Locating Pins - High Hardness Stainless Steel, Straight

Press Fit / Tapped

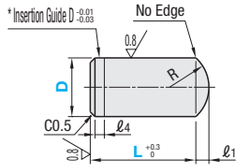
For products uncovered by e-Catalog Standard, see P.131.

Features: Straight Type with the dia. configurable in 0.01mm increments has been newly offered with affordable prices. For orders of up to 1,000 pcs., the 7th Day Shipping is available. (For details, see P.1617.)

Material	Hardness	Tip Shape	Type: Press Fit	Type: Tapped
High Hardness Stainless Steel	35HRC~	R	APSFR	APSTFR
		Tapered	APST	APSTT
		Taper R	APSTR	APSTTR

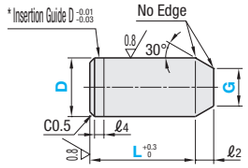
Press Fit

• Tip Shape: R



$\ell_1 = R\sqrt{R^2 - \frac{D^2}{4}}$

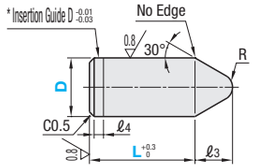
• Tip Shape: Tapered



$\ell_2 = \frac{D-G}{2\tan 30°}$ Reference: $2\tan 30° \approx 1.15$

When G=D, add about C0.2 chamfering.

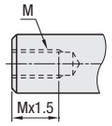
• Tip Shape: Taper R



$\ell_3 = \frac{D}{2} \div \tan 30° + R - (R \div \sin 30°)$

Reference: $\tan 30° \approx 0.577$, $\sin 30° = 0.5$

Tapped



For Tapped Type, unless described otherwise on the drawing, the spec. design is the same as for Press Fit Type.
* For D Tolerance g6, h7, no Insertion Guide is provided. (ℓ_4)

Tolerance Selection

D	m6	p6	g6	h7
3.01 ~ 6.00	+0.012 +0.004	+0.020 +0.012	-0.004 -0.012	0 -0.012
6.01 ~ 10.00	+0.015 +0.006	+0.024 +0.015	-0.005 -0.014	0 -0.015
10.01 ~ 10.30	+0.018 +0.007	+0.029 +0.018	-0.006 -0.017	0 -0.018

Press Fit

Part Number: Type	D Tol.	D 0.01mm Increment	L 0.1mm Increment	R 1mm Increment R, Taper R	G 1mm Increment Tapered	ℓ4	Unit Price
APSFR (R) APST (Tapered) APSTR (Taper R)	M (m6) P (p6) G (g6) H (h7)	3.01~5.00	3.0~60.0	R R≥D/2 Taper R R≤D/2	Tapered G≤D	1	
		5.01~7.99					
		8.00~10.30					

2D≤L≤10D

Ordering Example

Part Number: Type	D Tol.	D	L	R	G
APSFR	M	D6.25	L14.0	R6	
APSTT	P	D3.30	L25.0		G3

Tapped

Part Number: Type	D Tol.	D 0.01mm Increment	L 0.1mm Increment	R 1mm Increment R, Taper R	G 1mm Increment Tapered	M (Coarse)	* Tightening Torque N·cm	Unit Price
APSTFR (R) APSTT (Tapered) APSTTR (Taper R)	M (m6) P (p6) G (g6) H (h7)	6.01~7.99	10.0~60.0	R R≥D/2 Taper R R≤D/2	Tapered Tapered G≤D	M3	147	
		8.00~10.30	15.0~60.0			M4	333	

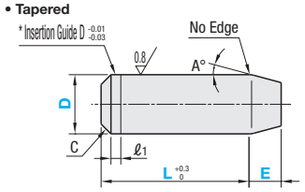
* Tightening torque (reference) is of Tightening Torque Strength Class (10.9) indicated on Technical Data P.2365. Not applicable when using locking materials or lock washers.

Material	Hardness	Tip Shape	Type: Press Fit	Type: Tapped
High Hardness Stainless Steel	35HRC~	Tapered	ALPSTA	ALPSTTA
		Sphere	ALPSQA	ALPSQTA

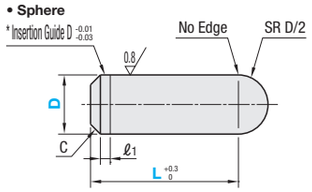
D-2EtanA≥0.73 (Tip Diameter Ø0.73 or more)
Ref.: $\tan 15° \approx 0.267$ $\tan 30° \approx 0.577$
$\tan 45° \approx 1$ $\tan 60° \approx 1.732$

Press Fit

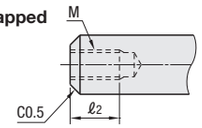
• Tapered



• Sphere



Tapped



For Tapped Type, unless described otherwise on the drawing, the spec. design is the same as for Press Fit Type.
* For D Tolerance g6, h7, no Insertion Guide is provided. (ℓ_1)

Tolerance Selection

D	m6	p6	g6	h7
3	+0.008 +0.002	+0.012 +0.006	-0.002 -0.008	0 -0.010
4~6	+0.012 +0.004	+0.02 +0.012	-0.004 -0.012	0 -0.012
8·10	+0.015 +0.006	+0.024 +0.015	-0.005 -0.014	0 -0.015

Press Fit

Part Number: Type	D Tol.	D	L 0.1mm Increment	Tapered only: E 0.1mm Increment	A Selection	C	ℓ1	Unit Price Tapered	Unit Price Sphere
ALPSTA (Tapered) ALPSQA (Sphere)	M (m6) P (p6) G (g6) H (h7)	3	3.0~40.0	0.5~10.0	15 30 45 60	0.5	1		
		4							
		5				1			
		6							
		8							
		10							

Tapped

Part Number: Type	D Tol.	D	L 0.1mm Increment	Tapered only: E 0.1mm Increment	A Selection	M (Coarse)	* Recommended Tightening Torque N·cm	ℓ2	Unit Price Tapered	Unit Price Sphere
ALPSTTA (Tapered) ALPSQTA (Sphere)	M (m6) P (p6) G (g6) H (h7)	6	10.0~40.0	0.5~10.0	15 30 45 60	M3	147	5		
		8	15.0~40.0			M4	333	6		
		10				M5	676	8		

* Tightening torque (reference) is of Tightening Torque Strength Class (10.9) indicated on Technical Data P.2365. Not applicable when using locking materials or lock washers.

Ordering Example

Part Number: Type	D Tol.	D	L	E	A
ALPSTA	M	6	L14.0	E2.5	A30

Locating Pins - High Hardness Stainless Steel, Shouldered

Tapered Press Fit / Tapped / Threaded

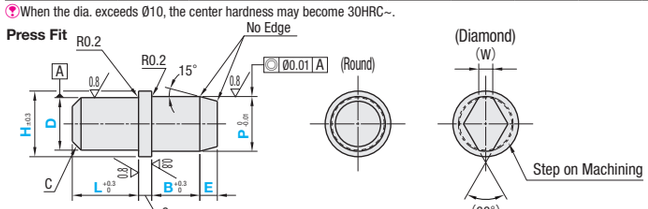
For products uncovered by e-Catalog Standard, see P.131.

Features: New Shouldered, Tapered Type has been added to the High Hardness Stainless Steel Locating Pin product line-up. For orders of up to 500 pcs., 5th Day Shipping is available. (For details, see P.1617.)

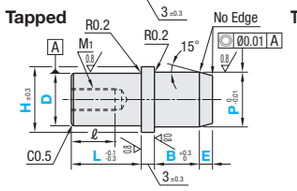
Material	Hardness	Pin Shape	Press Fit: m6	Press Fit: p6	Press Fit: g6	Press Fit: h7	Tapped: g6	Tapped: h7	Threaded: g6	Threaded: h7
High Hardness Stainless Steel	35HRC~	Round	APJA	APJPA	APJGA	APJHA	APUA	APUHA	APNA	APNHA
		Diamond	APJD	APJPD	APJGD	APJHD	APUD	APUHD	APND	APNHD

When the dia. exceeds Ø10, the center hardness may become 30HRC~.

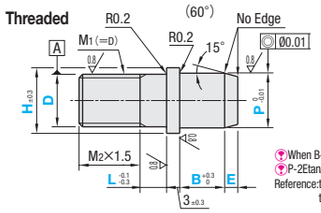
Press Fit



Tapped



Threaded



A machining step remains on the shoulder top for Diamond Shape.

When B+E>20mm, the P dim. tolerance is 0-0.02.
P-2EtanA≥0.73 (Tip dia. Ø0.73 or more)
Reference: $\tan 15° \approx 0.267$ $\tan 30° \approx 0.577$
$\tan 45° = 1$ $\tan 60° \approx 1.732$

Tolerance

D or P	m6	p6	g6	h7
2.00 ~ 3.00	+0.008 +0.002	+0.012 +0.006	-0.002 -0.008	0 -0.010
3.01 ~ 6.00	+0.012 +0.004	+0.020 +0.012	-0.004 -0.012	0 -0.012
6.01 ~ 10.00	+0.015 +0.006	+0.024 +0.015	-0.005 -0.014	0 -0.015
10.01 ~ 17.30	+0.018 +0.007	+0.029 +0.018	-0.006 -0.017	0 -0.018

Press Fit

Part Number: Type	D	P 0.01mm Increment	L 1mm Increment	B 0.1mm Increment	E Not Configurable	E 0.1mm Increment	C	H	(W)	Unit Price Round Shape	Unit Price Diamond Shape
<Round> APJA (m6) APJPA (p6) APJGA (g6) APJHA (h7) <Diamond> APJD (m6) APJPD (p6) APJGD (g6) APJHD (h7)	3	2.00~4.00	3(4)~16	1.0(2.0)~15.0	2	0.5~10.0	0.5	6	1		
	4			1.0~30.0 (2.0)~(20.0)					1.2		
	5	3.00~6.00			3		1	8	1.5		
	6								1.8		
	8	5.00~9.00	4(5)~16		4		1.5	11	2.2		
	10	6.00~11.00	5~25				2	13	3		
	12	7.00~13.00						15	3.2		

L, B dimensions in ( ) are applicable to Diamond Shape.

Tapped

Part Number: Type	D	P 0.01mm Increment	L 1mm Increment	B 0.1mm Increment	E Not Configurable	E 0.1mm Increment	M1 (Coarse)	* Recommended Tightening Torque N·cm	H	ℓ	(W)	Unit Price Round Shape	Unit Price Diamond Shape
<Round> APUA (g6) APUHA (h7) <Diamond> APUD (g6) APUHD (h7)	6	3.00~6.00	6(9)~16	2.0~30.0(20.0)	2	0.5~10.0	M3	147	8	5	1.8		
	8	5.00~9.00	8(12)~16		3		M4	333	11	6	2.2		
	10	6.00~11.00	10(12)~20				M5	676	13	8	3		
	12	7.00~13.00	12~25						15		3.2		

Note the strength of under-head part. P.1618 L, B dimensions in ( ) are applicable to Diamond Shape. Please confirm pilot hole depth on P.1618. Holes may go through.
* Tightening torque (reference) is of Tightening Torque Strength Class (10.9) indicated on Technical Data P.2365. Not applicable when using locking materials or lock washers.

Threaded

Part Number: Type	D	P 0.01mm Increment	L 1mm Increment	B 0.1mm Increment	E Not Configurable	E 0.1mm Increment	M2 (Coarse)	* Tightening Torque N·cm	H	(W)	Unit Price Round Shape	Unit Price Diamond Shape
<Round> APNA (g6) APNHA (h7) <Diamond> APND (g6) APNHD (h7)	3	2.00~4.00	3~10	1.0(2.0)~15.0	1	0.5~10.0	M3	147	6	1.0		
	4			1.0 ~ 30.0 (2.0) ~ (20.0)			M4	333		1.2		
	5	3.00~6.00			2		M5	676	8	1.5		
	6						M6	1156		1.8		
	8	5.00~9.00			3		M8	2803	11	2.2		
	10	6.00~11.00	4~20				M10	5557	13	3.0		
	12	7.00~13.00					M12	9702	15	3.2		

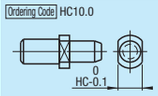
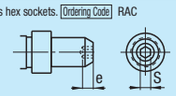
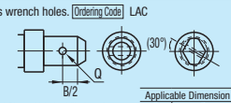
B dimension in ( ) is applicable to Diamond Shape.
* Tightening torque (reference) is of Tightening Torque Strength Class (10.9) indicated on Technical Data P.2365. Not applicable when using locking materials or lock washers.

Ordering Example

Part Number: Type	D	P	L	B	E
E dim. (Not Configurable) APUA	6	P4.01	L8	B5.0	
E dim. (Configurable) APUA	6	P4.01	L8	B5.0	E5.0

Alterations

Part Number	P	L	B	E	(HC, RAC, LAC, TBA)
APNA6	P4.88	L8	B3.5		HC7.0 - TBA2.0

Alterations	Wrench Flats Alteration	Hex Socket Machining	Wrench Hole	Shoulder Thickness
Code	HC	RAC	LAC	TBA
Spec.	Ordering Code HC10.0  HC = 0.5mm Increment HC>D HC>P	Machines hex sockets. Ordering Code RAC  S+3 ≤ P -2 x E x tan15°(=0.27) Values in ( ) are applicable to Tapped Type. Combination with LAC is not available. (D: Applicable Dimension B; Hex Hole Dimensions S, e: 8 7.0(12.0)~ 4 2.5; 10 8.0(13.0)~ 5 3; 12 9.0(13.0)~ 6 4)	Machines wrench holes. Ordering Code LAC  Diamond Shape Hole is drilled on the diamond head vertically but with arbitrary orientation of its diamond surfaces against those of the diamond head. Applicable when D≥6 Combination with RAC is not available. (Applicable Dimension P: 5.50~9.99 B: 5.0~ 9.9, 10.0~30.0 Q: 2.5; 10.00~ B: 5.0~ 7.9, 8.0~11.9, 12.0~30.0 Q: 2, 2.5, 3.5; Wrench Hole Dims.)	Changes the Shoulder Thickness dimension. Ordering Code TBA2.5 1.0~10.0 (0.1mm increment) Shoulder Thickness Tolerance: ±0.05 Applicable when D≥4.