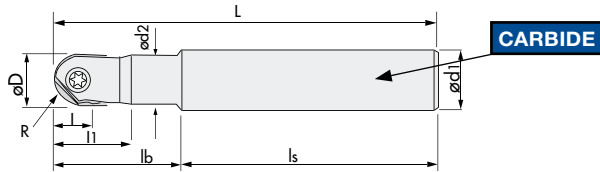
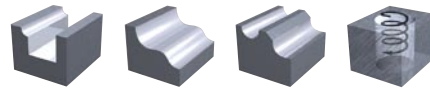


Indexable Milling Tools

ABPF | Ball High Precision Finish - Carbide Shank

| | | | | |
|----------------------------|----------------|-----------|------------------|--------------------------|
| V max High Speed | Semi Finishing | Finishing | HRC 65 | No. of Teeth 2 |
|----------------------------|----------------|-----------|------------------|--------------------------|



| | |
|--------|---------|
| R | ± 0.005 |
| Set-up | ± 0.010 |



ABPF-W Ball High Precision Finish - Carbide Shank Regular

| ID Code | Item Code | Stock | Flutes | ØD | R | L | l | l ₁ | lb | ls | Ød ₁ | Ød ₂ | Inserts x1 |
|---------|--------------------|-------|--------|----|------|-----|------|----------------|----|-----|-----------------|-----------------|------------|
| FH 393 | ABPF-08S08W | ■ | 2 | 8 | 4 | 100 | 4.4 | 18 | 30 | 70 | 8 | 7.8 | ZPFG080 |
| FH 394 | ABPF-10S10W | ■ | 2 | 10 | 5 | 100 | 5.5 | 23 | 35 | 65 | 10 | 9.8 | ZPFG100 |
| FH 395 | ABPF-12S12W | ■ | 2 | 12 | 6 | 110 | 6.6 | 26 | 45 | 65 | 12 | 11.8 | ZPFG120 |
| FH 478 | ABPF-16S16W | ■ | 2 | 16 | 8 | 140 | 8.8 | 19 | 35 | 105 | 16 | 15.5 | ZPFG160 |
| FH 479 | ABPF-20S20W | ■ | 2 | 20 | 10 | 160 | 11 | 22 | 40 | 120 | 20 | 19.5 | ZPFG200 |
| FH 480 | ABPF-25S25W | ■ | 2 | 25 | 12.5 | 180 | 13.7 | 25 | 45 | 135 | 25 | 24.5 | ZPFG250 |
| FH 481 | ABPF-32S32W | ■ | 2 | 32 | 16 | 180 | 17.6 | 30 | 55 | 125 | 32 | 31.5 | ZPFG320 |



ABPF-WL Ball High Precision Finish - Carbide Shank Long Neck

| ID Code | Item Code | Stock | Flutes | ØD | R | L | l | l ₁ | lb | ls | Ød ₁ | Ød ₂ | Inserts x1 |
|---------|---------------------|-------|--------|----|---|-----|-----|----------------|----|----|-----------------|-----------------|------------|
| FH 396 | ABPF-08S08WL | ■ | 2 | 8 | 4 | 130 | 4.4 | 18 | 65 | 65 | 8 | 7.8 | ZPFG080 |
| FH 397 | ABPF-10S10WL | ■ | 2 | 10 | 5 | 140 | 5.5 | 23 | 75 | 65 | 10 | 9.8 | ZPFG100 |
| FH 398 | ABPF-12S12WL | ■ | 2 | 12 | 6 | 150 | 6.6 | 26 | 85 | 65 | 12 | 11.8 | ZPFG120 |



ABPF-WE Ball High Precision Finish - Carbide Shank Extra Long

| ID Code | Item Code | Stock | Flutes | ØD | R | L | l | l ₁ | lb | ls | Ød ₁ | Ød ₂ | Inserts x1 |
|---------|---------------------|-------|--------|----|------|-----|------|----------------|-----|-----|-----------------|-----------------|------------|
| FH 458 | ABPF-16S16WE | ■ | 2 | 16 | 8 | 200 | 8.8 | 19 | 120 | 80 | 16 | 15.8 | ZPFG160 |
| FH 459 | ABPF-20S20WE | ■ | 2 | 20 | 10 | 250 | 11 | 22 | 150 | 100 | 20 | 19.8 | ZPFG200 |
| FH 460 | ABPF-25S25WE | ■ | 2 | 25 | 12.5 | 300 | 13.7 | 25 | 190 | 110 | 25 | 24.8 | ZPFG250 |
| FH 482 | ABPF-32S32WE | ■ | 2 | 32 | 16 | 350 | 17.6 | 30 | 230 | 120 | 32 | 31.8 | ZPFG320 |

■ = Stock | Germany

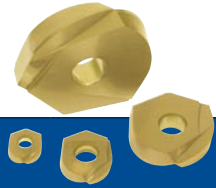
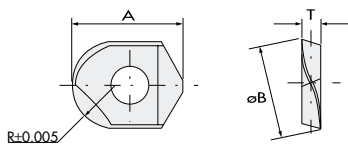
Inserts p. 7

Parts **Clamp Screw** **Wrench**

| | Body | ID-Code | Item-Code | ID-Code | Item-Code |
|----------------|------|---------------------|-----------|---------|-----------------|
| ABPF-W | | ABPF-08S08W | ET 153 | 581-141 | ET 13 104-T8 |
| | | ABPF-10S10W | ET 154 | 581-142 | ET 11 104-T10 |
| | | ABPF-12S12W | ET 155 | 581-143 | ET 14 105-T20 |
| | | ABPF-16S16W | ET 156 | 581-144 | ET 14 105-T20 |
| | | ABPF-20S20W | ET 157 | 581-145 | ET 9 101-T25S |
| | | ABPF-25S25W | ET 168 | 581-146 | ET 167 105-T30A |
| | | ABPF-32S32W | ET 169 | 581-147 | ET 167 105-T30A |
| ABPF-WL | | ABPF-08S08WL | ET 153 | 581-141 | ET 13 104-T8 |
| | | ABPF-10S10WL | ET 154 | 581-142 | ET 11 104-T10 |
| | | ABPF-12S12WL | ET 155 | 581-143 | ET 14 105-T20 |
| ABPF-WE | | ABPF-16S16WE | ET 156 | 581-144 | ET 14 105-T20 |
| | | ABPF-20S20WE | ET 157 | 581-145 | ET 9 101-T25S |
| | | ABPF-25S25WE | ET 168 | 581-146 | ET 167 105-T30A |
| | | ABPF-32S32WE | ET 169 | 581-147 | ET 167 105-T30A |

Indexable Milling Tools | Grades Overview

INSERTS | Ball High Precision Finish



| ID Code | Item Code | Grade | C-Coated | | G-Coated | | TH-Coated | | R | I(A) | T | W(B) |
|---------|-----------------|--------|----------|--------|----------|--|-----------|--|------|------|-----|------|
| | | | PCA08M | PCA12M | | | PTH08M | | | | | |
| WF 645 | ZPFG-080 | PTH08M | | | | | ■ | | 4 | 9.7 | 2.1 | 8 |
| WF 594 | ZPFG-080 | PCA08M | ■ | | | | | | 4 | 9.7 | 2.1 | 8 |
| WF 547 | ZPFG-080 | PCA12M | | ■ | | | | | 4 | 9.7 | 2.1 | 8 |
| WF 646 | ZPFG100 | PTH08M | | | | | ■ | | 5 | 12.1 | 2.7 | 10 |
| WF 595 | ZPFG100 | PCA08M | ■ | | | | | | 5 | 12.1 | 2.7 | 10 |
| WF 548 | ZPFG100 | PCA12M | | ■ | | | | | 5 | 12.1 | 2.7 | 10 |
| WF 647 | ZPFG120 | PTH08M | | | | | ■ | | 6 | 14.6 | 3.2 | 12 |
| WF 596 | ZPFG120 | PCA08M | ■ | | | | | | 6 | 14.6 | 3.2 | 12 |
| WF 549 | ZPFG120 | PCA12M | | ■ | | | | | 6 | 14.6 | 3.2 | 12 |
| WF 648 | ZPFG160 | PTH08M | | | | | ■ | | 8 | 16.6 | 4.2 | 16 |
| WF 597 | ZPFG160 | PCA08M | ■ | | | | | | 8 | 16.6 | 4.2 | 16 |
| WF 598 | ZPFG160 | PCA12M | | ■ | | | | | 8 | 16.6 | 4.2 | 16 |
| WF 649 | ZPFG200 | PTH08M | | | | | ■ | | 10 | 20.3 | 5.2 | 20 |
| WF 599 | ZPFG200 | PCA08M | ■ | | | | | | 10 | 20.3 | 5.2 | 20 |
| WF 600 | ZPFG200 | PCA12M | | ■ | | | | | 10 | 20.3 | 5.2 | 20 |
| WF 650 | ZPFG250 | PTH08M | | | | | ■ | | 12.5 | 24.1 | 6.2 | 25 |
| WF 601 | ZPFG250 | PCA08M | ■ | | | | | | 12.5 | 24.1 | 6.2 | 25 |
| WF 602 | ZPFG250 | PCA12M | | ■ | | | | | 12.5 | 24.1 | 6.2 | 25 |
| WF 651 | ZPFG320 | PTH08M | | | | | ■ | | 16 | 30 | 7.2 | 32 |
| WF 603 | ZPFG320 | PCA08M | ■ | | | | | | 16 | 30 | 7.2 | 32 |
| WF 604 | ZPFG320 | PCA12M | | ■ | | | | | 16 | 30 | 7.2 | 32 |

■ = Stock | Germany

| ISO | | | | | | | | | | | | | | |
|--------|-----|-----|-----|-----|--------|-----|-----|-----|-----|--------|-----|--------|-----|-----|
| P01 | P10 | P20 | P30 | P40 | M01 | M10 | M20 | M30 | M40 | K01 | K10 | K20 | K30 | K40 |
| PTH08M | | | | | PCA12M | | | | | PTH08M | | | | |
| PCA08M | | | | | PCA12M | | | | | PCA08M | | | | |
| PCA12M | | | | | PCA12M | | | | | PCA12M | | | | |
| N01 | N10 | N20 | N30 | N40 | S01 | S10 | S20 | S30 | S40 | H01 | H10 | H20 | H30 | H40 |
| | | | | | | | | | | | | PTH08M | | |
| | | | | | | | | | | | | PCA08M | | |
| | | | | | | | | | | | | PCA12M | | |

Indexable
Milling
+Modular Series

No. 322

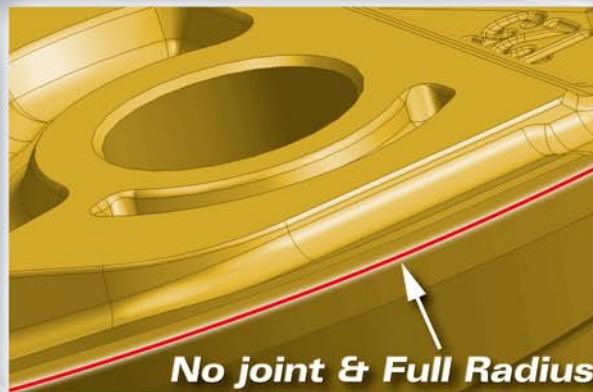
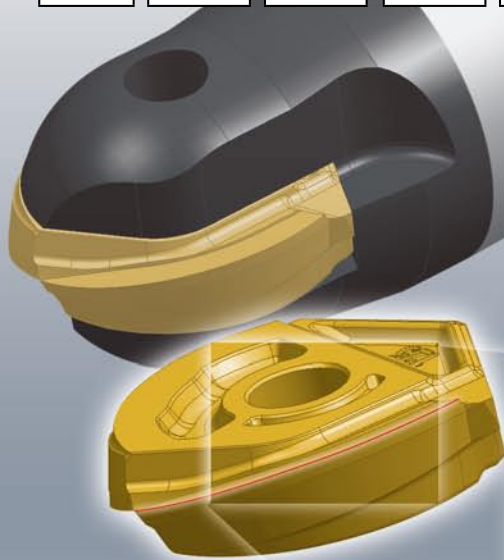
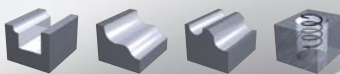
ZDFG High Speed Precision

Advanced Nano-Composite Coating **ATH+ACS**

Tool Life +

ZDFG | W Type Inserts for ABPF

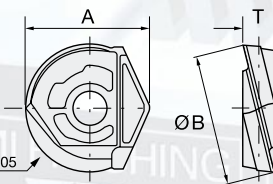
| | | | | |
|--------------|---|---|------------|---------------------|
| V max |  |  | HRC | No. of Teeth |
| High Speed | Semi Finishing | Finishing | 65 | 2 |



Vertical Wall Machining

Hardened Steel:
Strong edge for
long tool life

Mild Steel, Cast Iron:
Sharp edge for
best surface quality



| ID Code | Item Code | Grade | ATH-Coated ATH80D | ACS-Coated ACS05E | R | A | ØB | T |
|---------|-------------------|--------|----------------------|----------------------|------|------|----|-----|
| WF164 | ZDFG160-WH | ATH80D | ■ | | 8 | 16.6 | 16 | 4.2 |
| WF168 | ZDFG160-WF | ACS05E | | ■ | | | | |
| WF165 | ZDFG200-WH | ATH80D | ■ | | 10 | 20.3 | 20 | 5.2 |
| WF169 | ZDFG200-WF | ACS05E | | ■ | | | | |
| WF166 | ZDFG250-WH | ATH80D | ■ | | 12.5 | 24.1 | 25 | 6.2 |
| WF170 | ZDFG250-WF | ACS05E | | ■ | | | | |
| WF167 | ZDFG320-WH | ATH80D | ■ | | 16 | 30.2 | 32 | 7.2 |
| WF171 | ZDFG320-WF | ACS05E | | ■ | | | | |