# Applications and Speed & Feed chart for Ball Nose and Flat Bottom & BackDraft Insert End Mills

| 557 and 558 Series Application Specifications | | | |
|---|---|---|---|
| Type | Grade | Style | Application |
| "G" | | Chip Breaker Insert | soft, gummy materials ie: aluminum, brass, low carbon steels and stainless |
| "A" | | Flat Face Insert | high carbon, die and mold steel |
| | * LT-90 | TiCN-PVD | light roughing and finishing cuts in die and mold steels better edge strength than 586XRm |
| | 586XRm | AlTiN-PVD Coated | light roughing and finishing cuts in die and mold steels and any finishing cuts in hard steels and non-ferrous materials |
| | 606jRm | AlTiN-PVD Coated | roughing low and high carbon steels, die mold steels and ferrous materials |
| | LTC-10 | Class C2 Uncoated | aluminum and non-ferrous materials |
| | LTC-14 | Class C5 Uncoated | carbon steels, die and mold steels |
| | * 900XRm | AlTiN-PVD Coated | finish cuts in all materials |

***LT-90 offered for 558 series backdraft and flat bottom cutters only!** ***900XRm offered for 557 series only!**

| CHART "A" | Speed and Feed chart for Ball Nose and Flat Bottom Insert End Mills | | | |
|---|---|---|---|---|
| Material | Application | Grade | SFPM | IPR |
| Carbon,Alloy,Tool Steels H10-H14,H21-H26,P2-P6,P20, P21,P4,A4,A6,A7,D2,D3,D4,D5,D7 | Finishing | LTC-10 | 300-560 | .004"-.008" |
| | Finishing | 586XRm | 400-700 | .004"-.008" |
| | Finishing | LT-90 | 400-700 | .004"-.008" |
| | Roughing | LTC-14 | 300-450 | .006"-.016" |
| | Roughing | 606jRm | 350-600 | .006"-.016" |
| Stainless Steel,High Temp Alloys (300, 400 Series) Must use chip breaker | | LTC-10 | 230-330 | .004"-.020" |
| | | LT-90 | 300-360 | .003"-.010" |
| | | 586XRm | 300-360 | .003"-.010" |
| Cast Steel | Finishing | LTC-10 | 300-560 | .004"-.008" |
| | Roughing | LTC-14 | 300-450 | .006"-.016" |
| | Roughing | 606jRm | 400-700 | .006"-.020" |
| Grey Cast Iron Hard and Soft | | LTC-10 | 340-560 | .006"-.024" |
| | | LT-90 | 400-640 | .006"-.024" |
| | | 586XRm | 400-640 | .006"-.024" |
| Aluminum, Kirksite Must use chip breaker | | LTC-10 | 660-1500 | .006"-.032" |
| | | LT-90 | 900 and UP | .006"-.024" |
| | | 586XRm | 900 and UP | .006"-.024" |
| Brass, Copper, Bronze Must use chip breaker | | LTC-10 | 400-600 | .006"-.020" |
| | | LT-90 | 450-760 | .006"-.020" |
| | | 586XRm | 450-760 | .006"-.020" |
| Graphite | | LTC-10 | 640-1320 | .006"-.032" |
| | | LT-90 | 900-1500 | .006"-.032" |
| | | 586XRm | 900-1500 | .006"-.032" |
| Wood (Rock Maple, Mahogany) | | LTC-10 | 1320-1900 | .008"-.048" |

Note: The effective cutting diameter on full radius inserts will be less than the full diameter of the cutter when the depth of cut is not equal to half of the diameter.

Please consult page 40 for the effective cutting diameter and the multiplying factors for increasing speeds & feeds in relationship to effective cutting diameter.

| Screw Torque Specifications | |
|---|---|
| Screw Number | Torque (Inch lbs) |
| GWS 08 | 35 |
| GWS 10 | 35 |
| GWS 12 | 53 |
| GWS 16 | 55 |
| GWS 20 | 55 |
| GWS 25 | 58 |
| GWS 32 | 58 |

# *Application Data for 557 Series*

**CHART "B" RPM Factor = RF**

**Insert & Ball Nose Diameter**

| Depth of Cut | 0.312 | 0.375 | 0.500 | 0.625 | 0.750 | 1.000 | 1.250 |
|---|---|---|---|---|---|---|---|
| **Inch Effective Cutting Diameter** | | | | | | | |
| 0.020 | 0.153 | 0.169 | 0.196 | 0.220 | 0.242 | 0.280 | 0.314 |
| 0.050 | 0.229 | 0.255 | 0.300 | 0.339 | 0.374 | 0.436 | 0.490 |
| 0.075 | 0.267 | 0.300 | 0.357 | 0.406 | 0.450 | 0.527 | 0.594 |
| 0.100 | 0.292 | 0.332 | 0.400 | 0.458 | 0.510 | 0.600 | 0.678 |
| 0.125 | 0.306 | 0.354 | 0.433 | 0.500 | 0.559 | 0.661 | 0.750 |
| 0.156 | 0.313 | 0.370 | 0.464 | 0.541 | 0.609 | 0.726 | 0.827 |
| 0.188 | | 0.375 | 0.484 | 0.573 | 0.650 | 0.781 | 0.893 |
| 0.250 | | | 0.500 | 0.612 | 0.707 | 0.866 | 1.000 |
| 0.312 | | | | 0.625 | 0.739 | 0.927 | 1.082 |
| 0.375 | | | | | 0.750 | 0.968 | 1.146 |
| 0.500 | | | | | | 1.000 | 1.225 |
| 0.625 | | | | | | | 1.250 |

Divide the IPR found on page 108 Chart "A"by the factor from the table below. Use the same depth of cut used to calculate the RPM in the chart above.

**SFPM = Surface Feet per Minute**
**IPR = Inches per Revolution**

Stepover should be: equal to or greater than Depth of Cut (D.O.C.)

**RPM = Revolutions per Minute**
**FPT = Feed per Tooth**

**RF = RPM Factor**
**FRF = Feed Rate Factor**

**CHART "C" Feed Rate Factor = FRF**

**Insert & Ball Nose Diameter**

| Depth of Cut | 0.312 | 0.375 | 0.500 | 0.625 | 0.750 | 1.000 | 1.250 |
|---|---|---|---|---|---|---|---|
| **Inch Effective Feed Rate Factor** | | | | | | | |
| 0.020 | 0.49 | 0.45 | 0.39 | 0.35 | 0.32 | 0.28 | 0.25 |
| 0.050 | 0.73 | 0.68 | 0.60 | 0.54 | 0.50 | 0.44 | 0.39 |
| 0.075 | 0.85 | 0.80 | 0.71 | 0.65 | 0.60 | 0.53 | 0.47 |
| 0.100 | 0.93 | 0.88 | 0.80 | 0.73 | 0.68 | 0.60 | 0.54 |
| 0.125 | 0.98 | 0.94 | 0.87 | 0.80 | 0.75 | 0.66 | 0.60 |
| 0.156 | 1.00 | 0.99 | 0.93 | 0.87 | 0.81 | 0.73 | 0.66 |
| 0.188 | | 1.00 | 0.97 | 0.92 | 0.87 | 0.78 | 0.71 |
| 0.250 | | | 1.00 | 0.98 | 0.94 | 0.87 | 0.80 |
| 0.312 | | | | 1.00 | 0.99 | 0.93 | 0.87 |
| 0.375 | | | | | 1.00 | 0.97 | 0.92 |
| 0.500 | | | | | | 1.00 | 0.98 |
| 0.625 | | | | | | | 1.00 |

**Insert Indexing and Screw Torque Specifications**

- Always ensure that insert pockets are clean and free of debris or burrs.
- Utilize holders that are stable and in good condition.
- Clean and recoat screw with anti-seize lubricant during each index.
- For optimum results, replace locking screw after ten inserts.
- For optimum results, replace holders after one hundred inserts.
- Utilize the proper driver to tighten locking screw.
- Hold the insert in place during the tightening process.
- Never force the locking process - check for interference or damage.
- Do not use a pipe or other extensions to tighten the locking screw.
- Generally speaking, drivers supplied with the tools provide proper torque.
- If a torque wrench is available, follow the recommended torque specifications found on page 108.

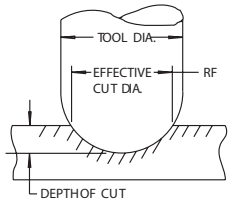


Figure 1.

**Step (1)** To find corrected RPM :
3.82 x SFPM / RF = RPM (corrected)
Chart "A" Chart "B"

**Step (2)** IPR / 2 = FPT (starting)
Chart "A"

**Step (3)** To find corrected FPT:
FPT (starting) / FRF = FPT (corrected)
Chart "C"

**Step (4)** IPM = (corrected) RPM x no. of effective teeth x (corrected) FPT

**Example Starting Parameters:**
**Material: Aluminum, SFPM: 1000, IPR: .020**
Tool: .75 dia. with .188 D.O.C.

**Examples: see figure 1.**
**Step (1)** To find corrected RPM:
3.82 x 1000 / .650 = 5877 RPM (corrected)
**Step (2)** To find starting FPT:
.020 / 2 = .010 FPT (starting)
**Step (3)** To find corrected FPT:
.010 / .870 = .0115 FPT (corrected)
**Step (4)** To find IPM:
5877 x 2 (all 557 series) x .0115 = 135.171