



*FEED the SPEED!*

**T9200 SERIES**



**NEW GENERATION  
IN CVD GRADES**



# **GET STARTED!**

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- 4 - Overview / Features
- 10 - Selection Guide
- 12 - Standard Cutting Conditions
- 14 - Success Stories



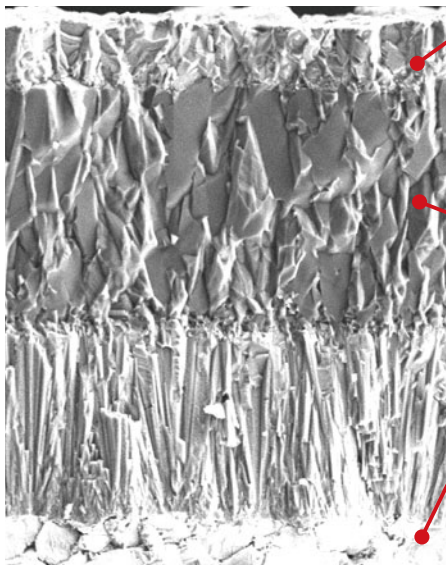
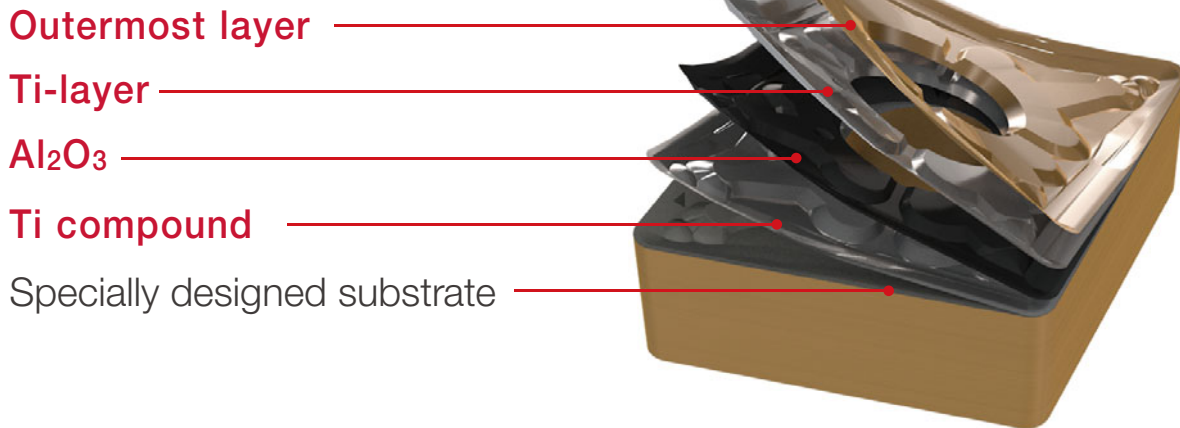
## The T9200 series now offers T9225 to further improve your **machining efficiency**

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### **PREMIUMTEC**

TUNGALOY

*A new surface treatment technology is applied, making T9200 series hard to break*



#### **Hard outer layer.**

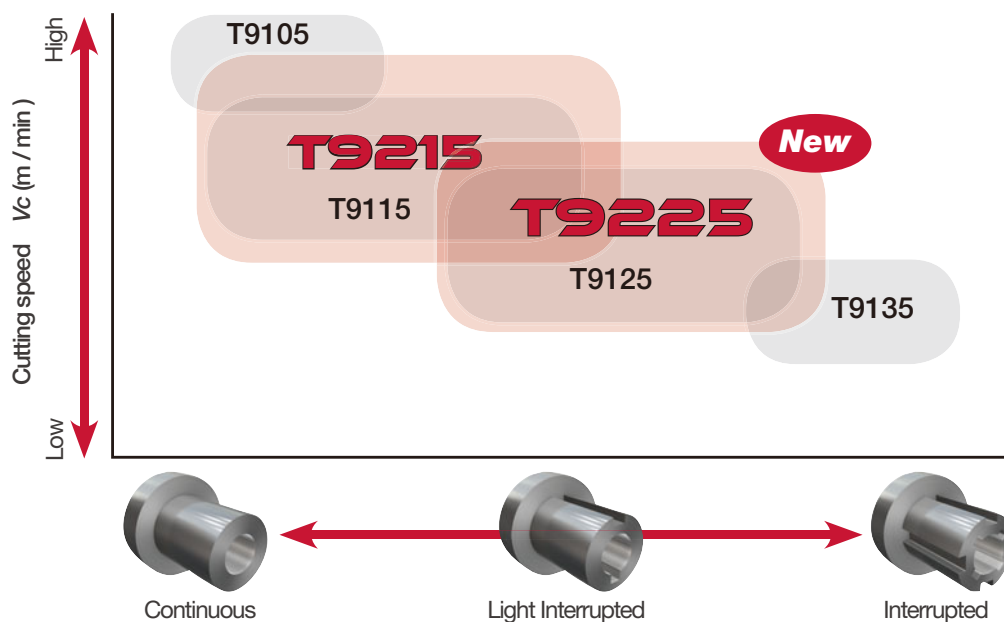
A new developed hard coating layer, with a high resistance to flank wear.

**Thick Al<sub>2</sub>O<sub>3</sub> layer** with excellent resistance to high heat and crater wear, especially effective for high-speed machining.

#### **New cemented carbide substrate.**

Exclusively designed for T9200 series drastically reduces defects in alloys, which greatly improves fracture resistance.

## APPLICATION AREA



| Application | Grade | Substrate        |                |              | Coating layer                         |                             |
|-------------|-------|------------------|----------------|--------------|---------------------------------------|-----------------------------|
|             |       | Specific gravity | Hardness (HRA) | T.R.S. (GPa) | Main Composition                      | Thickness ( $\mu\text{m}$ ) |
| <b>P</b>    | T9215 | 14.0             | 90.5           | 2.6          | Ti compound + $\text{Al}_2\text{O}_3$ | 18                          |
|             | T9225 | 13.4             | 89.8           | 2.7          | Ti compound + $\text{Al}_2\text{O}_3$ | 16                          |

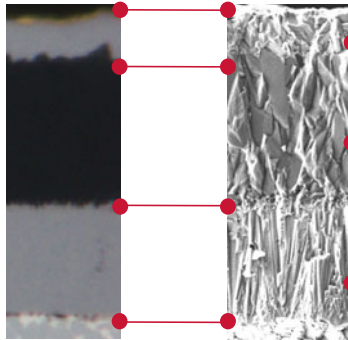




## Excellent Crater Wear Resistance

$\text{Al}_2\text{O}_3$  coating with strengthened wear resistance

### T9200SERIES

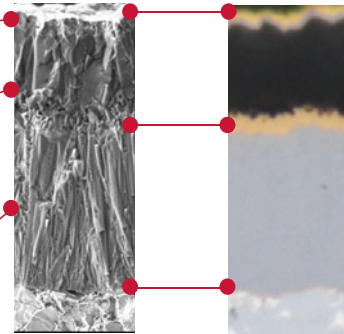


Ti-layer

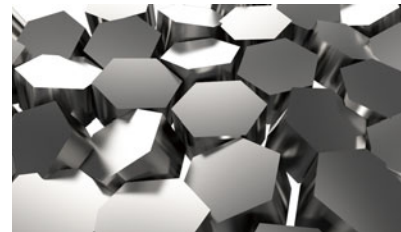
$\text{Al}_2\text{O}_3$

Ti compound

Existing



Highly homogeneous structure of  $\text{Al}_2\text{O}_3$



Surface image of  $\text{Al}_2\text{O}_3$

## Excellent Flank Wear Resistance

**T9200 series** Provided Outstanding Flank Wear Resistance!

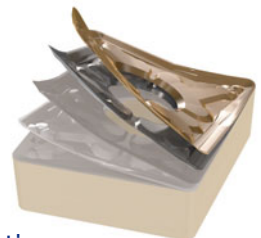
### T9200SERIES



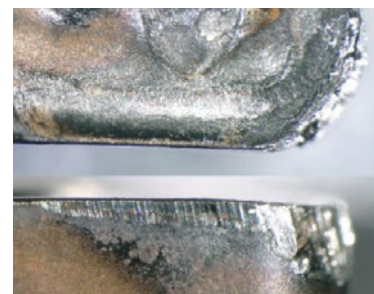
Long tool life and stable tool life

**Extended tool life**  
**High speed and high feed**  
**Stable machining**

Reduced machine downtime  
Cost reduction  
High productivity



Existing



Increased flank wear leads to small chipping and welding

**Fracture**

## **PREMIUMTEC**

TUNGALOY

Excellent fracture resistance, due to a New improved surface coating treatment

A unique tough coating treatment technology that prevents cracks in operation and provides stable machining.

### **ADVANTAGE of the new technology**

Effect of the new improved surface treatment which prolongs insert's tool life

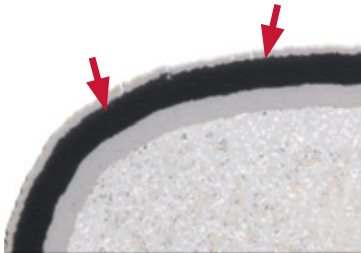
## **T9200SERIES**

**Vs.**

Existing

**Suppress crack generation and progress**

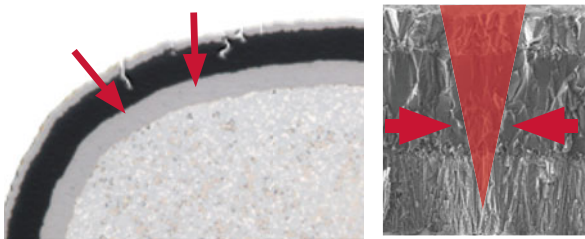
Insert cross section



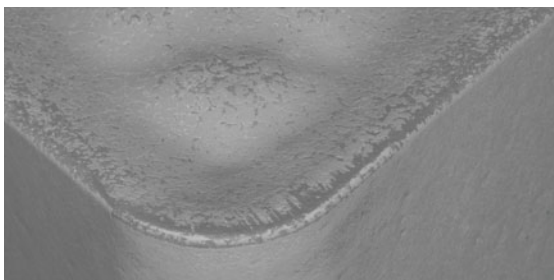
**PREMIUMTEC**

TUNGALOY

**Suppress crack propagation**



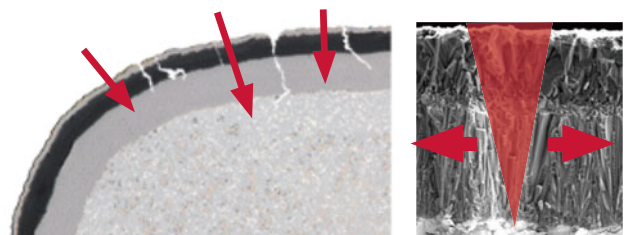
**Still using**



**Results: stable machining!**

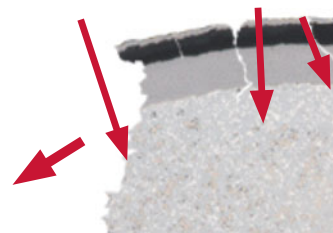
**Crack occurs in coating files. Crack proceeds**

Insert cross section

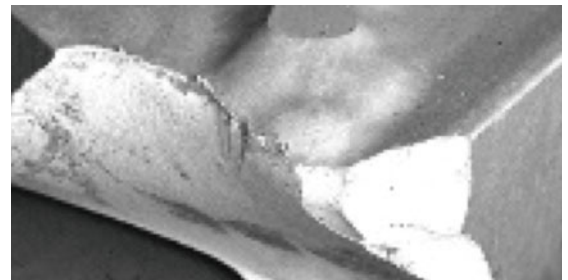


The crack gradually spreads

**Fracture**



**Fracture**



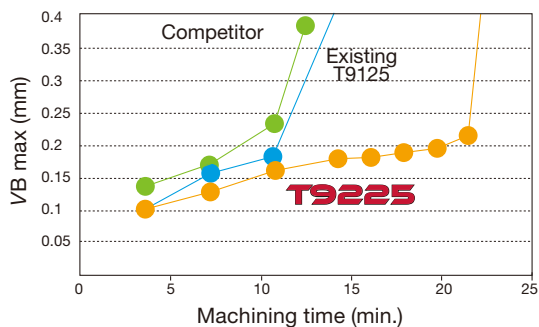


## T9225

### CUTTING PERFORMANCE

#### **P** S45C / C45

T9225 provides better wear resistance, extending tool life over competitors' CVD grades



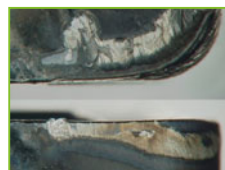
Insert : CNMG120408-\*\*  
 Cutting speed :  $V_c = 250$  m/min  
 Feed :  $f = 0.28$  mm/rev  
 Depth of cut :  $a_p = 2.0$  mm  
 Machining : Continuous cutting  
 Coolant : Wet

#### T9225

22 min.



Competitor  
12 min.

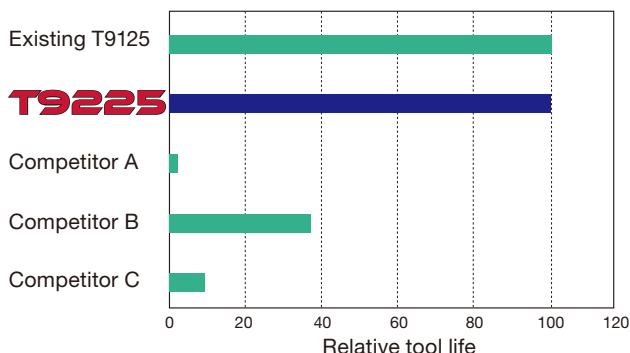


Existing  
14 min.



#### **P** S45C / C45

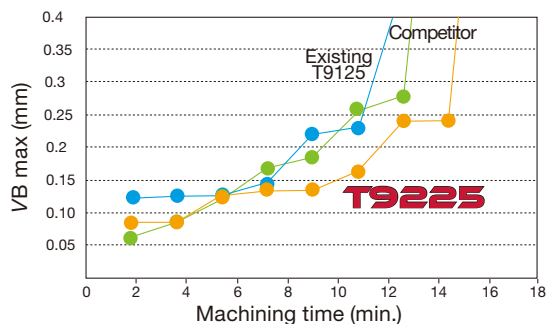
T9225 offers high fracture toughness over competitors' grades



Insert : CNMG120408-\*\*  
 Cutting speed :  $V_c = 150$  m/min  
 Feed :  $f = 0.30$  mm/rev  
 Depth of cut :  $a_p = 1.5$  mm  
 Machining : Interrupted cutting  
 Coolant : Wet

#### **P** SCM440

T9225 features superior resistance to wear resistance, making the grade ideal for a wide range of applications.



Insert : CNMG120408-\*\*  
 Cutting speed :  $V_c = 250$  m/min  
 Feed :  $f = 0.28$  mm/rev  
 Depth of cut :  $a_p = 2.0$  mm  
 Machining : Continuous cutting  
 Coolant : Wet

#### T9225

14 min.



CompetitorA  
13 min.



Existing  
13 min.



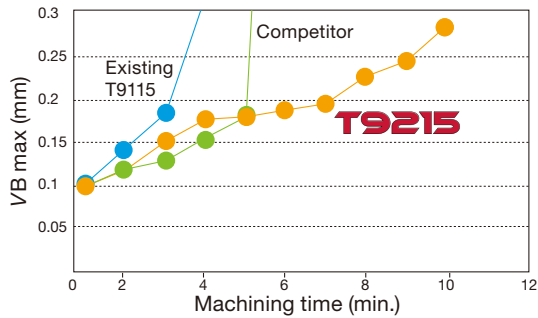


## T9215

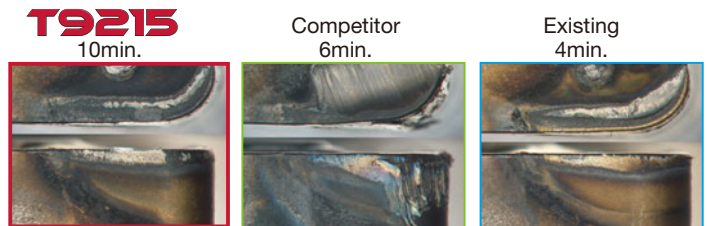
### CUTTING PERFORMANCE

#### **P** S45C / C45 , High speed machining

Long tool life and stable machining in a wide range of applications is compared to existing equivalent P15 grade products.

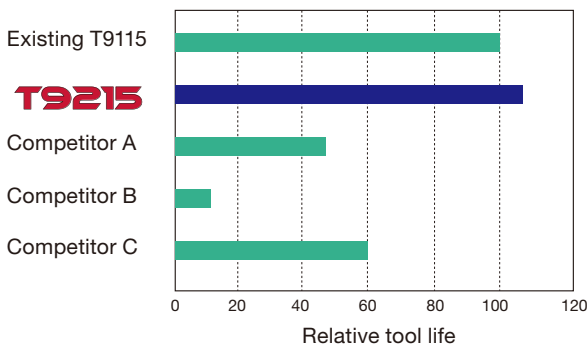


Insert : CNMG120408-\*\*  
 Cutting speed :  $V_c = 400$  m/min  
 Feed :  $f = 0.28$  mm/rev  
 Depth of cut :  $a_p = 2.0$  mm  
 Machining : Continuous cutting  
 Coolant : Wet



#### **P** S45C / C45

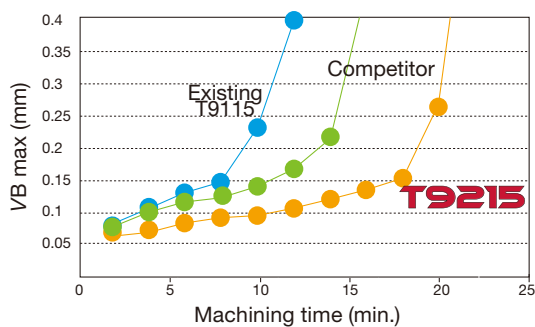
The fracture resistance of grade T9215 is equivalent to T9115 but exceeds the competitor's equivalent grades.



Insert : CNMG120408-\*\*  
 Cutting speed :  $V_c = 150$  m/min  
 Feed :  $f = 0.15$  mm/rev  
 Depth of cut :  $a_p = 1.5$  mm  
 Machining : Interrupted cutting  
 Coolant : Wet

#### **P** SCM440 / 42CrMo4

T9215 provides better wear resistance, extending tool life over competitors' CVD grades



Insert : CNMG120408-\*\*  
 Cutting speed :  $V_c = 300$  m/min  
 Feed :  $f = 0.28$  mm/rev  
 Depth of cut :  $a_p = 2.0$  mm  
 Machining : Continuous cutting  
 Coolant : Wet

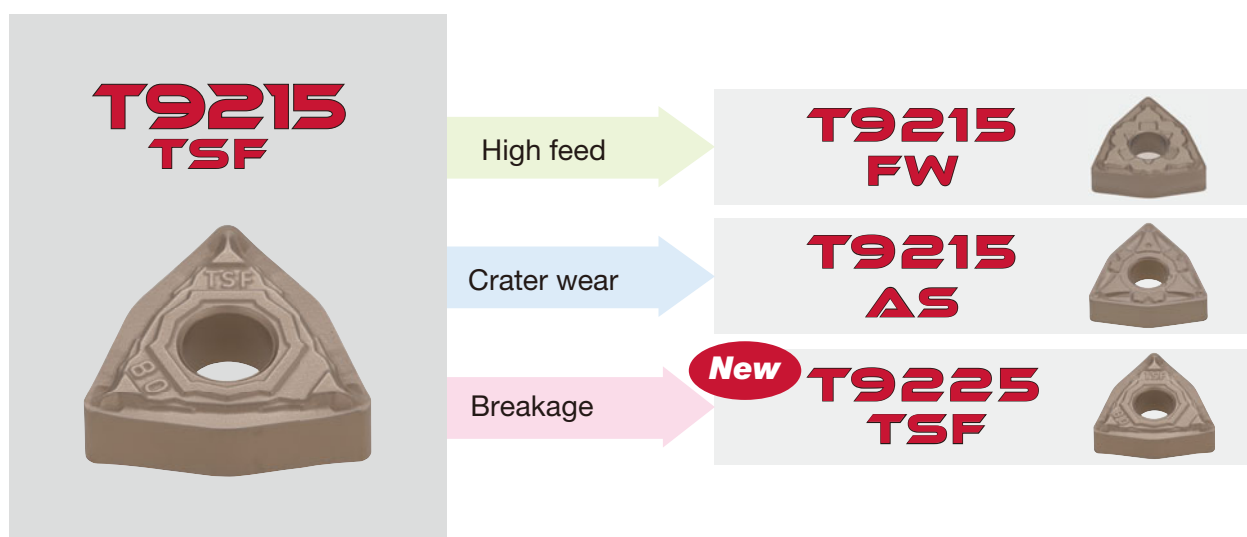


# SELECTION GUIDE

## NEGATIVE TYPE

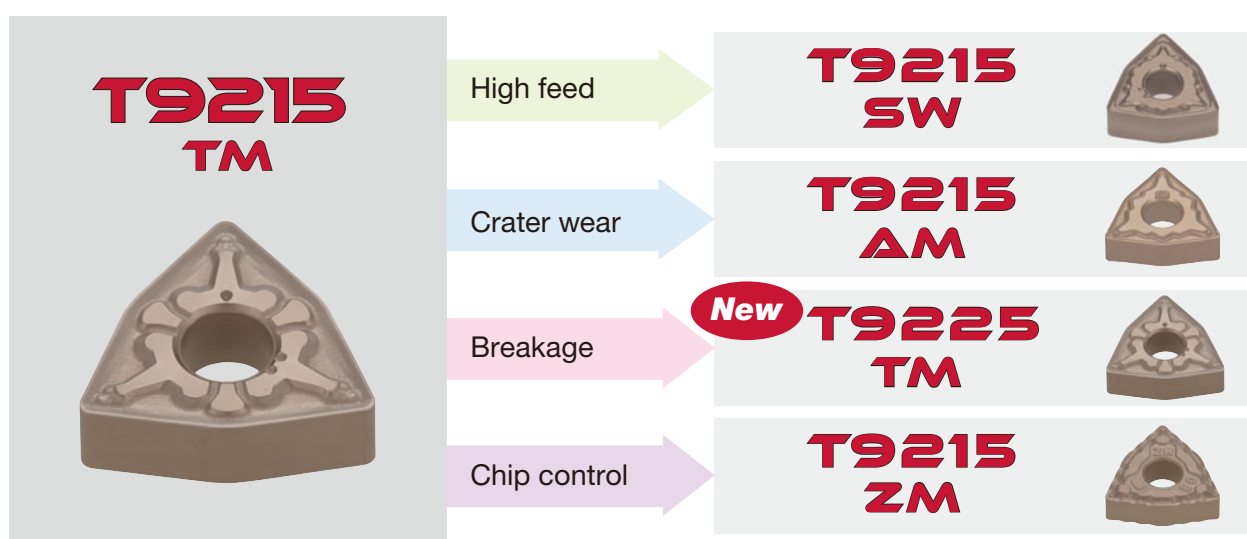
- For finishing ( $a_p = 0.3 - 1.5$  mm)

*The 1st recommendation*



- For finish to medium cutting ( $a_p = 1.0 - 4.0$  mm)

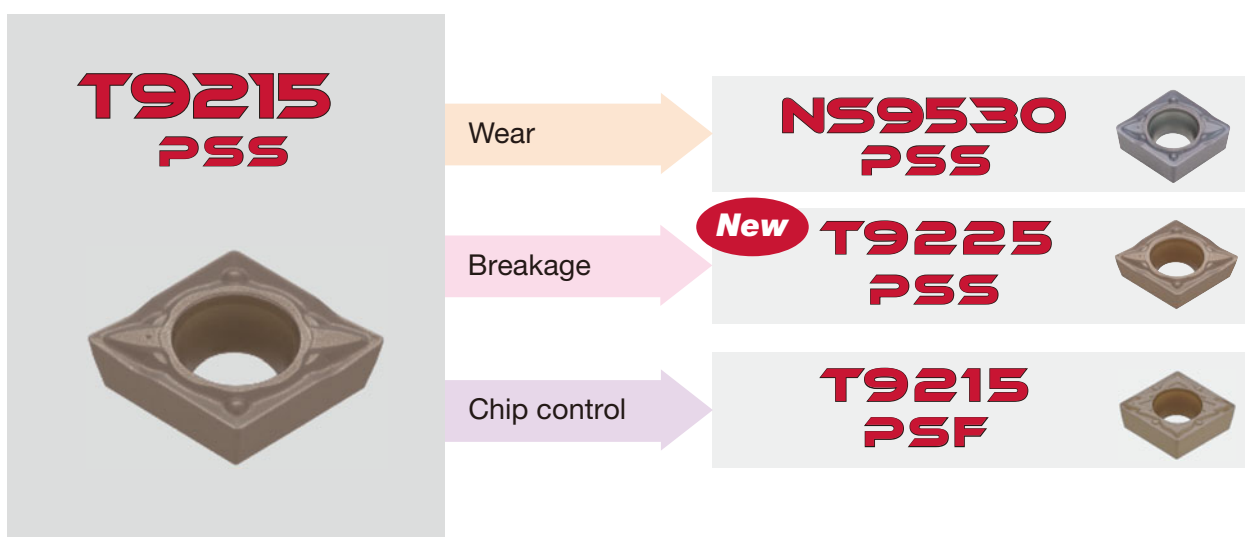
*The 1st recommendation*



## POSITIVE TYPE

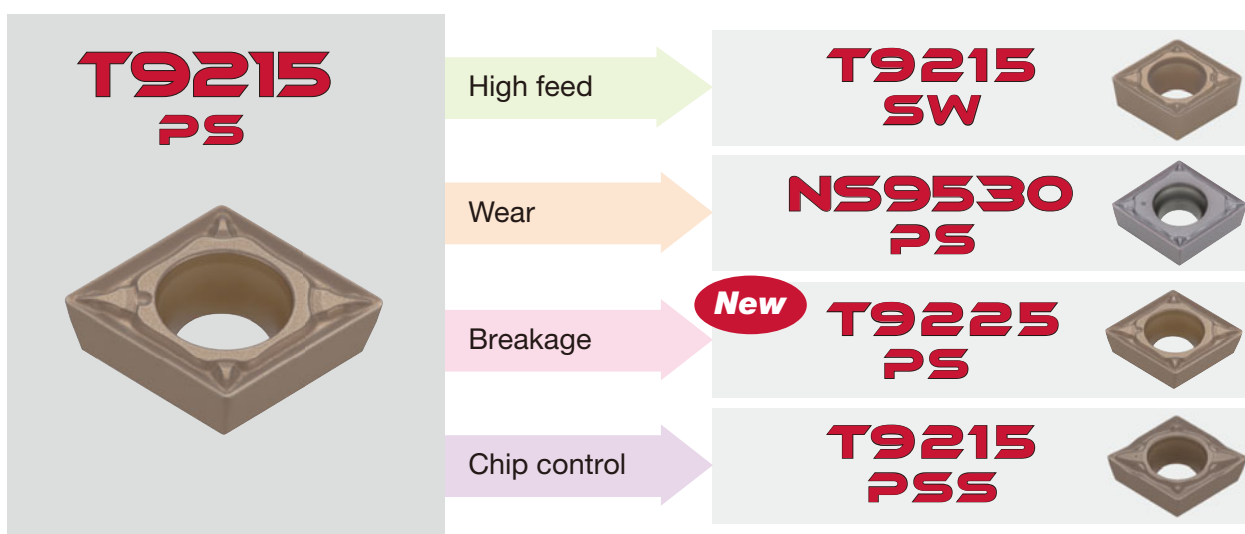
- For finishing ( $a_p = 0.1 - 0.5 \text{ mm}$ )

**The 1st recommendation**



- For finishing to medium cutting ( $a_p = 0.5 - 2.5 \text{ mm}$ )

**The 1st recommendation**






# STANDARD CUTTING CONDITIONS

For Negative Inserts

| ISO               | Operation                  | Chipbreaker | Grades | Depth of cut<br>ap (mm) | Feed<br>f (mm/rev) | Cutting speed: Vc (m/min)             |  |  |  |
|-------------------|----------------------------|-------------|--------|-------------------------|--------------------|---------------------------------------|--|--|--|
|                   |                            |             |        |                         |                    | Low carbon<br>steels, alloy<br>steels | Medium carbon<br>steels, alloy<br>steels | High carbon<br>steels, alloy<br>steels |  |
| <div>P</div>      | Finishing                  | TSF         | T9215  | 0.2 - 1.5               | 0.08 - 0.4         | 150 - 400                             | 150 - 400                                | 120 - 300                              |  |
|                   |                            |             | T9225  |                         |                    | 120 - 300                             | 120 - 300                                | 100 - 250                              |  |
|                   |                            | AS          | T9215  | 0.5 - 2.0               | 0.2 - 0.6          | 150 - 400                             | 150 - 400                                | 120 - 300                              |  |
|                   |                            |             | T9225  |                         |                    | 120 - 300                             | 120 - 300                                | 100 - 250                              |  |
|                   |                            | FW          | T9215  | 0.5 - 1.5               | 0.2 - 0.4          | 150 - 400                             | 150 - 400                                | 120 - 300                              |  |
|                   |                            |             | T9225  |                         |                    | 120 - 300                             | 120 - 300                                | 100 - 250                              |  |
|                   | Medium<br>cutting          | TM          | T9215  | 1 - 5                   | 0.2 - 0.5          | 150 - 400                             | 150 - 400                                | 120 - 300                              |  |
|                   |                            |             | T9225  |                         |                    | 120 - 300                             | 120 - 300                                | 100 - 250                              |  |
|                   |                            | AM          | T9215  | 1.5 - 4.5               | 0.2 - 0.6          | 150 - 400                             | 150 - 400                                | 120 - 300                              |  |
|                   |                            |             | T9225  |                         |                    | 120 - 300                             | 120 - 300                                | 100 - 250                              |  |
|                   |                            | SW          | T9215  | 0.5 - 2                 | 0.3 - 0.6          | 150 - 400                             | 150 - 400                                | 120 - 300                              |  |
|                   |                            |             | T9225  |                         |                    | 120 - 300                             | 120 - 300                                | 100 - 250                              |  |
|                   | Medium to<br>heavy cutting | TH          | T9215  | 3 - 6                   | 0.3 - 0.6          | 150 - 400                             | 150 - 400                                | 120 - 300                              |  |
|                   |                            |             | T9225  |                         |                    | 120 - 300                             | 120 - 300                                | 100 - 250                              |  |
| <div>M</div>      | Finishing                  | TSF         | T9215  | 0.2 - 1.5               | 0.08 - 0.4         | Stainless steel                       |  |  |  |
|                   |                            |             | T9225  |                         |                    | 100 - 250                             |  |  |  |
|                   | Medium<br>cutting          | TM          | T9215  | 1 - 5                   | 0.2 - 0.5          | 100 - 250                             |  |  |  |
|                   |                            |             | T9225  |                         |                    | 100 - 250                             |  |  |  |
|                   | <div>K</div>               | Finishing   | TSF    | T9215                   | 0.2 - 1.5          | 0.08 - 0.4                            | Cast iron                                |  |  |
|                   |                            |             |        | T9225                   |                    |                                       | 140 - 500                                |  |  |
| Medium<br>cutting |                            | TM          | T9215  | 1 - 5                   | 0.2 - 0.5          | 140 - 500                             |  |  |  |
|                   |                            |             | T9225  |                         |                    | 140 - 500                             |  |  |  |



## For Positive Inserts

| ISO   | Operation               | Chipbreaker | Grades | Depth of cut<br>ap (mm) | Feed<br>f (mm/rev) | Cutting speed: Vc (m/min)             |  |  |
|---|-------------------------|-------------|--------|-------------------------|--------------------|---------------------------------------|--|--|
|   |                         |             |        |                         |                    | Low carbon<br>steels, alloy<br>steels | Medium carbon<br>steels, alloy<br>steels | High carbon<br>steels, alloy<br>steels |
|    | Finishing               | PSF         | T9215  | 0.1 - 0.5               | 0.05 - 0.3         | 120 - 350                             | 100 - 350                                | 80 - 250                               |
|   |                         |             | T9225  |                         |                    | 100 - 300                             | 80 - 300                                 | 80 - 250                               |
|   | Medium                  | PS          | T9215  | 0.5 - 2.5               | 0.08 - 0.3         | 120 - 300                             | 100 - 300                                | 80 - 250                               |
|   |                         |             | T9225  |                         |                    | 100 - 300                             | 80 - 250                                 | 80 - 200                               |
|   |                         | SW          | T9215  | 0.5 - 2                 | 0.15 - 0.4         | 150 - 350                             | 150 - 350                                | 120 - 300                              |
|   |                         |             | T9225  |                         |                    | 100 - 300                             | 100 - 300                                | 80 - 250                               |
|   | Medium to heavy cutting | PM          | T9215  | 1 - 3                   | 0.15 - 0.3         | 120 - 300                             | 100 - 300                                | 80 - 200                               |
|   |                         |             | T9225  |                         |                    | 100 - 300                             | 80 - 300                                 | 80 - 200                               |
| Stainless steel   |                         |             |        |                         |                    |                                       |  |  |
|   | Finishing               | PSF         | T9215  | 0.1 - 0.5               | 0.05 - 0.3         | 50 - 200                              |  |  |
|   |                         |             | T9225  |                         |                    | 50 - 200                              |  |  |
|   | Medium                  | PS          | T9215  | 0.5 - 2.5               | 0.08 - 0.3         | 50 - 200                              |  |  |
|   |                         |             | T9225  |                         |                    | 50 - 200                              |  |  |
| Cast iron   |                         |             |        |                         |                    |                                       |  |  |
|  | Finishing               | PSF         | T9215  | 0.1 - 0.5               | 0.05 - 0.3         | 100 - 350                             |  |  |
|   |                         |             | T9225  |                         | 0.05 - 0.3         | 100 - 350                             |  |  |
|   | Medium                  | PS          | T9215  | 0.5 - 2.5               | 0.08 - 0.3         | 100 - 350                             |  |  |
|   |                         |             | T9225  |                         | 0.08 - 0.3         | 100 - 350                             |  |  |



# SUCCESS STORIES

**1** In machining automotive parts, the competitor's tool life was 20pcs/corner due to the insufficient wear resistance, and it was a problem for the user.

**Industry:** **Automotive** / Automotive Parts

**Material:** S55C (C55)

**Toolholder:** AWLNR2525M08-A

**Insert:** WNMG080408-AM

**Grade:** **T9215**

**Cutting conditions:**

$V_c = 300$  m/min (984 sfm)

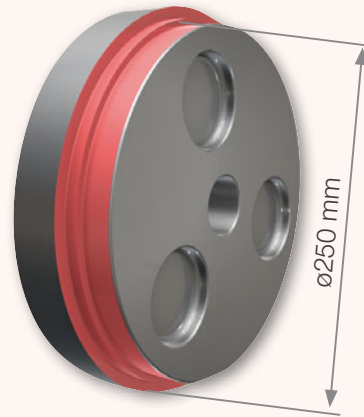
$f = 0.25$  mm/rev (0.01 ipr)

$ap = 1.5$  mm (0.059")

coolant = Wet

**Application:** External Face Turning

**Machine:** NC Lathe



**Result:**

**T9215** extended tool life by 2.0 times to 37 pcs. The damage was equivalent to that of the competitor after machining 20pcs.

New P15 grade **T9215** with excellent wear resistance provides stable machining, increasing customer productivity.

**2** In internal face turning of automotive parts, the competitor's tool life was 40pcs/corner due to the insufficient wear resistance, and it was a problem for the user.

**Industry:** **Automotive** / Automotive Parts

**Material:** S55C (C55)

**Toolholder:** AWLNR2525M08-A

**Insert:** WNMG080408-AM

**Grade:** **T9215**

**Cutting conditions:**

$V_c = 300$  m/min (984 sfm)

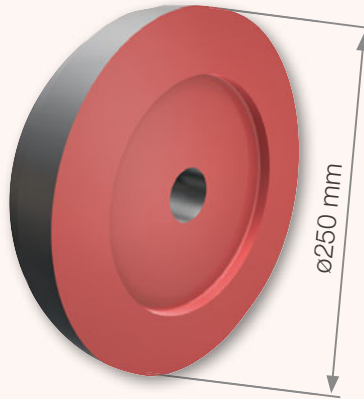
$f = 0.3$  mm/rev (0.012 ipr)

$ap = 1.0$  mm (0.040")

coolant = Wet

**Application:** Internal Face Turning

**Machine:** NC Lathe



**Result:**

**T9215** extended tool life by 1.6 times to 65 pcs. The damage was equivalent to that of the competitor after machining 40pcs.

New P15 grade **T9215** with excellent wear resistance provides stable machining, increasing customer productivity.

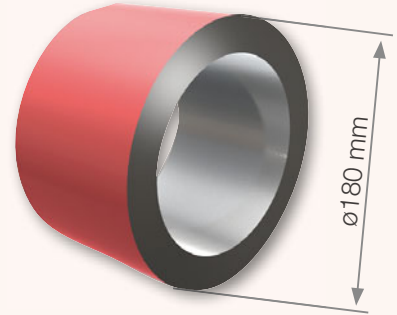
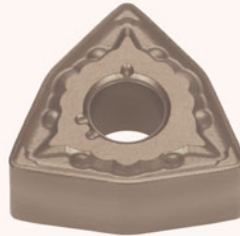
- 3 In machining carrier parts, the tool life of the competitor's wiper insert was only 30pcs/edge, and tool life needed to be extended.

**Industry:** Automotive / Carrier Parts  
**Material:** S55C (C45)  
**Toolholder:** AWLNR2525M08-A  
**Insert:** WNMG080408-SW  
**Grade:** T9215

**Cutting conditions:**

$V_c = 300 \text{ m/min (984 sfm)}$   
 $f = 0.4 \text{ mm/rev (0.016 ipr)}$   
 $ap = 1.0 \text{ mm (0.04")}$   
**coolant = Wet**

**Application:** External Turning  
**Machine:** NC Lathe



**Result:**

We recommended our newest T9215 with outstanding wear resistance and the new SW wiper insert. The combination extended tool life by 1.2 times to 35 pcs, achieving Tungaloy's Accelerated Machining. T9215 helps customers increase productivity due to outstanding wear resistance.

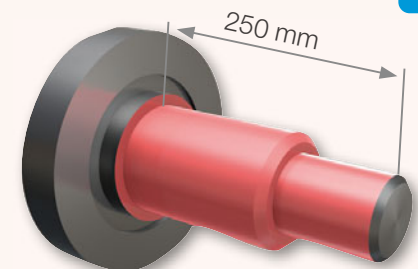
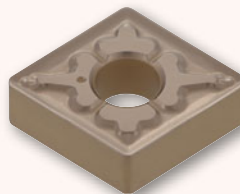
- 4 In external facing of shaft parts, the tools had to be changed after machining 4pcs. Improvement in tool life was a priority to increase the user's productivity.

**Industry:** Automotive / Shaft Parts  
**Material:** SCM440 (42CrMo4)  
**Toolholder:** ACLNR2525M12-A  
**Insert:** CNMG120408-TM  
**Grade:** T9215

**Cutting conditions:**

$V_c = 250 \text{ m/min (820 sfm)}$   
 $f = 0.3 \text{ mm/rev (0.012 ipr)}$   
 $ap = 3.5 \text{ mm (0.138")}$   
**coolant = Wet**

**Application:** External & Face Turning  
**Machine:** NC Lathe



**Result:**

T9215 extended tool life by 1.7 times, to 7pcs. Also, no sudden fracture occurred, delivering stable machining. New P15 grade T9215 helps customers increase productivity due to outstanding wear resistance.

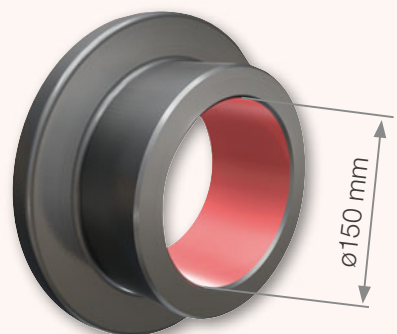
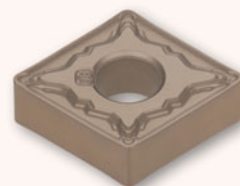
- 5 In internal turning of machine parts, the competitor's tool life was 120 pcs per edge. However, sudden breakage and chipping occurred during machining, which made it difficult to deliver stable machining.

**Industry:** General Engineering / Machine Parts  
**Material:** SNCM439 (4340)  
**Toolholder:** ACLNR2525M12-A  
**Insert:** CNMG120408-AM  
**Grade:** T9215

**Cutting conditions:**

$V_c = 170 \text{ m/min (558 sfm)}$   
 $f = 0.4 \text{ mm/rev (0.016 ipr)}$   
 $ap = 2.5 \text{ mm (0.1")}$   
**coolant = Wet**

**Application:** Internal Turning  
**Machine:** NC Lathe



**Result:**

The user tested our newest T9215 with outstanding wear and fracture resistance. T9215 finished machining 120 pcs per edge with stability, and there was no significant tool damage, such as chipping and crater wear, drastically improving customer productivity.

## T9200 SERIES – New Generation Grades for *Accelerated Machining*

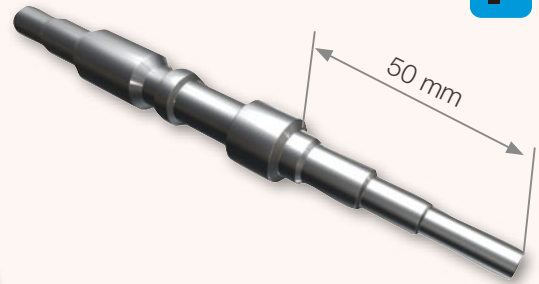
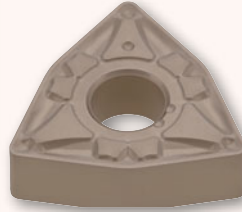
- 6 In external turning of pump shaft parts, the tool life of the conventional tool was only 200pcs per edge due to insufficient wear resistance.

**Industry:** Automotive / Pump Shaft Parts  
**Material:** S45C (C45)  
**Toolholder:** C4AWLNR27050-08N  
**Insert:** WNMG080412-AS  
**Grade:** T9215

**Cutting conditions:**

$V_c = 300$  m/min (984 sfm)  
 $f = 0.3$  mm/rev (0.12 ipr)  
 $ap = 0.6$  mm (0.024")  
**coolant = Wet**

**Application:** External Turning  
**Machine:** NC Lathe



**Result:**

The user tested our newest T9215 with higher wear resistance. T9215 provided stability in machining 400pcs, outperforming the competitor's tool life. The damage on T9215 was less than the conventional tool after machining 200pcs, which means the tool life would be further extended. As a result, T9215 doubled tool life and drastically improved customer productivity.

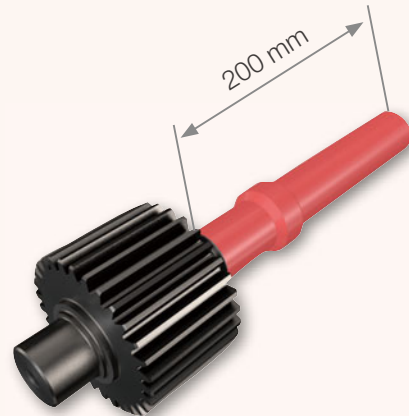
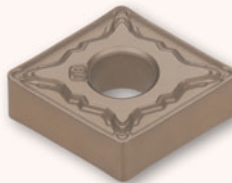
- 7 In external roughing of topshaft parts, the competitor's tool life was only 50 pcs/edge due to fracture caused by increased wear.

**Industry:** Automotive / Top Shaft Parts  
**Material:** SCM material  
**Toolholder:** ACLNR2525M12-A  
**Insert:** CNMG120408-AM  
**Grade:** T9215

**Cutting conditions:**

$V_c = 250$  m/min (820 sfm)  
 $f = 0.25 - 0.35$  mm/rev (0.010 - 0.016 ipr)  
 $ap = 2.0$  mm (0.079")  
**coolant = Wet**

**Application:** External Turning  
**Machine:** NC Lathe



**Result:**

T9215 provided tool life of 100 pcs per edge with high machining stability. Catastrophic damage was observed on the cutting edge of the competitor's insert after machining 50pcs. However, damage on the T9215 inserts was minimal. T9215 doubled tool life and provided stable machining, drastically improving customer productivity.

- 8 In external finishing of sliding shaft parts, the competitor's tool life was 300pcs, and P25 grade was used to prevent sudden fracture. However, wear increased quickly with P25, and it shortened tool life.

**Industry:** Automotive / Sliding Shaft Parts  
**Material:** S30C (C30)  
**Toolholder:** ATGNR2525M16-A  
**Insert:** TNMG160408-AM  
**Grade:** T9215

**Cutting conditions:**

$V_c = 200$  m/min (656 sfm)  
 $f = 0.25 - 0.3$  mm/rev (0.01 - 0.012 ipr)  
 $ap = 2.5$  mm (0.1")  
**coolant = Wet**

**Application:** External Turning  
**Machine:** NC Lathe



**Result:**

The user tested our newest T9215 with higher wear resistance and also the same fracture resistance as P25 grade. T9215 provided stability in machining 300pcs, and the damage was less than the competitor after machining the same number of parts. As a result, T9215 delivered stable machining and drastically improved customer productivity.



- 9 In external turning of shaft parts, the competitor's tool life was 1 pcs. So, it was urgently required that the tool life be extended with optimum cutting conditions to increase productivity.

**Industry:** Automotive / Shaft Parts

**Material:** SCM440 (42CrMo4)

**Toolholder:** ACJNR2525M12-A

**Insert:** CNMG120412-TM

**Grade:** T9215

### Cutting conditions:

$V_c = 140$  m/min (459 sfm)  
 $f = 0.38$  mm/rev (0.015 ipr)  
 $ap = 4.0$  mm (0.158") x 6 pass  
 coolant = Wet

### Competitor

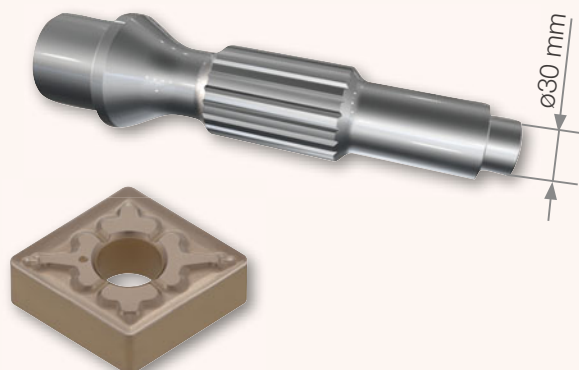
2.0 x 12 pass

**Application:** External Turning

**Machine:** NC Lathe

### Result:

The customer tested our latest T9215 with higher wear resistance. Also, the insert shape and the cutting conditions were optimized. As a result, the number of passes was reduced to half, and the tool life was extended by 5 times. Thus, machining time per piece and the number of insert changes were reduced, which drastically increased customer productivity.



P

- 10 In external profiling of bearing parts, the competitor machined 500pcs, but the productivity was low due to sudden fracture.

**Industry:** General Engineering / Bearing Parts

**Material:** SUJ2

**Toolholder:** PDJNR2525

**Insert:** DNMG150408-AM

**Grade:** T9215

### Cutting conditions:

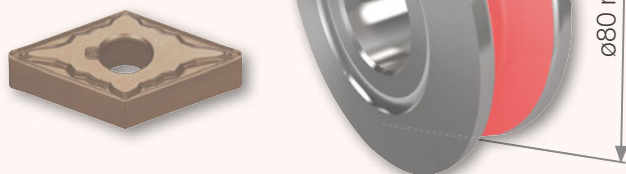
$V_c = 250$  m/min (820 sfm)  
 $f = 0.25 - 0.35$  mm/rev (0.010 - 0.016 ipr)  
 $ap = 0.25$  mm (0.01")  
 coolant = Wet

**Application:** External & Profile Turning

**Machine:** NC Lathe

### Result:

Our latest T9215 grade, with higher wear resistance, machined 500pcs without sudden fracture, providing stable machining. Also, the damage was minimal. T9215 prevented sudden fracture and drastically increased customer productivity.



P

- 11 In external machining of pipe parts, the competitor's tool life was only 80 pcs, and the customer needed to improve productivity.

**Industry:** General Engineering / Pipe Parts

**Material:** SM490 (DIN:ST52-3)

**Toolholder:** PDJNR2525M15

**Insert:** DNMG150608-TM

**Grade:** T9215

### Cutting conditions:

$V_c = 200$  m/min (656 sfm)  
 $f = 0.35$  mm/rev (0.014 ipr)  
 $ap = 3$  mm (0.118")  
 coolant = Wet

### Competitor

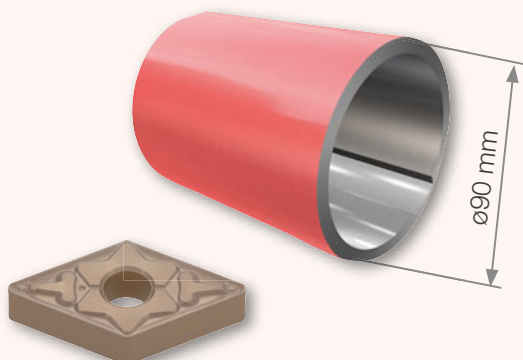
180 mm/min  
 0.27 mm/rev

**Application:** Internal Turning

**Machine:** NC Lathe

### Result:

The customer tested our latest T9215 with higher wear resistance and also optimized cutting speed and feed to improve productivity. As a result, T9215 delivered stability in machining 100pcs, and machining time per piece was reduced by 30%. T9215 provided stable machining and drastically increased customer productivity.



P

## T9200 SERIES – New Generation Grades for *Accelerated Machining*

- 12** In interrupted internal machining of clutch parts, the competitor was able to machine only 400 pcs per edge due to sudden fracture caused by insufficient wear resistance.

**Industry:** Automotive / Clutch Parts  
**Material:** S45C (C45)  
**Toolholder:** A32S-SVZBL16-D320  
**Insert:** VBMT160408-PS  
**Grade:** T9215

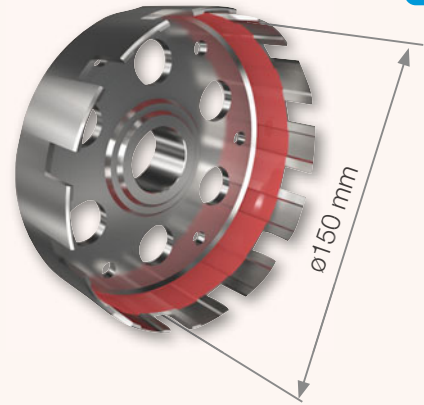
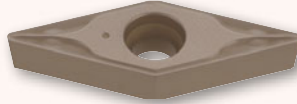
**Cutting conditions:**

$V_c = 130$  m/min (426 sfm)  
 $f = 0.2$  mm/rev (0.008 ipr)  
 $a_p = 0.5$  mm (0.02")  
 coolant = Wet

**Application:** Internal Turning  
**Machine:** NC Lathe

**Result:**

The customer tested our newest T9215 with good balance between wear and fracture resistance, and the grade machined 600pcs without sudden fracture. T9215 delivered stable machining and drastically improved customer productivity.



- 13** In external turning and facing of machine parts, the tool life of the conventional tool was only 400 pcs due to a burr on the work piece caused by increased wear.

**Industry:** General Engineering / Machine Parts  
**Material:** SCM415 (15CrMo4)  
**Toolholder:** AWLNR2525M08-A  
**Insert:** WNMG080408-TM  
**Grade:** T9215

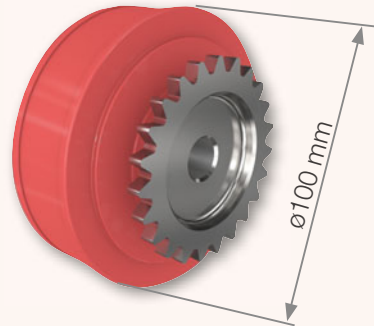
**Cutting conditions:**

$V_c = 240$  m/min (787 sfm)  
 $f = 0.1 - 0.25$  mm/rev (0.004 - 0.01 ipr)  
 $a_p = 1.0$  mm (0.04")  
 coolant = Wet

**Application:** External & Face Turning  
**Machine:** NC Lathe

**Result:**

The customer tested our latest T9215 with higher wear resistance, and the grade machined 800 pcs without a burr and provided stable machining. The damage on T9215 after machining 800pcs was equivalent to that of the conventional tool after 400pcs. T9215 doubled tool life and drastically increased customer productivity.



- 14** In face turning of synchronizer parts, the competitor machined only 1,800 pcs per edge due to bad surface quality.

**Industry:** Automotive / Synchronizer Parts  
**Material:** SCM420 (20CrMo4)  
**Toolholder:** Special  
**Insert:** VCMT160404-PS  
**Grade:** T9215

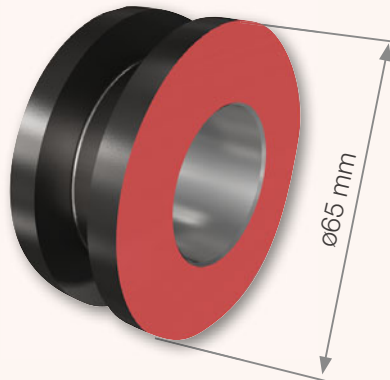
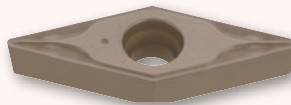
**Cutting conditions:**

$V_c = 180$  m/min (590 sfm)  
 $f = 0.15$  mm/rev (0.006 ipr)  
 $a_p = 1.0$  mm (0.04")  
 coolant = Wet

**Application:** Face Turning  
**Machine:** NC Lathe

**Result:**

The customer tested our latest T9215 with higher wear resistance. The grade machined 2,600 pcs and delivered better surface quality. T9215 extended tool life by 1.5 times and drastically increased customer productivity.



- 15 In face turning of connector parts, the competitor's tool life was shortened due to chipping and fracture. The customer was seeking a solution for stable machining and long tool life.

**Industry:** Automotive / Connector Parts

**Material:** SNCM439 (4340)

**Toolholder:** PCLNR2525M12

**Insert:** CNMG120408-TM

**Grade:** T9215

**Cutting conditions:**

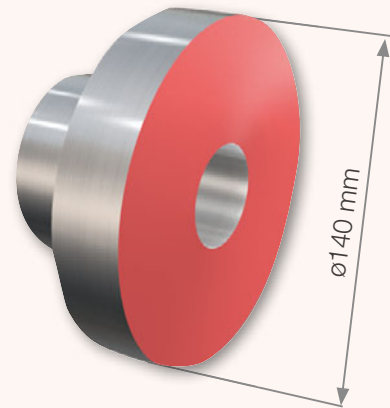
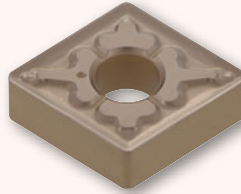
$V_c = 270 \text{ m/min (886 sfm)}$   
 $f = 0.25 \text{ mm/rev (0.01 ipr)}$   
 $ap = 2.0 \text{ mm (0.079")}$   
 coolant = Wet

**Application:** Face Turning

**Machine:** NC Lathe

**Result:**

We recommended our latest T9215 with excellent wear and fracture resistance. In the test, the grade machined 50 pcs (1.7 times more than the competitor), and no sudden breakage, such as chipping and fracture, occurred. T9215 provided stable machining and long tool life, drastically improving customer productivity.



- 16 The customer requested was improvement in tool life for external turning of BT shank and gave us a chance for a test.

**Industry:** General Engineering / BT Shank Parts

**Material:** SNCM430

**Toolholder:** ACLNR2525M12-A

**Insert:** CNMG120408-TM

**Grade:** T9215

**Cutting conditions:**

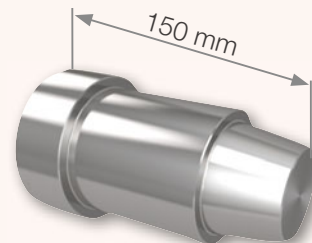
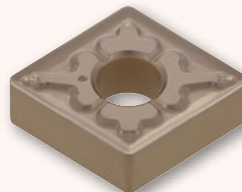
$V_c = 240 \text{ m/min (787 sfm)}$   
 $f = 0.3 \text{ mm/rev (0.012 ipr)}$   
 $ap = 3.0 \text{ mm (0.118")}$   
 coolant = Wet

**Application:** External Turning

**Machine:** NC Lathe

**Result:**

We recommended our latest T9215 with outstanding wear resistance. The grade achieved 300 pcs, which is more than 2 times compared to 140 pcs the competitor machined. No abnormal damage, such as chipping and fracture, occurred on the cutting edge, providing stable machining. T9215 drastically improved productivity and satisfied the customer's request.



- 17 In external machining of machine parts, the competitor's tool life was 5pcs due to its insufficient wear resistance. Extend tool life and improved productivity were urgently required.

**Industry:** General Engineering / Machine Parts

**Material:** SCM440 (42CrMo4)

**Toolholder:** PDLNR2525M15

**Insert:** DNMG150608-TM

**Grade:** T9215

**Cutting conditions:**

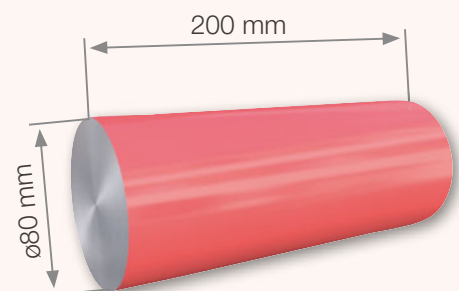
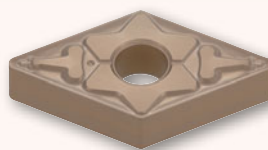
$V_c = 120 \text{ m/min (393 sfm)}$   
 $f = 0.35 \text{ mm/rev (0.016 ipr)}$   
 $ap = 1.5 \text{ mm (0.059")}$   
 coolant = Wet

**Application:** External & Face Turning

**Machine:** NC Lathe

**Result:**

Our newest T9215's tool life was doubled compared to the competitor, and the T9215 machined 10pcs. Also, TM chipbreaker, our 1st recommendation, provided better chip control. As a result, the customer's productivity was drastically improved.



## T9200 SERIES – New Generation Grades for *Accelerated Machining*

18 In internal machining of Hub parts, the competitor's tool life was 200 pcs due to its insufficient wear resistance. Tool life needed to be extended when taking pre- and post-processes into consideration.

**Industry:** Automotive / Hub Parts  
**Material:** S55C (C55)  
**Toolholder:** PDLNR2525M15  
**Insert:** DNMG150412-TS  
**Grade:** T9215

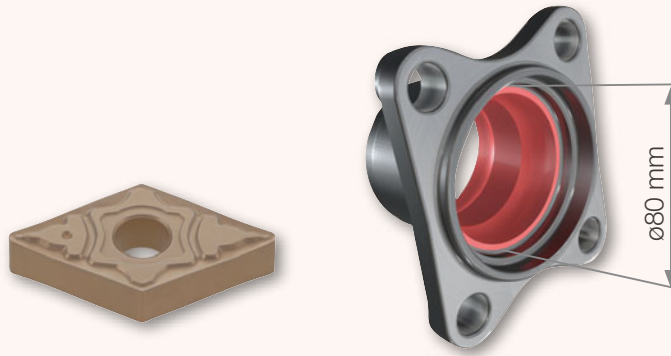
**Cutting conditions:**

$V_c = 180 \text{ m/min (590 sfm)}$   
 $f = 0.35 \text{ mm/rev (0.016 ipr)}$   
 $ap = 1.4 \text{ mm (0.055")}$   
**coolant = Wet**

**Application:** Internal Turning  
**Machine:** NC Lathe

**Result:**

Our newest T9215's tool life was doubled, machining 380 pcs. Also, the tool damage was less than the competitor's, and productivity was drastically improved.



P

19 In external turning of spring pin parts, the competitor's tool life of 200pcs was satisfactory, however improved efficiency and shortened cycle time were still required when taking pre- and post-machining processes into consideration.

**Industry:** Automotive / Spring Pin Parts  
**Material:** SCM440 (42CrMo4)  
**Toolholder:** DDJNR2525M1504  
**Insert:** DNMG150404-TSF  
**Grade:** T9215

**Cutting conditions:**

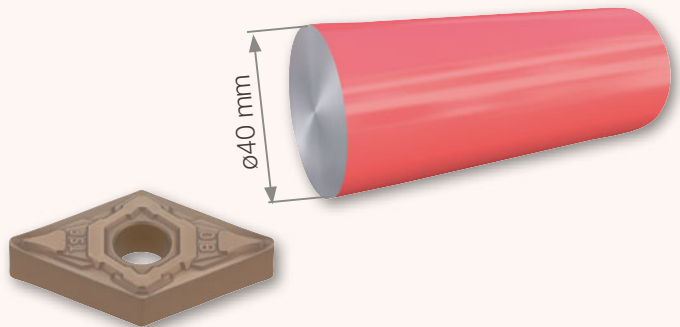
$V_c = 300 \text{ m/min (984 sfm)}$   
 $f = 0.2 \text{ mm/rev (0.008 ipr)}$   
 $ap = 1.0 \text{ mm (0.04")}$   
**coolant = Wet**

**Application:** External Turning  
**Machine:** NC Lathe

**Result:**

The customer tested our latest T9215 with outstanding wear resistance at the cutting speed doubled to 300m/min. The grade achieved 200pcs, which was the same tool life as the competitor's, and reduced cycle time. T9215 delivered ACCELERATED MACHINING and drastically improved customer productivity.

**Competitor**  
 $150 \text{ mm/min}$



P



**20** In machining stainless steel, the competitor was able to machine only 100 pcs due to increased flank wear, which was one of the reasons to decrease customer productivity.

**Industry:** General Engineering / Machine Parts

**Material:** SUS304 (X5CrNi18-9)

**Toolholder:** PCLNR2020K12

**Insert:** CNMG120408-TM

**Grade:** T9215

**Cutting conditions:**

$V_c = 205 \text{ m/min (666 sfm)}$

$f = 0.3 \text{ mm/rev (0.012 ipr)}$

$ap = 2.0 \text{ mm (0.079")}$

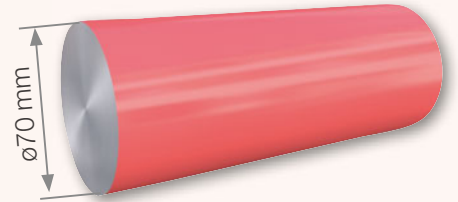
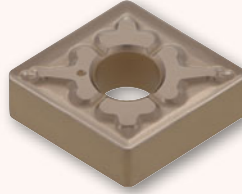
**coolant = Wet (30 Bar)**

**Application:** External

**Machine:** NC Lathe

**Result:**

Our newest T9215's tool life was 1.5 times longer than the competitor. Flank wear was drastically reduced, even in stainless machining.



**M**

**21** In machining super duplex stainless steel, the competitor was able to machine only 50pcs due to increased notch wear, which was one of the reasons to decrease customer productivity. Sudden breakage also occurred, and stable machining and improvement in productivity were urgently required.

**Industry:** General Engineering / Machine Parts

**Material:** S32750 (1.4410)

**Toolholder:** PCLNR2020K12-CHP

**Insert:** CNMG120408-TM

**Grade:** T9215

**Cutting conditions:**

$V_c = 100 \text{ m/min (328 sfm)}$

$f = 0.35 \text{ mm/rev (0.016 ipr)}$

$ap = 1.5 \text{ mm (0.059")}$

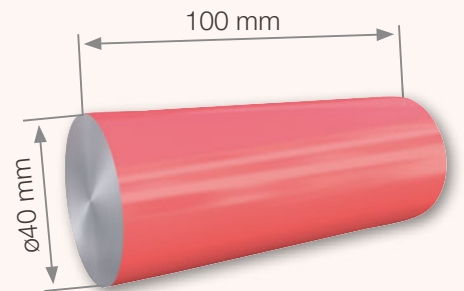
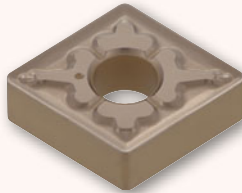
**coolant = Wet (30 Bar)**

**Application:** External & Face Turning

**Machine:** NC Lathe

**Result:**

Our newest T9215's tool life was doubled compared to the competitor, machining 100pcs. Sudden breakage was drastically reduced, which delivered remarkable increase in customer productivity.



**M**

**22** The customer requested improvement in a tool life for external turning in cast iron machining.

**Industry:** Automotive / Differential Case

**Material:** FCD600 (600-3)

**Toolholder:** C4AWLNR27050-08N

**Insert:** WNMG080412-TM

**Grade:** T9215

**Cutting conditions:**

$V_c = 180 \text{ m/min (591 sfm)}$

$f = 0.3 \text{ mm/rev (0.012 ipr)}$

$ap = 1.0 \text{ mm (0.039")}$

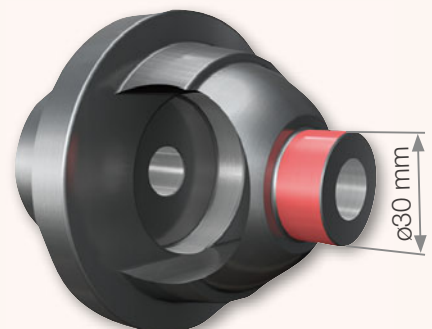
**coolant = Wet (30 Bar)**

**Application:** External

**Machine:** NC Lathe

**Result:**

We recommended our latest T9215 with outstanding wear resistance and chipping resistance. T9215 achieved 110 pcs, which is more than 2 times compared to the 50 pcs achieved by the competitor. T9215 can also be used in cast iron machining.



**K**

## T9200 SERIES – New Generation Grades for *Accelerated Machining*

23 Tool life was short and unpredictable with the competitor's inserts.

**Industry:** Gear parts  
**Material:** SCM418 (18CrMo4)  
**Toolholder:** AVJNR2525M16-A  
**Insert:** VNMG160408-TM  
**Grade:** T9225

**Cutting conditions:**

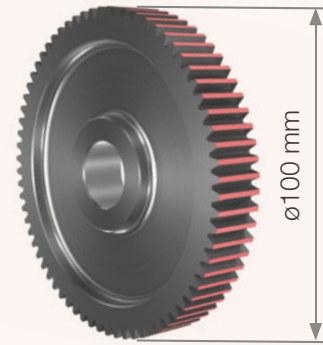
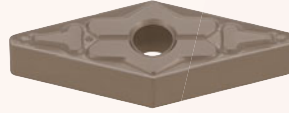
$V_c = 300$  m/min (984 sfm)  
 $f = 0.3$  mm/rev (0.012 ipr)  
 $a_p = 1.5$  mm (0.059")  
**coolant = Wet**

**Application:** External turning  
**Machine:** NC Lathe

**Result:**

T9225 improved tool life by 1.7x, machining 50 parts per edge with stability. Cutting edge wear was equivalent to that of the competitor's after machining 30 parts.

T9225 features superior resistance to wear and fractures, ensuring high productivity in machining various materials.



24 The competitor's inserts frequently fractured during machining ring parts.

**Industry:** Ring parts  
**Material:** SCM440 (42CrMo4)  
**Toolholder:** AWLNR2525M08-A  
**Insert:** WNMG080408-TM  
**Grade:** T9225

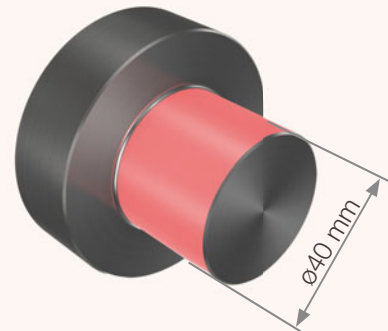
**Cutting conditions:**

$V_c = 240$  m/min (787 sfm)  
 $f = 0.35$  mm/rev (0.014 ipr)  
 $a_p = 2$  mm (0.079")  
**coolant = Wet**

**Application:** External turning  
**Machine:** NC Lathe

**Result:**

T9225 improved tool life by 1.2x, machining 50 parts per edge with stability. Insert fractures were significantly reduced. T9225 is a grade equivalent to ISO P25, featuring superior resistance to fracture and wear, which ensures stable machining of a variety of materials.



25 Short tool life was more common with the competitor's inserts due to its low wear resistance. The customer was requesting tool life improvement.

**Industry:** Automotive parts  
**Material:** SCR420H (20Cr4H)  
**Toolholder:** A16Q-SCLCR09-D180  
**Insert:** CCMT09T304-PS  
**Grade:** T9225

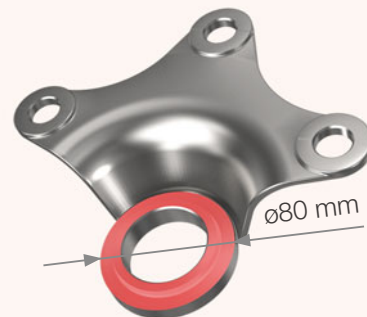
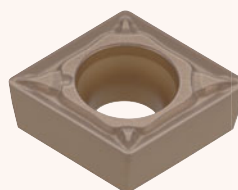
**Cutting conditions:**

$V_c = 150$  m/min (492 sfm)  
 $f = 0.2 - 0.3$  mm/rev (0.008 - 0.012 ipr)  
 $a_p = 1 - 2.5$  mm (0.039 - 0.098")  
**coolant = Wet**

**Application:** External & face turning  
**Machine:** NC Lathe

**Result:**

T9225 improved tool life by 1.2x, machining 1,200 parts per edge with stability. Wear on T9225 after machining 1,200 part was observed to be less than that of the competitor's after 1,000 parts. T9225 features superior resistance to fracture and wear, ensuring high productivity in machining various materials.



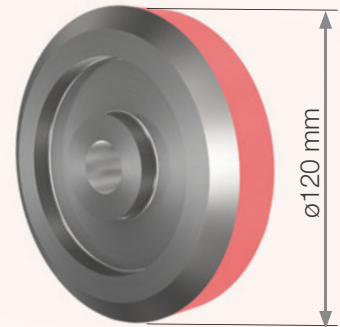
**26** Short tool life was common issue with the competitor's inserts due to its low wear resistance. The customer was requesting tool life improvement.

**Industry:** Pulley parts  
**Material:** CM418 (18CrMo4)  
**Toolholder:** AWLNR2525M08-A  
**Insert:** WNMG080408-TM  
**Grade:** T9225

**Cutting conditions:**

$V_c = 210$  m/min (689 sfm)  
 $f = 0.25$  mm/rev (0.010 ipr)  
 $ap = 1.5$  mm (0.059")  
 coolant = Wet

**Application:** External turning  
**Machine:** NC Lathe



**Result:**

T9225 improved tool life by 2.2x, machining 90 parts per edge with stability. Cutting edge wear after machining 90 parts was observed to be equivalent to that on the competitor's insert after 40 parts. T9225 features superior resistance to fracture and wear, ensuring stable machining of a variety of materials.

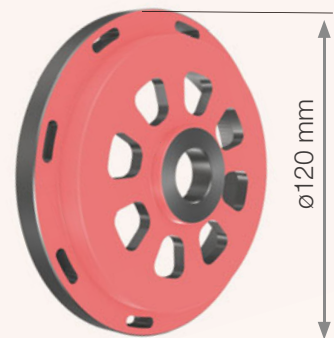
**27** Fractures and short tool life due to low wear resistance was more common with the competitor's inserts in machining clutch parts.

**Industry:** Clutch parts  
**Material:** SCM418 (18CrMo4)  
**Toolholder:** AWLNR2525M08-A  
**Insert:** WNMG080412-TM  
**Grade:** T9225

**Cutting conditions:**

$V_c = 220$  m/min (722 sfm)  
 $f = 0.3$  mm/rev (0.012 ipr)  
 $ap = 1.0$  mm (0.039")  
 coolant = Wet

**Application:** Face turning  
**Machine:** NC Lathe



**Result:**

T9225 increased tool life by 1.7x to 250 parts per edge with stability. T9225 is a grade equivalent to ISO P25, featuring superior resistance to fracture and wear, which ensures stable machining of a variety of materials.

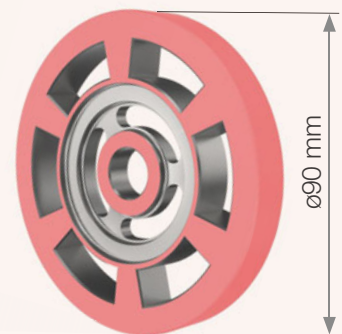
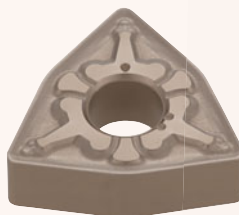
**28** The customer was requesting tool life improvement for OD turning operation of rotor parts.

**Industry:** Rotor parts  
**Material:** S10C (C10)  
**Toolholder:** AWLNR22525M08-A  
**Insert:** WNMG080412-TM  
**Grade:** T9225

**Cutting conditions:**

$V_c = 400$  m/min (1312 sfm)  
 $f = 0.45$  mm/rev (0.018 ipr)  
 $ap = 1.5$  mm (0.059")  
 coolant = Wet

**Application:** External turning  
**Machine:** NC Lathe



**Result:**

T9225 doubled tool life to 200 parts per edge with stability. T9225 is a grade equivalent to ISO P25, featuring superior resistance to fracture and wear, which ensures stable machining of a variety of materials.

## T9200 SERIES – New Generation Grades for *Accelerated Machining*

29

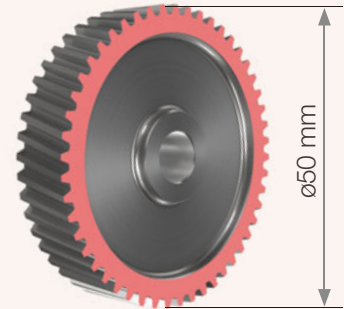
The competitor's tool was causing premature insert failure and generating burrs on the interrupted areas, deterring productivity improvement.

**Industry:** Ring gear parts  
**Material:** SCR420 (20Cr4)  
**Toolholder:** AWLNR22525M08-A  
**Insert:** WNMG080408-TM  
**Grade:** T9225

### Cutting conditions:

$V_c = 280$  m/min (919 sfm)  
 $f = 0.25$  mm/rev (0.010 ipr)  
 $ap = 1.0$  mm (0.039")  
**coolant = Wet**

**Application:** Face turning  
**Machine:** NC Lathe



P

### Result:

T9225 improved tool life by 1.7x, machining 50 parts per edge with stability. Cutting edge wear was equivalent to that of the competitor's after machining 30 parts.

T9225 features superior resistance to wear and fractures, ensuring high productivity in machining various materials.

30

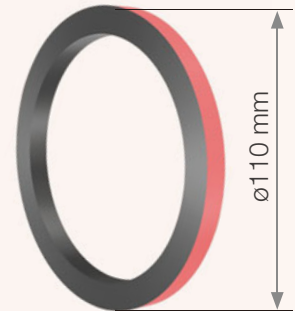
The customer was seeking to improve tool life in machining nut parts.

**Industry:** Nut parts  
**Material:** STKM13  
**Toolholder:** AWLNR22525M08-A  
**Insert:** WNMG080408-TM  
**Grade:** T9225

### Cutting conditions:

$V_c = 220$  m/min (722 sfm)  
 $f = 0.3$  mm/rev (0.012 ipr)  
 $ap = 2.0$  mm (0.079")  
**coolant = Wet**

**Application:** External turning  
**Machine:** NC Lathe



P

### Result:

T9225 machined 1,500 parts per edge, improving tool life by 1.5x with stability. T9225 is a grade equivalent to ISO P25, featuring superior resistance to fracture and wear, ensuring stable machining of a variety of materials.

31

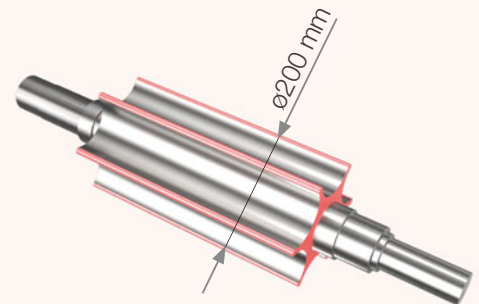
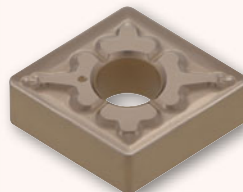
Premature insert failure and excessive wear pattern were issues with the competitor's tool when interrupted OD turning machine parts.

**Industry:** Machine parts  
**Material:** S35C (35C)  
**Toolholder:** ACLNL2525M12-A  
**Insert:** CNMG120408-TM  
**Grade:** T9225

### Cutting conditions:

$V_c = 150$  m/min (492 sfm)  
 $f = 0.25-0.4$  mm/rev (0.010 -0.016 ipr)  
 $ap = 0.5-1.5$  mm (0.020 -0.059")  
**coolant = Wet**

**Application:** External & face turning  
**Machine:** NC Lathe



P

### Result:

T9225 doubled tool life, machining 6 parts per edge, successfully improving productivity. T9225 is a grade equivalent to ISO P25, featuring superior resistance to fracture and wear, ensuring stable machining of a variety of materials.



**32** Short tool life was a common issue with the competitor's tool due to insufficient wear resistance. The customer was requesting tool life improvement.

**Industry:** Shaft parts  
**Material:** SCM440 (42CrMo4)  
**Toolholder:** DDJNL2525M16  
**Insert:** DNMG150408-AM  
**Grade:** T9225

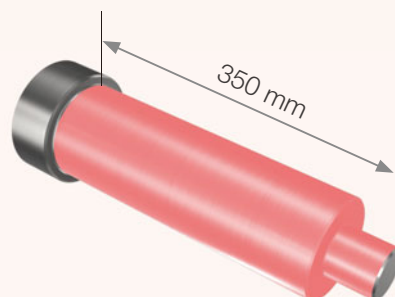
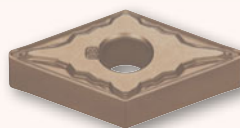
**Cutting conditions:**

$V_c = 180$  m/min (591 sfm)  
 $f = 0.3$  mm/rev (0.012 ipr)  
 $ap = 1.0$  mm (0.039")  
coolant = Wet

**Application:** External turning  
**Machine:** NC Lathe

**Result:**

T9225 improved the insert life by 1.4x, machining 70 parts per edge to increase productivity. T9225 is a grade equivalent to ISO P25, featuring superior resistance to fracture and wear, ensuring stable machining of a variety of materials.



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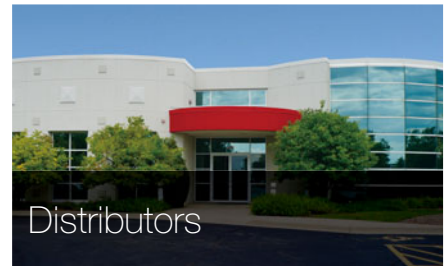
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