



**NANOLOY**

Made in KOREA

Meet the best NANOTECHNOLOGY

**THE WORLD CLASS Cutting Tools  
for difficult-to-cut Material industries.**

# NANOLOY

**NANOLOY will provide you best solution  
on cost efficiency and high productivity.**

The World's first invented ultrafine 0.2 $\mu$ m powder  
for difficult-to-cut materials cutting solution

Applying ultrafine powder material  
present excellent wear resistance

Specialized on cutting Stainless steel, Inconel,  
Titanium and other difficult-to-cut materials

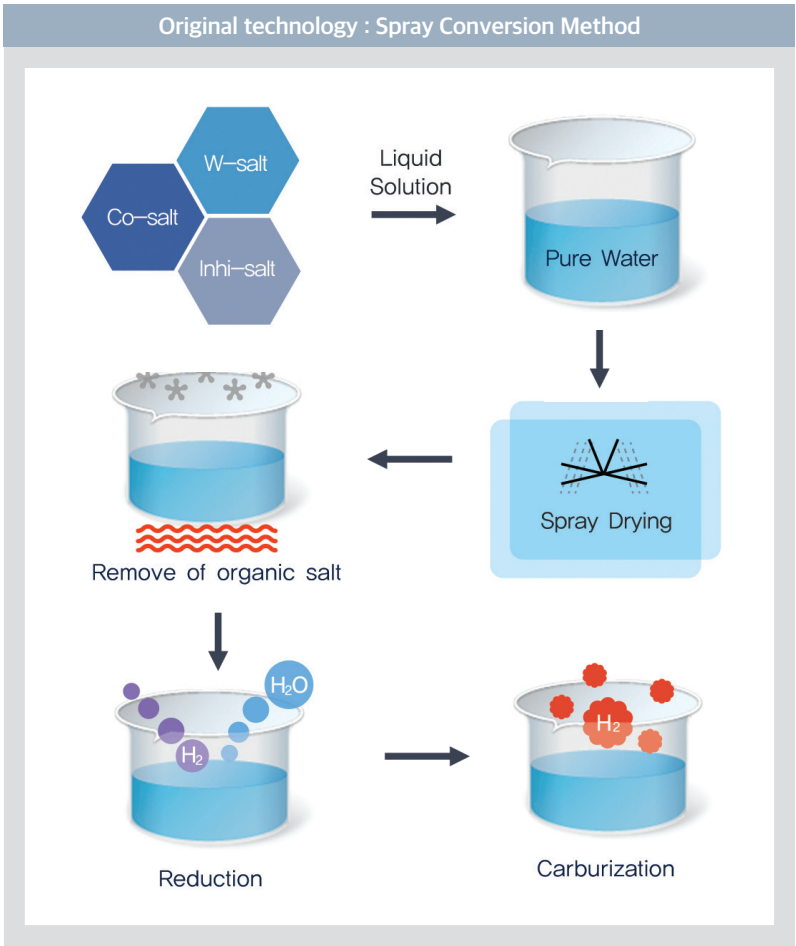
In Aerospace, Shipbuilding, Automobile, Medical industry, etc.



[www.nanoloy.co.kr](http://www.nanoloy.co.kr)

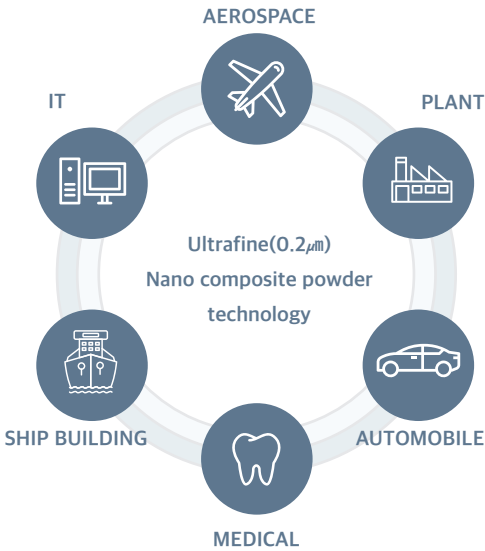
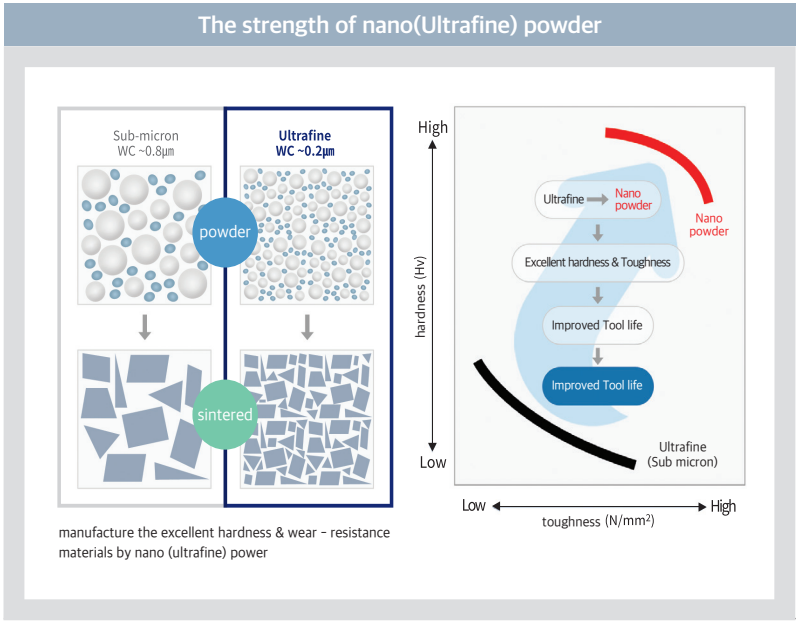
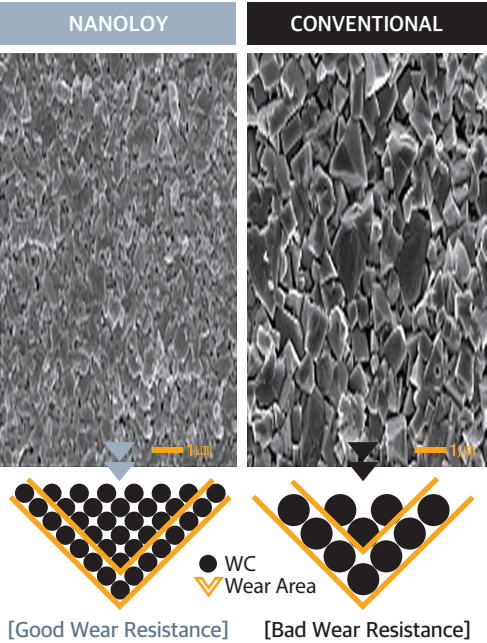
CORE TECHNOLOGY

- World's first patented ultrafine 0.2μm WC-Co composite powder.
- By nano composite powder, specialized on cutting Stainless steel, Inconel, Titanium, difficult to cut material by nano composite powder.



Features of difficult-to-cut materials machining

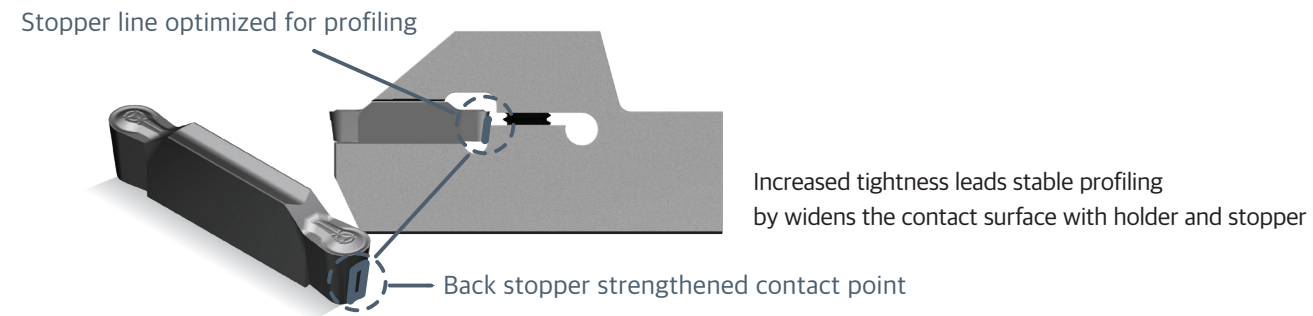
- **HRSA** : Tool temperature increase due to low thermal conductivity  
▶ Surface, Internal, Mechanical defects.
- **High hardened steel** : High hardness and toughness material with  
▶ High cutting resistance high cutting load.





| NANOLOY Independently developed clamping system  
Applied to stable machining and increasing productivity

- Suitable for various machining such as Grooving, Turning, Cut-off etc.
- Optimized for cutting Inconel, Stainless steel, Titanium in aerospace, shipbuilding and automobile industries



**F1**

- Machining type
- Grooving / Parting off

**Features**

Sharp edge / Low cutting force / Prevent B.U.E

**M1**

- Machining type
- Grooving / Turning
- Parting off

**Features**

Various machining type / Excellent tool life / Enhanced chip control

**C1**

- Machining type
- Parting off

**Features**

Sharp edge / Low cutting force / Enhanced chip control

**F1M**

- Machining type
- Grooving / Turning
- Parting off

**Features**

Sharp edge / Low cutting force / Prevent built up edge

**M1(R)**

- Machining type
- Grooving / Turning
- Parting off

**Features**

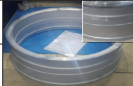


Various machining type / Excellent tool life / Enhanced chip control / Full Radius for profiling

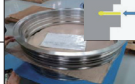

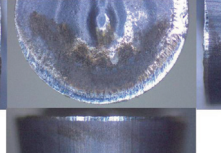
**R1**

- Machining type
- Grooving / Turning
- Parting off

**Features**

High feed machining / Strong cutting edge / Enhanced productivity

User test (Aerospace_TC*)		Grooving insert		S grade (HRSA)	
Workpiece	Aerospace parts (CASE, HPT STTR)	material	Inconel 718		
Machining type	Ring shape /Vertical lathe (Chamfer, O.D) / Wet				
Cutting coundition	max.dia 630mm vc 35m/min fn 0.04~0.13mm/rev ap 10.0mm				
Item	2NG50N-08G-F1M NV3025				
Division	Nanology		Competitor		
Tool life/ Wear image (25 min)					
Status comparison	Normal wear		Normal wear		
Result	Wear and damage comparison → Better wear resistance performance than competitor				

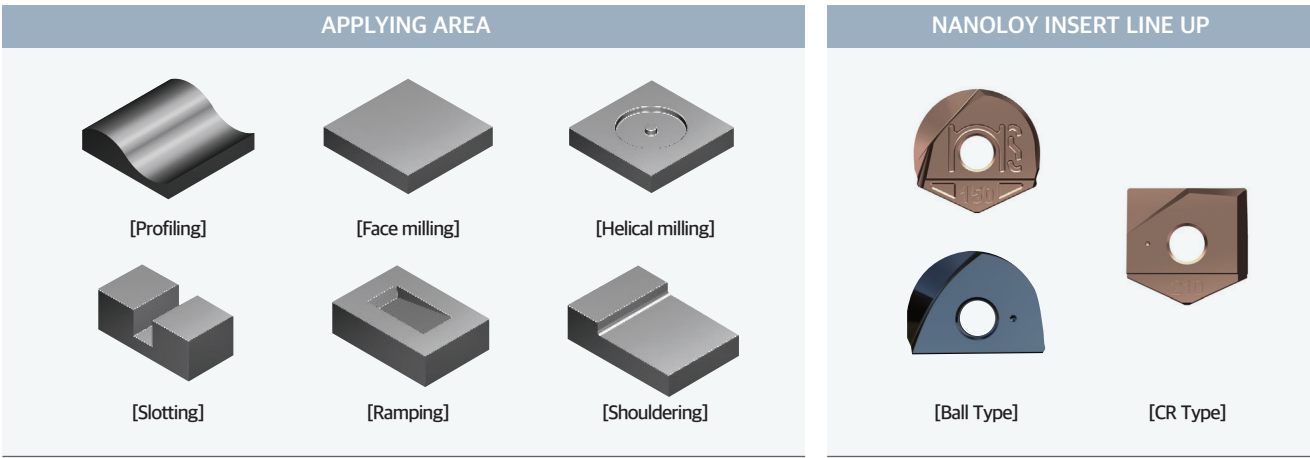
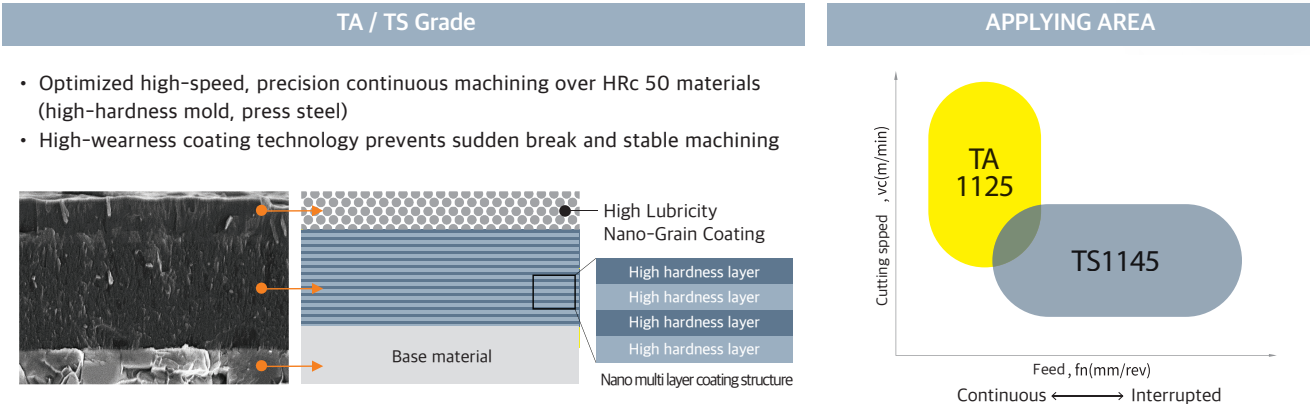
User test (Aerospace_TC*)		Grooving insert		S grade (HRSA)
Workpiece	Aerospace parts	material	Inconel 718	
Machining type	Ring shape /Vertical lathe (O.D deep grooving) / Wet			
Cutting coundition	max.dia 500mm vc 40m/min fn 0.05~0.1mm/rev ap 15.0mm			
Item	1NG31.8R-15.9G-M1 NC3025			
Division	Nanology		Competitor	
Tool life/ Wear image (25 min)				
Status comparison	Normal wear		Normal wear	
Result	Wear and damage comparison → Better wear resistance performance than competitor			


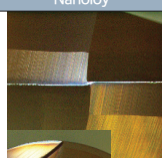
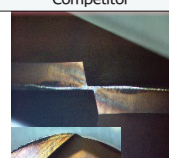
# INDEXABLE ENDMILL INSERT


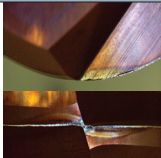
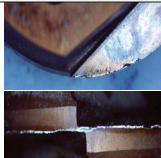


## | Solution for die&mold industry

- Specialized for cutting high-hardness work piece over HRC 50~70
- High-precision, high-wearness, high-quality inserts recognized beyond the world



User test (Automobile)		Indexable endmill		H grade (high hardness)	
Workpiece	automobile door mold	material	SKD11 (HRC55)		
Machining type	Face milling / Finishing / Dry				
Cutting coundition	vc 500m/min fn 0.47mm/tooth ap 0.15mm				
Item	NBGT-HS-15R TS1145				
Division	Nanoly			Competitor	
Tool life/ Wear image (16 hours)					
Status comparison	After 24 hours maching			After 16 hours machining	
Result	Wear and damage comparison → 1.5 times better wear resistance performance than competitor				

User test (Automobile)		Indexable endmill		H grade (high hardness)	
Workpiece	automobile mold parts		material	SKD11 (HRC55~62)	
Machining type	Face milling / Finishing / Dry				
Cutting coundition	vc 330m/min fn 0.42mm/tooth ap 0.15mm				
Item	NBGT-HS-15R TS1145				
Division	Nanoly			Competitor	
Tool life/ Wear image (8 hours)					
Status comparison	After 9 hours machining (normal wear)			After 8 hours machining (side edge chipping)	
Result	Wear and damage comparison → 1.5 times better wear resistance performance than competitor				



# N-SH SERIES FOR HIGH HARDENED STEEL



## | Product feature







- Specially designed for machining high hardened material (HRC50~70)
- Excellent quality and performance for automotive and mold industry
- Apply optimal design for cutting edge and coating improve wear resistance and toughness

NBHS Series 2Flute Ball	NRHS Series 2Flute, 4Flute Corner Radius	NFHS Series 2Flute, 4Flute Flat																																	
Size Range OD 0.1mm~12mm	2F CR Size Range OD 0.4mm~12mm 4F CR Size Range OD 1.0mm~12mm	2F Flat Size Range OD 0.1mm~12mm 4F Flat Size Range OD 1.0mm~12mm																																	
																																			
  <div>30° HELIX</div>	  <div>30° HELIX</div>	  <div>30° HELIX</div>																																	
<table><tr><td>d1</td><td>d1</td><td>r</td><td>r</td></tr><tr><td>-0.01~0</td><td>-0.015 ~-0.005</td><td>±0.005</td><td>±0.01</td></tr><tr><td>d1≤6</td><td>6&lt;d1</td><td>r≤3</td><td>3&lt;r</td></tr></table>	d1	d1	r	r	-0.01~0	-0.015 ~-0.005	±0.005	±0.01	d1≤6	6<d1	r≤3	3<r	<table><tr><td>d1</td><td>d1</td><td>r</td><td>r</td><td>r</td></tr><tr><td>-0.01~0</td><td>-0.015 ~-0.005</td><td>±0.005</td><td>±0.01</td><td>±0.01</td></tr><tr><td>d1≤6</td><td>6&lt;d1</td><td>r≤0.5</td><td>0.5&lt;r&lt;2</td><td>2≤r</td></tr></table>	d1	d1	r	r	r	-0.01~0	-0.015 ~-0.005	±0.005	±0.01	±0.01	d1≤6	6<d1	r≤0.5	0.5<r<2	2≤r	<table><tr><td>d1</td><td>d1</td></tr><tr><td>-0.01~0</td><td>-0.025 ~-0.01</td></tr><tr><td>d1≤6</td><td>6&lt;d1</td></tr></table>	d1	d1	-0.01~0	-0.025 ~-0.01	d1≤6	6<d1
d1	d1	r	r																																
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d1≤6	6<d1	r≤0.5	0.5<r<2	2≤r																															
d1	d1																																		
-0.01~0	-0.025 ~-0.01																																		
d1≤6	6<d1																																		

# N-SM SERIES FOR STAINLESS STEEL & SUPER ALLOY

## | Product feature

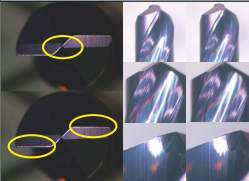
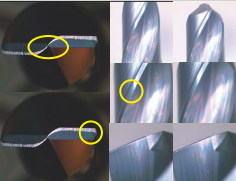
- Superior material, coating, geometry for stainless steel & Ni based alloy & Ti alloy machining
- Unequal indexing multiple-helix design for reduced chatter and improved stability
- Excellent performance in ISO M,S group
- Wide range of applications with various geometries and specifications

NFMS Series 4Flute Flat	NRMS Series 4Flute Corner Radius	NFMR Series 3~5Flute Roughing																											
Size Range OD 1.0~20.0mm	Size Range OD 1.0~20.0mm	Size Range 3.0mm~20.0mm																											
																													
																													
<table><tr><td>d1</td><td>d1</td></tr><tr><td>-0.01~0</td><td>-0.025 ~-0.01</td></tr><tr><td>d1≤6</td><td>6&lt;d1</td></tr></table>	d1	d1	-0.01~0	-0.025 ~-0.01	d1≤6	6<d1	<table><tr><td>d1</td><td>d1</td><td>r</td><td>r</td><td>r</td></tr><tr><td>-0.01~0</td><td>-0.015 ~-0.005</td><td>±0.005</td><td>±0.01</td><td>±0.015</td></tr><tr><td>d1≤6</td><td>6&lt;d1</td><td>r≤0.5</td><td>0.5&lt;r&lt;2</td><td>2≤r</td></tr></table>	d1	d1	r	r	r	-0.01~0	-0.015 ~-0.005	±0.005	±0.01	±0.015	d1≤6	6<d1	r≤0.5	0.5<r<2	2≤r	<table><tr><td>d1</td><td>d1</td></tr><tr><td>-0.04 ~-0.02</td><td>-0.05 ~-0.02</td></tr><tr><td>d1≤6</td><td>6&lt;d1</td></tr></table>	d1	d1	-0.04 ~-0.02	-0.05 ~-0.02	d1≤6	6<d1
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d1≤6	6<d1																												
d1	d1	r	r	r																									
-0.01~0	-0.015 ~-0.005	±0.005	±0.01	±0.015																									
d1≤6	6<d1	r≤0.5	0.5<r<2	2≤r																									
d1	d1																												
-0.04 ~-0.02	-0.05 ~-0.02																												
d1≤6	6<d1																												

# “NANO DRILL PRO” SOLID CARBIDE DRILL SERIES

## Product feature

- Optimized point & flute geometry dramatically improves chip separation and evacuation
- Newly developed NANO NS coating suitable for drilling
- Improved tool life, high efficiency, multipurpose by consolidating grinding know-how

Test Report			
Workpiece	Mold parts	material	HP4M(HRc32~36)
Machining type	Drilling / Finishing / Wet		
Cutting coudition	RPM3,180 vf1.4 Depth30mm		
Division	Nanoly		Competitor
Tool life/ Wear image (240min.)			
Status comparison	After 240min Machining (normal wear)		After 240min Machining (chipping with largewear)
Result	2times better wear resistance performance than competitor		



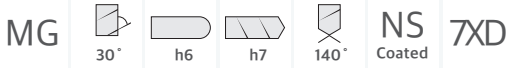
### NDG05 Regular Series

Size Range 1.0mm~13.0mm (0.1Step)



### NDG07 Long Series

Size Range 1.0mm~13.0mm (0.1Step)



## N-SG SERIES FOR GENERAL PURPOSE

### Product feature

- Superior material, coating, geometry for general materials (HRC50↓)
- Excellent quality and performance for mold and parts machining
- Wide range of applications with various geometries and specifications



#### NBGS2 2F BALL



#### NFGS2&4 2F&4F FLAT



#### NFRS2F & 4F CR



## N-SN SERIES FOR ALUMINUM

### Product feature

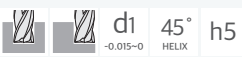
- Solution for machining Aluminum alloy and nonferrous metal
- Optimal design for reduce cutting resistance and increasing surface roughness
- Applying proper geometry for preventing B.L.E and high surface roughness



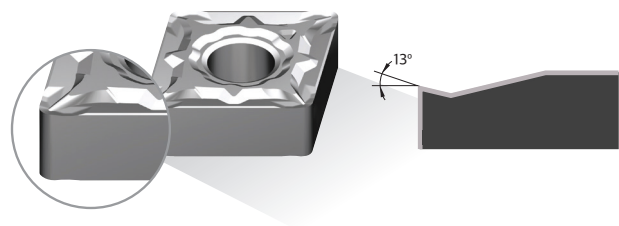
#### NFNS3 3F FLAT



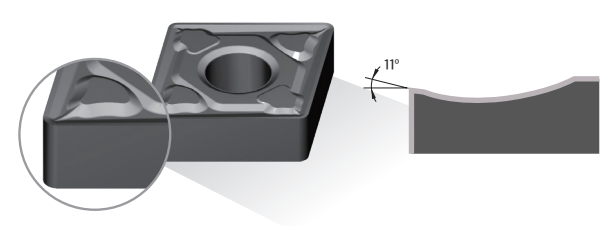
#### NFNS3R 3F ROUGHING



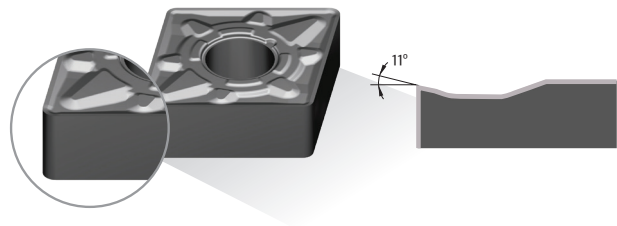
F11



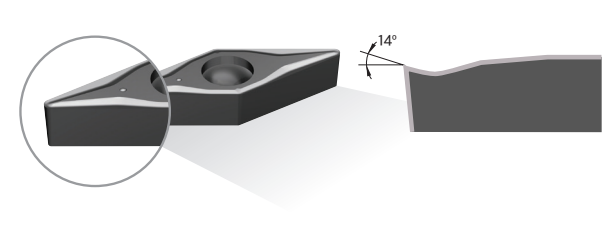
M12



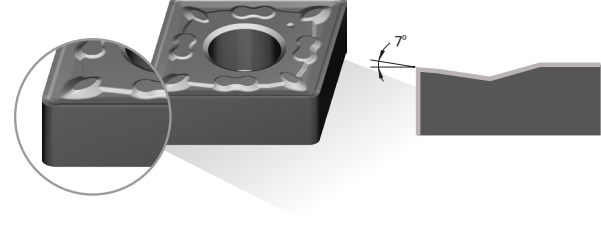
M11



F51

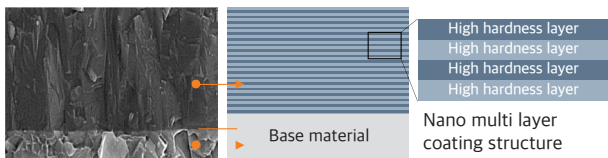


R11



NV Grade

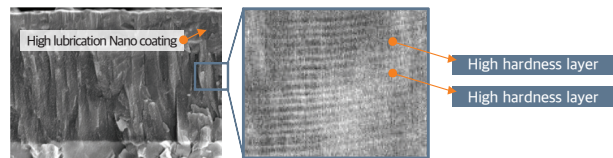
- Optimized to high-speed and continuous machining Inconel, Titanium, etc.in aviation and medical industry and etc.
- Nano composite powder technology improved both wearness and toughness



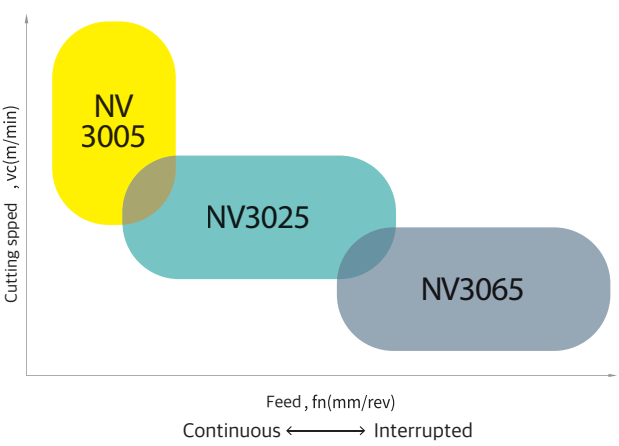
201.5 mm

NS Grade

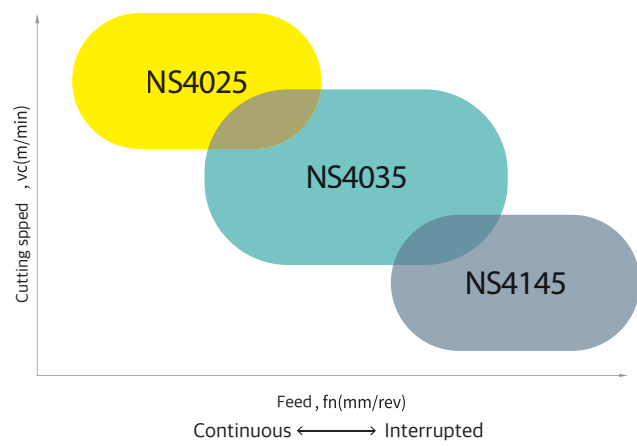
- Optimized to machining stainless steel, general steel and heat-resistant alloy including turbo charger and etc.
- Nano composite powder technology applied to prevent sudden break and complex machining process



APPLYING AREA



APPLYING AREA





# DRILL INSERTS

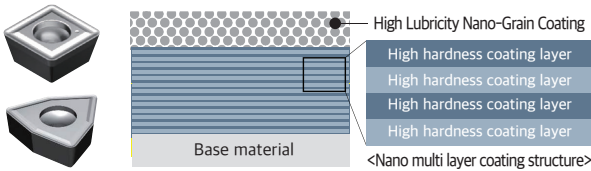


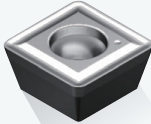
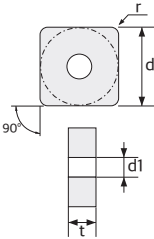
## | Power Drill Process Superior Cost Performance, All Core Function included!

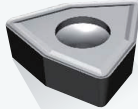
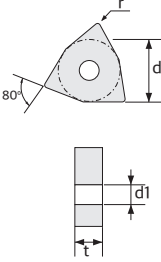
- Optimized for drilling of Steel (Carbon, Alloy steel, etc.) and Stainless steel
- Tool cost reduction based on excellent cost
- Effectiveness

### High lubricity Nano-grain coating

- Smooth evacuation of chips, prevention of breakage due to built-up edge, and secure machinability

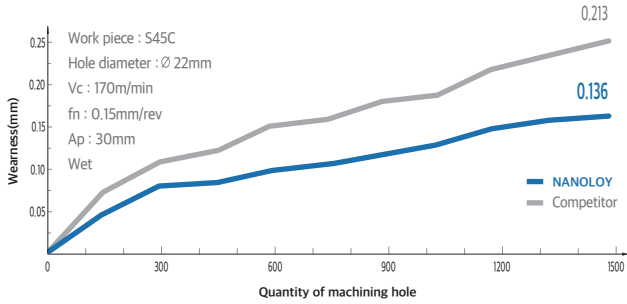


SHAPE	Desingnation	Dimension					Main dimension
		D	t	r	d1	d2	
<b>S - TYPE</b> 	SPMT050204-ND1	5.0	2.38	0.4	2.27	2.9	
	SPMT060204-ND1	6.0	2.38	0.4	2.61	3.47	
	SPMT07T308-ND1	7.94	3.97	0.8	2.78	3.97	
	SPMT090408-ND1	9.8	4.3	0.8	4.0	5.7	
	SPMT090412-ND1	9.8	4.3	1.2	4.0	5.7	
	SPMT110408-ND1	11.5	4.8	0.8	4.45	6.2	
	SPMT140512-ND1	14.3	5.2	1.2	5.75	7.65	

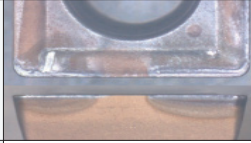
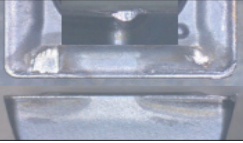
SHAPE	Desingnation	Dimension					Main dimension
		D	t	r	d1	d2	
<b>W - TYPE</b> 	WCMT03T104-ND1	4.76	1.98	0.4	2.15	3.08	
	WCMT030204-ND1	5.56	2.38	0.4	2.8	3.75	
	WCMT030204-ND2	5.56	2.38	0.4	2.55	3.6	
	WCMT030208-ND1	5.56	2.38	0.8	2.8	3.75	
	WCMT030208-ND2	5.56	2.38	0.8	2.55	3.6	
	WCMT040204-ND1	6.35	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	

### Nano Multi Layer Coating

- Relieves machining stress and prevents rapid breakage.



### Drilling Insert Field Test Report

Work piece	SUS316L	Machining type	Drilling / Though hole precessing / Wet
Cutting condition	vc 200m/min fz 0.12mm/rev ap 30mm		
Item Code	drilling / though hole precessing / wet		
Division	Nanology		Competitor
Wear image			
Tool life	Nanology 198 hole		Competitor 88 hole

120%

