

CENTERING TOOLS

Single-ended coated centering tools for high accuracy multi-processing

▪ Single-Ended coated centering tools ▪

AUCES

AUPEQ

MHCDS

AUCDS

AUPES



AUCES

High helix angle - A type 60°
Single-ended coated center drills, h7 shank



- Sharp edge for good surface finish



AUCDS

Low helix angle - A type 60°
Single-ended coated center drills, h7 shank

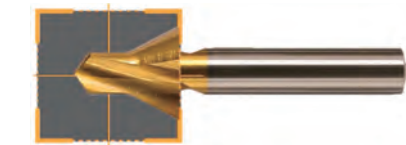


- Strong edge for stable and long life



Product features

- Single-Ended Drills developed to offer higher accuracy in center hole drilling.
- Single-Ended Coated Center Drills provide excellent quality and stable processing of center holes.
- Compared to the Double-Ended Drills, Single-Ended Drills can be easily installed and result in stable drilling.



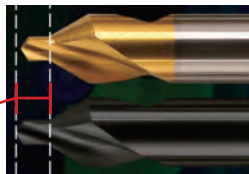
The Single-Ended Drills cutting edge and shank accuracy have been considerably improved compared to Double-Ended Drills.



The shank marking position has been moved to the rear of the drill to ensure the collet or holder does not grip on the uneven surface of the markings.

For higher speed and higher feed

Old type with longer drill length

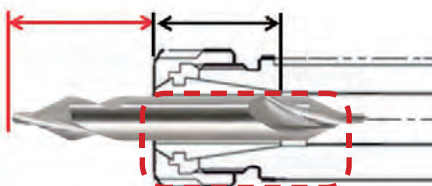


Higher speed and higher feed drilling is now possible thanks to the shorter drill length.

Double-ended type

Smaller flexibility in the overhang portion

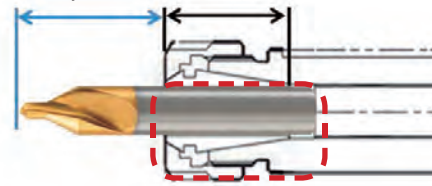
Minimum clamping length



Single-ended type

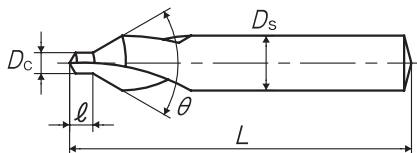
The extended shank gives more overhang flexibility

Minimum clamping length

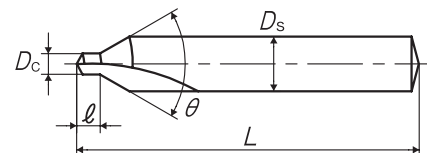


Dimensions and sizes

AUCES



AUCDS



Size Dc x Ø x Ds	Dc	Ds	L	ℓ	Code
1 x 60° x 4	1	4	35	1.1	YH61.00ZNEVD
1.5 x 60° x 5	1.5	5	40	1.6	YH61.50ZNEVE
2 x 60° x 6	2	6	45	2.1	YH62.00ZNEVF
2.5 x 60° x 8	2.5	8	50	2.7	YH62.50ZNEVI
3 x 60° x 8	3	8	50	3.2	YH63.00ZNEVI
4 x 60° x 10	4	10	55	4.3	YH64.00ZNEVJ
5 x 60° x 12	5	12	65	5.3	YH65.00ZNEVM
6 x 60° x 16	6	16	70	6.4	YH66.00ZNEVP

Size Dc x Ø x Ds	Dc	Ds	L	ℓ	Code
1 x 60° x 4	1	4	35	1.1	YL61.00ZNEVD
1.5 x 60° x 5	1.5	5	40	1.6	YL61.50ZNEVE
2 x 60° x 6	2	6	45	2.1	YL62.00ZNEVF
2.5 x 60° x 8	2.5	8	50	2.7	YL62.50ZNEVI
3 x 60° x 8	3	8	50	3.2	YL63.00ZNEVI
4 x 60° x 10	4	10	55	4.3	YL64.00ZNEVJ
5 x 60° x 12	5	12	65	5.3	YL65.00ZNEVM
6 x 60° x 16	6	16	70	6.4	YL66.00ZNEVP

Parameters

AUCES





Work-materials	Feed (mm/rev)	Vc (m/min)
Soft steel	0.05 - 0.10	10 - 40
Carbon steel	0.05 - 0.20	20 - 40
Alloy steel	0.05 - 0.10	20 - 40
Stainless steel	0.05	10 - 20
Aluminium	0.10 - 0.20	20 - 60
Ductile cast iron	0.05 - 0.20	10 - 40

AUCDS

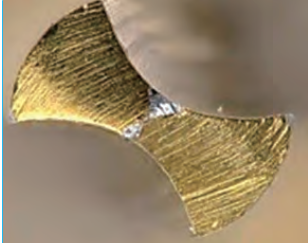
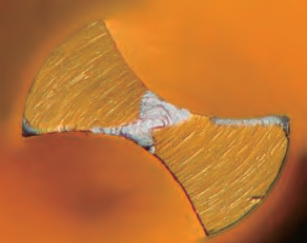
Work-materials	Feed (mm/rev)	Vc (m/min)
Carbon steel	0.05 - 0.20	20 - 40
Alloy steel	0.05 - 0.15	20 - 40
Hardened steel	0.05 - 0.20	30 - 40
Ductile cast iron	0.05 - 0.20	10 - 40

Process data

PRODUCT	AUCES, single-ended Coated Center Drills	Market alternative, double-ended Coated Center Drills
Size	Ø3x60°x8	
Workpiece material	Ck50 (96-98HRB)	
Drilling speed	30m/min	10m/min
Feed	0.12mm/rev	0.05mm/rev
Drilling length	6mm	6.5mm
Drilling fluid	Water soluble FX30 chlorine free (emulsionx20)	
Machine	Machining center vertical type	

Conditions	AUCES	Market alternative
Ck50 Cutting Speed: 10m/min Feed:0.5mm/rev		
Ck50 Cutting Speed: 30m/min Feed:0.12mm/rev		

Size	Ø1x60°x4
Workpiece material	Ck50
Drilling Length	30m/min
Feed	0.04mm/rev
Drilling fluid	Water soluble oil (emulsionx20)
Machine	Machining center vertical type

AUCES	Market alternative
	

AUPEQ

Single-ended coated point drills PEQ-90°



AUPES

Single-ended coated point drills PES-60°



Product features

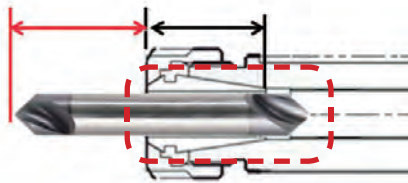
- Excellent surface finish thanks to the sharp cutting edge and the high accuracy of Single-Ended Drill design.
- High speed drilling can now be achieved thanks to high rigidity.
- Reduced drill breakage problem.
- Simultaneous hole positioning and chamfering, straight edge chamfering and multi-purpose processes such as slotting and channeling can now be achieved with one tool.
- 125° wide centering angle allows high accuracy and stable process.
- Smooth chip ejection is performed thanks to longer overhang portion.

Difference in clamping and overhang portion

Double-ended type

Smaller flexibility in the overhang portion

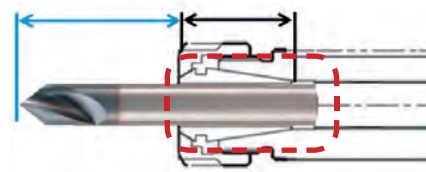
Minimum clamping portion



Single-ended type

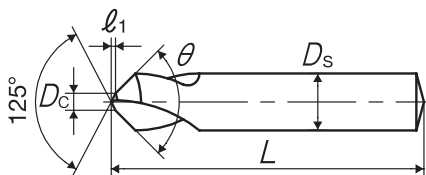
The extended shank gives more overhang flexibility

Minimum clamping portion

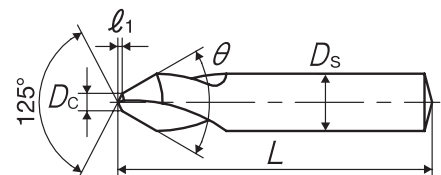


Dimensions and sizes

AUPEQ (90°)



AUPES (60°)



Size DsxDc x Ø	Ds	Dc	L	ℓ	Code
3 x 0.5 x 90°	3	0.5	35	0.13	PZ93.00ZNETZ
4 x 1 x 90°	4	1	35	0.26	PZ94.00ZNETZ
6 x 2 x 90°	6	2	45	0.52	PZ96.00ZNETZ
8 x 2.5 x 90°	8	2.5	50	0.65	PZ98.00ZNETZ
10 x 3 x 90°	10	3	55	0.78	PZ910.0ZNETZ
12 x 3.5 x 90°	12	3.5	65	0.91	PZ912.0ZNETZ
16 x 4 x 90°	16	4	70	1.04	PZ916.0ZNETZ
20 x 5 x 90°	20	5	80	1.30	PZ920.0ZNETZ

Size Ds x Dc x Ø	Ds	Dc	L	ℓ	Code
3 x 0.5 x 60°	3	0.5	35	0.13	PZ63.00ZNETZ
4 x 1 x 60°	4	1	35	0.26	PZ64.00ZNETZ
6 x 2 x 60°	6	2	45	0.52	PZ66.00ZNETZ
8 x 2.5 x 60°	8	2.5	50	0.65	PZ68.00ZNETZ
10 x 3 x 60°	10	3	55	0.78	PZ610.0ZNETZ
12 x 3.5 x 60°	12	3.5	65	0.91	PZ612.0ZNETZ
16 x 4 x 60°	16	4	70	1.04	PZ616.0ZNETZ
20 x 5 x 60°	20	5	80	1.30	PZ620.0ZNETZ

Parameters

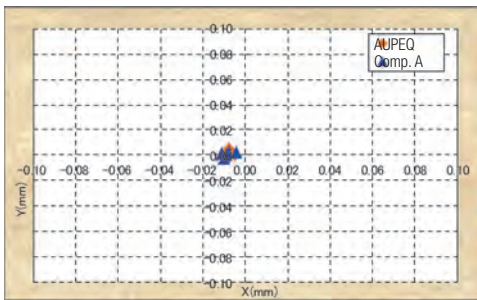
AUPEQ, AUPES HSS+TiCN

Workpiece Material	Soft Steels 1.0044 - St.44-2		Carbon steels 1.1206 - Ck50		Alloy steels 1.7225 - 42CrMo4		Thermal refined steels		Stainless steels 1.4301 - X5CrNi18-9 - AISI304		Aluminium alloy castings G-AISI8Cu3 - A380	
Vc (m/min)	38-48		28-38		26-33		13-17		13-20		84-120	
Diameter (mm)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)	RPM (min-1)	Feed (mm/rev)
3	4550	0.04-0.08	3500	0.04-0.08	3150	0.04-0.08	1800	0.03-0.06	1750	0.04-0.08	10800	0.10-0.22
4	3400	0.05-0.10	2650	0.05-0.10	2350	0.05-0.10	1200	0.04-0.08	1300	0.05-0.10	8100	0.12-0.26
6	2300	0.06-0.12	1750	0.06-0.12	1550	0.06-0.12	800	0.05-0.10	900	0.06-0.12	5400	0.15-0.30
8	1700	0.08-0.15	1300	0.08-0.15	1150	0.08-0.15	600	0.06-0.12	650	0.08-0.15	4050	0.18-0.35
10	1350	0.10-0.18	1050	0.10-0.18	950	0.10-0.18	500	0.08-0.15	500	0.10-0.18	3250	0.21-0.40
12	1150	0.12-0.22	900	0.12-0.22	800	0.12-0.22	400	0.10-0.18	450	0.12-0.22	2700	0.25-0.45
16	850	0.16-0.26	650	0.16-0.26	600	0.16-0.26	300	0.12-0.22	350	0.16-0.26	2050	0.32-0.50
20	700	0.20-0.35	500	0.20-0.35	450	0.20-0.35	250	0.16-0.26	250	0.20-0.35	1800	0.40-0.60

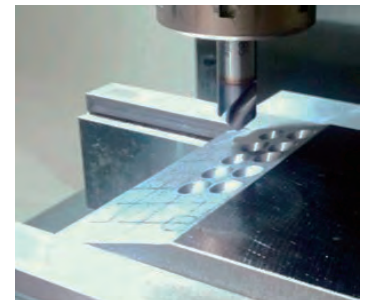
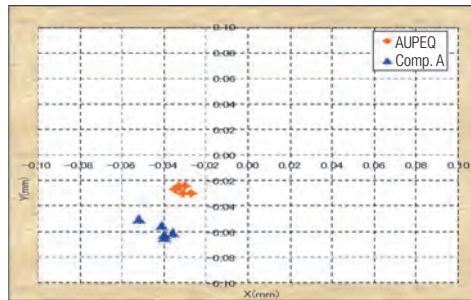
Process data

Size	Ø12x90°	Feed	0.15mm/rev
Product	AUPEQ, competitor's item	Chamfered hole dia	Ø8 (on the flat surface)
Workpiece material	42CrMo4 (alloy steel)	Drilling Fluid	Water soluble (emulsion x 20)
Part for process	Flat surface, 15° slant surface	Machine	Machining center vertical type
Drilling speed	25m/min		

Positioning accuracy on flat surface



Positioning accuracy on 15° slant surface



Applications

- Hole centering or chamfering



- Corner chamfering



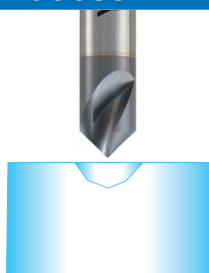
- Channel processing



Production Process

Point drilling

Hole centering and chamfering performed at the same time



Drilling



Tapping



MHCDS

Center drills for high speed in carbon steels of medium hardness

HSS-Co

COATING

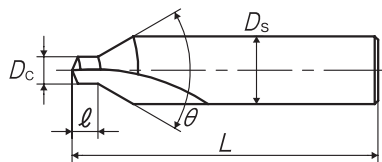


Product features

- High positioning accuracy thanks to h7 shank tolerance and compact design
- The cutting edge length (ℓ) is made as short as possible to increase toughness, rigidity and accuracy.
- To increase centrality, the drill point has “3 rakes” and “X thinning design”, which enables high speed cutting and feeding.
- Increased centrality leads to great improvement of surface finish and circularity of center-drilled hole.

Dimensions and sizes

Parameters



- Material: Carbon steel (Ck50)
Alloy steel (42CrMo4)

Size Dc x Ø x Ds	Ds	Dc	L	ℓ	Code
1 x 60° x 4	4	1	30	1.0	VMHCD1.0S
1.5 x 60° x 5	5	1.5	30	1.5	VMHCD1.5S
2 x 60° x 6	6	2	30	1.9	VMHCD2.0S
2.5 x 60° x 8	8	2.5	40	2.4	VMHCD2.5S
3 x 60° x 8	8	3	40	2.8	VMHCD3.0S
4 x 60° x 10	10	4	45	3.8	VMHCD4.0S
5 x 60° x 12	12	5	55	4.6	VMHCD5.0S
6 x 60° x 16	16	6	65	5.5	VMHCD6.0S

Size Dc x Ø x Ds	Feed f (mm/rev)	Vc (m/min)
1 x 60° x 4	0.1	30 - 45
1.5 x 60° x 5		
2 x 60° x 6	0.15	
2.5 x 60° x 8		
3 x 60° x 8	0.2	
4 x 60° x 10		
5 x 60° x 12		
6 x 60° x 16		

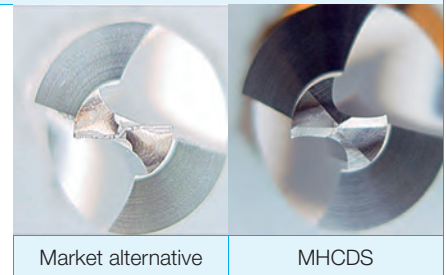
Cutting data

Great extension of tool life with MHCDS

The pictures on the right show the different damage of MHCDS and a market alternative cutting edges after 480 holes machined at the same cutting condition. As shown, the MHCDS has smaller wear and edge damage allowing the MHCDS to run much further than a standard center drill.

Cutting Condition

Size: 3x60°x8
Material: Ck55
Machine: NC lathe
Cutting speed: 30m/min
Feed: 0.15mm/rev
Coolant: water soluble

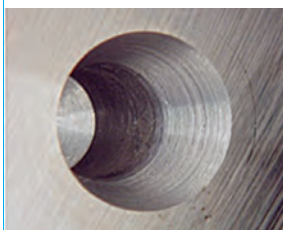


Market alternative

MHCDS

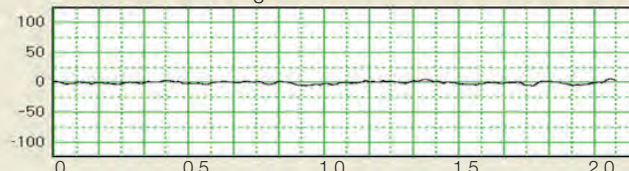
Great improvement in surface roughness and circularity with MHCDS

Enlarged picture

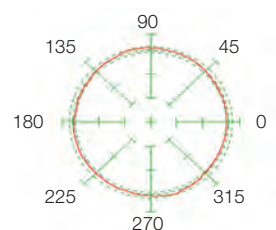


Under the cutting condition stated above, the surface finish of center-drilled hole has been greatly improved. Circularity of center drilled hole as well as run-out tolerance of turning axis has been improved.

µm Surface roughness of center drilled 60° face



Circularity of center drilled 60° face



Associated Product

SHANK EXTENSION

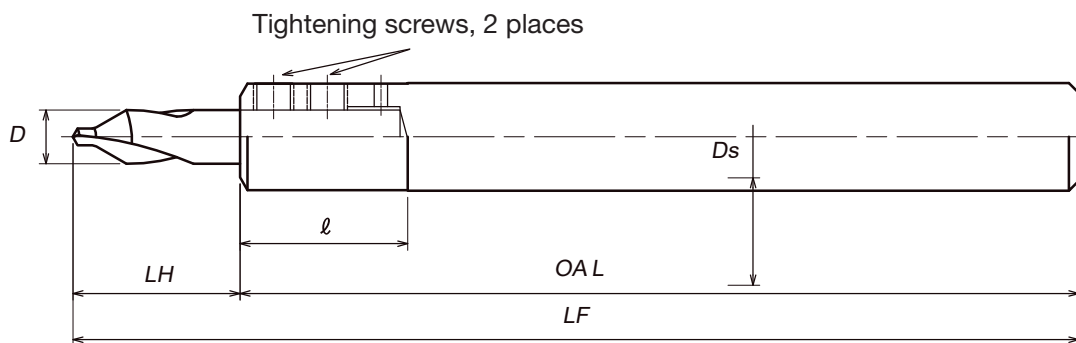


Product features

- Shank Extensions designed for the Single-Ended Coated Center Drill AUCES, AUCDS, AUPES and AUPEQ now make long shank processing achievable.
- Shank diameters of Ds:16, Ds:20 available for the general tooling.

Dimensions and sizes

- Total Overall Length LF:150mm for the Single-Ended Coated Center Drill AUCES, AUCDS, AUPES and AUPEQ.



Size DxDs \times LF	D	Ds	OAL	LF	LH	ℓ	Code
SHANK EXTENSION D06 DS16 LF-150	6	16	128	150	22	23	YH61.00ZNEVD
SHANK EXTENSION D08 DS16 LF-150	8	16	125	150	25	25	YH61.50ZNEVE
SHANK EXTENSION D10 DS20 LF-150	10	20	123	150	27	28	YH62.00ZNEVF

WARNING

- Tools may shatter. Wear cover or eye glass to avoid injury during tapping.
- Tools may be shatter. Use tools under the proper tapping condition.
- Never wear gloves during turning operations as the gloves may get caught with the tools.
- Wear safety shoes to avoid injuring yourself by the falling tools.
- On attaching tools to the machine, fasten firmly to avoid chattering and run-out.
- Fasten the workpieces firmly so that they never move during operation. Never use worn tools or damaged tools with chipping.
- Take a special care to fire trouble. High temperature during machining may cause fire.



JQA-QMA14664 JQA-EM3465

