



MISUMI

MISUMI

Standard Components for Plastic Mold

Standard Components for Plastic Mold 2011 Volume 1



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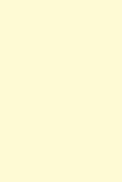
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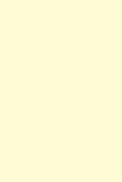
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Extensive Range of Products
Increase in Stocks Sizes & Varieties

2011
Volume 1



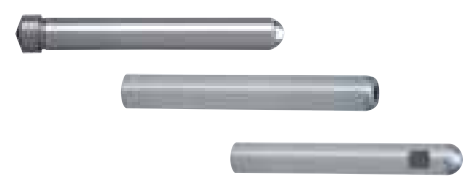
COMPONENTS HIGHLIGHT

WIDE RANGE of TOP QUALITY PLASTIC MOLD STANDARD COMPONENTS

Delivery Shorten!



Ejector Pins, Ejector Sleeves & Core Pins
 CODE: EPH EPHJ ERPH ESNV
 ESN CPD CPH etc.
 P. 1~24



Angular Pins
 CODE: AP APZ APU APUS etc.
 P. 25~30



Parting Locks
 CODE: PL PLBS PLH PLL PLM PLS PLSZ PLSW MPLK MPLKH MLK MLKC
 P.25~116

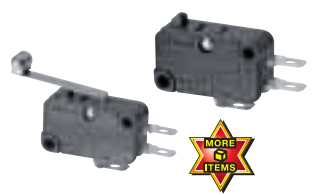
**Additional 800 Stock Items
 Total 2800 Items in Stock now**



Leader Pins & Bushings
 CODE: GPH GBH GBS GBHE
 GBSE GBAM GBBM
 P. 67~74



Ejector Leader Pins & Bushings
 CODE: EGH EGHC EGBH EGBZ
 EGBLT EGBB etc.
 P. 85~91



Microswitch
 CODE: EGS-ANGLE EGS-AV
 EGS-BOARD V-15-1A5-T etc.
 P. 93~94



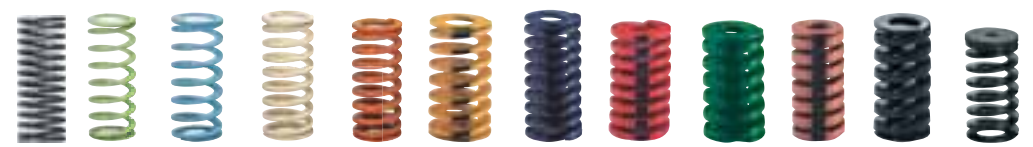
Cooling Items
 CODE: KPM JPJ F120-PM NPL M-POC
 JTW WCP BFP ORG etc.
 P. 125~152



Taper Pin Sets
 CODE: TPN TPNV VTPN TPNC
 TPV TPNF TPNFC TPVX etc.
 P. 75~81



Sprue Bushings & Locating Rings
 CODE: SBBK SBBP SBGK SBSD
 LAR LRBW LRK etc.
 P. 47~52



Springs
 CODE: WY WR WF WL WT WM WH SWY SWU SWR SWS SWF SWL SWM SWH
 SWB SWG WSW
 P. 166~192

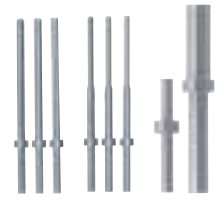






Product information are also available on our website.

*Warehouse is located in Singapore.

Visit www.my.misumi-ec.com (MISUMI MALAYSIA) or www.sg.misumi-ec.com (MISUMI SOUTH EAST ASIA)

Line-up of Standard Components for Plastic Mold

		
Straight Ejector Pins P.1~	Stepped Ejector Pins P.9~	Free Flange-position Ejector Pins
		
Rectangular Ejector Pins P.13~	Ejector Sleeves P.15	Straight Center Pins
		
Stepped Center Pins	Taperless Center Pins	Straight Core Pins P.23~
		
Steps-type Round Core Pins	Taperless Core Pins	Shaped Inlay Core Pins for Boss
		
Block Core Pins - Cavity Inserts	Steel Plates	Date Marked Pins - Recycle Marketed Pins - Pins with Gas Vent
		
Angular Pins - Locking Blocks P.25~	Slide Cores - Loose Cores P.31~	Guide Rails - Center Rails

		
Sprue Bushings - Locating Rings P.47~	Components of Runner P.53~	Components of Gate P.59~
		
Electrodes P.65~	Leader Components P.67~	Components for Positioning P.75~
		
Components for Ejector Space P.85~	Mold Opening Controllers P.95~	Couplers - Quick Fitting Joints P.121~
		
Joints - Hoses - Cooling inside of mold P.140~	Heating Items P.153~	Heat Insulation Sheets
		
Bolts - Screws - Washers P.155~	Mold Accessories P.154~	Chemical Products
		
Coil Springs P.163~	Components of Large Mold	Components of Die Casting

How to Start Business with MiSUMi

How to Order

For New Customers


Fill out the Customer Registration Form and send it to the Customer Service Department either by fax or e-mail. You will receive your customer code once the registration procedure is completed.

For Existing Customers

1. Send in your inquiry with the details of your order (Misumi part no. & Quantity) together with your company details to our Customer Service by fax or e-mail.
2. Our Customer Service will send you the quotation.
3. After confirmation of the price and delivery date, please send in the Official PO.

*For customers without credit terms, payment is to be made after PO confirmation.

Delivery

Destination	Singapore	Malaysia	Other Countries
Non-stock	 Delivery as shown on each page	+ 2 days	Depends on your courier service
Stock	1 day	+ 2 days	

- Time of delivery stipulated in catalog might delay in case of stock shortage and/or required
- Order received after 3pm will be treated as next working day order.
- Warehouse is located at Tuas, Singapore.

About Express Delivery Services

This system shortens the production time so that your order can be shipped out faster.

- To meet your urgent orders, we offer expedited services for many products. Our Express Delivery Services are available for the products marked with one of the symbols below. Depending on the specifications / dimensions of a product, the services may not be available. Before placing an order, please confirm the service availability indicated on the product pages.










Special Emergency Service [Express T]

- **[Express T]** is a special emergency service that allows orders to be shipped out after 2 business days of your order.
- Please note that this service might not be available depending on the order volume.

Reception Time of Emergency Service System [Express]

- Request for Express Services must be received before the following dead line. From 9:00 a.m. to 10:00 a.m. for **[Express T]**, by 3:00 p.m. for **[Express A]** and by 5:00 p.m. for **[Express B and C]**. Please note that orders placed after the above timings will be treated as next day orders.

Emergency System	 Express T	 Express A	 Express B	 Express C
Orders Received	 By 10:00 a.m.	 By 3:00 p.m.	 By 5:00 p.m.	
Shipped Out	After 2 Business Days of Your Order	After 3 Business Days of Your Order	After 5 Business Days of Your Order	After 7 Business Days of Your Order

- **[Express T]** orders must be placed by 10:00 a.m. Please use **[Express A]** (After 3 Business days of your order) after 10:00 a.m.
- Changes or cancellation after ordering of **[Express T]** will not be accepted. Changes or cancellation of Express A, B and C varies depending on the time.
- "Shipped out", "Shipment" denotes the required actual business days before the product is shipped.
- Please note that the actual delivery may vary depending on your location. Please consult your local Misumi office for expected arrival dates. Please note that above delivery days are subject to change depending on the order volume.
- The above conditions only applicable to Singapore area. Please contact our subsidiary in your country for details.

Express Delivery Fee

- Kindly contact our customer service for the express delivery charges for your country.

Changing or Canceling Orders

Changing or canceling orders (the Cancellation) is treated according to the shipment date and the timing when you make the cancellation. Cancellation charges will be imposed in some cases. Please contact our subsidiary in your country for details.

- Items with  logo

No cancellation is accepted.

- Items with  logo or logo shows longer days

Please refer to the table of the cancellation and shipment date below. Cancellation is acceptable with or without charges (40% of product cost) depending on the timing of the cancellation.


Please contact our subsidiary in your country for details.

- Table of Cancellation and Shipment date


Catalogue Delivery Schedule and Service Days from the Day of Ordering	3 Days Catalog Item	4 Days Catalog Item	5 Days Catalog Item	6 Days Catalog Item	7 Days Catalog Item	8 Days Catalog Item	9 Days Catalog Item	12 Days Catalog Item	14 Days Catalog Item	16 Days Catalog Item	18 Days Catalog Item	22 Days Catalog Item	Express T	Express A	Express B	Express C
Day of Ordering	×	△	○	○	○	○	○	○	○	○	○	○	×	△	○	○
1 Days Later	×	×	△	△	○	○	○	○	○	○	○	○	×	×	△	△
2 Days Later	×	×	×	△	△	△	△	○	○	○	○	○	Shipment Date	×	×	△
3 Days Later	Shipment Date	×	×	×	△	△	△	○	○	○	○	○		Shipment Date	×	△
4 Days Later		Shipment Date	×	×	×	△	△	△	○	○	○	○			×	×
5 Days Later			Shipment Date	×	×	×	△	△	△	△	○	○			Shipment Date	×
6 Days Later				Shipment Date	×	×	×	△	△	△	△	△				×
7 Days Later					Shipment Date	×	×	△	△	△	△	△				Shipment Date
8 Days Later						Shipment Date	×	△	△	△	△	△				
9 Days Later							Shipment Date	×	△	△	△	△				
10 Days Later								×	△	△	△	△				
11 Days Later									×	△	△	△				
12 Days Later								Shipment Date	×	△	△	△				
13 Days Later									×	×	△	△				
14 Days Later									Shipment Date	×	△	△				
15 Days Later										×	×	△				
16 Days Later										Shipment Date	×	△				
17 Days Later											×	△				
18 Days Later												Shipment Date	×			
19 Days Later													×			
20 Days Later														×		
21 Days Later															×	
22 Days Later												Shipment Date				

○: Cancellation without charge. △: 40% of product cost is imposed on the cancellation. ×: No cancellation is accepted.

Returning and Replacing Goods

- Item with  logo can be returned. Administration charges applicable and customer is kindly request to contact our customer service prior making the return.

Please note that the delivery cost of returning goods to the destination we determined must be paid by the customer.

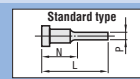
- Items with  logo or logo shows longer days, cannot be returned as they have been manufactured-to-order.
- When the received goods differ from the placed order, please contact our subsidiary for the replacement.

⚠ Please note that the above returning and replacing of goods are subjected to terms and conditions.

HOW TO USE CATALOG

Product Name

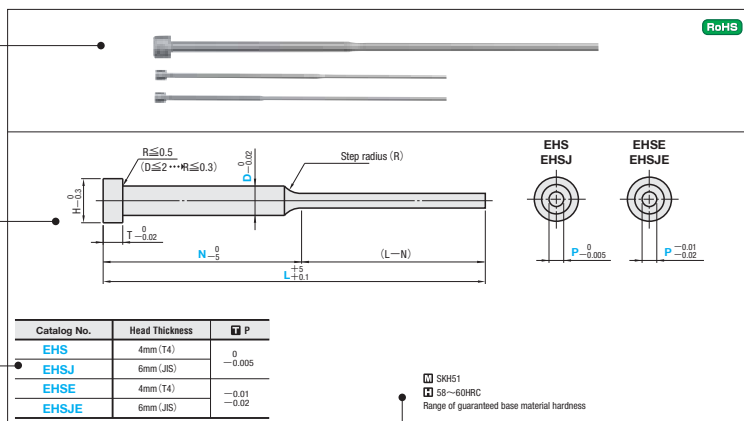
High Speed Steel SKH51 STEPPED EJECTOR PINS — STANDARD TYPE —



Photograph



Drawing



Catalog No.

Catalog No.	Head Thickness	P
EHS	4mm (T4)	0
EHSJ	6mm (JIS)	-0.005
EHSE	4mm (T4)	-0.01
EHSJE	6mm (JIS)	-0.02

Materials and others

H	T	Catalog No.	Type	D	L	P	N
3	4	EHS (P=0.005)	1	60	0.3 0.4 0.5 0.6 0.7 0.8		20 35
				100		40 50 60	
				150		50 70 90	
4	4	EHSE (P=0.01)	2	150	0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.8		40 50 60
				200		40 50 60	
				250		50 70 90	
5	4	EHSJ (P=0.005)	4	200		2.0 2.5 3.0	70 80 100
				250			100 125
				150			50 70
6	4	EHSJE (P=0.01)	5	200		3.0	70 100
				250			100 125
				150			50 70

Dimension Table

Select blue characters one by one from the left to find order symbols.

Dimensions unnecessary to specify for order symbols are covered with blue mesh.

Printed in red means Stock

How to Order

Order example

Page number

9

Days to ship

The number of days (business days following the day of your order) required before shipping from MISUMI's distribution center in Singapore. P.i

SGP Stock	3 Days	5 Days	7 Days
8 Days	10 Days	12 Days	14 Days
18 Days			

Express delivery services P.i

Express T	Express A	Express B	Express C
-----------	-----------	-----------	-----------

Alterations

Alterations	Code	Spec.	Price
VKC	Single flat cutting (precision) D/2 ≤ VKC < H/2	About Designation Unit for Key Flat Cutting	Quotation
WVC	Two parallel flats cutting (precision) D/2 ≤ WVC < H/2		
KC	Single flat cutting D/2 ≤ KC < H/2		
WKC	Two flats cutting D/2 ≤ WKC < H/2		
KAC	Vaned with parallel flats cutting D/2 ≤ KAC < H/2 HCC = 1mm increments only KAC < KBC < H/2		
RKC	Two flats /right angled cutting D/2 ≤ RKC < H/2 0.6mm increments possible		
DKC	Three flats cutting D/2 ≤ DKC < H/2		
SKC	Four flats cutting D/2 ≤ SKC < H/2		
KGC	Two flats (angled) cutting D/2 ≤ KGC < H/2 AG = 1° increments 0 < AG < 360		
KTC	Three flats cutting at 120° D/2 ≤ KTC < H/2		
HCC	HC = 0.1mm increments TD + 1 ≤ HCC < H - 0.3, D ≥ 1.5		
HCC	HCC = 0.1mm increments TD + 1 ≤ HCC < H - 0.3, D ≥ 1.5		
TC	TC = 0.1mm increments TD ≤ TC < T, D ≥ 1.5 Dimensions L and N become shorter by (T-TC).		
NC	Dowel hole boring Available when H ≥ 4 Combination with other than NHC/NHN not available.		
NCW	Dowel hole boring + Spring pin driving Available when H ≥ 4 Combination with other than NHC/NHN not available.		
NHC	Numbering on the head Combination with SKC not available.		
NHN	Automatic sequential numbering on the head Combination with SKC not available.		

Quantity discount rate

Catalog No.	Type	D	P	L	U/Price
EHS	1	1.5	0.3	60	Quotation
			0.4	100	
			0.5	150	
			0.6~0.8	100	
			0.6~1.2	150	
EHSE	2	2.5	0.7~1.8	150	Quotation
			0.8~2.1	200	
			1.0~2.6	150	
				200	
				200	

Alterations	Code	Spec.	Price
HCC	HC = 0.1mm increments TD + 1 ≤ HCC < H - 0.3, D ≥ 1.5	Quotation	
HCC	HCC = 0.1mm increments TD + 1 ≤ HCC < H - 0.3, D ≥ 1.5		
TC	TC = 0.1mm increments TD ≤ TC < T, D ≥ 1.5 Dimensions L and N become shorter by (T-TC).		
NC	Dowel hole boring Available when H ≥ 4 Combination with other than NHC/NHN not available.		
NCW	Dowel hole boring + Spring pin driving Available when H ≥ 4 Combination with other than NHC/NHN not available.		
NHC	Numbering on the head Combination with SKC not available.		
NHN	Automatic sequential numbering on the head Combination with SKC not available.		

Volume discount is also applicable to alteration fees.

Alteration

Select alterations with code.

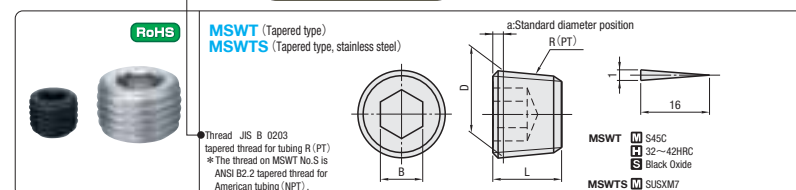
Price

Prices are to be quoted. Volume discount rates are available for most products.

How to find the product

Use the Contents page to find the products by production name and page number.

JIS notation



The indication of JIS standard on the page of each commodity is for reference only and does not signify on-product.

CAD data

Two-dimensional CAD data (in DXF and IGES formats) is available for some products in this catalog. Download the files from the MISUMI's website. MISUMI SOUTH EAST ASIA <http://sg.misumi-ec.com/contents/cad/> MISUMI MALAYSIA <http://my.misumi-ec.com/contents/cad/>

Contents

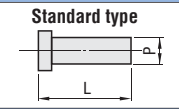


: Additional sizes/New stock items

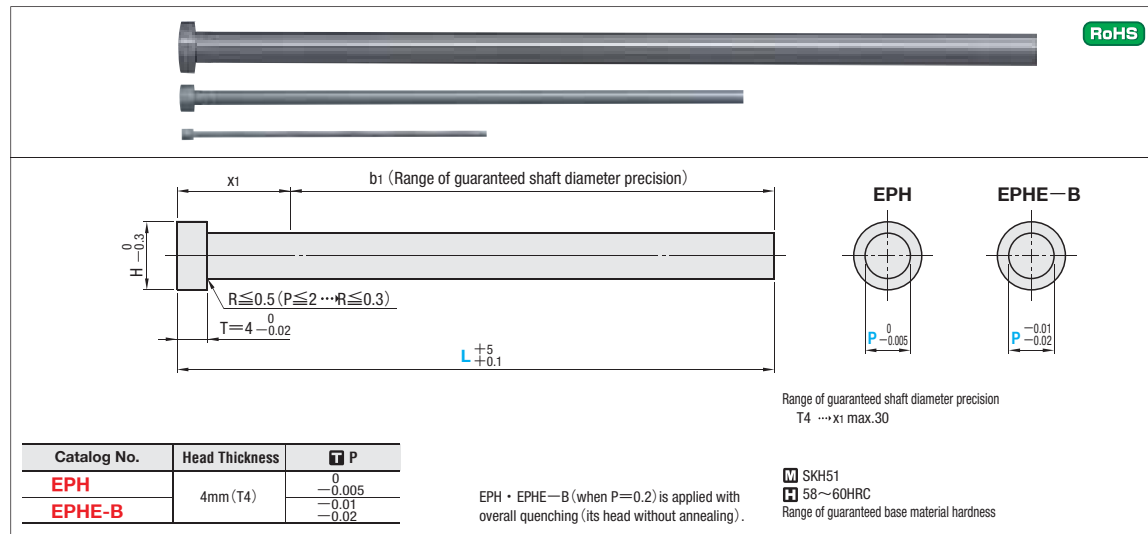


: Existing stock items

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The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.



H	T	Type	Catalog No.	P	L Selection
2	4	EPH (P _{-0.005})	0.2		60
			0.3		60
			0.4	0.5	60 100
			0.6	0.7	100 150
			0.8	0.9	100 150
			1	1.1 1.2 1.3 1.4	100 150 200
			1.5		100 150 200 250
			1.6		100 150 200 250
			1.7	1.8 1.9	100 150 200
			2		100 150 200 250 300
			2.1		100 150 200 250
			3	4	EPHE-B (P _{-0.02})
2.5		100 150 200 250 300			
2.6		100 150 200 250			
2.7	2.8 2.9	100 150 200			
3		100 150 200 250 300 350			
3.1		100 150 200 250			
3.2	3.3 3.4	100 150 200			
3.5		100 150 200 250 300 350			
3.6		100 150 200 250			
3.7	3.8 3.9	100 150 200			
4		100 150 200 250 300 350			
4	4	EPHE-B (P _{-0.02})			
			4.5		100 150 200 250 300 350
			4.6		100 150 200 250
			*4.7 *4.8 *4.9		100 150 200
			5		100 150 200 250 300 350
			5.1		100 150 200 250
			5.5		100 150 200 250 300 350
			5.6		100 150 200 250
			6		100 150 200 250 300 350
			6.1		100 150 200 250
			6.5		100 150 200 250 300 350
			6.6		100 150 200 250
5	4	EPHE-B (P _{-0.02})	7		100 150 200 250 300 350
			7.1		100 150 200 250
			*7.5 *7.6		100 150 200 250
			8		100 150 200 250 300 350
			8.1		100 150 200 250
			*8.5 *8.6		100 150 200 250
			9		100 150 200 250 300 350
			9		100 150 200 250 300 350
			*9.1 *9.5 *9.6		100 150 200 250
			10		100 150 200 250 300 350
			10.1		100 150 200 250
			6	4	EPHE-B (P _{-0.02})
*11.5 *11.6		100 150 200 250			
12		150 200 250 300 350			

Order **Catalog No.** — L — **EPH 1.5 — 150** Delivery **SGP Stock** **3** Days

Alterations **Catalog No.** — L — (KC · WKC...etc) **EPH 2.5 — 150 — TC3.0** Express **5** Days Express **T · A**

• P dimension with * mark
 5 Days Express T Express A
 ☉ For area out of Singapore please refer to P.i.
 ☒ Express services not available for NHC · NHN

Alterations	Code	Spec.	Price
	VKC	Precision single flat cutting P/2 ≤ VKC < H/2	Quotation
	VWC	Precision two flats cutting P/2 ≤ VWC < H/2	
	KC	Single flat cutting P/2 ≤ KC < H/2	
	WKC	Two flats cutting P/2 ≤ WKC < H/2	
	KAC KBC	Varied width parallel flats cutting P/2 ≤ KAC < H/2 KBC=0.1mm increments only KAC < KBC < H/2	
	RKC	Two flats (right angled) cutting P/2 ≤ RKC < H/2	
	DKC	Three flats cutting P/2 ≤ DKC < H/2	
	SKC	Four flats cutting P/2 ≤ SKC < H/2	
	KGC	Two flats (angled) cutting P/2 ≤ KGC < H/2 AG=1° increments 0 < AG < 360	
	KTC	Three flats cutting at 120° P/2 ≤ KTC < H/2	

Unit of designation: 0.05mm increments possible
Unit of designation: 0.1mm

Quantity discount rate

Quantity	Rate
1~49	5%
50~100	5%

Type	Catalog No.	P	U/Price for 1~49						
			L60	L100	L150	L200	L250	L300	L350
EPH EPHE-B	0.2								
	0.3								
	0.4								
	0.5								
	0.6 0.7								
	0.8 0.9								
	1 1.1								
	1.2 1.3 1.4								
	1.5								
	1.6								
	1.7 1.8 1.9								
	2								
	2.1								
	2.2 2.3 2.4								
	2.5								
	2.6								
	2.7 2.8 2.9								
	3								
3.1									
3.2 3.3 3.4									
3.5									
3.6									
3.7 3.8 3.9									

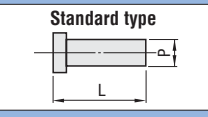
Alterations	Code	Spec.	Price
	HC	HC=0.1mm increments ☉ P+1 ≤ HC < H, P ≥ 1.5	Quotation
	HCC	HCC=0.1mm increments ☉ P+1 ≤ HCC < H-0.3, P ≥ 1.5	
	TC	TC=0.1mm increments ☉ 2.0 ≤ TC < 4, P ≥ 1.5 ☉ Dimension L becomes shorter by (4-TC)	
	NC	Dowel hole boring ☉ Available when H ≥ 4 ☒ Combination with other than NHC · NHN not available.	
	NCW	Dowel hole boring+ Spring pin driving ☉ Available when H ≥ 4 ☒ Combination with other than NHC · NHN not available.	
	NCS	Dowel hole boring+ Dowel pin driving ☉ Available when H ≥ 4 ☒ Combination with other than NHC · NHN not available.	
	NHC	Numbering on the head ☉ Available when H ≥ 2 ☒ Combination with SKC not available.	
	NHN	Automatic sequential numbering on the head ☉ Available when H ≥ 2 ☒ Combination with SKC not available.	

Type	Catalog No.	P	U/Price for 1~49					
			L100	L150	L200	L250	L300	L350
EPH EPHE-B	4							
	4.1							
	4.2 4.3 4.4							
	4.5							
	4.6							
	4.7 4.8 4.9							
	5							
	5.1							
	5.5							
	5.6							
	6							
	6.1							
	6.5							
	6.6							
	7							
	7.1							
	7.5							
	7.6							
8								
8.1								
8.5 8.6								
9								
9.1								
9.5 9.6								
10								
10.1								
10.5 10.6 11 11.1								
11.5 11.6								
12								

☉ When * is indicated for P dimension, production time is 3 business days. ☒ Please take the order for head JIS type [EPHJ] (P_{-0.005}) / [EPHE] (P_{-0.02}).

STRAIGHT EJECTOR PINS

— STANDARD —



The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.

RoHS

Catalog No.	Head Thickness	P
EPHJ	6·8mm (JIS)	0 -0.005
EPHJE		-0.01 -0.02

Range of guaranteed shaft diameter precision
JIS → x1 max.35

SKH51
58~60HRC
Range of guaranteed base material hardness

H	T	Catalog No.		L Selection					
		Type	P	100	150	200	250	300	
8	6	EPHJ (P ₀ ^{-0.005})	4	100	150	200	250	300	
			4.5	100	150	200	250	300	
			5	100	150	200	250	300	350
			5.5	100	150	200	250	300	350
			6	100	150	200	250	300	350
11	8	EPHJE (P ^{-0.01} _{-0.02})	7	100	150	200	250	300	350
			8	100	150	200	250	300	350
			9	100	150	200	250	300	350
			10	100	150	200	250	300	350
17			12	150	200	250	300	350	

⚠ For JIS head type less than P4 is T=4, please place the order for 4mm head type of EPH(P₀^{-0.005})/EPHE(B)(P₀^{-0.01}).

Order Catalog No. — L
EPHJ4 — 200

Delivery 5 Days Express T Express A P.i.
⚠ For area out of Singapore please refer to P.i.

Alterations Catalog No. — L — (KC · WKC...etc)
EPHJ4 — 200 — TC3.0

5 Days Express T·A P.i. Express services not available for NHC · NHN · MC
⚠ For area out of Singapore please refer to P.i.

Alterations	Code	Spec.	Price
	VKC	Precision single flat cutting P/2 ≤ VKC < H/2	Quotation
	WVC	Precision two flats cutting P/2 ≤ WVC < H/2	
	KC	Single flat cutting P/2 ≤ KC < H/2	
	WKC	Two flats cutting P/2 ≤ WKC < H/2	
	KAC KBC	Varied width parallel flats cutting P/2 ≤ KAC < H/2 KBC = 0.1mm increments only KAC < KBC < H/2	
	RKC	Two flats (right angled) cutting P/2 ≤ RKC < H/2	
	DKC	Three flats cutting P/2 ≤ DKC < H/2	
	SKC	Four flats cutting P/2 ≤ SKC < H/2	
	KGC	Two flats (angled) cutting P/2 ≤ KGC < H/2 AG = 1° increments 0 < AG < 360	
	KTC	Three flats cutting at 120° P/2 ≤ KTC < H/2	
(1) To align the key flat with the shaft diameter Unit of designation 0.05mm increments possible			
(2) To designate arbitrary key flat dimensions Unit of designation 0.1mm			

Alterations	Code	Spec.	Price
	HC	HC = 0.1mm increments P + 1 ≤ HC < H	Quotation
	HCC	HCC = 0.1mm increments P + 1 ≤ HCC < H - 0.3	
	TC	TC = 0.1mm increments T/2 ≤ TC < T Dimension L becomes shorter by (T - TC).	
	NC	Dowel hole boring ⊗ Combination with other than NHC · NHN not available.	
	NCW	Dowel hole boring + Spring pin driving ⊗ Combination with other than NHC · NHN not available.	
	NCS	Dowel hole boring + Dowel pin driving ⊗ Combination with other than NHC · NHN not available.	
	NHC	Numbering on the head ⊗ Combination with SKC not available.	
	NHN	Automatic sequential numbering on the head ⊗ Combination with SKC not available.	
	MC	Head tapping ⊗ Available when P ≥ 8 ⊗ Combination with any other alteration not available.	

Quantity discount rate

Quantity	1~49	50~100
Rate	—	5%

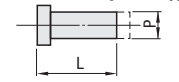
Catalog No.		U/Price for 1~49					
Type	P	L100	L150	L200	L250	L300	L350
EPHJ EPHJE	4						—
	4.5						—
	5						
	5.5						
	6						
	6.5						
	7						
	8						
	9						
	10						
	12	—					

High Speed Steel
SKH51
4mm head

STRAIGHT EJECTOR PINS

— L DIMENSION DESIGNATION TYPE —

L dimension designation type



The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.

RoHS

EPY-L
EPH-L

EPHE-L

Range of guaranteed shaft diameter precision
EPY-L → x1 max.10
T4 → x1 max.30

SKH51
58~60HRC
Range of guaranteed base material hardness

EPY-L is applied with overall quenching (its head without annealing)

Catalog No.	Head Thickness	T P
EPY-L	4mm (T4)	0
EPH-L		-0.005
EPHE-L		-0.01 -0.02

Order

Catalog No. — L

EPH-L5 — 210.00

5 Days

Express T
Express A

Express services not available for NHC·NHN·TMC

For area out of Singapore please refer to P.i.

Alterations

Catalog No. — L — (KC·WKC...etc)

EPH-L5 — 210.00 — TC3

5 Days

Express T·A

Express services not available for NHC·NHN·TMC

For area out of Singapore please refer to P.i.

Alterations	Code	Spec.	Price	Alterations	Code	Spec.	Price
	VKC	Precision single flat cutting P/2 ≤ VKC < H/2	Quotation		HC	HC=0.1mm increments P+1 ≤ HC < H, P ≥ 1.5	Quotation
	VWC	Precision two flats cutting P/2 ≤ VWC < H/2			HCC	HCC=0.1mm increments P+1 ≤ HCC < H-0.3, P ≥ 1.5	
	KC	Single flat cutting P/2 ≤ KC < H/2			TC	TC=0.1mm increments 2.0 ≤ TC < 4, P ≥ 1.5 (Dimension L remains unchanged.) 4 - TC ≤ Lmax. - L	
	WKC	Two flats cutting P/2 ≤ WKC < H/2			NC	Dowel hole boring Available when H ≥ 4 Combination with other than NHC·NHN·TMC·GVC not available.	
	KAC KBC	Varied width parallel flats cutting P/2 ≤ KAC < H/2 KBC=0.1mm increments only KAC < KBC < H/2			NCW	Dowel hole boring + Spring pin driving Available when H ≥ 4 Combination with other than NHC·NHN·TMC·GVC not available.	
	RKC	Two flats (right angled) cutting P/2 ≤ RKC < H/2			NCS	Dowel hole boring + Dowel pin driving Available when H ≥ 4 Combination with other than NHC·NHN·TMC·GVC not available.	
	DKC	Three flats cutting P/2 ≤ DKC < H/2			NHC	Numbering on the head Available when H ≥ 2 Combination with SKC not available.	
	SKC	Four flats cutting P/2 ≤ SKC < H/2			NHN	Numbering on the head Available when H ≥ 2 Combination with SKC not available.	
	KGC	Two flats (angled) cutting P/2 ≤ KGC < H/2 AG = 1° increments 0 < AG < 360			TMC	Lapping on the tip face Available when P ≥ 0.6 EPY-L not available.	
	KTC	Three flats cutting at 120° P/2 ≤ KTC < H/2			GVC	S,B = 1mm increments 2 ≤ S ≤ 10, S+5 ≤ B ≤ 30 Available when P ≥ 3	

Quantity discount rate

Quantity	1~4	5~12	13~49	50~100
Rate	—	5%	10%	20%

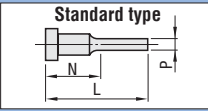
H	T	Catalog No.		L		U/Price
		Type	P	0.01mm increments		
2	4	EPY-L	0.3	20.00~60.00	1~4	Quotation
			0.4			
			0.5			
			0.6			
			0.7			
			0.8			
			0.9			
1						

H	T	Catalog No.		L		U/Price for 1~4					
		Type	P	Lmin.	Lmax.	L40.00 ~100.00	L100.01 ~150.00	L150.01 ~200.00	L200.01 ~250.00	L250.01 ~300.00	L300.01 ~350.00
3	4	EPH-L (P = 0.005)	0.3	40.00	60.00	—	—	—	—	—	—
			0.4		100.00	—	—	—	—		
			0.5		150.00	—	—	—	—		
			0.6 0.7		200.00	—	—	—	—		
			0.8 0.9		250.00	—	—	—	—		
			1 1.1		300.00	—	—	—	—		
			1.2 1.3 1.4		350.00	—	—	—	—		
			1.5		400.00	—	—	—	—		
			1.6		450.00	—	—	—	—		
			1.7 1.8 1.9		500.00	—	—	—	—		
			2		550.00	—	—	—	—		
			2.1		600.00	—	—	—	—		
			2.2 2.3 2.4		650.00	—	—	—	—		
			2.5		700.00	—	—	—	—		
			2.6		750.00	—	—	—	—		
			2.7 2.8 2.9		800.00	—	—	—	—		
			4		4	EPHE-L (P = 0.01)	3	40.00	350.00	—	—
3.1	250.00	—		—			—		—		
3.2 3.3 3.4	200.00	—		—			—		—		
3.5	150.00	—		—			—		—		
3.6	100.00	—		—			—		—		
3.7 3.8 3.9	50.00	—		—			—		—		
4	250.00	—		—			—		—		
4.1	200.00	—		—			—		—		
4.2 4.3 4.4	150.00	—		—			—		—		
4.5	100.00	—		—			—		—		
4.6	50.00	—		—			—		—		
4.7 4.8 4.9	250.00	—		—			—		—		
5	200.00	—		—			—		—		
5.1	150.00	—		—			—		—		
5.5	100.00	—		—			—		—		
5.6	50.00	—		—			—		—		
6	250.00	—		—			—		—		
5	4	EPHE-L (P = 0.01)	6.1	40.00	250.00	—	—	—	—	—	
			6.5		200.00	—	—	—	—		
			6.6		150.00	—	—	—	—		
			7		100.00	—	—	—	—		
			7.1		50.00	—	—	—	—		
			7.5		250.00	—	—	—	—		
			7.6		200.00	—	—	—	—		
			8		150.00	—	—	—	—		
			8.1		100.00	—	—	—	—		
			8.5 8.6		50.00	—	—	—	—		
			9		250.00	—	—	—	—		
			9.1		200.00	—	—	—	—		
			9.5 9.6		150.00	—	—	—	—		
			10		100.00	—	—	—	—		
			10.1		50.00	—	—	—	—		
			10.5 10.6		250.00	—	—	—	—		
			17		4	EPHE-L (P = 0.01)	11 11.1	40.00	250.00	—	—
11.5 11.6	200.00	—		—			—		—		
12	150.00	—		—			—		—		

When the ejector pin's dimension L is less than 40mm, the length of b₁ (guaranteed shaft diameter precision range) may be too short for your particular application. For such application, use EPY-L or core pins instead.
Please take the order for JIS head type EPHJ-L (P = 0.005) / EPHJE-L (P = 0.01).

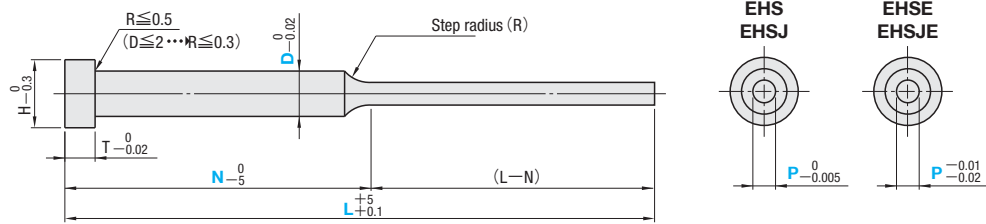
STEPPED EJECTOR PINS

— STANDARD TYPE —



The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.

RoHS



Catalog No.	Head Thickness	T P
EHS	4mm (T4)	0 -0.005
EHSJ	6mm (JIS)	
EHSE	4mm (T4)	-0.01 -0.02
EHSJE	6mm (JIS)	

SKH51
58~60HRC
Range of guaranteed base material hardness

H	T	Catalog No. Type	D	L	P	N	
3	4	EHS (P _{-0.005})	1	60	(0.3) (0.4) (0.5) 0.6 0.7 0.8	20 35	
			100		40 50 60		
			150		40 50 60		
		EHSE (P _{-0.01})	2	150	0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.8	40 50 60	70 80 90
			200		40 50 60	70 80 100	
			250		70 80 100		
	6	EHSJ (P _{-0.005})	3	150	1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1	50 70 90	
			200		70 80 100		
			250		70 80 100		
		EHSJE (P _{-0.01})	4	200	2.0 2.5 3.0	50 70 100	
			250		70 100		
			250		100 125		
9	6	EHSJ (P _{-0.005})	4.5	200	2.0 2.5	50 70 100	
			250		70 100 125		
			250		100 125		
	EHSE (P _{-0.01})	5	200	3.0	50 70 100		
		200		70 100			
		250		100 125			

The figures in () for P dimensions are applicable for EHS only.

Order **Catalog No.** — L — P — N
 EHS 2 — 150 — 1.0 — 70
 EHSE 2.5 — 200 — P1.5 — N70
 Note that alphabetical characters (P.N) are not necessary in ordering EHS.

Delivery •EHS **3** Days
 •EHSE **5** Days
 •EHSJ **5** Days
 •EHSJE **5** Days
 Express T Express A P.i.
 For area out of Singapore please refer to P.i.

Alterations **Catalog No.** — L — P — N — (KC · WKC...etc)
 EHS 2 — 150 — 1.0 — 70 — RKC1
5 Days Express T·A Express services not available for NHC · NHN
 For area out of Singapore please refer to P.i.

Alterations	Code	Spec.	Price
	VKC	Single flat cutting (precision) D/2 ≤ VKC < H/2	Quotation
	VWC	Two parallel flats cutting (precision) D/2 ≤ VWC < H/2	
	KC	Single flat cutting D/2 ≤ KC < H/2	
	WKC	Two flats cutting D/2 ≤ WKC < H/2	
	KAC	Varied width parallel flats cutting D/2 ≤ KAC < H/2 KBC = 0.1mm increments only KAC < KBC < H/2	
	RKC	Two flats (right angled) cutting D/2 ≤ RKC < H/2	
	DKC	Three flats cutting D/2 ≤ DKC < H/2	
	SKC	Four flats cutting D/2 ≤ SKC < H/2	
	KGC	Two flats (angled) cutting D/2 ≤ KGC < H/2 AG = 1° increments 0 < AG < 360	
	KTC	Three flats cutting at 120° D/2 ≤ KTC < H/2	
About Designation Unit for Key Flat Cutting (1) To align the key flat with the shaft diameter (2) To designate arbitrary key flat dimensions Unit of designation 0.05mm increments possible / 0.1mm			

Quantity discount rate

Quantity	Rate
1~49	5%
50~100	

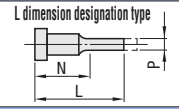
Catalog No. Type	D	P	L	U/Price 1~49
EHS	1	0.3	60	Quotation
		0.4		
		0.5		
	1.5	0.6~0.8	100	
		0.3		
		0.4		
EHSE	2	0.5	150	
		0.6~1.2		
		0.3		
	2.5	0.4	100	
		0.5		
		0.6~1.2		
3	0.7~1.8	150		
	0.3			
	0.4			
3	0.5	150		
	0.6~1.2			
	0.3			
3	0.7~1.8	150		
	0.3			
	0.4			
3	0.8~2.1	150		
	0.3			
	0.4			
3	1.0~2.6	150		
	0.3			
	0.4			

Alterations	Code	Spec.	Price									
	HC	HC = 0.1mm increments D+1 ≤ HC < H, D ≥ 1.5	Quotation									
	HCC	HCC = 0.1mm increments D+1 ≤ HCC < H-0.3, D ≥ 1.5										
	TC	TC = 0.1mm increments T/2 ≤ TC < T, D ≥ 1.5 Dimensions L and N become shorter by (T-TC).										
	NC	Dowel hole boring Available when H ≥ 4 Combination with other than NHC/NHN not available.										
	NCW	Dowel hole boring + Spring pin driving Available when H ≥ 4 Combination with other than NHC/NHN not available.										
	NHC	Numbering on the head Combination with SKC not available.										
	NHN	Automatic sequential numbering on the head Combination with SKC not available.										
	217											
	1 2 3											
		<table border="1"> <thead> <tr> <th>T</th> <th>d</th> <th>φ1</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>2</td> <td>3</td> </tr> <tr> <td>6</td> <td>3</td> <td>5</td> </tr> </tbody> </table>		T	d	φ1	4	2	3	6	3	5
T	d	φ1										
4	2	3										
6	3	5										
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T	d	φ1										
4	2	3										
6	3	5										

Catalog No. Type	D	P	L	U/Price 1~49
EHSJ	4	2.0~3.0	150	Quotation
			200	
			250	
EHSJE	4.5	2.0 2.5	150	
			200	
			250	
EHSJE	5	3.0	150	
			200	
			250	

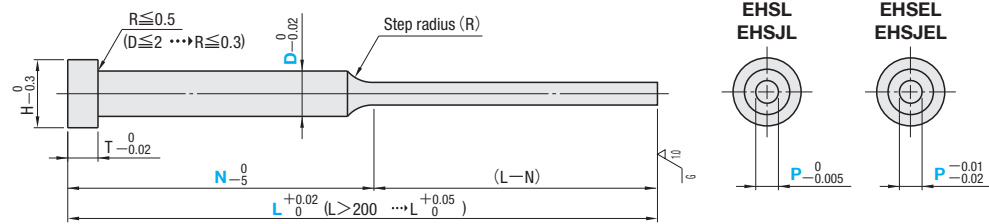
STEPPED EJECTOR PINS

— L DIMENSION DESIGNATION TYPE —



The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.

RoHS



Catalog No.	Head Thickness	P
EHSL	4mm (T4)	0 -0.005
EHSJL	6mm (JIS)	
EHSEL	4mm (T4)	-0.01 -0.02
EHSJEL	6mm (JIS)	

Range of guaranteed shaft diameter precision
Step R

SKH51
58~60HRC
Range of guaranteed base material hardness

H	T	Catalog No.	L	P	N		
		Type	D	0.01mm increments			
3	EHSL (P -0.005)	1	50.00~60.00	(0.3)(0.4)(0.5) 0.6 0.7 0.8	20 35		
			60.01~100.00		40 50 60		
		1.5	50.00~60.00	(0.3)(0.4)(0.5)	20 35		
			60.01~100.00	(0.3)(0.4)(0.5) 0.6 0.7 0.8 0.9 1.0 1.2	40 50 60		
		4	EHSEL (P -0.02)	2	100.01~150.00	0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.8	40 50 70 90
					150.01~200.00		70 80 100
5	2.5	100.00~150.00	0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1	50 70 90			
		150.01~200.00		70 80 100			
6	3	100.00~150.00	1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6	50 70 90			
		150.01~200.00		70 80 100			
8	EHSJL (P -0.005)	4	100.00~150.00		50 70		
			150.01~200.00	2.0 2.5 3.0	70 100		
		4.5	100.00~150.00		50 70		
			150.01~200.00	2.0 2.5	70 100		
9	EHSJEL (P -0.01 -0.02)	5	100.00~150.00		50 70		
			150.01~200.00	3.0	70 100		

The figures in () for P dimensions are applicable for EHSL only. L-N ≥ 10

Order Catalog No. — L — P — N
EHSJL 4 — 240.30 — P2.5 — N100

Delivery 5 Days Express T Express A P.i
For area out of Singapore please refer to P.i.

Alterations Catalog No. — L — P — N — (KC · WKC...etc)
EHSL 2 — 150.00 — P1.5 — N70 — KTC1.5
Express services not available for NHC · NHN · TMC

Alterations	Code	Spec.	Price
	VKC	Single flat cutting (precision) D/2 ≤ VKC < H/2	Quotation
	VWC	Two parallel flats cutting (precision) D/2 ≤ VWC < H/2	
	KC	Single flat cutting D/2 ≤ KC < H/2	
	WKC	Two flats cutting D/2 ≤ WKC < H/2	
	KAC	Varied width parallel flats cutting D/2 ≤ KAC < H/2 KBC = 0.1mm increments only KAC < KBC < H/2	
	RKC	Two flats (right angled) cutting D/2 ≤ RKC < H/2	
	DKC	Three flats cutting D/2 ≤ DKC < H/2	
	SKC	Four flats cutting D/2 ≤ SKC < H/2	
	KGC	Two flats (angled) cutting D/2 ≤ KGC < H/2 AG = 1° increments 0 < AG < 360	
	KTC	Three flats cutting at 120° D/2 ≤ KTC < H/2	

Quantity discount rate

Quantity	1~4	5~12	13~49	50~100
Rate	—	5%	10%	20%

Catalog No.	P	L	U/Price
Type	D		1~4
EHSL	1	0.3	50.00~100.00
		0.4	
		0.5	
		0.6~0.8	
EHSEL	1.5	0.3	50.00~100.00
		0.4	
		0.5	
		0.6~1.2	
EHSJL	2	0.7~1.8	100.00~150.00
		1.0~2.6	
		1.5~2.0	
		2.0~2.5	

Alterations	Code	Spec.	Price
	HC	HC = 0.1mm increments D + 1 ≤ HC < H, D ≥ 1.5	Quotation
	HCC	HCC = 0.1mm increments D + 1 ≤ HCC < H - 0.3, D ≥ 1.5	
	TC	TC = 0.1mm increments T/2 ≤ TC < T, D ≥ 1.5 T - TC ≤ Lmax - L Dimension L remains unchanged. Dimension N becomes shorter by (T-TC).	
	NC	Dowel hole boring Available when H ≥ 4 Combination with other than NHC/NHN/TMC/GVC not available.	
	NCW	Dowel hole boring + Spring pin driving Available when H ≥ 4 Combination with other than NHC/NHN/TMC/GVC not available.	
	NHC	Numbering on the head Combination with SKC not available	
	NHN	Automatic sequential numbering on the head Combination with SKC not available	
	TMC	Lapping on the tip face Available when P ≥ 0.6	
	GVC	S.B = 1mm increments Available for P = 3.0 2 ≤ S ≤ 10, S + 5 ≤ B ≤ 30	

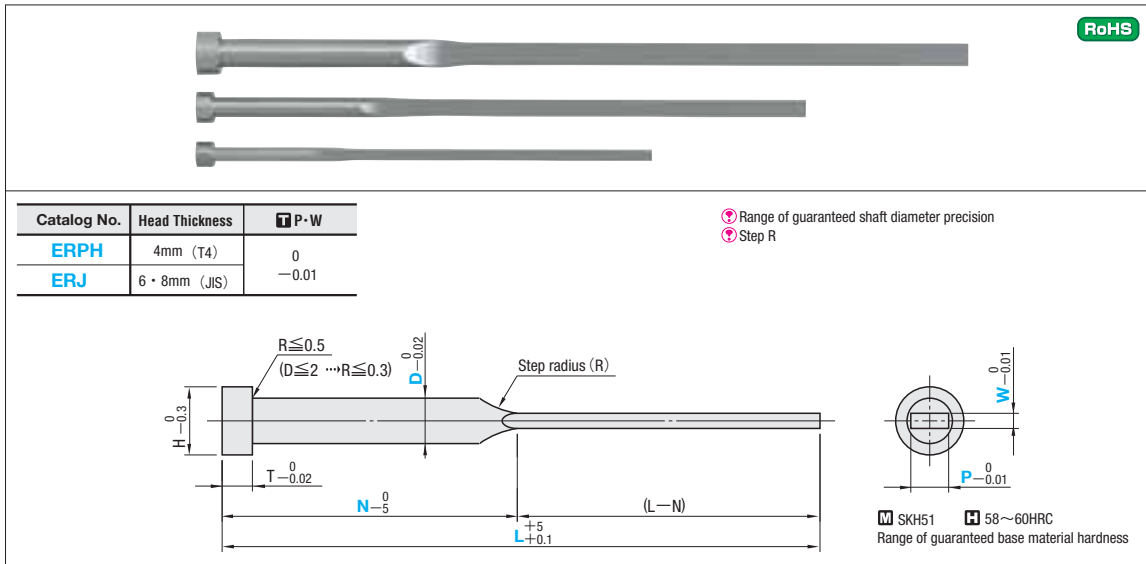
Catalog No.	P	L	U/Price
Type	D		1~4
EHSJL	4	2.0~3.0	100.00~150.00
		2.5~3.0	
		3.0~3.0	
EHSJEL	4.5	2.0 2.5	100.00~150.00
		2.5 3.0	
		3.0 3.0	

P·W $\begin{matrix} 0 \\ -0.01 \end{matrix}$
Standard

RECTANGULAR EJECTOR PINS

— STANDARD TYPE —

RoHS



Order **Catalog No.** **L** **P** **W** **N**
ERJ8 - 120 - P6.0 - W1.0 - N60

Delivery **5** Days Express **A** P.i
For area out of Singapore please refer to P.i.

Alterations **Catalog No.** **L** **P** **W** **N** (AKC · AWC...etc)
ERJ 8 - 120 - P6.0 - W1.0 - N60 - AKC 0
5 Days Express **A** Express services not available for KSA · WSA · NHC · NHN · MC
For area out of Singapore please refer to P.i.

Alterations	Code	Spec.	Price
	VAK	VAK=45° increments 0 ≤ VAK < 360 KSA, WSA not available	Quotation
	VAW	VAW=45° increments 0 ≤ VAW < 360 KSA, WSA not available	
	AKC	AKC=1° increments 0 ≤ AKC < 360 When combined with KSA/WSA, 90° increments only.	
	AWC	AWC=1° increments 0 ≤ AWC < 360 When combined with KSA/WSA, 90° increments only.	
	ARC	ARC=1° increments 0 ≤ ARC < 360 When combined with KSA/WSA, 90° increments only.	
	ADC	ADC=1° increments 0 ≤ ADC < 360 When combined with KSA/WSA, 90° increments only.	
	KGA	KGA=1° increments 0 < KGA < 360	
	KGD	KGD=1° increments 0 < KGD < 360	

Alterations	Code	Spec.	Price
	HC	HC=0.1mm increments D+1 ≤ HC < H	Quotation
	HCC	HCC=0.1mm increments D+1 ≤ HCC < H-0.3	
	KSA	KSA=0.1mm increments W/2+0.1 ≤ KSA ≤ D/2-0.1	
	WSA	WSA=0.1mm increments W/2+0.1 ≤ WSA ≤ D/2-0.1	
	TC	TC=0.1mm increments T/2 ≤ TC < T Dimensions L and N become shorter by (T-TC).	
	NHC	Numbering on the head	
	NHN	Automatic sequential numbering on the head	
	MC	Tapping Not available for ERPH. D8~8.5 → M4 D10~10.5 → M5 D12 → M6 Available when D ≥ 8	

All price & lead time are to be quoted.

The volume discount rate is also applicable to alteration cost.

4mm head JIS head		Catalog No.		L	P	W	N
H	T	4mm head	JIS head				
3				1.5	0.8 1.0 1.2	0.3 0.4 0.5 0.6	40 50 60 50 60 70 80
4				2	1.0 1.2 1.5	0.4 0.5 0.6 0.7 0.8 1.0	30 40 50 60 40 50 60 70 80 60 70 80
5				2.5	1.5 (2.0)	0.4 0.5 0.6 0.7 0.8 1.0 1.2 (1.5)	30 40 50 60 40 50 60 70 80 60 70 80 90 100
6				3	2.0 (2.5)	0.4 0.5 0.6 0.7 0.8 1.0 1.2 (1.5) (2.0)	40 50 60 40 50 60 70 80 90 60 70 80 100 120
7				3.5	2.5 (3.0)	0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.2 1.5 (2.0)	40 50 60 40 50 60 70 80 60 70 80 100 80 100
8				4	3.0 (3.5)	0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.2 1.5 (2.0)	40 50 60 40 50 60 70 40 50 60 70 80 90 60 70 80 100 120 80 100
8				4.5	3.5 (4.0)	0.6 0.7 0.8 0.9 1.0 1.2 1.5 1.8 (2.0)/(2.5)	40 50 60 70 40 50 60 70 40 50 60 70 60 70 80 90 100 90 100 120
8				5	4.0 (4.5)	0.6 0.7 0.8 0.9 1.0 1.2 1.5 1.8 2.0 2.5	40 50 60 70 40 50 60 70 40 50 60 70 80 90 60 70 80 60 70 80 100 100 120
9				5.5	4.5 (5.0)	0.8 0.9 1.0 1.2 1.5 1.8 2.0 (2.5)	40 50 60 70 40 50 60 70 40 50 60 70 60 70 60 70 80 100 100 120
9				6	5.0 (5.5)	0.8 0.9 1.0 1.2 1.5 1.8 2.0 2.5 3.0	40 50 60 70 40 50 60 70 80 60 70 80 60 70 80 90 100 90 100 120
10				6.5	6.0 (6.5)	0.8 0.9 1.0 1.2 1.5 1.8 2.0	40 50 60 70 80 100
10				7	6.0 (6.5) (7.0)	0.8 0.9 1.0 1.2 1.5 1.8 2.0 2.5	40 50 60 40 50 60 60 70 60 70 80 100 100 120 150 180
11				8	6.0 (6.5) (7.0) (7.5) (8.0)	0.8 0.9 1.0 1.2 1.5 1.8 2.0 2.5	40 50 60 40 50 60 60 70 60 70 80 100 100 120 130 160 150 180
14				8.5	7.0 (7.5) (8.0) (8.5)	0.8 0.9 1.0 1.2 1.5 1.8 2.0 2.5	40 50 60 50 60 60 70 80 100 100 120 130 160 150 180
15				10	8.0 (8.5) (9.0) (9.5) (10.0)	0.8 1.0 1.2 1.5 1.8 2.0 2.5	40 50 60 50 60 60 70 80 100 100 120 130 160 150 180
17				10.5	10.0 (10.5) (11.0) (11.5)	1.2 1.5 2.0	40 50 80 100 100 150 200
-				12	10.0 (10.5) (11.0) (11.5) (12.0)	1.2 1.5 1.8 2.0	40 60 80 100 100 100 150

L (120) (150) (175) (300) are available only for ERJ. Selections in which both the P and W dimensions are enclosed in brackets () cannot be made.

Quantity discount rate

Quantity	Rate
1~49	-
50~100	5%

Catalog No.	Type	U/Price for 1~49		
		D	L100·120·150	L175·200
ERPH	1.5			
	2			
	2.5			
	3			
	3.5			
	4			
	4.5			
	5			
	5.5			
	6			
	6.5			
	7			

Catalog No.	Type	U/Price for 1~49			
		D	L100·120·150	L175·200	L250
ERJ	4				
	4.5				
	5				
	5.5				
	6				
	6.5				
	7				
	8				
	8.5				
	10				
	10.5				
	12				

SKD61+Nitrided
Concentricity $\phi 0.03$
4mm head

STRAIGHT EJECTOR SLEEVES

— STANDARD TYPE —

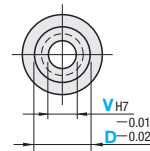
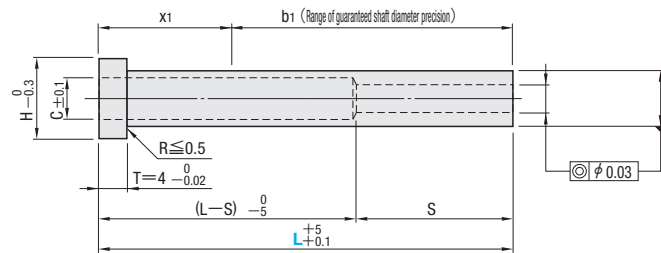
The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.



RoHS

Catalog No.	V	Applicable center pin shaft diameter tolerance
ESNV	H7	-0.01 -0.02 *Note that for sleeves with V dimension tolerance of H7, combination with center pins that have shaft diameter tolerance -0.005 is not recommended. The reason for this is the fitting sections S are longer.

VH7		
$V \leq 3.0$	$3.5 \leq V \leq 6.0$	$V \geq 6.5$
$+0.010$ 0	$+0.012$ 0	$+0.015$ 0



$C = V + 0.5$

L	75	100	125	150	175	200	225	250	275	300
S	40	50 (V1.5...4.0)	60 (V1.5...4.0)	60	80	80	80	80	90	90

Note that the Stepped Center Pin's shaft diameter (D) is too large to fit in the recess (C) of ESNV.

SKD61+Nitrided

Surface: 900HV~
Base material: 40±3HRC

b1 (Range of guaranteed shaft diameter precision)
x1 max.=30
Range of guaranteed base material hardness
Range of guaranteed surface hardness for nitriding



Alterations



Catalog No. — L — V — (KC · WKC...etc.)
ESNV8 — 100 — 4.0 — KC4.5

Alterations	Code	Spec.	Price
	KC	Single flat cutting $D/2 \leq KC < H/2$	Quotation
	WKC	Two flats cutting $D/2 \leq WKC < H/2$	
	KAC KBC	Varied width parallel flats cutting $D/2 \leq KAC < H/2$ $KBC = 0.1\text{mm}$ increments only $KAC < KBC < H/2$	
	RKC	Two flats (right angled) cutting $D/2 \leq RKC < H/2$	
	DKC	Three flats cutting $D/2 \leq DKC < H/2$	
	SKC	Four flats cutting $D/2 \leq SKC < H/2$	
	KGC	Two flats (angled) cutting $D/2 \leq KGC < H/2$ $AG = 1^\circ$ increments $0 < AG < 360$	
	KTC	Three flats cutting at 120° $D/2 \leq KTC < H/2$	
		(1) To align the key flat with the shaft diameter Unit of designation 0.05mm increments possible Tolerance -0.1 It remains at -0.1 even when D/2 is designated to fit shaft diameter. (2) To designate arbitrary key flat dimensions Unit of designation 0.1mm Tolerance -0.1	

Alterations	Code	Spec.	Price
	TC	TC=0.1mm increments $2.0 \leq TC < 4$ Dimensions L and (L-S) become shorter by (4-TC).	Quotation
	HC	HC=0.1mm increments $D \leq HC < H$ In relation to the head diameter tolerance, alteration may create a straight piece with little diameter difference between the head and shaft.	

H	Catalog No.		L							V Selection		
	Type	D	75	100	125	150	175	200	225	250	275	300
7	4	4	75	100	125	150						
			75	100	125	150	175	200				
8	4.5	4.5	75	100	125	150						
			75	100	125	150	175	200				
			75	100	125	150	175	200				
9	5.5	5.5	75	100	125	150	175	200				
			75	100	125	150	175	200	225	250		
10	6.5	6.5	75	100	125	150	175	200	225	250		
			75	100	125	150	175	200	225	250		
11	7.5	7.5	75	100	125	150	175	200	225	250		
			75	100	125	150	175	200	225	250		
14	9	9	100	125	150	175	200	225	250	275	300	
			100	125	150	175	200	225	250	275	300	
15	10	10	100	125	150	175	200	225	250	257	300	
			100	125	150	175	200	225	250	257	300	



Order

Catalog No. — L — V

ESNV8 — 100 — 4.0



Delivery

5 Days

For area out of Singapore please refer to P.I.

Quantity discount rate

Quantity	1~4	5~50
Rate	—	5%

Type	Catalog No.	D	U/Price for 1~4																			
			L																			
			75	100	125	150	175	200	225	250	275	300										
ESNV	4	V1.5																				
		V2.0 · 2.5																				
	4.5	V1.5																				
		V2.0 · 2.5																				
	5																					
	5.5																					
	6																					
	6.5																					
	7																					
	7.5																					
8																						
9																						
10																						

Quotation

SKD61+Nitrided
Concentricity $\odot 0.06$
4mm head

STRAIGHT EJECTOR SLEEVES

—STANDARD TYPE—

RoHS

Catalog No.	V	Applicable center pin shaft diameter tolerance
ESN	H7	$\begin{matrix} -0.01 \\ -0.02 \end{matrix}$ <small>**Note that for sleeves with V dimension tolerance of H7, combination with center pins that have shaft diameter tolerance ± 0.005 is not recommended. The reason for this is the fitting sections S are longer.</small>

V H7	$V \leq 3.0$	$3.5 \leq V \leq 6.0$	$6.5 \leq V \leq 10.0$	$V \geq 11.0$
	$\begin{matrix} +0.010 \\ 0 \end{matrix}$	$\begin{matrix} +0.012 \\ 0 \end{matrix}$	$\begin{matrix} +0.015 \\ 0 \end{matrix}$	$\begin{matrix} +0.018 \\ 0 \end{matrix}$

L	75	100	125	150	175	200	250	300
S	40	50 (V1.5 ~ 40)	60 (V1.5 ~ 40)	60	80	80	80	90

SKD61+Nitrided
 Surface : 900HV~
 Base material : 40±3HRC
 b1 (Range of guaranteed shaft diameter precision)
 x1 max=30
 Range of guaranteed base material hardness
 Range of guaranteed surface hardness for nitriding

Order **Catalog No.** - **L** - **V**
ESN8 - **100** - **4.0**
 Note that when you order ESN, entry of an alphabetical character (V) is not required.

Delivery **3** Days

Alterations **Catalog No.** - **L** - **V** - (KC · WKC...etc.)
ESN8 - **200** - **4.0** - **KC4.5**
5 Days Express A P.i.
 For area out of Singapore please refer to P.i.

Alterations	Code	Spec.	Price
	KC	Single flat cutting $D/2 \leq KC < H/2$	Quotation About Designation Unit and Tolerance for Key Flat Cutting (1) To align the key flat with the shaft diameter Unit of designation 0.05mm increments possible Tolerance $\begin{matrix} 0 \\ -0.1 \end{matrix}$ It remains at $\begin{matrix} 0 \\ -0.1 \end{matrix}$ even when D/2 is designated to fit shaft diameter.
	WKC	Two flats cutting $D/2 \leq WKC < H/2$	
	KAC KBC	Varied width parallel flats cutting $D/2 \leq KAC < H/2$ KBC=0.1mm increments only $KAC < KBC < H/2$	
	RKC	Two flats (right angled) cutting $D/2 \leq RKC < H/2$	
	DKC	Three flats cutting $D/2 \leq DKC < H/2$	
	SKC	Four flats cutting $D/2 \leq SKC < H/2$	
	KGC	Two flats (angled) cutting $D/2 \leq KGC < H/2$ AG=1° increments $0 < AG < 360$	
	KTC	Three flats cutting at 120° $D/2 \leq KTC < H/2$	Unit of designation 0.1mm Tolerance $\begin{matrix} 0 \\ -0.1 \end{matrix}$

Alterations	Code	Spec.	Price
	TC	TC=0.1mm increments $2.0 \leq TC < 4$ Dimensions L and (L-S) become shorter by (4-TC).	Quotation
	HC	HC=0.1mm increments $D \leq HC < H$ In relation to the head diameter tolerance, alteration may create a straight piece with little diameter difference between the head and shaft.	

The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.

H	Catalog No.		L								V Selection
	Type	D	75	100	125	150	175	200	250	300	
7	4	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	1.5
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	2.0
8	4.5	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	1.5
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	2.0
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	2.5
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	3.0
9	5.5	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	2.0
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	2.5
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	3.0
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	3.5
10	6.5	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	2.5
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	3.0
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	3.5
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	4.0
11	7.5	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	2.5
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	3.0
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	3.5
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	4.0
14	9	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	4.5
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	5.0
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	5.5
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	6.0
15	10	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	6.5
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	7.0
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	7.5
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	8.0
17	12	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	8.0
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	8.5
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	9.0
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	9.5
18	13	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	8.0
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	8.5
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	9.0
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	9.5
21	16	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	10.0
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	10.5
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	11.0
		\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	\triangle	12.0

Products with the \triangle marks are in 3-days, and ones with the \circ marks will be shipped in 5-days.

Quantity discount rate

Quantity	1~4	5~50
Rate	—	5%

Type	Catalog No.		U/Price for 1~4							
	D		L75	L100	L125	L150	L175	L200	L250	L300
ESN	4	V1.5								
		V2.0 · 2.5								
	4.5	V1.5								
		V2.0 · 2.5								
	5									
	5.5									
	6									
	6.5									
	7									
	7.5									
	8									
	9									
	10									
	12									
	13									
	16									

SKD61+Nitrided
Concentricity $\phi 0.06$
4mm head

STRAIGHT EJECTOR SLEEVES

— L DIMENSION DESIGNATION TYPE —

RoHS



Catalog No.	V	Applicable center pin shaft diameter tolerance
ESN-LC	H7	$\begin{matrix} -0.01 \\ -0.02 \end{matrix}$ ※Note that for sleeves with V dimension tolerance of H7, combination with center pins that have shaft diameter tolerance $\begin{matrix} 0 \\ -0.005 \end{matrix}$ is not recommended. The reason for this is the fitting sections S are longer.

VH7	V ≤ 3.0	3.5 ≤ V ≤ 6.0	6.5 ≤ V ≤ 10.0	V ≥ 11.0
	$\begin{matrix} +0.010 \\ 0 \end{matrix}$	$\begin{matrix} +0.012 \\ 0 \end{matrix}$	$\begin{matrix} +0.015 \\ 0 \end{matrix}$	$\begin{matrix} +0.018 \\ 0 \end{matrix}$

Ⓢ SKD61+Nitrided
 Ⓢ Surface : 900HV~
 Base material : 40±3HRC
 Ⓢ b1 (Range of guaranteed shaft diameter precision)
 x1 max. = 30
 Range of guaranteed base material hardness
 Range of guaranteed surface hardness for nitriding

Order **Catalog No.** — **L** — **V**
ESN-LC8 — **123.65** — **V4.0**

Delivery **5** Days **Express A** **P.i**
 Ⓢ For area out of Singapore please refer to P.i.

Alterations **Catalog No.** — **L** — **V** — (KC · WKC · etc.)
ESN-LC8 — **196.25** — **V4.0** — **KC4.5**

Ⓢ Express services not available for **CGX · RGX · CGZ · RGZ**.

Alterations	Code	Spec.	Price
	KC	Single flat cutting D/2 ≤ KC < H/2	Quotation About Designation Unit and Tolerance for Key Flat Cutting (1) To align the key flat with the shaft diameter Unit of designation 0.05mm increments possible Tolerance $\begin{matrix} 0 \\ -0.1 \end{matrix}$ Ⓢ It remains at $\begin{matrix} 0 \\ -0.1 \end{matrix}$ even when D/2 is designated to fit shaft diameter.
	WKC	Two flats cutting D/2 ≤ WKC < H/2	
	KAC	Varied width parallel flats cutting D/2 ≤ KAC < H/2 KBC = 0.1mm increments only KAC < KBC < H/2	
	RKC	Two flats (right angled) cutting D/2 ≤ RKC < H/2	
	DKC	Three flats cutting D/2 ≤ DKC < H/2	
	SKC	Four flats cutting D/2 ≤ SKC < H/2	
	KGC	Two flats (angled) cutting D/2 ≤ KGC < H/2 AG = 1° increments 0 < AG < 360	
	KTC	Three flats cutting at 120° D/2 ≤ KTC < H/2	
		(2) To designate arbitrary key flat dimensions Unit of designation 0.1mm Tolerance $\begin{matrix} 0 \\ -0.1 \end{matrix}$	

Alterations	Code	Spec.	Price
	TC	TC = 0.1mm increments 2.0 ≤ TC < 4, 4 - TC ≤ Lmax. - L Ⓢ Dimension L remains unchanged. Ⓢ Dimension Z becomes shorter by (4 - TC).	Quotation
	HC	HC = 0.1mm increments Ⓢ D ≤ HC < H Ⓢ In relation to the head diameter tolerance, alteration may create a straight piece with little diameter difference between the head and shaft.	
	CGX	CGX = 0.1mm increments Ⓢ 0.2 ≤ CGX ≤ 1.5 and CGX ≤ $\frac{D-V}{2} - 0.1$ Ⓢ Combination with RGX/CGZ/RGZ not available.	
	RGX	RGX = 0.1mm increments Ⓢ 0.3 ≤ RGX ≤ 1.5 and RGX ≤ $\frac{D-V}{2} - 0.1$ Ⓢ Combination with CGX/CGZ/RGZ not available.	
	CGZ	CGZ = 0.1mm increments Ⓢ 0.2 ≤ CGZ ≤ 1.0 and CGZ ≤ $\frac{D-V}{2} - 0.1$ Ⓢ Combination with CGX/RGX/RGZ not available.	
	RGZ	RGZ = 0.1mm increments Ⓢ 0.5 ≤ RGZ ≤ 1.0 and RGZ ≤ $\frac{D-V}{2} - 0.1$ Ⓢ Combination with CGX/RGX/CGZ not available.	

The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.

H	Catalog No.		L 0.01mm increments	V Selection
	Type	D		
7	ESN-LC	4	50.00 ~ 150.00	1.5
			50.00 ~ 200.00	2.0
8		4.5	50.00 ~ 150.00	1.5
			50.00 ~ 200.00	2.0
9		5	50.00 ~ 200.00	2.5
			50.00 ~ 200.00	3.0
10		6	50.00 ~ 200.00	2.0
			50.00 ~ 250.00	2.5
11		6.5	50.00 ~ 250.00	3.0
			50.00 ~ 250.00	3.5
14	7	50.00 ~ 250.00	4.0	
		50.00 ~ 250.00	4.5	
15	7.5	50.00 ~ 250.00	5.0	
		50.00 ~ 250.00	3.0	
17	8	50.00 ~ 250.00	3.5	
		50.00 ~ 250.00	4.0	
18	9	50.00 ~ 250.00	4.5	
		50.00 ~ 250.00	5.0	
21	10	50.00 ~ 250.00	5.5	
		50.00 ~ 250.00	6.0	
14	9	80.00 ~ 300.00	6.0	
		80.00 ~ 300.00	6.5	
15	10	80.00 ~ 300.00	7.0	
		80.00 ~ 300.00	8.0	
17	12	80.00 ~ 300.00	8.0	
		80.00 ~ 300.00	9.0	
18	13	80.00 ~ 300.00	8.0	
		80.00 ~ 300.00	9.0	
21	16	80.00 ~ 300.00	10.0	
		80.00 ~ 300.00	10.0	
21	16	80.00 ~ 300.00	11.0	
		80.00 ~ 300.00	12.0	

Ⓢ For L dimension less than 50mm, please use Short Ejector Sleeves ECB, ECBB. (Only for D4·5·6·7·8·10)

Quantity discount rate

Quantity	1~4	5~12	13~19	20~50
Rate	—	5%	10%	15%

Type	D	U/Price for 1~4							
		L50.00 ~ 75.00	L75.01 ~ 100.00	L100.01 ~ 125.00	L125.01 ~ 150.00	L150.01 ~ 175.00	L175.01 ~ 200.00	L200.01 ~ 250.00	L250.01 ~ 300.00
ESN-LC	4	V1.5							
	4.5	V2.0 · 2.5							
		V1.5							
	5	V2.0 · 2.5							
		V1.5							
	5.5								
	6								
	6.5								
	7								
	7.5								
	8								
	9								
	10								
	12								
	13								
	16								

Quotation

SKD61+Nitrided
Concentricity $\odot 0.06$
JIS head

STRAIGHT EJECTOR SLEEVES

— STANDARD TYPE —

RoHS

Catalog No.	V	Applicable center pin shaft diameter tolerance
ESJ	H7	-0.01 -0.02 ※ Note that for sleeves with V dimension tolerance of H7, combination with center pins that have shaft diameter tolerance $0_{-0.005}$ is not recommended. The reason for this is the fitting sections S are longer.

D	D ≤ 12	D ≥ 15
	-0.01 -0.02	-0.01 -0.03

V H7	V ≤ 3	3.5 ≤ V ≤ 6	6.5 ≤ V ≤ 10	V ≥ 12
	$+0.010$ 0	$+0.012$ 0	$+0.015$ 0	$+0.018$ 0

SKD61+Nitrided
Surface : 900HV~
Base material : 40±3HRC
b1 (Range of guaranteed shaft diameter precision)
x1 max.=35
Range of guaranteed base material hardness
Range of guaranteed surface hardness for nitriding

Alterations Catalog No. - L - V - (KC · WKC · etc.)
ESJ8 - 200 - 4 - KC4.0

Alterations	Code	Spec.	Price
	KC	Single flat cutting $D/2 \leq KC < H/2$	Quotation
	WKC	Two flats cutting $D/2 \leq WKC < H/2$	
	KAC KBC	Varied width parallel flats cutting $D/2 \leq KAC < H/2$ KBC=0.1mm increments only $KAC < KBC < H/2$	
	RKC	Two flats (right angled) cutting $D/2 \leq RKC < H/2$	
	DKC	Three flats cutting $D/2 \leq DKC < H/2$	
	SKC	Four flats cutting $D/2 \leq SKC < H/2$	
	KGC	Two flats (angled) cutting $D/2 \leq KGC < H/2$ AG=1° increments $0 < AG < 360$	
	KTC	Three flats cutting at 120° $D/2 \leq KTC < H/2$	

Alterations	Code	Spec.	Price
	TC	TC=0.1mm increments $T/2 \leq TC < T$	Quotation
	HC	HC=0.1mm increments $D \leq HC < H$ In relation to the head diameter tolerance, alteration may create a straight piece with little diameter difference between the head and shaft.	

The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.

H	T	Catalog No.	L	V Selection
		Type	D	
8		4	100 120 140	1.5
			100 120 140 160 180 200	2 2.5
		4.5	100 120 140	1.5
			100 120 140 160 180 200	2 2.5
9		5	100 120 140 160 180 200 225	2 2.5 3
			250 275 300	3
10		5.5	100 120 140 160 180 200 225	2 2.5 3
			250 275 300	3
11		6	100 120 140 160 180 200 225 250 275 300	2 2.5 3 3.5 4
			325 350 375 400 425 450	3 3.5
12		6.5	100 120 140 160 180 200 225 250 275 300	2 2.5 3 3.5 4
			325 350 375 400 425 450	3 3.5 4
13		7	100 120 140 160 180 200 225 250 275 300	2 2.5 3 3.5 4 4.5
			325 350 375 400 425 450	3 3.5 4 4.5
14		7.5	100 120 140 160 180 200 225 250 275 300	3 3.5 4 4.5
			325 350 375	3.5 4 4.5
15		8	100 120 140 160 180 200 225 250 275 300	2 2.5 3 3.5 4 4.5 5 5.5
			325 350 375 400 425 450	3 3.5 4 4.5 5
16		8	475 500	5
17		9	100 120 140 160 180 200 225 250 275 300	2 2.5 3 3.5 4 4.5 5 5.5
			325 350 375 400 425 450	3 3.5 4 4.5 5
18		9	475 500	5 5.5 6
19		10	100 120 140 160 180 200 225 250 275 300 325 350 375 400 425 450	4 4.5 5 5.5 6 6.5 7
			475 500	5 5.5 6 6.5 7
20		10	100 120 140 160 180 200 225 250 275 300 325 350 375 400 425 450	4 4.5 5 5.5 6 6.5 7 8 8.5
			475 500	5 5.5 6 6.5 7 8
21		12	100 120 140 160 180 200 225 250 275 300 325 350 375 400 425 450	4 4.5 5 5.5 6 6.5 7 8
			475 500	5 5.5 6 6.5 7 8
22		15	200 225 250 275 300 325 350 375 400 425 450 475 500	9 10
			200 225 250 275 300 325 350 375 400 425 450 475 500	12 15

Order Catalog No. - L - V Delivery **5** Days Express A P.i
ESJ6.5 - 120 - 2.5
Note that when you order ESJ, entry of an alphabetical character (V) is not required.
For area out of Singapore please refer to P.i.


Quantity discount rate

Quantity	1~4	5~50
Rate	-	5%

Catalog No.		U/Price for 1~4																	
		L																	
Type	D	100	120	140	160	180	200	225	250	275	300	325	350	375	400	425	450	475	500
ESJ	4	V1.5																	
		V2.5																	
	4.5	V1.5																	
		V2.5																	
		5																	
		5.5																	
		6																	
		6.5																	
		7																	
		7.5																	
		8																	
		9																	
		10																	
		12																	
		15																	
	20																		

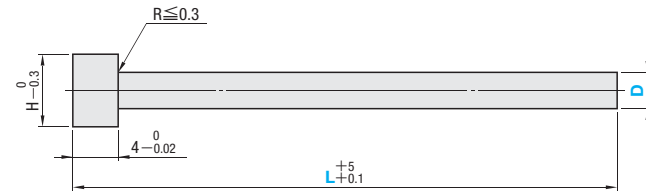
CORE PIN BLANKS

The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.




RoHS

Catalog No.	Material	Hardness	Tolerance
CPD	SKD61	48~52HRC	-0.01 -0.02
CPH	SKH51	58~60HRC	0 -0.005





H	Catalog No.		L
	Type	D	
3	CPD* (SKD61)	1	60*
		1.1	
		1.2	
		1.3	
		1.4	
		1.5	
4	CPD* (SKD61)	1.6	60*
		1.7	
		1.8	
		1.9	
5	CPH (SKH51)	2*	100*
2.5*			
3*			
3.5*			
4*			
4.5*			
5*			
5.5*			
6*			
6.5*			
7*			
8*			
10	CPH (SKH51)	10*	100*
13			
15			
18			
21	CPH (SKH51)	21	100*
21			

CPD with * are Stock Product.

 Order

Catalog No. — **L**
CPD6 — **60**

 Delivery

CPD*CPH • **Printed in Blue**
 **SGP Stock** **3** Days

☎ For area out of Singapore please refer to P.I.

Quantity discount rate


Quantity	1~49	50~100
Rate	—	5%

Catalog No.	U/Price for 1~49		
	Type	D	L60
CPD (SKD61)	1		
	1.1		
	1.2		
	1.3		
	1.4		
	1.5		
	1.6		
	1.7		
	1.8		
	1.9		
	2		
	2.5		
	3		
	3.5		
	4		
	4.5		
5			
5.5			
6			
6.5			
7			
8			
10			
13			
16			

Catalog No.	U/Price for 1~49		
	Type	D	L60
CPH (SKH51)	1		
	1.1		
	1.2		
	1.3		
	1.4		
	1.5		
	1.6		
	1.7		
	1.8		
	1.9		
	2		
	2.5		
	3		
	3.5		
	4		
	4.5		
5			
5.5			
6			
6.5			
7			
8			
10			
13			
16			

ANGULAR PINS

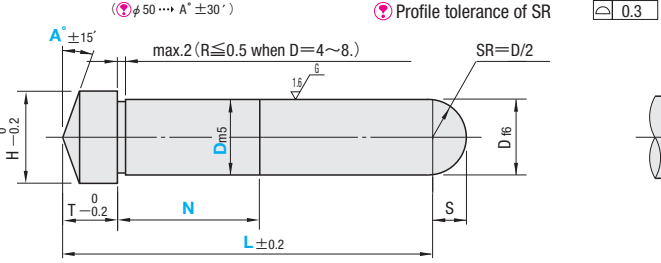
The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.



RoHS

D	M	H
4~8	SKD11	60~63HRC
10~50	SUJ2	58HRC~ (Induction hardening)

AP



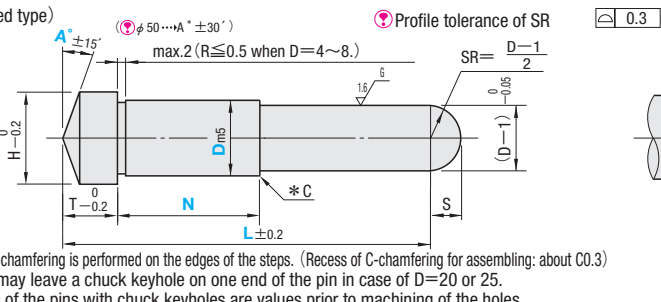
⚠ Profile tolerance of SR $\Delta 0.3$

⚠ When $D \geq 25$, the pin tip becomes as shown in the drawing on the left.

⚠ $R \leq 0.5$ when $D = 4 \sim 8$.

⚠ Machining may leave a chuck keyhole on one end of the pin in case of $D=20$ or 25. Dimensions of the pins with chuck keyholes are values prior to machining of the holes. In case of $D=30$ or more, the both ends may have chuck keyholes.

APS (Stepped type)



⚠ Profile tolerance of SR $\Delta 0.3$

⚠ When $D \geq 25$, the pin tip becomes as shown in the drawing on the left.

⚠ $R \leq 0.5$ when $D = 4 \sim 8$.

* For $D4 \sim 25$, C-chamfering is performed on the edges of the steps. (Recess of C-chamfering for assembling: about C0.3)

⚠ Machining may leave a chuck keyhole on one end of the pin in case of $D=20$ or 25. Dimensions of the pins with chuck keyholes are values prior to machining of the holes. In case of $D=30$ or more, the both ends may have chuck keyholes.

Order

Catalog No.	L	N	A
AP25	200.0	N30.0	A15
APS25	200.0	N30.0	A15

Quantity discount rate

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

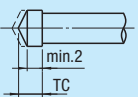
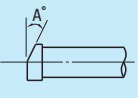
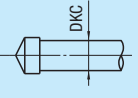
Delivery

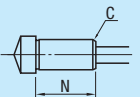
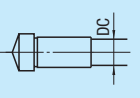
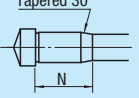
- D4~25 **5** Days **P.i**
- D30~50 **5** Days **P.i**

⚠ For area out of Singapore please refer to P.i.

Alterations

Catalog No.	L	N	A	(TC · CM · DKC · DC · KAC · TM)
APS 25	200.0	N30.0	A15	DC24.5 - DKC - KAC

Alterations	Code	Spec.	Price
	TC	TC=0.1mm increments (Reduces the head thickness. The full length remains unchanged.) ⚠ $T > TC \geq H/2 \tan A + 2.0$ TC min: Fractions are rounded up to the first digit ⚠ $TC = 13/2 \tan 18^\circ + 2.0 = 4.112 \approx 4.2$	Quotation
	KAC	Single flat chamfering Changes the head shape from a cone to a single flat cut. ⚠ Available when $D \leq 30$	
	DKC	Press-fit section tolerance alteration Changes $D_{ms} \rightarrow D + 0.005$ ⚠ Available when $D \leq 30$ ⚠ Available when $N \leq 200$	

Alterations	Code	Spec.	Price
	CM	Performs chamfering on the edge of the step. (Recess of C-chamfering for assembling: about C0.3) ⚠ Available for APS when $D \geq 30$ Chamfering is performed as standard for $D \leq 25$.	Quotation
	DC	Changes (D-1) step by designation. DC=0.1mm increments Tolerance of the step's external diameter: -0.05 ⚠ $D - 0.1 \geq DC > D - 1$ ⚠ When DC is used $SR = \frac{DC}{2}$ ⚠ Available for APS when $D \leq 30$	
	TM	Adds a 30° Taper on the edge of step. (Taper for installation) ⚠ Available for APS ⚠ Combination with CM · DC not available	

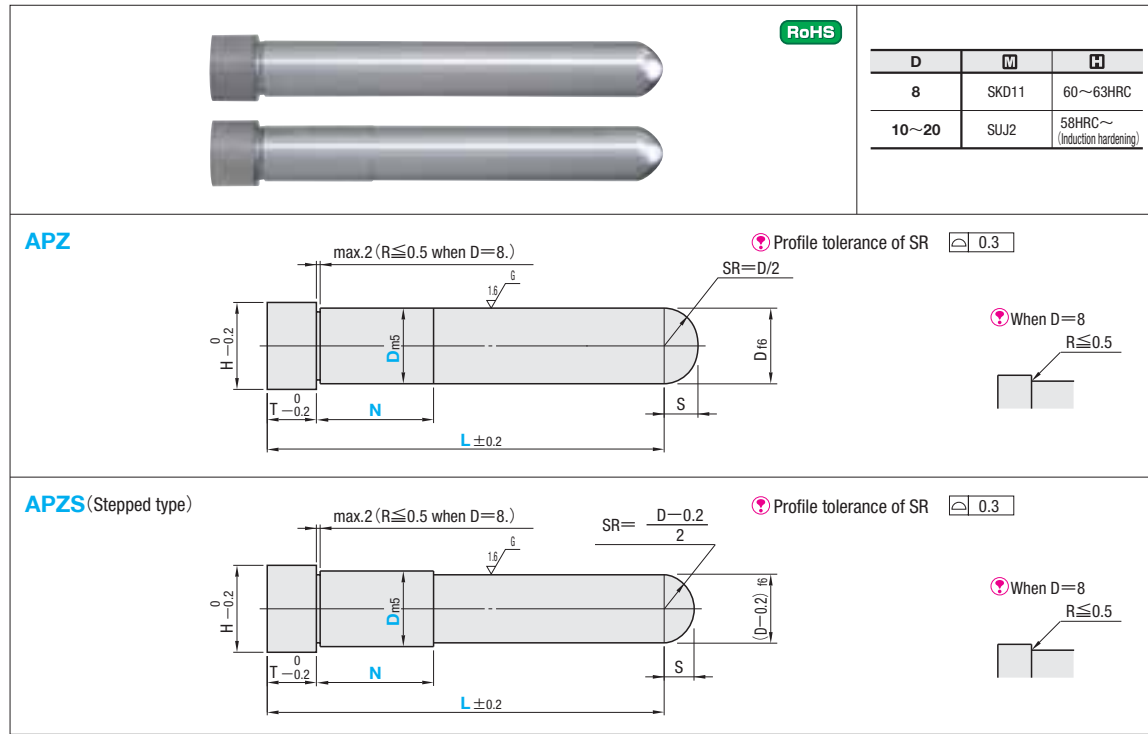
D	m5	f6 (AP)	T	H	S		Catalog No.		0.1mm increments		A 1° increments	U/Price for 1~9	
					AP	APS	Type	D	L	N		AP	APS
4			5	7	2	1.5	AP	4	15.0~70.0	2 ≤ N N ≤ L - T - 1 or N = 0 (No press-fit section)	0~30		
5	+0.009 +0.004	-0.010 -0.018		8	2.5	2		5	70.1~90.0 15.0~70.0 70.1~90.0 90.1~100.0				
6			10	9	3	2.5	AP	6	15.0~70.0 70.1~90.0 90.1~110.0				
8	+0.012 +0.006	-0.013 -0.022		11	4	3.5		8	15.0~80.0 80.1~110.0 110.1~130.0 20.0~110.0				
10			13	13	5	4.5	APS (Stepped type)	10	110.1~160.0 160.1~200.0 20.0~110.0				
12				15	6	5.5		12	110.1~160.0 160.1~200.0 200.1~250.0 20.0~110.0				
13	+0.015 +0.007	-0.016 -0.027	13	16	6.5	6	AP	13	110.1~160.0 160.1~200.0 200.1~250.0 20.0~110.0				
15				18	7.5	7		15	110.1~160.0 160.1~200.0 200.1~250.0 20.0~110.0				
16			13	19	8	7.5	APS (Stepped type)	16	110.1~160.0 160.1~200.0 200.1~250.0 40.0~130.0 130.1~200.0 20.0~110.0				
20				23	9.5	9		20	130.1~200.0 200.1~300.0 300.1~350.0 40.0~130.0				
25	+0.017 +0.008	-0.020 -0.033	15	28	10	10	AP	25	130.1~200.0 200.1~300.0 300.1~350.0 350.1~400.0 60.0~160.0				
30				35	10	10		30	160.1~220.0 220.1~300.0 300.1~400.0 400.1~500.0 70.0~160.0				
32			15	37	10	10	APS (Stepped type)	32	160.1~220.0 220.1~300.0 300.1~400.0 400.1~500.0 100.0~160.0				
35	+0.020 +0.009	-0.025 -0.041		40	10	10		35	160.1~220.0 220.1~300.0 300.1~400.0 400.1~500.0 100.0~160.0				
40			20	45	10	10	AP	40	160.1~220.0 220.1~300.0 300.1~400.0 400.1~500.0 200.0~260.0				
50				55	10	10		50	260.1~320.0 320.1~400.0 400.1~500.0				

Quotation

ANGULAR PINS

—ECONOMY TYPE—

The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.



Order Catalog No. — L — N
APZ13 — 100 — N30.0

Delivery 5 Days Express T Express A P.i.
For area out of Singapore please refer to P.i.

Alterations Catalog No. — L(LC) — N — (ATC · KAC · TTC · DKC · DC · TM)
APZ13 — 100 — N30.0 — ATC — A15 — TC6.0
APZS13 — LC95 — N30.0 — KAC — A15 — TTC6.0 — DKC — DC12.5

Quantity discount rate

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

Alterations	Code	Spec.	Price	Alterations	Code	Spec.	Price
	ATC	Makes the head end into a cone and reduces the head thickness. The full length becomes shorter by (T-TC). The full length is the same as LC when LC is combined. A=1° increments A=0~30° TC=0.1mm increments T ≥ TC ≥ 2.0 Designation method ATC—A15—TC6.0 TC ≥ H/2 tanA + 2.0 TC min: Fractions are rounded up to the first decimal place. TC = 16/2 tan15° + 2.0 = 4.1432 → 4.2	Quotation		LC	Full length alteration LC=0.1mm increments D LC 8 40 < LC < 110 10 12 50 < LC < 130 13 15 70 < LC < 140 16 20 90 < LC < 180 When this pin is used in combination with an ATC, the overall length becomes the dimension from the thick end face of the flange specified by the ATC.	Quotation
	KAC	Single flat chamfering Adds a single flat on the head. A=1° increments A=0~30° Designation method KAC—A15 Combination with ATC · TTC not available.			DKC	Press-fit section tolerance alteration Changes Dm5 → D +0.005 / 0	
	TTC	Head thickness change TTC=0.1mm increments T > TTC ≥ 2.0 The full length becomes shorter by (T-TTC). The full length is the same as LC when LC is combined.			DC	Changes (D-0.2) step by designation. DC=0.1mm increments D-0.1 ≥ DC > D-1 Tolerance of the step's external diameter: f6 Available for APZS.	
	TM	Adds a 30° Taper on the edge of step. (Taper for installation) Available for APZS Combination with DC not available.					

D	m5	f6	T	H	S		Catalog No.		L	N	U/Price for 1~9			
					APZ	APZS	Type	D			APZ	APZS		
8			5	11	4	3.9	APZ	APZS	8	0.1mm increments	2 ≤ N ≤ L-T-1 or N=0 (No press-fit section)	40		
												50		
												60		
												70		
												80		
10			10	13	5	4.9	APZ	APZS	10	0.1mm increments	2 ≤ N ≤ L-T-1 or N=0 (No press-fit section)	40		
												50		
												60		
												70		
												80		
12			12	15	6	5.9	APZ	APZS	12	0.1mm increments	2 ≤ N ≤ L-T-1 or N=0 (No press-fit section)	50		
												60		
												70		
												80		
												90		
13			13	16	6.5	6.4	APZ	APZS	13	0.1mm increments	2 ≤ N ≤ L-T-1 or N=0 (No press-fit section)	100		
												110		
												120		
												130		
												140		
15			15	18	7.5	7.4	APZ	APZS	15	0.1mm increments	2 ≤ N ≤ L-T-1 or N=0 (No press-fit section)	70		
												80		
												90		
												100		
												110		
16			16	19	8	7.9	APZ	APZS	16	0.1mm increments	2 ≤ N ≤ L-T-1 or N=0 (No press-fit section)	120		
												130		
												140		
												140		
												70		
20			20	23	10	9.9	APZ	APZS	20	0.1mm increments	2 ≤ N ≤ L-T-1 or N=0 (No press-fit section)	90		
												100		
												110		
												120		
												130		

Quotation