

| Drill dia. | Shank dia. | Overall length | Drill length |
|------------|------------|----------------|----------------|
| Dc | Ds | L | ℓ ₁ |

JIS

①

Spiral Fluted Taps
(for blind hole)

②

Spiral Fluted Taps
(for through hole)

③

Spiral Pointed Taps
(for through hole)

④

Hand Taps

⑤

Cemented
Carbide Taps

⑥

Roll Taps

⑦

Special Thread Taps
Simple Inspection Tools

⑧

Pipe Taps

⑨

Thread Mills
Premium Thread Mills

⑩

Dies

⑪

Center Drills
Centering Tools

⑫

Precision Machinery/
Medical Surgical Instruments

AUPEQ

Coated Single End Point Drill PE-90°



AUPES

Coated Single End Point Drill PE-60°



Specification Cutting Speed depending on Materials

| HSS | Low carbon steels 低炭素鋼 | Medium carbon steels 中炭素鋼 | High carbon steels 高炭素鋼 | Alloy steels 合金鋼 |
|---------|-------------------------------|------------------------------|----------------------------|------------------------------------|
| | 38~48 (m/min) | 33~43 (m/min) | 28~38 (m/min) | 26~33 (m/min) |
| Coating | Thermal refined steels 調質鋼 | Stainless steels ステンレス鋼 | Cast irons 鋳鉄 | Aluminum alloy castings アルミ合金鋳物 |
| | 13~17 (m/min) 25~35HRC | 13~20 (m/min) | 40~50 (m/min) | 84~120 (m/min) |

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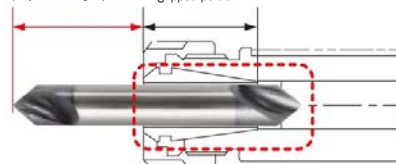
Product Features

- An excellent surface finish can be obtained while maintaining cutting edge sharpness from the high helix flute design.
- Accuracy improvements are also achieved from the single end design.
- A design for higher rigidity enables high speed cutting.
- The problem of cutting edge breakage when the center hole drill is in use has been solved by using the point drill.
- Simultaneous combining the center positioning and chamfering is possible. It can also be used as a multi function tool like groove processing.
- Higher precision machining can be achieved with the two stage point shape design.
- With a single end center point drill, the degree of chip space widens, so the chips are discharged smoothly.

Differences in projection length and degrees of freedom between single end and double end point drills

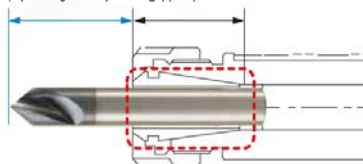
Double-ended type

Smaller flexibility in the projected length portion The minimum gripped portion



Single-ended type

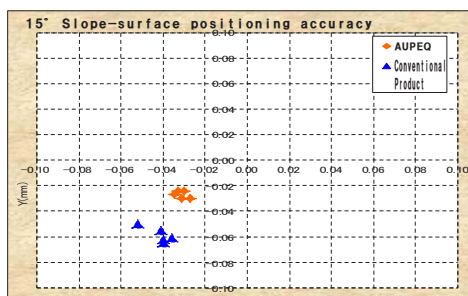
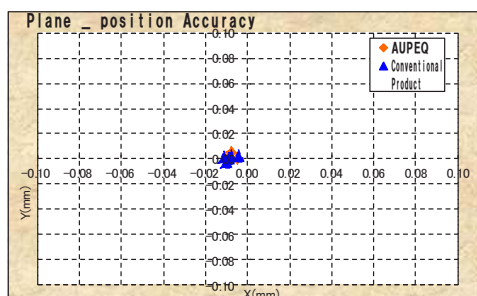
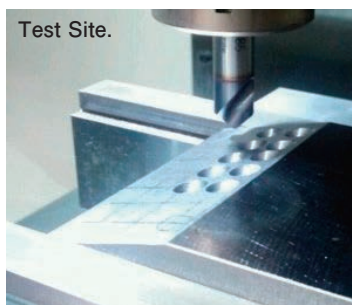
The extended shank gives more projected length flexibility. The minimum gripped portion



Cutting data

| Tool Type | Coated Single End Point Drill AUPEQ | Coated Double End Point Drill Comparison Product |
|--------------------|-------------------------------------|--|
| Size | 12×3.5×90° | |
| Workpiece Material | SCM440(alloy steel) | |
| Surface Condition | flat 15° incline surface | |
| Cutting Speed | 10m/min | |
| Feed Per Rev. | 0.05mm/rev | |
| Processing Length | φ8 flat surface | |
| Cutting Fluid | Water soluble cutting fluid (x20) | |
| Machinery Type | Vertical machining center | |

Test Site.



AUPEQ / AUPES improves positioning accuracy dramatically.
High precision positioning is possible as shown in the above figure.

Think threads with
YAMAWA

| Drill dia. | Shank dia. | Overall length | Drill length |
|------------|------------|----------------|--------------|
| Dc | Ds | L | ℓ_1 |

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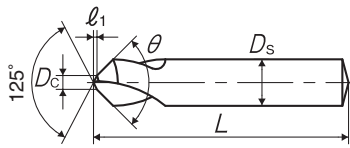
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JIS

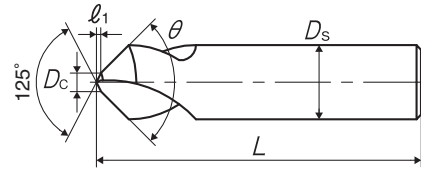
⑪-40

AUPEQ Coated Single End Point Drill PE-90°

TYPE: 1



TYPE: 2

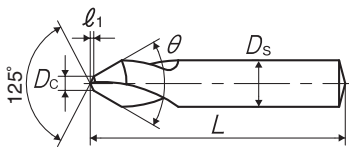


Segment : 56

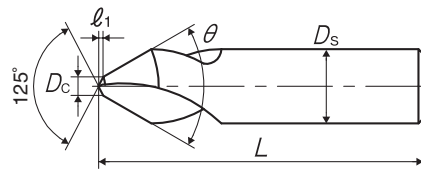
| Size Ds × Dc × θ | Code | Dc (mm) | Ds (mm) | L (mm) | ℓ ₁ (mm) | TYPE | MSRP |
|---------------------|--------------|------------|------------|-----------|------------------------|------|----------|
| 3×0.5×90° | PZ93.00ZNETZ | 0.5 | 3 | 35 | 0.13 | 1 | ¥ 3,220 |
| 4×1×90° | PZ94.00ZNETZ | 1 | 4 | 35 | 0.26 | 1 | ¥ 2,910 |
| 6×2×90° | PZ96.00ZNETZ | 2 | 6 | 45 | 0.52 | 1 | ¥ 3,240 |
| 8×2.5×90° | PZ98.00ZNETZ | 2.5 | 8 | 50 | 0.65 | 1 | ¥ 3,980 |
| 10×3×90° | PZ910.0ZNETZ | 3 | 10 | 55 | 0.78 | 1 | ¥ 5,150 |
| 12×3.5×90° | PZ912.0ZNETZ | 3.5 | 12 | 65 | 0.91 | 1 | ¥ 6,610 |
| 16×4×90° | PZ916.0ZNETZ | 4 | 16 | 70 | 1.04 | 2 | ¥ 9,870 |
| 20×5×90° | PZ920.0ZNETZ | 5 | 20 | 80 | 1.30 | 2 | ¥ 15,100 |

AUPES Coated Single End Point Drill PE-60°

TYPE: 1



TYPE: 2



Segment : 56

| Size Ds × Dc × θ | Code | Dc (mm) | Ds (mm) | L (mm) | ℓ ₁ (mm) | TYPE | MSRP |
|---------------------|--------------|------------|------------|-----------|------------------------|------|----------|
| 3×0.5×60° | PZ63.00ZNETZ | 0.5 | 3 | 35 | 0.13 | 1 | ¥ 3,220 |
| 4×1×60° | PZ64.00ZNETZ | 1 | 4 | 35 | 0.26 | 1 | ¥ 2,910 |
| 6×2×60° | PZ66.00ZNETZ | 2 | 6 | 45 | 0.52 | 1 | ¥ 3,240 |
| 8×2.5×60° | PZ68.00ZNETZ | 2.5 | 8 | 50 | 0.65 | 1 | ¥ 3,980 |
| 10×3×60° | PZ610.0ZNETZ | 3 | 10 | 55 | 0.78 | 1 | ¥ 5,150 |
| 12×3.5×60° | PZ612.0ZNETZ | 3.5 | 12 | 65 | 0.91 | 1 | ¥ 6,610 |
| 16×4×60° | PZ616.0ZNETZ | 4 | 16 | 70 | 1.04 | 2 | ¥ 9,870 |
| 20×5×60° | PZ620.0ZNETZ | 5 | 20 | 80 | 1.30 | 2 | ¥ 15,100 |