



For more information

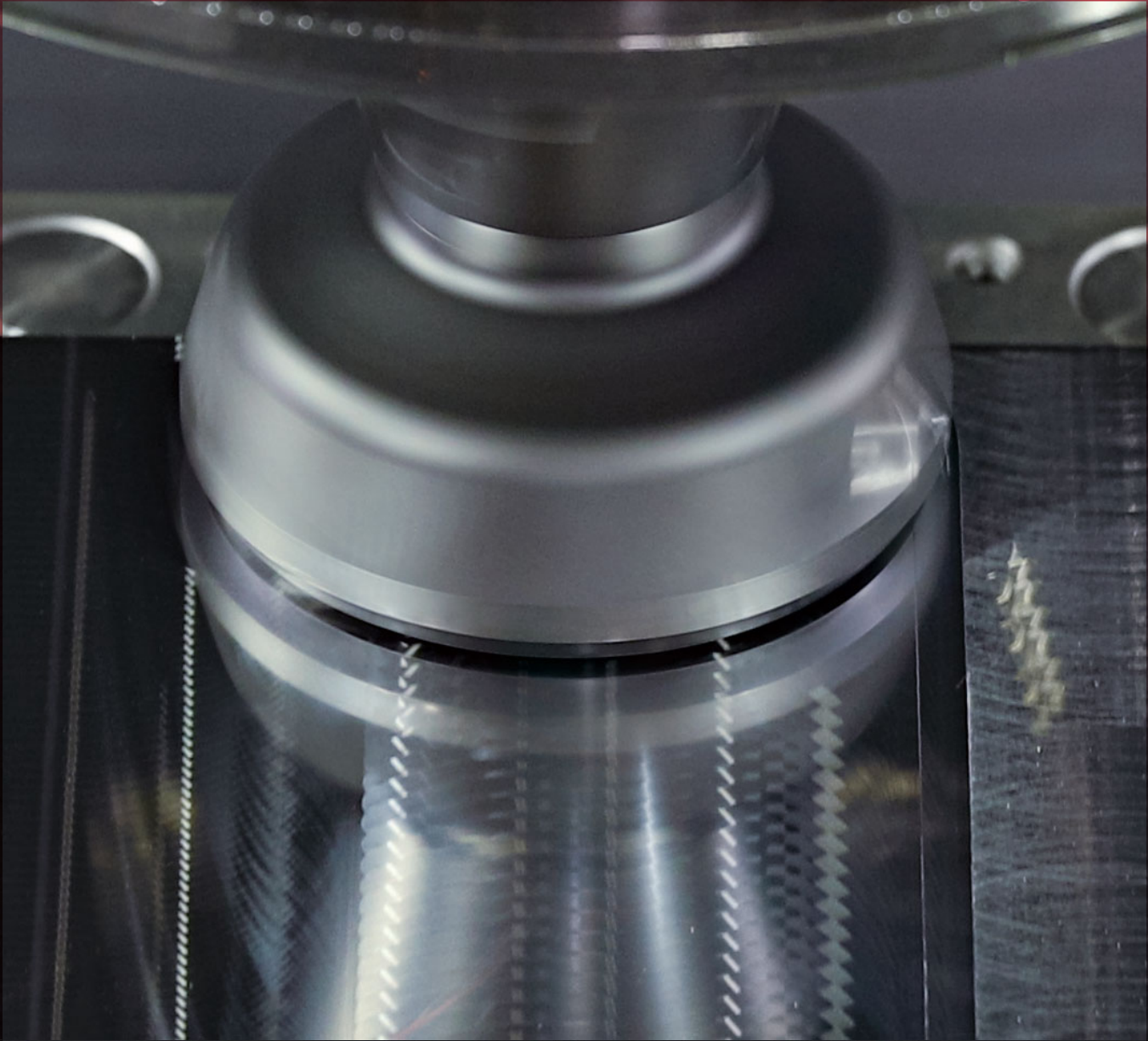
Super finishing cutter

**NMS**

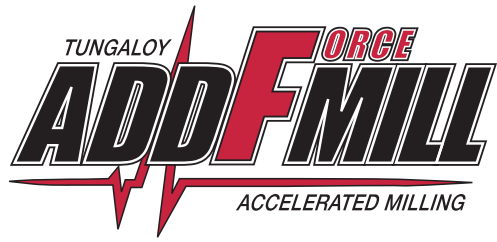
Tungaloy Report No. 306-G

# Easy-to-index milling cutters for superior surface quality









# NMS

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High reliability, stability, and efficiency



## Achieve supreme surface quality with just a few simple setups

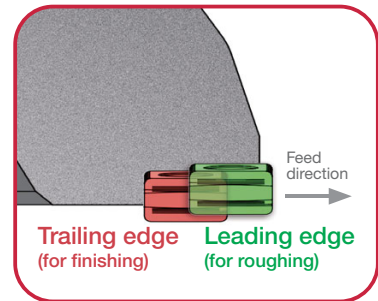
### ■ Excellent surface quality

- No axial/radial run-out adjustments needed.
- The insert pockets are designed so that the finishing insert always performs the finishing, providing consistent surface roughness.
- Light cutting geometry with wiper edge incorporating a great circular arc.

Leading edge  
(for roughing)



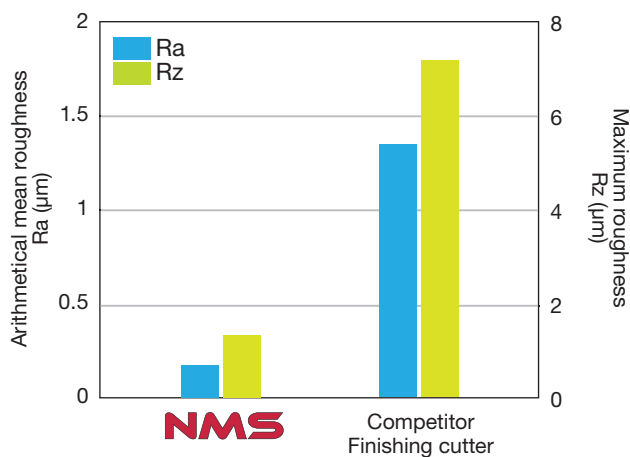
Trailing edge  
(for finishing)



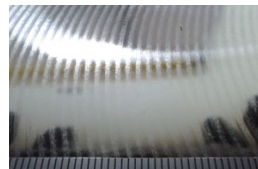
Designed so that the finishing insert always performs the surface finishing.

### ■ Surface quality

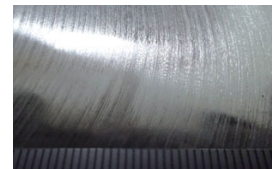
**P** S55C / C55 (189HB)



**NMS**



Competitor Finishing cutter



Cutter : NMS09125R  
 Insert : LNCQ0906N-100L AH120  
 Cutting speed :  $V_c = 200$  m/min  
 Feed per revolution :  $f_z = 2$  mm/rev  
 Depth of cut :  $a_p = 0.2$  mm  
 Width of cut :  $a_e = 100$  mm  
 Coolant : Dry  
 Machine : Vertical M/C BT50

## 3 styles of inserts for your application needs

LNCQ0906N-100L



LNCQ0906N-50L



LNCQ0906R-50S



### First choice

- Provides superior surface quality

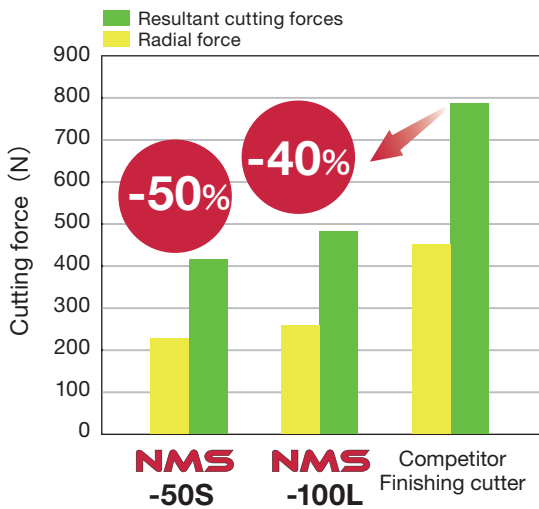
### Light cutting

- Generates light cutting action with excellent surface finishing thanks to the same wiper geometry as the LNCQ0906N-100L.

### For super light cutting / Finishing close to the shoulders

- Reduced radial force
- Allows minimum interference with the shoulders when machining into the work corners

### Cutting force



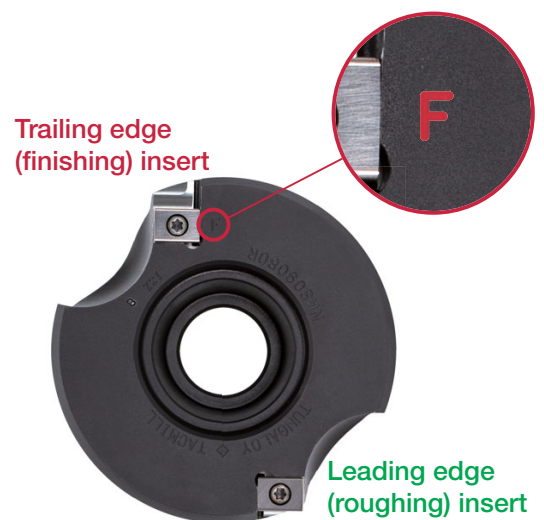
**P** S55C / C55

Cutter : NMS09125R  
 Insert : LNCQ0906R-50S NS740  
 : LNCQ0906N-100L NS740  
 Cutting speed : Vc = 300 m/min  
 Feed per revolution : f = 4 mm/rev  
 Depth of cut : ap = 0.1 mm  
 Width of cut : ae = 70 mm  
 Coolant : Dry

**NMS provides reduced cutting forces over the competitor!**

## Optimizing the insert combinations for workpieces with thin walls or shoulders

Applications	Leading edge (roughing) insert	Trailing edge (finishing) insert
General applications Depth of cut: ~ 0.2 mm 	LNCQ0906N-100L LNCQ0906N-50L 	LNCQ0906N-100L LNCQ0906N-50L 
Milling hollow thin-walled structured parts Depth of cut: ~ 0.2 mm 	LNCQ0906R-50S 	LNCQ0906R-50S 
Milling close to the workpiece corners Depth of cut: ~ 0.05 mm 	LNCQ0906R-50S 	



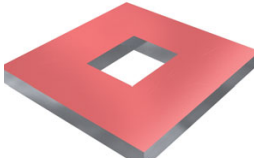

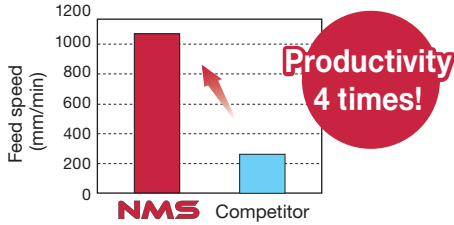
Please make sure to always assemble the **leading edge (roughing) insert** in the leading edge pocket and assemble the **trailing edge (finishing) insert** in the finishing edge pocket. The inserts may not be interchanged. Make sure to assemble the **trailing insert** in the pocket marked with "F".



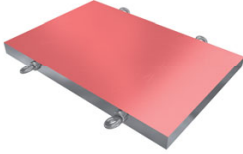

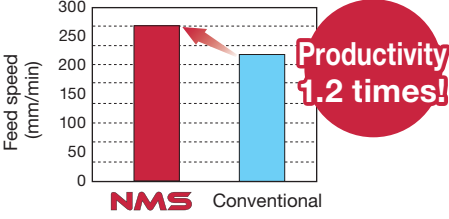

## STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hardness (HB)	Grade	Cutting speed Vc (m/min)	LNCQ0906N-100(50)L		LNCQ0906R-50S	
					Depth of cut APMX (mm)	Feed per tooth f (mm/rev)	Depth of cut APMX (mm)	Feed per tooth f (mm/rev)
<b>P</b>	Mild steels SS400, etc. E275A, etc.	< 180	NS740	200 - 300	< 0.2	2 - 6	≤ 0.2	1 - 2.5
	Carbon steels S55C, etc. C55, etc.	< 300	NS740	150 - 250				
	Alloy steels SCM440, etc. 42CrMo4, etc.	< 300	NS740	120 - 200				
	Die steels SKD61, etc. X40CrMoV5-1, etc.	< 300	NS740	100 - 150				
<b>M</b>	Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-3, etc.	< 250	AH120 NS740	150 - 220	< 0.2	2 - 6	≤ 0.2	1 - 2.5
<b>K</b>	Cast irons FC250, etc. 250, etc.	150 - 250	GH110 AH120	120 - 200	< 0.2	2 - 6	≤ 0.2	1 - 2.5

## PRACTICAL EXAMPLES

Workpiece type		Part for expansion chamber	Cylinder block						
Cutter		NMS09160R	NMS09160R						
Insert		LNCQ0906N-100L	LNCQ0906N-100L						
Grade		AH120	AH120						
Workpiece material		SUS304 / X5CrNi18-9  <b>M</b>	FC250 / 250  <b>K</b>						
Cutting conditions	Cutting speed : Vc (m/min)	180	200						
	Feed per revolution : f (mm/rev)	3	3						
	Depth of cut : ap (mm)	0.1	0.15						
	Width of cut : ae (mm)	130	110						
	Machining	Face milling	Face milling						
Coolant	External	Dry							
Machine	Horizontal M/C BT50	Vertical M/C BT50							
Results		 <p><b>Productivity 4 times!</b></p> <p>NMS provided better surface quality at an increased feed rate, improving efficiency by over 4 times.</p>	<p><b>Excellent surface roughness and flatness</b></p> <table border="1"> <thead> <tr> <th></th> <th>Ra (μm)</th> <th>Flatness (μm)</th> </tr> </thead> <tbody> <tr> <td>Results</td> <td>0.69 μm</td> <td>10 μm</td> </tr> </tbody> </table> <p>Despite interruptions on the workpiece, NMS provided superior surface quality and flatness.</p>		Ra (μm)	Flatness (μm)	Results	0.69 μm	10 μm
	Ra (μm)	Flatness (μm)							
Results	0.69 μm	10 μm							

## PRACTICAL EXAMPLES

Workpiece type	Plate	Pump part
Cutter	NMS09160R	NMS09125R
Insert	LNCQ0906N-100L	LNCQ0906R-100L
Grade	NS740	AH120
Workpiece material	SCM440 / 42CrMo4	SUS316 / X5CrNiMo17-12-3
	 <b>P</b>	 <b>M</b>
Cutting conditions	Cutting speed : $V_c$ (m/min)	200
	Feed per revolution : $f$ (mm/rev)	2
	Depth of cut : $a_p$ (mm)	0.1
	Width of cut : $a_e$ (mm)	110
	Machining	Face milling
	Coolant	Dry
Machine	Vertical M/C BT50	
Results	 <p><b>Productivity 1.2 times!</b></p> <p>The competitor cutter provided unstable surface quality. <b>NMS</b> provided improved surface and reduced machining time by over 20%.</p>	 <p><b>Eliminated grinding process</b></p> <p>The use of <b>NMS</b> eliminated the subsequent grinding process required by the conventional method, simplifying quality control for the finishing operation.</p>



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