


Coated cubic boron nitride (CBN) grade for hardened steels

**MIBC010**

New sintering technology provides high wear and fracture resistance and good surface finish.

**Achieves cutting speed of over 300m/min.**

High-grade, coated CBN for machining hardened steels.

# Coated cubic boron nitride (CBN) grade for hardened steels

# MBC010



## Ultra high-speed cutting

**MBC010** is a coated CBN grade for hardened steels. High wear resistance enables high-speed cutting.

## Excellent surface finish

Micrograin CBN makes **MBC010** a "high-grade" grade for excellent surface finish.

## Features

### High wear resistance properties and high-speed cutting performance

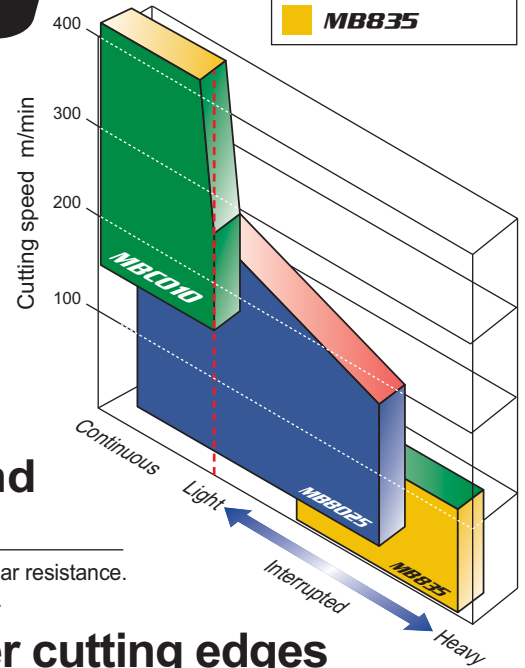
MBC010 makes the best use of special ceramic binder structure, actualizing high wear resistance. High wear resistance enables continuous machining at high speed of over 300m/min.

### Superior surface finish

MBC010 employs micrograin CBN for the first time in the world. Micrograin CBN and a special ceramic coating achieve excellent surface finish.

### Tougher cutting edges

Mitsubishi Materials' newly developed "particle-activated sintering method" provides both high wear resistance and high toughness. Because of high resistance to fracture, which high-grade CBN is liable to, MBC010 increases tool life and is less costly.

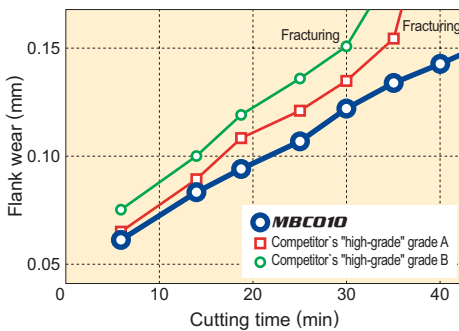


## Recommended cutting conditions

| Workpiece                       | Machining condition | Cutting speed (m/min)   |     |     |     | Feed (mm/rev) | Depth of cut (mm) | Coolant  |
|---------------------------------|---------------------|-------------------------|-----|-----|-----|---------------|-------------------|----------|
|                                 |                     | 100                     | 200 | 300 | 400 |               |                   |          |
| Hardened steel (Tempered steel) | Continuous cutting  | ----- ----- ----- ----- |     |     |     | -0.2          | -0.2              | Wet, Dry |

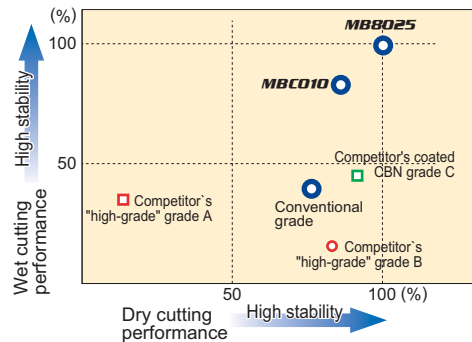
## Cutting performance

### Wear resistance



<Cutting conditions>  
 Workpiece : SCM415 HRC60  
 Continuous cutting  
 Insert : NP-CNGA120408GS2  
 Cutting speed : 300m/min  
 Feed : 0.05mm/rev  
 Depth of cut : 0.1mm  
 Dry cutting

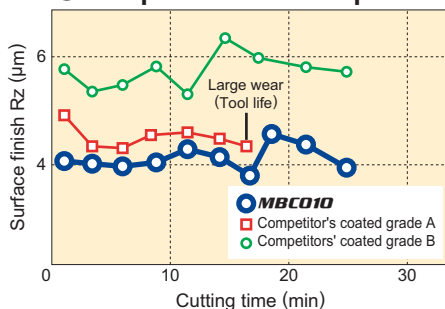
### Toughness



<Cutting conditions>  
 Workpiece : SCM415 HRC60  
 Interrupted external cutting of eight slits  
 Insert : NP-CNGA120408GS2  
 Cutting speed : 150m/min  
 <Wet cutting>  
 Feed : 0.1mm/rev  
 Depth of cut : 0.1mm  
 <Dry cutting>  
 Feed : 0.15mm/rev  
 Depth of cut : 0.2mm

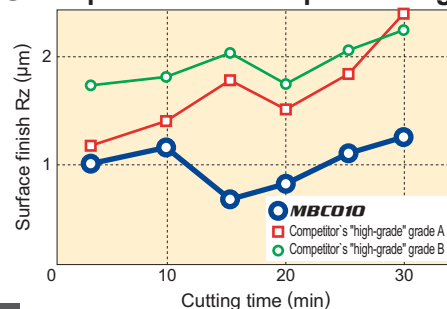
### Surface finish

#### Comparison with competitors' coated CBN grades



<Cutting conditions>  
 Workpiece : SCM415 HRC60  
 Continuous cutting  
 Insert : NP-CNGA120408GS2  
 Cutting speed : 150m/min  
 Feed : 0.15mm/rev  
 Depth of cut : 0.2mm  
 Dry cutting


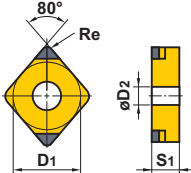

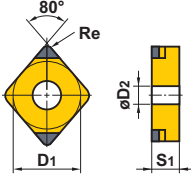

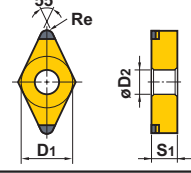

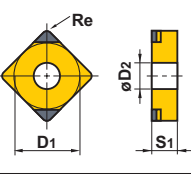

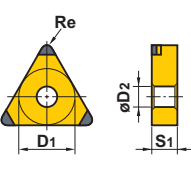

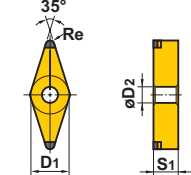

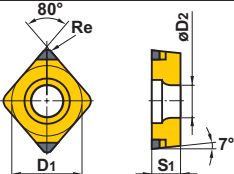

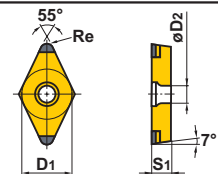

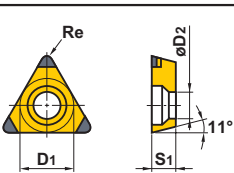
#### Comparison with competitors' high-grade CBN grades



<Cutting conditions>  
 Workpiece : SCM415 HRC60  
 Continuous cutting  
 Insert : NP-CNGA120408GS2  
 Cutting speed : 300m/min  
 Feed : 0.05mm/rev  
 Depth of cut : 0.1mm  
 Dry cutting

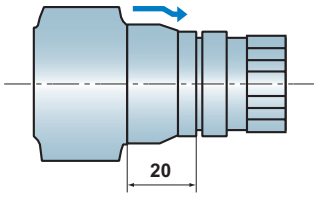
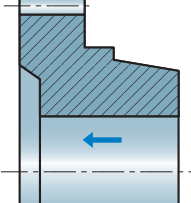
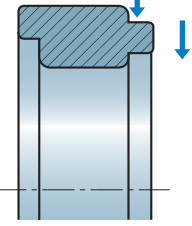
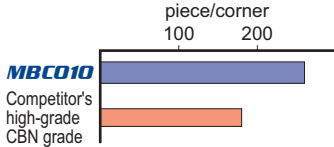
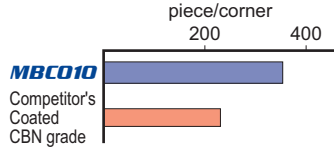
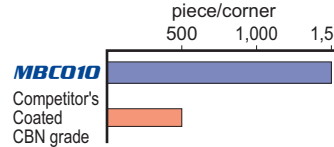
# MBC010

## Insert standards

| Shape   | Order number             | Stock | Geometry  | Dimensions (mm) |      |     |      | Holders   |
|---|--------------------------|-------|---|-----------------|------|-----|------|---|
|   |                          |       |   | D1              | S1   | Re  | D2   |   |
|    | <b>NP-CNGA120404GS2</b>  | ●     |    | 12.7            | 4.76 | 0.4 | 5.16 | LL holder<br>Double clamp holder<br>P type boring bar<br>D type boring head<br>LL cartridge                           |
|   | <b>120408GS2</b>         | ●     |   | 12.7            | 4.76 | 0.8 | 5.16 |   |
|   | <b>120412GS2</b>         | ●     |   | 12.7            | 4.76 | 1.2 | 5.16 |   |
|    | <b>NP-CNGA120408GSW2</b> | ●     |    | 12.7            | 4.76 | 0.8 | 5.16 | LL holder<br>Double clamp holder<br>P type boring bar<br>D type boring head<br>LL cartridge                           |
|    | <b>NP-DNGA150404GS2</b>  | ●     |    | 12.7            | 4.76 | 0.4 | 5.16 | LL holder<br>Double clamp holder<br>P type boring bar<br>D type boring head   |
|   | <b>150408GS2</b>         | ●     |   | 12.7            | 4.76 | 0.8 | 5.16 |   |
|   | <b>150412GS2</b>         | ●     |   | 12.7            | 4.76 | 1.2 | 5.16 |   |
|   | <b>NP-SNGA120404GS2</b>  | ●     |   | 12.7            | 4.76 | 0.4 | 5.16 | LL holder<br>ML holder<br>P type boring bar<br>LL cartridge   |
|   | <b>120408GS2</b>         | ●     |   | 12.7            | 4.76 | 0.8 | 5.16 |   |
|   | <b>120412GS2</b>         | ●     |   | 12.7            | 4.76 | 1.2 | 5.16 |   |
|  | <b>NP-TNGA160404GS3</b>  | ●     |  | 9.525           | 4.76 | 0.4 | 3.81 | LL holder<br>Double clamp holder<br>ML holder<br>WP holder<br>P type boring bar<br>D type boring head<br>LL cartridge |
|   | <b>160408GS3</b>         | ●     |   | 9.525           | 4.76 | 0.8 | 3.81 |   |
|   | <b>160412GS3</b>         | ●     |   | 9.525           | 4.76 | 1.2 | 3.81 |   |
|  | <b>NP-VNGA160404GS2</b>  | ●     |  | 9.525           | 4.76 | 0.4 | 3.81 | MP holder<br>D type boring head   |
|   | <b>160408GS2</b>         | ●     |   | 9.525           | 4.76 | 0.8 | 3.81 |   |
|  | <b>NP-CCGW060204GS2</b>  | ●     |  | 6.35            | 2.38 | 0.4 | 2.8  | SP holder<br>SMALL TOOLS<br>S type boring bar   |
|   | <b>09T304GS2</b>         | ●     |   | 9.525           | 3.97 | 0.4 | 4.4  |   |
|   | <b>09T308GS2</b>         | ●     |   | 9.525           | 3.97 | 0.8 | 4.4  |   |
|  | <b>NP-DCGW070204GS2</b>  | ●     |  | 6.35            | 2.38 | 0.4 | 2.8  | SP holder<br>SMALL TOOLS<br>Dimple bar<br>S type boring bar   |
|   | <b>11T302GS2</b>         | ●     |   | 9.525           | 3.97 | 0.2 | 4.4  |   |
|   | <b>11T304GS2</b>         | ●     |   | 9.525           | 3.97 | 0.4 | 4.4  |   |
|   | <b>11T308GS2</b>         | ●     |   | 9.525           | 3.97 | 0.8 | 4.4  |   |
|  | <b>NP-TPGX080202GS3</b>  | ●     |  | 4.76            | 2.38 | 0.2 | 2.5  | F type boring bar<br>MI holder<br>FA/FV boring unit   |
|   | <b>080204GS3</b>         | ●     |   | 4.76            | 2.38 | 0.4 | 2.5  |   |
|   | <b>090202GS3</b>         | ●     |   | 5.56            | 2.38 | 0.2 | 3    |   |
|   | <b>090204GS3</b>         | ●     |   | 5.56            | 2.38 | 0.4 | 3    |   |
|   | <b>110304GS3</b>         | ●     |   | 6.35            | 3.18 | 0.4 | 3.5  |   |
|   | <b>110308GS3</b>         | ●     |   | 6.35            | 3.18 | 0.8 | 3.5  |   |

**MBC010**

## Application examples

| Insert             | NP-DNGA150408GS2   | NP-CNGA120408GS2   | NP-CNGA120408GS2   |      |
|--------------------|--|--|--|------|
| Workpiece          | DIN 34Mn5 (HRC60)<br>Surface finish : Ra<0.8µm<br>  | DIN 20MoCrS4 (HRC50-61)<br>Surface finish : Rz<3µm<br>   | JIS SCr420H (HRC60)<br>   |      |
|                    | Component  | Accelerator  | Gear   | Gear |
| Cutting conditions | Cutting speed (m/min)  | 230  | 300  | 180  |
|                    | Feed (mm/rev)  | 0.08   | 0.06   | 0.15 |
|                    | Depth of cut (mm)  | 0.1  | 0.07   | 0.1  |
| Coolant            | Wet cutting  | Wet cutting  | Wet cutting  |      |
| Result             | <br>A competitor's "high-grade" grade made a poor surface finish after machining 190 pieces. Meanwhile, MBC010 maintained a good surface finish even after machining as many as 250 pieces. | <br>A competitor's coated CBN suffered large wear after machining 250 pieces, while MBC010 lengthened tool life and produced 380 pieces. | <br>A competitor's grade cut 500 pieces, while MBC010 increased tool life and machined 1500 pieces. |      |

## For your safety

●Do not touch cutting or chips without wearing gloves. ●Use tools under recommended cutting conditions, and exchange tools before excessive wear occurs. ●Chips become extremely hot, scattered over and may be stretched. Ensure safety guards and goggles are used. ●In case of using non-water soluble oil, make sure to have a fire prevention countermeasure. ●Use the provided wrench spanner, and ensure the inserts and spare parts are damped securely.

**MITSUBISHI MATERIALS CORPORATION**


## Overseas Operations Center :

## Cutting Tools

KFC bldg., 7F, 1-6-1, Yokoami, Sumida-ku, Tokyo 130-0015, Japan  
TEL 81-3-5819-8771 FAX 81-3-5819-8774

## MMC HARTMETALL GmbH

Comeniusstr.2, 40670, Meerbusch GERMANY  
TEL 49-2159-9189-0 FAX 49-2159-50462

## MITSUBISHI MATERIALS U.S.A. CORPORATION

## Headquarters

17401, Eastman Street, Irvine, California, 92614, USA  
TEL 1-949-862-5100 FAX 1-949-862-5180

## MMC METAL SINGAPORE PTE LTD.

10, Arumugam Road, #04-00 Lion Industrial Bldg.,409957, SINGAPORE  
TEL 65-6743-9370 FAX 65-6749-1469

**Mitsubishi Carbides Home page :** <http://www.mitsubishicarbide.com>  
(Tools specifications subject to change without notice.)