

Meet The Best Nanotechnology



NANOLOY CUTTING TOOL

“Beyond the cutting Tools”

The Solution Provider for Difficult to cut Materials



 www.nanoloy.co.kr



The world's first ultrafine 0.2 μ m powder Difficult-to-cut materials cutting solution

全球第一0.2 μ mNANO(纳米级)复合粉末材料开发
针对加工难切削材料最佳解决方案

Nanotech Co., Ltd. Developed the world's first 0.2 μ m WC-Co composite powder and manufactures Inserts and End mills by Nano (Ultrafine) powder. Our products (Nanoloy) are specialized in machining difficult-to-cut materials in various industries. We are expanding global network by selling nanoloy cutting tools to all around of world

NANOLOY研制出世界上第一0.2 μ mWC-Co复合粉末, 并以Nano(Ultrafine)粉末制造绝缘体和端面磨坊 NANOLOY产品是专门加工各种工业中难以切割材料的 我们向全世界销售纳米合金切削工具,以扩大全球网络

N A N O T E C H



Aerospace
航空航天



Turbocharger for automobile
汽车涡轮增压器



Pump & Valve Oil & Gas
泵阀石油&气油



General Machining (SUS)
通用加工(SUS)

TIME LINE

1999

1999. 09 Established NANOTECH Co., LTD.
成立NANOTECH
1999. 12 The 20 century Korea Top 100 technologies selected (MK).
被选20世纪韩国百强科技评选

2000~2004

2000. 04 Established the annex research institute of NANOTECH CO.,LTD.
成立NANOTECH
2000. 09 Selected as a venture enterprise (MSIT).
被选为风险企业(Venture enterprise) (MSIT)
2001. 09 Manufactured Nano composite powder of tungsten carbide and cobalt.
碳化钨钴纳米复合粉体材料的研究制造
2003. 03 Selected as INNO-BIZ enterprise (MSIT Chungbuk).
被选为INNO-BIZ企业
2004. 07 Selected as an excellent manufacturing technology research center-Nano powder (MOCIE).
被选为优秀纳米粉体制造技术研究中心(MOCIE)

2006~2009

2006. 05 Cemented carbide (WC-CO) material production.
胶结及生产硬质合金材料
2007. 02 Selected with material part technology development business - Nano materials (MOTIE).
被选材料技术开发部门-纳米材料(MOCIE)
2008. 01 ISO 9001 ISO 14001 Certification (System Korea Certification).
ISO9001:ISO14001认证(韩国认证体系)
2008. 11 300 Million Dollars of Exports Award - 45th Trade Day (President).
300万美元出口奖-第45届韩国贸易日(总统奖)
2009. 08 Selected with material part technology development business - Difficult-to-cut materials (MOTIE).
被选材料技术开发部门-难切削材料(MOCIE)

2012~2015

2012. 09 Selected with material part technology development business - Cermet powder (MOCIE).
被选材料技术开发部门-金属陶瓷粉(MOCIE)
2013. 02 Selection of outstanding R&D performance utilization company (KEIT).
被选优秀研发绩效利用公司(KEIT)
2015. 01 NANOLOY inserts and end mills production. NANOLOY
NANOLOY立铣刀和刀片生产

2016~2018

2016. 05 Selected with material part technology development business - (W, Ti)C powder (MOCIE).
被选材料技术开发部门(钨、钛)钴粉末(MOCIE)
2016. 05 Designated as a global hidden champion (MSIT).
被指定为全球隐形冠军(MSIT)
2016. 09 Established NT Vina Factory.
建立了NT越南工厂
2018. 02 Selected as a promising small and medium-sized enterprise in Cheongju (Cheongju City).
被选为清州市有发展前途的中小企业

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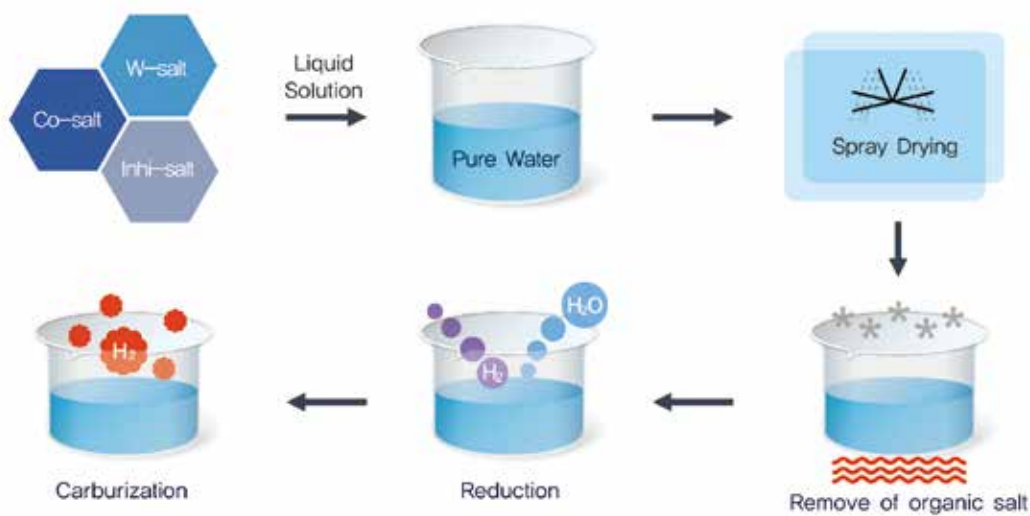
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CORE TECHNOLOGY

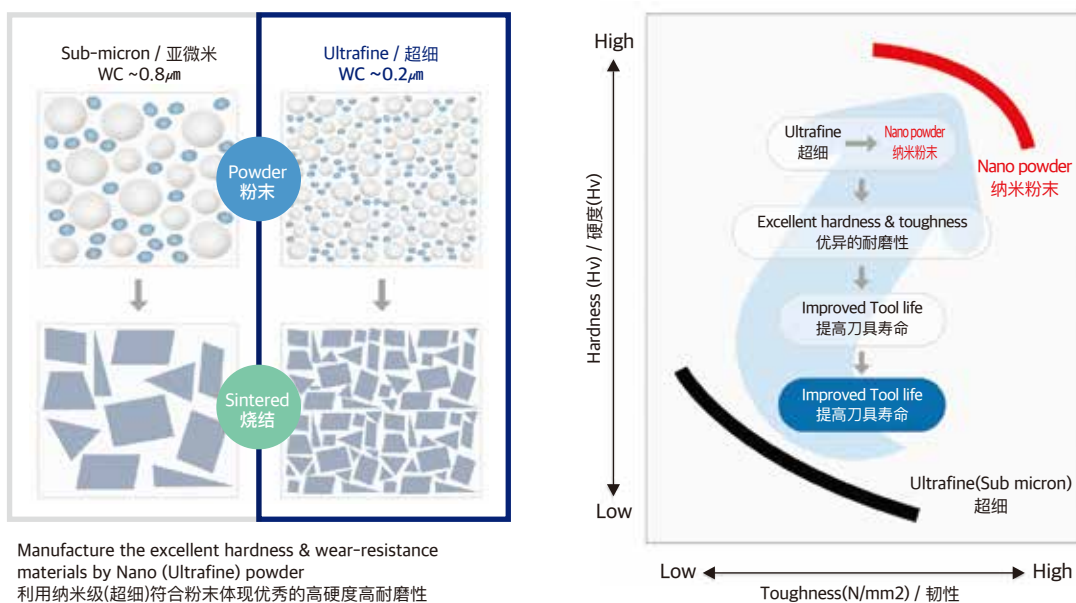
核心技术

- Patent the original technology to manufacture the Nano composite powder.
- 获得纳米复合粉体的原始技术专利
- Specialized in difficult-to-cut material like aerospace and automobile industries.
- 专业航空航天汽车行业等难切削材料的加工

NANOTECH original technology : Spray Conversion Method / 原创技术：喷雾转化法



The strength of NANO(ultrafine) powder / 纳米级(超细)粉体材料的优点

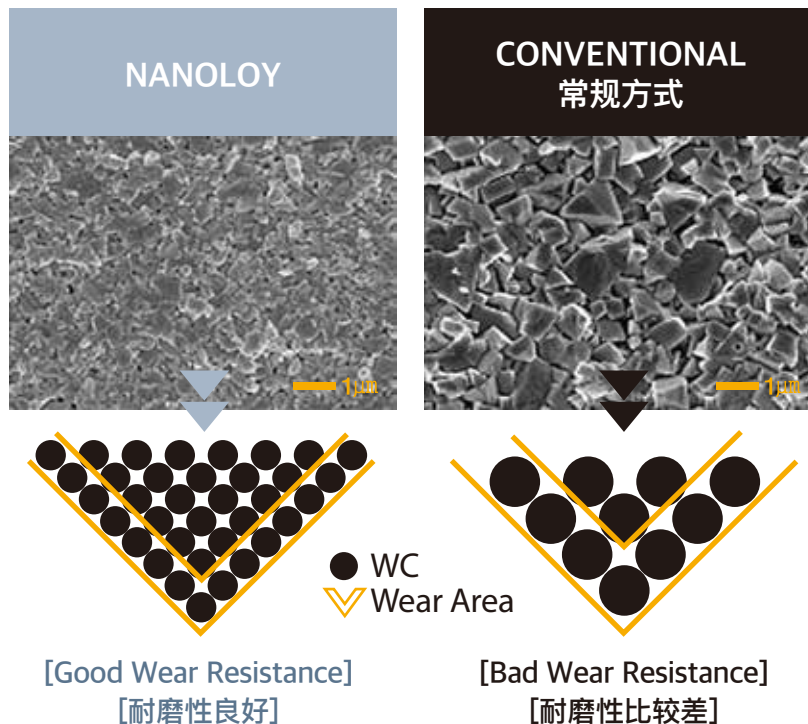


Specialized in difficult-to-cut materials / 专业用于难切削材料

- original Patented technology to manufacture the Nano composite powder.
- 获得纳米复合粉体的原始技术专利
- Specialized in difficult-to-cut material like aerospace and automobile industries.
- 专业航空航天汽车行业等难切削材料的加工

Features of difficult-to-cut materials machining / 难切削材料加工的特点

- HRSA : Tool temperature increase due to low thermal conductivity ▶ Surface, Internal, Mechanical defects.
- HRSA : 由于热系数低以及刀具温度升高 ▶ 导致表面、内部、机械缺陷
- High hardened steel : High hardness and toughness material with ▶ High cutting resistance high cutting load.
- 超硬度钢件 : 高硬度、高韧性、高抗切削性材料 ▶ 导致高切削负荷



NANOLOY GRADE

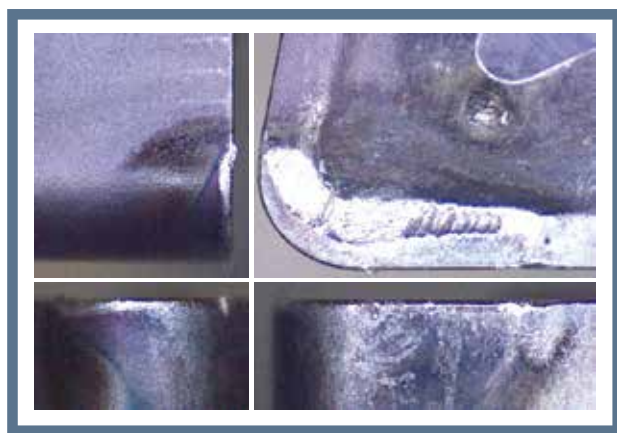
NANOLOY 材质介绍

NV Series

- Applied to difficult to cut materials high speed, continuous machining like HRSA (Ti alloy, Inconel), Stainless steel Increase tool life and prevent defects with NANO composite powder.
- 适用于难切削材料的高速加工、连续加工, 如HRSA(钛合金、铬镍铁合金)、不锈钢等使用纳米复合粉末提高刀具寿命, 防止缺陷

Features / 特点

- Excellent wear resistance and toughness in high temperature with NANO composite powder
- 采用超级WC体现优良的硬度、韧性、耐磨性
- High speed continuous machining available ► Increase productivity
- 提供高速连续加工 ► 提高生产效率



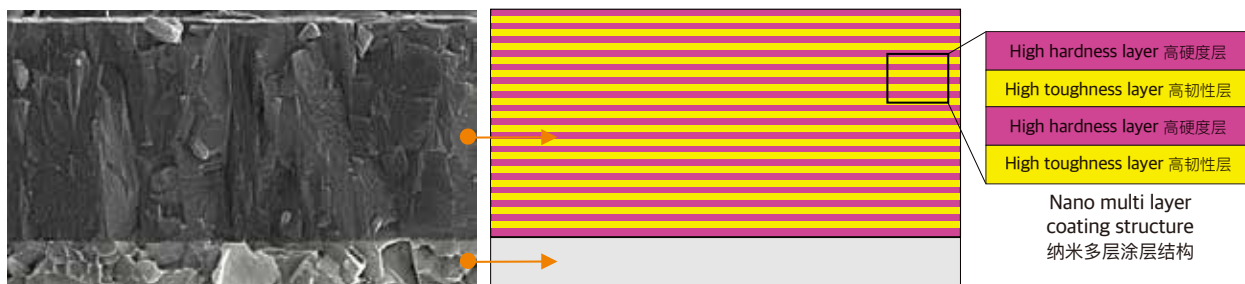
[Nanoloy]



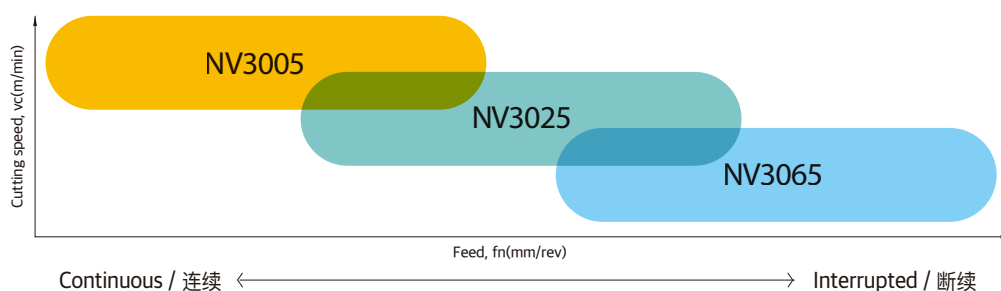
[Competitor / 竞争对手]

NV coating / NV涂层

- Lower coefficient of friction ► Better surface roughness and decrease machining stress
- 低摩擦系数 ► 提高表面粗糙度, 降低加工应力
- Nano multi coating layer ► High hardness and toughness
- NANO多层涂层 ► 高硬度、高韧性

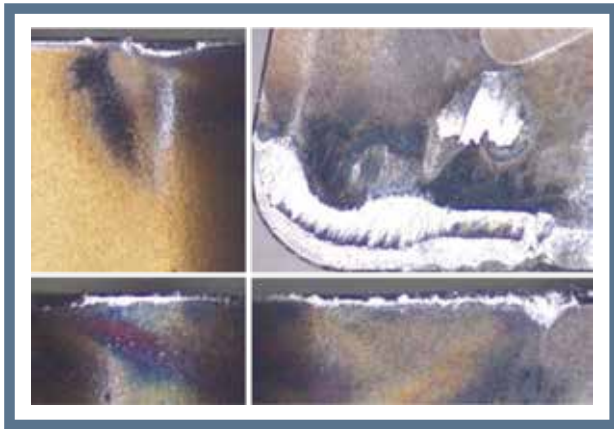


Applied area / 应用范围

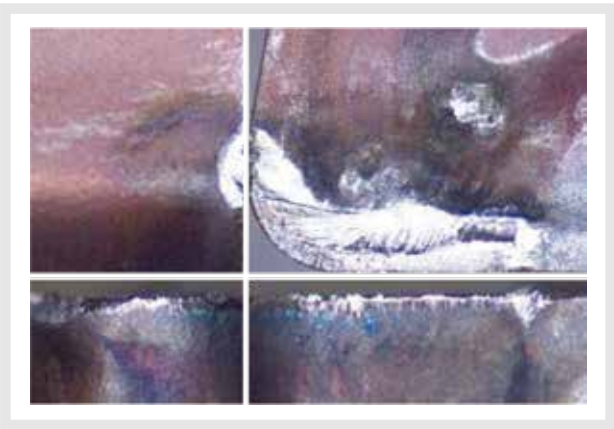


NS Series

- Suitable for high speed, continuous machining of Stainless steel and Steel (Carbon, Alloy, Mold steel, etc.)
- 适用高速连续加工不锈钢和钢料(碳钢，合金钢，模具钢等)
- Superior wear resistance with Nano composite powder
- 因此纳米级粉末可实现优势的耐磨性



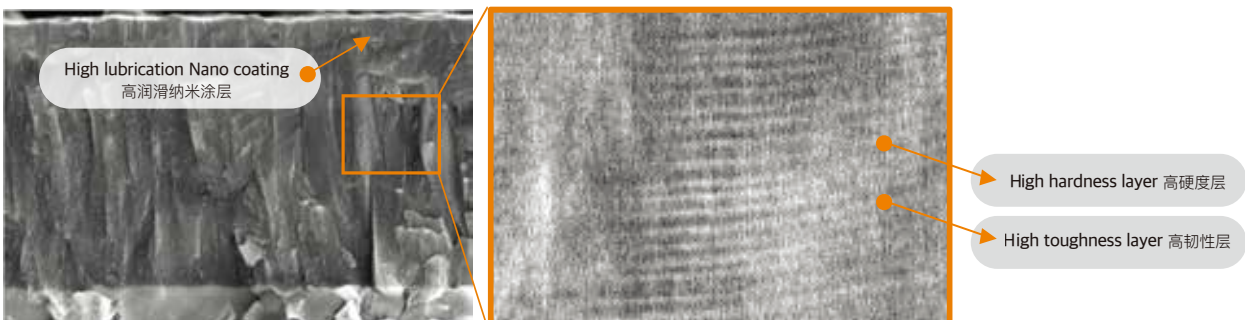
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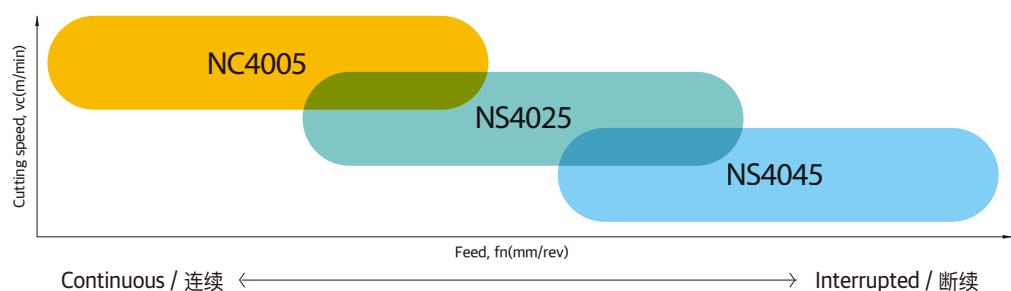
[Competitor / 竞争对手]

Features / 特点

- Applying Nano multilayer coating ► Heat resistance, wear resistance and high toughness available
- 应用纳米多层涂层 ► 提升耐热性, 耐磨性, 韧性
- High lubrication coating layer apply to prevent built up edge
- 高润滑涂层为防止积屑瘤



Applied area / 应用范围



NANOLOY GRADE

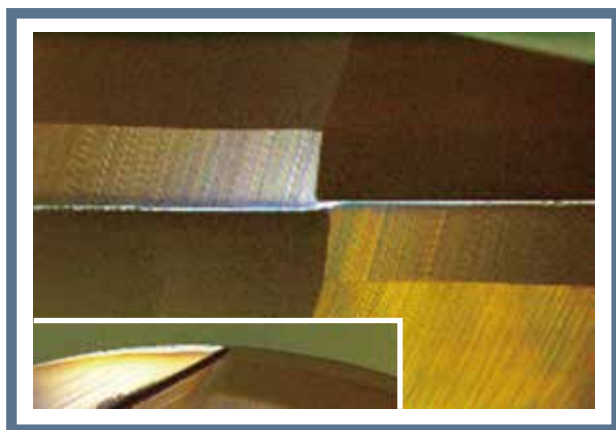
NANOLOY 材质介绍

TA/TS Series

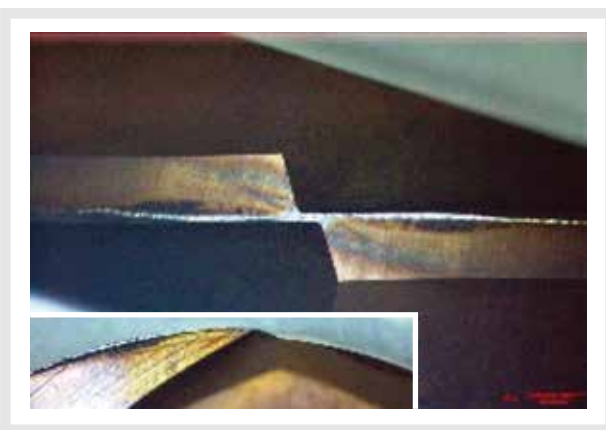
- Applied to over HRC 55 materials (mold, press steel) high speed, continuous machining
- 适用于HRC 55以上材料(模具钢、压型钢)的高速、连续加工
- Specially designed coating for prevent defects and increase tool life
- 特殊设计的涂层, 防止缺陷, 提高刀具寿命

Features / 特点

- Excellent wear resistance and prevent chipping with NANO Ultra-fine powder
- NANO超细粉末体现优异的耐磨性防止崩刃现象
- Applying specially PVD coating for superior high temperature properties
- 采用特殊PVD涂层, 具有优异的忍耐高温性能

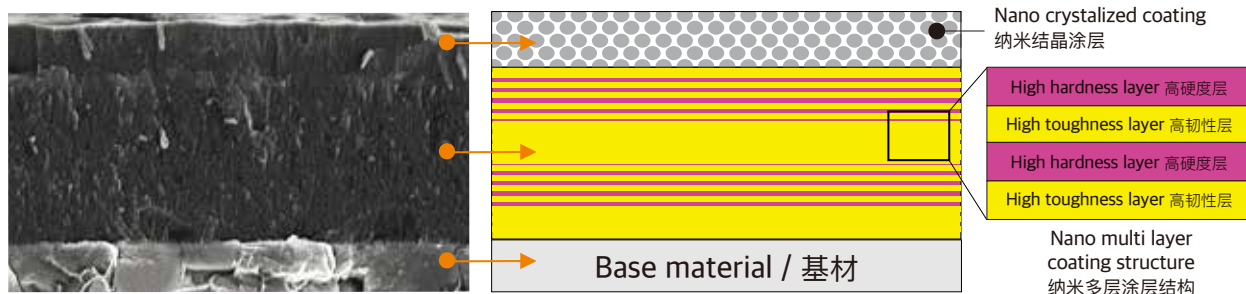


[Nanoloy]

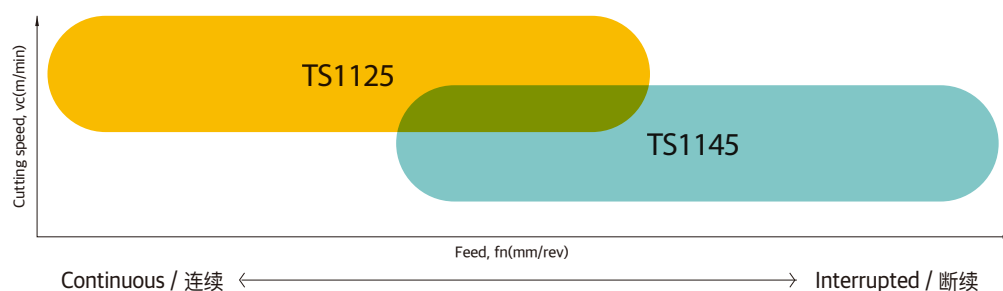


[Competitor / 竞争对手]

- Surface : Nano crystalized coating ► Excellent wear resistance and high temperature properties
- 表面 : 纳米结晶涂层 ► 优异的耐磨性和高温性能
- Under layer : High hardness bumper layer coating ► Prevent rapid breakage and reduce machining stress
- 下层 : 高硬度缓冲涂层 ► 防止快速断裂, 降低加工应力



Applied area / 应用范围



Comparison table of PVD grades

PVD涂层材质对比表

Application	Work Material	Classification Code	NANOLOY	Sumitomo	Mitsubishi	Tungaloy	Kyocera	Sandvik	Kennametal	SECO	WALTER	ISCAR	TaeguTec
For Turning		P05	NS4005	ACZ150		AH710 AH110	PR915 PR1005						
		P10	NS4005 NS4025	AC1030U ACZ150 AC5025S AC520U	VP15TF MS6015	AH120 AH725	PR930 PR1215 PR1225					IC807	
		P20	NS4025	AC1030U AC5025S AC520U AC530U	VP15TF VP20RT	AH120 AH725 AH3135	PR1225 PR1425	GC15 GC1125	KCU25			IC807 IC808 IC810	TT9080
		P30	NS4025 NS4045	AC1030U AC530U	VP15TF VP20RT	AH120 AH725 SH730	PR4125 PR1525 PR1535	GC1125				IC328 IC330 IC830 IC928	TT8020 TT8080 TT9080
		P40	NS4045 NS5045	AC1030U			PR660	GC4335 GC4235				IC830	TT8020 TT9080
	 	M10 S10	NV3005 NV3025 NS4005 NS4025	AC5015S AC5025S AC510U AC520U ACZ150	MP9005 MP9015 VP15TF VP05RT VP10RT	AH110 AH710 AH725 AH905 AH8005	PR0055 PR0155 PR915 PR1025 PR1215 PR1225 PR1305 PR1310	GC1105 GC1115	KC5510 KCU10	TS2000	WSM01 WSM10 WSM10S	IC807 IC808 IC907 IC908	TT5080 TT3010
		M20 S20	NV3025 NS4025	AC5015S AC5025S AC1030U AC520U	MP9015 MP9025 VP15TF VP20RT VP20MF UP20M	AH630 AH120 AH725 AH8015	PR0155 PR915 PR930 PR1025 PR1125 PR1215 PR1225 PR1325	GC15 GC1115 GC1125	KC5525 KCU25 KC5025	TS2500	WSM20 WSM20S	IC330 IC806 IC808 IC830 IC908 IC925	TT9080 TT9020 TT3020
		M30	NS4025 NS4045	AC5025S AC6040M AC1030U AC520U AC530U	MP7035 VP15TF VP20MF	AH630 AH645 AH725	PR1125 PR1525 PR1535	GC1125			WSM30 WSM30S	IC328 IC330 IC830 IC840 IC882	TT8020 TT8080 TT9080
		M40	NV3065 NS4045 NS5045	AC6040M AC1030U AC530U	MP7035 VP15TF MS6015	AH645	PR1125 PR1535					IC830 IC928	TT8020 TT8080
		K10	NH4025	AC1030U AC510U ACZ150	VP10RT	AH110 AH120	PR905	GC15				IC810	TT6080
		K20	NH4025 NH4045	AC1030U AC510U AC530U ACZ150	VP10RT VP20RT VP15TF	AH120	PR905						TT6080
		K30	NH4045 NH5045	AC1030U AC530U	VP15TF VP20RT	AH110 AH120 AH725						IC830 IC908 IC910 IC928	



ISO TURNING INSERT

[Turning insert for ISO S,M group]
加工S、M系列材料专用ISO车刀片

ISO车刀片

"N-IT" SERIES

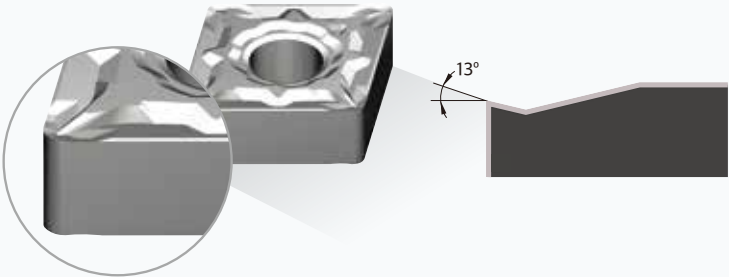
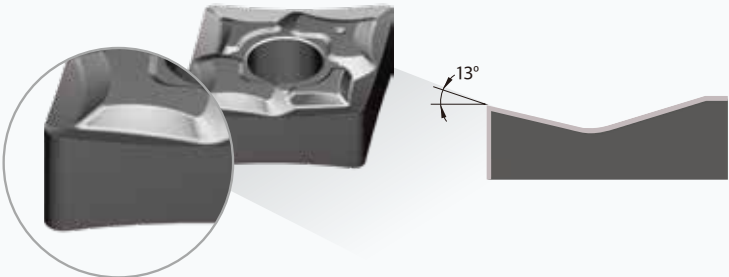
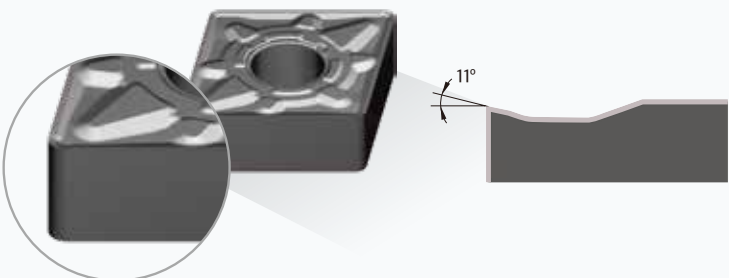
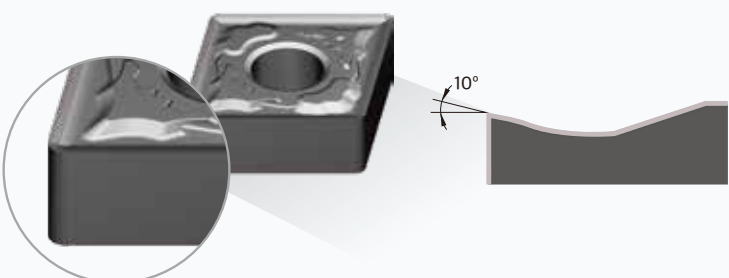
Nano ultrafine powder technology & optimal geometry for aerospace and automobile parts machining

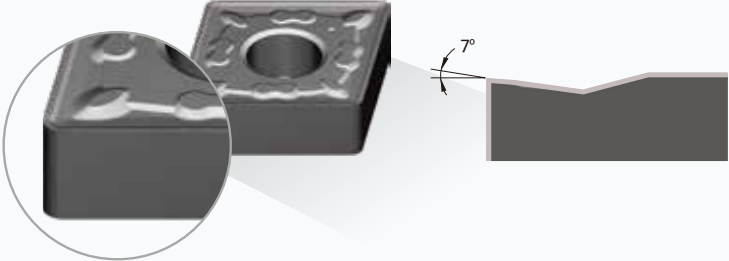
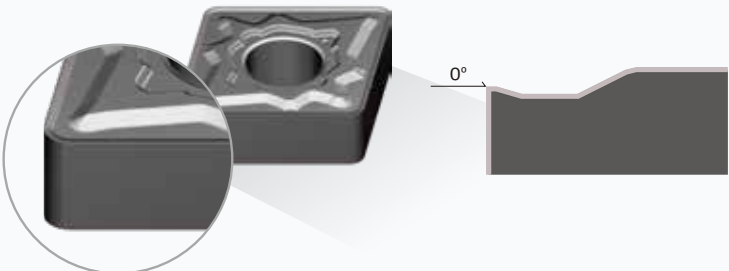
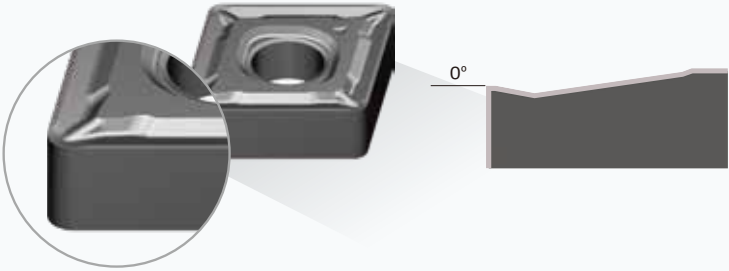
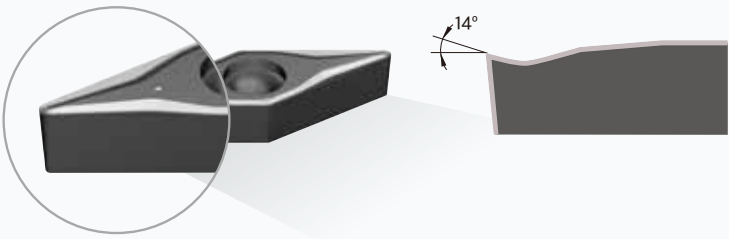
NANOLOY独特的超微符合粉末技术, 应用于广泛加工难切削行业
航空航天行业、汽车行业等应用于不锈钢和耐热合金材质最佳化技术
提高工具耐磨性以及工具寿命

1. Excellent hardness and wear resistance
1. 优异的硬度和耐磨性
2. Designed for ISO S,M group (Prevent built up edge and burrs)
2. 专为ISO S,M系列设计(防止边角沾屑和毛刺)
3. Various geometries from roughing to finishing
3. 从精加工到粗加工各种几何形状

GEOMETRY FEATURE

形状特点

Insert shape / 刀片形状	Features / 形状特点
F11 Chip Breaker / 断屑槽 	• Prevents B.U.E with sharp edge • 避免沾屑采用高锋利刃线形状 • Prevents B.U.E with sharp edge • 为了提加强高稳定排屑采用刃尖刃口接近突起处理 • Optimized in finishing ISO S,M group • ISO S和M类材料精加工最佳化槽型
7FM Chip Breaker / 断屑槽 	• Waved cutting edge. • 采用波浪刃线槽提高抑制加工震动 • Guaranteed high quality surface roughness. • 保证高质量的表面粗糙度 • Optimized in semi finishing ISO S,M group. • ISO S和M类材料半精加工最佳化槽型
M11 Chip Breaker / 断屑槽 	• Stable chip evacuation. • 特殊断屑槽设计保证稳定排屑加强耐磨性 • Applied variable land for crater wear resistance. • 应用了可变后角刃地弹坑耐磨性 • Prevents B.U.E with sharp edge • 避免沾屑采用高锋利刃线形状 • Optimized in medium machining ISO S,M group. • ISO S和M类材料半精加工最佳化槽型
M22 Chip Breaker / 断屑槽 	• Sharp cutting edge & low cutting force. • 采用高锋利刃线形状减少切削负载确保优秀的面照度 • Stable chip evacuation. • 特的大宽度装刀片支撑面确保稳定加工 • Guaranteed high quality surface roughness • 保证高质量的表面粗糙度 • Optimized in medium machining ISO S,M group. • ISO S类材料精加工最佳化槽型

Insert shape / 刀片形状	Features / 形状特点
R11 Chip Breaker / 断屑槽 	• Excellent for cutting edge strength. • 加强刃线设计以实现高负载加工 • Designed for deep depth of cut. • 独特的大宽度装刀片支撑面确保稳定加工 • Optimized in roughing ISO S,M group. • ISO S和M类材料粗加工最佳化槽型
R21 Chip Breaker / 断屑槽 	• Excellent for cutting edge strength. • 具有平摊部设计以及加强刃线部实现大深度切削加工 • Designed for deep depth of cut. • 采用大宽度断屑口袋提高排屑处理,适合高速加工 • Optimized in universal roughing machining. • 通用性粗加工最佳化
M51 Chip Breaker / 断屑槽 	• Low cutting force. • 低切削力 • Excellent chip evacuation at low feed, depth of cut. • 舒缓倾角设计抑制切削负载 • Optimized in universal medium machining. • 通用性粗加工最佳化
2FM Chip Breaker / 断屑槽 	• Prevents B.U.E with sharp edge. • 避免沾屑采用高锋利刃线形状 • Guaranteed high quality surface roughness at finishing. • 精加工时保证高质量的表面粗糙度 • Optimized in finishing ISO S,M group. • ISO S和M类材料精加工最佳化槽型

应用范围根据断屑槽型 (双面式车刀片)

M Stainless steel
不锈钢

Roughing
粗加工

Medium
半精加工

Finishing
精加工

S HRS A
超耐热合金

Roughing
粗加工

Medium
半精加工

Finishing
精加工



APPLIED AREA BY C/B TYPE (POSTIVE)

"ISO TURNING INSERT" series

NANOLOY

应用范围根据断屑槽型 (单面式车刀片)

Chip Breaker 断屑槽	Corner section 角部单面	Recommended cutting condition / 推荐加工条件										Features 特点
		ap (mm)										
		0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6		
		feed (mm/rev)										
		0.04	0.08	0.12	0.16	0.20	0.24	0.28	0.32	0.36		
 F11 Finishing 精加工		0.13 ~ 1.8				0.10 ~ 0.20						- Prevents B.U.E with sharp edge - 避免沾屑采用高锋利刀线形状 - Stable chip evacuation - 特殊断屑槽设计保证稳定排屑加强耐磨性
 2FM Semi finishing 半精加工		0.5 ~ 2.0				0.08 ~ 0.20						- Prevents B.U.E with sharp edge - 避免沾屑采用高锋利刀线形状 - Guaranteed high quality surface roughness at finishing - 精加工时保证高质量的表面粗糙度
 M11 Medium 半精加工		0.35 ~ 2.2				0.12 ~ 0.24						- Stable chip evacuation - 特殊断屑槽设计保证稳定排屑加强耐磨性 - Applied variable land for crater wear resistance - 应用了可变后角刃地弹坑耐磨性
 M51 Medium 半精加工		0.4 ~ 2.5				0.10 ~ 0.22						- Low cutting force - 低切削力 - Excellent chip evacuation at low feed, depth of cut - 舒缓倾角设计抑制切削负载
 R11 Roughing 粗加工		1.2 ~ 3.0				0.14 ~ 0.28						- Excellent for cutting edge strength - 加强刃线设计以实现高负载加工 - Designed for deep depth of cut - 独特的大宽度装刀片支撑面确保稳定加工

M Stainless steel 不锈钢

Roughing 粗加工 

Medium 半精加工  

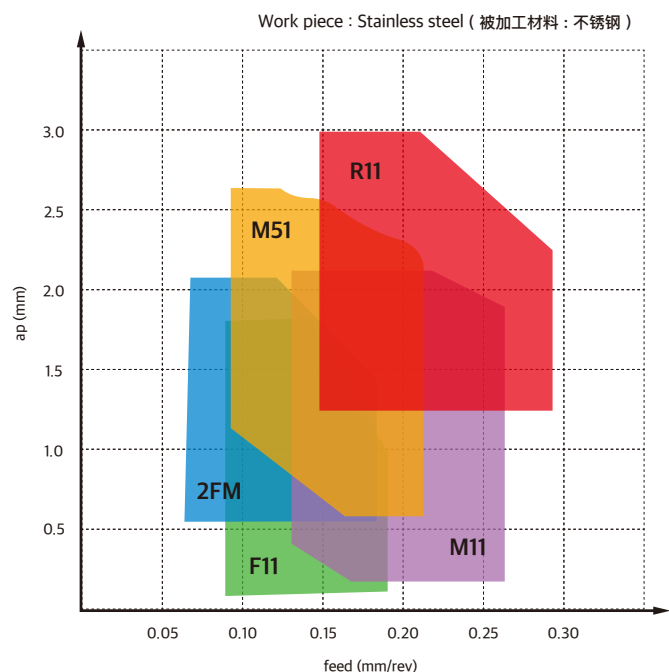
Finishing 精加工 

S HRSA 超耐热合金

Roughing 粗加工 

Medium 半精加工  

Finishing 精加工 

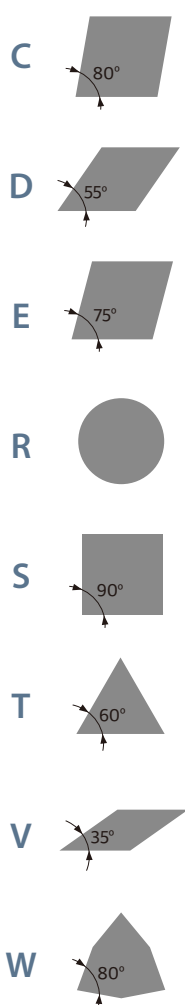


ISO TURNING INSERT NUMBERING SYSTEM

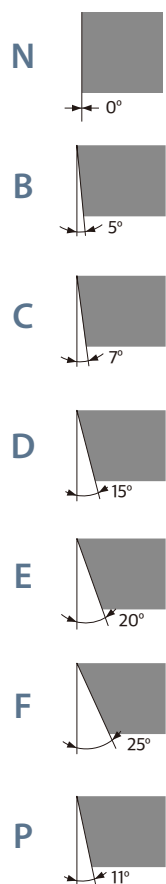
ISO车刀片命名系统

C 1	N 2	M 3	G 4
Insert Shape 刀片形状	Relief angle 主切削刃后角	Tolerance 公差	Cross Section shape 夹固形状

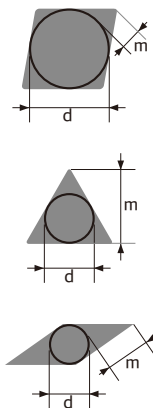
① Insert Shape
刀片形状



② Relief angle
主切削刃后角



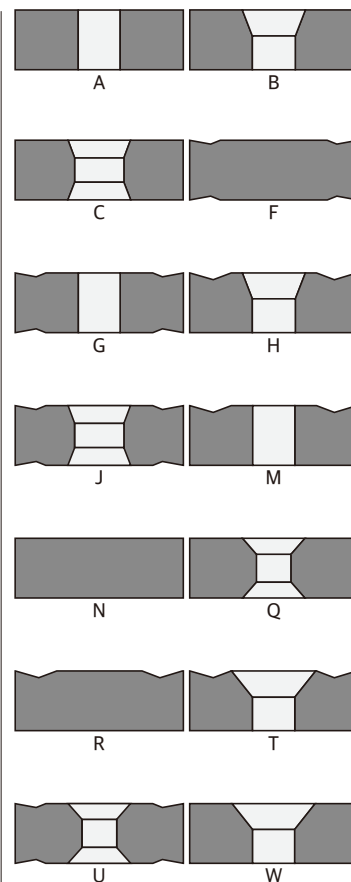
③ Tolerance
公差



Unit (mm) / 单位(mm)

	d	m	t
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	±0.05~0.15	±0.005	±0.025
K	±0.05~0.15	±0.013	±0.025
L	±0.05~0.15	±0.025	±0.025
M	±0.05~0.15	±0.130	±0.127
N	±0.05~0.15	±0.025	±0.025
U	±0.08~0.25	±0.130	±0.127

④ Cross Section shape
夹固形状



SPECIAL
X

12 ⁵	04 ⁶	08 ⁷	M11 ⁸
I.C, cutting edge length 刀削刃长度	Height of cutting edge 刀片厚度	Nose R 刀尖圆弧	Chip Breaker 断屑槽型

5 I.C, cutting edge length / 刀削刃长度

							
IC "d" (mm)	C	D	R	S	T	V	W
3.97	S4	4	3	3	6	-	-
4.76	4	5	4	4	8	8	S3
5.56	5	6	5	5	9	9	3
6	-	-	6	-	-	-	-
6.35	6	7	6	6	11	11	4
7.94	8	9	7	7	13	13	5
8	-	-	8	-	-	-	-
9.525	9	11	9	9	16	16	6
10	-	-	10	-	-	-	-
11.11	11	13	11	11	19	19	7
12	-	-	12	-	-	-	-
12.7	12	15	12	12	22	22	8
14.29	14	17	14	14	24	24	9
15.875	16	19	15	15	27	27	10
16	-	-	16	-	-	-	-
17.46	17	21	17	17	30	30	11
19.05	19	23	19	19	33	33	13
20	-	-	20	-	-	-	-
22.225	22	27	22	22	38	38	15
25	-	-	25	-	-	-	-
25.4	25	31	25	25	44	44	17
31.75	32	38	31	31	54	54	21
32	-	-	32	-	-	-	-

6 Height of cutting edge
刀片厚度

		
	t1	t2
1	1.59	
T1	1.98	
2	2.38	
T2	2.76	
3	3.18	
T3	3.97	
4	4.76	
5	5.56	
6	6.35	
7	7.94	
9	9.52	

7 Nose R
刀尖圆弧

	
	r
01	0.1
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
32	3.2

8 Chip breaker
断屑槽型

▼ Negative type / 负前种类



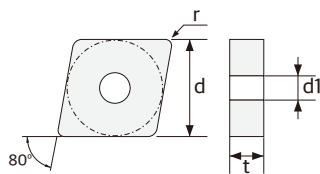
▼ Positive type / 正前种类



ISO TURNING INSERT SERIES

ISO车刀片系列

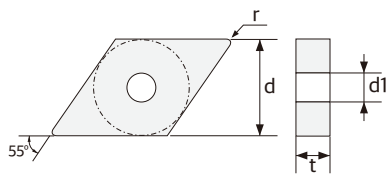
| 80° Rhombic (C) Negative
80° 菱形 (C)



Size 规格	Dimension (mm) / 尺寸		
	d	t	d1
09	9.525	3.18	3.81
12	12.7	4.76	5.16
16	15.875	6.35	6.35
19	19.05	6.35	7.93

Insert shape / 刀片形状		Designation / 形号		Feed / 进给率 (mm/rev)	Ap / 切削深度 (mm)
F11 Finishing 精加工		CNMG	090304-F11	0.06~0.20	0.10~1.00
			120404-F11	0.06~0.24	0.12~1.20
			120408-F11	0.12~0.32	0.12~1.20
M11 Medium 半精加工		CNMG	120404-M11	0.12~0.36	0.6~4.5
			120408-M11	0.12~0.36	0.6~4.5
			120412-M11	0.12~0.45	0.6~4.5
			120416-M11	0.12~0.50	0.6~4.5
			160612-M11	0.10~0.40	2.3~4.5
M22 Medium 半精加工		CNMG	120402-M22	0.10~0.22	0.5~3.0
			120404-M22	0.10~0.22	0.5~3.0
			120408-M22	0.12~0.30	0.5~3.0
			120412-M22	0.12~0.40	0.5~3.5
			160612-M22	0.15~0.40	2.5~5.0
			190608-M22	0.20~0.50	3.0~5.5
			190612-M22	0.20~0.50	3.0~6.0
			190616-M22	0.20~0.50	3.0~6.5
M51 Semi Finishing 半精加工		CNMG	090308-M51	0.25~0.40	1.2~4.0
R11 Roughing 粗加工		CNMG	120408-R11	0.18~0.48	2.4~6.0
			120412-R11	0.18~0.48	2.4~6.0
			120416-R11	0.18~0.50	2.4~6.0
			190612-R11	0.18~0.45	2.4~8.0
			190616-R11	0.18~0.55	2.4~8.0
R21 Roughing 粗加工		CNMG	120408-R21	0.12~0.35	0.7~3.8
			120412-R21	0.18~0.45	0.7~3.8
			190616-R21	0.30~0.60	1.0~9.0
1RM Roughing 粗加工		CNMG	120408-1RM	0.18~0.48	2.4~6.0
			190612-1RM	0.18~0.45	2.4~8.0
7FM Finishing 精加工		CNGG	120402-7FM	0.08~0.14	0.3~3.0
			120404-7FM	0.08~0.20	0.3~3.0
			120408-7FM	0.08~0.40	0.3~3.0

55° Rhombic (D) Negative
55° 菱形 (D)



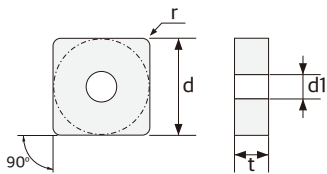
Size 规格	Dimension (mm) / 尺寸		
	d	t	d1
11	9.525	3.18~4.76	3.81
15	12.7	4.76~6.35	5.16

Insert shape / 刀片形状		Designation / 形号		Feed / 进给率 (mm/rev)	Ap / 切削深度 (mm)
F11 Finishing 精加工		DNMG	110402-F11	0.06~0.24	0.12~1.0
			110404-F11	0.06~0.24	0.12~1.0
			150404-F11	0.06~0.24	0.12~1.2
			150408-F11	0.12~0.32	0.12~1.2
			150604-F11	0.06~0.24	0.12~1.2
			150608-F11	0.12~0.32	0.12~1.2
9FN Finishing 精加工		DNMG	150404-9FN	0.10~0.25	0.5~2.5
			150408-9FN	0.15~0.30	0.5~2.5
			150604-9FN	0.10~0.25	0.5~2.5
			150608-9FN	0.15~0.30	0.5~2.5
M11 Medium 半精加工		DNMG	110408-M11	0.12~0.40	0.6~3.0
			150408-M11	0.18~0.30	0.3~2.0
			150412-M11	0.12~0.45	0.6~4.0
			150608-M11	0.12~0.40	0.6~4.0
			150612-M11	0.12~0.45	0.6~4.0
M22 Medium 半精加工		DNMG	150404-M22	0.12~0.25	0.3~2.0
			150408-M22	0.18~0.30	0.3~2.0
			150412-M22	0.25~0.40	0.3~2.0
			150416-M22	0.30~0.45	0.3~2.5
			150604-M22	0.12~0.25	0.3~2.2
			150608-M22	0.18~0.30	0.3~2.2
			150612-M22	0.25~0.40	0.3~2.2
			150616-M22	0.30~0.45	0.3~2.5
R11 Roughing 粗加工		DNMG	150408-R11	0.18~0.45	2.4~4.5
			150412-R11	0.18~0.45	2.4~4.5
			150416-R11	0.15~0.60	2.0~6.0
			150608-R11	0.18~0.45	2.4~4.5
			150612-R11	0.18~0.45	2.4~4.5
			150616-R11	0.15~0.60	2.0~6.0

ISO TURNING INSERT SERIES

ISO车刀片系列

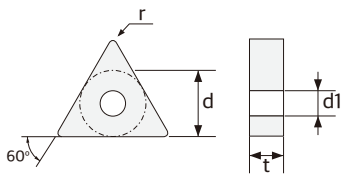
| 90° Square (S) Negative
90° 正方形



Size 规格	Dimension (mm) / 尺寸		
	d	t	d1
09	9.525	3.18	3.81
12	12.7	3.18~4.76	5.16
15	15.875	4.76~6.35	6.35
19	19.05	4.76~6.35	7.93

Insert shape / 刀片形状		Designation / 形号		Feed / 进给率 (mm/rev)	Ap / 切削深度 (mm)
F11 Finishing 精加工		SNMG	090304-F11	0.06~0.20	0.10~1.0
			120404-F11	0.06~0.24	0.12~1.2
			120408-F11	0.12~0.32	0.12~1.2
M11 Medium 半精加工		SNMG	120408-M11	0.12~0.36	0.6~5.0
			120412-M11	0.12~0.45	0.6~5.0
			120416-M11	0.12~0.48	0.6~5.0
			190612-M11	0.15~0.60	0.5~8.0
			190616-M11	0.15~0.63	0.5~8.0
M22 Medium 半精加工		SNMG	120404-M22	0.15~0.40	0.5~4.0
			120408-M22	0.15~0.40	0.5~5.0
M51 Semi Finishing 半精加工		SNMG	090308-M51	0.25~0.40	1.2~4.0
R11 Roughing 粗加工		SNMG	120408-R11	0.18~0.44	2.4~6.0
			120412-R11	0.40~0.60	2.5~5.5
			150612-R11	0.15~0.60	2.0~8.0
			150616-R11	0.15~0.70	2.0~8.0
			190612-R11	0.18~0.48	2.4~5.5
			190616-R11	0.25~0.55	2.4~8.0
			190624-R11	0.30~0.90	2.5~9.0
R21 Roughing 粗加工		SNMG	190612-R21	0.30~0.50	1.0~9.0

60° Triangular (T) Negative
60° 三角形



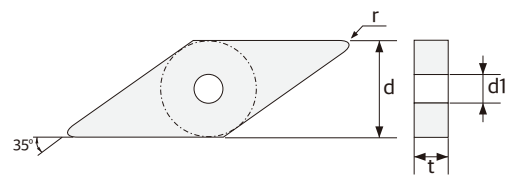
Size 规格	Dimension (mm) / 尺寸		
	d	t	d1
16	9.525	3.18~4.76	3.81
22	12.7	4.76	5.16

Insert shape / 刀片形状		Designation / 形号		Feed / 进给率 (mm/rev)	Ap / 切削深度 (mm)
F11 Finishing 精加工		TNMG	160404-F11	0.06~0.24	0.12~1.2
			160408-F11	0.12~0.32	0.12~1.2
M11 Medium 半精加工		TNMG	160404-M11	0.14~0.35	0.5~3.0
			160408-M11	0.14~0.35	0.5~3.0
			160412-M11	0.16~0.50	0.6~4.0
			220412-M11	0.1~0.5	0.5~6.0
			220416-M11	0.1~0.55	0.5~6.0
M22 Medium 半精加工		TNMG	160402-M22	0.10~0.22	0.3~2.5
			160404-M22	0.10~0.22	0.3~2.5
			160408-M22	0.15~0.30	0.3~2.5
			160412-M22	0.20~0.40	0.3~2.5
			220408-M22	0.2~0.5	0.3~4.0
			220412-M22	0.2~0.5	0.3~4.0
M31 Medium 半精加工		TNMG	160412-M31	0.22~0.50	1.0~4.5
R11 Roughing 粗加工		TNMG	160408-R11	0.18~0.44	2.4~4.3
			160412-R11	0.18~0.45	2.4~4.3
			220412-R11	0.15~0.50	2.0~7.0
			220416-R11	0.15~0.60	2.0~7.0

ISO TURNING INSERT SERIES

ISO车刀片系列

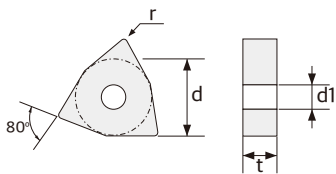
| 35° Rhombic (V) Negative
35° 斜方形



Size 规格	Dimension (mm) / 尺寸		
	d	t	d1
16	9.525	4.76	3.81

Insert shape / 刀片形状		Designation / 形号		Feed / 进给率 (mm/rev)	Ap / 切削深度 (mm)
F11 Finishing 精加工		VNMG	160404-F11	0.06~0.24	0.12~1.2
			160408-F11	0.18~0.40	0.40~3.5
F21 Finishing 精加工		VNMG	160412-F21	0.12~0.25	0.40~2.0
M11 Medium 半精加工		VNMG	160404-M11	0.12~0.32	0.48~3.2
			160408-M11	0.12~0.36	0.60~3.2
M22 Medium 半精加工		VNMG	160402-M22	0.10~0.20	0.10~1.7
			160404-M22	0.10~0.20	0.10~1.7
			160408-M22	0.10~0.20	0.30~1.5
			160412-M22	0.10~0.25	0.50~2.0

| 80° Trigon (W) Negative
80° 六角形



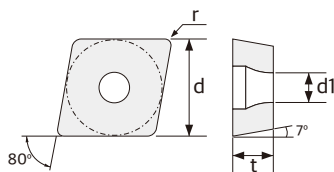
Size 规格	Dimension (mm) / 尺寸		
	d	t	d1
06	9.525	4.76	3.81
08	12.7	4.76	5.16

Insert shape / 刀片形状		Designation / 形号		Feed / 进给率 (mm/rev)	Ap / 切削深度 (mm)
F11 Finishing 精加工		WNMG	060404-F11	0.12~0.25	0.60~2.0
			060408-F11	0.18~0.40	0.60~2.0
			080404-F11	0.12~0.25	0.60~1.6
			080408-F11	0.12~0.32	0.12~1.2
			080412-F11	0.12~0.45	0.12~1.2
M11 Medium 半精加工		WNMG	060408-M11	0.12~0.36	0.60~2.5
			060412-M11	0.12~0.36	0.60~2.5
			080404-M11	0.10~0.30	0.12~1.2
			080408-M11	0.10~0.33	0.12~1.2
			080412-M11	0.12~0.45	0.60~3.2
M21 Medium 半精加工		WNMG	080404-M21	0.15~0.30	0.30~2.5
			080408-M21	0.15~0.30	0.30~2.5
M22 Medium 半精加工		WNMG	080404-M21	0.12~0.30	0.50~3.0
			080408-M22	0.12~0.30	0.50~3.0
			080412-M22	0.15~0.40	0.50~3.0
R11 Roughing 粗加工		WNMG	080408-R11	0.18~0.35	2.40~3.2
			080412-R11	0.18~0.48	2.40~3.2
R21 Roughing 粗加工		WNMG	080408-R21	0.12~0.35	0.60~3.5
			080412-R21	0.12~0.40	0.60~3.5

ISO TURNING INSERT SERIES

ISO车刀片系列

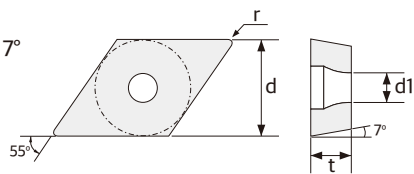
80° Rhombic (C) Positive Relief angle 7°
80° 斜方形主切削刃后角



Size 规格	Dimension (mm) / 尺寸		
	d	t	d1
06	6.35	2.38	2.8
09	9.525	3.97	4.4
12	12.7	4.76	5.5

Insert shape / 刀片形状	Designation / 形号	Feed / 进给率 (mm/rev)	Ap / 切削深度 (mm)
F11 Finishing 精加工	060202-F11	0.05~0.09	0.07~1.35
	060204-F11	0.06~0.15	0.12~1.35
	060208-F11	0.08~0.18	0.16~1.35
	09T302-F11	0.05~0.12	0.10~1.60
	09T304-F11	0.07~0.18	0.13~1.60
	09T308-F11	0.10~0.24	0.18~1.60
	120402-F11	0.06~0.20	0.17~1.92
	120404-F11	0.08~0.22	0.17~1.92
2GF Semi Finishing 半精加工	09T308-2GF	0.08~0.25	0.20~1.20
M11 Medium 半精加工	060204-M11	0.07~0.15	0.24~1.92
	060208-M11	0.10~0.18	0.28~1.92
	09T304-M11	0.10~0.20	0.30~2.50
	09T308-M11	0.12~0.25	0.60~2.50
	09T312-M11	0.12~0.25	0.60~2.50
	120402-M11	0.11~0.22	0.35~3.00
	120404-M11	0.11~0.22	0.35~3.00
	120408-M11	0.15~0.30	0.50~3.00
M51 Semi Finishing 半精加工	060201-M51	0.02~0.10	0.12~1.30
	060202-M51	0.02~0.10	0.12~1.30
	060204-M51	0.10~0.25	0.40~1.60
	09T302-M51	0.03~0.10	0.08~1.30
	09T304-M51	0.10~0.20	0.40~2.00
	09T308-M51	0.14~0.30	0.60~2.40
	120404-M51	0.10~0.20	0.40~3.50

55° Rhombic (D) Positive Relief angle 7°
55° 斜方形主切削刃后角



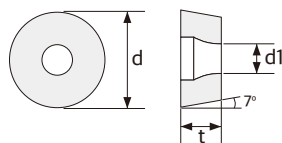
Size 规格	Dimension (mm) / 尺寸		
	d	t	d1
07	6.35	2.38	2.8
11	9.525	3.97	4.4

Insert shape / 刀片形状		Designation / 形号		Feed / 进给率 (mm/rev)	Ap / 切削深度 (mm)
F11 Finishing 精加工		DCMT	070202-F11	0.04~0.10	0.08~1.2
			070204-F11	0.06~0.15	0.10~1.2
			11T302-F11	0.05~0.12	0.10~1.6
			11T304-F11	0.10~0.20	0.13~1.8
			11T308-F11	0.10~0.24	0.18~1.8
M11 Medium 半精加工		DCMT	070204-M11	0.07~0.15	0.23~1.2
			070208-M11	0.10~0.20	0.40~1.2
			11T304-M11	0.10~0.20	0.35~2.2
			11T308-M11	0.12~0.25	0.60~2.5
			11T312-M11	0.14~0.32	0.72~2.2
R11 Roughing 粗加工		DCMT	11T308-R11	0.14~0.28	1.20~3.0
			11T312-R11	0.17~0.35	1.40~3.0
F11 Roughing 粗加工		DCGT	11T304-F11	0.10~0.20	0.40~2.5
M51 Semi Finishing 半精加工		DCGT	070202-M51	0.02~0.10	0.12~1.3
			070204-M51	0.10~0.22	0.60~2.2
			11T301-M51	0.02~0.05	0.12~0.8
			11T302-M51	0.02~0.05	0.12~1.3
			11T304-M51	0.10~0.22	0.40~2.5
			11T308-M51	0.14~0.30	0.40~2.5

ISO TURNING INSERT SERIES

ISO车刀片系列

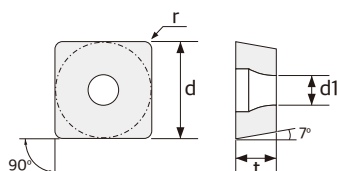
| Round (R) Positive Relief angle 7°
圆形主切削刃后角



Size 规格	Dimension (mm) / 尺寸		
	d	t	d1
08	8	3.18	3.35
10	10	3.18	3.6
12	12	4.76	4.2
16	16	6.35	5.2
19	19	6.35	6.5

Insert shape / 刀片形状		Designation / 形号		Feed / 进给率 (mm/rev)	Ap / 切削深度 (mm)
M21 Medium 半精加工		RCMT	1204M0-M21	0.20~0.40	0.5~4.0
M22 Medium 半精加工		RCMT	0803M0-M22	0.06~0.08	0.3~2.0
			10T3M0-M22	0.08~0.10	0.3~2.2
			1204M0-M22	0.10~0.16	0.5~3.0
			1606M0-M22	0.12~0.16	0.8~4.0
M41 Medium 半精加工		RCMT	190600-M41	0.15~0.65	2.0~8.0

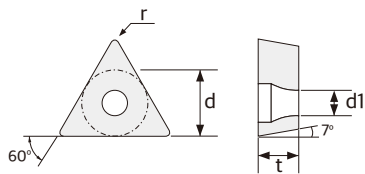
| Square (S) Positive Relief angle 7°
主切削刃后角



Size 规格	Dimension (mm) / 尺寸		
	d	t	d1
09	9.525	3.97	4.4

Insert shape / 刀片形状		Designation / 形号		Feed / 进给率 (mm/rev)	Ap / 切削深度 (mm)
F11 Finishing 精加工		SCMT	09T304-F11	0.07~0.18	0.13~1.6
			09T308-F11	0.10~0.24	0.18~1.6
M11 Medium 半精加工		SCMT	09T304-M11	0.10~0.20	0.28~2.4
			09T308-M11	0.12~0.24	0.60~2.4
			120404-M11	0.15~0.30	0.4~4
			120408-M11	0.15~0.30	0.4~4

60° Triangular (T) Positive Relief angle 7°
六角形主切削刃后角



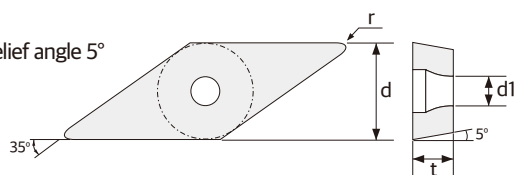
Size 规格	Dimension (mm) / 尺寸		
	d	t	d1
06	3.97	1.98	2.2
09	5.56	2.38	2.5
11	6.35	2.38	2.8
16	9.525	3.97	4.4

Insert shape / 刀片形状		Designation / 形号		Feed / 进给率 (mm/rev)	Ap / 切削深度 (mm)
F11 Finishing 精加工		TCMT	06T101-F11	0.05~0.09	0.07~1.20
			06T102-F11	0.05~0.09	0.07~1.20
			06T104-F11	0.06~0.15	0.10~1.20
			06T108-F11	0.07~0.18	0.13~1.20
			090202-F11	0.05~0.10	0.07~1.35
			090204-F11	0.06~0.15	0.12~1.35
			110202-F11	0.06~0.15	0.12~1.35
			110204-F11	0.06~0.15	0.12~1.35
			110302-F11	0.05~0.10	0.07~1.35
			110304-F11	0.06~0.15	0.12~1.35
			110308-F11	0.08~0.21	0.16~1.35
			16T302-F11	0.05~0.20	0.10~1.80
			16T304-F11	0.08~0.18	0.15~1.60
			16T308-F11	0.10~0.25	0.50~2.50
F51 Finishing 精加工		TCMT	16T308-F51	0.07~0.20	0.25~1.80
M11 Medium 半精加工		TCMT	090204-M11	0.07~0.15	0.23~1.80
			090208-M11	0.10~0.18	0.46~1.80
			110208-M11	0.10~0.18	0.46~1.80
			110308-M11	0.11~0.21	0.50~2.00
			16T304-M11	0.10~0.18	0.30~2.50
			16T312-M11	0.14~0.32	0.80~2.50
M51 Semi Finishing 半精加工		TCMT	16T308-M51	0.14~0.35	0.60~3.50
M51 Semi Finishing 半精加工		TCGT	090202-M51	0.02~0.10	0.10~1.20
			110302-M51	0.02~0.12	0.10~1.50
			110304-M51	0.08~0.23	0.30~2.30
			16T302-M51	0.07~0.17	0.50~2.30
			16T304-M51	0.08~0.18	0.50~2.50
			16T308-M51	0.10~0.23	0.50~2.50

ISO TURNING INSERT SERIES

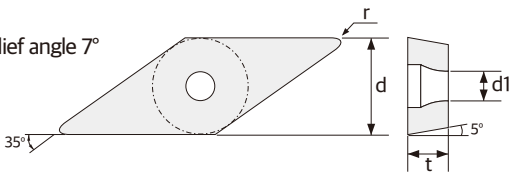
ISO车刀片系列

35° Rhombic (V) Positive Relief angle 5°
35° 斜方形主切削刃后角



Size 规格	Dimension (mm) / 尺寸		
	d	t	d1
11	6.35	3.18	2.8
12	7.5	3.18	2.8
16	9.525	4.76	4.4

Insert shape / 刀片形状		Designation / 形号		Feed / 进给率 (mm/rev)	Ap / 切削深度 (mm)
F11 Finishing 精加工		VBMT	110302-F11	0.05~0.10	0.07~1.35
			110304-F11	0.06~0.15	0.12~1.35
			110308-F11	0.08~0.21	0.16~1.35
			160404-F11	0.06~0.16	0.12~1.45
			160408-F11	0.08~0.22	0.17~1.45
M11 Medium 半精加工		VBMT	110304-M11	0.12~0.20	0.35~2.00
			110308-M11	0.15~0.30	0.50~2.00
			160404-M11	0.08~0.16	0.28~2.20
			160408-M11	0.11~0.22	0.54~2.20
			160412-M11	0.13~0.26	0.65~2.20
R11 Roughing 粗加工		VBMT	160412-R11	0.16~0.30	1.30~2.70
F11 Finishing 精加工		VBGT	110302-F11	0.01~0.08	0.05~1.50
			110304-F11	0.01~0.08	0.05~1.50
			160404-F11	0.06~0.16	0.12~1.45
2FM Finishing 精加工		VBGT	160404-2FM	0.05~0.12	0.20~1.60
			160408-2FM	0.08~0.25	0.20~1.60
			160412-2FM	0.10~0.30	0.20~1.60
9NF Finishing 精加工		VBGT	120302S-9NF	0.01~0.08	0.05~0.50
			120304S-9NF	0.01~0.08	0.05~0.50
			120302K-9NF	0.01~0.08	0.05~0.50
			120304K-9NF	0.01~0.08	0.05~0.50
M51 Semi Finishing 半精加工		VBGT	110302-M51	0.10~0.20	0.40~2.50
			110304-M51	0.10~0.20	0.40~2.50
			160402-M51	0.14~0.30	0.40~3.20
			160404-M51	0.14~0.30	0.40~3.20
			160408-M51	0.14~0.30	0.40~3.20

35° Rhombic (V) Positive Relief angle 7° 35° 斜方形主切削刃后角				<table><tr><th rowspan="2">Size 规格</th><th colspan="3">Dimension (mm) / 尺寸</th></tr><tr><th>d</th><th>t</th><th>d1</th></tr><tr><td>11</td><td>6.35</td><td>3.18</td><td>2.8</td></tr><tr><td>12</td><td>7.5</td><td>3.18</td><td>2.8</td></tr><tr><td>16</td><td>9.525</td><td>4.76</td><td>4.4</td></tr></table>	Size 规格	Dimension (mm) / 尺寸			d	t	d1	11	6.35	3.18	2.8	12	7.5	3.18	2.8	16	9.525	4.76	4.4
Size 规格	Dimension (mm) / 尺寸																						
	d	t	d1																				
11	6.35	3.18	2.8																				
12	7.5	3.18	2.8																				
16	9.525	4.76	4.4																				
Insert shape / 刀片形状		Designation / 形号		Feed / 进给率 (mm/rev)		Ap / 切削深度 (mm)																	
F11 Finishing 精加工 	VCMT	110304-F11	0.06~0.15	0.12~1.5																			
		160404-F11	0.06~0.16	0.12~1.5																			
		160408-F11	0.10~0.22	0.16~1.6																			
M11 Medium 半精加工 	VCMT	110304-M11	0.12~0.20	0.35~2.4																			
M51 Semi Finishing 半精加工 	VCMT	160404-M51	0.10~0.25	0.60~3.2																			
		160408-M51	0.14~0.35	0.60~3.2																			
9NF Finishing 精加工 	VCGT	1203005-9NF	0.01~0.03	0.05~0.5																			
		1203008-9NF	0.01~0.04	0.05~0.5																			
		120301-9NF	0.01~0.05	0.05~0.5																			
		120302S-9NF	0.01~0.08	0.05~0.5																			
		120304S-9NF	0.01~0.08	0.05~0.5																			
		120302K-9NF	0.01~0.08	0.05~0.5																			
		120304K-9NF	0.01~0.08	0.05~0.5																			
		1203CF-9NF	0.10~0.08	0.05~0.5																			
2FM Finishing 精加工 	VCGT	160404-2FM	0.05~0.12	0.20~1.6																			
		160408-2FM	0.08~0.25	0.20~1.6																			
		160412-2FM	0.10~0.30	0.20~1.6																			
M51 Semi Finishing 半精加工 	VCGT	110302-M51	0.02~0.10	0.12~1.3																			
		110304-M51	0.10~0.20	0.40~2.5																			
		160402-M51	0.03~0.10	0.12~1.3																			
		160404-M51	0.10~0.25	0.40~3.2																			
		160408-M51	0.14~0.30	0.40~3.2																			



GROOVING TOOL

槽刀片

"N-MT" SERIES

Applying stable clamping system,
guaranteed high quality and efficiency machining

采用稳定的该系统, 可实现高品质、高效率加工

Grooving inserts & holders

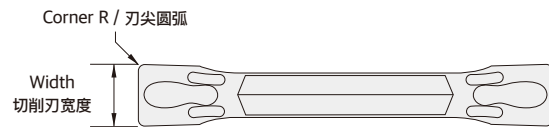
槽刀片&刀杆

1. Stable clamping system for specially designed grooving machining
1. 为特殊设计的槽加工提供稳定的夹紧系统
2. Various machining available (grooving, parting off, turning)
2. 可用各种机械加工(开槽、分型、车削)
3. High quality and high efficiency machining in aerospace and automobile industry
3. 从精加工到粗加工各种几何形状

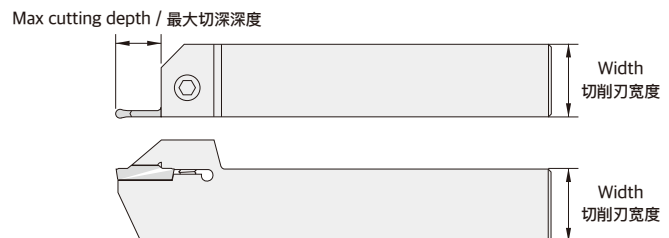
NUMBERING SYSTEM

命名系统

| Numbering system (Insert & holder)
命名系统(槽刀片&刀杆)



INSERT								
2	NG	30	N	-	04	M	-	M1
Number. of corner 切削刃数(2)	Nano grooving Nano 切槽	Width 切削刃宽度 (3.0mm)	Edge shape 切削刃数(2)		Corner R 刃尖圆弧 (0.4mm)	Tolerance 精度级别 (M class)		C/B



HOLDER							
NG	3	E	H	R	2525	-	T11
Nano grooving Nano 切槽	Insert width 刀片宽度	Application 用途 E : External 外径用 I : Internal 内径用	Holder type 刀杆形式 H : Horizontal 水平形(卧式) V : Vertical 垂直形(立式) U : Under cut 底切削	Hand 手柄 L : Left 左 R : Right 右	Shank size 柄径尺寸 (Height / Width 25mm) (高度/宽度 25mm)		Max cutting depth(11mm) 最大切深深度(11mm) 9~30mm

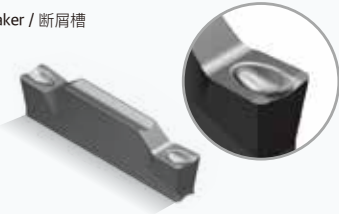
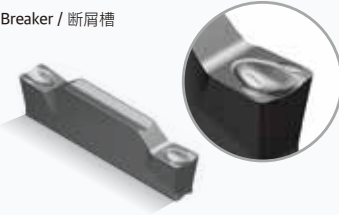
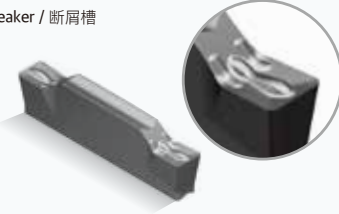
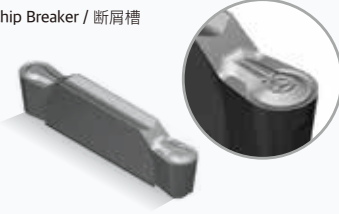
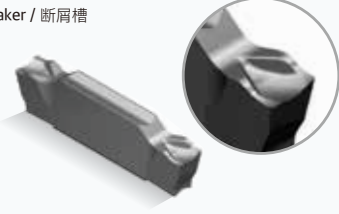
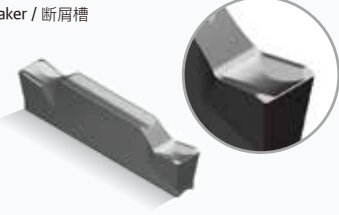
※ Right hand shown / 右手型

GEOMETRY FEATURE

形状特点

"GROOVING TOOL" series

NANOLOY

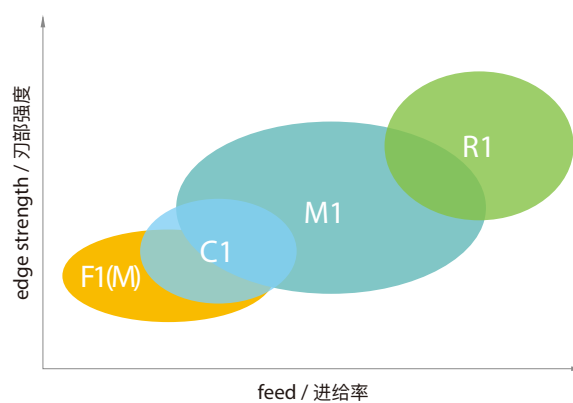
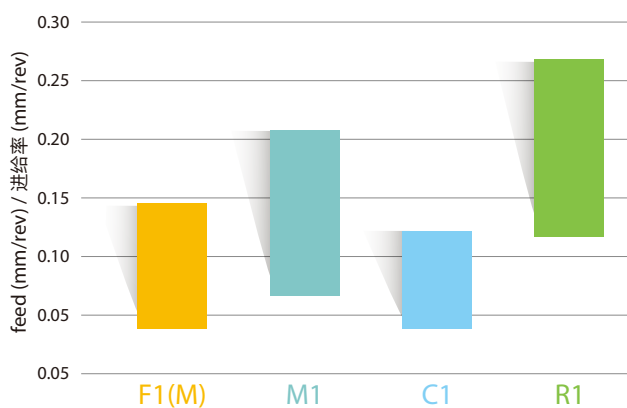
Insert shape / 刀片形状	Machining type 加工方式	Work piece 被加工材料	Features 特点
F1 Chip Breaker / 断屑槽 	Grooving / 切槽	P,M,S Group / P,M,S 系列 M (Mold/冲压级) G (Grind/研磨)	• Sharp edge • 锋利刃线 • Low cutting force • 减少切削力 • Prevent B.U.E • 防止切屑瘤
F1M Chip Breaker / 断屑槽 	Grooving / 切槽 Turning / 切削 Parting off / 切断	P,M,S Group / P,M,S 系列 M (Mold/冲压级) G (Grind/研磨)	• Sharp edge • 锋利刃线 • Enhanced chip control • 容易排屑 • Prevent B.U.E • 防止切屑瘤
M1 Chip Breaker / 断屑槽 	Grooving / 切槽 Turning / 切削 Parting off / 切断	P,M,S Group / P,M,S 系列 M (Mold/冲压级) G (Grind/研磨)	• Multi function • 多样的的应用范围 • Excellent tool life • 优秀的寿命 • Enhanced chip control • 容易排屑
M1(R) Chip Breaker / 断屑槽 	Profiling / 外形加工 Under cut / 底切	P,M,S Group / P,M,S 系列 M (Mold/冲压级) G (Grind/研磨)	• Multi function • 多样的的应用范围 • Excellent tool life • 优秀的寿命 • Enhanced chip control • 容易排屑 • For profiling • 外形加工
C1 Chip Breaker / 断屑槽 	Parting off / 切断	P,M,S Group / P,M,S 系列 G (Grind/研磨)	• Sharp edge • 锋利刃线 • Low cutting force • 减少切削力 • Enhanced chip control • 容易排屑
R1 Chip Breaker / 断屑槽 	Grooving / 切槽 Turning / 切削 Parting off / 切断	P,M,S Group / P,M,S 系列 M (Mold/冲压级)	• High speed machining • 适合高进给加工 • Enhanced edge rigidity • 提升刃部刚性 • Enhanced productivity • 提升产率

MACHINING TYPE BY GEOMETRY

根据刀片形状的应用形式

Insert shape 刀片形状	Application / 应用				
	Grooving / 切槽	Turning / 车削	Parting off / 切断	Profiling / 仿形切削	Under cut / 底切削
F1	●		●		
F1M	●	●	●		
M1	●	●	●		
F1				●	●
M1				●	●
C1			●		
R1	●	●	●		

APPLIED AREA / 应用范围根据断屑槽型



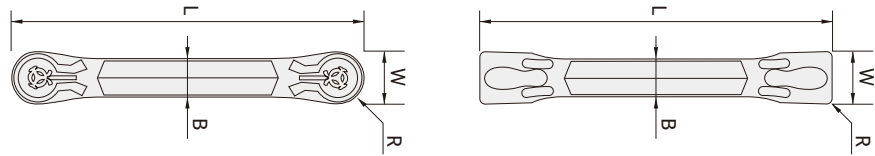
GROOVING INSERT SERIES (M)

GROOVING 槽刀片系列 (M级)

"GROOVING TOOL" series

NANOLOY

Configuration
主要尺寸

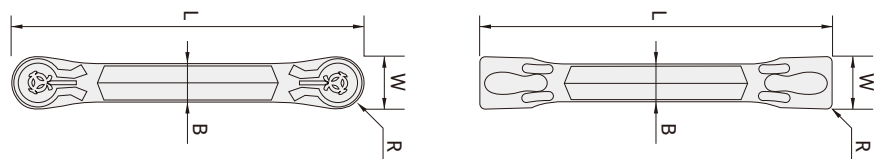


Insert shape / 刀片形状	Designation / 形号	Dimension (mm) / 尺寸				Feed (mm/rev) 进给
		W	L	B	R	
F1	2NG20N-02M-F1	2	20	1.7	0.2	0.03~0.12
	2NG30N-02M-F1	3	20	2.2	0.2	0.05~0.18
	2NG30N-03M-F1	3	20	2.2	0.3	0.05~0.18
	2NG30N-04M-F1	3	20	2.2	0.4	0.05~0.20
	2NG40N-04M-F1	4	20	3.2	0.4	0.05~0.20
	2NG40N-08M-F1	4	20	3.2	0.8	0.05~0.25
	2NG50N-02M-F1	5	25	4	0.2	0.05~0.15
	2NG50N-04M-F1	5	25	4	0.4	0.05~0.20
	2NG50N-08M-F1	5	25	4	0.8	0.05~0.25
M1	2NG20N-02M-M1	2	20	1.7	0.2	0.03~0.12
	2NG30N-02M-M1	3	20	2.2	0.2	0.05~0.20
	2NG30N-04M-M1	3	20	2.2	0.4	0.05~0.25
	2NG40N-02M-M1	4	20	3.2	0.2	0.05~0.20
	2NG40N-04M-M1	4	20	3.2	0.4	0.05~0.25
	2NG40N-08M-M1	4	20	3.2	0.8	0.05~0.27
	2NG50N-02M-M1	5	25	4	0.2	0.05~0.20
	2NG50N-04M-M1	5	25	4	0.4	0.05~0.25
	2NG50N-08M-M1	5	25	4	0.8	0.05~0.30
F1M	2NG60N-08M-M1	6	25	5	0.8	0.05~0.22
	2NG80N-08M-M1	8	30.3	6	0.8	0.05~0.30
	2NG30N-04M-F1M	3	20	2.2	0.4	0.05~0.20
	2NG40N-03M-F1M	4	20	3.2	0.3	0.05~0.18
	2NG40N-04M-F1M	4	20	3.2	0.4	0.05~0.20
	2NG40N-08M-F1M	4	20	3.2	0.8	0.05~0.20
	2NG50N-02M-F1M	5	25	4	0.2	0.05~0.15
	2NG50N-04M-F1M	5	25	4	0.4	0.05~0.20
	2NG50N-08M-F1M	5	25	4	0.8	0.05~0.25
M1	2NG60N-03M-F1M	6	25	5	0.3	0.05~0.20
	2NG30R-15M-M1	3	20	2.2	1.5	0.05~0.20
	2NG40R-20M-M1	4	20	3.2	2	0.05~0.22
	2NG50R-25M-M1	5	25	4	2.5	0.05~0.25
	2NG60R-30M-M1	6	25	5	0.3	0.05~0.27
F1	2NG80R-40M-M1	8	30.3	6	0.4	0.05~0.30
	2NG30R-15M-F1	3	20	2.2	1.5	0.05~0.15
	2NG40R-20M-F1	4	20	3.2	2	0.05~0.20
R1	2NG50R-25M-F1	5	25	4	2.5	0.05~0.22
	2NG20N-02M-R1	2	20	1.7	0.2	0.08~0.15
	2NG30N-02M-R1	3	20	2.2	0.2	0.08~0.20
	2NG40N-03M-R1	4	20	3.2	0.3	0.08~0.22
	2NG50N-03M-R1	5	25	4	0.3	0.08~0.25
	2NG60N-03M-R1	6	25	5	0.3	0.08~0.27
	2NG80N-04M-R1	8	30.3	6	0.4	0.08~0.30

GROOVING INSERT SERIES (G)

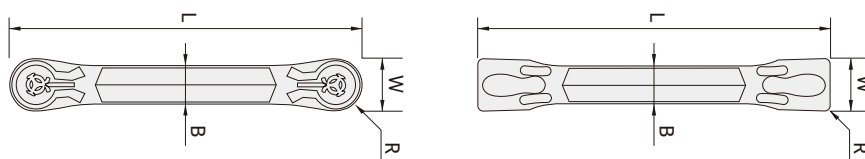
GROOVING 槽刀片系列 (G级)

Configuration
主要尺寸



Insert shape / 刀片形状	Designation / 形号	Dimension (mm) / 尺寸				Feed (mm/rev) 进给
		W	L	B	R	
M1 	2NG20N-02G-M1	3	20	2.2	0.2	0.05~0.20
	2NG20N-03G-M1	3	20	2.2	0.3	0.05~0.20
	2NG20N-04G-M1	3	20	2.2	0.4	0.05~0.20
	2NG30N-02G-M1	3	20	3.2	0.2	0.05~0.25
	2NG30N-03G-M1	3	20	3.2	0.3	0.05~0.25
	2NG30N-04G-M1	3	20	3.2	0.4	0.05~0.25
	2NG40N-02G-M1	4	20	3.2	0.2	0.05~0.25
	2NG40N-03G-M1	4	20	3.2	0.3	0.05~0.25
	2NG40N-04G-M1	4	20	3.2	0.4	0.05~0.25
	2NG40N-06G-M1	4	20	3.2	0.6	0.05~0.25
	2NG40N-08G-M1	4	20	3.2	0.8	0.05~0.30
	2NG50N-02G-M1	5	25	4	0.2	0.05~0.22
	2NG50N-03G-M1	5	25	4	0.3	0.05~0.25
	2NG50N-04G-M1	5	25	4	0.4	0.05~0.25
	2NG50N-06G-M1	5	25	4	0.6	0.05~0.30
	2NG50N-08G-M1	5	25	4	0.8	0.05~0.30
	2NG60N-02G-M1	6	25	5	0.2	0.05~0.25
	2NG60N-03G-M1	6	25	5	0.3	0.05~0.25
	2NG60N-04G-M1	6	25	5	0.4	0.05~0.25
	2NG60N-06G-M1	6	25	5	0.6	0.05~0.30
	2NG60N-08G-M1	6	25	5	0.8	0.05~0.30
	2NG80N-04G-M1	8	30.3	6	0.4	0.05~0.30
	2NG80N-06G-M1	8	30.3	6	0.6	0.05~0.35
	2NG80N-08G-M1	8	30.3	6	0.8	0.05~0.35
F1 	2NG20N-02G-F1	2	20	1.7	0.2	0.03~0.12
	2NG20N-03G-F1	2	20	1.7	0.3	0.05~0.20
	2NG20N-04G-F1	2	20	1.7	0.4	0.05~0.20
	2NG27N-08G-F1	2.7	20	2.2	0.8	0.05~0.25
	2NG30N-02G-F1	3	20	2.2	0.2	0.05~0.20
	2NG30N-03G-F1	3	20	2.2	0.3	0.05~0.20
	2NG30N-04G-F1	3	20	2.2	0.4	0.05~0.20
	2NG30N-06G-F1	3	20	2.2	0.6	0.05~0.25
	2NG30N-08G-F1	3	20	2.2	0.8	0.05~0.25
	2NG40N-02G-F1	4	20	3.2	0.2	0.05~0.20
	2NG40N-03G-F1	4	20	3.2	0.3	0.05~0.20
	2NG40N-04G-F1	4	20	3.2	0.4	0.05~0.20
	2NG40N-06G-F1	4	20	3.2	0.6	0.05~0.25
	2NG40N-08G-F1	4	20	3.2	0.8	0.05~0.25
	2NG50N-02G-F1	5	25	4	0.2	0.05~0.20
	2NG50N-03G-F1	5	25	4	0.3	0.05~0.22
	2NG50N-04G-F1	5	25	4	0.4	0.05~0.22
	2NG50N-06G-F1	5	25	4	0.6	0.05~0.25
	2NG50N-08G-F1	5	25	4	0.8	0.05~0.25
	2NG60N-02G-F1	6	25	5	0.2	0.03~0.12
	2NG60N-03G-F1	6	25	5	0.3	0.05~0.20
	2NG60N-04G-F1	6	25	5	0.4	0.05~0.20
	2NG60N-06G-F1	6	25	5	0.6	0.05~0.25
	2NG60N-08G-F1	6	25	5	0.8	0.05~0.25
	2NG80N-04G-F1	8	30.3	6	0.4	0.05~0.20
	2NG80N-06G-F1	8	30.3	6	0.6	0.05~0.25
	2NG80N-08G-F1	8	30.3	6	0.8	0.05~0.25
	2NG80N-12G-F1	8	30.3	6	1.2	0.05~0.30

Configuration
主要尺寸

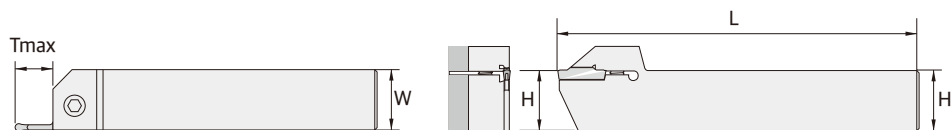


Insert shape / 刀片形状	Designation / 形号	Dimension (mm) / 尺寸				Feed (mm/rev) 进给
		W	L	B	R	
F1M 	2NG30N-02G-F1M	3	20	2.2	0.2	0.05~0.18
	2NG30N-03G-F1M	3	20	2.2	0.3	0.05~0.20
	2NG30N-04G-F1M	3	20	2.2	0.4	0.05~0.20
	2NG30N-06G-F1M	3	20	2.2	0.6	0.05~0.22
	2NG30N-08G-F1M	3	20	2.2	0.8	0.05~0.22
	2NG40N-02G-F1M	4	20	3.2	0.2	0.05~0.18
	2NG40N-03G-F1M	4	20	3.2	0.3	0.05~0.20
	2NG40N-04G-F1M	4	20	3.2	0.4	0.05~0.20
	2NG40N-06G-F1M	4	20	3.2	0.6	0.05~0.22
	2NG40N-08G-F1M	4	20	3.2	0.8	0.05~0.22
	2NG50N-02G-F1M	5	25	4	0.2	0.03~0.12
	2NG50N-03G-F1M	5	25	4	0.3	0.05~0.20
	2NG50N-04G-F1M	5	25	4	0.4	0.05~0.20
	2NG50N-06G-F1M	5	25	4	0.6	0.05~0.25
	2NG50N-08G-F1M	5	25	4	0.8	0.05~0.25
M1 	2NG20R-10G-M1	2	20	1.7	1	0.03~0.15
	2NG30R-15G-M1	3	20	2.2	1.5	0.05~0.20
	2NG40R-20G-M1	4	20	3.2	2	0.05~0.22
	2NG50R-25G-M1	5	25	4	2.5	0.05~0.25
	2NG60R-30G-M1	6	25	5	3	0.05~0.25
	2NG80R-40G-M1	8	30.3	6	4	0.05~0.30
F1 	2NG30R-15G-F1	3	20	2.2	1.5	0.05~0.15
	2NG40R-20G-F1	4	20	3.2	2	0.05~0.20
	2NG50R-25G-F1	5	25	4	2.5	0.05~0.22
C1 	2NG20C-02G-L/Ra-C1	2	20	1.7	0.2	0.03~0.12
	2NG20C-03G-L/Ra-C1	2	20	1.7	0.3	0.03~0.15
	2NG20C-04G-L/Ra-C1	2	20	1.7	0.4	0.03~0.20
	2NG30C-02G-L/Ra-C1	3	20	2.2	0.2	0.03~0.15
	2NG30C-03G-L/Ra-C1	3	20	2.2	0.3	0.03~0.18
	2NG30C-04G-L/Ra-C1	3	20	2.2	0.4	0.03~0.20

GROOVING TOOL HOLDER SERIES

GROOVING 槽刀片刀杆系列

Configuration
主要尺寸

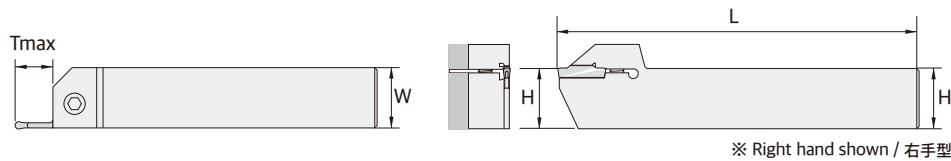


※ Right hand shown / 右手型

Application / 应用	Designation / 形号	Dimension (mm) / 尺寸				
		Insert width / 刀片宽度	H	W	L	Tmax
External holder 外径刀杆	NG2EHR/L2020-T09	2	20	20	125	9
	NG2EHR/L2020-T13		20	20	125	13
	NG2EHR/L2020-T15		20	20	125	15
	NG2EHR/L2525-T09		25	25	150	9
	NG2EHR/L2525-T13		25	25	150	13
	NG2EHR/L2525-T15		25	25	150	15
	NG2EHR/L2525-T17		25	25	150	17
	NG2EHR/L3225-T09		32	25	150	9
	NG2EHR/L3225-T13		32	25	150	13
	NG2EHR/L3225-T15		32	25	150	15
	NG2EHR/L3225-T17		32	25	150	17
	NG3EHR/L2020-T09	3	20	20	120	9
	NG3EHR/L2020-T11		20	20	120	11
	NG3EHR/L2020-T13		20	20	120	13
	NG3EHR/L2020-T15		20	20	120	15
	NG3EHR/L2020-T17		20	20	120	17
	NG3EHR/L2020-T20		20	20	120	20
	NG3EHR/L2525-T09		25	25	150	9
	NG3EHR/L2525-T11		25	25	150	11
	NG3EHR/L2525-T13		25	25	150	13
	NG3EHR/L2525-T15		25	25	150	15
	NG3EHR/L2525-T17		25	25	150	17
	NG3EHR/L2525-T20		25	25	150	20
	NG3EHR/L3225-T09		32	25	150	9
	NG3EHR/L3225-T11		32	25	150	11
	NG3EHR/L3225-T13		32	25	150	13
	NG3EHR/L3225-T15		32	25	150	15
	NG3EHR/L3225-T17		32	25	150	17
	NG3EHR/L3225-T20		32	25	150	20
	NG3EHR/L3232-T09		32	32	150	9
	NG3EHR/L3232-T11		32	32	150	11
	NG3EHR/L3232-T13		32	32	150	13
	NG3EHR/L3232-T15		32	32	150	15
	NG3EHR/L3232-T17		32	32	150	17
	NG3EHR/L3232-T20		32	32	150	20
	NG4EHR/L2020-T09	4	20	20	125	9
	NG4EHR/L2020-T11		20	20	125	11
	NG4EHR/L2020-T13		20	20	125	13
	NG4EHR/L2020-T15		20	20	125	15
	NG4EHR/L2525-T09		25	25	150	9
	NG4EHR/L2525-T11		25	25	150	11
	NG4EHR/L2525-T13		25	25	150	13
	NG4EHR/L2525-T15		25	25	150	15
	NG4EHR/L3225-T09		32	25	150	9
	NG4EHR/L3225-T11		32	25	150	11
	NG4EHR/L3225-T13		32	25	150	13
	NG4EHR/L3225-T15		32	25	150	15
	NG4EHR/L3225-T17		32	25	150	17
	NG4EHR/L3225-T20		32	25	150	20

*Holder is possibly designed by customer order / 订购

Configuration
主要尺寸



Application / 应用	Designation / 形号	Dimension (mm) / 尺寸				
		Insert width / 刀片宽度	H	W	L	Tmax
External holder 外径刀杆	NG5EHR/L2525-T15	5	25	25	150	15
	NG5EHR/L2525-T20		25	25	150	20
	NG5EHR/L3225-T15		32	25	150	15
	NG5EHR/L3225-T20		32	25	150	20
	NG5EHR/L3225-T25		32	25	150	25
	NG5EHR/L3232-T15		32	32	170	15
	NG5EHR/L3232-T20		32	32	170	20
	NG5EHR/L3232-T25		32	32	170	25
	NG6EHR/L2525-T15	6	25	25	150	15
	NG6EHR/L2525-T20		25	25	150	20
	NG6EHR/L2525-T25		25	25	150	25
	NG6EHR/L3225-T15		32	25	150	15
	NG6EHR/L3225-T20		32	25	150	20
	NG6EHR/L3225-T25		32	25	150	25
	NG6EHR/L3232-T15		32	32	170	15
	NG6EHR/L3232-T20		32	32	170	20
	NG6EHR/L3232-T25		32	32	170	25
	NG8EHR/L3225-T15	8	32	25	170	15
	NG8EHR/L3225-T20		32	25	170	20
	NG8EHR/L3225-T25		32	25	170	25
	NG8EHR/L3225-T30		32	25	170	30
	NG8EHR/L3232-T15		32	32	170	15
	NG8EHR/L3232-T20		32	32	170	20
	NG8EHR/L3232-T25		32	32	170	25
	NG8EHR/L3232-T30		32	32	170	30
	NG8EHR/L3232-T32		32	32	170	32

*Holder is possibly designed by customer order / 订购

DRILL INSERTS

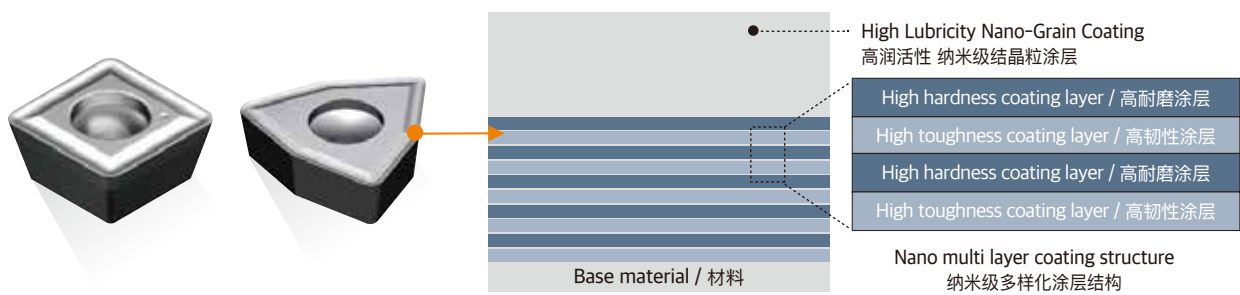
钻刀片

Features / 特点

- Suitable for drilling Steel(Carbon, Alloy Steel, etc.) and Stainless Steel / 适合钻孔加工钢料（碳钢,合金钢等）和不锈钢
- Reasonable price to reduce cost / 合理的价格为减少加工费用
- Applied independent Nano coating for optimal performance / 采用独自涂层为确保产品性能

High Lubricity Nano multilayer coating / 采用高润滑纳米涂层

Smooth evacuation of chips, prevention of breakage due to built-up edge, and secure machinability
确保稳定的排屑和防止积屑瘤

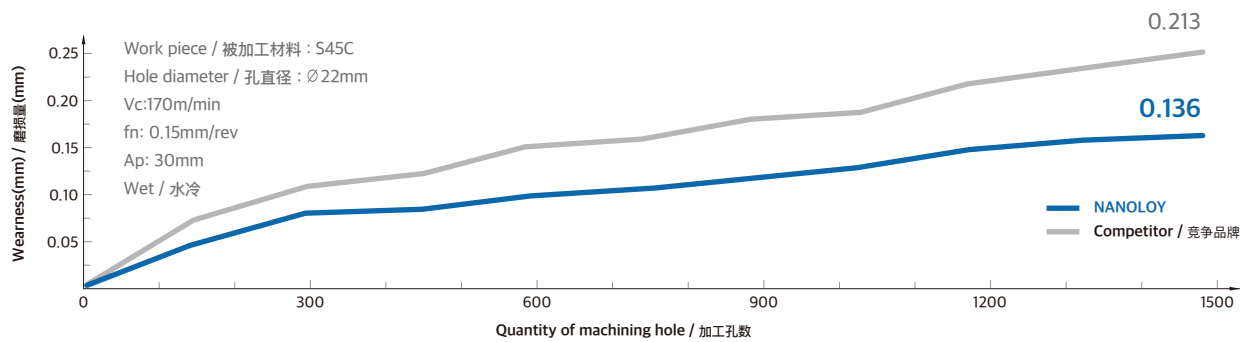


Drill insert test report / 钻刀片测试报告

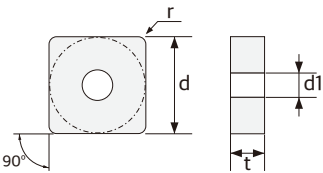
Item code / 产品型号	SPMT060204-ND1 NS4145	Nanology198hole Competitor88hole 120%
Workpiece / 被加工材料	SUS316L	
Type / 加工方式	CNC Milling, Ø16 Drilling, wet / CNC 铣削, Ø16钻孔, 湿式加工	
Item code / 产品型号	vc200m/min fn0.12mm/rev ap30mm	
Division / 区分	NANOLOY	Competitor / 竞争对手
Image / 照片		

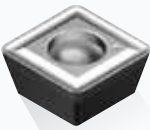
Nano Multi Layer Coating / 加工上主力降低, 防止突发破损

Relieves machining stress and prevents rapid breakage / 加工1,500个孔后磨损量比较

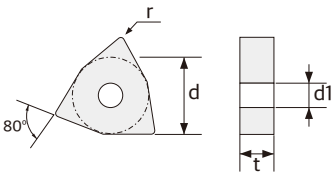


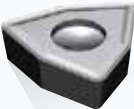
Configuration
主要尺寸



Insert shape / 刀片形状	Designation / 形号	Dimension (mm) / 尺寸				
		D	t	r	d1	d2
S - TYPE 	SPMT050204-ND1	5.0	2.38	0.4	2.27	2.9
	SPMT060204-ND1	6.0	2.38	0.4	2.61	3.47
	SPMT07T308-ND1	7.94	3.97	0.8	2.78	3.97
	SPMT090408-ND1	9.8	4.3	0.8	4.0	5.7
	SPMT090412-ND1	9.8	4.3	1.2	4.0	5.7
	SPMT110408-ND1	11.5	4.8	0.8	4.45	6.2
	SPMT140512-ND1	14.3	5.2	1.2	5.75	7.65

Configuration
主要尺寸



Insert shape / 刀片形状	Designation / 形号	Dimension (mm) / 尺寸				
		D	t	r	d1	d2
W - TYPE 	WCMT03T104-ND1	4.76	1.98	0.4	2.15	3.08
	WCMT030204-ND1	5.56	2.38	0.4	2.8	3.75
	WCMT030204-ND2	5.56	2.38	0.4	2.55	3.6
	WCMT030208-ND1	5.56	2.38	0.8	2.8	3.75
	WCMT030208-ND2	5.56	2.38	0.8	2.55	3.6
	WCMT040204-ND1	6.35	2.38	0.4	3.0	4.4
	WCMT040204-ND2	6.35	2.38	0.4	2.8	4.1
	WCMT040208-ND1	6.35	2.38	0.8	3.0	4.4
	WCMT050308-ND1	7.94	3.18	0.8	3.4	4.55
	WCMT06T308-ND1	9.525	3.97	0.8	3.8	5.35
	WCMT080412-ND1	12.7	4.76	1.2	4.4	6.35



INDEXABLE END MILL

可转位性面铣球刀片

"N-IB/IR" SERIES

Indexable end mill series for hardened materials
of mold steel machining

高硬度模具钢材料加工可转位铣刀片系列

1. New coating layer with nano grade
: specially designed for mold steel machining
1. 采用NANOLOY
超微符合粉末材料以及新型纳米级涂层适合加工高硬度钢材料
2. Excellent performance with optimal geometry
2. 具有最佳几何结构的卓越性能
3. Wide range of machining application
: various geometries and specification3
3. 拥有多种形状, 可适用于宽阔的加工领域

“N-IB/IR” INDEXABLE ENDMILL INSERTS

“N-IB/IR” 高硬度模具钢专用可转位铣刀片

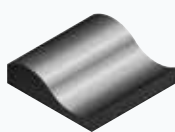
| Features / 特点

Excellent tool life for high hardened materials machining with superior NANO ultrafine grade

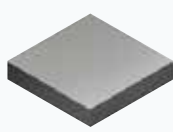
采用了NANOLOY超微粒材料提高耐磨性适合加工高硬度材料

1. High precision in R (ball type : ± 0.01 / corner R type : ± 0.015) / 高精密度,刀片安装R精度
2. Wide range of applications with various geometries and specifications / 拥有多种形状,可适用于宽阔的加工领域
3. Excellent quality and performance for mold and parts machining / 确保模具及配件加工的卓越性能和质量

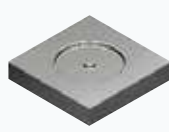
APPLICATION / 应用



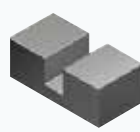
Profiling
仿形铣



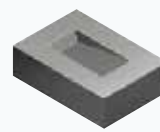
Face milling
面铣



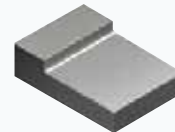
Helical milling
螺旋铣



Slotting
开槽



Ramping
线性坡走铣



Shouldering
侧铣

CLAMPING PROCEDURE / 装配顺序



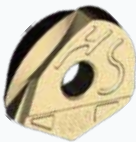
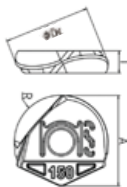
- ① Cleaning the clamping area. (Use air blow)
清扫刀片座, 通过气冷等方法清扫刀片座面
- ② Inserts the engraving side of indexable endmills insert to be forward into the holder and tighten the screw.
将刀片的数字面标记对准刀具本体 的螺钉紧固侧, 插入刀片
- ③ Tighten the screw using the torque wrench at a given torque.
Don't push the insert during tightening.
用专用扳手紧固高精度螺钉, 此时请无按压刀片
- ④ Clamping complete
紧固结束

※ Follow this procedure for optimal precision / 请根据如下夹紧为最佳精度

ITEM CODE / 型号		CLAMPING TORQUE / 夹紧扭矩 (N·M)
BALL TYPE / 球形	CORNER RADIUS TYPE / 圆鼻型	
NBGT-XX-5R	JRGT-HS-100(110)-Rx.x	1.8
NBGT-XX-6R	JRGT-HS-120(130)-Rx.x	3.7
NBGT-XX-8R	JRGT-HS-160(170)-Rx.x	3.7
NBGT-XX-10R	JRGT-HS-200(210)-Rx.x	3.8
NBGT-XX-12.5R	JRGT-HS-250(260)-Rx.x	5.2
NBGT-XX-15R	JRGT-HS-300-Rx.x	5.7

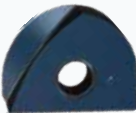
N-IB SERIES (BALL TYPE)

N-IB 系列 (球头刀片)

SHAPE 形状	ITEM CODE 型号	SPECIFICATION / 规格				Configuration 主要尺寸
		R	ØDc	A	T	
	NBGT-NHS-5R/5.5R	5.0/5.5	10.0/11.0	12.2/12.0	2.7	
	NBGT-NHS-6R/6.5R	6.0/6.5	12.0/13.0	14.6	3.2	
	NBGT-NHS-8R/8.5R	8.0/8.5	16.0/17	16.6/17.1	4.2	
	NBGT-NHS-10R/10.5R	10.0/10.5	20.0/21.0	20.3/20.8	5.2	
	NBGT-NHS-12.5R	12.5	25.0	24.1	6.2	
	NBGT-NHS-13R	13.0	26.0	24.6	6.2	
	NBGT-NHS-15R	15.0	30.0	29.2	7.2	
	NBGT-NHS-16R	16.0	32.0	30.2	7.2	

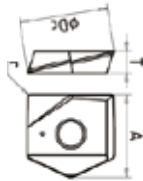
N-IB SERIES (BALL TYPE)

N-IB 系列 (球头刀片)

SHAPE 形状	ITEM CODE 型号	SPECIFICATION / 规格				Configuration 主要尺寸
		R	ØDc	A	T	
	HBGT-HS-5R	5.0	10.0	8.5	2.3	
	HBGT-HS-6R	6.0	12.0	10.0	3.0	
	HBGT-HS-8R	8.0	16.0	12.0	4.0	
	HBGT-HS-10R	10.0	20.0	15.0	5.0	
	HBGT-HS-12.5R	12.5	25.0	18.5	6.0	
	HBGT-HS-15R	15.0	30.0	22.5	7.0	

N-IR SERIES (CORNER RADIUS TYPE)

N-IR 系列 (圆鼻刀片)

SHAPE 形状	ITEM CODE 型号	SPECIFICATION / 规格				Configuration 主要尺寸
		R	ØDc	A	T	
	JRGT-HS-100-R0.5	0.5	10	12	2.7	
	JRGT-HS-100-R1.0	1.0	10	12	2.7	
	JRGT-HS-110-R0.5	0.5	11	12.1	2.7	
	JRGT-HS-110-R1.0	1.0	11	12.1	2.7	
	JRGT-HS-120-R0.5	0.5	12	14.6	3.2	
	JRGT-HS-120-R1.0	1.0	12	14.6	3.2	
	JRGT-HS-130-R0.5	0.5	13	14.6	3.2	
	JRGT-HS-130-R1.0	1.0	13	14.6	3.2	
	JRGT-HS-160-R0.5	0.5	16	16.6	4.2	
	JRGT-HS-160-R1.0	1.0	16	16.6	4.2	
	JRGT-HS-170-R0.5	0.5	17	16.4	4.2	
	JRGT-HS-170-R1.0	1.0	17	16.4	4.2	
	JRGT-HS-200-R0.5	0.5	20	19.8	5.2	
	JRGT-HS-200-R1.0	1.0	20	19.8	5.2	
	JRGT-HS-210-R0.5	0.5	21	19.8	5.2	
	JRGT-HS-210-R1.0	1.0	21	19.8	5.2	
	JRGT-HS-250-R0.5	0.5	25	22.55	6.1	
	JRGT-HS-250-R1.0	1.0	25	22.55	6.1	
	JRGT-HS-250-R2.0	2.0	25	22.55	6.1	
	JRGT-HS-260-R0.5	0.5	26	22.6	6.2	
	JRGT-HS-260-R1.0	1.0	26	22.6	6.2	
	JRGT-HS-300-R0.5	0.5	30	27.2	7.2	
	JRGT-HS-300-R1.0	1.0	30	27.2	7.2	

“N-IB/IR” HOLDER

“N-IB/IR” 刀杆

- | Steel type and cemented carbide type / 钢种类和钨钢种类的刀杆
- | Both ball and corner R inserts are available / 求刀片和圆弧刀片都能受用



ITEM CODE		OD	SD	OAL	SCREW	WRENCH
型号		直径	柄径	全长	螺钉	扳手
NMC (CARBIDE/钨钢)	100 10 145	10	10	2.5	TPM35082	T10-T
	100 10 200	10	10	2.5		
	120 12 155	12	12	2.5	TPM50098	T20-T
	120 12 200	12	12	3		
	160 16 200	16	16	3	TPM50136	
	160 16 250	16	16	3		
	200 20 220	20	20	3	TPM60168	T25-T
	200 20 250	20	20	3		
	200 20 300	20	20	3		
	250 25 250	25	25	3	TPM60219	T30-T
	250 25 300	25	25	3		
	300 30 300	30	30	3	TPM80251	
	300 30 350	30	30	3		
	NMS (STEEL/钢)	160 16 220	16	16	3	TPM50136
160 16 250		16	16	4		
200 20 220		20	20	4	TPM60168	T25-T
200 20 250		20	20	4		
250 25 220		25	25	4	TPM60219	T30-T
250 25 250		25	25	4		
250 25 300		25	25	4		
300 32 220		30	30	4	TPM80251	
300 32 250		30	30	4		
300 32 300		30	30	5		
300 32 350		30	30	5		
300 32 400		30	30	6		

RECOMMENDED CUTTING CONDITION

推荐加工参数

"INDEXABLE END MILL" series | **NANOLOY**

| N-IB SERIES (BALL TYPE) / N-IB 系列 (球头刀片)
[HARDED STEEL (HRC 45~63) / 高硬度钢 (HRC 45~63)]

H	Hardness 硬度	Cutting condition TEST 参数条件	5R		6R		8R		10R		12.5R		15R	
			Semi Finishing 半精加工	Finishing 精加工	Semi Finishing 半精加工	Finishing 精加工	Semi Finishing 半精加工	Finishing 精加工	Semi Finishing 半精加工	Finishing 精加工	Semi Finishing 半精加工	Finishing 精加工	Semi Finishing 半精加工	Finishing 精加工
HRC 45~55	vc (m/min)		100~210	260	100~200	290	100~150	350	100~150	400	100~150	450	100~150	500
	fz (mm/t)		0.10~0.20	0.2	0.10~0.20	0.2	0.12~0.24	0.3	0.12~0.24	0.4	0.12~0.24	0.5	0.12~0.24	0.6
	ap (mm)		0.15~0.25	0.1	0.20~0.30	0.1	0.60~0.80	0.1	0.70~1.00	0.1	0.90~1.25	0.1	1.10~1.60	0.1
	ae (mm)		0.80~1.00	0.25	0.90~1.20	0.3	1.10~1.60	0.3	1.50~2.00	0.4	1.80~2.50	0.5	2.40~3.20	0.6
HRC 55~63	vc (m/min)		80~170	200	80~160	230	80~200	280	80~120	320	80~120	360	80~120	400
	fz (mm/t)		0.10~0.20	0.2	0.10~0.20	0.2	0.12~0.24	0.3	0.12~0.24	0.4	0.12~0.24	0.5	0.12~0.24	0.6
	ap (mm)		0.15~0.25	0.1	0.20~0.30	0.1	0.60~0.80	0.1	0.70~1.00	0.1	0.90~1.25	0.1	1.10~1.60	0.1
	ae (mm)		0.80~1.00	0.25	0.90~1.20	0.3	1.10~1.60	0.3	1.50~2.00	0.4	1.80~2.50	0.5	2.40~3.20	0.6

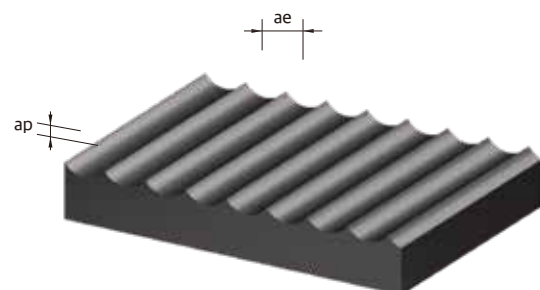
※Caution / 备注

- Using suitable coolant for the cutting materials and machining types
按照被加工材料和加工条件, 请使用适当的冷却液
- Conditions shown in above table are general guidance.
Adjust the parameters by the user's processing conditions.
表上推荐的加工条件是参考用, 请按照贵司的条件来调整参数
- Tools are possible to damaged during machining
Please follow the safety caution (safety glasses, cover, shoes, etc)
加工时工具可能会受伤, 为了安全请戴保护装备 (安全眼镜, 鞋子等等)

Overhang	vc (m/min)	fz (mm/t)
0~3D	100%	100%
3D~5D	70%	70%
5D~8D	60%	60%
8D~10D	50%	50%

※ If overhang length is 3 times over than diameter,
Please adjust the speed and feed condition lower
to use shown in right table

※ 如果悬伸比外径大于3倍的话, 请减速和减进给率, 如图所示



RECOMMENDED CUTTING CONDITION

推荐加工参数

| N-IR SERIES (CORNER RADIUS TYPE) / N-IR 系列 (圆鼻刀片)

[HARDED STEEL (HRC 45~63) / 高硬度钢 (HRC 45~63)]

H	Hardness 硬度	Cutting condition TEST 参数条件	Φ10		Φ11		Φ12		Φ13		Φ16		Φ17	
			Semi Finishing 半精加工	Finishing 精加工	Semi Finishing 半精加工	Finishing 精加工	Semi Finishing 半精加工	Finishing 精加工	Semi Finishing 半精加工	Finishing 精加工	Semi Finishing 半精加工	Finishing 精加工	Semi Finishing 半精加工	Finishing 精加工
H	HRC 45~55	vc (m/min)	100~280	280	110~310	310	100~280	280	110~300	300	100~280	280	110~300	300
		fz (mm/t)	0.05~0.10	0.05	0.05~0.10	0.05	0.05~0.10	0.05	0.05~0.10	0.05	0.06~0.12	0.06	0.06~0.12	0.06
		ap (mm)	0.25	0.1	0.25	0.1	0.3	0.1	0.3	0.1	0.8	0.2	0.8	0.2
		ae (mm)	0.25~1.00	0.2	0.25~1.00	0.2	0.30~1.20	0.2	0.30~1.20	0.2	0.80~1.60	0.2	0.80~1.60	0.2
H	HRC 55~63	vc (m/min)	80~220	220	90~240	240	80~220	220	90~240	240	80~220	220	80~230	230
		fz (mm/t)	0.05~0.10	0.05	0.05~0.10	0.05	0.05~0.10	0.05	0.05~0.10	0.05	0.06~0.12	0.06	0.06~0.13	0.06
		ap (mm)	0.25	0.1	0.25	0.1	0.3	0.1	0.3	0.1	0.8	0.2	0.8	0.2
		ae (mm)	0.25~1.00	0.2	0.25~1.00	0.2	0.30~1.20	0.2	0.30~1.20	0.2	0.80~1.60	0.2	0.80~1.60	0.2

H	Hardness 硬度	Cutting condition TEST 参数条件	Φ20		Φ21		Φ25		Φ26		Φ30	
			Semi Finishing 半精加工	Finishing 精加工	Semi Finishing 半精加工	Finishing 精加工	Semi Finishing 半精加工	Finishing 精加工	Semi Finishing 半精加工	Finishing 精加工	Semi Finishing 半精加工	Finishing 精加工
H	HRC 45~55	vc (m/min)	100~280	280	100~290	290	100~280	280	100~290	290	100~280	280
		fz (mm/t)	0.06~0.12	0.06	0.06~0.13	0.06	0.06~0.12	0.06	0.06~0.12	0.06	0.06~0.12	0.06
		ap (mm)	1.0	0.2	1.0	0.2	1.25	0.2	1.25	0.2	1.6	0.2
		ae (mm)	1.00~2.00	0.2	1.00~2.00	0.2	1.25~2.50	0.2	1.25~2.50	0.2	1.60~3.20	0.2
H	HRC 55~63	vc (m/min)	80~220	220	80~230	230	80~220	220	80~230	230	80~220	220
		fz (mm/t)	0.06~0.12	0.06	0.06~0.12	0.06	0.06~0.12	0.06	0.06~0.12	0.06	0.06~0.12	0.06
		ap (mm)	1.0	0.2	1.0	0.2	1.25	0.2	1.25	0.2	1.6	0.2
		ae (mm)	1.00~2.00	0.2	1.00~2.00	0.2	1.25~2.50	0.2	1.25~2.50	0.2	1.60~3.20	0.2

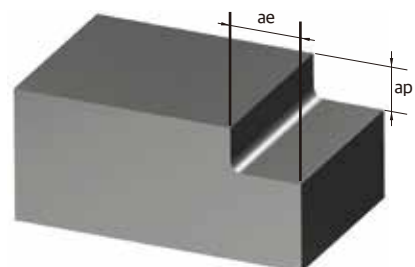
※Caution / 备注

- Using suitable coolant for the cutting materials and machining types
按照被加工材料和加工条件, 请使用适当的冷却液
- Conditions shown in above table are general guidance.
Adjust the parameters by the user's processing conditions.
表上推荐的加工条件是参考用, 请按照贵司的条件来调整参数
- Tools are possible to damaged during machining
Please follow the safety caution (safety glasses, cover, shoes, etc)
加工时工具可能会受伤, 为了安全请戴保护装备 (安全眼镜, 鞋子等等)

※ If overhang length is 3 times over than diameter,
Please adjust the speed and feed condition lower
to use shown in right table

※ 如果悬伸比外径大于3倍的话, 请减速和减进给率, 如图所示

Overhang	vc (m/min)	fz (mm/t)
0~3D	100%	100%
3D~5D	70%	70%
5D~8D	60%	60%
8D~10D	50%	50%



航空行业实地测试结果

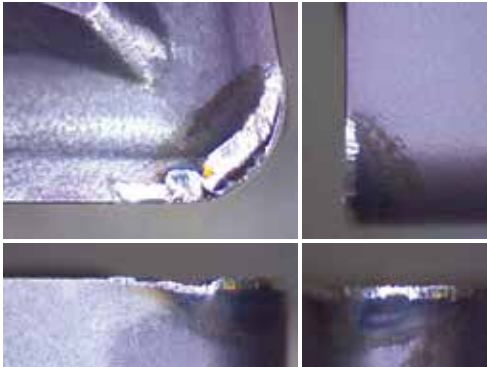
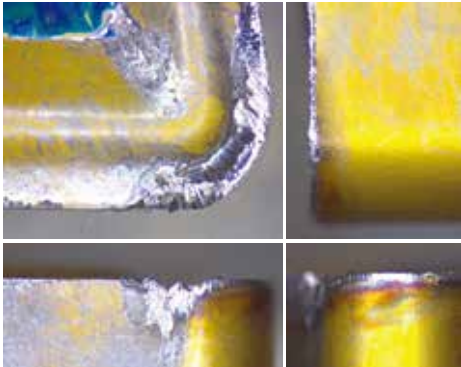
Results of user test in aerospace industry



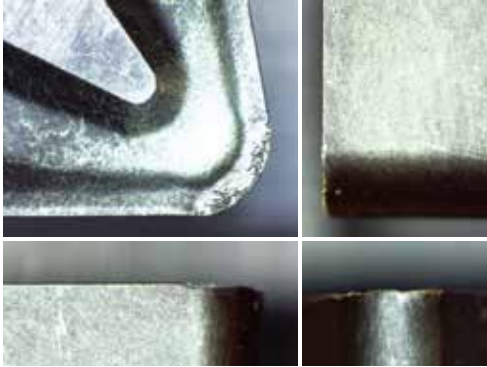
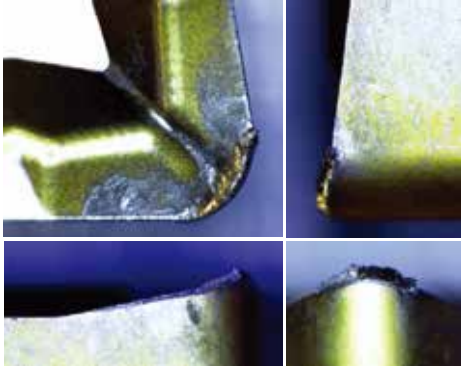
Results of user test in aerospace industry

航空行业实地测试结果

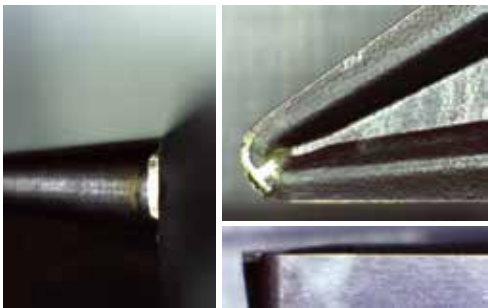
User test (aerospace_TC) / NANOLOY测试成功案例 (航空行业_A社)		Turning (ISO) / ISO车刀片	S grade (HRSA) / S系列(难切削材料)
Workpiece name / 被加工材料名称	Aerospace parts / 飞机部暑品 (CASE, HPT STTR)	Workpiece material/ 被加工材料	Inconel 718 / 镍合金 718
Machining type / TEST摘要	Ring shape housing / Vertical lathe (Inner dia roughing) / Wet / 圆形形状/ 立式车床加工(内径粗加工) / 湿式加工		
Cutting condition / TEST参数条件	max dia 600mm vc 60~80m/min fn 0.25mm/rev ap ~1.1mm / 被加工材料直径600mm 速度 60-80m/min 进给 0.25mm/rev 切削深度 ~1.1mm		
Item / 产品型号	WNMG080412-M22 NV3025		

Division / 区分	NANOLOY	COMPETITOR / 竞争对手
Tool life / Wear image 寿命 / 磨损对比		
Status comparison 现象对比	Normal wear (Edge fine chipping) 正常磨损发生 (崩刃)	Breakage by edge chipping 崩刃
Result 判断标准/结果	Wear and damage comparison → Better wear resistance performance than competitor 同样加工(时间以及加工总量)磨损程度以及刀片损伤程度比较 → NANOLOY产品比竞争对手产品耐磨性更好	

User test (aerospace_A*) / NANOLOY测试成功案例 (航空行业_D社)		Turning (ISO) / ISO车刀片	S grade (HRSA) / S系列(难切削材料)
Workpiece name / 被加工材料名称	Aerospace parts / 飞机部暑品 (RING)	Workpiece material/ 被加工材料	C263 (CASTING)
Machining type / TEST摘要	Ring shape / Vertical lathe (Section_O.D) / Wet / 圆形形状/ 立式车床加工(端面_外径) / 湿式加工		
Cutting condition / TEST参数条件	max dia 520mm vc 30~40m/min fn 0.16mm/rev ap 0.5mm / 被加工材料直径520mm 速度 30~40m/min 进给 0.16mm/rev 切削深度 0.5mm		
Item / 产品型号	CNMG120412-M11 NV3025		

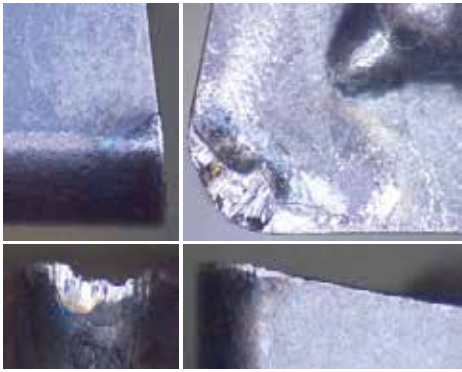
Division / 区分	NANOLOY	COMPETITOR / 竞争对手
Tool life / Wear image 寿命 / 磨损对比		
Status comparison 现象对比	Normal wear 正常磨损发生	Edge chipping (large wear) and adhesion 崩刃(过大磨损)以及沾削发生
Result 判断标准/结果	Wear and damage comparison → Better wear resistance performance than competitor 同样加工(时间以及加工总量)磨损程度以及刀片损伤程度比较 → NANOLOY产品比竞争对手产品耐磨性更好	

User test (aerospace_D*) / NANOLOY测试成功案例 (航空行业_F社)		Turning (ISO) / ISO车刀片	S grade (HRSA) / S系列(难切削材料)
Workpiece name / 被加工材料名称	Aerospace parts / 飞机部暑品 (SEAL-A/O, TRANS-)	Workpiece material/ 被加工材料	MIXED (Rene+Inconel)
Machining type / TEST摘要	Ring shape / Vertical lathe (section) / Wet / 圆形形状/ 立式车床加工(端面加工) / 湿式加工		
Cutting condition / TEST参数条件	max.dia 495mm vc 45m/min fn 0.15mm/rev ap 1.0mm / 被加工材料直径495mm 速度 45m/min 进给 0.15mm/rev 切削深度 1.0mm		
Item / 产品型号	VCGT160408-2FM NV3025		

Division / 区分	NANOLOY	COMPETITOR / 竞争对手
Tool life / Wear image 寿命 / 磨损 对比		
Status comparison 现象对比	Normal wear 正常磨损发生	Large wear at corner R角部位 过大磨损发生
Result 判断标准/结果	Wear and damage comparison → Better wear resistance performance than competitor 按照同样加工条件磨损程度对比 → NANOLOY产品比竞争对手耐磨性优秀	

User test (aerospace_D*) / NANOLOY测试成功案例 (航空行业_G社)		Turning (ISO) / ISO车刀片	S grade (HRSA) / S系列(难切削材料)
Workpiece name / 被加工材料名称	Aerospace parts / 飞机部暑品 (power train shaft)	Workpiece material/ 被加工材料	Titanium/ 钛合金
Machining type / TEST摘要	Ring shape / Horizontal lathe (section) / O.Dmachining) / Wet / 圆形形状/ 卧式车床加工(端面_外径) / 湿式加工		
Cutting condition / TEST参数条件	max.dia 65mm vc 66m/min fn 0.19mm/rev ap 0.8mm / 被加工材料直径 65mm 速度 66m/min 进给 0.19mm/rev 切削深度 0.8mm		
Item / 产品型号	CNMG120408-M11 NC3005		



Division / 区分	NANOLOY	COMPETITOR / 竞争对手
Tool life / Wear image 寿命 / 磨损 对比		
Status comparison 现象对比	10EA machining 10pcs 加工完成	6EA machining 6pcs 加工完成
Result 判断标准/结果	Wear and damage comparison → Better wear, chipping resistance performance than competitor 按照同样加工条件磨损量以及磨损程度 → NANOLOY产品比竞争对手耐磨性优秀	

Results of user test in aerospace industry

航空行业实地测试结果

User test (aerospace_TC*) / NANOLOY测试成功案例 (航空行业_A社)		Grooving insert / 槽加工刀	S grade (HRSA) / S系列(难切削材料)
Workpiece name / 被加工材料名称	Aerospace parts / 飞机部暑品 (CASE,HPT STTR)	Workpiece material/ 被加工材料	Inconel 718 / 镍合金 718
Machining type / TEST摘要	Ring shape / Vertical lathe (O.D roughing) / Wet / 圆形形状/ 立式车床加工(倒角, 外径粗加工) / 湿式加工		
Cutting condition / TEST参数条件	max.da 630mm vc 30m/min fn 0.15~0.25mm/rev ap 5~8.0mm / 被加工材料直径630mm 速度 30m/min 进给 0.15~0.25mm/rev 切削深度 5~8.0mm		
Item / 产品型号	ZNG80N-08G-F1 NC3025		



Division / 区分	NANOLOY	COMPETITOR / 竞争对手
Tool life / Wear image 寿命 / 磨损对比 (15min)		
Status comparison 现象对比	Normal wear 正常磨损	Large wear at corner 刃部过大磨损
Result 判断标准/结果	Wear and damage comparison → Better wear resistance performance than competitor 按照同样加工条件磨损量以及损伤程度比较 → NANOLOY产品比竞争对手产品耐磨性更好	

User test (aerospace_TC*) / NANOLOY测试成功案例 (航空行业_A社)		Grooving insert / 槽加工刀片	S grade (HRSA) / S系列(难切削材料)
Workpiece name / 被加工材料名称	Aerospace parts / 飞机部暑品	Workpiece material/ 被加工材料	Inconel 718 / 镍合金 718
Machining type / TEST摘要	Ring shape / Vertical lathe (O.D deep grooving) / Wet / 圆形形状/ 立式车床加工(外径深孔加工) / 湿式加工		
Cutting condition / TEST参数条件	max.da 500mm vc 40m/min fn 0.05~0.1mm/rev ap 15.0mm / 被加工材料直径500mm 速度 40m/min 进给 0.05~0.1mm/rev 切削深度 15.0mm		
Item / 产品型号	ING31.8R-15.9G-M1 NC3025		



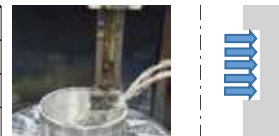
Division / 区分	NANOLOY	COMPETITOR / 竞争对手
Tool life / Wear image 寿命 / 磨损对比		
Status comparison 现象对比	Normal wear 正常磨损	Partial large wear and chipping 过大磨损以及崩刃发生
Result 判断标准/结果	Wear and damage comparison → Better wear resistance performance than competitor 按照同样加工条件磨损量以及损伤程度比较 → NANOLOY产品比竞争对手产品耐磨性更好	

User test (aerospace_K) / NANOLOY测试成功案例 (航空行业_B社)		Grooving insert / 槽加工刀片	S grade (HRSA) / S系列(难切削材料)
Workpiece name / 被加工材料名称	Aerospace parts / 飞机部零件 (COMP AFT INNER)	Workpiece material/ 被加工材料	Inconel 718 / 镍合金 718
Machining type / TEST摘要	Ring shape / Vertical lathe (O.D deep grooving) / Wet / 圆形形状/ 立式车床加工(外径深孔加工) / 湿式加工		
Cutting condition / TEST参数条件	max.dia 542mm vc 40m/min fn 0.15mm/rev ap 0.7mm / 被加工材料直径542mm 速度 40m/min 进给 0.15mm/rev 切削深度 0.7mm		
Item / 产品型号	2NG50R-25G-M1 (NV3025)		



Division / 区分	NANOLOY	COMPETITOR / 竞争对手
Tool life / Wear image 寿命 / 磨损 对比 (7min)		
Status comparison 现象对比	Normal wear 正常磨损	Lots of chipping at edge 崩刃发生
Result 判断标准/结果	Wear and damage comparison → Better wear resistance performance than competitor 按照同样加工条件磨损量以及损伤程度比较 → NANOLOY产品比竞争对手产品耐磨性更好	

User test (aerospace_S) / NANOLOY测试成功案例 (航空行业_C社)		Grooving insert / 槽加工刀片	S grade (HRSA) / S系列(难切削材料)
Workpiece name / 被加工材料名称	Aerospace parts / 飞机部零件 (CASE, CO-STATO-)	Workpiece material/ 被加工材料	Inconel 718 / 镍合金 718
Machining type / TEST摘要	Ring shape / Vertical lathe / Inner dia grooving / Wet / 圆形形状/ 立式车床加工/ 内径粗槽加工/ 湿式加工		
Cutting condition / TEST参数条件	max.dia 600mm vc 35m/min fn 0.08-mm/rev ap 6.0mm / 被加工材料直径600mm 速度 35m/min 进给 0.08-mm/rev 切削深度 6.0mm		
Item / 产品型号	2NG80N-08G-F1 NV3025		



Division / 区分	NANOLOY	COMPETITOR / 竞争对手
Tool life / Wear image 寿命 / 磨损 对比 (25min)		
Status comparison 现象对比	Normal wear 正常磨损	Partial large wear and chipping 过大磨损以及刃线崩刃
Result 判断标准/结果	Wear and damage comparison → Better wear resistance performance than competitor 按照同样加工条件磨损量以及损伤程度比较 → NANOLOY产品比竞争对手产品耐磨性更好	

汽车行业实地测试结果

Results of user test in automobile industry



User test (automobile) / NANOLOY测试成功案例 (汽车行业)		Grooving insert / 槽加工刀片	M grade (SUS) / M系列(SUS)
Workpiece name / 被加工材料名称	Automobile parts / 汽车配件 (turbocharger housing)	Workpiece material/ 被加工材料	1.4837
Machining type / TEST摘要	Turbocharger housing / Horizontal lathe (Shouldering, Grooving) / Wet / 涡轮增压器 / 卧式车床加工 / 湿式加工		
Cutting condition / TEST参数条件	max.dia 99mm vc 150m/min fn 0.05~0.2mm/rev ap 3.0mm / 被加工材料直径99mm 速度 150m/min 进给 0.05~0.2mm/rev 切削深度 3.0mm		
Item / 产品型号	2NG30N-04M-M1 NV3025		



Division / 区分	NANOLOY	COMPETITOR / 竞争对手
Tool life / Wear image 寿命 / 磨损 对比		
Status comparison 现象对比	After 10pcs machining : normal wear 10pcs 加工完成 : 正常磨损	After 5pcs machining : partial chipping, large wear 5pcs 加工完成 : 过大磨损以及崩刃发生
Result 判断标准/结果	Wear and damage comparison at limit → 2 times better wear, chipping resistance performance than competitor 产品寿命以及破损测试时寿命和磨损量 → NANOLOY产品比竞争对手耐磨性优秀(比竞争对手高100%)	

User test (automobile) / NANOLOY测试成功案例 (汽车行业)		Turning (ISO) / ISO车刀片	M grade (SUS) / M系列(SUS)
Workpiece name / 被加工材料名称	Aerospace parts / 汽车配件 (Cylinder housing)	Workpiece material/ 被加工材料	SUS420J2
Machining type / TEST摘要	Cylinder housing / Horizontal lathe (Inner dia roughing) / Wet / 卧式车床加工(内径粗加工) / 湿式加工		
Cutting condition / TEST参数条件	max.dia 31~38mm vc 120m/min fn 0.12mm/rev ap 0.8mm / 被加工材料直径31~38mm 速度 120m/min 进给 0.12mm/rev 切削深度 0.8mm		
Item / 产品型号	CCMT09T308-F11 NV3025		

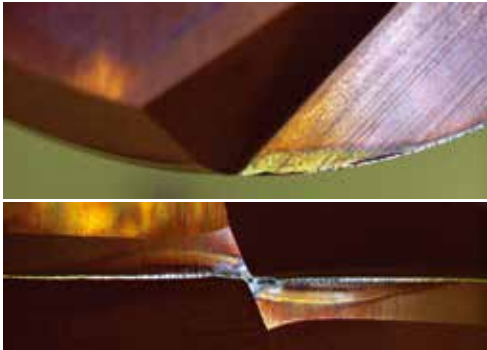
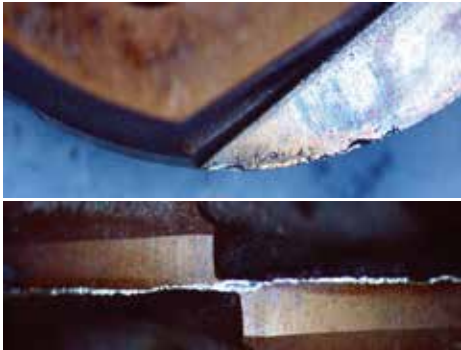
Division / 区分	NANOLOY	COMPETITOR / 竞争对手
Tool life / Wear image 寿命 / 磨损 对比		
Status comparison 现象对比	After 40pcs machining : normal wear 40pcs 加工完成 : 正常磨损	After 40pcs machining : partial large wear, chipping 40pcs 加工完成 : 过大磨损以及崩刃发生
Result 判断标准/结果	Wear and damage comparison at same pcs → Better wear, chipping resistance performance than competitor 磨损量以及损伤程度比较 → NANOLOY产品比竞争对手耐磨性优秀	

Results of user test in automobile industry

汽车行业实地测试结果

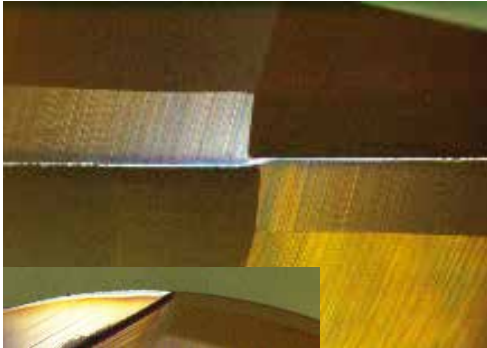
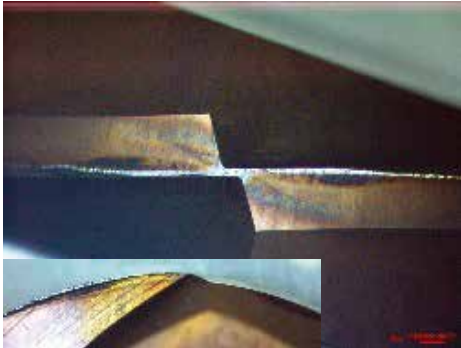
User test (automobile) / NANOLOY测试成功案例 (汽车行业)		Indexable endmill / 球刀片	H grade (high hardness) / H系列(高硬度钢)
Workpiece name / 被加工材料名称	Automobile mold parts / 汽车模具加工	Workpiece material/ 被加工材料	SKD11 (HRC55~62)
Machining type / TEST摘要	Face milling / Finishing / Dry 面加工/ 精加工 / Dry Cut		
Cutting condition / TEST参数条件	vc 330m/min fr 0.42mm/tooth ap 0.15mm 速度 330m/min 单刃进给 0.42mm/tooth 切削深度 0.15mm		
Item / 产品型号	NBGT-HS-15R TS114NBGT-HS-15R TS1145		



Division / 区分	NANOLOY	COMPETITOR / 竞争对手
Tool life / Wear image 寿命 / 磨损对比 (8 hours)		
Status comparison 现象对比	After 9 hours machining (normal wear) 最终加工9个小时加工完成 (正常磨损)	After 8 hours machining (side edge chipping) 最终加工8个小时加工(侧面崩刃发生 _ 刀片交换)
Result 判断标准/结果	Wear and damage comparison → 1.5 times better wear resistance performance than competitor 同等时间加工后磨损量对比 → NANOLOY产品比竞争对手耐磨性优秀 (比竞争对手高10%)	

User test (automobile) / NANOLOY测试成功案例 (汽车行业)		Indexable endmill / 球刀片	H grade (high hardness) / H系列(高硬度钢)
Workpiece name / 被加工材料名称	Automobile door mold / 汽车模具加工	Workpiece material/ 被加工材料	SKD11 (HRC55)
Machining type / TEST摘要	Face milling / Finishing / Dry 面加工/ 精加工 / Dry Cut		
Cutting condition / TEST参数条件	vc 500m/min fr 0.47mm/tooth ap 0.15mm 速度 500m/min 单刃进给 0.47mm/tooth 切削深度 0.15mm		
Item / 产品型号	NBGT-HS-15R TS1145		



Division / 区分	NANOLOY	COMPETITOR / 竞争对手
Tool life / Wear image 寿命 / 磨损对比 (16 hours)		
Status comparison 现象对比	After 24 hours machining 最终 24个小时 加工完成	After 16 hours machining 最终 16 个小时 加工完成
Result 判断标准/结果	Wear and damage comparison → 1.5 times better wear resistance performance than competitor 同等时间加工后磨损量对比 → NANOLOY产品比竞争对手耐磨性优秀 (比竞争对手高50%)	

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NANOTECH

836-18, Dureungyuri-ro, Ochang-eup, Cheongwon-gu, Cheongju-si, Chungcheongbuk-do, 28107, Republic of Korea
TEL : +82-43-217-6390 / FAX : +82-43-218-6391 / E-mail : sales@nanoloy.co.kr

办事处 Gyeonggi Office

59-20, Seouldaehak-ro, Siheung-si, Gyeonggi-do, Republic of Korea (15012) / TEL : +82-43-217-6390 / E-mail : kjshin@nanoloy.co.kr

办事处 Busan Office

105-23, 37, Gwaegam-ro, Sasang-gu, Busan, Republic of Korea (46977) / TEL : +82-43-714-3525 / E-mail : stha@nanoloy.co.kr

OVERSEAS BRANCH

越南 Vietnam 04 Plot, Ba Thien Industrial Park, Ba Hien Town, Binh Xuyen District, Vinh Phuc Pro., Vietnam / TEL: +84-211-3887-272

中国 China Jiang Jun road, Zhou Tian Village, Qiuchang Town, Huiyang, Huizhou, Guangdong province, China / TEL : +86-752-356-2988

