8-1. Chipbreaker Code

代号 Symbol	用途 Application
F	精加工 Finishing
	轻切削 / 切削力优先 Light Cutting / Cutting Strength First
S	半精加工 Semi Finishing
M	中等加工 Medium Machining
R	粗加工 Roughing
	寿命优先 Service Life First
H	重切削 Heavy Machining
W	Wiper 修光刃 Wiper Edge

#### 8-2、功能代号

##### 8-2. Function Code

代号 Symbol
2
4
5
6
7



功能序号 Function No.	说明 Description	详情 Details			
1	AHNO 阿诺				
2	基础材料及 涂层代码 Basic Materials & Coating Code	C	硬质合金 +CVD Carbide +CVD	V	金属陶瓷 +PVD Cermet +PVD
		P	硬质合金 +PVD Carbide + PVD	I	塞隆陶瓷 Sialon Ceramics
		B	CBN	W	晶须陶瓷 Whisker Ceramics
		D	PCD	N	硬质合金无涂层 Cemented Carbide Uncoated
		T	金属陶瓷 Cermet		
3	第一推荐应用 First Recommended Application	P	钢 Steel	S	难加工材料 Hard-to-machine Materials
		M	不锈钢 Stainless Steel	H	硬材料 Hard Materials
		K	铸铁 Cast Iron	U	通用 General
	N	有色金属 Nonferrous Metals			
4	ISO 应用范围 ISO Application Range	<p>耐磨性 Wear Resistance</p> <p>韧性 Toughness</p>			
	代次代码 Generation Code				
5	代次代码				

## 铣削命名规则

## Milling-Code System

## Milling Name Code

示例 1:

Example 1:



## 1、刀具产品系列

## 1. Product Series

代号 Symbol	切削方式 Cutting Method	系列号 Series Number
MF	面铣 Face Milling	M1
MS	方肩铣刀 Shoulder Milling	M2
MH	快进给 High Feed	M3
MP	仿形 Profiling	M4
MD	三面刃 Three-side Edge	M5
MT	螺纹铣刀 Thread Milling	M6
MC	倒角 Chamfer	M7
PE	玉米铣 Corn Milling	M9

## 2、代次

## 2. Generation

系列代次 Method
----------------

## 3、主偏角 (Kr)

## 3. Cutting Edge Angle

数值 Value	角度 Angle
90	90
88	88
75	75
60	60
.	.
.	.
15	15
00	圆刀片 Circular Insert

## 4、刀刃类型

## 4. Cutting Edge Type

代号 Symbol	微调节刃 Micro Adjusting Edge
F	带微调节刃 With Micro Adjusting Edge

## 5、刀片

## 5. Insert

刀片型号 Insert Type
---------------------

## 6、刀盘类型

## 6. Milling Cutter Type

代号 Symbol	楔块式刀盘 Wedge Milling Cutter
N	带楔块式刀盘 With Wedge Milling Cutter

## 7、直径

## 7. Diameter

刀具直径 Tool Diameter
-----------------------

## 8、接口

## 8. Interface

代号 Symbol	连接方式 Connection Method
B	芯轴式 Arbor
W	侧固式 Weldon
A	圆柱式 Cylindrical
M	螺纹接口 Threading Interface

## 9、切削方向

## 9. Cutting Direction

代号 Symbol	旋向 Rotation Direction
R	右手(缺省) Right-hand (Default)
L	左手 Left-hand

## 10、齿数

## 10. Number of Teeth

刀体齿数 Milling Cutter Number of Teeth
--

## 11、长度

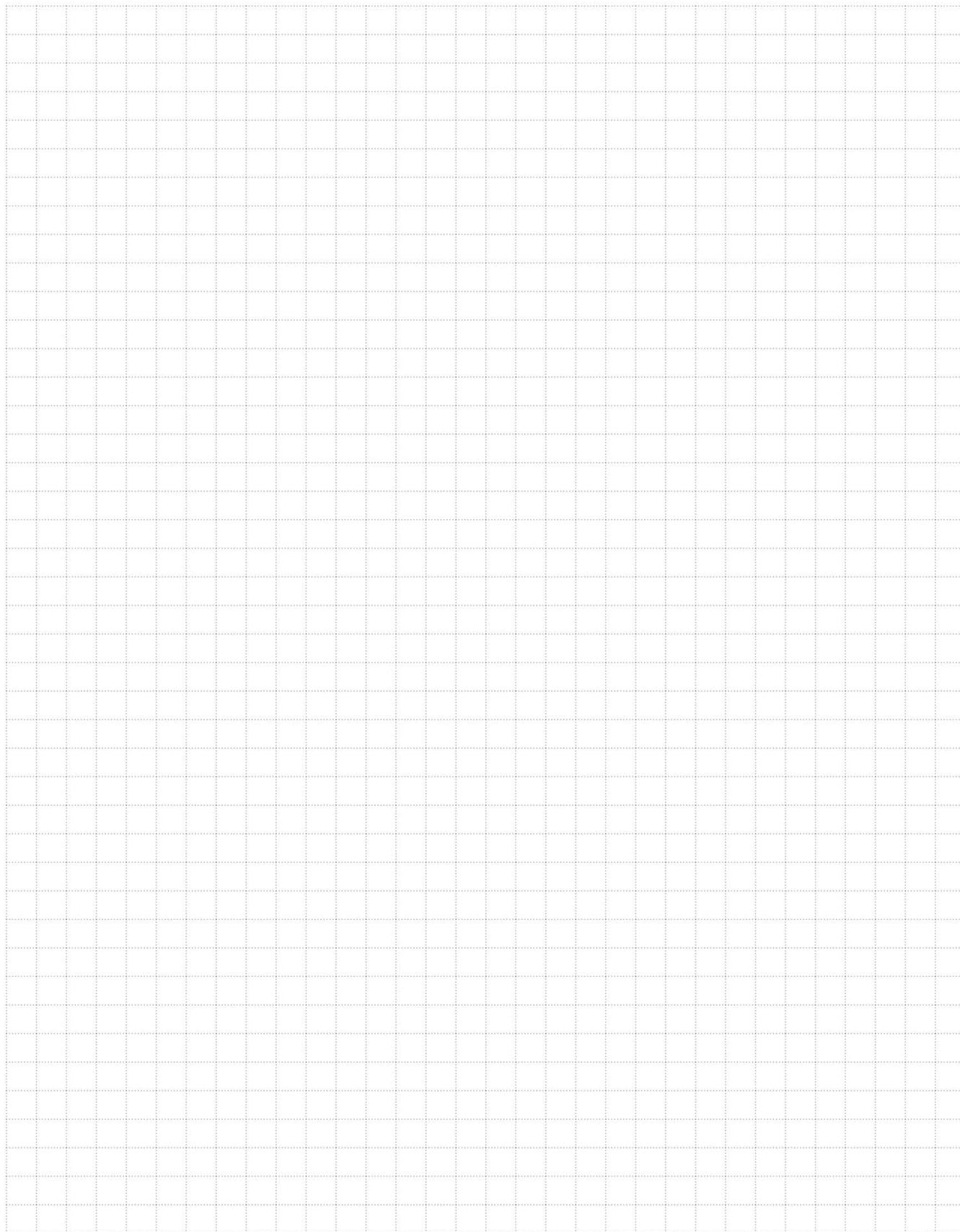
## 11. Length

特殊长度 Special Length
------------------------

## 12、其他

## 12. Number of Teeth

代号 Symbol	类型 Type
C	带内冷 With internal coolant
无标记 Unmarked	不带内冷 Without internal coolant



## 阿诺 - Loong 龍系列 - 铣削材质

## Milling Grades

## AHNO Loong Series-Milling Materials

## 铣削材质一览

## Milling Materials Overview

## 铣削材料应用

## Turning Materials Application

铣削材质 Milling Materials	ISO 组别 ISO Group	涂层工艺 Coating Technology	工件材料组别 Workpiece Material Group						应用范围 Application Range					技术说明 Technology Description
			P	M	K	S	N	H	05	15	25	35	45	
ACP25A	P15~P25	CVD	●						●					铣削通用材质，高强度基体搭载中温化学涂层，实现了耐磨性和韧性的均衡结合，适用于加工钢和铸铁材料，尤其是较高线速度的应用场合。 Milling general materials and high-strength matrix with medium-temperature chemical coatings achieve a balanced combination of wear resistance and toughness, which are used in the machining of steel and cast iron, especially for high linear speeds cutting applications.
	K20~K30				●				●					
APP25A	P25~P35	PVD	●						●					多功能的铣削材质，具有良好的热稳定性，广泛应用于各类钢、球铁以及不锈钢材料，是通用铣削的最佳选择。 The multifunctional milling material with good thermal stability is widely used in all kinds of steel, ductile iron and stainless steel materials, the best choice for general milling.
	M20~M30			●					●					
	K25~K35				●				●					
APU35A	P30~P40	PVD	●						●					多功能的铣削材质，凭借高韧性的基体以及领先的物理涂层技术，即使面对不利的加工条件，依然能够保持良好的可靠性，有效覆盖了钢、不锈钢以及部分难加工材料的切削。 The multifunctional milling material, with high-toughness matrix and leading physical coating technology, can maintain good reliability even in the face of adverse processing conditions, covering the cutting of steel, stainless steel and some difficult-to-machine materials.
	M25~M35			●					●					
	S20~S30					●			●					

● 第一推荐 1<sup>st</sup> choice    ◐ 第一推荐 2<sup>nd</sup> choice

Milling Grades

阿诺 - Loong 龍系列 - 铣削材质

AHNO Loong Series-Milling Materials

铣削材质一览

Milling Materials Overview

	被加工材料组 Work Material Group	刀具材质 Tool Material	涂层类型 Coating Class	应用类别 Application Category				
				05	15	25	35	45
P	碳素钢 / 合金钢 Carbon Steel / Alloyed Steel	硬质合金 Carbide	CVD		ACP25A			
		硬质合金 Carbide	PVD			APP25A		
		硬质合金 Carbide	PVD				APU35A	
M	不锈钢 Stainless Steel	硬质合金 Carbide	PVD		APP25A			
		硬质合金 Carbide	PVD			APU35A		
K	铸铁 Cast Iron	硬质合金 Carbide	CVD		ACP25A			
		硬质合金 Carbide	PVD			APP25A		
S	铝合金 Aluminum Alloy	-	-					
	高温合金 / 钛合金 High Temperature Alloy Titanium Alloys	硬质合金 Carbide	PVD		APU35A			
	硬材料 Hard Materials	-	-					

## 阿诺 - Loong 龍系列 - 铣削目录

## Milling Contents

## AHNO Loong Series-Milling Catalog

## 合金刀片类

## Alloy Insert Series

系列 Series			M1345-HN06	M1345-HN09	M1345-ON06		M2390-TN11	M2390-SX09	M2390-SX12
									
页码 Page			P.50	P.52	P.54		P.56	P.60	P.62
主偏角 Cutting Edge Angle			45°	45°	43°		90°	90°	90°
最大切深 Maximum Cutting Depth			3.0	5.0	4.0 / 7.0		5.0	8.0	10.0
直径范围 Diameter Range			25~125	50~315	50~250		18~63	20~125	50~160
刀片 Insert									
			HN0604	HN0906	ON0605	SN1705	TN1104	SX09T3	SX1205
应用 Application	面铣 Face Milling		√	√	√	√	√	√	√
	方肩铣 Shoulder Milling						√	√	√
	槽铣 Slot Milling						√	√	√
	坡铣 Slope Milling								
	螺旋插补铣 Spiral Interpolation Milling						√		
	插铣 Plunge Milling								
	仿形铣 Profiling Milling								
	倒角铣 Chamfer Milling		√	√					
	型腔铣 Cavity Milling								

合金刀片类

Alloy Insert Series

系列 Series			M2390-XO10	M2390-XO16	M1300-RC10	M1300-RC12	M1300-RC16	M1300-RC20
								
页码 Page			P.64	P.66	P.68	P.70	P.72	P.74
主偏角 Cutting Edge Angle			90°	90°	-	-	-	-
最大切深 Maximum Cutting Depth			9.0	15.0	5.0	6.0	8.0	10.0
直径范围 Diameter Range			16-50	25-160	25-66	40-100	63-160	80-160
刀片 Insert								
			XO1003	XO1606	RC10T3	RC1204	RC1606	RC2006
应用 Application	面铣 Face Milling		√	√	√	√	√	√
	方肩铣 Shoulder Milling		√	√				
	槽铣 Slot Milling		√	√				
	坡铣 Slope Milling		√	√	√	√	√	√
	螺旋插补铣 Spiral Interpolation Milling		√	√	√	√	√	√
	插铣 Plunge Milling							
	仿形铣 Profiling Milling				√	√	√	√
	倒角铣 Chamfer Milling							
	型腔铣 Cavity Milling		√	√	√	√	√	√

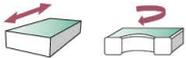
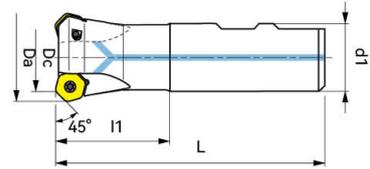
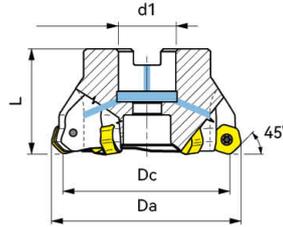
## 阿诺 - Loong 龍系列 - 45°主偏角面铣刀

M1345-HN06 Series

## AHNO Loong Series-45°Cutting Edge Angle Face Milling

&lt; B &gt; 芯轴 Arbor

&lt; W &gt; 侧固 Weldon



单位 Unit: mm

Series W	型号 Type	Dc	Da	d1	l1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
	M1345-HN06-D025-W25-Z2-C	25	32.2	25	42	99	3.0	2	有 Yes
<b>HN0604</b>	M1345-HN06-D032-W32-Z3-C	32	39.3	32	42	103	3.0	3	有 Yes

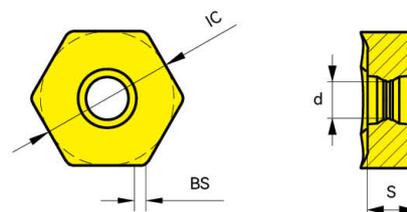
Series B	型号 Type	Dc	Da	d1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
	M1345-HN06-D040-B16-Z5-C	40	47.3	16	40	3.0	5	有 Yes
	M1345-HN06-D050-B22-Z4-C	50	57.3	22	40	3.0	4	有 Yes
	M1345-HN06-D050-B22-Z6-C	50	57.3	22	40	3.0	6	有 Yes
	M1345-HN06-D063-B22-Z6-C	63	70.3	22	40	3.0	6	有 Yes
	M1345-HN06-D063-B22-Z8-C	63	70.3	22	40	3.0	8	有 Yes
<b>HN0604</b>	M1345-HN06-D080-B27-Z7-C	80	86.8	27	50	3.0	7	有 Yes
	M1345-HN06-D080-B27-Z10-C	80	86.8	27	50	3.0	10	有 Yes
	M1345-HN06-D100-B32-Z8-C	100	107.1	32	50	3.0	8	有 Yes
	M1345-HN06-D100-B32-Z12-C	100	107.1	32	50	3.0	12	有 Yes
	M1345-HN06-D125-B40-Z10-C	125	132.2	40	63	3.0	10	有 Yes

M1345-HN06 Series

阿诺 - Loong 龍系列 - 45°主偏角面铣刀

AHNO Loong Series-45°Cutting Edge Angle Face Milling

	IC	d	S
HN0604 XN0604	10.5	3.7	4.76



Series	型号 Type	R	BS	P			M		K		S
				ACP25A	APP25A	APU35A	APP25A	APU35A	ACP25A	APP25A	APU35A
-F5	HNGX0604ANSN-F5	-	1.1	●	●	●	●	●	●	●	●
-M5	HNGX0604ANSN-M5	-	0.8	●	●	●	●	●	●	●	●
-R5	HNGX0604ANSN-R5	-	0.8	●		●		●	●		
-W5	XNGX0604ANSN-W5	-	4.15	●	●		●		●	●	

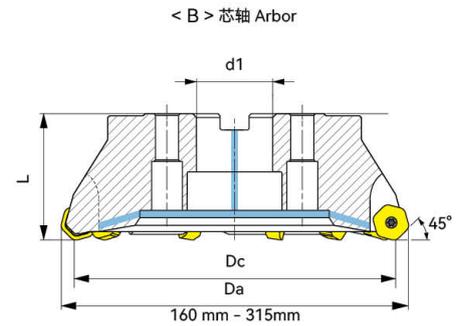
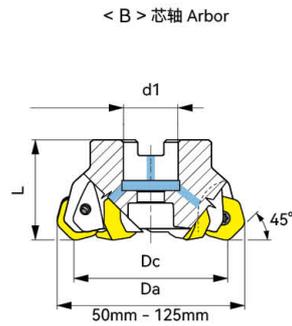
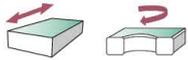
附件 Number of		D25~D32	D40~D125
	刀片锁紧螺钉 Milling	AF9021 (Torx 09IP) - 2.0 Nm	AF9021 (Torx 09IP) - 2.0 Nm
	旗形扳手 Flag-shaped Wrench	AF8010-T09IP	
	钥匙形扳手 Key-shaped Wrench		AF8020-T09IP

备件 Spare Part		D40	D50~D63	D80	D100	D125
	内六角螺栓 Hexagon Socket Bolt	AF5111	AF5112			
	十字螺栓 Cross Bolt			AF5201	AF5202	AF5203
	十字螺栓扳手 Cross Bolt Wrench			AF6201	AF6202	AF6203

## 阿诺 - Loong 龍系列 - 45°主偏角面铣刀

M1345-HN09 Series

## AHNO Loong Series-45°Cutting Edge Angle Face Milling



单位 Unit: mm

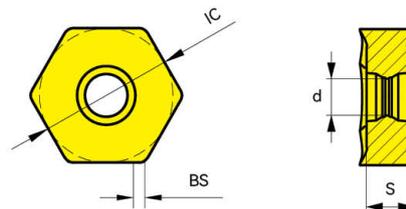
Series B	型号 Type	Dc	Da	d1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
	M1345-HN09-D050-B22-Z4-C	50	61.7	22	40	5.0	4	有 Yes
	M1345-HN09-D063-B22-Z6-C	63	74.7	22	40	5.0	6	有 Yes
	M1345-HN09-D080-B27-Z6-C	80	91.7	27	50	5.0	6	有 Yes
	M1345-HN09-D080-B27-Z8-C	80	91.7	27	50	5.0	8	有 Yes
	M1345-HN09-D100-B32-Z6-C	100	111.7	32	50	5.0	6	有 Yes
	M1345-HN09-D100-B32-Z8-C	100	111.7	32	50	5.0	8	有 Yes
	M1345-HN09-D100-B32-Z10-C	100	111.7	32	50	5.0	10	有 Yes
	M1345-HN09-D125-B40-Z6-C	125	136.7	40	63	5.0	6	有 Yes
<b>HN0906</b>	M1345-HN09-D125-B40-Z8-C	125	136.7	40	63	5.0	8	有 Yes
	M1345-HN09-D125-B40-Z10-C	125	136.7	40	63	5.0	10	有 Yes
	M1345-HN09-D125-B40-Z12-C	125	136.7	40	63	5.0	12	有 Yes
	M1345-HN09-D160-B40-Z8-C	160	171.7	40	63	5.0	8	有 Yes
	M1345-HN09-D160-B40-Z12-C	160	171.7	40	63	5.0	12	有 Yes
	M1345-HN09-D160-B40-Z14-C	160	171.7	40	63	5.0	14	有 Yes
	M1345-HN09-D200-B60-Z10-C	200	211.7	60	63	5.0	10	有 Yes
	M1345-HN09-D250-B60-Z14-C	250	261.7	60	63	5.0	14	有 Yes
	M1345-HN09-D315-B60-Z16-C	315	326.7	60	80	5.0	16	有 Yes

M1345-HN09 Series

阿诺 - Loong 龍系列 - 45°主偏角面铣刀

AHNO Loong Series-45°Cutting Edge Angle Face Milling

	IC	d	S
HN0906 XN0906	16.5	4.9	6.35



Series	型号 Type	R	BS	P			M		K		S
				ACP25A	APP25A	APU35A	APP25A	APU35A	ACP25A	APP25A	APU35A
-F1	HNGX0906ANEN-F1	-	1.5		●	●	●	●			●
-F5	HNGX0906ANSN-F5	-	1.2	●	●	●	●	●	●	●	●
-M5	HNGX0906ANSN-M5	-	1.2	●	●	●	●	●	●	●	●
-R5	HNGX0906ANSN-R5	-	1.2	●	●	●	●	●	●	●	●
-W5	XNGX0906ANSN-W5	-	7.5	●	●		●		●	●	

附件 Number of		D50~D160	D200~D315
	刀片锁紧螺钉 Insert Locking Screw	AF9022 (Torx 15IP) - 5.0 Nm	AF9022 (Torx 15IP) - 5.0 Nm
	钥匙形扳手 Key-shaped Wrench	AF8020-T15IP	
	螺丝刀 Screwdriver		AF8030-T15IP

备件 Spare Part		D50~D63	D80	D100	D125	D160	D200	D250	D315
	内六角螺栓 Hexagon Socket Bolt	AF5112				AF5114	AF5115	AF5115	AF5115
	十字螺栓 Cross Bolt		AF5201	AF5202	AF5203				
	十字螺栓扳手 Cross Bolt Wrench		AF6201	AF6202	AF6203				
	内冷端盖 Internal Coolant End Cover					AF5311	AF5312	AF5313	AF5314
	端盖锁紧内六角螺钉 Lock the End Cover with the Hex Socket Screw					AF5121	AF5122	AF5122	AF5123
	端盖锁紧内六角扳手 Lock the End Cover with the Hex Wrench					AF6100-05	AF6100-07	AF6100-07	AF6100-07
	堵头 Plug								AF5501

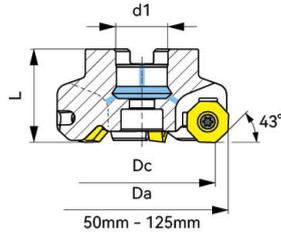
## 阿诺 - Loong 龍系列 - 43°主偏角面铣刀

M1345-ON06 Series

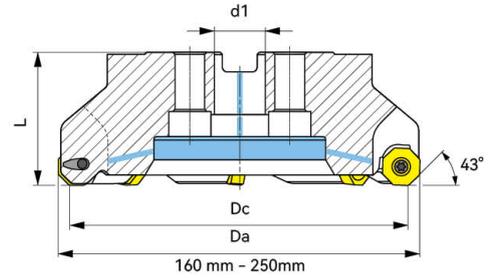
## AHNO Loong Series-43°Cutting Edge Angle Face Milling



&lt; B &gt; 芯轴 Arbor



&lt; B &gt; 芯轴 Arbor



单位 Unit: mm

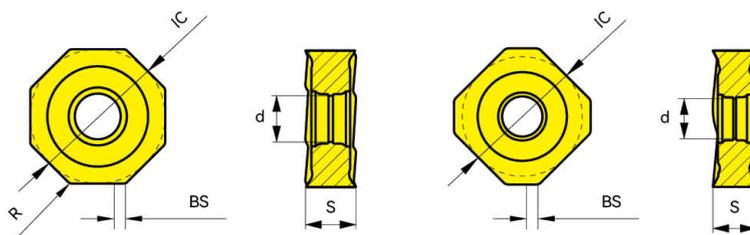
Series B	型号 Type	Dc	Da	d1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
	M1345-ON06-D050-B22-Z4-C	50	60.8	22	40	4.0	4	有 Yes
	M1345-ON06-D050-B22-Z5-C	50	60.8	22	40	4.0	5	有 Yes
	M1345-ON06-D063-B22-Z5-C	63	73.8	22	40	4.0	5	有 Yes
	M1345-ON06-D063-B22-Z6-C	63	73.8	22	40	4.0	6	有 Yes
	M1345-ON06-D080-B27-Z6-C	80	90.8	27	50	4.0	6	有 Yes
	M1345-ON06-D080-B27-Z8-C	80	90.8	27	50	4.0	8	有 Yes
	M1345-ON06-D100-B32-Z8-C	100	110.8	32	50	4.0	8	有 Yes
	M1345-ON06-D100-B32-Z10-C	100	110.8	32	50	4.0	10	有 Yes
ON0605	M1345-ON06-D125-B40-Z8-C	125	135.8	40	63	4.0	8	有 Yes
	M1345-ON06-D125-B40-Z10-C	125	135.8	40	63	4.0	10	有 Yes
	M1345-ON06-D125-B40-Z12-C	125	135.8	40	63	4.0	12	有 Yes
	M1345-ON06-D160-B40-Z8-C	160	170.8	40	63	4.0	8	有 Yes
	M1345-ON06-D160-B40-Z12-C	160	170.8	40	63	4.0	12	有 Yes
	M1345-ON06-D160-B40-Z14-C	160	170.8	40	63	4.0	14	有 Yes
	M1345-ON06-D200-B60-Z12-C	200	210.8	60	63	4.0	12	有 Yes
	M1345-ON06-D200-B60-Z16-C	200	210.8	60	63	4.0	16	有 Yes
	M1345-ON06-D250-B60-Z14-C	250	260.8	60	63	4.0	14	有 Yes
	M1345-ON06-D250-B60-Z18-C	250	260.8	60	63	4.0	18	有 Yes

M1345-ON06 Series

阿诺 - Loong 龍系列 - 43°主偏角面铣刀

AHNO Loong Series-43°Cutting Edge Angle Face Milling

	IC	d	S
ON0605 SN1705	17	5.7	5.56



Series	型号 Type	R	BS	P			M		K		S
				ACP25A	APP25A	APU35A	APP25A	APU35A	ACP25A	APP25A	APU35A
-F5	ONMX060508SR-F5	0.8	0.75	●	●	●	●	●	●	●	●
-M5	ONMX060508SR-M5	0.8	0.75	●	●	●	●	●	●	●	●
-R5	ONMX060508SR-R5	0.8	0.75	●	●	●	●	●	●	●	●
-W5	ONMX060508SR-W5	0.8	4.3	●	●	●	●	●	●	●	●
-M5	SNMX170508SR-M5	0.8	0.7	●	●	●	●	●	●	●	●
-R5	SNMX170508SR-R5	0.8	0.7	●	●	●	●	●	●	●	●

附件 Number of		D50~D160	D200~D315
	刀片锁紧螺钉 Insert Locking Screw	AF9031 (Torx 20IP) - 5.0 Nm	AF9031 (Torx 20IP) - 5.0 Nm
	钥匙形扳手 Key-shaped Wrench	AF8020-T20IP	
	螺丝刀 Screwdriver		AF8030-T20IP

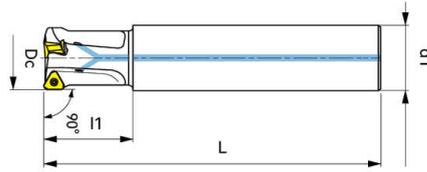
备件 Spare Part		D50~D63	D80	D100	D125	D160	D200	D250
	内六角螺栓 Hexagon Socket Bolt	AF5112	AF5113			AF5114	AF5115	AF5115
	十字螺栓 Cross Bolt			AF5202	AF5203			
	十字螺栓扳手 Cross Bolt Wrench			AF6202	AF6203			
	内冷端盖 Internal Coolant End Cover					AF5311	AF5312	AF5313
	端盖锁紧内六角螺钉 Lock the End Cover with the Hex Socket Screw					AF5121	AF5122	AF5122
	端盖锁紧内六角扳手 Lock the End Cover with the Hex Wrench					AF6100-05	AF6100-07	AF6100-07

## 阿诺 - Loong 龍系列 - 90°主偏角方肩铣刀

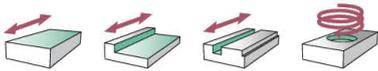
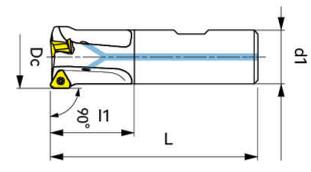
M2390-TN11 Series

AHNO Loong Series  
90°Cutting Edge Angle Shoulder Millings

&lt; A &gt; 圆柱 Cylinder



&lt; W &gt; 侧固 Weldon



单位 Unit: mm

Series A	型号 Type	Dc	d1	l1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
	M2390-TN11-D020-A20-Z2-C	20	20	29	150	5.0	2	有 Yes
	M2390-TN11-D022-A25-Z3-C	22	25	50	180	5.0	3	有 Yes
	M2390-TN11-D025-A25-Z3-C	25	25	34	170	5.0	3	有 Yes
	M2390-TN11-D025-A25-Z4-C	25	25	34	170	5.0	4	有 Yes
	M2390-TN11-D030-A32-Z4-C	30	32	50	200	5.0	4	有 Yes
	M2390-TN11-D032-A32-Z4-C	32	32	37	195	5.0	4	有 Yes
	M2390-TN11-D032-A32-Z5-C	32	32	37	195	5.0	5	有 Yes
	M2390-TN11-D035-A32-Z5-C	35	32	80	200	5.0	5	有 Yes

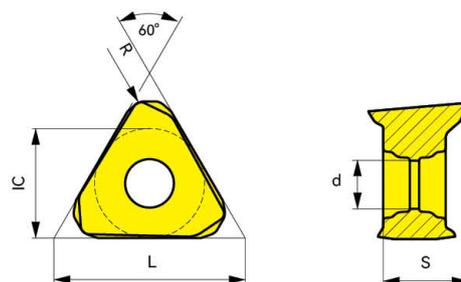
Series W	型号 Type	Dc	d1	l1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
	M2390-TN11-D020-W20-Z2-C	20	20	32	90	5.0	2	有 Yes
	M2390-TN11-D025-W25-Z3-C	25	25	42	100	5.0	3	有 Yes
<b>TN1104</b>	M2390-TN11-D025-W25-Z4-C	25	25	42	100	5.0	4	有 Yes
	M2390-TN11-D032-W32-Z4-C	32	32	42	110	5.0	4	有 Yes
	M2390-TN11-D032-W32-Z5-C	32	32	42	110	5.0	5	有 Yes

M2390-TN11 Series

阿诺 - Loong 龍系列 - 90°主偏角方肩铣刀

	IC	d	L	S
<b>TN1104</b>	6.35	2.8	11	4.69

AHNO Loong Series  
90°Cutting Edge Angle Shoulder Millings



Series	型号 Type	R	BS	P			M		K		S
				ACP25A	APP25A	APU35A	APP25A	APU35A	ACP25A	APP25A	APU35A
-F5	TNEX110404SR-F5	0.4	1.3	●	●	●	●	●	●	●	●
-F5	TNEX110408SR-F5	0.8	0.9	●	●	●	●	●	●	●	●
-M5	TNEX110404SR-M5	0.4	1.3	●	●	●	●	●	●	●	●
-M5	TNEX110408SR-M5	0.8	0.9	●	●	●	●	●	●	●	●

附件 Number of		D18~D35	D40~D63
	刀片锁紧螺钉 Insert Locking Screw	AF9041 (Torx 071P) - 0.8 Nm	AF9041 (Torx 071P) - 0.8 Nm
	旗形扳手 Flag-shaped Wrench	AF8010-T071P	
	钥匙形扳手 Key-shaped Wrench		AF8020-T071P

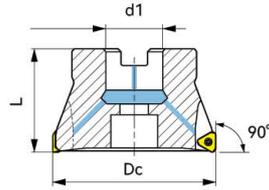
备件 Spare Part		D40	D50~D63
	内六角螺栓 Hexagon Socket Bolt	AF5111	AF5112

## 阿诺 - Loong 龍系列 - 90°主偏角方肩铣刀

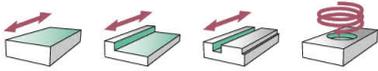
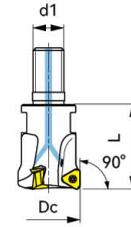
M2390-TN11 Series

AHNO Loong Series  
90°Cutting Edge Angle Shoulder Millings

&lt; B &gt; 芯轴 Arbor



&lt; M &gt; 螺纹 Thread



单位 Unit: mm

Series M	型号 Type	Dc	d1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
TN1104	M2390-TN11-D020-M10-Z2-C	20	M10	26	5.0	2	有 Yes
	M2390-TN11-D025-M12-Z3-C	25	M12	33	5.0	3	有 Yes
	M2390-TN11-D025-M12-Z4-C	25	M12	33	5.0	4	有 Yes
	M2390-TN11-D032-M16-Z4-C	32	M16	43	5.0	4	有 Yes
	M2390-TN11-D032-M16-Z5-C	32	M16	43	5.0	5	有 Yes

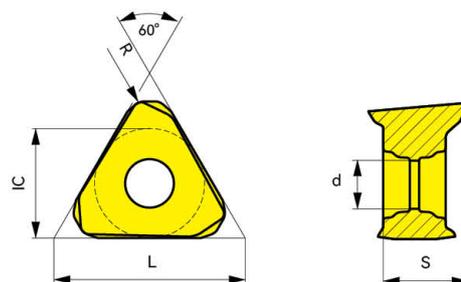
Series B	型号 Type	Dc	d1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
TN1104	M2390-TN11-D040-B16-Z4-C	40	16	40	5.0	4	有 Yes
	M2390-TN11-D040-B16-Z6-C	40	16	40	5.0	6	有 Yes
	M2390-TN11-D050-B22-Z5-C	50	22	40	5.0	5	有 Yes
	M2390-TN11-D050-B22-Z7-C	50	22	40	5.0	7	有 Yes
	M2390-TN11-D063-B22-Z6-C	63	22	40	5.0	6	有 Yes
	M2390-TN11-D063-B22-Z9-C	63	22	40	5.0	9	有 Yes

M2390-TN11 Series

阿诺 - Loong 龍系列 - 90°主偏角方肩铣刀

	IC	d	L	S
TN1104	6.35	2.8	11	4.69

AHNO Loong Series  
90°Cutting Edge Angle Shoulder Millings



Series	型号 Type	R	BS	P			M		K		S
				ACP25A	APP25A	APU35A	APP25A	APU35A	ACP25A	APP25A	APU35A
-F5	TNEX110404SR-F5	0.4	1.3	●	●	●	●	●	●	●	●
-F5	TNEX110408SR-F5	0.8	0.9	●	●	●	●	●	●	●	●
-M5	TNEX110404SR-M5	0.4	1.3	●	●	●	●	●	●	●	●
-M5	TNEX110408SR-M5	0.8	0.9	●	●	●	●	●	●	●	●

附件 Number of		D18~D35	D40~D63
	刀片锁紧螺钉 Insert Locking Screw	AF9041 (Torx 071P) - 0.8 Nm	AF9041 (Torx 071P) - 0.8 Nm
	旗形扳手 Flag-shaped Wrench	AF8010-T071P	
	钥匙形扳手 Key-shaped Wrench		AF8020-T071P

备件 Spare Part		D40	D50~D63
	内六角螺栓 Hexagon Socket Bolt	AF5111	AF5112

# 阿诺 - Loong 龍系列 - 90°主偏角方肩铣刀

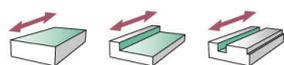
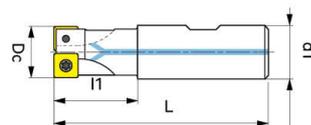
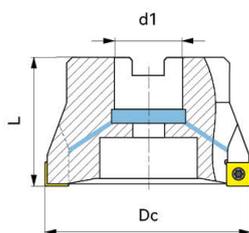
M2390-SX09 Series

## AHNO Loong Series 90°Cutting Edge Angle Shoulder Millings



&lt; B &gt; 芯轴 Arbor

&lt; W &gt; 侧固 Weldon



单位 Unit: mm

Series A	型号 Type	Dc	d1	l1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
	M2390-SX09-D020-W20-Z2-C	20	20	32	82	8.0	2	有 Yes
SX09T3	M2390-SX09-D025-W25-Z3-C	25	25	42	98	8.0	3	有 Yes
	M2390-SX09-D032-W32-Z4-C	32	32	42	102	8.0	4	有 Yes

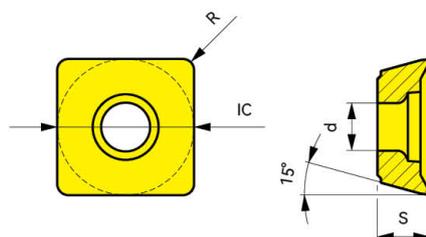
Series B	型号 Type	Dc	d1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
	M2390-SX09-D040-B16-Z5-C	40	16	40	8.0	5	有 Yes
	M2390-SX09-D050-B22-Z6-C	50	22	40	8.0	6	有 Yes
	M2390-SX09-D063-B22-Z7-C	63	22	40	8.0	7	有 Yes
SX09T3	M2390-SX09-D080-B27-Z9-C	80	27	50	8.0	9	有 Yes
	M2390-SX09-D100-B32-Z10-C	100	32	50	8.0	10	有 Yes
	M2390-SX09-D125-B40-Z12-C	125	40	63	8.0	12	有 Yes

M2390-SX09 Series

阿诺 - Loong 龍系列 - 90°主偏角方肩铣刀

AHNO Loong Series  
90°Cutting Edge Angle Shoulder Millings

	IC	d	S
<b>SX09T3</b>	9.55	3.5	3.97



Series	型号 Type	R	BS	P			M		K		S
				ACP25A	APP25A	APU35A	APP25A	APU35A	ACP25A	APP25A	APU35A
-M3	 SXMT09T304SR-M3	0.4	1.3	●	●	●	●	●	●	●	●
-M4	 SXMT09T304SR-M4	0.4	1.3	●	●	●	●	●	●	●	●
-M5	 SXMT09T308SR-M5	0.8	0.9	●	●	●	●	●	●	●	●

附件 Number of		D20~D32	D40~D125
	刀片锁紧螺钉 Insert Locking Screw	AF9051 (Torx 09IP) - 2.0 Nm	AF9051 (Torx 09IP) - 2.0 Nm
	旗形扳手 Flag-shaped Wrench	AF8010-T09IP	
	钥匙形扳手 Key-shaped Wrench		AF8020-T09IP

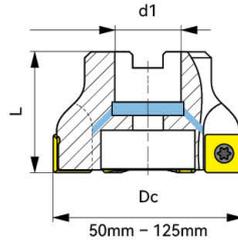
备件 Spare Part		D40	D50~D63	D80	D100	D125
	内六角螺栓 Hexagon Socket Bolt	AF5111	AF5112			
	十字螺栓 Cross Bolt			AF5201	AF5202	AF5203
	十字螺栓扳手 Cross Bolt Wrench			AF6201	AF6202	AF6203

## 阿诺 - Loong 龍系列 - 90°主偏角方肩铣刀

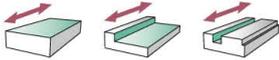
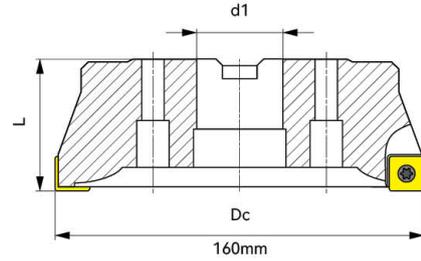
M2390-SX12 Series

AHNO Loong Series  
90°Cutting Edge Angle Shoulder Millings

&lt; B &gt; 芯轴 Arbor



&lt; B &gt; 芯轴 Arbor



单位 Unit: mm

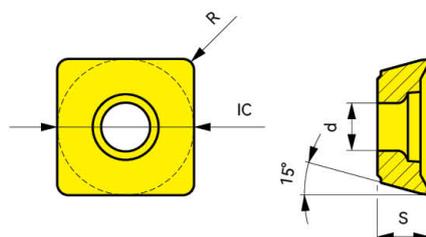
Series B	型号 Type	Dc	d1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
SX1205	M2390-SX12-D050-B22-Z5-C	50	22	40	10	5	有 Yes
	M2390-SX12-D063-B22-Z6-C	63	22	40	10	6	有 Yes
	M2390-SX12-D080-B27-Z6-C	80	27	50	10	6	有 Yes
	M2390-SX12-D100-B32-Z8-C	100	32	50	10	8	有 Yes
	M2390-SX12-D125-B40-Z9-C	125	40	63	10	9	有 Yes
	M2390-SX12-D160-B40-Z12	160	40	63	10	12	无 No

M2390-SX12 Series

阿诺 - Loong 龍系列 - 90°主偏角方肩铣刀

AHNO Loong Series  
90°Cutting Edge Angle Shoulder Millings

	IC	d	S
<b>SX1205</b>	12.7	4.4	5



Series	型号 Type	R	BS	P			M		K		S
				ACP25A	APP25A	APU35A	APP25A	APU35A	ACP25A	APP25A	APU35A
-F5	 SXMT120508SR-F5	0.8	-	●	●	●	●	●	●	●	●
-M5	 SXMT120508SR-M5	0.8	-	●	●	●	●	●	●	●	●
-R5	 SXMT120508PR-R5	0.8	-	●	●	●	●	●	●	●	●

附件 Number of		D50~D160	
	刀片锁紧螺钉 Insert Locking Screw	AF9052 (Torx 15) - 3.0 Nm	
	钥匙形扳手 Key-shaped Wrench	AF8020-T15	

备件 Spare Part		D50~D63	D80	D100	D125	D160
	内六角螺栓 Hexagon Socket Bolt	AF5112				AF5114
	十字螺栓 Cross Bolt		AF5201	AF5202	AF5203	
	十字螺栓扳手 Cross Bolt Wrench		AF6201	AF6202	AF6203	
	刀片垫片 Insert Gasket		AF5510-SX12	AF5510-SX12	AF5510-SX12	AF5510-SX12
	垫片内六角螺钉 Hex Socket Screw for Gasket		AF5401	AF5401	AF5401	AF5401
	垫片内六角扳手 Hex Wrench for Gasket		AF6100-3.5	AF6100-3.5	AF6100-3.5	AF6100-3.5

## 阿诺 - Loong 龍系列 - 90°主偏角方肩铣刀

M2390-XO10 Series

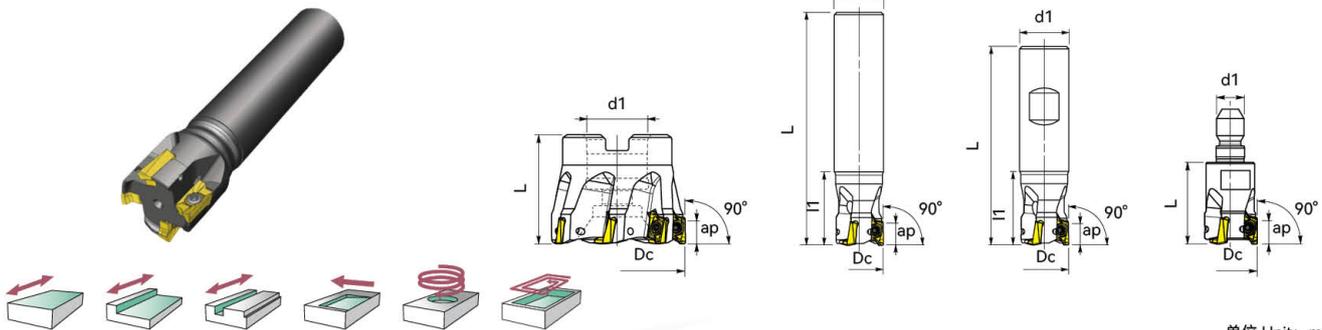
AHNO Loong Series  
90°Cutting Edge Angle Shoulder Millings

&lt; B &gt; 芯轴 Arbor

&lt; A &gt; 圆柱 Cylinder

&lt; W &gt; 侧固 Weldon

&lt; M &gt; 螺纹 Thread



单位 Unit: mm

Series A	型号 Type	Dc	d1	l1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
XO1003 XO10T3	M2390-XO10-D016-A16-Z2-C	16	16	30	100	9.0	2	有 Yes
	M2390-XO10-D020-A16-Z2-C	20	16	30	100	9.0	2	有 Yes
	M2390-XO10-D020-A20-Z3-C	20	20	30	110	9.0	3	有 Yes
	M2390-XO10-D025-A20-Z3-C	25	20	40	110	9.0	3	有 Yes
	M2390-XO10-D025-A25-Z4-C	25	25	40	120	9.0	4	有 Yes
	M2390-XO10-D032-A25-Z3-C	32	25	50	120	9.0	3	有 Yes
	M2390-XO10-D032-A32-Z5-C	32	32	50	130	9.0	5	有 Yes

Series W	型号 Type	Dc	d1	l1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
XO1003 XO10T3	M2390-XO10-D016-W16-Z2-C	16	16	30	79	9.0	2	有 Yes
	M2390-XO10-D020-W20-Z3-C	20	20	30	81	9.0	3	有 Yes
	M2390-XO10-D025-W25-Z4-C	25	25	40	97	9.0	4	有 Yes
	M2390-XO10-D032-W32-Z5-C	32	32	50	111	9.0	5	有 Yes

Series M	型号 Type	Dc	d1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
XO1003 XO10T3	M2390-XO10-D016-M08-Z2	16	M8	25	9.0	2	无 No
	M2390-XO10-D020-M10-Z3	20	M10	30	9.0	3	无 No
	M2390-XO10-D025-M12-Z4	25	M12	35	9.0	4	无 No
	M2390-XO10-D032-M16-Z5	32	M16	43	9.0	5	无 No

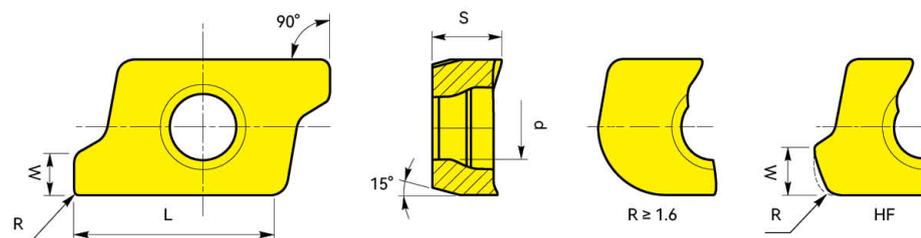
Series B	型号 Type	Dc	d1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
XO1003 XO10T3	M2390-XO10-D040-B16-Z6-C	40	16	40	9.0	6	有 Yes
	M2390-XO10-D050-B22-Z7-C	50	22	40	9.0	7	有 Yes

M2390-XO10 Series

阿诺 - Loong 龍系列 - 90°主偏角方肩铣刀

AHNO Loong Series  
90°Cutting Edge Angle Shoulder Millings

	d
XO1003	2.9



Series	型号 Type	L	S	R	W	P			M		K		S
						ACP25A	APP25A	APU35A	APP25A	APU35A	ACP25A	APP25A	APU35A
-F5	XOMT100304R-F5	9.1	3.4	0.4	1.8		●	●	●	●		●	●
-M4	XOGT1003PER-M4	6.7	3.4	0.8	1.8	●	●	●	●	●	●	●	●
-M4	XOMT100302R-M4	9.1	3.4	0.2	1.8		●	●	●	●	●	●	●
	XOMT100304R-M4	9.1	3.4	0.4	1.8	●	●	●	●	●	●	●	●
	XOMT100308R-M4	9.1	3.4	0.8	1.8	●	●	●	●	●	●	●	●
	XOMT100310R-M4	9.1	3.4	1.0	1.8	●	●	●	●	●	●	●	●
	XOMT100312R-M4	9.1	3.4	1.2	1.8	●	●	●	●	●	●	●	●
	XOMT100316R-M4*	7.8	3.32	1.6	-	●	●	●	●	●	●	●	●
	XOMT100320R-M4*	7.7	3.28	2.0	-	●	●	●	●	●	●	●	●
	XOMT100330R-M4*	7.5	3.19	3.0	-	●	●	●	●	●	●	●	●
-M5	XOMT100304R-M5	9.1	3.4	0.4	1.6	●	●	●	●	●	●	●	●
	XOMT100308R-M5	9.1	3.4	0.8	1.6	●	●	●	●	●	●	●	●
-R5	XOMT100304R-R5	9.1	3.4	0.4	1.6	●	●	●	●	●	●	●	●
	XOMT100308R-R5	9.1	3.4	0.8	1.6	●	●	●	●	●	●	●	●
-HF	XOMT100310-HF	8.3	3.38	1.0	2.2	●	●	●	●	●	●	●	●

编程圆角  
Programming  
Corners  
刃口宽度  
Edge Width

\* 刀体必须经过改造: R(刀体)=R(刀片)-0.5  
\* The tool body must be modified: R (tool body) = R (insert) - 0.5

附件 Number of		D16~D32	D40~D50
	刀片锁紧螺钉 Insert Locking Screw	AF9011 (Torx 08IP) - 1.2 Nm	AF9011 (Torx 08IP) - 1.2 Nm
	旗形扳手 Flag-shaped Wrench	AF8010-T08IP	
	钥匙形扳手 Key-shaped Wrench		AF8020-T08IP
备件 Spare Part		D40	D50
	内六角螺栓 Hexagon Socket Bolt	AF5111	AF5112

## 阿诺 - Loong 龍系列 - 90°主偏角方肩铣刀

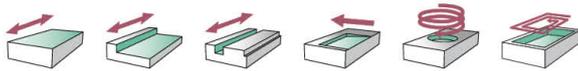
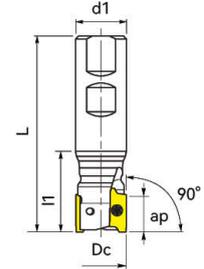
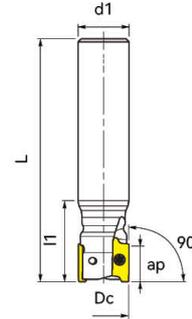
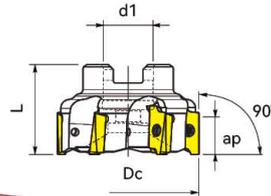
M2390-XO16 Series

AHNO Loong Series  
90°Cutting Edge Angle Shoulder Millings

&lt; B &gt; 芯轴 Arbor

&lt; A &gt; 圆柱 Cylinder

&lt; W &gt; 側固 Weldon



单位 Unit: mm

Series A	型号 Type	Dc	d1	l1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
XO1606	M2390-XO16-D025-A25-Z2-C	25	25	40	120	15	2	有 Yes
	M2390-XO16-D032-A25-Z2-C	32	25	50	120	15	2	有 Yes
	M2390-XO16-D032-A32-Z3-C	32	32	50	130	15	3	有 Yes
	M2390-XO16-D040-A25-Z3-C	40	25	50	120	15	3	有 Yes
	M2390-XO16-D040-A32-Z4-C	40	32	50	130	15	4	有 Yes

Series W	型号 Type	Dc	d1	l1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
XO1606	M2390-XO16-D025-W25-Z2-C	25	25	40	97	15	2	有 Yes
	M2390-XO16-D032-W32-Z3-C	32	32	50	111	15	3	有 Yes
	M2390-XO16-D040-W32-Z4-C	40	32	50	111	15	4	有 Yes

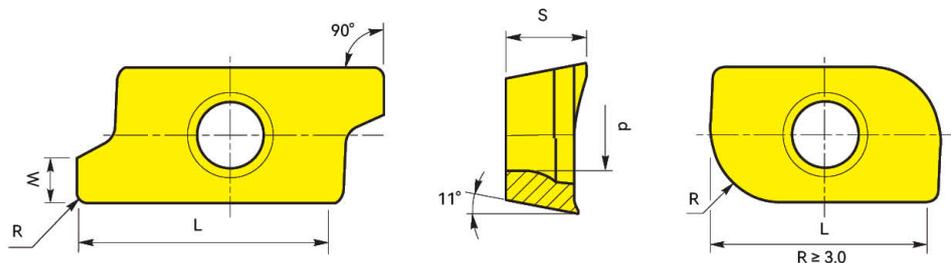
Series B	型号 Type	Dc	d1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
XO1606	M2390-XO16-D040-B16-Z4-C	40	16	40	15	4	有 Yes
	M2390-XO16-D050-B22-Z5-C	50	22	40	15	5	有 Yes
	M2390-XO16-D063-B22-Z6-C	63	22	40	15	6	有 Yes
	M2390-XO16-D080-B27-Z7-C	80	27	50	15	7	有 Yes
	M2390-XO16-D100-B32-Z8-C	100	32	50	15	8	有 Yes
	M2390-XO16-D125-B40-Z9-C	125	40	63	15	9	有 Yes
	M2390-XO16-D160-B40-Z10	160	40	63	15	10	无 No

M2390-XO16 Series

阿诺 - Loong 龍系列 - 90°主偏角方肩铣刀

AHNO Loong Series  
90°Cutting Edge Angle Shoulder Millings

	d
XO1606	4.7



Series	型号 Type	L	S	R	W	P			M		K		S
						ACP25A	APP25A	APU35A	APP25A	APU35A	ACP25A	APP25A	APU35A
-F5	XOMT160608R-F5	18	6.42	0.8	3.3	●	●	●	●	●	●	●	●
	XOMT160604R-M4	18	6.48	0.4	3.0	●	●	●	●	●	●	●	●
-M4	XOMT160608R-M4	18	6.44	0.8	3.0	●	●	●	●	●	●	●	●
	XOMT160612R-M4	18	6.40	1.2	3.0	●	●	●	●	●	●	●	●
	XOMT160616R-M4	18	6.36	1.6	3.0	●	●	●	●	●	●	●	●
	XOMT160630R-M4*	15.9	6.10	3.0	-	●	●	●	●	●	●	●	●
	XOMT160640R-M4*	15.8	6.03	4.0	-	●	●	●	●	●	●	●	●
	XOMT160650R-M4*	15.7	5.96	5.0	-	●	●	●	●	●	●	●	●
-R5	XOMT160660R-M4*	15.6	5.89	6.0	-	●	●	●	●	●	●	●	●
	XOMT160608R-R5	18	6.40	0.8	2.9	●	●	●	●	●	●	●	●
-R7	XOMT160608R-R7	18	6.40	0.8	2.9	●	●	●	●	●	●	●	●

\* 刀体必须经过改造: R(刀体)=R(刀片)-0.5  
\* The tool body must be modified: R(tool body) = R(insert) - 0.5

附件 Number of		D25~D40	D40~D160
	刀片锁紧螺钉 Insert Locking Screw	AF9012 (Torx 15IP) - 3.0 Nm	AF9012 (Torx 15IP) - 3.0 Nm
	旗形扳手 Flag-shaped Wrench	AF8010-T15IP	
	钥匙形扳手 Key-shaped Wrench		AF8020-T15IP

备件 Spare Part		D40	D50~D63	D80	D100	D125	D160
	内六角螺栓 Hexagon Socket Bolt	AF5111	AF5112	AF5113	—	AF5117	AF5114

## 阿诺 - Loong 龍系列 - 仿形铣刀

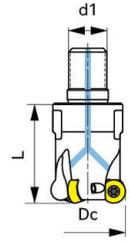
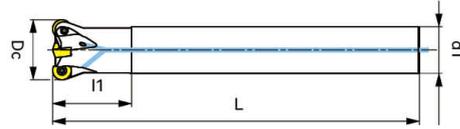
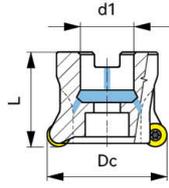
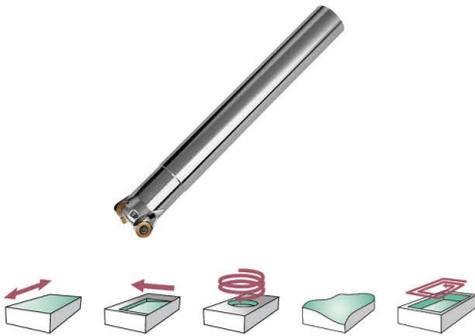
M1300-RC10 Series

## AHNO Loong Series-Profiling Millings

&lt; B &gt; 芯轴 Arbor

&lt; A &gt; 圆柱 Cylinder

&lt; M &gt; 螺纹 Thread



单位 Unit: mm

Series A	型号 Type	Dc	d1	l1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
RC10T3	M1300-RC10-D025-A20-Z2-C	25	20	34	170	5.0	2	有 Yes
	M1300-RC10-D025-A20-Z3-C	25	20	34	170	5.0	3	有 Yes
	M1300-RC10-D032-A25-Z3-C	32	25	42	200	5.0	3	有 Yes
	M1300-RC10-D032-A25-Z4-C	32	25	42	200	5.0	4	有 Yes

Series M	型号 Type	Dc	d1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
RC10T3	M1300-RC10-D025-M12-Z2-C	25	M12	32	5.0	2	有 Yes
	M1300-RC10-D025-M12-Z3-C	25	M12	32	5.0	3	有 Yes
	M1300-RC10-D032-M16-Z4-C	32	M16	42	5.0	4	有 Yes
	M1300-RC10-D035-M16-Z4-C	35	M16	42	5.0	4	有 Yes

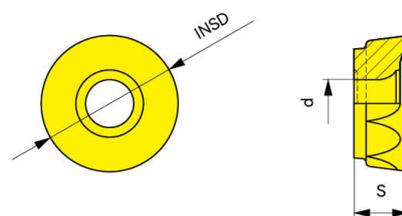
Series B	型号 Type	Dc	d1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
RC10T3	M1300-RC10-D040-B16-Z5-C	40	16	40	5.0	5	有 Yes
	M1300-RC10-D050-B22-Z5-C	50	22	40	5.0	5	有 Yes
	M1300-RC10-D050-B22-Z6-C	50	22	40	5.0	6	有 Yes
	M1300-RC10-D052-B22-Z5-C	52	22	40	5.0	5	有 Yes
	M1300-RC10-D052-B22-Z6-C	52	22	40	5.0	6	有 Yes
	M1300-RC10-D063-B22-Z6-C	63	22	40	5.0	6	有 Yes
	M1300-RC10-D063-B22-Z7-C	63	22	40	5.0	7	有 Yes
	M1300-RC10-D066-B27-Z6-C	66	27	50	5.0	6	有 Yes
	M1300-RC10-D066-B27-Z7-C	66	27	50	5.0	7	有 Yes

M1300-RC10 Series

阿诺 - Loong 龍系列 - 仿形铣刀

AHNO Loong Series-Profiling Millings

	INSD	d	S
<b>RC10T3</b>	10	3.9	3.97



Series	型号 Type	P			M		K		S
		ACP25A	APP25A	APU35A	APP25A	APU35A	ACP25A	APP25A	APU35A
-F5	 RCMT10T3M0SN-F5		●	●	●	●		●	●
-M5	 RCMT10T3M0SN-M5	●	●	●	●	●	●	●	●
-R5	 RCMT10T3M0SN-R5	●		●		●	●		●

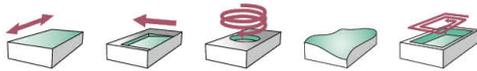
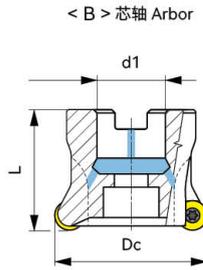
附件 Number of		D25~D35	D40~D66
	刀片锁紧螺钉 Insert Locking Screw	AF9061 (Torx 10IP) - 3.0 Nm	AF9061 (Torx 10IP) - 3.0 Nm
	旗形扳手 Flag-shaped Wrench	AF8010-T10IP	
	钥匙形扳手 Key-shaped Wrench		AF8020-T10IP

备件 Spare Part		D40	D50~D63	D66
	内六角螺栓 Hexagon Socket Bolt	AF5111	AF5112	AF5113

# 阿诺 - Loong 龍系列 - 仿形铣刀

M1300-RC12 Series

## AHNO Loong Series-Profiling Millings



单位 Unit: mm

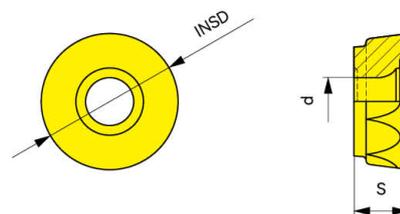
Series B	型号 Type	Dc	d1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
	M1300-RC12-D040-B16-Z3-C	40	16	40	6.0	3	有 Yes
	M1300-RC12-D050-B22-Z4-C	50	22	40	6.0	4	有 Yes
	M1300-RC12-D052-B22-Z5-C	52	22	40	6.0	5	有 Yes
<b>RC1204</b>	M1300-RC12-D063-B22-Z5-C	63	22	40	6.0	5	有 Yes
	M1300-RC12-D066-B27-Z6-C	66	27	50	6.0	6	有 Yes
	M1300-RC12-D080-B27-Z5-C	80	27	50	6.0	5	有 Yes
	M1300-RC12-D100-B32-Z6-C	100	32	50	6.0	6	有 Yes

M1300-RC12 Series

阿诺 - Loong 龍系列 - 仿形铣刀

AHNO Loong Series-Profiling Millings

	INSD	d	S
RC1204	12	4.4	4.76



Series	型号 Type	P			M		K		S
		ACP25A	APP25A	APU35A	APP25A	APU35A	ACP25A	APP25A	APU35A
-F5	RCMT1204M0EN-F5	●	●	●	●	●	●	●	●
-M5	RCMT1204M0SN-M5	●	●	●	●	●	●	●	●
-R5	RCMT1204M0EN-R5	●	●	●	●	●	●	●	●

附件 Number of		D40~D100
	刀片锁紧螺钉 Insert Locking Screw	AF9062 (Torx 15IP) - 3.0 Nm
	钥匙形扳手 Key-shaped Wrench	AF8020-T15IP

备件 Spare Part		D40	D50~D63	D66~D80	D100
	内六角螺栓 Hexagon Socket Bolt	AF5116	AF5112	AF5113	
	十字螺栓 Cross Bolt				AF5202
	十字螺栓扳手 Cross Bolt Wrench				AF6202

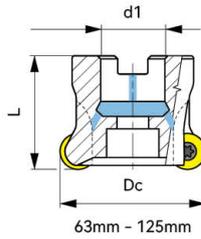
# 阿诺 - Loong 龍系列 - 仿形铣刀

M1300-RC16 Series

## AHNO Loong Series-Profiling Millings

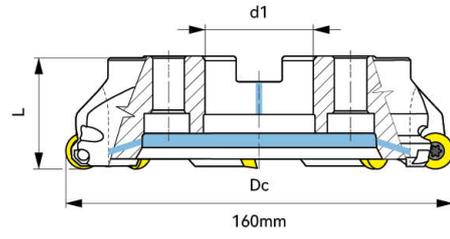


&lt; B &gt; 芯轴 Arbor



63mm - 125mm

&lt; B &gt; 芯轴 Arbor



160mm



单位 Unit: mm

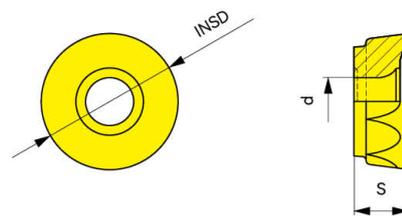
Series B	型号 Type	Dc	d1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
RC1606	M1300-RC16-D063-B22-Z4-C	63	22	50	8.0	4	有 Yes
	M1300-RC16-D066-B27-Z5-C	66	27	50	8.0	5	有 Yes
	M1300-RC16-D080-B27-Z5-C	80	27	50	8.0	5	有 Yes
	M1300-RC16-D100-B32-Z6-C	100	32	50	8.0	6	有 Yes
	M1300-RC16-D125-B40-Z7-C	125	40	63	8.0	7	有 Yes
	M1300-RC16-D160-B40-Z8-C	160	40	63	8.0	8	有 Yes

M1300-RC16 Series

阿诺 - Loong 龍系列 - 仿形铣刀

AHNO Loong Series-Profiling Millings

	INSD	d	S
<b>RC1606</b>	16	5.5	6.35



Series	型号 Type	P			M		K		S
		ACP25A	APP25A	APU35A	APP25A	APU35A	ACP25A	APP25A	APU35A
-F5	 RCMT1606M0EN-F5	●	●	●	●	●	●	●	●
-M5	 RCMT1606M0SN-M5	●	●	●	●	●	●	●	●
-R5	 RCMT1606M0SN-R5	●	●	●	●	●	●	●	●

附件 Number of		D63~D160
	刀片锁紧螺钉 Insert Locking Screw	AF9063 (Torx 20IP) - 5.0 Nm
	钥匙形扳手 Key-shaped Wrench	AF8020-T20IP

备件 Spare Part		D63	D66~D80	D100	D125	D160
	内六角螺栓 Hexagon Socket Bolt	AF5112	AF5113		AF5117	AF5114
	十字螺栓 Cross Bolt			AF5202		
	十字螺栓扳手 Cross Bolt Wrench			AF6202		

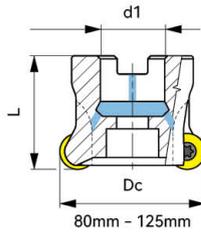
# 阿诺 - Loong 龍系列 - 仿形铣刀

**M1300-RC20 Series**

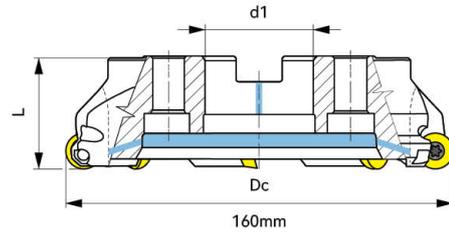
## AHNO Loong Series-Profiling Millings



&lt; B &gt; 芯轴 Arbor



&lt; B &gt; 芯轴 Arbor



单位 Unit: mm

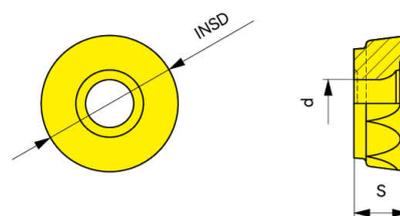
Series B	型号 Type	Dc	d1	L	apmax	齿数 Number of Teeth	内冷 Internal Coolant
<b>RC2006</b>	M1300-RC20-D080-B27-Z4-C	80	27	50	10	4	有 Yes
	M1300-RC20-D100-B32-Z5-C	100	32	50	10	5	有 Yes
	M1300-RC20-D125-B40-Z6-C	125	40	63	10	6	有 Yes
	M1300-RC20-D160-B40-Z7-C	160	40	63	10	7	有 Yes

M1300-RC20 Series

阿诺 - Loong 龍系列 - 仿形铣刀

AHNO Loong Series-Profiling Millings

	INSD	d	S
RC2006	20	6.5	6.35



Series	型号 Type	P			M		K		S
		ACP25A	APP25A	APU35A	APP25A	APU35A	ACP25A	APP25A	APU35A
-F5	 RCMT2006M0SN-F5	●	●	●	●	●	●	●	●
-M5	 RCMT2006M0SN-M5	●	●	●	●	●	●	●	●
-R5	 RCMT2006M0SN-R5	●		●		●			●

附件 Number of		D80~D160
	刀片锁紧螺钉 Insert Locking Screw	AF9064 (Torx 25IP) - 7.5 Nm
	T形扳手 T-shaped Wrench	AF8040-T25IP

备件 Spare Part		D80	D100	D125	D160
	内六角螺栓 Hexagon Socket Bolt	AF5113		AF5117	AF5114
	十字螺栓 Cross Bolt		AF5202		
	十字螺栓扳手 Cross Bolt Wrench		AF6202		

# 阿诺 - Loong 龍系列 - 切削参数

## Cutting Parameter

### AHNO Loong Series-Cutting Parameters

#### M1345-HN06 Series

切削参数 Cutting Parameters				Vc (m/min)			fz(mm/z)			
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP25A	APP25A	APU35A	F5	M5	R5	W5
P	非合金钢 Unalloyed steel	430	125	225~270	180~270	160~240	0.24	0.27	0.32	0.12
		640-1010	190-300	160~250	150~240	125~225	0.2	0.24	0.27	0.12
	低合金钢 Low-alloyed Steel	700-950	200-280	150~240	125~225	100~200	0.2	0.24	0.27	0.12
		高合金钢 High-alloyed Steel	950-1200	280-355	120~160	100~150	80~120	0.18	0.2	0.24
	1200-1400		355-415	80~100	75~90	60~75	0.18	0.2	0.24	0.1
M	双相不锈钢 Duplex Stainless Steel	780	230		100~150	90~120	0.18	0.2	0.24	0.1
	奥氏体不锈钢 Austenitic Stainless Steel	680	200		120~160	100~125	0.18	0.2	0.24	0.1
	沉淀硬化不锈钢 PH Stainless Steel	1010	300		80~120	75~100	0.15	0.18	0.2	0.1
K	灰口铸铁 Grey Cast Iron	200-350	180-245	180~320	160~240		0.27	0.3	0.36	0.12
	球墨铸铁 Nodular Cast Iron	400-700	155-265	125~225	120~200		0.24	0.27	0.32	0.12
	蠕墨铸铁 Vermicular graphite cast iron	400	230	120~160	100~150		0.2	0.24	0.27	0.12
S	镍基 / 钴基合金 Cobalt Base Nickel Base Alloy	840-1180	250-350			40~60	0.12	0.15	0.18	0.1
	钛合金 Titanium Alloy	1260-1400	375-410			30~50	0.12	0.15	0.18	0.1
N	铝合金 Aluminium Alloy	260-450	75-130							
H	淬硬钢 Hardened Steel	-	HRC50-60							
	淬硬铸铁 Hardened Cast Iron	-	HRC55							

#### M1345-HN09 Series

切削参数 Cutting Parameters				Vc (m/min)			fz(mm/z)				
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP25A	APP25A	APU35A	F1	F5	M5	R5	W5
P	非合金钢 Unalloyed steel	430	125	225~270	180~270	160~240	0.24	0.27	0.32	0.36	0.12
		640-1010	190-300	160~250	150~240	125~225	0.2	0.24	0.27	0.3	0.12
	低合金钢 Low-alloyed Steel	700-950	200-280	150~240	125~225	100~200	0.2	0.24	0.27	0.3	0.12
		高合金钢 High-alloyed Steel	950-1200	280-355	120~160	100~150	80~120	0.18	0.2	0.24	0.27
	1200-1400		355-415	80~100	75~90	60~75	0.18	0.2	0.24	0.27	0.1
M	双相不锈钢 Duplex Stainless Steel	780	230		100~150	90~120	0.18	0.2	0.24	0.27	0.1
	奥氏体不锈钢 Austenitic Stainless Steel	680	200		120~160	100~125	0.18	0.2	0.24	0.27	0.1
	沉淀硬化不锈钢 PH Stainless Steel	1010	300		80~120	75~100	0.15	0.18	0.2	0.24	0.1
K	灰口铸铁 Grey Cast Iron	200-350	180-245	180~320	160~240		0.27	0.3	0.36	0.4	0.12
	球墨铸铁 Nodular Cast Iron	400-700	155-265	125~225	120~200		0.24	0.27	0.32	0.36	0.12
	蠕墨铸铁 Vermicular graphite cast iron	400	230	120~160	100~150		0.2	0.24	0.27	0.3	0.12
S	镍基 / 钴基合金 Cobalt Base Nickel Base Alloy	840-1180	250-350			40~60	0.12	0.15	0.18	0.2	0.1
	钛合金 Titanium Alloy	1260-1400	375-410			30~50	0.12	0.15	0.18	0.2	0.1
N	铝合金 Aluminium Alloy	260-450	75-130								
H	淬硬钢 Hardened Steel	-	HRC50-60								
	淬硬铸铁 Hardened Cast Iron	-	HRC55								

M1345-ON06 Series

切削参数 Cutting Parameters				Vc (m/min)			fz(mm/z)			
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP25A	APP25A	APU35A	F5	M5	R5	W5
P	非合金钢 Unalloyed steel	430	125	225~270	180~270	160~240	0.27	0.32	0.36	0.1
		640-1010	190-300	160~250	150~240	125~225	0.24	0.27	0.3	0.1
	低合金钢 Low-alloyed Steel	700-950	200-280	150~240	125~225	100~200	0.24	0.27	0.3	0.1
		高合金钢 High-alloyed Steel	950-1200	280-355	120~160	100~150	80~120	0.2	0.24	0.27
	1200-1400		355-415	80~100	75~90	60~75	0.2	0.24	0.27	0.08
M	双相不锈钢 Duplex Stainless Steel	780	230		100~150	90~120	0.2	0.24	0.27	0.08
	奥氏体不锈钢 Austenitic Stainless Steel	680	200		120~160	100~125	0.2	0.24	0.27	0.08
	沉淀硬化不锈钢 PH Stainless Steel	1010	300		80~120	75~100	0.18	0.2	0.24	0.08
K	灰口铸铁 Grey Cast Iron	200-350	180-245	180~320	160~240		0.3	0.36	0.4	0.1
	球墨铸铁 Nodular Cast Iron	400-700	155-265	125~225	120~200		0.27	0.32	0.36	0.1
	蠕墨铸铁 Vermicular graphite cast iron	400	230	120~160	100~150		0.24	0.27	0.3	0.1
S	镍基 / 钴基合金 Cobalt Base Nickel Base Alloy	840-1180	250-350			40~60	0.15	0.18	0.2	0.08
	钛合金 Titanium Alloy	1260-1400	375-410			30~50	0.15	0.18	0.2	0.08
N	铝合金 Aluminium Alloy	260-450	75-130							
H	淬硬钢 Hardened Steel	-	HRC50-60							
	淬硬铸铁 Hardened Cast Iron	-	HRC55							

M2390-TN11 Series

切削参数 Cutting Parameters				Vc (m/min)			fz(mm/z)		
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP25A	APP25A	APU35A	F5	M5	R5
P	非合金钢 Unalloyed steel	430	125	225~270	180~270	160~240	0.24	0.27	
		640-1010	190-300	160~250	150~240	125~225	0.2	0.24	
	低合金钢 Low-alloyed Steel	700-950	200-280	150~240	125~225	100~200	0.2	0.24	
		高合金钢 High-alloyed Steel	950-1200	280-355	120~160	100~150	80~120	0.18	0.2
	1200-1400		355-415	80~100	75~90	60~75	0.18	0.2	
M	双相不锈钢 Duplex Stainless Steel	780	230		100~150	90~120	0.18	0.2	
	奥氏体不锈钢 Austenitic Stainless Steel	680	200		120~160	100~125	0.18	0.2	
	沉淀硬化不锈钢 PH Stainless Steel	1010	300		80~120	75~100	0.15	0.18	
K	灰口铸铁 Grey Cast Iron	200-350	180-245	180~320	160~240		0.27	0.3	
	球墨铸铁 Nodular Cast Iron	400-700	155-265	125~225	120~200		0.24	0.27	
	蠕墨铸铁 Vermicular graphite cast iron	400	230	120~160	100~150		0.2	0.24	
S	镍基 / 钴基合金 Cobalt Base Nickel Base Alloy	840-1180	250-350			40~60	0.12	0.15	
	钛合金 Titanium Alloy	1260-1400	375-410			30~50	0.12	0.15	
N	铝合金 Aluminium Alloy	260-450	75-130						
H	淬硬钢 Hardened Steel	-	HRC50-60						
	淬硬铸铁 Hardened Cast Iron	-	HRC55						

## 阿诺 - Loong 龍系列 - 切削参数

## Cutting Parameter

## AHNO Loong Series-Cutting Parameters

## M2390-SX09 Series

切削参数 Cutting Parameters				Vc (m/min)			fz(mm/z)		
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP25A	APP25A	APU35A	M3	M4	M5
P	非合金钢 Unalloyed steel	430	125	225~270	180~270	160~240	0.2	0.24	0.27
		640-1010	190-300	160~250	150~240	125~225	0.18	0.2	0.24
	低合金钢 Low-alloyed Steel	700-950	200-280	150~240	125~225	100~200	0.18	0.2	0.24
		高合金钢 High-alloyed Steel	950-1200	280-355	120~160	100~150	80~120	0.16	0.18
			1200-1400	355-415	80~100	75~90	60~75	0.16	0.18
M	双相不锈钢 Duplex Stainless Steel	780	230		100~150	90~120	0.16	0.18	0.2
	奥氏体不锈钢 Austenitic Stainless Steel	680	200		120~160	100~125	0.16	0.18	0.2
	沉淀硬化不锈钢 PH Stainless Steel	1010	300		80~120	75~100	0.12	0.15	0.18
K	灰口铸铁 Grey Cast Iron	200-350	180-245	180~320	160~240		0.24	0.27	0.3
	球墨铸铁 Nodular Cast Iron	400-700	155-265	125~225	120~200		0.2	0.24	0.27
	蠕墨铸铁 Vermicular graphite cast iron	400	230	120~160	100~150		0.18	0.2	0.24
S	镍基 / 钴基合金 Cobalt Base Nickel Base Alloy	840-1180	250-350			40~60	0.1	0.12	0.15
	钛合金 Titanium Alloy	1260-1400	375-410			30~50	0.1	0.12	0.15
N	铝合金 Aluminium Alloy	260-450	75-130						
H	淬硬钢 Hardened Steel	-	HRC50-60						
	淬硬铸铁 Hardened Cast Iron	-	HRC55						

## M2390-SX12 Series

切削参数 Cutting Parameters				Vc (m/min)			fz(mm/z)		
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP25A	APP25A	APU35A	F5	M5	R5
P	非合金钢 Unalloyed steel	430	125	225~270	180~270	160~240	0.2	0.24	0.27
		640-1010	190-300	160~250	150~240	125~225	0.18	0.2	0.24
	低合金钢 Low-alloyed Steel	700-950	200-280	150~240	125~225	100~200	0.18	0.2	0.24
		高合金钢 High-alloyed Steel	950-1200	280-355	120~160	100~150	80~120	0.16	0.18
			1200-1400	355-415	80~100	75~90	60~75	0.16	0.18
M	双相不锈钢 Duplex Stainless Steel	780	230		100~150	90~120	0.16	0.18	0.2
	奥氏体不锈钢 Austenitic Stainless Steel	680	200		120~160	100~125	0.16	0.18	0.2
	沉淀硬化不锈钢 PH Stainless Steel	1010	300		80~120	75~100	0.12	0.15	0.18
K	灰口铸铁 Grey Cast Iron	200-350	180-245	180~320	160~240		0.24	0.27	0.3
	球墨铸铁 Nodular Cast Iron	400-700	155-265	125~225	120~200		0.2	0.24	0.27
	蠕墨铸铁 Vermicular graphite cast iron	400	230	120~160	100~150		0.18	0.2	0.24
S	镍基 / 钴基合金 Cobalt Base Nickel Base Alloy	840-1180	250-350			40~60	0.1	0.12	0.15
	钛合金 Titanium Alloy	1260-1400	375-410			30~50	0.1	0.12	0.15
N	铝合金 Aluminium Alloy	260-450	75-130						
H	淬硬钢 Hardened Steel	-	HRC50-60						
	淬硬铸铁 Hardened Cast Iron	-	HRC55						

M2390-XO10 Series

切削参数 Cutting Parameters				Vc (m/min)			fz(mm/z)				
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP25A	APP25A	APU35A	F5	M4	M5	R5	HF
P	非合金钢 Unalloyed steel	430	125	225~270	180~270	160~240	0.2	0.24	0.24	0.27	0.8
		640-1010	190-300	160~250	150~240	125~225	0.18	0.2	0.2	0.24	0.75
	低合金钢 Low-alloyed Steel	700-950	200-280	150~240	125~225	100~200	0.18	0.2	0.2	0.24	0.75
		高合金钢 High-alloyed Steel	950-1200	280-355	120~160	100~150	80~120	0.16	0.18	0.18	0.2
	1200-1400		355-415	80~100	75~90	60~75	0.16	0.18	0.18	0.2	0.6
M	双相不锈钢 Duplex Stainless Steel	780	230		100~150	90~120	0.16	0.18	0.18	0.2	0.6
	奥氏体不锈钢 Austenitic Stainless Steel	680	200		120~160	100~125	0.16	0.18	0.18	0.2	0.6
	沉淀硬化不锈钢 PH Stainless Steel	1010	300		80~120	75~100	0.12	0.15	0.15	0.18	0.5
K	灰口铸铁 Grey Cast Iron	200-350	180-245	180~320	160~240		0.24	0.27	0.27	0.3	1.0
	球墨铸铁 Nodular Cast Iron	400-700	155-265	125~225	120~200		0.2	0.24	0.24	0.27	0.8
	蠕墨铸铁 Vermicular graphite cast iron	400	230	120~160	100~150		0.18	0.2	0.2	0.24	0.75
S	镍基 / 钴基合金 Cobalt Base Nickel Base Alloy	840-1180	250-350			40~60	0.1	0.12	0.12	0.15	0.45
	钛合金 Titanium Alloy	1260-1400	375-410			30~50	0.1	0.12	0.12	0.15	0.45
N	铝合金 Aluminium Alloy	260-450	75-130								
H	淬硬钢 Hardened Steel	-	HRC50-60								
	淬硬铸铁 Hardened Cast Iron	-	HRC55								

M2390-XO16 Series

切削参数 Cutting Parameters				Vc (m/min)			fz(mm/z)			
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP25A	APP25A	APU35A	F5	M4	R5	R7
P	非合金钢 Unalloyed steel	430	125	225~270	180~270	160~240	0.2	0.24	0.27	0.27
		640-1010	190-300	160~250	150~240	125~225	0.18	0.2	0.24	0.24
	低合金钢 Low-alloyed Steel	700-950	200-280	150~240	125~225	100~200	0.18	0.2	0.24	0.24
		高合金钢 High-alloyed Steel	950-1200	280-355	120~160	100~150	80~120	0.16	0.18	0.2
	1200-1400		355-415	80~100	75~90	60~75	0.16	0.18	0.2	0.2
M	双相不锈钢 Duplex Stainless Steel	780	230		100~150	90~120	0.16	0.18	0.2	0.2
	奥氏体不锈钢 Austenitic Stainless Steel	680	200		120~160	100~125	0.16	0.18	0.2	0.2
	沉淀硬化不锈钢 PH Stainless Steel	1010	300		80~120	75~100	0.12	0.15	0.18	0.18
K	灰口铸铁 Grey Cast Iron	200-350	180-245	180~320	160~240		0.24	0.27	0.3	0.3
	球墨铸铁 Nodular Cast Iron	400-700	155-265	125~225	120~200		0.2	0.24	0.27	0.27
	蠕墨铸铁 Vermicular graphite cast iron	400	230	120~160	100~150		0.18	0.2	0.24	0.24
S	镍基 / 钴基合金 Cobalt Base Nickel Base Alloy	840-1180	250-350			40~60	0.1	0.12	0.15	0.15
	钛合金 Titanium Alloy	1260-1400	375-410			30~50	0.1	0.12	0.15	0.15
N	铝合金 Aluminium Alloy	260-450	75-130							
H	淬硬钢 Hardened Steel	-	HRC50-60							
	淬硬铸铁 Hardened Cast Iron	-	HRC55							

# 阿诺 - Loong 龍系列 - 切削参数

## Cutting Parameter

### AHNO Loong Series-Cutting Parameters

#### M1300-RC10 Series

切削参数 Cutting Parameters				Vc (m/min)			fz(mm/z)		
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP25A	APP25A	APU35A	F5	M5	R5
P	非合金钢 Unalloyed steel	430	125	225~270	180~270	160~240	0.2~0.75	0.24~0.8	0.27~1.0
		640-1010	190-300	160~250	150~240	125~225	0.18~0.6	0.2~0.75	0.24~0.8
	低合金钢 Low-alloyed Steel	700-950	200-280	150~240	125~225	100~200	0.18~0.6	0.2~0.75	0.24~0.8
		950-1200	280-355	120~160	100~150	80~120	0.16~0.5	0.18~0.6	0.2~0.75
高合金钢 High-alloyed Steel	1200-1400	355-415	80~100	75~90	60~75	0.16~0.5	0.18~0.6	0.2~0.75	
	1200-1400	355-415	80~100	75~90	60~75	0.16~0.5	0.18~0.6	0.2~0.75	
M	双相不锈钢 Duplex Stainless Steel	780	230		100~150	90~120	0.16~0.5	0.18~0.6	0.2~0.75
	奥氏体不锈钢 Austenitic Stainless Steel	680	200		120~160	100~125	0.16~0.5	0.18~0.6	0.2~0.75
	沉淀硬化不锈钢 PH Stainless Steel	1010	300		80~120	75~100	0.12~0.45	0.15~0.5	0.18~0.6
K	灰口铸铁 Grey Cast Iron	200-350	180-245	180~320	160~240		0.24~0.8	0.27~1.0	0.3~1.2
	球墨铸铁 Nodular Cast Iron	400-700	155-265	125~225	120~200		0.2~0.75	0.24~0.8	0.27~1.0
	蠕墨铸铁 Vermicular graphite cast iron	400	230	120~160	100~150		0.18~0.6	0.2~0.75	0.24~0.8
S	镍基 / 钴基合金 Cobalt Base Nickel Base Alloy	840-1180	250-350			40~60	0.1~0.4	0.12~0.45	0.15~0.5
	钛合金 Titanium Alloy	1260-1400	375-410			30~50	0.1~0.4	0.12~0.45	0.15~0.5
N	铝合金 Aluminium Alloy	260-450	75-130						
H	淬硬钢 Hardened Steel	-	HRC50-60						
	淬硬铸铁 Hardened Cast Iron	-	HRC55						

#### M1300-RC12 Series

切削参数 Cutting Parameters				Vc (m/min)			fz(mm/z)		
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP25A	APP25A	APU35A	F5	M5	R5
P	非合金钢 Unalloyed steel	430	125	225~270	180~270	160~240	0.2~0.75	0.24~0.8	0.27~1.0
		640-1010	190-300	160~250	150~240	125~225	0.18~0.6	0.2~0.75	0.24~0.8
	低合金钢 Low-alloyed Steel	700-950	200-280	150~240	125~225	100~200	0.18~0.6	0.2~0.75	0.24~0.8
		950-1200	280-355	120~160	100~150	80~120	0.16~0.5	0.18~0.6	0.2~0.75
高合金钢 High-alloyed Steel	1200-1400	355-415	80~100	75~90	60~75	0.16~0.5	0.18~0.6	0.2~0.75	
	1200-1400	355-415	80~100	75~90	60~75	0.16~0.5	0.18~0.6	0.2~0.75	
M	双相不锈钢 Duplex Stainless Steel	780	230		100~150	90~120	0.16~0.5	0.18~0.6	0.2~0.75
	奥氏体不锈钢 Austenitic Stainless Steel	680	200		120~160	100~125	0.16~0.5	0.18~0.6	0.2~0.75
	沉淀硬化不锈钢 PH Stainless Steel	1010	300		80~120	75~100	0.12~0.45	0.15~0.5	0.18~0.6
K	灰口铸铁 Grey Cast Iron	200-350	180-245	180~320	160~240		0.24~0.8	0.27~1.0	0.3~1.2
	球墨铸铁 Nodular Cast Iron	400-700	155-265	125~225	120~200		0.2~0.75	0.24~0.8	0.27~1.0
	蠕墨铸铁 Vermicular graphite cast iron	400	230	120~160	100~150		0.18~0.6	0.2~0.75	0.24~0.8
S	镍基 / 钴基合金 Cobalt Base Nickel Base Alloy	840-1180	250-350			40~60	0.1~0.4	0.12~0.45	0.15~0.5
	钛合金 Titanium Alloy	1260-1400	375-410			30~50	0.1~0.4	0.12~0.45	0.15~0.5
N	铝合金 Aluminium Alloy	260-450	75-130						
H	淬硬钢 Hardened Steel	-	HRC50-60						
	淬硬铸铁 Hardened Cast Iron	-	HRC55						

M1300-RC16 Series

切削参数 Cutting Parameters				Vc (m/min)			fz(mm/z)		
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP25A	APP25A	APU35A	F5	M5	R5
P	非合金钢 Unalloyed steel	430	125	225~270	180~270	160~240	0.24~0.8	0.27~1.0	0.32~1.2
		640~1010	190~300	160~250	150~240	125~225	0.2~0.75	0.24~0.8	0.27~1.0
	低合金钢 Low-alloyed Steel	700~950	200~280	150~240	125~225	100~200	0.2~0.75	0.24~0.8	0.27~1.0
		950~1200	280~355	120~160	100~150	80~120	0.18~0.6	0.2~0.75	0.24~0.8
M	高合金钢 High-alloyed Steel	1200~1400	355~415	80~100	75~90	60~75	0.18~0.6	0.2~0.75	0.24~0.8
		双相不锈钢 Duplex Stainless Steel	780	230		100~150	90~120	0.18~0.6	0.2~0.75
	奥氏体不锈钢 Austenitic Stainless Steel	680	200		120~160	100~125	0.18~0.6	0.2~0.75	0.24~0.8
	沉淀硬化不锈钢 PH Stainless Steel	1010	300		80~120	75~100	0.15~0.5	0.18~0.6	0.2~0.75
K	灰口铸铁 Grey Cast Iron	200~350	180~245	180~320	160~240		0.27~1.0	0.3~1.2	0.36~1.5
	球墨铸铁 Nodular Cast Iron	400~700	155~265	125~225	120~200		0.24~0.8	0.27~1.0	0.32~1.2
	蠕墨铸铁 Vermicular graphite cast iron	400	230	120~160	100~150		0.2~0.75	0.24~0.8	0.27~1.0
S	镍基 / 钴基合金 Cobalt Base Nickel Base Alloy	840~1180	250~350			40~60	0.12~0.45	0.15~0.5	0.18~0.6
	钛合金 Titanium Alloy	1260~1400	375~410			30~50	0.12~0.45	0.15~0.5	0.18~0.6
N	铝合金 Aluminium Alloy	260~450	75~130						
H	淬硬钢 Hardened Steel	-	HRC50~60						
	淬硬铸铁 Hardened Cast Iron	-	HRC55						

M1300-RC20 Series

切削参数 Cutting Parameters				Vc (m/min)			fz(mm/z)		
ISO	材料组 Material Group	抗拉强度 Tensile Strength (N/mm <sup>2</sup> )	布氏硬度 (HB)	ACP25A	APP25A	APU35A	F5	M5	R5
P	非合金钢 Unalloyed steel	430	125	225~270	180~270	160~240	0.24~0.8	0.27~1.0	0.32~1.2
		640~1010	190~300	160~250	150~240	125~225	0.2~0.75	0.24~0.8	0.27~1.0
	低合金钢 Low-alloyed Steel	700~950	200~280	150~240	125~225	100~200	0.2~0.75	0.24~0.8	0.27~1.0
		950~1200	280~355	120~160	100~150	80~120	0.18~0.6	0.2~0.75	0.24~0.8
M	高合金钢 High-alloyed Steel	1200~1400	355~415	80~100	75~90	60~75	0.18~0.6	0.2~0.75	0.24~0.8
		双相不锈钢 Duplex Stainless Steel	780	230		100~150	90~120	0.18~0.6	0.2~0.75
	奥氏体不锈钢 Austenitic Stainless Steel	680	200		120~160	100~125	0.18~0.6	0.2~0.75	0.24~0.8
	沉淀硬化不锈钢 PH Stainless Steel	1010	300		80~120	75~100	0.15~0.5	0.18~0.6	0.2~0.75
K	灰口铸铁 Grey Cast Iron	200~350	180~245	180~320	160~240		0.27~1.0	0.3~1.2	0.36~1.5
	球墨铸铁 Nodular Cast Iron	400~700	155~265	125~225	120~200		0.24~0.8	0.27~1.0	0.32~1.2
	蠕墨铸铁 Vermicular graphite cast iron	400	230	120~160	100~150		0.2~0.75	0.24~0.8	0.27~1.0
S	镍基 / 钴基合金 Cobalt Base Nickel Base Alloy	840~1180	250~350			40~60	0.12~0.45	0.15~0.5	0.18~0.6
	钛合金 Titanium Alloy	1260~1400	375~410			30~50	0.12~0.45	0.15~0.5	0.18~0.6
N	铝合金 Aluminium Alloy	260~450	75~130						
H	淬硬钢 Hardened Steel	-	HRC50~60						
	淬硬铸铁 Hardened Cast Iron	-	HRC55						

# 阿诺 - Loong 龍系列 - 切削参数

Cutting Parameter

## AHNO Loong Series-Cutting Parameters

车削系列 TURNING

铣削系列 MILLING

技术信息 TECHNICAL INFO



# TECHNICAL INFORMATION

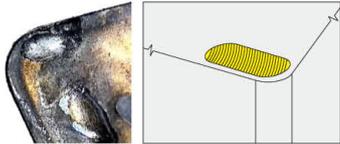
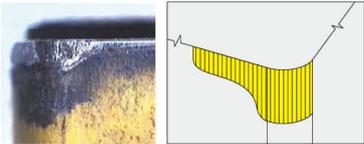
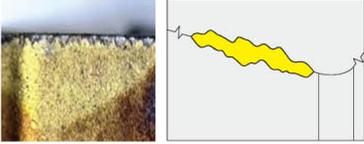
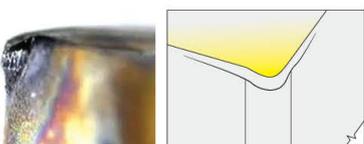
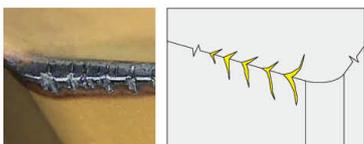
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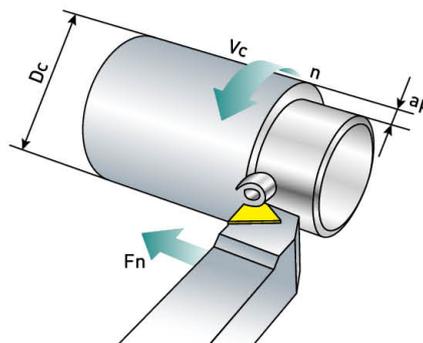


## 刀片失效形式与分析

## Blade Failure Forms and Analysis

## Insert Failure Forms and Analysis

失效类型 Failure Type	表现形式 Patterns	原因分析 Reasons	改进措施 Solutions	
月牙洼磨损 Crater Wear		刀片前刀面有凹陷状磨损 Oncave wear on the front edge of the insert	切屑与刀片前刀面的接触导致扩散磨损； 刀片材质过软； 线速度过高； The contact between the chip and the front edge of the insert leads to diffuse wear. Insert material is too soft. The linear velocity is too high.	选择更耐磨材质 (Al <sub>2</sub> O <sub>3</sub> 含量更高的涂层) 刀片； 降低线速度； 使用更开放槽型； 优化冷却； Choose more wear-resistant material (coating with higher Al <sub>2</sub> O <sub>3</sub> content) insert. Reduce the line speed. Use more open grooves. Optimized cooling.
后刀面磨损 Flank Face Wear		主要位于刀片后刀面的磨损 The wear is mainly on the back of the insert	刀片材质过软； 切削线速度过高； 进给量太小； Insert material is too soft. Cutting line speed is too high. The feed is too small.	选择更耐磨材质的刀片； 降低线速度； 提高进给量； 优化冷却； Choose Inserts with more wear resistant materials. Reduce the line speed. Increase the feed rate. Optimized cooling.
崩刃 Chipping		刀片切削刃或刀尖处崩口 The cutting edge or tip of the insert is broken	刀片材料过硬； 进给量太大； 刀片槽型刃口不够稳固；刀杆、刀柄刚性不足； The insert material is excellent. The feed is too large. The groove edge of the insert is not stable enough. The tool bar and handle are not rigid enough.	使用韧性更好的刀片； 减小进给量； 使用更稳固的槽型； 加强刀杆结构，减少悬长； Use Inserts with better toughness. Reduce the feed rate. Use a more stable chipbreaker. Strengthen the tool bar structure to reduce the overhang length.
积屑瘤 Built-up Edge		刀片前刀面沿切削刃有工件材料粘堆积 Oncave wear on the front edge of the insert The workpiece material is bonded and deposited along the cutting edge of the front cutter face of the insert	切削线速度低； 刀片刃口不够锋利； 刀具材料或涂层不合适； Low cutting line speed. The edge of the insert is not sharp enough. Inappropriate tool material or coating.	提高切削线速度； 使用更加锋利的槽型； 选择亲和力小的刀具材料或涂层； 优化冷却； Improve cutting line speed. Use sharper grooves. Select tool materials or coatings with low affinity. Optimized cooling.
塑性变形 Plastic Deformation		刀尖或者切削刃塌陷变形 Tip or cutting edge collapse deformation	刀具材料过软； 切削速度过高； 切削深度，进给太大； 切削温度过高； Tool material is too soft. Cutting speed is too high. Cutting depth, feed is too large. Cutting temperature is too high.	使用更耐磨材质的刀具； 降低切削速度； 减小切削深度，进给量； 优化冷却； Use more wear-resistant tools. Reduce cutting speed. Reduce cutting depth and feed rate. Optimized cooling.
热龟裂 Thermal Crack		刀片切削刃上有梳齿状龟裂 There is a comb crack on the cutting edge of the insert	切削热引起的膨胀和收缩波动导致； 刀具材料过硬； Expansion and contraction fluctuation caused by cutting heat. The tool material is excellent.	采用干式切削或者精密充分的冷却； 使用韧性更好的刀具材质； Use dry cutting or precise and sufficient cooling. Use tool materials with better toughness.
沟槽磨损 Groove Wear		刀片切削刃上有缺口状磨损 Here is notched wear on the cutting edge of the insert	加工硬材料； 工件表面有氧化皮； Processing hard materials. The workpiece surface has oxide skin.	选择较小的主偏角； 使用变化的切深； 使用韧性更好的刀具材质； 使用更稳固的槽型； 优化冷却； Select the smaller main declination Angle. Use varying depth of cut. Use tool materials with better toughness. Use a more stable chipbreaker. Optimized cooling.



## 公式 Formulas

切削速度 Cutting Speed	$V_c = (D_c \times \pi \times n) \div 1000$
转速 Spindle Speed	$n = (V_c \times 1000) \div (D_c \times \pi)$
进给速度 Feed Rate	$V_f = n \times F_n$
每转进给量 Feed per Revolution	$F_n = V_f \div n$
金属去除率 Metal Removal Rate	$Q = V_c \times V_f \times A_p$
加工时间 Cutting Time	$T = L \div V_f$

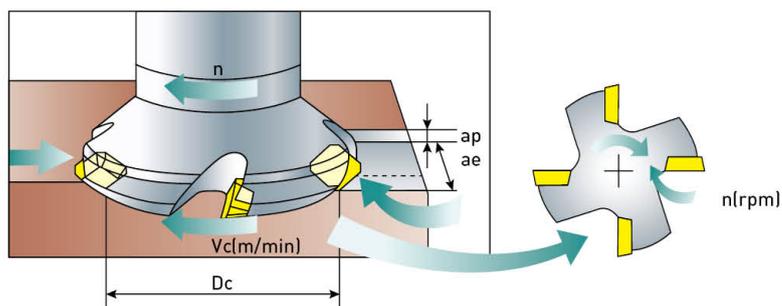
## 释义 Terms

n	主轴转速 Spindle Speed	rpm
Vc	切削速度 Cutting Speed	m/min
Vf	进给速度 Feed Rate	mm/min
Fn	每转进给量 Feed per Revolution	mm
Dc	零件加工直径 Work Diameter	mm
ap	零件切深 Depth of Cut	mm
Q	金属去除率 Metal Removal Rate	cm <sup>3</sup> /min
L	零件加工长度 Length of Cut	mm
T	加工时间 Cutting Time	min
π	圆周率 3.14 π 3.14	

## 铣削计算公式

## Milling Formulas

## Milling Formulas

公式  
Formulas

切削速度 Cutting Speed	$V_c = (D_c \times \pi \times n) \div 1000$
转速 Spindle Speed	$n = (V_c \times 1000) \div (D_c \times \pi)$
进给速度 Feed Rate	$V_f = f_z \times n \times Z$
每齿进给量 Feed per Revolution	$f_z = V_f \div (n \times Z)$
金属去除率 Metal Removal Rate	$Q = (a_p \times a_e \times V_f) \div 1000$
加工时间 Cutting Time	$T = L \div V_f$

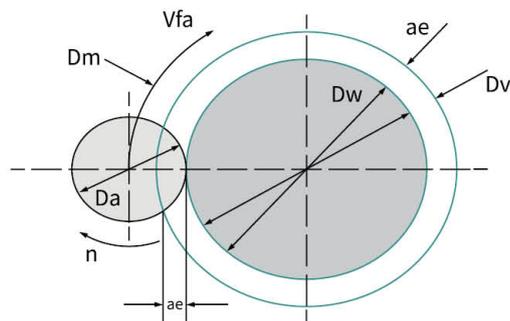
释义  
Terms

n	主轴转速 Spindle Speed	rpm
Vc	切削速度 Cutting Speed	m/min
Vf	进给速度 Feed Rate	mm/min
fz	每齿进给量 Feed per Tooth	mm
Dc	铣刀直径 Milling Diameter	mm
Z	铣刀齿数 Number of Milling Teeth	
ap	切深 Depth of Cut	mm
ae	切宽 Width of Cut	mm
Q	金属去除率 Metal Removal Rate	cm <sup>3</sup> /min
L	零件铣削长度 Cutting Edge Length	mm
T	加工时间 Cutting Time	min
π	圆周率 3.14 π 3.14	

Milling Formulas

铣削计算公式

Milling Formulas



外圆插补铣切削比例  
Cylindrical Interpolation Milling Cutting Ratio

外部轮廓进给速度  
External Profile Feed Speed

$$V_{fa} = \left( 1 + \frac{D_c}{D_w + a_e} \right) \times V_f \quad [\text{mm/min}]$$

圆周插补铣加工时间  
Circumferential Interpolation Milling Time

$$T_{rev} = \frac{D_m \times \pi}{n \times f_z \times z} \quad [\text{min}] \quad T_{rev} = \frac{(D_w + D_a) D_a \times \pi^2 \times 60}{V_c \times f_z \times z \times 1000} \quad [\text{s}]$$

圆周插补铣切削宽度  
Circumference Interpolation Milling Cutting Width

$$a_e = \frac{(D^2_v - D^2_w)}{4(D_w + D_a)} \quad [\text{mm}]$$

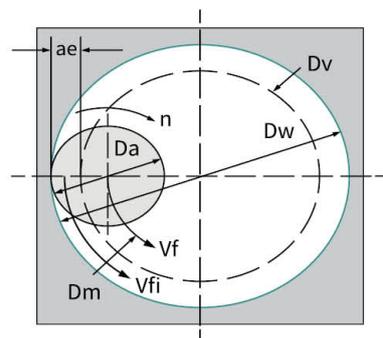
外部轮廓  
External Contour

Vfa	刀具中心轨迹进给速度 Tool Center Path Feed Speed	mm/min
Da	铣刀外径 Outside Diameter of Milling	m/min
Dm	中心轨迹直径 Center Track Diameter	mm/min
Dv	工件毛坯直径 The Blank Diameter of the Workpiece	mm
Dw	工件成品直径 Finished Diameter of Workpiece	mm
ae	切削宽度 Cutting Width	mm
n	转速 Rotational Speed	mm
fz	每齿进给量 Feed per Tooth	rpm
Z	齿数 Number of Teeth	mm

## 铣削计算公式

## Milling Formulas

## Milling Formulas



## 插补铣孔的切削比例

## Interpolation Cutting Ratio of the Milling Hole

内部轮廓进给速度  
Internal Profile Feed Speed

$$V_{fi} = \left( 1 - \frac{D_c}{D_w} \right) \times V_f \quad [\text{mm/min}]$$

圆周插补铣加工时间  
Circumferential Interpolation  
Milling Time

$$T_{rev} = \frac{D_m \times \pi}{n \times f_z \times z} \quad [\text{min}]$$

$$T_{rev} = \frac{(D_w - D_a) D_a \times \pi^2 \times 60}{V_c \times f_z \times z \times 1000} \quad [\text{s}]$$

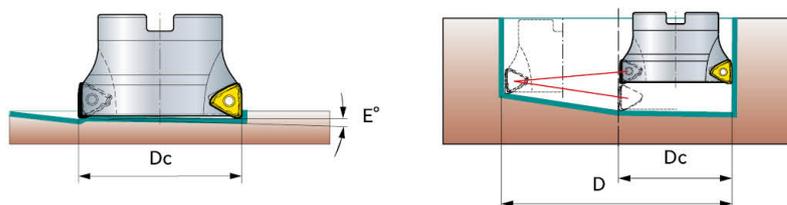
圆周插补铣切削宽度  
Circumference Interpolation  
Milling Cutting Width

$$ae = \frac{(D^2_w - D^2_v)}{4(D_w - D_a)} \quad [\text{mm}]$$

## 内部轮廓

## Internal Contour

<b>V<sub>f</sub></b>	进给速度 Feed Rate	mm/min
<b>V<sub>fi</sub></b>	刀具中心轨迹进给速度 Tool Center Path Feed Speed	mm/min
<b>D<sub>a</sub></b>	铣刀外径 Outside Diameter of Milling	mm
<b>D<sub>m</sub></b>	中心轨迹直径 Center Track Diameter	mm
<b>D<sub>v</sub></b>	工件毛坯直径 The Blank Diameter of the Workpiece	mm
<b>D<sub>w</sub></b>	工件成品直径 Finished Diameter of Workpiece	mm
<b>ae</b>	加工余量 Machining Allowance	mm
<b>n</b>	转速 Rotational Speed	rpm
<b>f<sub>z</sub></b>	每齿进给量 Feed per Tooth	mm
<b>Z</b>	齿数 Number of Teeth	
<b>T<sub>rev</sub></b>	圆周插补铣加工时间 Circumferential Interpolation Milling Time	s



### 坡铣信息 Slope Milling

铣刀切削直径 Dc Milling Diameter	最大坡铣角度 E max Maximum Slope Milling Angle	最大坡铣深度 ap max Maximum Slope Milling Depth
18	1.8	3.05
20	1.6	2.7
22	1.2	2.0
25	1.0	1.7
30	0.9	1.45
32	0.8	1.3
35	0.65	1.0
40	0.6	0.9
50	0.5	0.7
63	0.4	0.5

### 螺旋插补铣(实心材料) Spiral Interpolation Milling (Solid material)

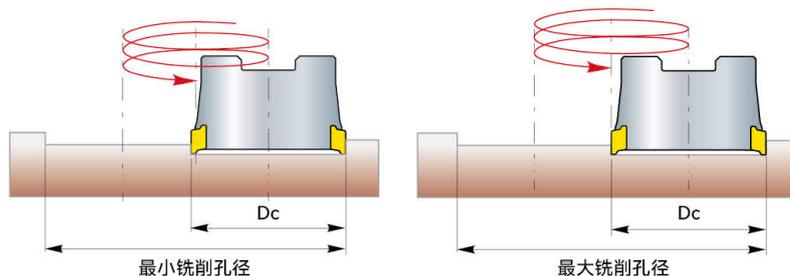
铣刀切削直径 D Milling Diameter	最小铣削孔径 D min Minimum Milling Diameter	最大铣削孔径 D max Maximum Milling Diameter	最大切深 ap max Maximum Depth of Cut
18	33	36	1.2
20	37	40	1.2
22	41	44	1.0
25	47	50	1.0
30	57	60	1.0
32	61	64	1.0
35	67	70	0.9
40	77	80	0.9
50	97	100	0.9
63	123	126	0.9

## AHNO Milling Technology Application



### 坡铣信息 Slope Milling

铣刀切削直径 Dc Milling Diameter	XO10 (R ≤ 1.2)		XO16 (R ≤ 2.4)	
	最大坡铣角度 Maximum Slope Milling Angle	最大坡铣深度 Maximum Slope Milling Depth	最大坡铣角度 Maximum Slope Milling Angle	最大坡铣深度 Maximum Slope Milling Depth
16	11.7°	6		
20	8.3°	6		
25	6.1°	6	12°	15
32	4.4°	6	8°	15
40	3.4°	6	5°	15
50	2.6°	6	4°	15
63			3°	15
80			2°	15
100			1.5°	15
125			1°	15
160			1°	15



螺旋插补铣 (实心材料) - XO10 系列

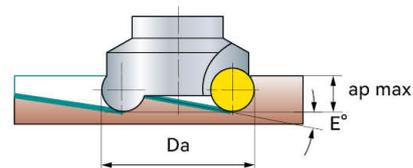
Spiral Interpolation Milling (Solid material) - XO10 Series

铣刀切削直径 Milling Diameter Dc	XO10	XO10-R0.2	XO10-R0.4	XO10-R0.8	XO10-R1.0	XO10-R1.2
	最小铣削孔径 Minimum Milling Diameter	最大铣削孔径 Maximum Milling Diameter				
16	28.4	31.6	31.2	30.4	30	29.6
20	36.4	39.6	39.2	38.4	38	37.6
25	46.4	49.6	49.2	48.4	48	47.6
32	60.4	63.6	63.2	62.4	62	61.6
40	76.4	79.6	79.2	78.4	78	77.6
50	96.4	99.6	99.2	98.4	98	97.6

螺旋插补铣 (实心材料) - XO16 系列

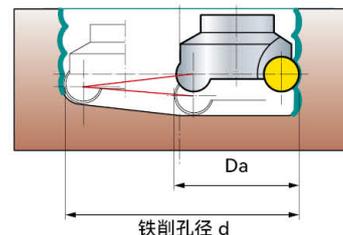
Spiral Interpolation Milling (Solid material) - XO16 Series

铣刀切削直径 Milling Diameter Dc	XO16	XO16-R0.4	XO16-R0.8	XO16-R1.2	XO16-R1.6	XO16-R2.0
	最小铣削孔径 Minimum Milling Diameter	最小铣削孔径 Minimum Milling Diameter				
25	43.6	49.2	48.4	47.6	46.8	46
32	57.6	63.2	62.4	61.6	60.8	60
40	73.6	79.2	78.4	77.6	76.8	76
50	93.6	99.2	98.4	97.6	96.8	96
63	119.6	125.2	124.4	123.6	122.8	122
80	153.6	159.2	158.4	157.6	156.8	156
100	193.6	199.2	198.4	197.6	196.8	196
125	243.6	249.2	248.4	247.6	246.8	246
160	313.6	319.2	318.4	317.6	316.8	316



### 坡铣信息 Slope Milling

铣刀切削直径 Milling Diameter $D_a$	RC10		RC12		RC16		RC20	
	最大坡铣角度 Maximum Slope Milling Angle	最大坡铣深度 Maximum Slope Milling Depth	最大坡铣角度 Maximum Slope Milling Angle	最大坡铣深度 Maximum Slope Milling Depth	最大坡铣角度 Maximum Slope Milling Angle	最大坡铣深度 Maximum Slope Milling Depth	最大坡铣角度 Maximum Slope Milling Angle	最大坡铣深度 Maximum Slope Milling Depth
25	13.2°	5.0						
32	12.6°	5.0						
35	12.3°	5.0						
40	9.5°	5.0	9.0°	6.0				
50	6.4°	5.0	7.0°	6.0				
52	6.1°	5.0	6.5°	6.0				
63	4.7°	5.0	5.0°	6.0	7.0°	8.0		
66	4.4°	5.0	4.5°	6.0	6.5°	8.0		
80			3.0°	5.1	5.0°	8.0	7.0°	10
100			2.0°	3.3	4.0°	6.8	5.0°	8.6



螺旋插补铣 (实心材料)

Spiral Interpolation Milling (Solid material)

铣刀切削直径 Milling Diameter Da	RC10		RC12		RC16		RC20	
	最小铣削孔径 Minimum Milling Diameter	最大铣削孔径 Maximum Milling Diameter						
25	32	50						
32	45	64						
35	51	70						
40	61	80	56	80				
50	81	100	76	100				
52	85	104	80	104				
63	107	126	102	126	94	126		
66	113	132	108	132	100	132		
80			136	160	128	160	120	160
100			176	200	168	200	160	200

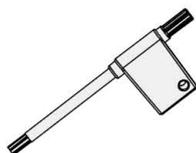
**AHNO Loong Series-Indexable Millings Attachment**
**刀片锁紧螺钉  
 Insert Locking Screw**

序号 No.	螺钉型号 Screw Type	Torx	紧固扭矩 Fastening Torque	尺寸 Diameter
1	AF9041	7IP	0.8 Nm	M2.5*6
2	AF9011	8IP	1.2 Nm	M2.5*7.3
3	AF9051	9IP	2.0 Nm	M3*6
4	AF9021	9IP	2.0 Nm	M3*7.3
5	AF9061	10IP	3.0 Nm	M3.5*9
6	AF9062	15IP	3.0 Nm	M3.5*10
7	AF9052	15	3.0 Nm	M3.5*11
8	AF9012	15IP	3.0 Nm	M4*8.5
9	AF9042	15IP	3.5 Nm	M4*10
10	AF9022	15IP	5.0 Nm	M4.5*11
11	AF9031	20IP	5.0 Nm	M5*13
12	AF9063	20IP	5.0 Nm	M5*14
13	AF9064	25IP	7.5 Nm	M6*15

阿诺 - Loong 龍系列产品 - 旗形扳手



AHNO Loong Series-Flag-shaped Wrench

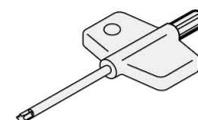


序号 No.	螺丝刀型号 Screwdriver Type	Torx
1	AF8010-T07IP	T07IP
2	AF8010-T08IP	T08IP
3	AF8010-T09IP	T09IP
4	AF8010-T10IP	T10IP
5	AF8010-T15IP	T15IP

阿诺 - Loong 龍系列产品 - 钥匙形扳手



AHNO Loong Series-Key-shaped Wrench



序号 No.	螺丝刀型号 Screwdriver Type	Torx
1	AF8020-T07IP	T07IP
2	AF8020-T08IP	T08IP
3	AF8020-T09IP	T09IP
4	AF8020-T10IP	T10IP
5	AF8020-T15	T15
6	AF8020-T15IP	T15IP

阿诺 - Loong 龍系列产品 - 螺丝刀



AHNO Loong Series-Screwdriver

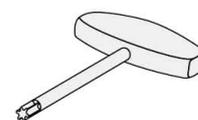


序号 No.	螺丝刀型号 Screwdriver Type	Torx
1	AF8030-T15IP	T15IP
2	AF8030-T20IP	T20IP

阿诺 - Loong 龍系列产品 - T 型扳手



AHNO Loong Series-T-shaped Wrench

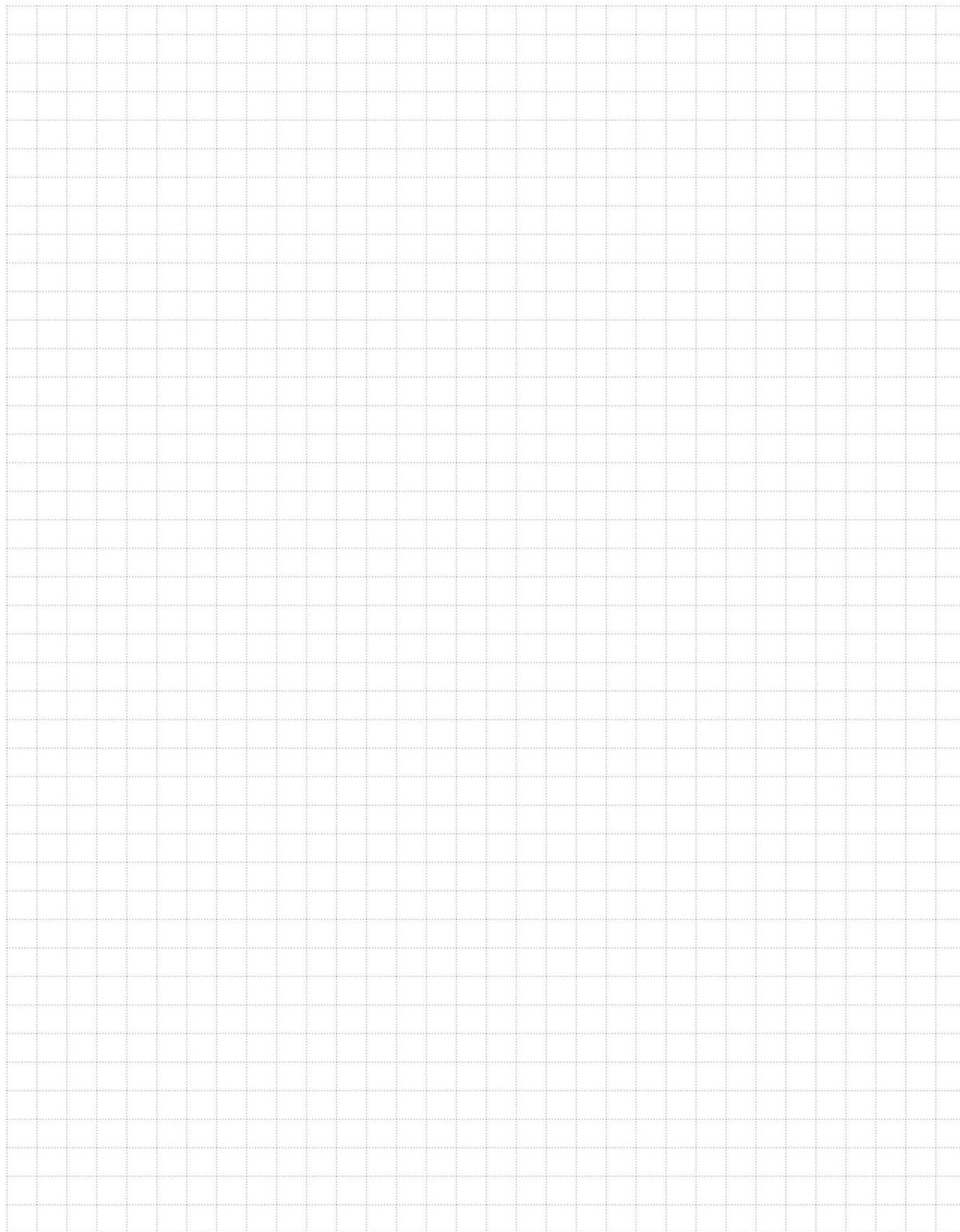


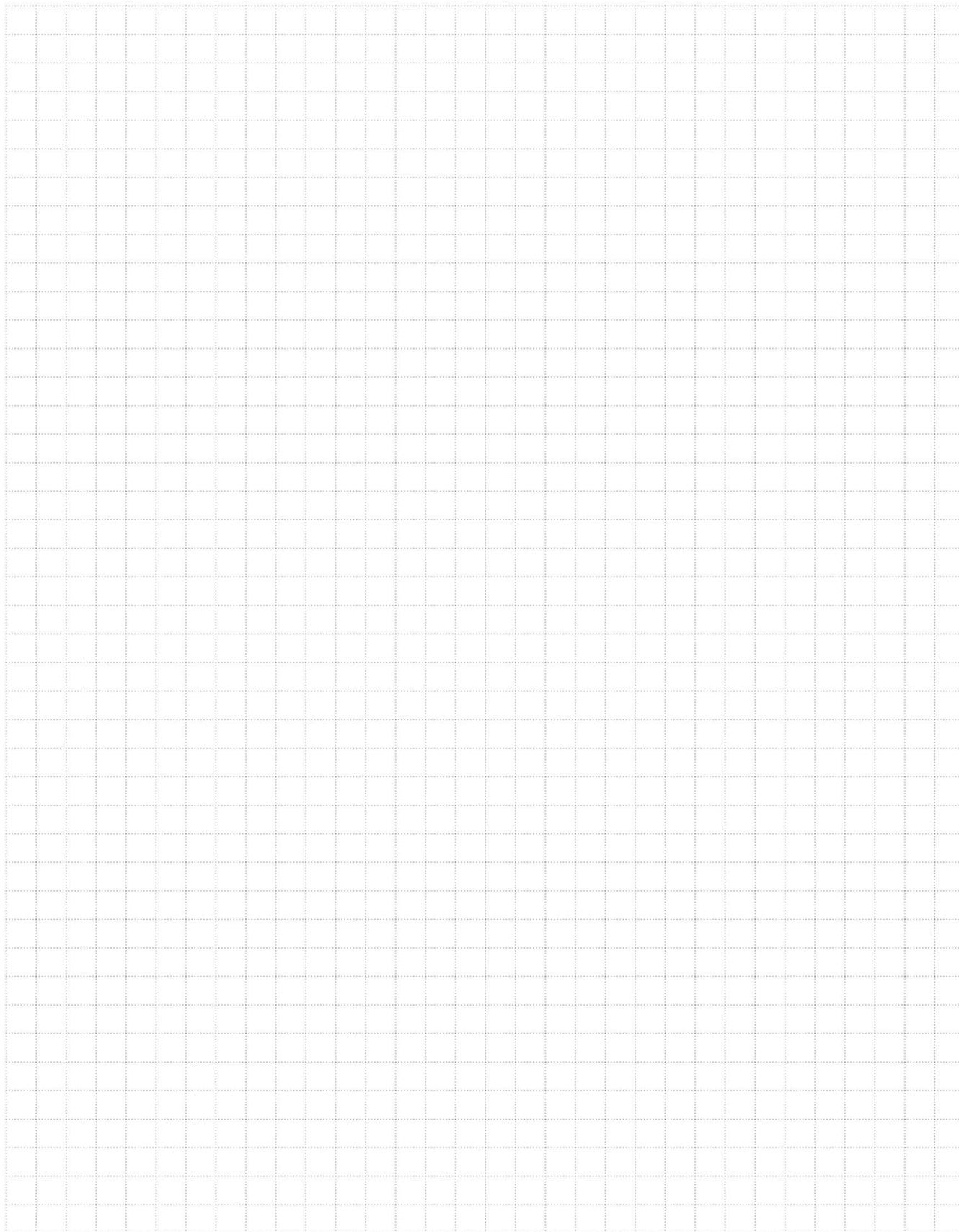
序号 No.	螺丝刀型号 Screwdriver Type	Torx
1	AF8040-T25IP	T25IP

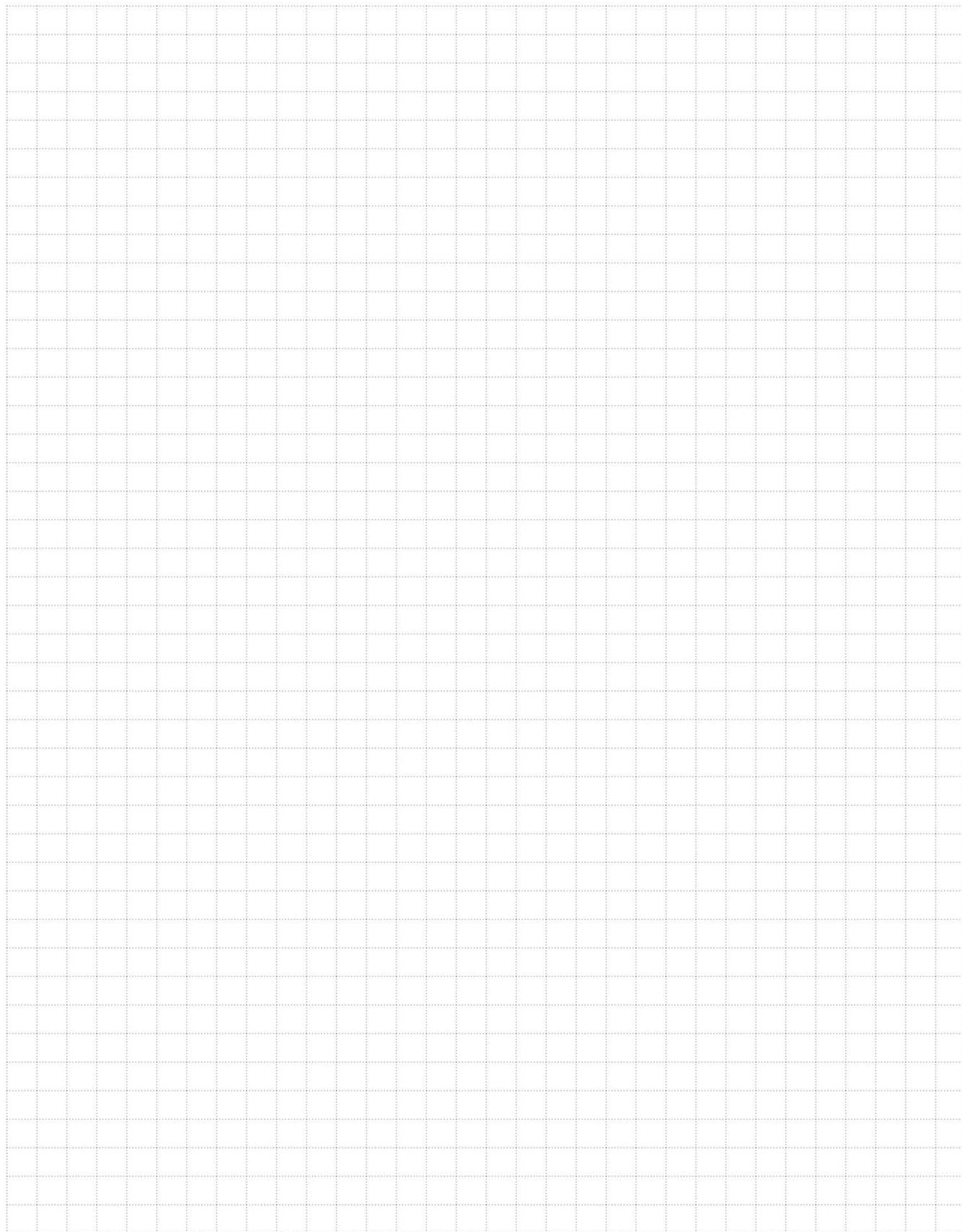
## 硬度换算对照表

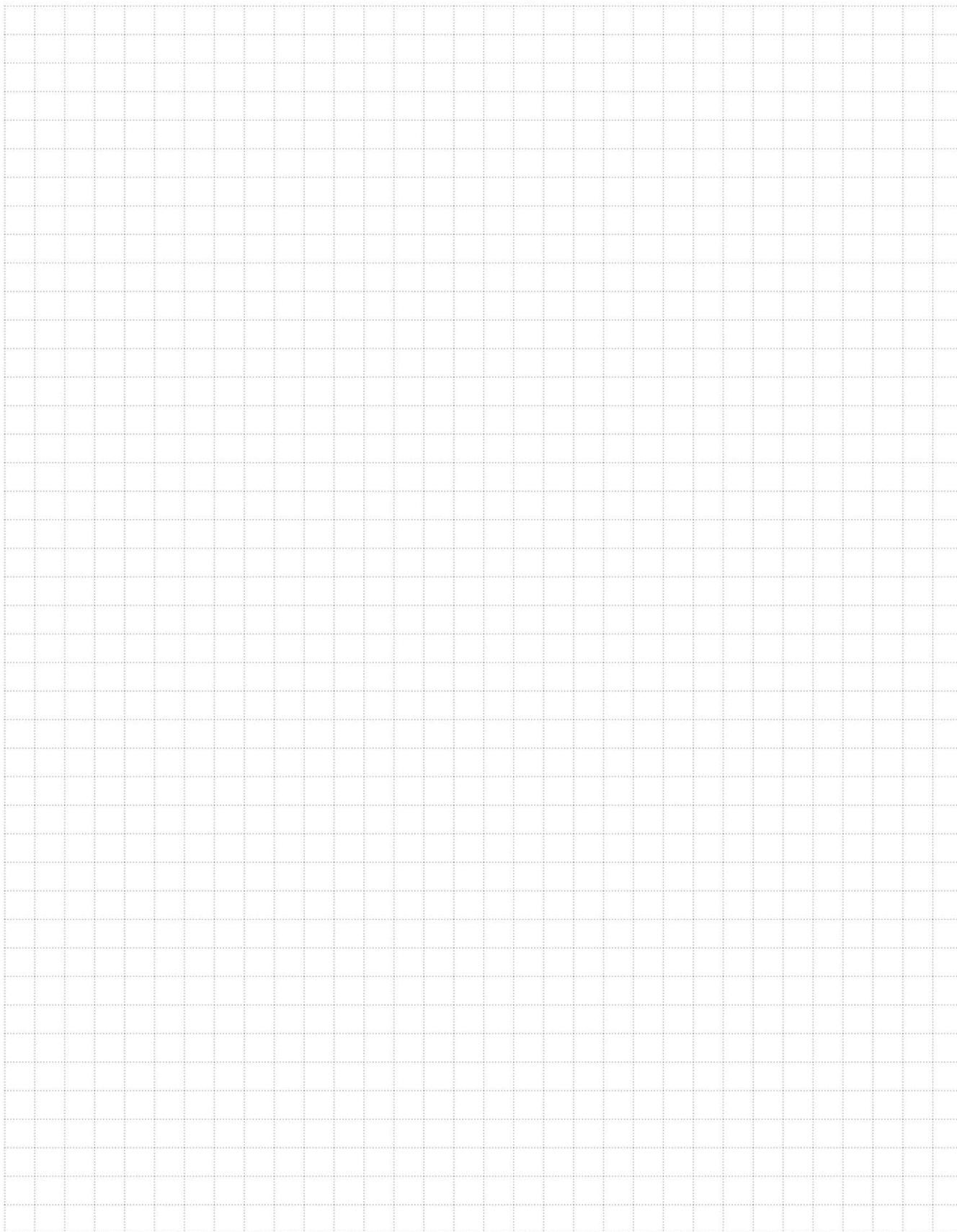
## Hardness Conversion Table

布氏硬度 (HB)	维氏硬度 (HV)	洛氏硬度 (HR)		抗拉强度 Tensile Strength (N/mm <sup>2</sup> )
		150kg 金钢石锥 Diamond Cone (HRC)	100kg 钢球 Steel Ball (HRB)	
208	198	-	93	667
212	201	-	94	680
217	206	(16.0)	95	696
220	209	(17.5)	95	706
222	211	(18.7)	96	716
235	223	(19.1)	97	755
242	230	20.2	97	775
248	236	22.1	99	794
257	244	23.1	100	824
262	249	24.1	100	838
266	253	24.8	101	853
272	258	25.7	101	870
275	261	26.4	102	880
277	263	27.0	103	892
291	276	29.1	104	941
302	287	29.9	105	971
308	293	30.9	106	990
315	299	32.1	107	1020
322	306	32.3	107	1035
325	309	32.4	107	1049
338	321	33.6	107	1089
343	326	35.4	108	1118
361	343	36.6	109	1157
369	351	37.6	110	1187
383	364	39.4	-	1236
392	372	40.3	-	1265
408	388	41.7	-	1314
425	404	42.9	-	1363
433	411	43.6	-	1390
441	419	44.6	-	1422
447	425	45.0	-	1447
455	432	45.8	-	1471
470	447	46.9	-	1520
485	461	48.1	-	1569













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