

**MITSUBISHI**

**MITSUBISHI CARBIDE**

**MBC020**

Coated CBN Grade for Hardened Steel

B093E

Exceptional wear and fracture resistance.

# Superior grade for machining hardened materials.

- Using **MIRACLE**® coating technology
- Cost effective, double sided, multi-corner types available.
- A wide variety honing types available for continuous to light interrupted cutting.



**MIRACLE**  
*Technology*



# Coated CBN Grade for Hardened Steel

# MBC020

## Features

MBC020 is a general purpose coated CBN grade suitable for continuous turning to light interrupted machining of hardened steel. The combination of high cutting edge rigidity and a coating for higher wear resistance allows MBC020 to cover a wider range of machining applications than conventional CBN grades.

### Coating for Higher Wear Resistance

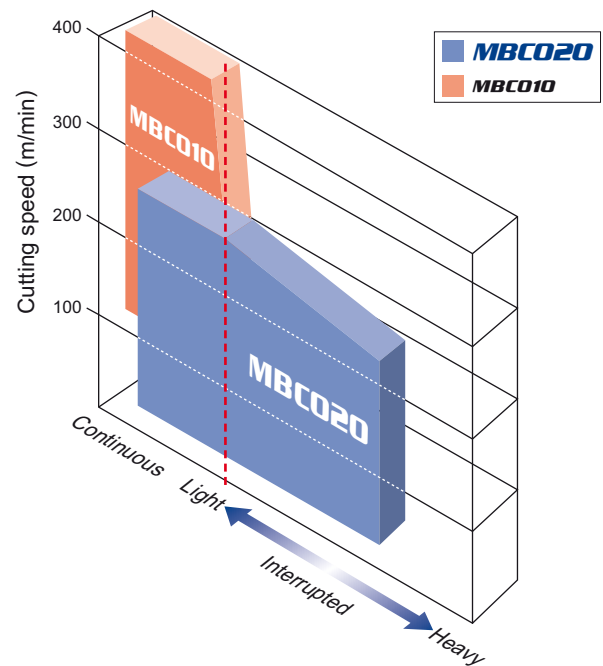
A special new coating, originating from MIRACLE technology, is used for MBC020. This coating technology gives superb wear resistance for machining hardened steels.

### Tougher Cutting Edge

MBC020 utilises a “Particle-activated Sintering Method” during the manufacturing process. As a result, the cutting edge toughness has been increased and also provides superior wear resistance.

### Application Range

**MBC020** further expands the application range of high efficiency machining.



### Recommended Cutting Conditions

Work Material	Cutting Mode	Cutting Speed (m/min)			Feed (mm/rev)	Depth of Cut (mm)	Coolant
		100	200	300			
Hardened Steel (Tempered steel)	Continuous cutting	[Bar chart showing range from ~100 to ~350]			-0.5	-0.5	Wet, Dry
	Interrupted cutting	[Bar chart showing range from ~100 to ~250]			-0.2	-0.3	

### Why is a high hardness CBN grade coated using MIRACLE coating technology?

MBC020 is a new coated CBN grade to complement the existing MBC010 type. By applying a coating to the substrate, MBC020 can obtain a higher wear resistance.

### Why does a coating on a high hardness CBN grade increase wear resistance?

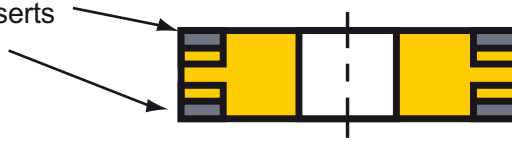
CBN has a hardness value second only to diamond. Taking advantage of this feature, CBN tools are able to withstand high temperatures when machining hardened steels.

However, for MBC020, MIRACLE coating technology has been used and covers the CBN with a highly heat-resistant ceramic coating layer that maximises the hardness properties. As a result, MBC020 displays a higher wear resistance than uncoated CBN inserts of the same grade.

**MBC020** elevating speed and efficiency to a higher level

## New economical double sided inserts

Both sides of negative type inserts now have cutting edges



## A Wide Variety of Edge Preparations (Honing)

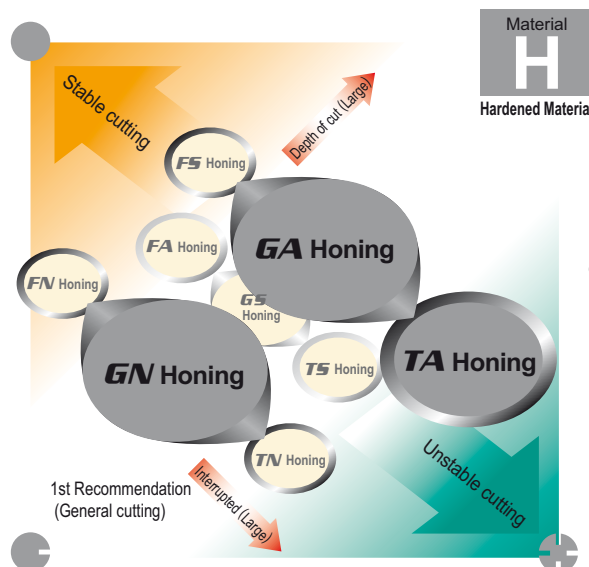
Cutting performance of CBN tools greatly depends on the type of edge preparation. To make tools available with the optimum edge preparation, Mitsubishi's CBN insert series offers an additional 6 types of edge honing based on the 3 conventional honing types, namely F (for continuous cutting), G (for general purpose) and T (for interrupted cutting). For MBC020, to maximize the benefits of its grade properties, three honing types, GA (for general purpose), GN (for general purpose & for less crater wear) and TA (for interrupted cutting) are offered as standard.

- Improved F, G and T type honing, optimum edge geometries available for a wider range of applications.
- Selection of inserts; by required surface finish or cutting conditions.
- The use of different honing types and wiper edge styles for lower cutting resistance achieves efficient and high quality machining where conventional inserts would not be suitable.

### HONING

NP-CNGA120404 <b>F</b> <b>A</b> W2						
		Main Application	Edge Honing Type			
EDGE HONING TYPE	MAIN APPLICATION	<b>A</b> For General Purpose Machining (First recommendation)	<b>S</b> For Very Small Depths of Cut (Sharp anti-burr type)	<b>N</b> For High Load Machining (Crater wear resistant)		
<b>F</b> For Continuous Machining	<b>FA</b> Honing	0.1 15°	<b>FS</b> Honing	0.1 15° R0.015	<b>FN</b> Honing	0.05 15° R0.015
<b>G</b> For Continuous - Light Interrupted Machining	<b>GA</b> Honing	0.13 25° R0.03	<b>GS</b> Honing	0.13 25° R0.015	<b>GN</b> Honing	0.05 25° R0.015
<b>T</b> For Interrupted Machining	<b>TA</b> Honing	0.13 35° R0.03	<b>TS</b> Honing	0.13 35° R0.015	<b>TN</b> Honing	0.05 35° R0.015


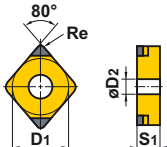

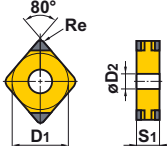

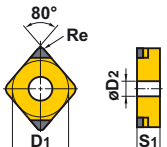

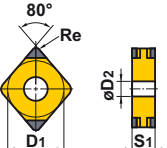

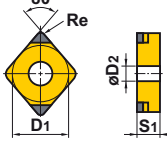

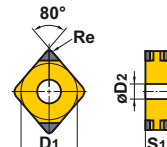
(Note) First, select the insert edge type from the main application area (F,G,T) then choose a honing type (A,S,N) that compliments the machining requirement.



Please select GA honing if the major application is continuous to light interrupted cutting, and select TA honing if the major application is interrupted cutting.


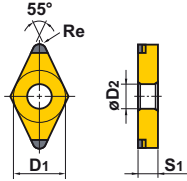

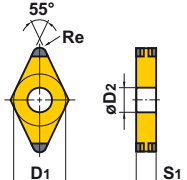

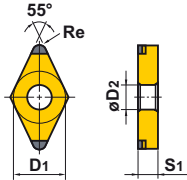

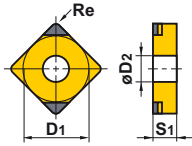

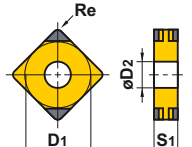
# CBN Turning Insert Series


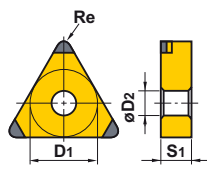

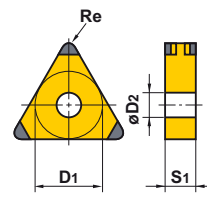
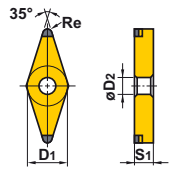




## Negative Inserts

Shape	Order Number	Coated CBN	Dimensions (mm)				Geometry
		MBC020	D1	S1	Re	D2	
NEW PETIT CUT 	<b>NP-CNGA120404GA2</b>	□	12.7	4.76	0.4	5.16	
	<b>120404TA2</b>	□	12.7	4.76	0.4	5.16	
	<b>120404TN2</b>	□	12.7	4.76	0.4	5.16	
	<b>120408FS2</b>	□	12.7	4.76	0.8	5.16	
	<b>120408GA2</b>	□	12.7	4.76	0.8	5.16	
	<b>120408TA2</b>	□	12.7	4.76	0.8	5.16	
	<b>120408TN2</b>	□	12.7	4.76	0.8	5.16	
	<b>120412FS2</b>	□	12.7	4.76	1.2	5.16	
	<b>120412GA2</b>	□	12.7	4.76	1.2	5.16	
	<b>120412TA2</b>	□	12.7	4.76	1.2	5.16	
	<b>120412TN2</b>	□	12.7	4.76	1.2	5.16	
NEW PETIT CUT 	<b>NP-CNGA120404GN4</b>	★	12.7	4.76	0.4	5.16	
	<b>120404GA4</b>	●	12.7	4.76	0.4	5.16	
	<b>120404TA4</b>	●	12.7	4.76	0.4	5.16	
	<b>120404TN4</b>	□	12.7	4.76	0.4	5.16	
	<b>120408FS4</b>	●	12.7	4.76	0.8	5.16	
	<b>120408GN4</b>	★	12.7	4.76	0.8	5.16	
	<b>120408GA4</b>	●	12.7	4.76	0.8	5.16	
	<b>120408TA4</b>	●	12.7	4.76	0.8	5.16	
	<b>120408TN4</b>	●	12.7	4.76	0.8	5.16	
	<b>120412FS4</b>	●	12.7	4.76	1.2	5.16	
	<b>120412GN4</b>	★	12.7	4.76	1.2	5.16	
	<b>120412GA4</b>	●	12.7	4.76	1.2	5.16	
	<b>120412TA4</b>	●	12.7	4.76	1.2	5.16	
<b>120412TN4</b>	●	12.7	4.76	1.2	5.16		
NEW PETIT CUT (With Wiper) 	<b>NP-CNGA120404GAW2</b>	□	12.7	4.76	0.4	5.16	
	<b>120408GAW2</b>	□	12.7	4.76	0.8	5.16	
	<b>120412GAW2</b>	□	12.7	4.76	1.2	5.16	
NEW PETIT CUT (With Wiper) 	<b>NP-CNGA120404GAW4</b>	●	12.7	4.76	0.4	5.16	
	<b>120408GAW4</b>	●	12.7	4.76	0.8	5.16	
	<b>120412GAW4</b>	●	12.7	4.76	1.2	5.16	
NEW PETIT CUT (With Wiper) 	<b>NP-CNGA120408GAWC2</b>	□	12.7	4.76	0.8	5.16	
NEW PETIT CUT (With Wiper) 	<b>NP-CNGA120408GAWC4</b>	●	12.7	4.76	0.8	5.16	

# CBN Turning Insert Series

## Negative Inserts


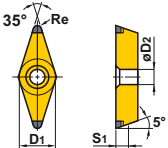
Shape	Order Number	Coated CBN	Dimensions (mm)				Geometry
		MBC020	D1	S1	Re	D2	
	NP-DNGA 150404GA2	□	12.7	4.76	0.4	5.16	
	150408GA2	□	12.7	4.76	0.4	5.16	
	150412GA2	□	12.7	4.76	1.2	5.16	
	150604GA2	□	12.7	6.35	0.4	5.16	
	150604TA2	□	12.7	6.35	0.4	5.16	
	150604TN2	□	12.7	6.35	0.4	5.16	
	150608GA2	□	12.7	6.35	0.8	5.16	
	150608TA2	□	12.7	6.35	0.8	5.16	
	150608TN2	□	12.7	6.35	0.8	5.16	
	150612GA2	□	12.7	6.35	1.2	5.16	
	150612TA2	□	12.7	6.35	1.2	5.16	
	NP-DNGA150404GN4	★	12.7	4.76	0.4	5.16	
	150404GA4	★	12.7	4.76	0.4	5.16	
	150404TA4	★	12.7	4.76	0.4	5.16	
	150408GN4	★	12.7	4.76	0.8	5.16	
	150408GA4	★	12.7	4.76	0.8	5.16	
	150408TA4	★	12.7	4.76	0.8	5.16	
	150412GN4	★	12.7	4.76	1.2	5.16	
	150412GA4	★	12.7	4.76	1.2	5.16	
	150412TA4	★	12.7	4.76	1.2	5.16	
	150604GA4	●	12.7	6.35	0.4	5.16	
	150604TA4	□	12.7	6.35	0.4	5.16	
	150604TN4	□	12.7	6.35	0.4	5.16	
	150608GA4	□	12.7	6.35	0.8	5.16	
	150608TA4	●	12.7	6.35	0.8	5.16	
	150608TN4	□	12.7	6.35	0.8	5.16	
	NP-DNGA150404GAW2JR	★	12.7	4.76	0.4	5.16	
	150404GAW2JL	★	12.7	4.76	0.4	5.16	
	150408GAW2JR	★	12.7	4.76	0.8	5.16	
	150408GAW2JL	★	12.7	4.76	0.8	5.16	
	150608GAW2JR	□	12.7	6.35	0.8	5.16	
	150608GAW2JL	□	12.7	6.35	0.8	5.16	
	150612GAW2JR	●	12.7	6.35	1.2	5.16	
150612GAW2JL	□	12.7	6.35	1.2	5.16		
	NP-SNGA 120404GA2	□	12.7	4.76	0.4	5.16	
	120408GA2	□	12.7	4.76	0.8	5.16	
	120412GA2	□	12.7	4.76	1.2	5.16	
	NP-SNGA120404GA4	★	12.7	4.76	0.4	5.16	
	120408GA4	★	12.7	4.76	0.8	5.16	
	120412GA4	★	12.7	4.76	1.2	5.16	

Shape	Order Number	Coated	Dimensions (mm)				Geometry
		CBN	D1	S1	Re	D2	
	NP-TNGA 160404GA3	□	9.525	4.76	0.4	3.81	
	160408GA3	□	9.525	4.76	0.8	3.81	
	160408TA3	□	9.525	4.76	0.8	3.81	
	160408TN3	□	9.525	4.76	0.8	3.81	
	160412GA3	□	9.525	4.76	1.2	3.81	
	160412TA3	□	9.525	4.76	1.2	3.81	
	160412TN3	□	9.525	4.76	1.2	3.81	
	NP-TNGA160404GN6	★	9.525	4.76	0.4	3.81	
	160404GA6	★	9.525	4.76	0.4	3.81	
	160404TA6	★	9.525	4.76	0.4	3.81	
	160408GN6	★	9.525	4.76	0.8	3.81	
	160408GA6	●	9.525	4.76	0.8	3.81	
	160408TA6	●	9.525	4.76	0.8	3.81	
	160408TN6	●	9.525	4.76	0.8	3.81	
	160412GN6	★	9.525	4.76	1.2	3.81	
	160412GA6	●	9.525	4.76	1.2	3.81	
	160412TA6	★	9.525	4.76	1.2	3.81	
160412TN6	□	9.525	4.76	1.2	3.81		
	NP-VNGA 160404GA2	□	9.525	4.76	0.4	3.81	
	160408GA2	□	9.525	4.76	0.8	3.81	
	NP-VNGA160404GA4	●	9.525	4.76	0.4	3.81	
	160408GA4	●	9.525	4.76	0.8	3.81	
 	NP-WNGA080408GA3	□	12.7	4.76	0.8	5.16	
	NP-WNGA080408GA6	●	12.7	4.76	0.8	5.16	
 	NP-WNGA080408GAW3	□	12.7	4.76	0.8	5.16	
	NP-WNGA080408GAW6	●	12.7	4.76	0.8	5.16	


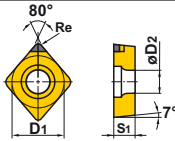

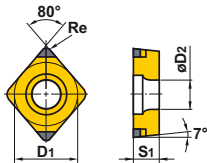

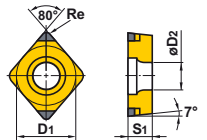

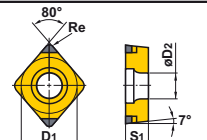

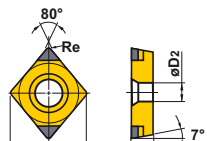



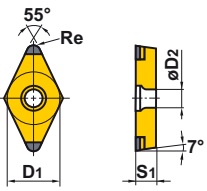

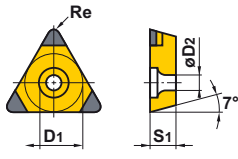
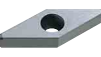
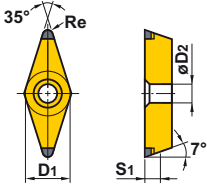

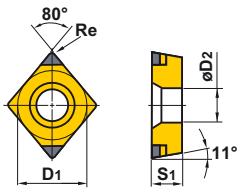

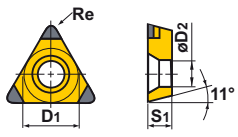
# CBN Turning Insert Series

## 5° Positive Inserts

Shape	Order Number	Coated CBN	Dimensions (mm)				Geometry
		MBC020	D1	S1	Re	D2	
	NP-VBGW160404GA2	●	9.525	4.76	0.4	3.81	
	160408GA2	●	9.525	4.76	0.8	3.81	

## 7° Positive Inserts

Shape	Order Number	Coated CBN	Dimensions (mm)				Geometry
		MBC020	D1	S1	Re	D2	
	NP-CCGW03S102FA	●	3.57	1.39	0.2	2.0	
	03S104FS	●	3.57	1.39	0.4	2.0	
	04T002FA	●	4.37	1.79	0.2	2.4	
	04T004FS	●	4.37	1.79	0.4	2.4	
	NP-CCGW060202FA2	●	6.35	2.38	0.2	2.8	
	060202GA2	●	6.35	2.38	0.2	2.8	
	060202TA2	●	6.35	2.38	0.2	2.8	
	060204FS2	●	6.35	2.38	0.4	2.8	
	060204GA2	●	6.35	2.38	0.4	2.8	
	060204TA2	●	6.35	2.38	0.4	2.8	
	060208GA2	●	6.35	2.38	0.8	2.8	
	060208TA2	●	6.35	2.38	0.8	2.8	
	09T302FS2	●	9.525	3.97	0.2	4.4	
	09T302GA2	●	9.525	3.97	0.2	4.4	
	09T302GN2	★	9.525	3.97	0.2	4.4	
	09T304FS2	●	9.525	3.97	0.4	4.4	
	09T304GA2	●	9.525	3.97	0.4	4.4	
	09T304GN2	★	9.525	3.97	0.4	4.4	
	09T304GS2	●	9.525	3.97	0.4	4.4	
	09T304TA2	●	9.525	3.97	0.4	4.4	
	09T304TN2	●	9.525	3.97	0.4	4.4	
	09T308FS2	●	9.525	3.97	0.8	4.4	
	09T308GA2	●	9.525	3.97	0.8	4.4	
	09T308GN2	★	9.525	3.97	0.8	4.4	
	09T308GS2	●	9.525	3.97	0.8	4.4	
	09T308TA2	●	9.525	3.97	0.8	4.4	
	09T308TN2	●	9.525	3.97	0.8	4.4	
	09T312GA2	●	9.525	3.97	1.2	4.4	
09T312GS2	●	9.525	3.97	1.2	4.4		
09T312TA2	●	9.525	3.97	1.2	4.4		
120404GA2	●	12.7	4.76	0.4	5.5		
120408GA2	●	12.7	4.76	0.8	5.5		
	NP-CCGW09T308GAW2	●	9.525	3.97	0.8	4.4	
	120404GAW2	●	12.7	4.76	0.4	5.5	
	120408GAW2	●	12.7	4.76	0.8	5.5	
	NP-CCGW09T304GSWC2	●	9.525	3.97	0.4	4.4	
	09T308GAWC2	●	9.525	3.97	0.8	4.4	
	09T308GSWC2	●	9.525	3.97	0.8	4.4	
	09T308TAWC2	●	9.525	3.97	0.8	4.4	
	NP-CCGB060204FS2	□	6.35	2.38	0.4	2.8	
	060204GA2	★	6.35	2.38	0.4	2.8	

Shape	Order Number	Coated	Dimensions (mm)				Geometry
		CBN	D1	S1	Re	D2	
	<b>NP-DCGW070202GA2</b>	●	6.35	2.38	0.2	2.8	
	<b>070202GN2</b>	★	6.35	2.38	0.2	2.8	
	<b>070204GN2</b>	★	6.35	2.38	0.4	2.8	
	<b>070204GA2</b>	●	6.35	2.38	0.4	2.8	
	<b>070204GS2</b>	●	6.35	2.38	0.4	2.8	
	<b>070204TA2</b>	●	6.35	2.38	0.4	2.8	
	<b>070208GA2</b>	●	6.35	2.38	0.8	2.8	
	<b>070208GN2</b>	●	6.35	2.38	0.8	2.8	
	<b>070208GS2</b>	★	6.35	2.38	0.8	2.8	
	<b>11T302GA2</b>	●	9.525	3.97	0.2	4.4	
	<b>11T302GN2</b>	★	9.525	3.97	0.2	4.4	
	<b>11T302TA2</b>	□	9.525	3.97	0.2	4.4	
	<b>11T304GA2</b>	●	9.525	3.97	0.4	4.4	
	<b>11T304GN2</b>	★	9.525	3.97	0.4	4.4	
	<b>11T304GS2</b>	●	9.525	3.97	0.4	4.4	
	<b>11T304TA2</b>	●	9.525	3.97	0.4	4.4	
	<b>11T308GA2</b>	●	9.525	3.97	0.8	4.4	
	<b>11T308GN2</b>	★	9.525	3.97	0.8	4.4	
	<b>11T308GS2</b>	●	9.525	3.97	0.8	4.4	
	<b>11T308TN2</b>	●	9.525	3.97	0.8	4.4	
<b>11T312GA2</b>	●	9.525	3.97	1.2	4.4		
	<b>NP-TCGW090202GA3</b>	●	5.56	2.38	0.2	2.5	
	<b>090204GA3</b>	●	5.56	2.38	0.4	2.5	
	<b>090208GA3</b>	●	5.56	2.38	0.8	2.5	
	<b>110202GA3</b>	●	6.35	2.38	0.2	2.8	
	<b>110204GA3</b>	●	6.35	2.38	0.4	2.8	
	<b>110208GA3</b>	●	6.35	2.38	0.8	2.8	
	<b>130304GA3</b>	●	7.94	3.18	0.4	3.4	
	<b>130308GA3</b>	●	7.94	3.18	0.8	3.4	
	<b>16T304GA3</b>	●	9.525	3.97	0.4	4.4	
	<b>16T308GA3</b>	●	9.525	3.97	0.8	4.4	
	<b>NP-VCGW160404GA2</b>	●	9.525	4.76	0.4	4.4	
	<b>160408GA2</b>	●	9.525	4.76	0.8	4.4	
	<b>NP-CPGB080204FS2</b>	□	7.94	2.38	0.4	3.6	
	<b>080204GA2</b>	●	7.94	2.38	0.4	3.6	
	<b>080208FS2</b>	□	7.94	2.38	0.8	3.6	
	<b>080208GA2</b>	●	7.94	2.38	0.8	3.6	
	<b>090304FS2</b>	□	9.525	3.18	0.4	4.6	
	<b>090304GA2</b>	●	9.525	3.18	0.4	4.6	
	<b>090308FS2</b>	□	9.525	3.18	0.8	4.6	
	<b>090308GA2</b>	●	9.525	3.18	0.8	4.6	
	<b>NP-TPGB 080204GA3</b>	●	4.76	2.38	0.4	2.5	
	<b>080208GA3</b>	★	4.76	2.38	0.8	2.5	
	<b>090204GA3</b>	★	5.56	2.38	0.4	2.9	
	<b>090208GA3</b>	★	5.56	2.38	0.8	2.9	
	<b>110304GA3</b>	★	6.35	3.18	0.4	3.4	
	<b>110308GA3</b>	●	6.35	3.18	0.8	3.4	
	<b>160304GA3</b>	★	9.525	3.18	0.4	4.4	
	<b>160308GA3</b>	●	9.525	3.18	0.8	4.4	