## GA insert (Molded Chipbreaker)

| Workpiece Material | Recommended Insert Grade (Cutting Speed: m/min) | | | | | | | | ① f for Grooving (mm/rev) ② f for Longitudinal turning (mm/rev) ③ // ap (mm) | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cermet | | | | CVD Coated Carbide | PVD Coated Carbide | | Carbide | | | | | | |
| | TN60 | TN90 | TC40 | TC60 | CR9025 | PR630 | PR930 | KW10 | GA 30 | GA 40 | GA 50 | | | |
| Carbon Steel | ☆ 130~200 | - | - | - | ★ 80~180 | - | - | - | ①0.06~0.18 ②0.05~0.15 ③Max. 0.8 | ①0.06~0.21 ②0.05~0.17 ③Max. 1.0 | ①0.06~0.25 ②0.05~0.2 ③Max. 1.3 | | | Coolant |
| Alloy Steel | ☆ 100~180 | - | - | - | ★ 80~160 | - | - | - | ①0.06~0.15 ②0.05~0.12 ③Max. 0.3 | ①0.06~0.18 ②0.05~0.15 ③Max. 0.5 | ①0.06~0.22 ②0.05~0.18 ③Max. 0.8 | | | |
| Stainless Steel | - | - | - | - | ★ 60~130 | - | - | - | ①0.06~0.1 ②0.05~0.08 ③Max. 0.8 | ①0.06~0.1 ②0.05~0.08 ③Max. 0.8 | ①0.06~0.12 ②0.05~0.1 ③Max. 1.2 | | | |

★ : 1st Recommendation ☆ : 2nd Recommendation

## GIA insert (Molded Chipbreaker)

| Workpiece Material | Recommended Insert Grade (Cutting Speed: m/min) | | | | | | | | ① f for Grooving (mm/rev) ② f for Longitudinal turning (mm/rev) ③ // ap (mm) | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cermet | | | | CVD Coated Carbide | PVD Coated Carbide | | Carbide | | | | | | |
| | TN60 | TN90 | TC40 | TC60 | CR9025 | PR630 | PR930 | KW10 | GIA 30 | GIA 40 | GIA 50 | | | |
| Carbon Steel | ☆ 60~120 | - | - | - | ★ 60~120 | - | - | - | ①0.04~0.08 ②0.02~0.08 ③Max. 0.3 | ①0.04~0.09 ②0.02~0.08 ③Max. 0.4 | ①0.05~0.1 ②0.05~0.08 ③Max. 0.5 | | | Coolant |
| Alloy Steel | ☆ 60~100 | - | - | - | ★ 60~100 | - | - | - | ①0.04~0.07 ②0.02~0.07 ③Max. 0.3 | ①0.04~0.07 ②0.02~0.07 ③Max. 0.4 | ①0.05~0.08 ②0.05~0.08 ③Max. 0.5 | | | |
| Stainless Steel | - | - | - | - | ★ 60~80 | - | - | - | ①0.04~0.07 ②0.02~0.07 ③Max. 0.3 | ①0.04~0.07 ②0.02~0.07 ③Max. 0.4 | ①0.05~0.08 ②0.05~0.08 ③Max. 0.5 | | | |

★ : 1st Recommendation ☆ : 2nd Recommendation

## GMN insert (CBN / PCD)

| Workpiece Material | Recommended Insert Grade (Cutting Speed: m/min) | | ① f for Grooving (mm/rev) ② f for Longitudinal turning (mm/rev) ③ // ap (mm) | | | | Remarks |
|---|---|---|---|---|---|---|---|
| | CBN | PCD | | | | | |
| | KBN510 KBN525 (KBN10B) | KPD001 (KPD010) | GMN2 | GMN3 | GMN4 GMN5 | GMN6 | |
| Aluminum | - | ★ 150~2000 | ①0.05~0.15 ②0.05~0.15 ③Max. 0.5 | ①0.05~0.15 ②0.05~0.15 ③Max. 0.8 | ①0.08~0.18 ②0.08~0.18 ③Max. 0.8 | ①0.10~0.20 ②0.10~0.20 ③Max. 0.8 | Coolant |
| Brass | - | ★ 200~800 | ①0.05~0.15 ②0.05~0.15 ③Max. 0.5 | ①0.05~0.15 ②0.05~0.15 ③Max. 0.8 | ①0.08~0.18 ②0.08~0.18 ③Max. 0.8 | ①0.10~0.20 ②0.10~0.20 ③Max. 0.8 | |
| Cast Iron | ★ 150~400 | - | ①0.04~0.09 ②0.04~0.09 ③Max. 0.3 | ①0.05~0.1 ②0.05~0.1 ③Max. 0.5 | ①0.05~0.12 ②0.05~0.12 ③Max. 0.5 | ①0.05~0.15 ②0.05~0.15 ③Max. 0.8 | |
| Hard Materials | ★ 80~120 | - | ①0.02~0.05 ②0.01~0.03 ③Max. 0.1 | ①0.03~0.07 ②0.01~0.05 ③Max. 0.2 | ①0.03~0.08 ②0.03~0.08 ③Max. 0.3 | ①0.05~0.1 ②0.05~0.1 ③Max. 0.4 | |

* Above cutting condition is for external grooving. Set feed rate lower than 20% for face grooving.

★ : 1st Recommendation

# FMM • FMN

| Workpiece Material | Recommended Insert Grade (Cutting Speed: m/min) | | | | | | Face Grooving (FMM type / FMN type) Width (mm) | | | Longitudinal turning (Case of FMM type) Width (mm) | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cermet | CVD Coated Carbide | PVD Coated Carbide | | | Carbide | | | | | | | |
| | TN90 | CR9025 | PR915 | PR930 | PR905 | KW10 | 3.0 | 4.0 | 5.0 / 6.0 | 3.0 | 4.0 | 5.0 / 6.0 | |
| | | | | | | | f (mm/rev) | | | f (mm/rev) | | | |
| Carbon Steel | ☆ 100~220 | ☆ 80~200 | ☆ 80~200 | ★ 80~200 | - | - | 0.03~0.05 | 0.03~0.08 | 0.05~0.10 | 0.05~0.10 | 0.05~0.25 | 0.10~0.30 | Coolant |
| Alloy Steel | ☆ 80~200 | ☆ 70~180 | ☆ 70~180 | ★ 70~180 | - | - | 0.03~0.05 | 0.03~0.08 | 0.05~0.10 | 0.05~0.10 | 0.05~0.25 | 0.10~0.30 | |
| Stainless Steel | ☆ 70~160 | ☆ 60~150 | ★ 60~150 | ☆ 60~150 | - | - | 0.03~0.05 | 0.03~0.08 | 0.05~0.10 | 0.05~0.10 | 0.05~0.25 | 0.10~0.30 | |
| Cast Iron | - | - | - | - | ★ 80~180 | ☆ 70~150 | 0.03~0.05 | 0.03~0.08 | 0.05~0.10 | 0.05~0.10 | 0.05~0.25 | 0.10~0.30 | |
| Aluminum | - | - | - | - | - | ★ 200~500 | 0.03~0.05 | 0.03~0.08 | 0.05~0.10 | 0.05~0.10 | 0.05~0.25 | 0.10~0.30 | |
| Brass | - | - | - | - | - | ★ 100~200 | 0.03~0.05 | 0.03~0.08 | 0.05~0.10 | 0.05~0.10 | 0.05~0.25 | 0.10~0.30 | |

Set the feed rate 1/100 of edge width on the first groove and check chip evacuation.

★ : 1st Recommendation ☆ : 2nd Recommendation

FMN type Inserts are only for Deep Grooving, and when used for longitudinal turning. set to ap=0.2mm and under.

◆ See the notes below for Longitudinal turning conditions.

**ap and f of FMM**

| | Recommended Conditions | |
|---|---|---|
| ap (MAX) mm | under 50% of Edge Width | ・ap≦0.5w |
| f (MAX) mm/rev | under 3~5% of Edge Width | ・f≦ [0.03 (Min.)~0.05 (MAX.)] w |

ap×f should be as follows.

| Load ($mm^2$) \ Edge Width (mm) | 3.0 | 4.0 | 5.0 | 6.0 |
|---|---|---|---|---|
| ap×f | ~0.09 | ~0.14 | ~0.25 | ~0.36 |

・ap×f≦0.01 $w^2$