

Ganzhou Grand Sea Semented Carbide Co.,Ltd Ganzhou Grand Sea Group

Grand 5 2.100

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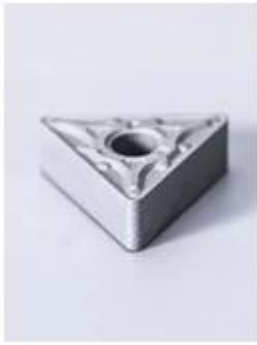
2.

3.

4.



















5.

|       |     |     |     | g / cm ±0.1 | hra ±0.5 | tr tr kgf /mm² |
|-------|-----|-----|-----|-------------|----------|----------------|
| 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           |

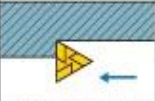
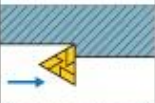

## 7. Insert Corner Configuration

| 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<br>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  |
|  |  |  |