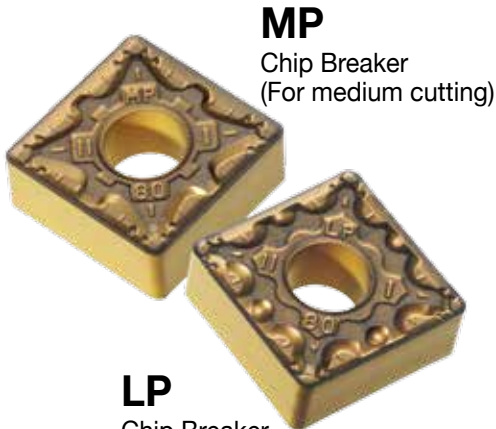


# NC3215 / NC3225



## High Performance CVD Coating with New Chip Breaker MP / LP

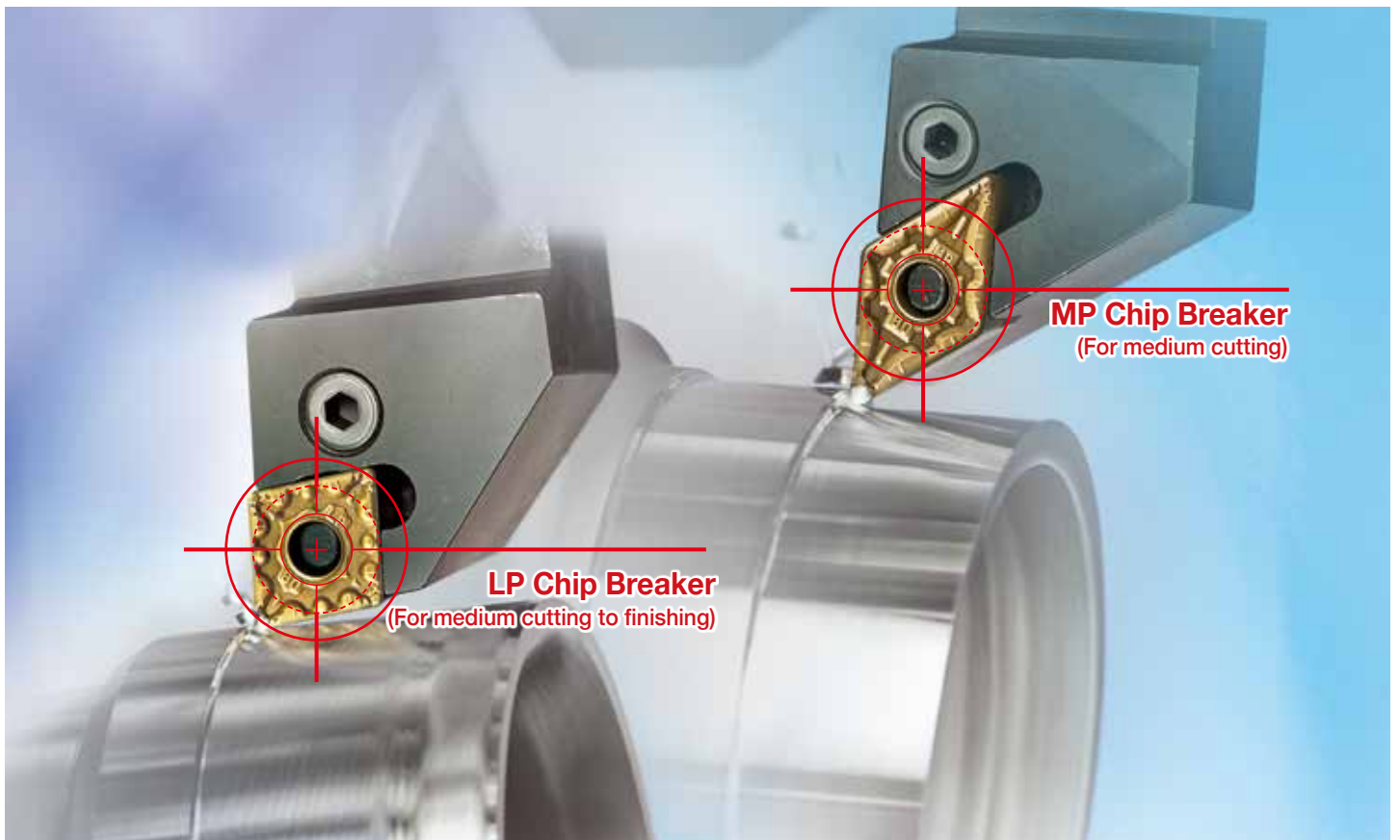
Complete turning solution to increase productivity at a wide range of cutting speed, feed and depth of cut.

### ■ Universal Chip Control

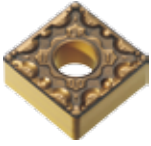
Increased productivity with stable chip control in various machining

### ■ Stable Tool Life

Reduced cutting force ensures stable tool life at high speed and high feed



## High Performance CVD Coated Turning Insert For Machining Forged Steel and Bearing Steel



**LP Chip Breaker** For medium cutting to finishing



**MP Chip Breaker** For medium cutting

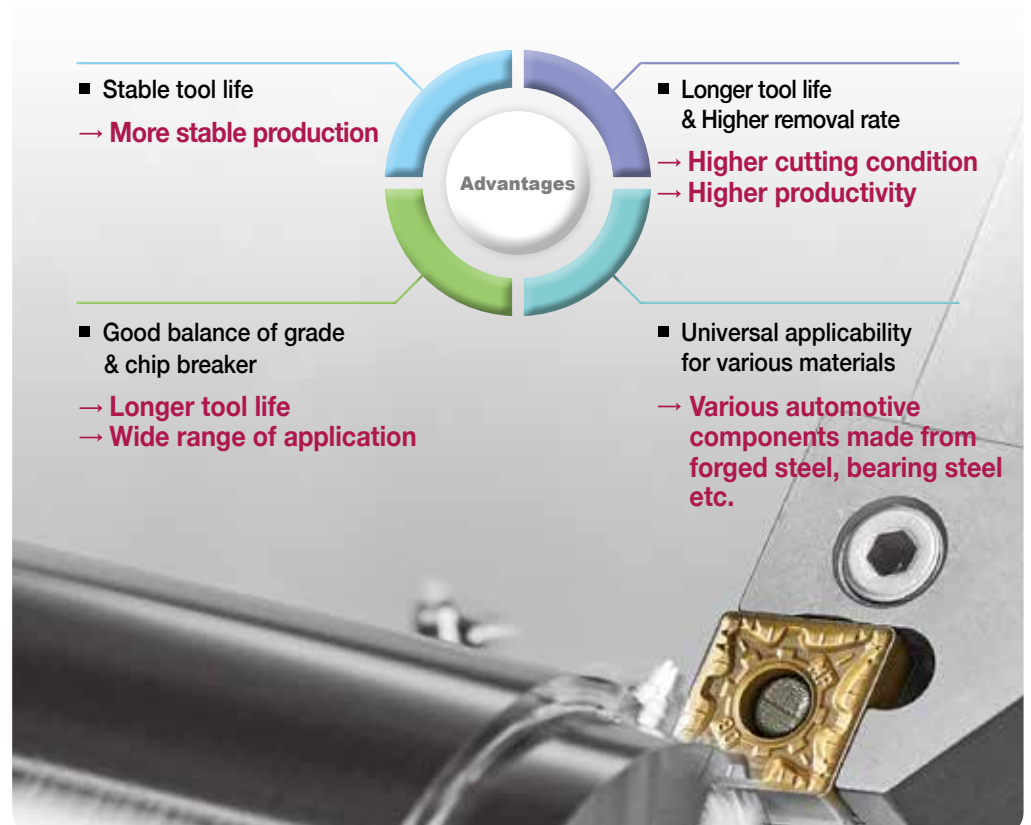
The surface of forged steel which is commonly used for automotive parts is harder and tougher while the inside is soft. Bearing steel also has those characteristics of high toughness and hardness. Machining these kinds of steel repeatedly causes built-up edge on cutting edges and chipping off the edge, which is one of the main reasons of falling productivity and causing unstable tool life.

Mass production of automotive parts requires faster cutting speed and higher feed along with much longer tool life than before.

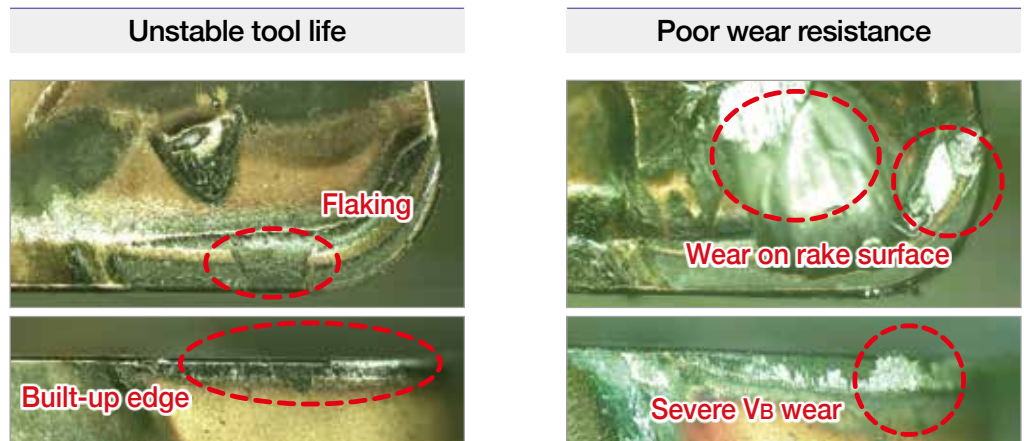
**NC3215 / NC3225** are a new CVD coated grades for turning application of automotive components made from forged steel and bearing steel. NC3225 is the first choice as an universal grade for machining forged parts while NC3215 is ideal for high speed and continuous machining. Coating, applied to these inserts, has been much improved than conventional ones with higher wear resistance and stability on cutting edges.

**LP / MP** Chip breakers have two step dots at the corner and bring measurable increase in productivity for machining forged steel at high speed (max. 350m/min) and high feed (max. 0.35mm/rev).

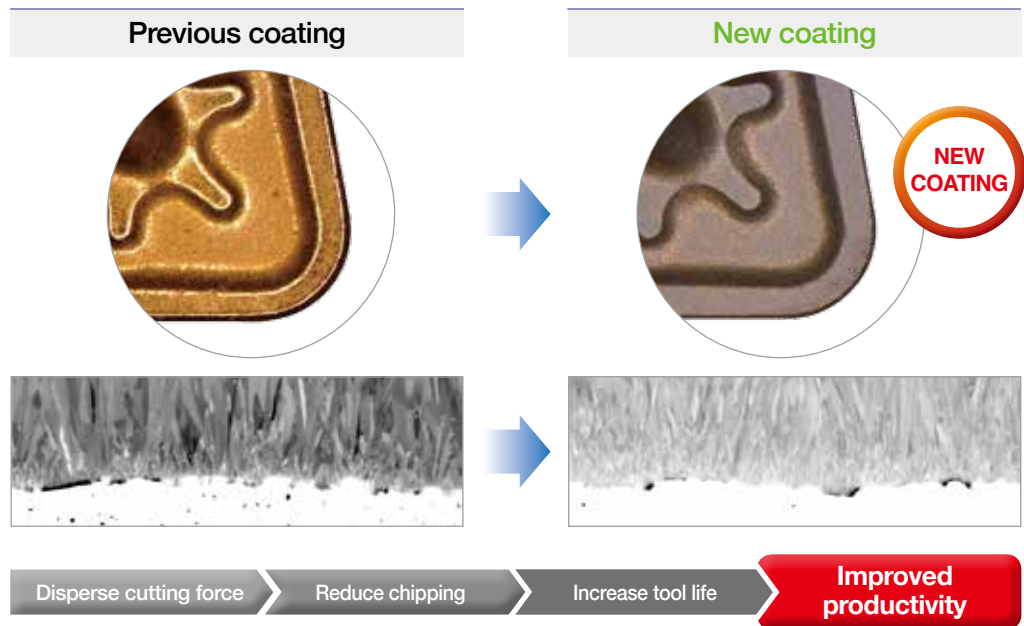
NC3215 / NC3225 in combination with LP / MP ensures a precise cutting as well as maximum cutting efficiency for machining automotive components.



## ⇒ Troubles When Machining Forged Steel



## ⇒ NC3215 / NC3225 Technology



## ⇒ Improvement Effect



NC3225 P25 is the first choice in turning application of steel. It can be also used for workpieces such as forged and hardened steel through post processing besides carbon steel, alloy steel and others.

## MP Chip Breaker (For medium cutting)



- Chip breaker for forged and general steel.
- Quad dots improve productivity through efficient chip control at high feed.
- Applied positive rake face to reduce the cutting force.

### Features of MP Chip Breaker

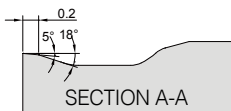
#### Front two step dot

- Higher stability of chip curls at high feed
- Excellent chip control when copying
- Lower cutting force at high depth of cut

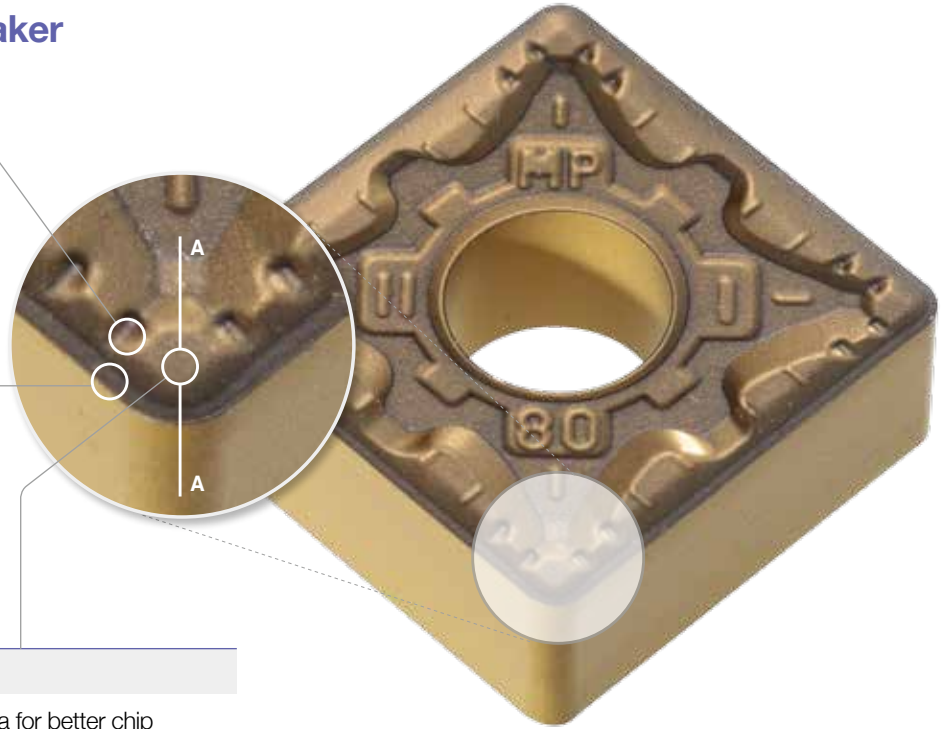
#### Variable land

- Less crater wear
- Prevents chipping on minor cutting edge
- Higher toughness at high depth of cut and interrupted cutting

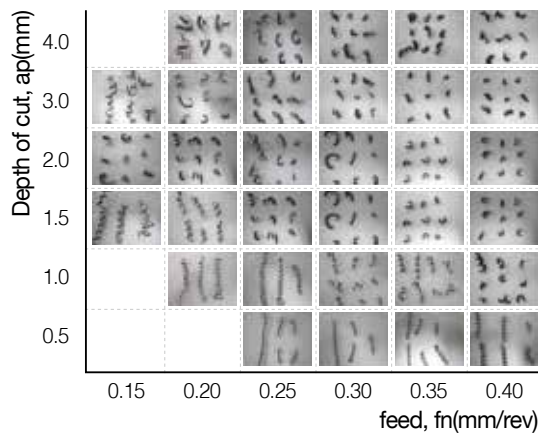
#### Flat zone



- Larger chip curling area for better chip evacuation at high feed
- Reduced cutting force with larger contact surface of chips

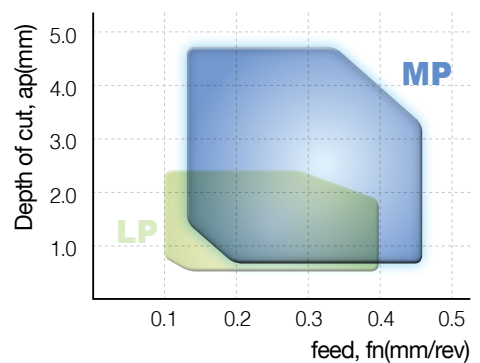


### Cutting Performance (Evaluation of chip map)



- Workpiece C50 (Forged steel), Ø100, External machining
- Cutting conditions  $vc(m/min) = 250$ ,  $ap(mm) = 0.5\sim 5.0$ ,  $fn(mm/rev) = 0.1\sim 0.5$ , wet
- Tools CNMG120408-MP

### Application Range (Medium cutting)

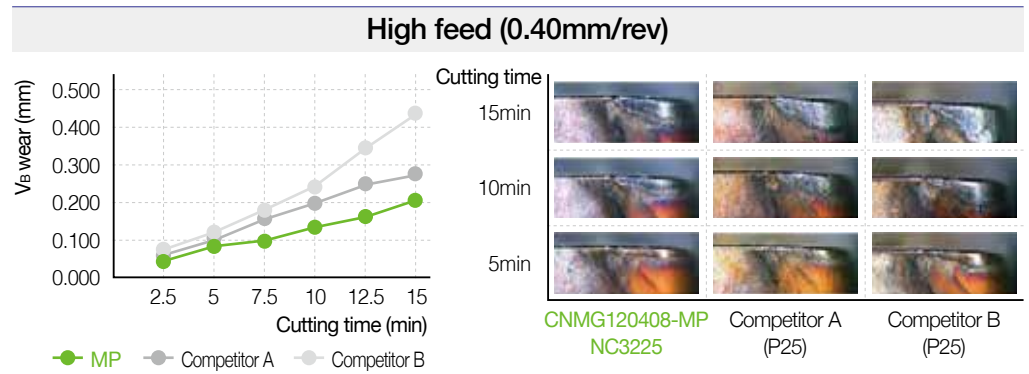
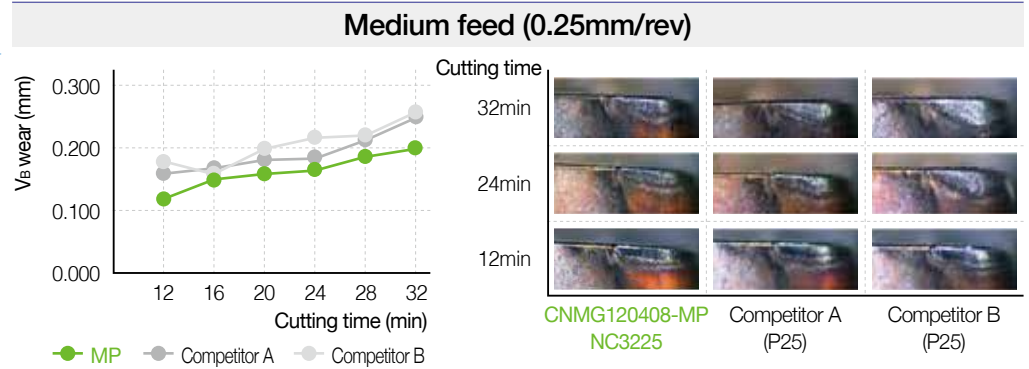


➔ Smooth chip flow and efficient chip control at low feed

## ➤ Performance Test (Wear Resistance)

- **Workpiece** 42CrMo4 (Alloy steel), Ø100, External machining
- **Cutting conditions**  $vc(m/min) = 280$ ,  $ap(mm) = 1.5$ ,  $fn(mm/rev) = 0.25 / 0.40$ , wet
- **Tools** CNMG120408-MP NC3225

Longer tool life due to lower cutting force at medium feed (0.25mm/rev) and high feed (0.40mm/rev)

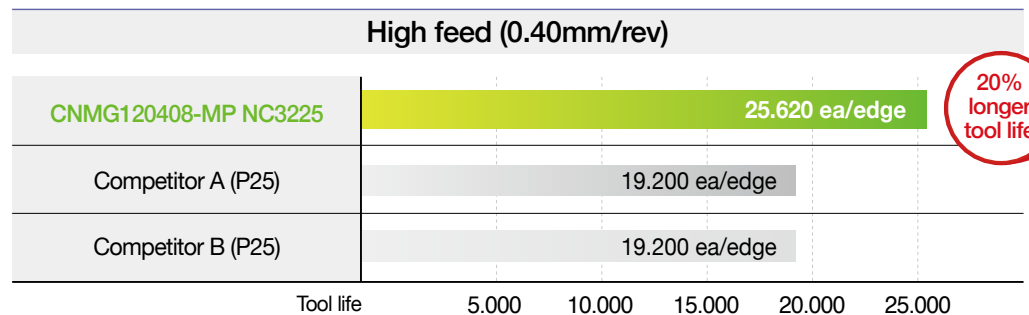
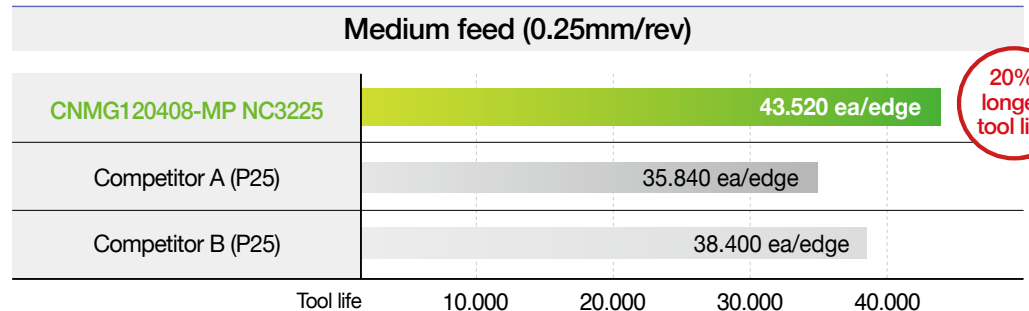


## ➤ Performance Test (Toughness)

- **Workpiece** C45 (Carbon steel), Ø100 (4 Grooves), Facing
- **Cutting conditions**  $vc(m/min) = 250$ ,  $ap(mm) = 1.5$ ,  $fn(mm/rev) = 0.25 / 0.40$ , wet
- **Tools** CNMG120408-MP NC3225



- NC3225 has **20% longer tool life** than competitor's P25
- MP Chip breaker ensures **stable chip control** and minimizes burr for **excellent surface roughness**.



## LP Chip Breaker (For medium cutting to finishing)



- Chip breaker for forged steel and general steel.
- Quad dots improve productivity through efficient chip control at high feed.
- Applied positive rake face to reduce the cutting force.

### Features of LP Chip Breaker

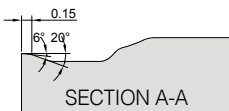
#### Front dot

- Higher stability of chip curls at high feed
- Excellent chip control when copying
- Lower cutting force at low depth of cut and high feed

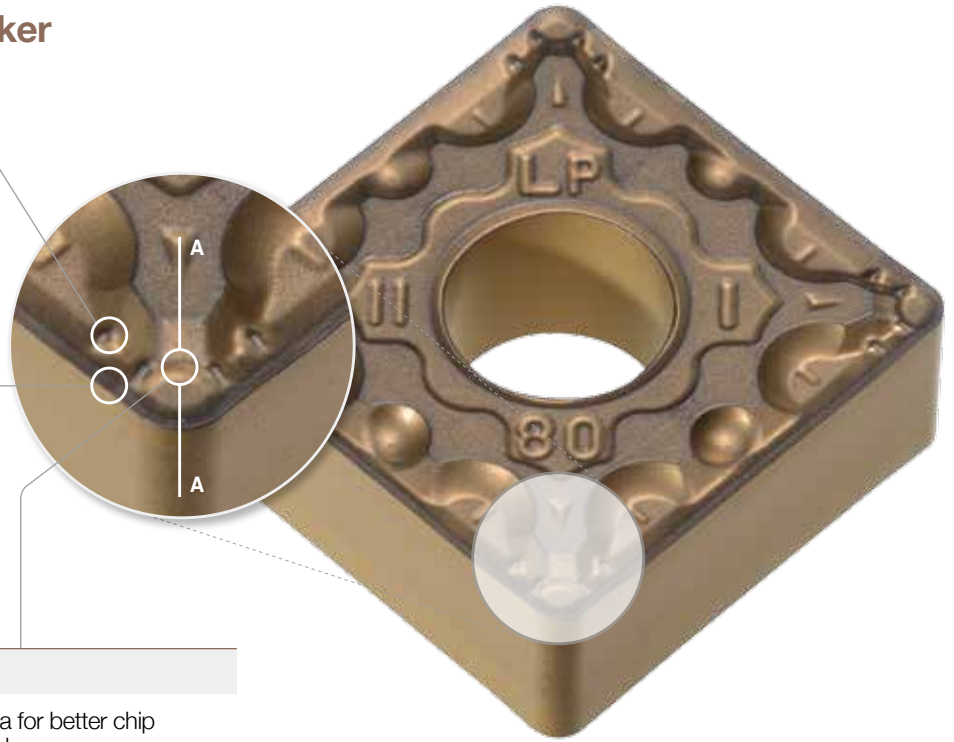
#### Variable land

- Less crater wear
- Prevents chipping on minor cutting edge

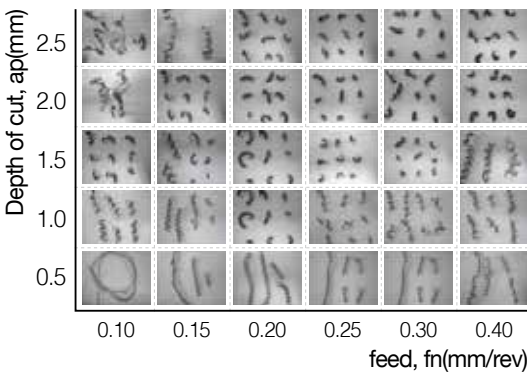
#### Flat zone



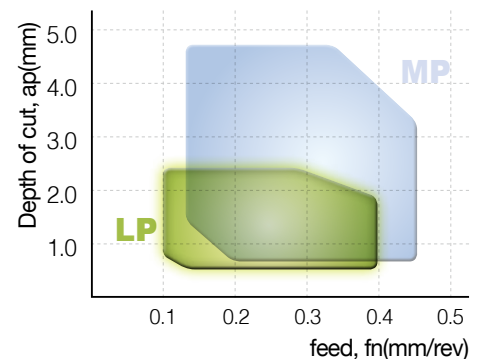
- Larger chip curling area for better chip evacuation at high feed
- Reduced cutting force with larger contact surface of chips



### Cutting Performance (Evaluation of chip map)



### Application Range (Medium to finish cutting)



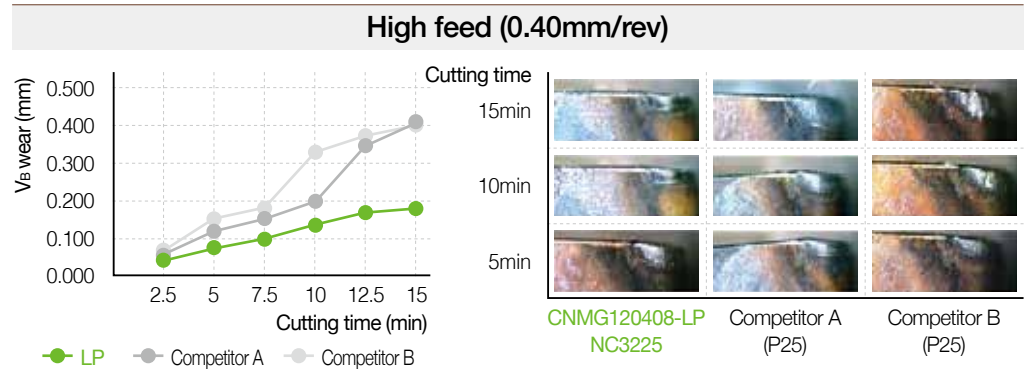
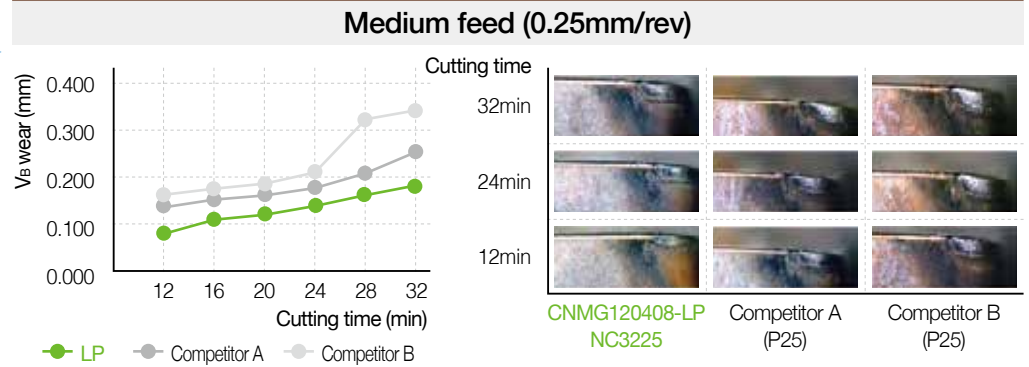
- Workpiece C50 (Forged steel), Ø100, External machining
- Cutting conditions  $vc(m/min) = 250$ ,  $ap(mm) = 0.5\sim 2.5$ ,  $fn(mm/rev) = 0.1\sim 0.4$ , wet
- Tools CNMG120408-LP

➔ Stable chip control even at low depth of cut.

## ➤ Performance Test (Wear Resistance)

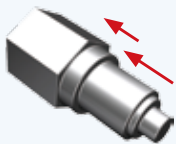
- **Workpiece** 42CrMo4 (Alloy steel), Ø100, External machining
- **Cutting conditions**  $vc(m/min) = 280$ ,  $ap(mm) = 1.0$ ,  $fn(mm/rev) = 0.25 / 0.40$ , wet
- **Tools** CNMG120408-LP NC3225

Longer tool life due to lower cutting force at medium feed (0.25mm/rev) and high feed (0.40mm/rev)

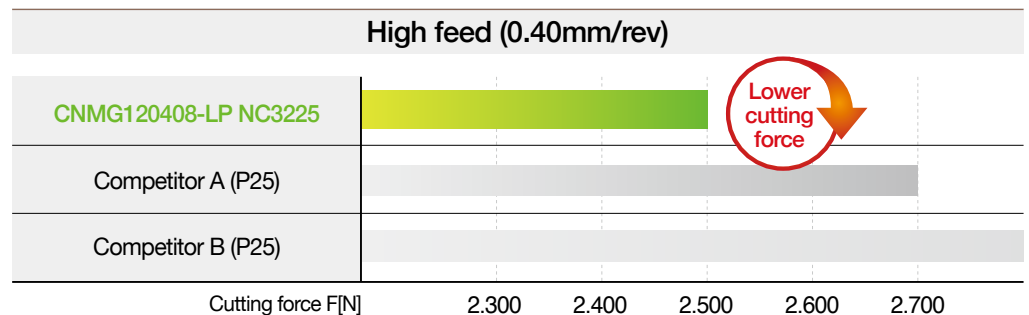
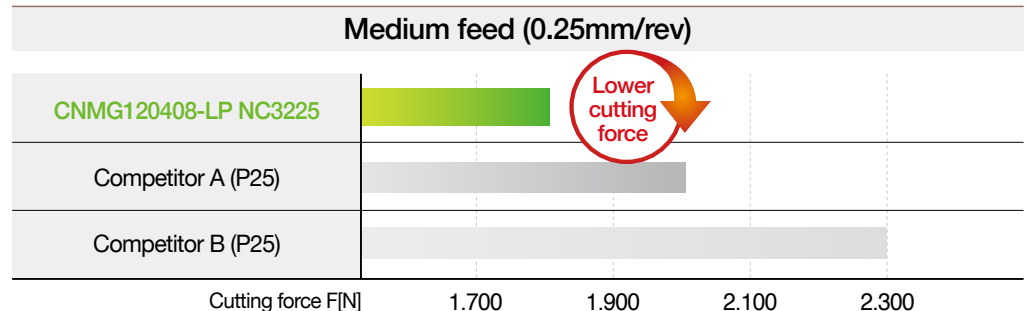


## ➤ Performance Test (Cutting Force)

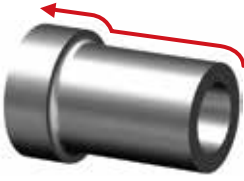
- **Workpiece** C45 (Carbon steel), Ø100, External machining
- **Cutting conditions**  $vc(m/min) = 250$ ,  $ap(mm) = 1.0$ ,  $fn(mm/rev) = 0.25 / 0.40$ , wet
- **Tools** CNMG120408-LP NC3225



Lower cutting force at medium feed (0.25mm/rev) and high feed (0.40mm/rev)



## Application Examples of Automotive Parts (MP)



### Engine parts (Cylinder block part)

- Workpiece Forged Alloy Steel
- Cutting conditions  $vc(m/min) = 100$ ,  $ap(mm) = 3.0$ ,  $fn(mm/rev) = 0.15$ , wet
- Tools CNMG120408-MP NC3225

MP NC3225

60 ea/edge

30% more

Competitor A (P25)

45 ea/edge

- ➔ 30% longer tool life than competitor A (P25) due to reduced cutting force and smooth chip evacuation when machining outer surface at high depth of cut (3.0mm)



### Engine parts (Nipple)

- Workpiece C20
- Cutting conditions  $vc(m/min) = 250\sim380$ ,  $ap(mm) = 1.5\sim2.0$ ,  $fn(mm/rev) = 0.2\sim0.3$ , wet
- Tools CNMG120412-MP NC3215

MP NC3215

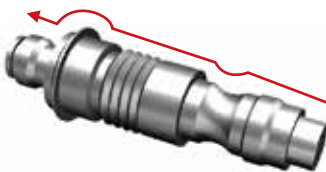
180 ea/edge

20% more

Competitor B (P15)

150 ea/edge

- ➔ Smooth chip evacuation and stable tool life in different cutting conditions 20% longer tool life than competitor B (P15)



### Steering system (Output shaft)

- Workpiece C40 (cold forged)
- Cutting conditions  $vc(m/min) = 170$ ,  $ap(mm) = 2.7\sim3.0$ ,  $fn(mm/rev) = 0.3$ , wet
- Tools DNMG150408-MP NC3215

MP NC3215

180 ea/edge

Higher stability

Competitor C (P15)

150 ea/edge

- ➔ Higher stability than competitor C(P15) by preventing chip curls of cold forged steel to interfere cutting operation



### Steering system (Wheel bearing)

- Workpiece C55 (hot forged)
- Cutting conditions  $vc(m/min) = 230$ ,  $ap(mm) = 0.5\sim1.5$ ,  $fn(mm/rev) = 0.3$ , wet
- Tools CNMG120408-MP NC3225

MP NC3225

100 ea/edge

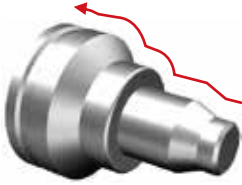
20% more

Competitor D (P30)

80 ea/edge

- ➔ Stable tool life even interrupted and hardened through hot forging 20% longer tool life than competitor D (P30)

## ⇒ Application Examples of Automotive Parts (LP)



### Steering system (BJ case)

- Workpiece C45 (cold forged)
- Cutting conditions  $vc(m/min) = 200\sim 250$ ,  $ap(mm) = 1.0\sim 2.0$ ,  $fn(mm/rev) = 0.25\sim 0.35$ , wet
- Tools DNMG150612-LP NC3215

LP NC3215

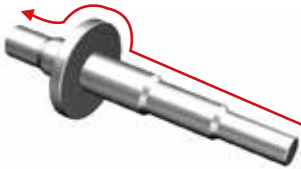
120 ea/edge

30%  
more

Competitor E (P15)

90 ea/edge

➔ Wide chip pockets improve chip evacuation and lower cutting force to avoid wear  
30% longer tool life than competitor E (P15)



### Transmission parts (Input shaft)

- Workpiece 20Cr4 (cold forged)
- Cutting conditions  $vc(m/min) = 160$ ,  $ap(mm) = 1.0$ ,  $fn(mm/rev) = 0.13$ , wet
- Tools DNMG150608-LP NC3225

LP NC3225

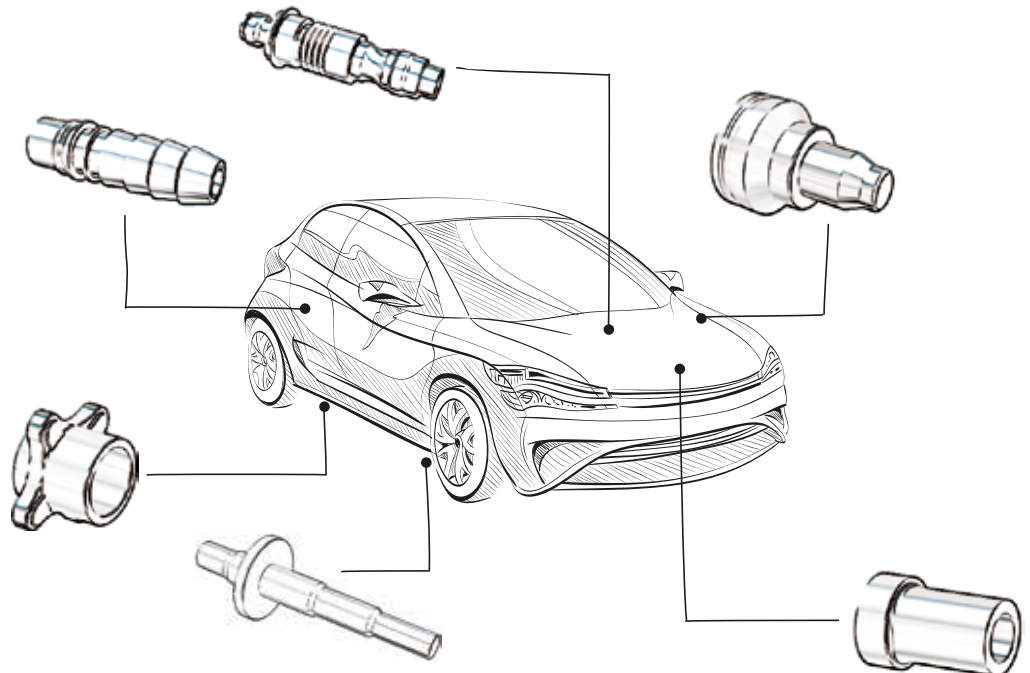
110 ea/edge

35%  
more

Competitor F (P25)

80 ea/edge

➔ Stable tool life in combination of interrupted and continuous machining  
30% longer tool life than competitor F (P25)



# NC3215 / NC3225











## ➤ Available Stock (Negative type)















Insert shape	Designation		Stock	
			NC3215	NC3225
	CNMG	120404-B25	▲	▲
		120408-B25	▲	▲
		120412-B25	▲	▲
		160608-B25	▲	▲
		160612-B25	▲	▲
		160616-B25	▲	▲
		190608-B25	▲	▲
		190612-B25	▲	▲
		190616-B25	▲	▲
	CNMG	120404-LP	▲	▲
		120408-LP	▲	▲
		120412-LP	▲	▲
	CNMG	120404-MP	▲	▲
		120408-MP	▲	▲
		120412-MP	▲	▲
		160608-MP	▲	▲
		160612-MP	▲	▲
		160616-MP	▲	▲
		190612-MP	▲	▲
		190616-MP	▲	▲
	CNMG	120404-VB	▲	▲
		120408-VB	▲	▲
		120412-VB	▲	▲
	CNMG	120404-VC	▲	▲
		120408-VC	▲	▲
		120412-VC	▲	▲
	CNMG	090304-VF	▲	▲
	CNMG	120408-VL	▲	▲
		120412-VL	▲	▲
	CNMG	190612-VR	▲	▲
		190616-VR	▲	▲
	CNMM	250724-GH	○	○
		250924-GH	▲	○
	CNMM	190612-VH	▲	○
		190616-VH	▲	○
		190624-VH	▲	○
		250724-VH	○	○
		250924-VH	▲	○

▲: Available in Europe ●: Available in Korea ○: Order-made item

Insert shape	Designation		Stock	
			NC3215	NC3225
	CNMM	190612-VT	▲	○
		190616-VT	▲	○
		190624-VT	▲	○
		250724-VT	▲	○
		250924-VT	▲	○
	DNMG	150404-B25	▲	▲
		150408-B25	▲	▲
		150412-B25	▲	▲
		150604-B25	▲	▲
		150608-B25	▲	▲
	DNMG	150404-LP	▲	▲
		150408-LP	▲	▲
		150412-LP	▲	▲
		150604-LP	▲	▲
		150608-LP	▲	▲
	DNMG	150404-MP	▲	▲
		150408-MP	▲	▲
		150412-MP	▲	▲
		150604-MP	▲	▲
		150608-MP	▲	▲
	DNMG	150404-VB	▲	▲
		150408-VB	▲	▲
		150412-VB	▲	▲
		150604-VB	▲	▲
		150608-VB	▲	▲
	DNMG	150408-VC	▲	▲
		150604-VC	▲	▲
		150608-VC	▲	▲
	DNMG	150404-VL	▲	▲
		150408-VL	▲	▲
	KNUX	160405L-11	▲	▲
		160405R-11	▲	▲
		160410L-11	▲	▲
		160410R-11	▲	▲
	KNUX	160405L-12	▲	▲
		160405R-12	▲	▲
		160410L-12	▲	▲
		160410R-12	▲	▲
	SNMG	120404-B25	▲	▲
		120408-B25	▲	▲
		120412-B25	▲	▲
		120416-B25	▲	▲
		190608-B25	▲	▲
		190612-B25	▲	▲
		190616-B25	▲	▲
250724-B25	▲	▲		

➔ Available Stock (Negative type)

Insert shape	Designation		Stock	
			NC3215	NC3225
	SNMG	120404-LP	▲	▲
		120408-LP	▲	▲
	SNMG	120404-MP	▲	▲
		120408-MP	▲	▲
		120412-MP	▲	▲
	SNMG	120408-VC	▲	▲
	SNMG	190612-VR	▲	▲
		190616-VR	▲	▲
	SNMM	190612-GH	▲	○
		190616-GH	▲	○
		190624-GH	▲	○
		250724-GH	▲	○
		250924-GH	▲	○
	SNMM	190612-VH	▲	○
		190616-VH	▲	○
		190624-VH	▲	○
		250724-VH	▲	○
		250924-VH	▲	○
	SNMM	190612-VT	▲	○
		190616-VT	▲	○
		190624-VT	▲	○
		250724-VT	▲	○
		250924-VT	▲	○
	TNMG	160404-B25	▲	▲
		160408-B25	▲	▲
		160412-B25	▲	▲
		220404-B25	▲	▲
		220408-B25	▲	▲
		220412-B25	▲	▲
		220416-B25	▲	▲
		270612-B25	▲	▲
		330716-B25	▲	▲
	TNMG	160404-LP	▲	▲
		160408-LP	▲	▲
	TNMG	160404-MP	▲	▲
		160408-MP	▲	▲
		160412-MP	▲	▲
		220404-MP	▲	▲
		220408-MP	▲	▲
		220412-MP	▲	▲

Insert shape	Designation		Stock	
			NC3215	NC3225
	TNMG	160408-VB	▲	▲
		220408-VB	▲	▲
	TNMG	160404-VC	▲	▲
		160408-VC	▲	▲
		160412-VC	▲	▲
	TNMG	160408-VM	●	●
		160412-VM	●	○
	VNMG	160404-MP	▲	▲
		160408-MP	▲	▲
	VNMG	160404-VB	▲	▲
		160408-VB	▲	▲
	VNMG	160404-VC	○	▲
		160408-VC	○	▲
	VNMG	160408-VF	▲	▲
	VNMG	160408-VL	○	▲
	VNMG	160408-VM	○	●
	WNMG	080404-B25	▲	▲
		080408-B25	▲	▲
		080412-B25	▲	▲
	WNMG	080404-LP	▲	▲
		080408-LP	▲	▲
		080412-LP	▲	▲
	WNMG	060408-MP	▲	▲
		080404-MP	▲	▲
		080408-MP	▲	▲
		080412-MP	▲	▲
	WNMG	080404-VB	▲	▲
		080408-VB	▲	▲
	WNMG	080408-VC	▲	▲
		080412-VC	▲	▲

▲: Available in Europe ●: Available in Korea ○: Order-made item

**Head Office**

Holystar B/D, 1350, Nambusunhwan-ro, Geumcheon-gu, Seoul, 08536, Korea  
Tel: +82-2-522-3181, Fax: +82-2-522-3184, +82-2-3474-4744  
Web: www.korloy.com E-mail: export@korloy.com

**Cheongju Factory**

55, Sandan-ro, Heungdeok-gu, Cheongju-si, Chungcheongbuk-do, 28589, Korea  
Tel: +82-43-262-0141, Fax: +82-43-262-0146

**Jincheon Factory**

54, Gwanghyewonsandan 2-gil, Gwanghyewon-myeon, Jincheon-gun, Chungcheongbuk-do, 27807, Korea  
Tel: +82-43-535-0141, Fax: +82-43-535-0144

**R & D Institute**

55, Sandan-ro, Heungdeok-gu, Cheongju-si, Chungcheongbuk-do, 28589, Korea  
Tel: +82-43-262-0141, Fax: +82-43-262-0711



620 Maple Avenue, Torrance, CA 90503, USA  
Tel: +1-310-782-3800, Toll Free: +1-888-711-0001, Fax: +1-310-782-3885  
Web: www.korloyamerica.com E-mail: sales@korloy.us



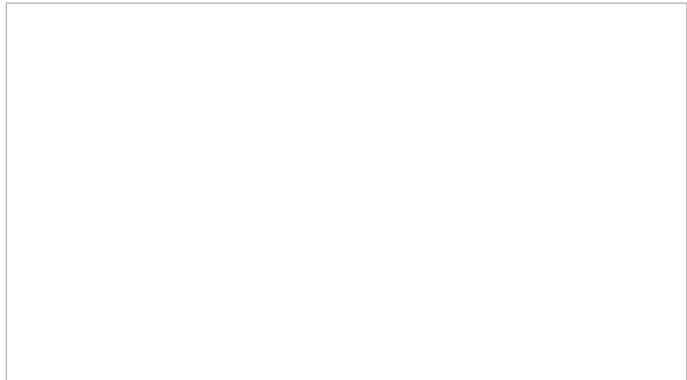
Ground Floor, Property No. 217, Udyog Vihar Phase 4, Gurgaon 122016, Haryana, India  
Tel: +91-124-4050030, Fax: +91-124-4050032  
Web: www.korloyindia.com E-mail: sales.kip@korloy.com



Av. Aruana 280, conj.12, WLC, Alphaville, Barueri, CEP06460-010, SP, Brasil  
Tel: +55-11-4193-3810  
E-mail: vendas@korloy.com



Gablonzer Str. 25-27, D-61440 Oberursel, Germany  
Tel: +49-6171-277-83-0, Fax: +49-6171-277-83-59  
Web: www.korloyeurope.com E-mail: info@korloyeurope.com



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