

Ganzhou Grand Sea Cemented Carbide Co.,Ltd is the wholly-owned subsidiary of Ganzhou Grand Sea Group which is Sino-foreign joint venture invested by Kyocera Corporation.

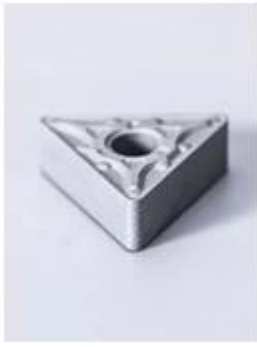
Now carbide insert project is the key development project of Grand Sea Cemented Carbide, Grand Sea has 5 electric presses imported from Japan, produce carbide insert 2 million per month.

### **Our Advantage**

1. 100% tungsten carbide raw material.
2. R&D and production ability to keep up with market trends.
3. Technical support ability to solve processing solutions for customers in all aspects.
4. Adequate stock to ensure fast delivery.
5. We are the supplier who can wholesale and customized the carbide inserts for you.



















### **The grade recommendation:**

Grade	WC %	CO %	Grain size (um)	Density (g/cm <sup>3</sup> )±0.1	Hardness (HRA)±0.5	TRS (kgf/mm <sup>2</sup> )
H10F	90	10	0.8	14.40	91.8	>350
H11F	87	12	0.3	14.50	91.4	>350
H12A	88	22	1.2	14.20	90.5	>350












1 2 3 4 5 6 7 8 9 10  
**C N M G 12 04 08 (E) (N)-MP**

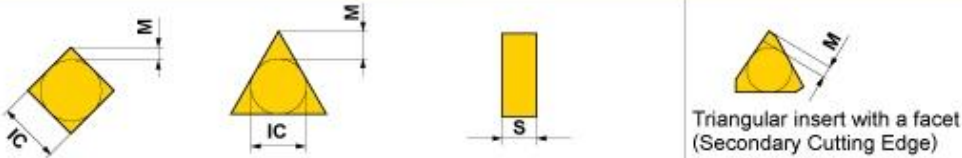
### 1. Insert Shape

1. Insert Shape		
Symbol	Insert Shape	
H	Hexagonal	
O	Octagonal	
P	Pentagonal	
S	Square	
T	Triangular	
C	Rhombic 80°	
D	Rhombic 55°	
E	Rhombic 75°	
F	Rhombic 50°	
M	Rhombic 86°	
V	Rhombic 35°	
W	Trigon	
L	Rectangular	
A	Parallelogram 85°	
B	Parallelogram 82°	
K	Parallelogram 55°	
R	Round	
X	Special Design	

### 2. Relief Angle

2. Relief Angle		
Symbol	Normal Clearance	
A	3°	
B	5°	
C	7°	
D	15°	
E	20°	
F	25°	
G	30°	
N	0°	
P	11°	
O	Other Relief Angle	
Major Relief Angle		

### 3. Tolerance Class

3. Tolerance Class										
										
3. Tolerance Class				Detail of M Class Insert Tolerance						
Symbol	Tolerance of Nose Height M (mm)	Tolerance of Inscribed Circle IC (mm)	Tolerance of Thickness S (mm)	●Tolerance of Nose Height M (mm)						
				D.I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
A	±0.005	±0.025	±0.025	6.35	±0.08	±0.08	±0.08	±0.11	±0.16	—
F	±0.005	±0.013	±0.025	9.525	±0.08	±0.08	±0.08	±0.11	±0.16	—
C	±0.013	±0.025	±0.025	12.70	±0.13	±0.13	±0.13	±0.15	—	—
H	±0.013	±0.013	±0.025	15.875	±0.15	±0.15	±0.15	±0.18	—	—
E	±0.025	±0.025	±0.025	19.05	±0.15	±0.15	±0.15	±0.18	—	—
G	±0.025	±0.025	±0.13	25.40	—	±0.18	—	—	—	—
J	±0.005	±0.05—±0.15	±0.025	31.75	—	±0.20	—	—	—	—
K*	±0.013	±0.05—±0.15	±0.025	●Tolerance of Inscribed Circle IC (mm)						
L*	±0.025	±0.05—±0.15	±0.025	D.I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
M*	±0.08—±0.18	±0.05—±0.15	±0.13	6.35	±0.05	±0.05	±0.05	±0.05	±0.05	—
N*	±0.08—±0.18	±0.05—±0.15	±0.025	9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
U*	±0.13—±0.38	±0.08—±0.25	±0.13	12.70	±0.08	±0.08	±0.08	±0.08	—	±0.08
The surface of insert with * mark is sintered.				15.875	±0.10	±0.10	±0.10	±0.10	—	±0.10
				19.05	±0.10	±0.10	±0.10	±0.10	—	±0.10
				25.40	—	±0.13	—	—	—	±0.13
				31.75	—	±0.15	—	—	—	±0.15


### 4. Chipbreaker and Clamping System

4. Chipbreaker and Clamping System									
Metric									
Symbol	Hole	Hole Configuration	Chip Breaker	Figure	Symbol	Hole	Hole Configuration	Chip Breaker	Figure
W	With Hole	Cylindrical Hole	No		A	With Hole	Cylindrical Hole	No	
T	With Hole	One Countersink (40–60°)	One Sided		M	With Hole	Cylindrical Hole	Single Sided	
Q	With Hole	Cylindrical Hole	No		G	With Hole	Cylindrical Hole	Double Sided	
U	With Hole	Double Countersink (40–60°)	Double Sided		N	Without Hole	—	No	
B	With Hole	Cylindrical Hole	No		R	Without Hole	—	Single Sided	
H	With Hole	One Countersink (70–90°)	One Sided		F	Without Hole	—	Double Sided	
C	With Hole	Cylindrical Hole	No		X	—	—	—	Special Design
J	With Hole	Double Countersink (70–90°)	Double Sided						

## 5. Insert Size

5. Insert Size							
Symbol							Diameter of Inscribed Circle (mm)
R	W	V	D	C	S	T	
	02		04	03	03	06	3.97
	L3	08	05	04	04	08	4.76
	03	09	06	05	05	09	5.56
06							6.00
	04	11	07	06	06	11	6.35
	05	13	09	08	07	13	7.94
08							8.00
09	06	16	11	09	09	16	9.525
10							10.00
12							12.00
12	08	22	15	12	12	22	12.70
15	10		19	16	15	27	15.875
16							16.00
19	13		23	19	19	33	19.05
20							20.00
			27	22	22	38	22.225
25							25.00
25			31	25	25	44	25.40
31			38	32	31	54	31.75
32							32.00

## 6. Insert Thickness

6. Insert Thickness	
 <p>*Thickness is from the bottom of the insert to the top of the cutting edge.</p>	
Symbol	Thickness (mm)
S1	1.39
01	1.59
T0	1.79
02	2.38
T2	2.78
03	3.18
T3	3.97
04	4.76
06	6.35
07	7.94
09	9.52

## 7. Insert Corner Configuration

7. Insert Corner Configuration	
Symbol	Corner Radius (mm)
00	Sharp Nose
V3	0.03
V5	0.05
01	0.1
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
28	2.8
32	3.2
00 : Inch M0 : Metric	Round Insert

## 8. Cutting Edge Condition

8. Cutting Edge Condition		
Figure	Cutting Edge	Symbol
	Sharp Cutting Edges	F
	Round Cutting Edges	E
	Chamfered Cutting Edges	T
	Chamfered and Rounded Cutting Edges	S
Mitsubishi Materials omit the honing symbol.		

## 9. Cutting Direction

9. Cutting Direction		
Figure	Hand	Symbol
	Right	R
	Left	L
	Neutral	N

## 10. Chip Breaker

10. Chip Breaker		
LP	MP	RP
LM	MM	RM
LK	MK	RK
LS	MS	RS
FP	LP	MP
MA	SW	MW
HZ	HX	HV