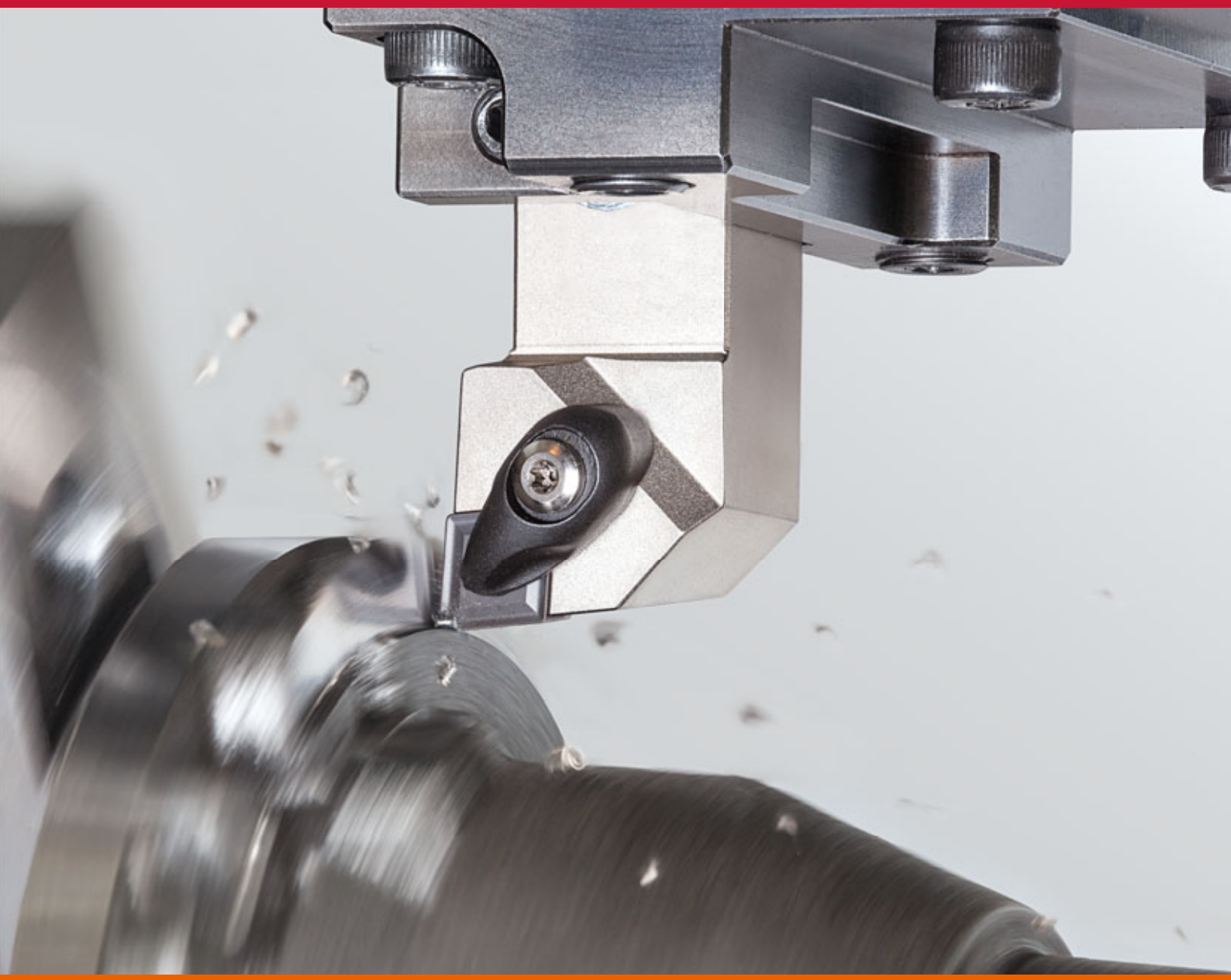
TurnLine

# T515

www.tungaloy.com

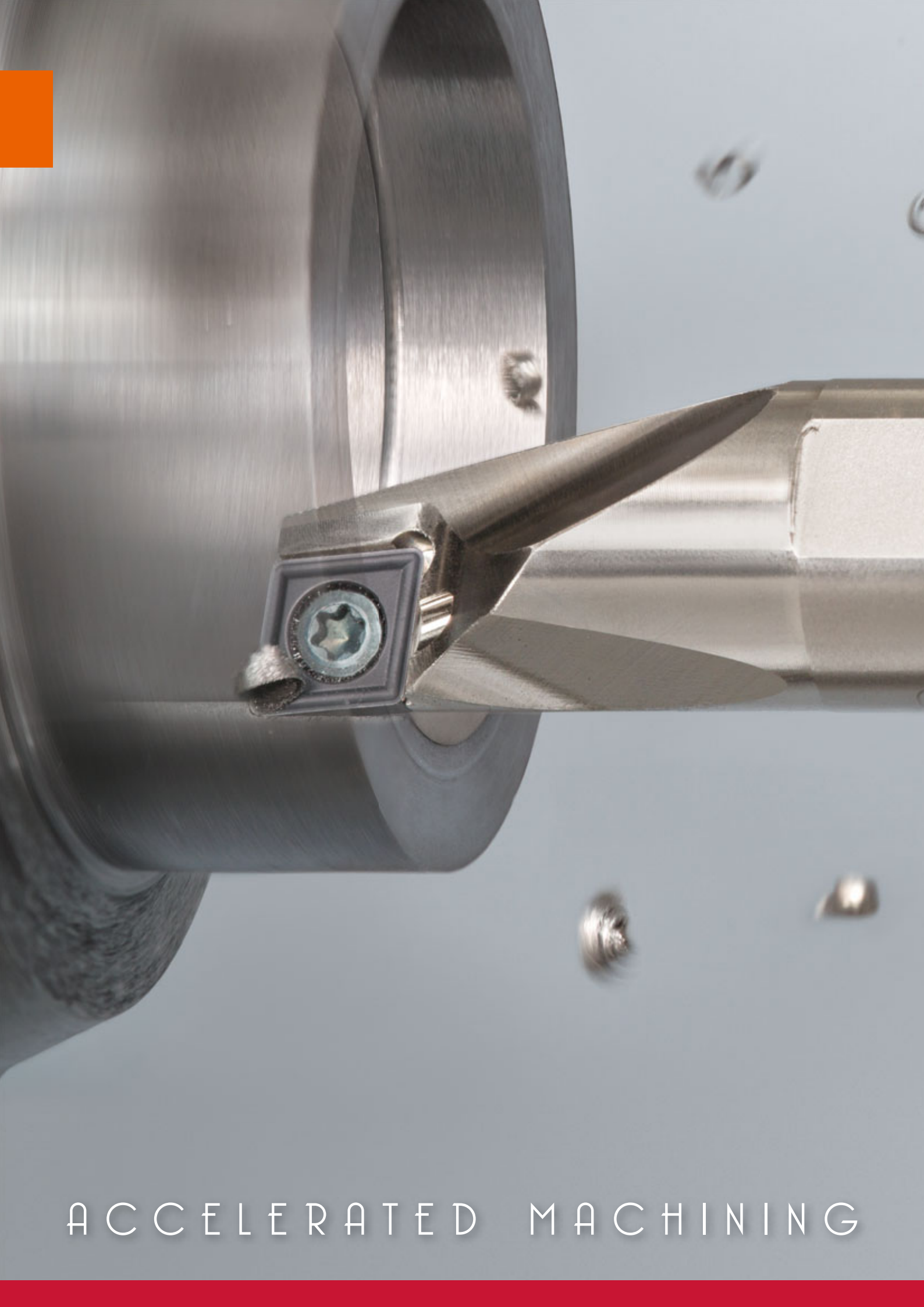
Tungaloy Report No. 433-G

# Versatility at work in cast iron turning



INDUSTRY 4.0

FEED the SPEED!



# ACCELERATED MACHINING

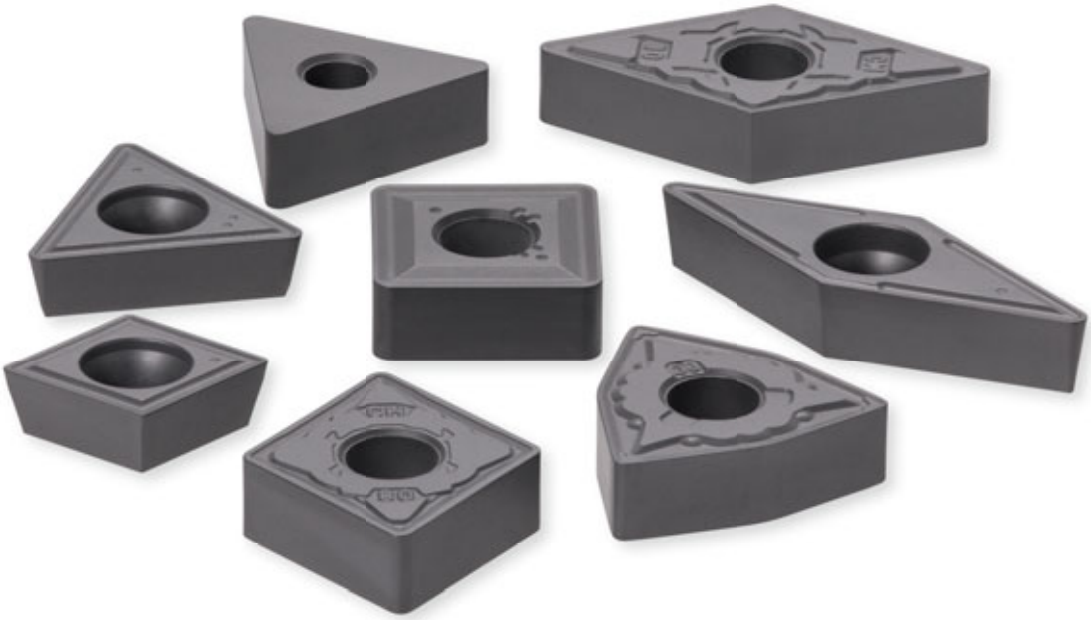
TurnLine

# T515

TUNGALOY

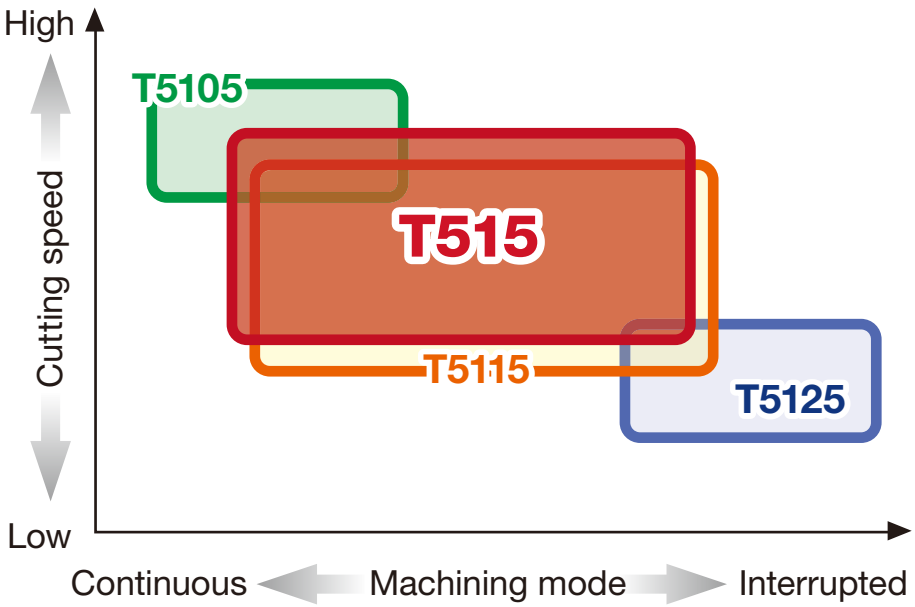
TUNGTURN FORCE

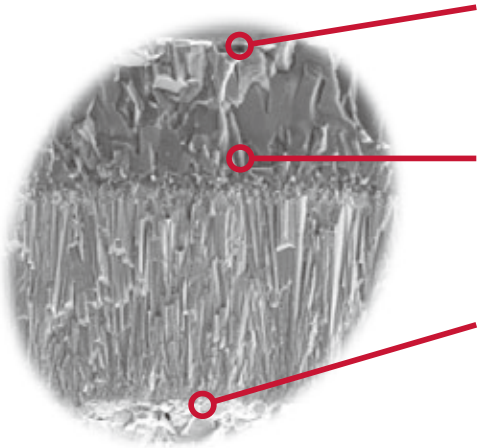
ACCELERATED MACHINING



Cast iron turning made **easy with an enhanced insert line-up** for higher performance and economy.

# Versatile grade for cast iron turning at high speed, complementing T5115



**Smooth surface reduces chipping and chip welding!**

PremiumTec, smooth surface technology, improves surface roughness.

**Excellent wear resistance in high-speed cutting!**

$Al_2O_3$ layer is 1.7 times thicker than the conventional coating.

**Incredible chipping and fracture resistance!**

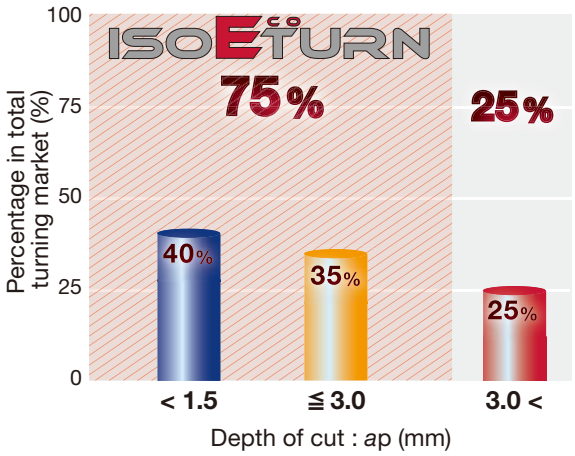
Strong adhesion between coating and substrate delivers remarkable toughness.

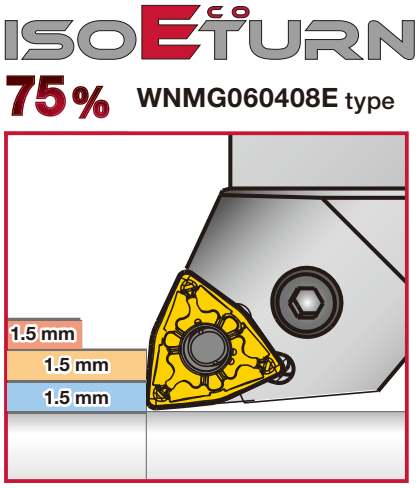
| Application | Grade | Substrate | | | Coating layer | |
|---|---|---|---|---|---|---|
| | | Specific gravity | Hardness (HRA) | T.R.S. (GPa) | Main Composition | Thickness (μm) |
| K | T515 | **14.8** | **91.5** | **2.7** | **Continuously formed columnar crystal TiCN + $Al_2O_3$** | **16** |
| | T5115 | 14.8 | 91.5 | 2.7 | Continuously formed columnar crystal TiCN + $Al_2O_3$ | 16 |

## New ISO-EcoTurn Small size inserts, for an economical advantage

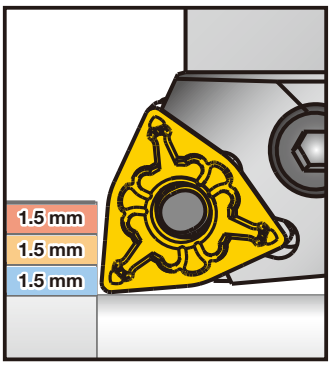
Over 75%* of the turning market only uses a depth of cut at or less than 3 mm

* Based on Tungaloy market research.




**Regular size inserts**
**WNMG080408**
**type**



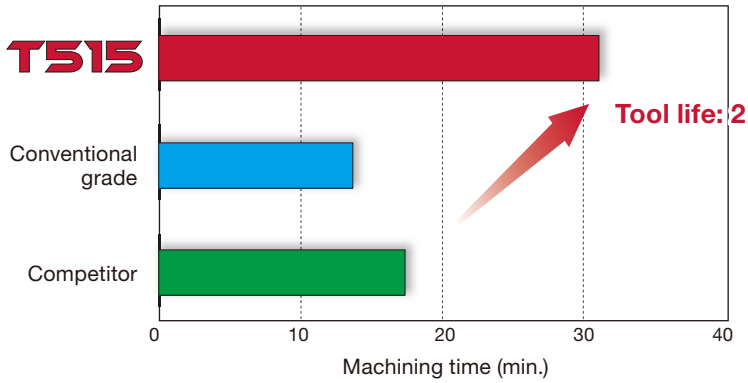

## CUTTING PERFORMANCE

T515 achieves stable, long tool life in both continuous and interrupted machining!

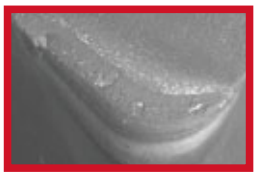
### K Grey cast iron (FC200 / GG20)

**Excellent wear resistance in continuous cutting at high speed!**

| | |
|---|---|
| Insert | : CNMA120408 |
| Cutting speed | : *Vc* = 700 m/min |
| Feed | : *f* = 0.3 mm/rev |
| Machining | : Continuous cutting |
| Coolant | : Wet |



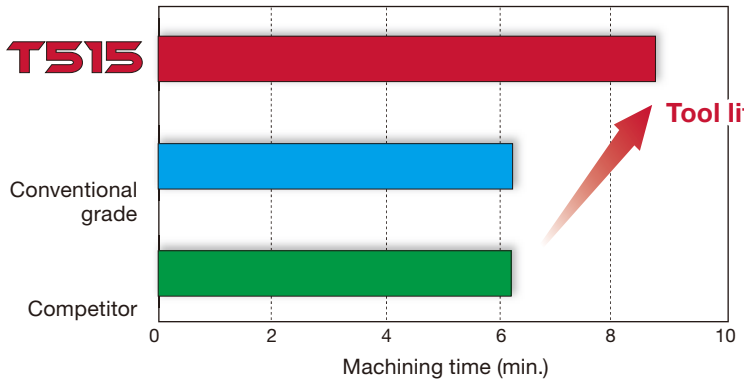

T515
28 min.



Conventional grade
15 min.

**Incredible chipping resistance in interrupted cutting!**

| | |
|---|---|
| Insert | : CNMA120408 |
| Cutting speed | : *Vc* = 400 m/min |
| Feed | : *f* = 0.35 mm/rev |
| Machining | : Interrupted cutting |
| Coolant | : Wet |

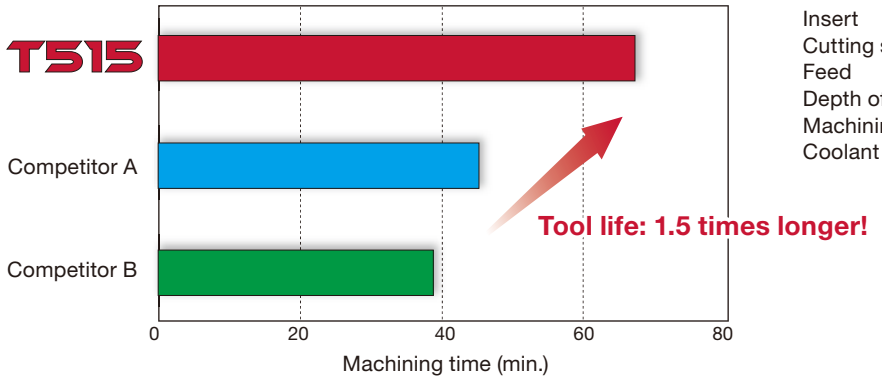



T515
8.4 min.

Conventional grade
6.6 min.

## FC200 Continuous internal machining

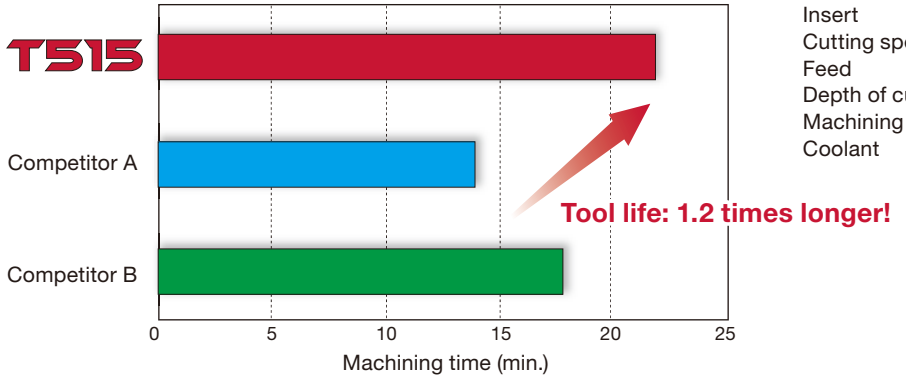
### K Grey cast iron (FC200 / GG20)



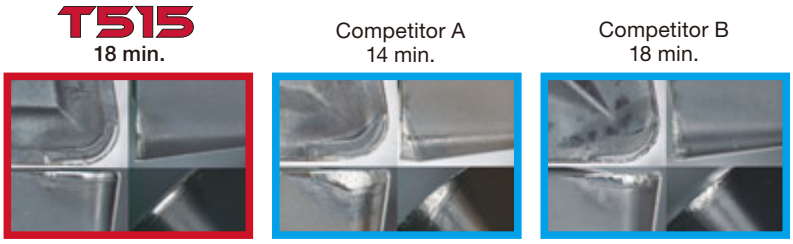

| | |
|---|---|
| Insert | : CCMT09T308-* |
| Cutting speed | : *Vc* = 300 m/min |
| Feed | : *f* = 0.2 mm/rev |
| Depth of cut | : *ap* = 1.5 mm |
| Machining | : Continuous Internal cutting |
| Coolant | : Wet |

## FCD600 Continuous internal machining

### K Ductile iron (FCD600 / GGG60)




| | |
|---|---|
| Insert | : CCMT09T308-* |
| Cutting speed | : *Vc* = 200 m/min |
| Feed | : *f* = 0.2 mm/rev |
| Depth of cut | : *ap* = 1.5 mm |
| Machining | : Continuous Internal cutting |
| Coolant | : Wet |



# STANDARD CUTTING CONDITIONS

## For negative inserts

| Chipbreaker | Grades | Corner radius $r_\varepsilon$ | Depth of cut *a*p (mm) | Feed *f* (mm/rev) | Cutting speed: *V*c (m/min) | |
|---|---|---|---|---|---|---|
| | | | | | Grey cast iron | Ductile cast iron |
| CM | T515 | 0.8 | 1.0 - 5.0 | 0.15 - 0.40 | 150 - 700 | 150 - 300 |
| | T515 | 1.2 | 1.0 - 5.0 | 0.15 - 0.50 | 150 - 700 | 150 - 300 |
| CH | T515 | 0.4 | 2.0 - 6.0 | 0.10 - 0.30 | 150 - 700 | 150 - 300 |
| | T515 | 0.8 | 2.0 - 6.0 | 0.20 - 0.45 | 150 - 700 | 150 - 300 |
| | T515 | 1.2 | 2.0 - 6.0 | 0.20 - 0.65 | 150 - 700 | 150 - 300 |
| All-round | T515 | 0.4 | 1.0 - 6.0 | 0.20 - 0.30 | 150 - 700 | 150 - 300 |
| | T515 | 0.8 | 1.0 - 6.0 | 0.20 - 0.50 | 150 - 700 | 150 - 300 |
| | T515 | 1.2 | 1.0 - 6.0 | 0.20 - 0.50 | 150 - 700 | 150 - 300 |
| | T515 | 1.6 | 1.0 - 6.0 | 0.30 - 0.50 | 150 - 700 | 150 - 300 |
| Fiat-top | T515 | 0.8 | 0.05 - 2.0 | 0.20 - 0.45 | 150 - 700 | 150 - 300 |
| | T515 | 1.2 | 0.05 - 2.0 | 0.30 - 0.80 | 150 - 700 | 150 - 300 |
| SW (Wiper) | T515 | 0.8 | 0.5 - 2.0 | 0.30 - 0.60 | 150 - 700 | 150 - 300 |
| | T515 | 1.2 | 0.5 - 2.0 | 0.50 - 0.80 | 150 - 700 | 150 - 300 |

## For positive insert

| Chipbreaker | Grades | Corner radius $r_\varepsilon$ | Depth of cut *a*p (mm) | Feed *f* (mm/rev) | Cutting speed: *V*c (m/min) | |
|---|---|---|---|---|---|---|
| | | | | | Grey cast iron | Ductile cast iron |
| CM | T515 | 0.4 | 0.05 - 2.0 | 0.05 - 0.2 | 150 - 700 | 150 - 300 |
| | T515 | 0.8 | 0.05 - 2.0 | 0.05 - 0.3 | 150 - 700 | 150 - 300 |
| | T515 | 1.2 | 0.05 - 2.0 | 0.05 - 0.3 | 150 - 700 | 150 - 300 |

# T515
TUNGALOY

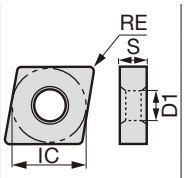
## Insert NEGATIVE TYPE

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

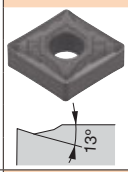
# CN

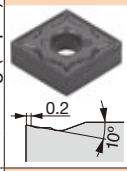
**Rhombic, 80° with hole**

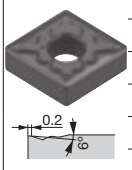
| | | T515 |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | ●◐ |
| N | Non-ferrous | |
| S | Superalloy | |
| H | Hard material | |

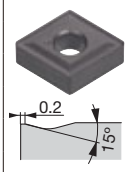


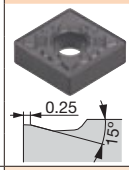

| Application | Chipbreaker | Designation | T515 (Coated) | RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Finishing | TSF | CNMG120404-TSF | ● | 0.4 | 12.7 | 4.76 | 5.16 |
| | | CNMG120408-TSF | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | CNMG120412-TSF | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| Finishing to medium cutting (wiper) | SW | CNMG120408-SW | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | CNMG120412-SW | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| | | *Wiper | | | | | |
| Medium cutting | TM | CNMG090404E-TM | ● | 0.4 | 9.525 | 4.76 | 3.81 |
| | | CNMG090408E-TM | ● | 0.8 | 9.525 | 4.76 | 3.81 |
| | | CNMG090412E-TM | ● | 1.2 | 9.525 | 4.76 | 3.81 |
| | | CNMG120404-TM | ● | 0.4 | 12.7 | 4.76 | 5.16 |
| | | CNMG120408-TM | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | CNMG120412-TM | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| | | CNMG120416-TM | ● | 1.6 | 12.7 | 4.76 | 5.16 |
| | | CNMG120404 | ● | 0.4 | 12.7 | 4.76 | 5.16 |
| | | CNMG120408 | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | CNMG120412 | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| | | CNMG120416 | ● | 1.6 | 12.7 | 4.76 | 5.16 |
| | | CNMG160612 | ● | 1.2 | 15.875 | 6.35 | 6.35 |
| | | CNMG160616 | ● | 1.6 | 15.875 | 6.35 | 6.35 |
| | | CNMG190612 | ● | 1.2 | 19.05 | 6.35 | 7.93 |
| | | CNMG190616 | ● | 1.6 | 19.05 | 6.35 | 7.93 |
| | CM | CNMG120404-CM | ● | 0.4 | 12.7 | 4.76 | 5.16 |
| | | CNMG120408-CM | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | CNMG120412-CM | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| | | CNMG160612-CM | ● | 1.2 | 15.875 | 6.35 | 6.35 |
| Medium to heavy cutting | TH | CNMG120408-TH | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | CNMG120412-TH | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| | | CNMG120416-TH | ● | 1.6 | 12.7 | 4.76 | 5.16 |

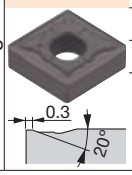



●: New
●: Line up

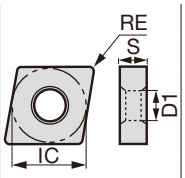
## Insert NEGATIVE TYPE

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

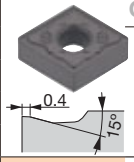
# CN

**Rhombic, 80° with hole**

| | | T515 |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | ●◐ |
| N | Non-ferrous | |
| S | Superalloy | |
| H | Hard material | |




| Application | Chipbreaker | Designation | Coated T515 | RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Medium to heavy cutting | CH | CNMG120408-CH | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | CNMG120412-CH | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| Finishing to medium cutting | - | CNMA090404E | ● | 0.4 | 9.525 | 4.76 | 3.81 |
| | | CNMA090408E | ● | 0.8 | 9.525 | 4.76 | 3.81 |
| | | CNMA090412E | ● | 1.2 | 9.525 | 4.76 | 3.81 |
| | | CNMA090416E | ● | 1.6 | 9.525 | 4.76 | 3.81 |
| | | CNMA120408 | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | CNMA120412 | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| | | CNMA160612 | ● | 1.2 | 15.875 | 6.35 | 6.35 |
| | | CNMA160616 | ● | 1.6 | 15.875 | 6.35 | 6.35 |
| | | CNMA190612 | ● | 1.2 | 19.05 | 6.35 | 7.93 |
| | | CNMA190616 | ● | 1.6 | 19.05 | 6.35 | 7.93 |



●: Line up

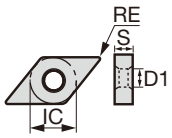
# Insert NEGATIVE TYPE

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## DN

**Rhombic, 55° with hole**

| | | |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | ●◐ |
| N | Non-ferrous | |
| S | Superalloy | |
| H | Hard material | |




| Application | Chipbreaker | Designation | Coated T515 | RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Finishing | TSF | DNMG150404-TSF | ● | 0.4 | 12.7 | 4.76 | 5.16 |
| | | DNMG150408-TSF | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | DNMG150412-TSF | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| Medium cutting | TM | DNMG150404-TM | ● | 0.4 | 12.7 | 4.76 | 5.16 |
| | | DNMG150408-TM | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | DNMG150412-TM | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| | | DNMG150416-TM | ● | 1.6 | 12.7 | 4.76 | 5.16 |
| | | DNMG150408 | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | DNMG150412 | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| | | DNMG150608 | ● | 0.8 | 12.7 | 6.35 | 5.16 |
| | | DNMG150612 | ● | 1.2 | 12.7 | 6.35 | 5.16 |
| | CM | DNMG150404-CM | ● | 0.4 | 12.7 | 4.76 | 5.16 |
| | | DNMG150408-CM | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | DNMG150412-CM | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| Medium to heavy cutting | TH | DNMG150408-TH | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | DNMG150412-TH | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| | CH | DNMG150408-CH | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | DNMG150412-CH | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| Finishing to medium cutting | - | DNMA110404E | ● | 0.4 | 9.525 | 4.76 | 3.81 |
| | | DNMA110408E | ● | 0.8 | 9.525 | 4.76 | 3.81 |
| | | DNMA110412E | ● | 1.2 | 9.525 | 4.76 | 3.81 |
| | | DNMA150404 | ● | 0.4 | 12.7 | 4.76 | 5.16 |
| | | DNMA150408 | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | DNMA150604 | ● | 0.4 | 12.7 | 6.35 | 5.16 |
| | | DNMA150608 | ● | 0.8 | 12.7 | 6.35 | 5.16 |

●: New
●: Line up

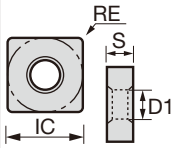
## Insert NEGATIVE TYPE

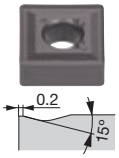
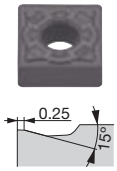
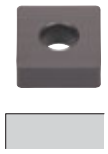
● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

# SN

**Square, 90° with hole**

| | | |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | ●◐ |
| N | Non-ferrous | |
| S | Superalloy | |
| H | Hard material | |




| Application | Chipbreaker | Designation | Coated T515 | RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Medium cutting | | SNMG090304 | ● | 0.4 | 9.525 | 3.18 | 3.81 |
| |  | SNMG090308 | ● | 0.8 | 9.525 | 3.18 | 3.81 |
| | | SNMG120404 | ● | 0.4 | 12.7 | 4.76 | 5.16 |
| | | SNMG120408 | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | SNMG120412 | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| | | SNMG120416 | ● | 1.6 | 19.05 | 6.35 | 7.93 |
| | CM | SNMG120408-CM | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| |  | SNMG120412-CM | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| Finishing to medium cutting | - | SNMA120408 | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| |  | SNMA120412 | ● | 1.2 | 12.7 | 4.76 | 5.16 |

●: Line up

# T515
TUNGALOY

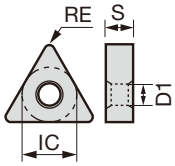
## Insert NEGATIVE TYPE

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

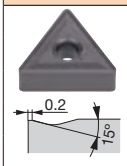
# TN

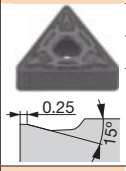
**Triangular, 60° with hole**

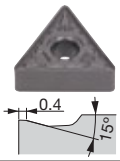
| | | T515 |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | ●◐ |
| N | Non-ferrous | |
| S | Superalloy | |
| H | Hard material | |




| Application | Chipbreaker | Designation | T515 (Coated) | RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Medium cutting | 全周 | TNMG160404 | ● | 0.4 | 9.525 | 4.76 | 3.81 |
| | | TNMG160408 | ● | 0.8 | 9.525 | 4.76 | 3.81 |
| | | TNMG160412 | ● | 1.2 | 9.525 | 4.76 | 3.81 |
| | CM | TNMG160404-CM | ● | 0.4 | 9.525 | 4.76 | 3.81 |
| | | TNMG160408-CM | ● | 0.8 | 9.525 | 4.76 | 3.81 |
| | | TNMG160412-CM | ● | 1.2 | 9.525 | 4.76 | 3.81 |
| Medium to heavy cutting | CH | TNMG160404-CH | ● | 0.4 | 9.525 | 4.76 | 3.81 |
| | | TNMG160408-CH | ● | 0.8 | 9.525 | 4.76 | 3.81 |
| | | TNMG160412-CH | ● | 1.2 | 9.525 | 4.76 | 3.81 |
| Finishing to medium cutting | - | TNMA110404E | ● | 0.4 | 6.35 | 4.76 | 2.26 |
| | | TNMA110408E | ● | 0.8 | 6.35 | 4.76 | 2.26 |
| | | TNMA110412E | ● | 1.2 | 6.35 | 4.76 | 2.26 |
| | | TNMA160404 | ● | 0.4 | 9.525 | 4.76 | 3.81 |
| | | TNMA160408 | ● | 0.8 | 9.525 | 4.76 | 3.81 |
| | | TNMA160412 | ● | 1.2 | 9.525 | 4.76 | 3.81 |



●: Line up

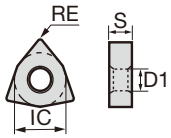
# Insert NEGATIVE TYPE

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## WN

Trigon, 80° with hole

| | | T515 |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | ●◐ |
| N | Non-ferrous | |
| S | Superalloy | |
| H | Hard material | |




| Application | Chipbreaker | Designation | T515 (Coated) | RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Finishing | TSF | WNMG080404-TSF | ● | 0.4 | 12.7 | 4.76 | 5.16 |
| | | WNMG080408-TSF | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | WNMG080412-TSF | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| Finishing to medium cutting (wiper) | SW | WNMG080408-SW | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | WNMG080412-SW | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| | | *Wiper | | | | | |
| Medium cutting | TM | WNMG080404-TM | ● | 0.4 | 12.7 | 4.76 | 5.16 |
| | | WNMG080408-TM | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | WNMG080412-TM | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| | | WNMG080416-TM | ● | 1.6 | 12.7 | 4.76 | 5.16 |
| | | WNMG080404 | ● | 0.4 | 12.7 | 4.76 | 5.16 |
| | | WNMG080408 | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | WNMG080412 | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| | | WNMG080416 | ● | 1.6 | 12.7 | 4.76 | 5.16 |
| | CM | WNMG080408-CM | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | WNMG080412-CM | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| Medium to heavy cutting | TH | WNMG080408-TH | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | WNMG080412-TH | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| | | WNMG080416-TH | ● | 1.6 | 12.7 | 4.76 | 5.16 |

●: New
●: Line up

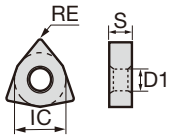
# Insert NEGATIVE TYPE

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## WN

**Trigon, 80° with hole**

| | | T515 |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | ●◐ |
| N | Non-ferrous | |
| S | Superalloy | |
| H | Hard material | |



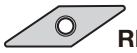

| Application | Chipbreaker | Designation | Coated T515 | RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | - | WNMA060404E | ● | 0.4 | 9.525 | 4.76 | 3.81 |
| | | WNMA060408E | ● | 0.8 | 9.525 | 4.76 | 3.81 |
| | | WNMA060412E | ● | 1.2 | 9.525 | 4.76 | 3.81 |
| | | WNMA060416E | ● | 1.6 | 9.525 | 4.76 | 3.81 |
| | | WNMA080408 | ● | 0.8 | 12.7 | 4.76 | 5.16 |
| | | WNMA080412 | ● | 1.2 | 12.7 | 4.76 | 5.16 |
| | | WNMA080416 | ● | 1.6 | 12.7 | 4.76 | 5.16 |

●: Line up

## Insert NEGATIVE TYPE

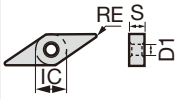
● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

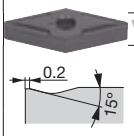
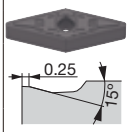
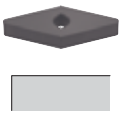
# VN



**Rhombic, 35° with hole**

| | | T515 |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | ●◐ |
| N | Non-ferrous | |
| S | Superalloy | |
| H | Hard material | |




| Application | Chipbreaker | Designation | Coated T515 | RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Medium cutting | | VNMG160404 | ● | 0.4 | 9.525 | 4.76 | 3.81 |
| | | VNMG160408 | ● | 0.8 | 9.525 | 4.76 | 3.81 |
| | | VNMG160412 | ● | 1.2 | 9.525 | 4.76 | 3.81 |
| | |   | | | | | |
| | CM | VNMG160408-CM | ● | 0.8 | 9.525 | 4.76 | 3.81 |
| | |   | | | | | |
| Finishing to medium cutting | - | VNMA120404E | ● | 0.4 | 7.15 | 4.76 | 3.81 |
| | | VNMA120408E | ● | 0.8 | 7.15 | 4.76 | 3.81 |
| | |  | | | | | |

●: Line up

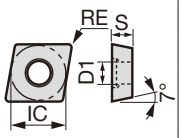
# Insert POSITIVE TYPE

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

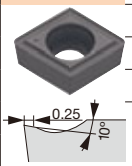
## CC

**Rhombic, 80° with hole Positive 7°**

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron ●◐ |
| N | Non-ferrous |
| S | Superalloy |
| H | Hard material |



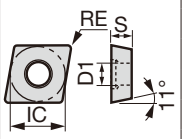

| Application | Chipbreaker | Designation | Coated T515 | RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | CM | CCMT060204-CM | ● | 0.4 | 6.35 | 2.38 | 2.8 |
| | | CCMT060208-CM | ● | 0.8 | 6.35 | 2.38 | 2.8 |
| | | CCMT09T304-CM | ● | 0.4 | 9.525 | 3.97 | 4.4 |
| | | CCMT09T308-CM | ● | 0.8 | 9.525 | 3.97 | 4.4 |



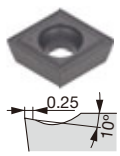

## CP

**Rhombic, 80° with hole Positive 11°**

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron ●◐ |
| N | Non-ferrous |
| S | Superalloy |
| H | Hard material |




| Application | Chipbreaker | Designation | Coated T515 | RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | CM | CPMT090304-CM | ● | 0.4 | 9.525 | 3.18 | 4.4 |
| | | CPMT090308-CM | ● | 0.8 | 9.525 | 3.18 | 4.4 |
| | | CPMT09T304-CM | ● | 0.4 | 9.525 | 3.97 | 4.4 |
| | | CPMT09T308-CM | ● | 0.8 | 9.525 | 3.97 | 4.4 |




●: Line up

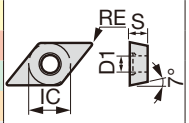
## Insert POSITIVE TYPE

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

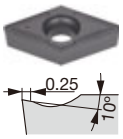
# DC

**Rhombic, 55° with hole Positive 7°**

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron ●ⓒ |
| N | Non-ferrous |
| S | Superalloy |
| H | Hard material |



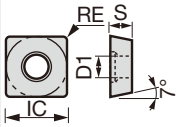

| Application | Chipbreaker | Designation | Coated T515 | RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | CM | DCMT11T304-CM | ● | 0.4 | 9.525 | 3.97 | 4.4 |
| | | DCMT11T308-CM | ● | 0.8 | 9.525 | 3.97 | 4.4 |



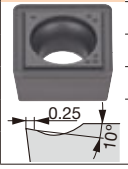

# SC

**Square, 90° with hole Positive 7°**

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron ●ⓒ |
| N | Non-ferrous |
| S | Superalloy |
| H | Hard material |




| Application | Chipbreaker | Designation | Coated T515 | RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | CM | SCMT09T304-CM | ● | 0.4 | 9.525 | 3.97 | 4.4 |
| | | SCMT09T308-CM | ● | 0.8 | 9.525 | 3.97 | 4.4 |
| | | SCMT120404-CM | ● | 0.4 | 12.7 | 4.76 | 5.5 |
| | | SCMT120408-CM | ● | 0.8 | 12.7 | 4.76 | 5.5 |




●: Line up

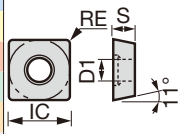
# Insert POSITIVE TYPE

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

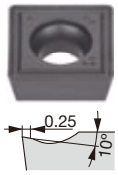
## SP

**Square, 90° with hole Positive 11°**

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron ●◐ |
| N | Non-ferrous |
| S | Superalloy |
| H | Hard material |



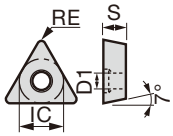

| Application | Chipbreaker | Designation | Coated T515 | Dimension (mm) RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | CM | SPMT120404-CM | ● | 0.4 | 12.7 | 4.76 | 5.5 |
| | | SPMT120408-CM | ● | 0.8 | 12.7 | 4.76 | 5.5 |



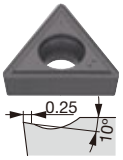

## TC

**Triangular, 60° with hole Positive 7°**

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron ●◐ |
| N | Non-ferrous |
| S | Superalloy |
| H | Hard material |




| Application | Chipbreaker | Designation | Coated T515 | Dimension (mm) RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | CM | TCMT16T304-CM | ● | 0.4 | 9.525 | 3.97 | 4.4 |
| | | TCMT16T308-CM | ● | 0.8 | 9.525 | 3.97 | 4.4 |
| | | TCMT16T312-CM | ● | 1.2 | 9.525 | 3.97 | 4.4 |




●: Line up

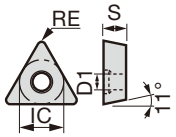
## Insert POSITIVE TYPE

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

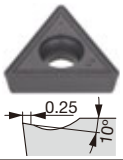
# TP

**Triangular, 60° with hole Positive 11°**

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron ●ⓒ |
| N | Non-ferrous |
| S | Superalloy |
| H | Hard material |



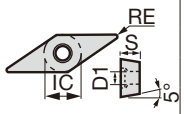

| Application | Chipbreaker | Designation | Coated T515 | RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | PM | TPMT16T304-CM | ● | 0.4 | 9.525 | 3.97 | 4.4 |
| | | TPMT16T308-CM | ● | 0.8 | 9.525 | 3.97 | 4.4 |
| | | TPMT16T312-CM | ● | 1.2 | 9.525 | 3.97 | 4.4 |



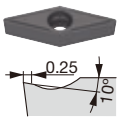

# VB

**Rhombic, 35° with hole Positive 5°**

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron ●ⓒ |
| N | Non-ferrous |
| S | Superalloy |
| H | Hard material |




| Application | Chipbreaker | Designation | Coated T515 | RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | CM | VBMT160404-CM | ● | 0.4 | 9.525 | 4.76 | 4.4 |
| | | VBMT160408-CM | ● | 0.8 | 9.525 | 4.76 | 4.4 |
| | | VBMT160412-CM | ● | 1.2 | 9.525 | 4.76 | 4.4 |




●: Line up

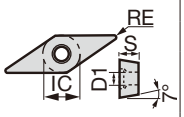
# Insert POSITIVE TYPE

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

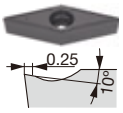
## VC

**Rhombic, 35° with hole Positive 7°**

| | | |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | ●◐ |
| N | Non-ferrous | |
| S | Superalloy | |
| H | Hard material | |

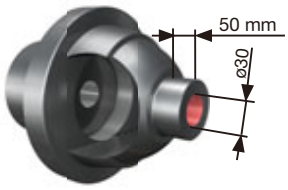
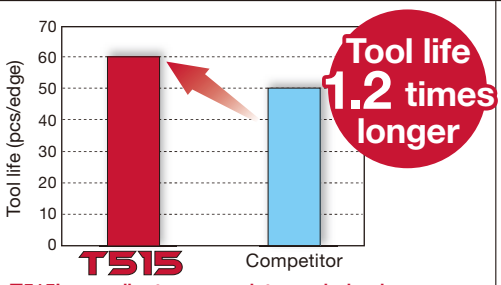
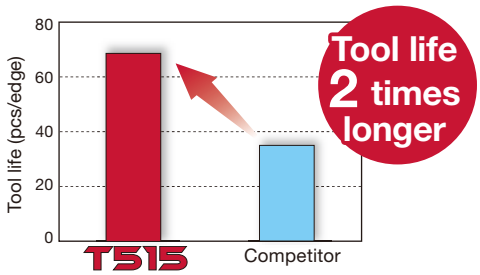
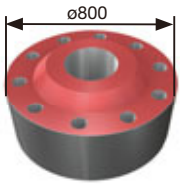
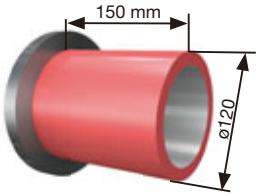
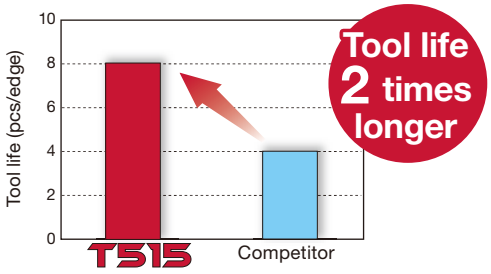
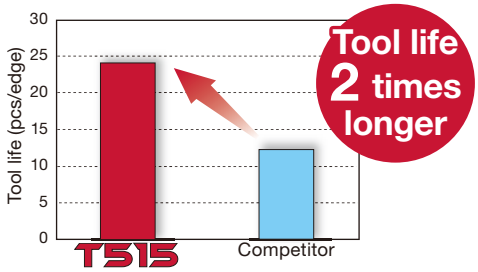


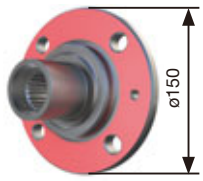
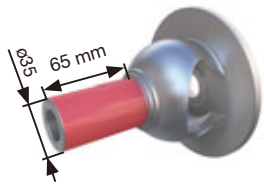
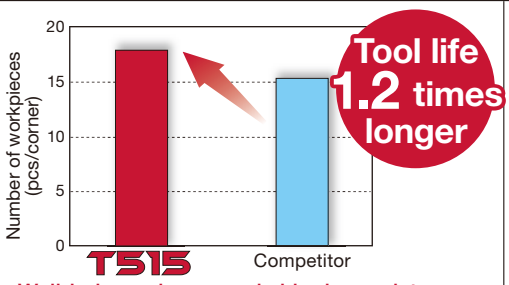
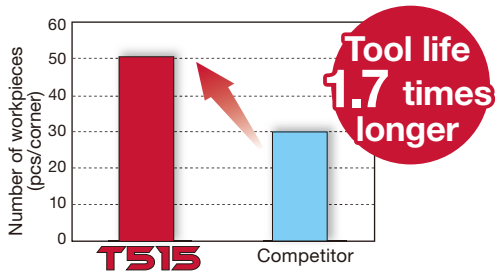

| Application | Chipbreaker | Designation | Coated T515 | RE | IC | S | D1 |
|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | CM | VCMT160404-CM | ● | 0.4 | 9.525 | 4.76 | 4.4 |
| | | VCMT160408-CM | ● | 0.8 | 9.525 | 4.76 | 4.4 |

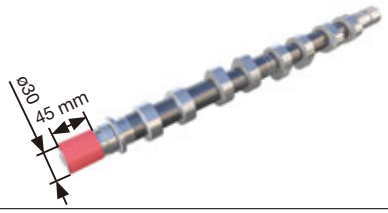
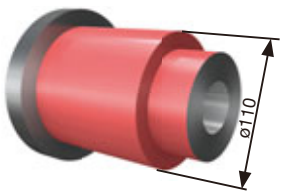
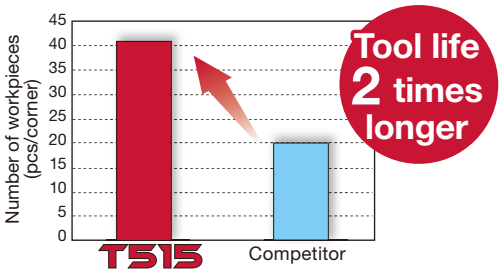
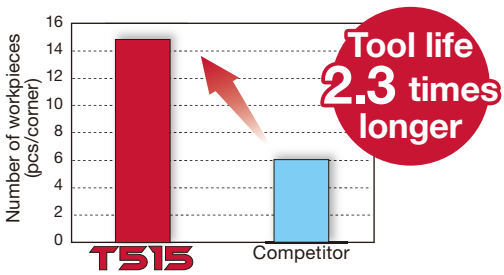



●: Line up

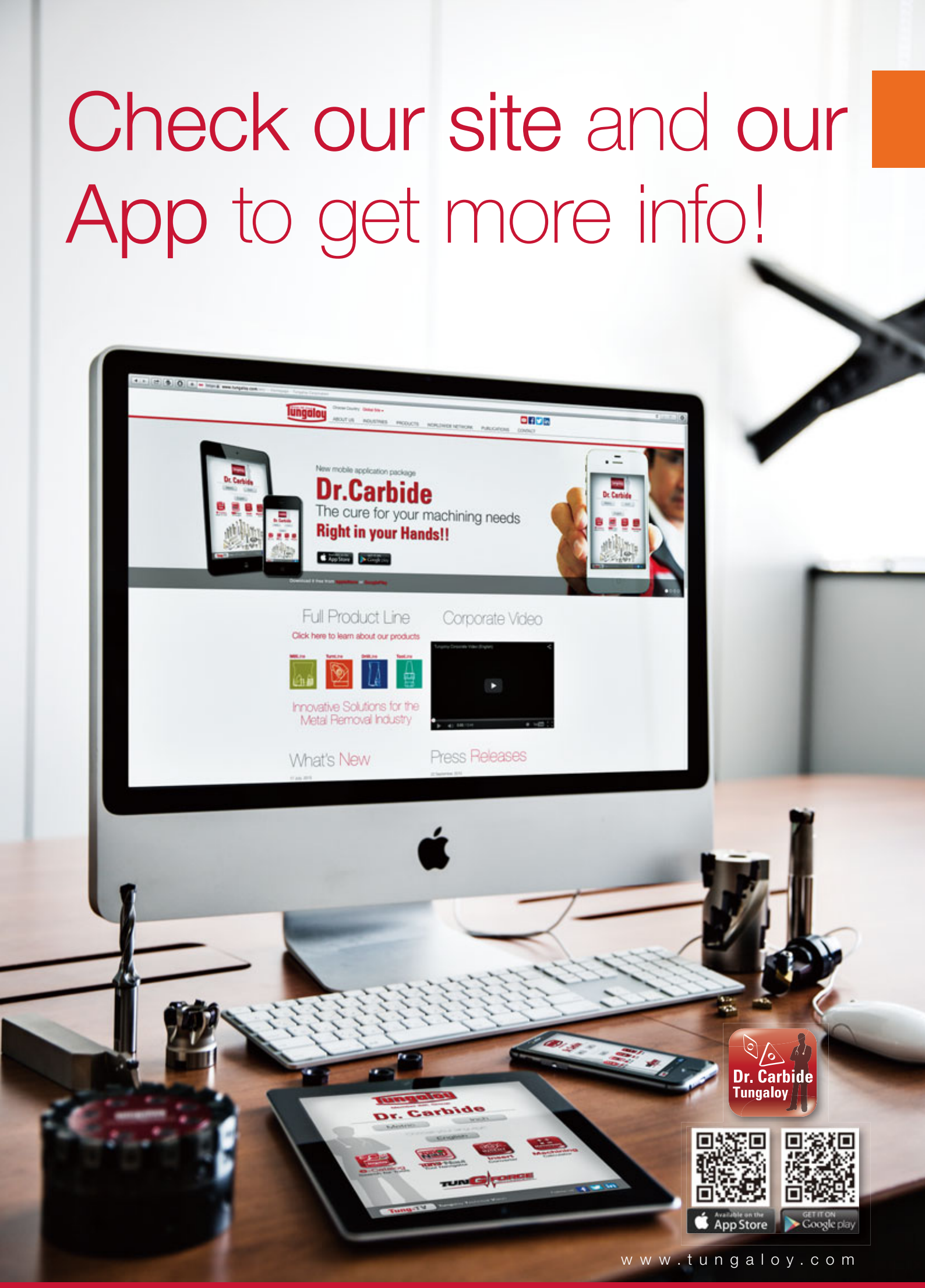
# PRACTICAL EXAMPLES

| | | | |
|---|---|---|---|
| | **Workpiece type** | **Water pump parts** | **Differential case** |
| | **Insert** | VBMT160408-CM | TCMT16T308-CM |
| | **Grade** | T515 | T515 |
| | **Workpiece material** | FC<br> <br> | FC<br>  <br> |
| Cutting conditions | **Cutting speed: *Vc* (m/min)** | 210 | 190 |
| Cutting conditions | **Feed : *f* (mm/rev)** | 0.1 | 0.30 |
| Cutting conditions | **Depth of cut : *ap* (mm)** | 4.0 | 2.0 |
| Cutting conditions | **Machining** | External & V-groove machining | Internal machining |
| Cutting conditions | **Coolant** | Wet | Wet |
| | **Results** |  <br><br>T515's excellent wear resistance helps increase productivity with the ability to withstand higher cutting speed and extends tool life by 1.2 times. |  <br><br>T515 provides remarkable wear resistance, which doubles tool life compared to the competitor. |
| | **Workpiece type** | **Machine** | **Machine** |
| | **Insert** | CNMG160612 | CNMG120412 |
| | **Grade** | T515 | T515 |
| | **Workpiece material** | Grey cast iron<br>  <br> | FCD<br>  <br> |
| Cutting conditions | **Cutting speed: *Vc* (m/min)** | 180 | 100 |
| Cutting conditions | **Feed : *f* (mm/rev)** | 0.40 | 0.40 |
| Cutting conditions | **Depth of cut : *ap* (mm)** | 4.0 mm x 3 passes | 1.75 |
| Cutting conditions | **Machining** | Facing | External and face turning |
| Cutting conditions | **Coolant** | Wet | Wet |
| | **Results** |  <br><br>T515 with excellent fracture resistance delivers stable machining and double tool life. |  <br><br>T515 extends tool life by 2 times compared to the competitor due to outstanding wear resistance. |

| Workpiece type | | Hub | Differential case |
|---|---|---|---|
| Insert | | CNMG120408 | CNMG120412 |
| Grade | | T515 | T515 |
| Workpiece material | | FCD400 / GGG40 | Ductile cast iron |
| | |   |   |
| Cutting conditions | Cutting speed: *Vc* (m/min) | 260 | 140 |
| | Feed : *f* (mm/rev) | 0.25 | 0.25 |
| | Depth of cut : *ap* (mm) | 3.0 | 1.0 |
| | Machining | Face turning | External turning |
| | Coolant | Wet | Wet |
| Results | |   Well-balanced wear and chipping resistance extends tool life by 1.2 times in interrupted machining of ductile cast iron. |   T515 grade with remarkable wear resistance provides tool life that is 1.7 times longer than the competitor. |

| Workpiece type | | Cam shaft | Automotive part |
|---|---|---|---|
| Insert | | TNMG160412 | SNMG120412 |
| Grade | | T515 | T515 |
| Workpiece material | | Grey cast iron | Grey cast iron |
| | |   |   |
| Cutting conditions | Cutting speed: *Vc* (m/min) | 140 | 520 |
| | Feed : *f* (mm/rev) | 0.35 | 0.40 |
| | Depth of cut : *ap* (mm) | 2.0 | 1.0 - 1.5 |
| | Machining | External turning | External and face turning |
| | Coolant | Wet | Wet |
| Results | |   Improved wear resistance with thick $Al_2O_3$ layer prolongs tool life by 200%. |   T515 grade demonstrates incredible wear resistance even in high-speed cutting, resulting in 230% longer tool life than the competitor. |

# Check our site and our App to get more info!



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