

Locating Pins for Jigs & Fixtures (Insulating Pins)

Alumina Coated Pins

Features: Suitable for locating pins in spot welding since Alumina coating excels in abrasion resistance and insulation.

Threaded	Set Screw	Shape	Material	Surface Treatment	Hardness
Z-LANA	Z-LATA	Round	Special Stainless (KCF)	Alumina Coating	Approx. 1300 HV min. (Approx. 200 HV min. inside)
Z-LAND	Z-LATD	Diamond			

Threaded (Round) (Diamond) $3.2 \sqrt{(1.6)}$ Surface Finish Relief

Set Screw (Round) (Diamond) $3.2 \sqrt{(1.6)}$ Surface Finish Relief

Part Number	Type	D ₉₆	P	B	L	ℓ	L ₁	ℓ ₁	H	d	R	Applicable Set Screw	W
Threaded (Round)	Set Screw (Round)	8	3.0-9.0	5	12 15	10 8			11	5	1.5	M5	1(2)
Z-LANA	Z-LATA	10	5.0-12.0	5-30 (B≤Px4)	10 12 15	12 10		8	13	7	2	M6	2(3)
Z-LAND	Z-LATD	12	9.0-13.0		12 15 18	15	12	10	15	9	3	M8	4
		16	13.0-16.0		15 18 20	18			19	13	4		5

W Dimension D8: W=2 when P>5.0. D10, 10T: W=3 when P>7.0.

Part Number Example

Part Number: Type D P B L

Z-LANA 10 - P7.8 - B6 - L10

Z-LATD 10 - P11.5 - B20

Application Example

General Items Z-LANA

Part Number Example

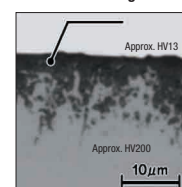
Part Number: P B L (SC, RC...etc.)

Z-LANA8 - P7.8 - B10 - L12 - SC

Z-LATA8 - P7.8 - B10 - SC

Alterations	Flat Position	Flat Machining	Wrench Flats	Tip Angle Change	Thread Diameter	Upper Relief Radius
Code	KC	KD	SC	RC	MC	RTC
Spec.	Ordering Code: KC Changes the flat position to 90° from the standard position 0°. Applicable to Diamond Shape Type only.	Ordering Code: KD Machining on one side. Applicable to Round Shape Type only.	Ordering Code: SC Adds wrench flats.	Ordering Code: RC6 Changes the tip angle. Selection: 60°, 90°, 120°	Ordering Code: MC8 Changes the thread diameter. D/3 < M < D M min 3	Ordering Code: RTC0.2 Changes R1 to R of the selection below. Selection: R1 R2 R3 RTC≤(H-P)/2

Alumina Coated Pin (Material: KCF) Cross-Section Diagram



Insulating Layer with depth of 5-10 μm (approx. HV1300) is formed.

Alumina coating excels in abrasion resistance and insulation compared to metal.
*Contacts with pointed objects may cause conduction.

Characteristics Comparison (Reference)

	Special Stainless KCF (Alumina Coated)	Stainless Steel 304 Stainless Steel	Ceramics A1203	Nylon	Bakelite (Paper Base)	Bakelite (Cloth Base)
Natural Resistance (Ω)	2 x 10 ⁸	72 x 10 ⁶	10 ¹⁴	5 x 10 ¹²	10 ¹⁰	10 ¹²
Insulation Breakdown Voltage (V)	150	—	10 ⁴	1.9 x 10 ⁴	—	—
Tensile Strength (MPa)	421	520	—	88	80	100
Elongation (%)	10	40	—	50	2	2
Flexural Strength (MPa)	—	—	350	103	180	160
Vickers Hardness (HV)	Front 1,300 Inside 200	200	1400	—	—	—
Insulation Properties	Good	Poor	Excellent	Excellent	Excellent	Excellent
Heat Resistance	Good	Good	Excellent	Poor	Questionable	Questionable
Machinability	Good	Good	Poor	Good	Good	Good
Cost	Good	Excellent	Poor	Good	Good	Good

Detection Pins

Sensor Embedded Unit / Work Detection Unit

Features: Fiber sensor is inserted into the pin, and the sensor's light level is used to detect the work presence.

Type	Material	Hardness
Threaded	4137 Alloy Steel	Treated Hardness 35-40 HRC min.
Notch	SCM415 Alloy Steel (JIS)	Carburized Treated Hardness: 55 HRC min. (Depth 0.7-0.8) Anti-Carburizing on Threads

Reference: $\sin 15^\circ = 0.259$ $\sin 30^\circ = 0.5$ $\sin 45^\circ = 0.707$
 $\tan 15^\circ = 0.267$ $\tan 30^\circ = 0.577$ $\tan 45^\circ = 1$

Tip Shape The center hole remains.

A Shape Tapered $e = P/2 \tan(A/2) \geq 0.73$

B Shape Taper R $e = P/2 \tan(A/2) + R - (R/\sin(A/2))$

Part Number	Type	Tip Shape	D ₉₆ Selection	P	B	L	A	E
Threaded	Notch	A	8	4.5-5.9	14.0-30.0 (B≤Px4)	5 8 10 12	30 60 90 120	1-10
NUTFN	NUTFT	B	10	6.0-7.9				
TNUTFN	TNUTFT			8.0-11.0				

When P≤5.9, no hardening due to thin thickness in order to prevent damage (Material: 4137 Alloy Steel). D8 is applicable up to P dimension 9.0mm. When P ≤ 5.9, part numbers TNUTFN, TNUTFT unavailable.

Type	Material	Hardness	Surface Treatment
NUTK	1045 Carbon Steel or Equivalent	—	—
BNUTK		45-50 HRC min.	Black Oxide

Reference: $\sin 15^\circ = 0.259$ $\sin 30^\circ = 0.5$ $\sin 45^\circ = 0.707$
 $\tan 15^\circ = 0.267$ $\tan 30^\circ = 0.577$ $\tan 45^\circ = 1$

Tip Shape The center hole remains.

A Shape Tapered $e = P/2 \tan(A/2) \geq 0.73$

B Shape Taper R $e = P/2 \tan(A/2) + R - (R/\sin(A/2))$

C Shape Sphere $SR \geq P/2$

Part Number	Type	Tip Shape	D	P	B	L	A	E	M
NUTK	BNUTK	A	12	5.0-10.0	5-30 (B≤Px4)	15-20	30 60 90 120	1-10	5 6 8
		B	16	10.1-12.0					5S 6S
		C	16	12.1-14.0					5S 6S 8S

Part Number Example

Part Number: Type Tip Shape D P B L A E M

NUTFN B 10 - P4.6 - B15 - L10 - A60

NUTK A 12 - P6.0 - B10 - L20 - A30 - E2 - M5

NUTK C 16 - P10.5 - B15 - L20 - M6

Part Number Alterations

Part Number: P B L A E M (TC / KD / CD)

NUTFN B10 - P6.0 - B10 - L10 - A30 - KD

Alterations	Shoulder Thickness	Flat Machining	Flat Position
Code	TC	KD	CD
Spec.	Ordering Code: TC8.5 Changes shoulder thickness from 8 mm. TC=0.5 mm Increment TC: 8.5-12.0 Applicable to Sensor Embedded Notch Shape only.	Ordering Code: KD Machining on one side. Applicable to Sensor Embedded Threaded Type only.	Ordering Code: CD1 Changes the position of Notch from the current position to one of the above 1, 2 or 3. Applicable to Sensor Embedded Notch Shape only.

Application Example

Workpiece Weld Nut Detecting Pin (Sensor Embedded Type) Fiber Sensor

Fiber sensor is inserted into a detecting pin, and the sensor light is used to detect the presence of a weld nut.