

Over 60 years of Quality and Service

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Royal

PINS

PUNCHES

PERFORATORS

and
Specialized
components
for Dies
and Molds



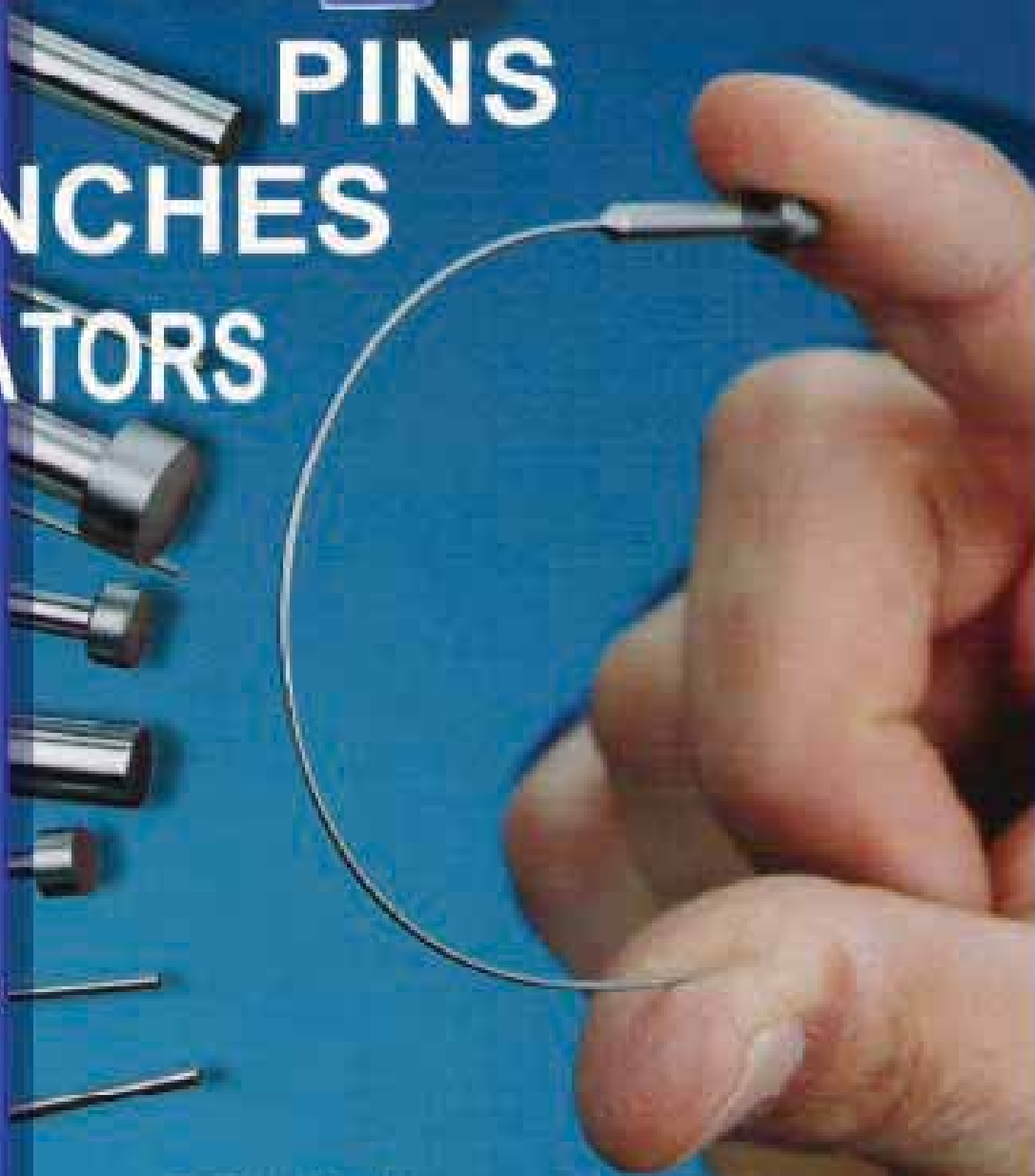
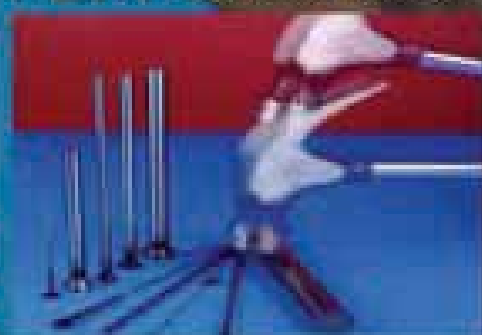
PRECISION



QUALITY



PERFORMANCE



Royal®



Precision Crafted Pins, Punches, Perforators, and Specialized Components for Dies and Molds

ESTABLISHED "1946"



Our modern plant in Warren, Rhode Island, and our large investment in highly specialized equipment ensures that all our customers receive the highest quality Punches, Pins and Perforators available in the world today.

THE ROYAL FAMILY of PUNCHES and PINS

Royal Diversified Products, Inc.,



was founded in 1946 and was one of the pioneers of the economical 60 degree "bevel headed" punch.

Royal offers a wide variety of Pins, Punches, and Perforators for use in the tool, die, automation, stamping, molding and related industries.

MATERIALS & COATINGS



Royal uses only the highest quality steels for our pins and punches. A variety of coatings are available including: Ion nitriding, Titanium Nitriding, Chrome, Black Oxide and Diconite Dry-lube. All of these and other coatings are offered per quotation.

EXPERT HEAT TREATMENT



Along with traditional methods, ROYAL's in-house heat treatment department utilizes computer regulated vacuum furnaces pre-programmed with a proprietary heat treating process. This results

in M-2 High Speed Steel with superior tensile strength, hand in hand with extraordinarily high hardness. This strength and flexibility is found only in Royal Pins.



ROYAL SERVICE

Royal ships more punches and perforators the same day, from stock, than anyone else. In most cases customer orders received before 3pm E.S.T. are shipped the same day.



PREMIUM SERVICES In a Hurry?

When you order non standard or special pins, we make every effort to get them to you as soon as we can. However, ROYAL recognizes that sometimes you



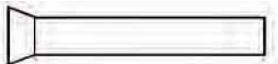
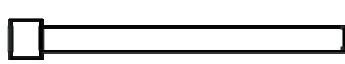
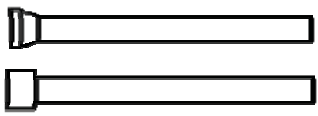
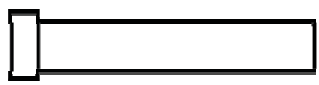
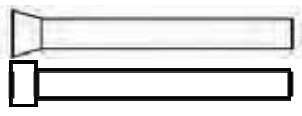
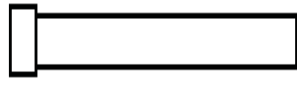
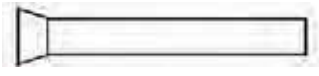
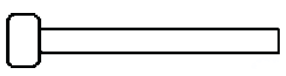
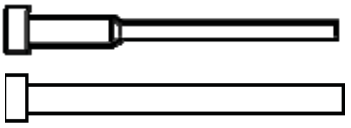
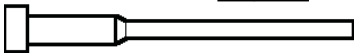
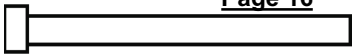
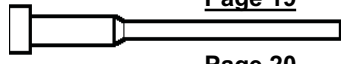
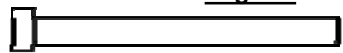
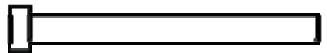
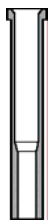
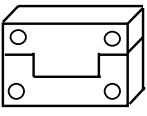
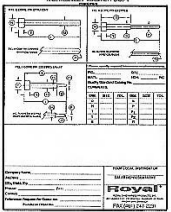
need to receive delivery earlier than our estimated shipment date. When this is the case, please call us. Usually we can offer other options to speed up delivery.

ROYAL DIVERSIFIED PRODUCTS

287 MARKET STREET WARREN, RI 02885 • PHONE: 401-245-6900 - TOLL FREE 800-556-7916 - FAX 401-247-2231

www.royalpins.com

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CUSTOM MODIFICATIONS



The modifications shown below are only those most frequently requested and do not represent the limit of our capabilities with regards to size ranges and tolerances. Also please refer to the worksheet templates provided on pages 25-28.

Modification	Type	Description	Tolerances	How To Order: Examples
	ML	REDUCED OVERALL LENGTH Stock removal from front-end. Minimum length .500". Lengths under .500" per special quote only.	+ .015" - .000"	SQD .230 ML=1.063 HSS B-1 .030 ML=1.750 RQA .056 ML=1.500
	CL	PRECISION OVERALL LENGTH Same as above except closer tolerance held.	+/- .001"	RQB .175 CL=2.157 RCX-9 CL=5.312 PT-5-1/2 CL=4.093
	MT	REDUCED HEAD THICKNESS Shorter head than standard. Stock removal from back of head Shortens overall length	+ .010" - .000"	SQD .157 X2-1/2 TS, MT=.094 RC-17 L-3, MT=.156
	CT	PRECISION HEAD THICKNESS Same as above except closer tolerance held.	+/- .001"	SQD .204 X 2 HSS, CT=.118 RQB .090 X 2-1/2, CT=.090 RQA .130 X 6, CT=.083
	MH	REDUCED HEAD DIAMETER Head diameter smaller than standard. Minimum head diameter equals "D". Grinding head diameter on RQA does not change head thickness.	+/- .001"	RQB .240 X 4, MH=.280 SQD .370 X 2-1/2 HSS, MH=.437 PT-11 L-6, MH=.250
	PS	PUNCH STEP "B" = .750" Max. Specify "B" or "SBR" and "P" including tolerance	B + .06" - .00" SBR + .06" - .00" P - Specify	RQB-PS .125 X 2-1/2, P=.093 +.0003/-0, B=.500 CPB-PS-12 X 2-1/2, P=.109+.0005/-0, B=.625 PPB-PS 37 X 3, P=.290 +.0002/-0, SBR=.437 AB-20-PS .312 X 3-1/2, P=.255 +.0003/-0, B=.500
	CS	CORE PIN STEP - STRAIGHT "B" = .750" Max. Should be ordered in conjunction with "CL" modification and "CT" if required. Specify "B", "P", "CL" and "CT" if required.	B +/- .001" CL +/- .001" CT +/- .001" P - Specify	RQB-CS .067, CL=.940, B=.210, P=.050 RCX-13-CS, CL=2.590, B=.700, P=.157 PT-10-CS, CL=3.750, B=.730, P=.133
	CSD	CORE PIN STEP - DRAFT B=.750" max. Includes custom modifications "CL" and "CT" if required. Specify "B", "P1", "P2", "CL" and "CT" if required.	B +/- .001" CL +/- .001" CT +/- .001" P1 +.001"/-0 P2 +.001"/-0	RCX-19 -CSD, CL=2.187, B=.431, P1=.255, P2=.263 RQB-CSD .236, CL=.870, B=.575, P1=.197, P2=.207, CT = .125
	PN	PILOT NOSE Pilot nose is included in the overall length.	Standard	SQF-PN .250 X 2-1/2 HSS B-15-PN .238 X 3 RQA-PN .136 X 2-1/2
	SR	SPHERICAL RADIUS Radius is half the diameter. Also specify "ML" or "CL" AND "CT" If required.	Standard	RQB-SR .060 X 2-1/2 AB-7-SR .125 X 2 RCX-11-SR L-3
Coatings	TiN	TITANIUM NITRIDE COATING PVD wear resistant thin film coating. TiN is an excellent coating for wear part applications demanding resistance to abrasive and adhesive wear. Typical coating thickness is .00005" to .00010" per side.	Diameter tolerances are before coating only. We cannot guarantee tolerance after coating.	RQB .075 X 4 TiN
	DICRONITE	PERMANENT DRY-LUBE TREATMENT A Tungsten Disulfide coating that provides a thin barrier between opposing metal surfaces and prevents metal to metal contact to improve lubricity. Applied at room temperature and unaffected by the heat of the molding process, it will extend the life of the pins while providing fail safe protection by eliminating galling and seizing. Dicronite does not migrate to the molded surface. Typical coating thickness is .000020" per side.	Diameter tolerances are before coating only. We cannot guarantee tolerance after coating.	RX-25 L- 10 Dicronite PT-5-2 L-6 DICRONITE

RQA TYPE

PERFORATORS/CORE PIN BLANKS

M-2 HIGH SPEED STEEL, 60-63 RC

PRECISION FORM-GROUND

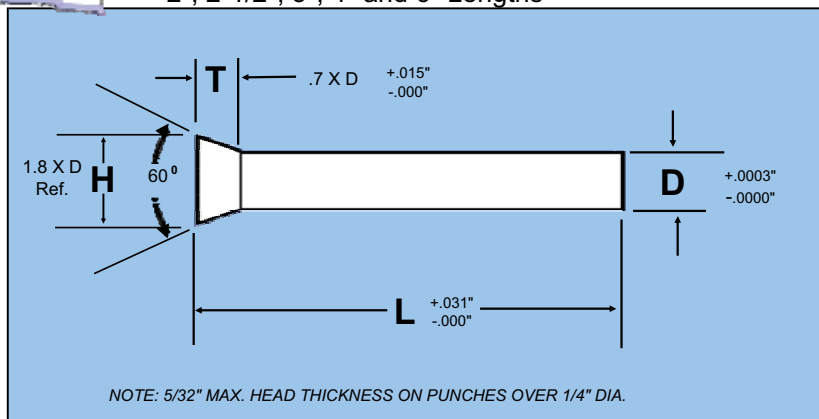
DIAMETERS IN .001" OR .0001" INCREMENTS

The following fractional diameters are included in the .001" increment price tables below: 1/32, 3/64, 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, & 3/8.



Royal

2", 2-1/2", 3", 4" and 6" Lengths



HOW TO ORDER: EXAMPLES				
Qty.	Type	Dia.	X	Length
25	RQA	.1875	X	4
50	RQA	.197	X	2-1/2

D DIAMETER .001" INCREMENTS	NET PRICE EACH PER QUANTITY (US \$)				
	L - LENGTH				
	2"				
	50-99	25-49	10-24	5-9	1-4
.010 - .014	3.08	3.22	3.36	4.20	5.04
.015 - .019	2.57	2.69	2.80	3.50	4.20
.020 - .029	2.06	2.15	2.25	2.81	3.37

D DIAMETER .001" INCREMENTS	NET PRICE EACH PER QUANTITY (US \$)																				ML MODIFY LENGTH ADD TO BASE PRICE
	L - LENGTH																				
	2-1/2"					3"					4"					6"					
	50-99	25-49	10-24	5-9	1-4	50-99	25-49	10-24	5-9	1-4	50-99	25-49	10-24	5-9	1-4	50-99	25-49	10-24	5-9	1-4	
.030 -.055	1.64	1.71	1.80	2.25	2.70	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	\$0.20 EACH OR \$15.00 MIN.
.056 -.087	1.76	1.84	1.92	2.39	2.88	2.26	2.36	2.46	4.29	7.97	3.80	3.98	4.16	6.00	9.67	6.89	7.20	7.52	9.36	13.03	
.088 -.131	1.96	2.05	2.14	2.68	3.21	2.47	2.58	2.70	4.54	8.21	3.51	3.66	3.82	5.66	9.33	6.59	6.89	7.18	9.02	12.69	
.132 -.179	2.06	2.15	2.25	2.81	3.37	2.57	2.69	2.80	4.64	8.32	3.60	3.76	3.94	5.78	9.45	6.69	6.99	7.30	9.14	12.81	\$0.26 EACH OR \$18.00 MIN.
.180 -.225	2.37	2.48	2.58	3.22	3.87	2.89	3.01	3.14	4.98	8.65	3.92	4.10	4.25	6.09	9.77	6.99	7.31	7.63	9.47	13.15	
.226 -.250	2.68	2.80	2.92	3.65	4.38	3.18	3.33	3.48	5.31	8.99	4.21	4.41	4.60	6.44	10.11	7.30	7.63	7.96	9.80	13.47	
.251 -.336	3.00	3.13	3.27	4.08	4.89	3.51	3.66	3.82	5.66	9.33	4.54	4.71	4.92	6.76	10.44	7.62	7.96	8.32	10.15	13.83	\$0.32 EACH OR \$23.00 MIN.
.337 -.375	3.26	3.39	3.54	4.42	5.31	3.76	3.93	4.11	5.94	9.62	4.79	5.00	5.22	7.06	10.73	7.88	8.23	8.59	10.43	14.10	
	STANDARD					NON-STANDARD															

DIAMETERS IN .0001" INCREMENTS MADE TO ORDER	SETUP CHARGE - ADD TO STANDARD PRICE			
	2-1/2"	3"	4"	6"
	\$20.00		\$40.00	

QUANTITY DISCOUNTS	
Based on one size, one shipment and one destination	
100 Pcs.....50 Pc. Price Less 7%	Over 300 Pieces..... Call For Pricing

CUSTOM MODIFICATIONS PRICE AND DELIVERY PER QUOTATION	The following are some of the modifications which can be made to this product. Please refer to page 1 for more information on ordering this product with these modifications or use the worksheet templates provided on pages 25-28.										
	ML*	CL	MT	CT	MH	PS	CS	CSD	PN	SR	COATINGS
											TIN Dicronite

*ML MODIFICATION IS PRICED IN THE TABLE ABOVE

Q = Price Per Quotation



PERFORATORS/CORE PIN BLANKS

M-2 HIGH SPEED STEEL, 60-63 RC

PRECISION FORM-GROUND .001" OR .0001" INCREMENTS

D DIAMETER .001" INCREMENTS	H HEAD DIA.	T HEAD THICK.	NET PRICE EACH PER QUANTITY (US \$)				
			2"				
			50-99	25-49	12-24	5-11	1-4
.010 - .014	1/32	1/16	3.14	3.28	3.42	4.28	5.13
.015 - .019	1/32	1/16	2.61	2.74	2.86	3.57	4.28
.020 - .029	3/64	1/16	2.10	2.19	2.29	2.87	3.43

Including the popular fraction sizes:

1/32, 3/64, 1/16, 5/64, 3/32,
7/64, 1/8, 9/64, 5/32, 3/16,
7/32, 1/4, 9/32, 5/16, & 3/8.

D DIAMETER .001" INCREMENTS	H HEAD DIA.	T HEAD THICK	NET PRICE EACH PER QUANTITY (US \$)									
			L - LENGTH									
			2-1/2"					3"				
			50-99	25-49	12-24	5-11	1-4	50-99	25-49	12-24	5-11	1-4
.030 -.036	1/16	1/16										
.037-.046	5/64	1/16	1.67	1.74	1.83	2.29	2.75	Q	Q	Q	Q	Q
.0469-.055	3/32	3/32										
.056-.064	7/64	3/32										
.065-.0781	1/8	3/32	1.80	1.88	1.95	2.45	2.93	2.07	2.15	2.26	2.82	3.39
.079-.087	9/64	3/32										
.088-.099	5/32	3/32										
.100-.120	11/64	3/32	1.98	2.09	2.18	2.72	3.27	2.30	2.40	2.51	3.13	3.76
.121-.131	3/16	1/8										
.132-.147	13/64	1/8										
.148-.163	7/32	1/8	2.10	2.19	2.29	2.87	3.43	2.42	2.53	2.63	3.29	3.95
.164-.179	15/64	1/8										
.180-.194	1/4	1/8										
.195-.210	17/64	1/8	2.42	2.53	2.63	3.29	3.95	2.77	2.90	3.03	3.79	4.55
.211-.225	9/32	1/8										
.226-.241	19/64	1/8										
.242-.256	5/16	3/16	2.78	2.91	3.04	3.79	4.55	3.20	3.34	3.49	4.37	5.23
.257-.272	21/64	3/16										
.273-.288	11/32	3/16										
.289-.304	23/64	3/16										
.305-.320	3/8	3/16	3.11	3.25	3.39	4.24	5.08	3.57	3.75	3.89	5.80	9.62
.321-.336	25/64	3/16										
.337-.352	13/32	3/16										
.353-.368	27/64	3/16	3.38	3.53	3.67	4.59	5.51	3.87	4.06	4.24	6.15	9.96
.369-.380	7/16	3/16										
.381-.396	29/64	3/16										
.397-.411	15/32	3/16	3.94	4.11	4.30	5.38	6.45	4.53	4.74	4.94	6.87	10.71
.412-.427	31/64	3/16										
.428-.443	1/2	3/16										
.444-.458	33/64	3/16	4.47	4.67	4.88	6.09	7.31	5.14	5.38	5.61	7.54	11.38
.459-.474	17/32	3/16										
.475-.489	35/64	3/16	5.01	5.24	5.46	6.84	8.20	5.76	6.02	6.27	8.20	12.05
.490-.505	9/16	3/16										

Q= Price Per Quotation

STANDARD

NON-STANDARD

DIAMETERS IN .0001" INCREMENTS MADE TO ORDER ADD THE FOLLOWING SET UP CHARGE TO BASE PRICE	2-1/2"	3"
	\$25.00	
OPTIONAL T = 3/16" MADE TO ORDER ADD THE FOLLOWING SET UP CHARGE TO BASE PRICE	\$10.00	

QUANTITY DISCOUNTS

Based on one size, one shipment and one destination
100 pieces50 pc. price - 7% Over 300 pieces Call for pricing

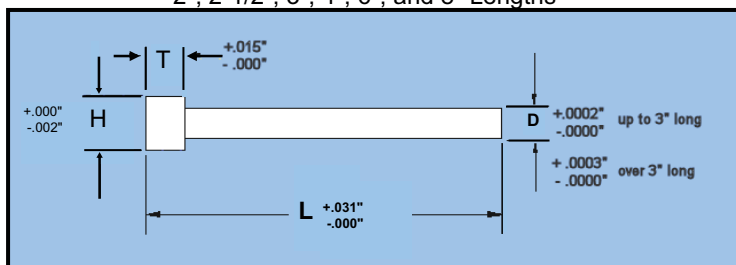
RQB TYPE



Royal

2", 2-1/2", 3", 4", 6", and 8" Lengths

HOW TO ORDER: EXAMPLE				
Qty.	Type	Dia.	X	Length
50	RQB	.128	X	2-1/2



NET PRICE EACH PER QUANTITY (US \$)															ML Modify Length Add To BasePrice
L - LENGTH															
4"					6"					8"					
50-99	25-49	12-24	5-11	1-4	50-99	25-49	12-24	5-11	1-4	50-99	25-49	12-24	5-11	1-4	
Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	\$0.20 EACH OR \$15.00 MIN.
3.87	4.05	4.23	6.11	9.85	7.16	7.48	7.80	9.70	13.52	Q	Q	Q	Q	Q	
3.57	3.73	3.90	5.78	9.51	6.84	7.16	7.46	9.36	13.18	10.13	10.59	11.06	15.88	25.50	
3.75	3.91	4.09	5.99	9.81	6.94	7.25	7.58	9.49	13.30	10.24	10.70	11.17	15.97	25.61	\$0.26 EACH OR \$18.00 MIN.
4.08	4.25	4.42	6.32	10.14	7.25	7.59	7.92	9.83	13.64	10.56	11.05	11.51	16.33	25.95	
4.42	4.62	4.82	6.75	10.59	7.65	7.99	8.35	10.27	14.13	10.80	11.28	11.77	16.54	26.08	\$0.32 EACH OR \$23.00 MIN.
4.75	4.95	5.16	7.10	10.94	7.98	8.35	8.72	10.64	14.49	11.11	11.61	12.11	16.88	26.43	
5.01	5.24	5.46	7.39	11.24	8.25	8.63	9.01	10.93	14.79	11.37	11.89	12.41	17.18	26.72	
6.09	6.36	6.63	8.56	12.41	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	PRICE PER QUOTE
7.17	7.50	7.81	9.74	13.59	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
7.71	8.06	8.40	10.32	14.18	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
Q= Price Per Quotation															
NON-STANDARD															

4"	6"	8"
\$40.00		PER QUOTATION
	\$10.00	

CUSTOM MODIFICATIONS PRICE AND DELIVERY PER QUOTATION	The following are some of the modifications which can be made to this product. Please refer to page 1 for more information on ordering this product with these modifications or use the worksheet templates provided on pages 25-28.										
	ML*	CL	MT	CT	MH	PS	CS	CSD	PN	SR	COATINGS
											TIN Dicronite

* ML Modification is priced in price table above

QUILL PUNCHES/ CORE PIN BLANKS

MATERIAL: TOOL STEEL (TS)

OHTS, 58-60 RC, HEADS DRAWN OVER 1/16 DIA.

HIGH SPEED STEEL (HSS)

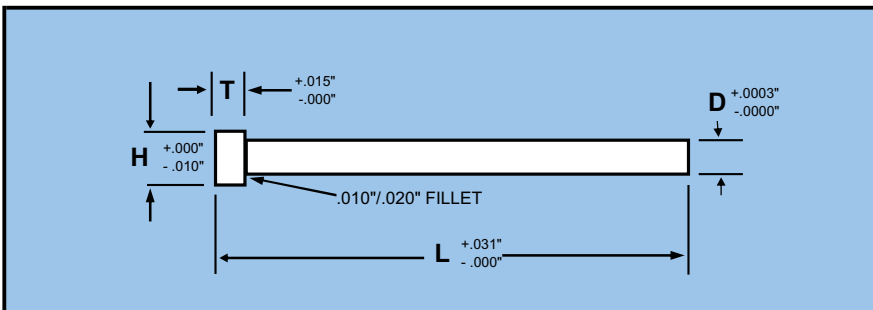
M-2, 60-63 RC

2" And 2-1/2" Lengths

PRECISION FORM - GROUND

SQF TYPE: FRACTIONAL DIAMETERS

SQD TYPE: DECIMAL DIAMETERS .030" THROUGH .374" IN .001" INCREMENTS. DIAMETERS IN .0001" INCREMENTS CAN BE MADE TO ORDER. ADD \$25.00 SET-UP CHARGE.



HOW TO ORDER: EXAMPLES					
Qty.	Type	Dia.	X	Length	Steel
50	SQF	.0937	X	2	TS
100	SQD	.136	X	2-1/2	HSS

SQF TYPE: FRACTIONAL BLANKS

D	H	T	L	NET PRICE EACH PER QUANTITY (US\$)										ML MODIFY LENGTH ADD TO BASE PRICE
BODY DIA. FRACTIONAL	HEAD DIA.	HEAD THICK	OVERALL LENGTH	TOOL STEEL					HIGH SPEED STEEL					
				100	50-99	25-49	10-24	1-9	100	50-99	25-49	10-24	1-9	
.0625"	*3/32	1/8	2" 2 1/2"	1.66	1.85	1.97	2.29	2.92	1.96	2.16	2.29	2.63	3.28	\$0.20 EACH OR \$15.00 MIN
.0937"	5/32	1/8	2" 2 1/2"											
.1250"	3/16	1/8	2" 2 1/2"											
.1562"	7/32	1/8	2" 2 1/2"	1.79	1.97	2.11	2.42	3.06	2.10	2.29	2.43	2.76	3.41	\$0.26 EACH OR \$18.00 MIN
.1875"	1/4	1/8	2" 2 1/2"											
.2187"	9/32	1/8	2" 2 1/2"											
.2500"	5/16	1/8	2" 2 1/2"	1.97	2.17	2.29	2.61	3.24	2.29	2.49	2.63	2.94	3.60	
.3125"	7/16	3/16	2" 2 1/2"	2.42	2.61	2.73	3.06	3.70	3.08	3.28	3.41	3.74	4.39	\$0.32 EACH OR \$23.00 MIN
.3750"	1/2	3/16	2" 2 1/2"	2.55	2.73	2.87	3.19	3.82	3.28	3.48	3.60	3.93	4.59	

* Optional Head Diameter of 1/8 can be made to order. Price upon quotation

SQD TYPE: DECIMAL DIAMETERS IN .001" INCREMENTS

D	H	T	L	NET PRICE EACH PER QUANTITY (US\$)										ML MODIFY LENGTH ADD TO BASE PRICE
BODY DIA. DECIMAL	HEAD DIA.	HEAD THICK	OVERALL LENGTH	TOOL STEEL					HIGH SPEED STEEL					
				100	50-99	25-49	10-24	1-9	100	50-99	25-49	10-24	1-9	
.030" - .062"	*3/32	1/8	2" 2-1/2"	1.97	2.23	2.42	2.92	3.56	2.35	2.63	2.81	3.34	3.99	\$0.20 EACH OR \$15.00 MIN
.063" - .093"	5/32	1/8	2" 2-1/2"											
.094" - .124"	3/16	1/8	2" 2-1/2"											
.126" - .156"	7/32	1/8	2" 2-1/2"	2.11	2.36	2.55	3.06	3.70	2.49	2.76	2.94	3.48	4.13	\$0.26 EACH OR \$18.00 MIN
.157" - .187"	1/4	1/8	2" 2-1/2"											
.188" - .218"	9/32	1/8	2" 2-1/2"	2.42	2.68	2.87	3.37	4.01	2.81	3.08	3.28	3.79	4.45	
.219" - .249"	5/16	1/8	2" 2-1/2"											
.251" - .312"	7/16	3/16	2" 2-1/2"	2.81	3.06	3.24	3.76	4.40	3.34	3.60	3.79	4.33	4.98	\$0.32 EACH OR \$23.00 MIN
.313" - .374"	1/2	3/16	2" 2-1/2"	2.92	3.19	3.37	3.89	4.53	3.54	3.79	3.99	4.53	5.19	

* Optional Head Diameter of 1/8 can be made to order. Price upon quotation

QUANTITY DISCOUNTS

Based on one size, one shipment, and one destination

Over 300 Pieces Call For Pricing

CUSTOM MODIFICATIONS PRICE AND DELIVERY PER QUANTITY	The following are some of the modifications which can be made to this product. Please refer to page 1 for more information on ordering this product with these modifications or use the worksheet templates provided on pages 25-28										
	ML**	CL	MT	CT	MH	PS	CS	CSD	PN	SR	COATINGS
											TIN Dicronite

** ML Modification is priced in price table above

B and AB TYPES

PERFORATORS/CORE PIN BLANKS

Ideal for tight center to center spacing in dies and molds
M-2 HIGH SPEED STEEL, 60-63 RC

PRECISION FORM-GROUND

DIAMETERS IN .001" INCREMENTS

The following fractional diameters are included in the .001" increment price tables below: 1/32, 3/64, 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, & 3/8.

TYPE B: STANDARD

TYPE AB: NON-STANDARD. CAN BE MADE TO ORDER FOR PROMPT DELIVERY IN THE SAME LENGTHS AND DIAMETER RANGES AS TYPE B. SAME PRICING APPLIES

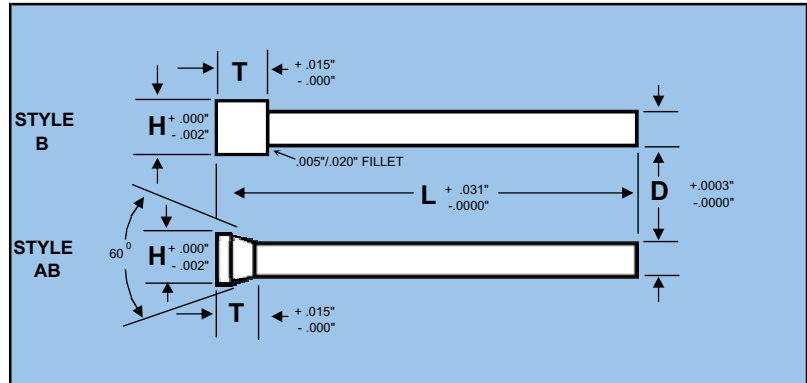
HOW TO ORDER: EXAMPLES

Qty	Cat No.	Dia.	X	Length
25	AB-4	.078	X	2-1/2
60	B-17	.269	X	3



Royal

1-1/2", 2", 2-1/2", 3", 3-1/2", and 4" Lengths



Catalog No.		D	H	T	L						NET PRICE EACH PER QUANTITY						ML MODIFY LENGTH ADD TO BASE PRICE	
AB TYPE	B TYPE	BODY DIA. .001" INCREMENTS	HEAD DIA.	HEAD THICK	OVERALL LENGTHS						100	50-99	25-49	10-24	5-9	1-4		
1/0	1/0	.025 - .029	.060	3/32	1-1/2	2					3.14	3.36	3.56	3.93	4.47	5.20	PER QUOTE	
1	1	.030 - .040	.070	3/32	1-1/2	2	2-1/2				2.84	3.03	3.22	3.55	4.04	4.89	\$0.20 EACH OR \$15.00 MIN	
2	2	.041 - .055	.085	3/32		2	2-1/2				2.72	2.88	3.09	3.40	3.86	4.59		
3	3	.056 - .070	.100	3/32		2	2-1/2				2.54	2.69	2.85	3.14	3.56	4.28		
4	4	.071 - .085	.115	3/32		2	2-1/2											
5	5	.086 - .100	.130	3/32		2	2-1/2	3										
6	6	.101 - .115	.145	3/32		2	2-1/2	3										
7	7	.116 - .130	.160	3/32		2	2-1/2	3			2.72	2.90	3.09	3.40	3.86	4.59	\$0.26 EACH OR \$18.00 MIN	
8	8	.131 - .145	.175	3/32		2	2-1/2	3										
9	9	.146 - .160	.190	3/32		2	2-1/2	3										
10	10	.161 - .175	.205	1/8			2-1/2	3			2.90	3.08	3.28	3.62	4.11	4.83		
11	11	.176 - .190	.220	1/8			2-1/2	3										
12	12	.191 - .205	.235	1/8			2-1/2	3			2.96	3.16	3.36	3.71	4.23	4.96		\$0.32 EACH OR \$23.00 MIN
13	13	.206 - .220	.250	1/8			2-1/2	3										
14	14	.221 - .235	.265	1/8			2-1/2	3			3.14	3.31	3.55	3.92	4.47	5.20		
15	15	.236 - .250	.280	1/8			2-1/2	3										
16	16	.251 - .265	.295	1/8			2-1/2	3	3-1/2		3.38	3.69	3.99	4.29	4.77	5.49	\$0.32 EACH OR \$23.00 MIN	
17	17	.266 - .280	.310	1/8				3	3-1/2									
18	18	.281 - .295	.325	1/8				3	3-1/2									
19	19	.296 - .310	.340	1/8				3	3-1/2		3.56	3.86	4.19	4.52	5.01	5.73		
20	20	.311 - .325	.355	3/16				3	3-1/2									
21	21	.326 - .340	.370	3/16				3	3-1/2	4	3.80	4.10	4.38	4.78	5.38	6.10		
22	22	.341 - .355	.385	3/16				3	3-1/2	4	3.99	4.27	4.58	4.99	5.62	6.22		
23	23	.356 - .370	.400	3/16				3	3-1/2	4	4.17	4.35	4.78	5.22	5.86	6.58		
24	24	.371 - .385	.415	3/16				3	3-1/2	4	4.35	4.53	4.98	5.42	6.10	6.83		

QUANTITY DISCOUNTS

Based on one size, one shipment, and one destination

Over 300 Pieces Call For Pricing

CUSTOM MODIFICATIONS PRICE AND DELIVERY PER QUANTITY	The following are some of the modifications which can be made to this product. Please refer to page 1 for more information on ordering this product with these modifications or use the worksheet templates provided on pages 25-28										COATINGS
	ML*	CL	MT	CT	MH	PS	CS	CSD	PN	SR	
											TIN Dicronite

* ML Modification is priced in price table above

CPB AND PPB TYPES

PUNCH BLANKS

M-2 HIGH SPEED STEEL, 60-63 RC

HEADS DRAWN, 45-55 RC

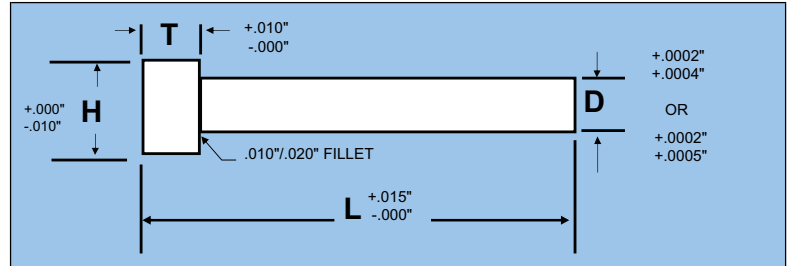
PRECISION FORM-GROUND

FRACTIONAL BLANKS FROM 1/8 THROUGH 1"



Royal

2", 2-1/2", 3" and 3-1/2" Lengths



HOW TO ORDER: EXAMPLES

QTY.	CAT. No.	DIA	X	LENGTH
12	CPB-25	1/4	X	2-1/2
6	PPB-75	3/4	X	3

CPB (COMMERCIAL TOLERANCES) D:

+ .0002"
+ .0005"

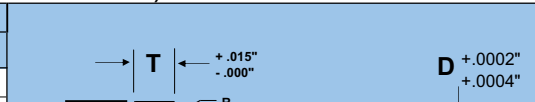
Catalog Number	D	H	T	L				NET PRICE EACH PER QUANTITY (US \$)				ML MODIFY LENGTH ADD TO BASE PRICE
	BODY DIA.	HEAD DIA.	HEAD THICK	OVERALL LENGTHS				50 +	25-49	10-24	1-9	
CPB-12	1/8	1/4	1/8	2"	2-1/2"			5.15	5.47	5.76	6.06	\$0.26 EACH OR \$18.00 MIN
CPB-15	5/32	9/32	1/8	2"	2-1/2"							
CPB-18	3/16	5/16	1/8	2"	2-1/2"							
CPB-25	1/4	3/8	1/8	2"	2-1/2"	3"		5.76	6.06	6.44	6.73	\$0.32 EACH OR \$23.00 MIN
CPB-31	5/16	7/16	1/8	2"	2-1/2"	3"						
CPB-37	3/8	1/2	3/16	2"	2-1/2"	3"						
CPB-43	7/16	9/16	3/16	2"	2-1/2"	3"	3-1/2"	6.61	7.03	7.40	7.77	
CPB-50	1/2	5/8	3/16	2"	2-1/2"	3"	3-1/2"					
CPB-62	5/8	3/4	1/4	2"	2-1/2"	3"	3-1/2"					
CPB-75	3/4	7/8	1/4		2-1/2"	3"	3-1/2"	12.56	13.32	14.08	14.77	PER QUOTE
CPB-87	7/8	1"	1/4		2-1/2"	3"	3-1/2"					
CPB-100	1"	1-1/8"	1/4		2-1/2"	3"	3-1/2"					
								20.99	22.20	23.46	24.66	

PPB (PRECISION TOLERANCES) D:

+ .0002"
+ .0004"

Catalog Number	D	H	T	L				NET PRICE EACH PER QUANTITY (US \$)				ML MODIFY LENGTH ADD TO BASE PRICE
	BODY DIA.	HEAD DIA.	HEAD THICK	OVERALL LENGTHS				50 +	25-49	10-24	1-9	
PPB-12	1/8	1/4	1/8	2"	2-1/2"			5.76	6.06	6.44	6.73	\$0.26 EACH OR \$18.00 MIN
PPB-15	5/32	9/32	1/8	2"	2-1/2"							
PPB-18	3/16	5/16	1/8	2"	2-1/2"							
PPB-25	1/4	3/8	3/16	2"	2-1/2"	3"		6.44	6.73	7.16	7.52	\$0.32 EACH OR \$23.00 MIN
PPB-31	5/16	7/16	3/16	2"	2-1/2"	3"						
PPB-37	3/8	1/2	3/16	2"	2-1/2"	3"						
PPB-43	7/16	9/16	3/16	2"	2-1/2"	3"	3-1/2"	7.46	7.82	8.68	8.73	
PPB-50	1/2	5/8	3/16	2"	2-1/2"	3"	3-1/2"					
PPB-62	5/8	3/4	3/16		2-1/2"	3"	3-1/2"					
PPB-75	3/4	7/8	3/16		2-1/2"	3"	3-1/2"	14.01	14.84	15.72	16.48	PER QUOTE
PPB-87	7/8	1"	3/16		2-1/2"	3"	3-1/2"					
PPB-100	1"	1-1/8	3/16		2-1/2"	3"	3-1/2"					
								23.46	24.85	26.17	27.58	

EB SLUG EJECTOR PUNCHES (WITH PPB DIMENSIONS)

CATALOG NUMBER	D	H	T	L					PRICE PER QUOTE
	BODY DIA.	HEAD DIA.	HEAD THICK.	OVERALL LENGTHS					
EB-12	1/8	1/4	1/8	2"	2-1/2"				
EB-15	5/32	9/32	1/8	2"	2-1/2"				
EB-18	3/16	5/16	1/8	2"	2-1/2"				
EB-25	1/4	3/8	3/16	2"	2-1/2"				
EB-31	5/16	7/16	3/16	2"	2-1/2"	3"			
EB-37	3/8	1/2	3/16	2"	2-1/2"	3"			
EB-43	7/16	9/16	3/16	2"	2-1/2"	3"	3-1/2"		
EB-50	1/2	5/8	3/16	2"	2-1/2"	3"	3-1/2"		

CUSTOM MODIFICATIONS PRICE AND DELIVERY PER QUOTATION	The following are some of the modifications which can be made to this product. Please refer to page 1 for more information on ordering this product with these modifications or use the worksheet templates provided on pages 25 - 28.					
	ML* CL	MT CT	MH	PS	PN	COATINGS
						TIN

* ML Modification is priced in price table above

MQA AND MQB TYPES



Royal

METRIC PERFORATORS/CORE PIN BLANKS

M-2 HIGH SPEED STEEL, 60-63 RC

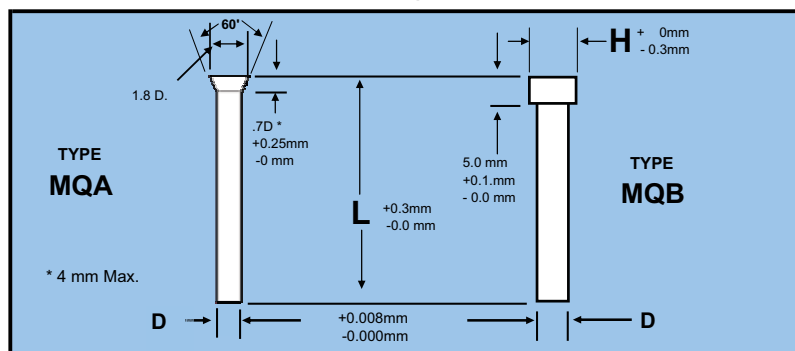
PRECISION FORM-GROUND DIAMETERS

MADE TO ORDER

IN 0.01 mm INCREMENTS

10 PIECES MINIMUM

63mm Length



HOW TO ORDER: EXAMPLES				
QTY.	TYPE	DIA	X	LENGTH
50	MQA	0.95	X	63
25	MQB	6.55	X	63

D DIAMETER RANGE MADE TO ORDER IN 0.01mm INCREMENTS			NET PRICE EACH PER QUANTITY (US \$)								MQB TYPE	ML MODIFY LENGTH ADD TO BASE PRICE
			MQA				MQB				H	
			100+	50-99	25-49	10-24	100+	50-99	25-49	10-24		
0.80mm	-	1.60mm	1.73	2.21	2.94	4.88	2.63	3.20	4.31	7.98	3	\$0.26 EACH OR \$18.00 MIN
1.61mm	-	2.00mm	1.84	2.31	3.05	4.99	2.94	3.57	4.78	8.82	4	
2.01mm	-	3.00mm	2.05	2.52	3.36	5.20	2.94	3.57	4.78	8.82	5	
3.01mm	-	4.00mm	2.15	2.63	3.47	5.30	3.10	3.78	5.04	9.35	6	\$0.32 EACH OR \$23.00 MIN
4.01mm	-	5.00mm	2.36	2.89	3.62	5.62	3.20	3.89	5.20	9.66	7	
5.01mm	-	6.00mm	2.68	3.20	3.94	5.93	3.20	3.89	5.20	9.66	8	
6.01mm	-	7.00mm	2.94	3.52	4.25	6.30	3.36	4.10	5.51	10.19	9	

MPB TYPE



Royal

METRIC PUNCH BLANKS

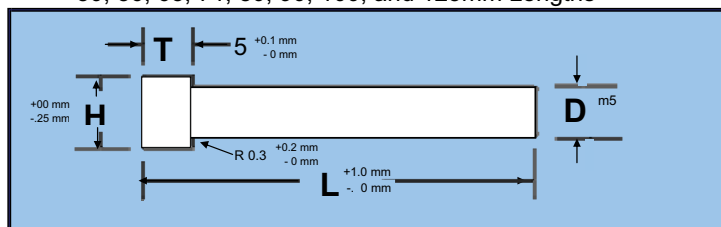
M-2 HIGH SPEED STEEL, RC 60-63

HEADS DRAWN 45-55 RC

MADE TO ORDER

10 PIECES MINIMUM

50, 56, 63, 71, 80, 90, 100, and 125mm Lengths



HOW TO ORDER: EXAMPLES			
QTY.	CAT No	X	LENGTH
50	MPB-3	X	63

CATALOG NUMBER	D BODY DIA		H HEAD DIA.	NET PRICE EACH PER QUANTITY (US \$)												ML MODIFY LENGTH ADD TO BASE PRICE
	L-LENGTH															
	NOMINAL DIA.	m ⁵ TOLERANCE		50, 56, & 63 mm			71 & 80 mm			90 & 100 mm			125 mm			
				50 +	25-49	10-24	50 +	25-49	10-24	50 +	25-49	10-24	50 +	25-49	10-24	
MPB-3	3	+ 0,009 + 0,004	5.0	4.86	5.40	6.01	5.42	6.02	6.69	6.77	7.53	8.36	Q	Q	Q	\$0.32 EACH OR \$23.00 MIN
MPB-4	4	+ 0,009 + 0,004	7.0	4.97	5.52	6.13	5.66	6.29	6.98	7.22	8.03	8.93	8.58	9.53	10.59	
MPB-5	5	+ 0,009 + 0,004	8.0	5.76	6.41	7.12	6.22	6.91	7.68	7.12	7.91	8.79	8.68	9.65	10.72	
MPB-6	6	+ 0,009 + 0,004	9.0	6.67	7.41	8.23	6.56	7.29	8.10	7.33	8.15	9.05	9.72	10.80	12.00	
MPB-8	8	+ 0,012 + 0,006	11.0	7.07	7.85	8.73	6.77	7.53	8.36	7.68	8.53	9.48	10.02	11.13	12.37	

BH SERIES



Royal

BEVEL HEADED PUNCHES

TOOL STEEL, (TS)

(OHTS), 58-60 RC, HEADS DRAWN

HIGH SPEED STEEL (HSS)

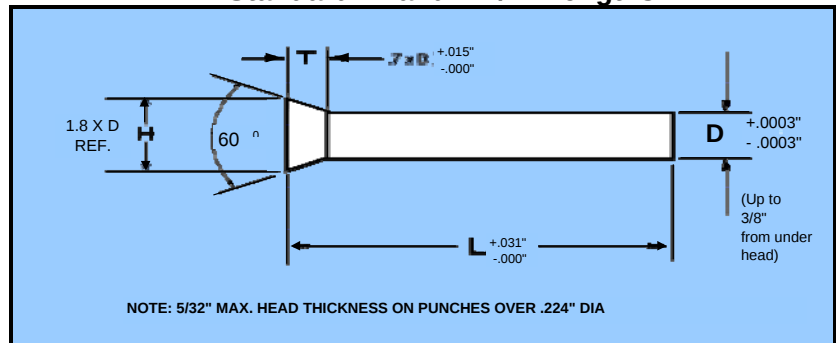
M-2, 60-63 RC

Used by tool, die, stamping, and mold manufacturers as perforators, punches, knock-out pins, gauge pins, ejectors and core pins.

Special lengths can be made to order with prompt delivery. Please refer to the "Modify Length" column in the price table below.

When closer tolerance and better wear resistance is desired, please refer to Type RQA found on page 2. RQA perforators/core pin blanks are form-ground to $+.0003"/-0"$ diameter tolerance, and are offered in M-2 HSS in diameter increments from .010" through .375".

Standard 2" and 2-1/2" Lengths



HOW TO ORDER: EXAMPLES

QTY.	TYPE	DIA.	X	LENGTH	STEEL
100	BH	.062	X	2	TS
50	BH	.136	X	2-1/2	HSS

D STANDARD DIAMETERS .001 INCREMENTS	L LENGTHS	NET PRICE EACH PER QUANTITY (US\$)										ML MODIFY LENGTH ADD TO BASE PRICE
		TOOL STEEL					HIGH SPEED STEEL					
		100	50-99	25-49	10-24	1-9	100	50-99	25-49	10-24	1-9	
.020" - .029"	2"	0.57	0.73	0.88	1.06	1.32	0.81	0.89	1.01	1.13	1.37	PER QUOTE
	2-1/2"	0.74	0.89	1.01	1.12	1.36	0.87	0.95	1.06	1.17	1.41	
.030" - .039"	2"	0.55	0.71	0.87	1.04	1.27	0.75	0.85	0.97	1.10	1.32	\$0.20 EACH OR \$15.00 MIN.
	2-1/2"	0.71	0.86	0.98	1.10	1.34	0.82	0.92	1.03	1.15	1.39	
.040" - .0625" (1/16)	2"	0.50	0.66	0.80	0.97	1.22	0.71	0.80	0.92	1.03	1.27	
	2-1/2"	0.67	0.81	0.93	1.03	1.26	0.74	0.84	0.95	1.08	1.31	
.063" - .0781" (5/64)	2"	0.50	0.66	0.80	0.97	1.26	0.75	0.84	0.95	1.08	1.31	
	2-1/2"	0.67	0.81	0.93	1.12	1.30	0.79	0.87	1.00	1.13	1.35	
.079" - .0937" (3/32)	2"	0.50	0.66	0.80	0.97	1.30	0.81	0.89	1.01	1.13	1.37	
	2-1/2"	0.67	0.81	0.93	1.12	1.36	0.87	0.95	1.06	1.17	1.41	
.094" - .1094" (7/64)	2"	0.61	0.76	0.92	1.09	1.42	0.97	1.05	1.16	1.29	1.53	
	2-1/2"	0.79	0.96	1.10	1.28	1.52	1.01	1.10	1.22	1.34	1.57	
.110" - .125" (1/8)	2"	0.61	0.76	0.92	1.09	1.42	1.00	1.09	1.20	1.32	1.56	
	2-1/2"	0.79	0.96	1.10	1.28	1.53	1.03	1.12	1.24	1.36	1.58	
.126" .127" .128"	2"	0.75	0.89	1.06	1.23	1.56	1.18	1.27	1.39	1.53	1.75	\$0.26 EACH OR \$18.00 MIN.
	2-1/2"	0.92	1.08	1.24	1.41	1.74	1.24	1.32	1.44	1.56	1.79	
⊙ .129"	2"	1.10	1.26	1.42	1.58	1.91	1.48	1.56	1.69	1.79	2.04	
	2-1/2"	1.28	1.43	1.59	1.77	2.05	1.52	1.61	1.73	1.85	2.10	
.130"	2"	0.75	0.89	1.06	1.23	1.56	1.18	1.27	1.39	1.53	1.75	
	2-1/2"	0.92	1.08	1.24	1.41	1.74	1.24	1.32	1.44	1.56	1.79	
⊙ .131" - .134"	2"	1.10	1.26	1.42	1.58	1.91	1.48	1.56	1.69	1.79	2.04	
	2-1/2"	1.28	1.43	1.59	1.77	2.05	1.52	1.61	1.73	1.85	2.10	
.135"	2"	0.75	0.89	1.06	1.23	1.56	1.18	1.27	1.39	1.53	1.75	
	2-1/2"	0.92	1.08	1.24	1.41	1.74	1.24	1.32	1.44	1.56	1.79	
⊙ .136" - .139"	2"	1.10	1.26	1.42	1.58	1.91	1.48	1.56	1.69	1.79	2.04	
	2-1/2"	1.28	1.43	1.59	1.77	2.05	1.52	1.61	1.73	1.85	2.10	
.140" .1406" (9/64)	2"	0.75	0.89	1.06	1.23	1.56	1.18	1.27	1.39	1.53	1.75	
	2-1/2"	0.92	1.08	1.24	1.41	1.75	1.24	1.32	1.44	1.56	1.79	
⊙ .141" - .156"	2"	1.10	1.26	1.42	1.58	1.91	1.48	1.56	1.69	1.79	2.04	
	2-1/2"	1.28	1.43	1.59	1.77	2.05	1.52	1.61	1.73	1.85	2.10	
.1562" (5/32)	2"	0.75	0.89	1.06	1.23	1.56	1.18	1.27	1.39	1.53	1.75	
	2-1/2"	0.92	1.08	1.24	1.41	1.74	1.24	1.32	1.44	1.56	1.79	

⊙ Denotes Form-Ground Diameters



BEVEL HEADED PUNCHES

Standard 2" and 2-1/2" Lengths (Continued)

D STANDARD DIAMETERS .001" INCREMENTS	L LENGTHS	NET PRICE EACH PER QUANTITY (US\$)										ML MODIFY LENGTH ADD TO BASE PRICE
		TOOL STEEL					HIGH SPEED STEEL					
		100	50-99	25-49	10-24	1-9	100	50-99	25-49	10-24	1-9	
⊙ .157" - .171"	2"	1.10	1.26	1.42	1.59	1.91	1.94	2.02	2.15	2.26	2.50	\$0.26 EACH OR \$18.00 MIN.
	2-1/2"	1.28	1.43	1.60	1.77	2.10	1.97	2.06	2.18	2.30	2.55	
.1719" (11/64)	2"	0.75	0.89	1.06	1.23	1.56	1.66	1.73	1.85	1.97	2.22	
	2-1/2"	0.92	1.08	1.24	1.41	1.75	1.69	1.77	1.89	2.01	2.24	
⊙ .172" - .187"	2"	1.10	1.26	1.42	1.59	1.91	1.94	2.02	2.15	2.26	2.50	
	2-1/2"	1.28	1.43	1.60	1.77	2.10	1.97	2.06	2.18	2.30	2.55	
.1875" (3/16)	2"	0.75	0.89	1.06	1.23	1.56	1.66	1.73	1.85	1.97	2.22	
	2-1/2"	0.92	1.08	1.24	1.41	1.75	1.69	1.77	1.89	2.01	2.24	
⊙ .188" - .203"	2"	1.28	1.43	1.60	1.77	2.10	1.97	2.06	2.18	2.30	2.55	
	2-1/2"	1.47	1.61	1.79	1.94	2.30	2.01	2.10	2.22	2.34	2.58	
.2031" (13/64)	2"	0.92	1.08	1.24	1.41	1.75	1.69	1.77	1.89	2.01	2.24	
	2-1/2"	1.10	1.26	1.42	1.59	1.91	1.72	1.81	1.93	2.05	2.28	
⊙ .204" - .218"	2"	1.28	1.43	1.60	1.77	2.10	1.97	2.06	2.18	2.30	2.55	
	2-1/2"	1.47	1.61	1.79	1.94	2.30	2.01	2.10	2.22	2.34	2.58	
.2187" (7/32)	2"	0.92	1.08	1.24	1.41	1.75	1.69	1.77	1.89	2.01	2.24	
	2-1/2"	1.10	1.26	1.42	1.59	1.91	1.72	1.81	1.93	2.05	2.28	
⊙ .219" - .234"	2"	1.28	1.43	1.60	1.77	2.10	1.97	2.06	2.18	2.30	2.55	
	2-1/2"	1.47	1.61	1.79	1.94	2.30	2.01	2.10	2.22	2.34	2.58	
.2343" (15/64)	2"	0.92	1.08	1.24	1.41	1.75	1.69	1.68	1.89	2.01	2.24	
	2-1/2"	1.10	1.26	1.42	1.59	1.91	1.72	1.81	1.93	2.05	2.28	
⊙ .235" - .249"	2"	1.28	1.43	1.60	1.77	2.10	1.97	2.06	2.18	2.30	2.55	
	2-1/2"	1.47	1.61	1.79	1.94	2.30	2.01	2.10	2.22	2.34	2.58	
.250" (1/4)	2"	0.92	1.08	1.24	1.41	1.75	1.69	1.77	1.89	2.01	2.24	
	2-1/2"	1.10	1.26	1.42	1.59	1.91	1.72	1.81	1.93	2.05	2.28	
⊙ .251" - .2812" (9/32)	2"	1.47	1.61	1.79	1.94	2.30	2.06	2.15	2.26	2.39	2.64	
	2-1/2"	1.72	1.88	2.04	2.21	2.55	2.10	2.18	2.30	2.43	2.66	
⊙ .282" - .3125" (5/16)	2"	1.59	1.73	1.90	2.07	2.39	2.17	2.25	2.38	2.49	2.73	
	2-1/2"	1.84	2.01	2.15	2.33	2.67	2.21	2.28	2.42	2.52	2.77	
⊙ .313" - .3437" (11/32)	2"	1.64	1.79	1.94	2.13	2.46	2.32	2.40	2.51	2.64	2.88	
	2-1/2"	1.88	2.04	2.21	2.36	2.72	2.35	2.43	2.56	2.67	2.91	
⊙ .344" - .375" (3/8)	2"	1.64	1.79	1.94	2.13	2.46	2.52	2.61	2.74	2.87	3.12	
	2-1/2"	1.88	2.04	2.21	2.36	2.72	2.56	2.65	2.78	2.90	3.15	
⊙ .3906" (25/64) .4062" (13/32) .4219" (27/64) .4375" (7/16)	2"	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
	2-1/2"	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
⊙ .4531" (29/64) .4688" (15/32) .4844" (31/64) .5000" (1/2)	2"	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
	2-1/2"	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	

⊙ Denotes Form-Ground Diameters

Q = PRICE PER QUOTATION

QUANTITY DISCOUNTS	
Based on one size, one shipment, and one destination	
500 Pieces	100 pc. Price Less 10%
1,000 Pieces	100 pc. Price Less 15%

CUSTOM MODIFICATIONS PRICE AND DELIVERY PER QUOTATION	The following are some of the modifications which can be made to this product. Please refer to page 1 for more information on ordering this product with these modifications or use the worksheet templates provided on pages 25 - 28.		
	ML**	MT	MH

** ML Modification is priced in the price table above

BH SERIES

BEVEL HEADED PUNCHES

MATERIAL:

TOOL STEEL, (TS)

(OHTS), 58-60 RC, HEADS DRAWN

HIGH SPEED STEEL (HSS)

M-2, 60-63 RC

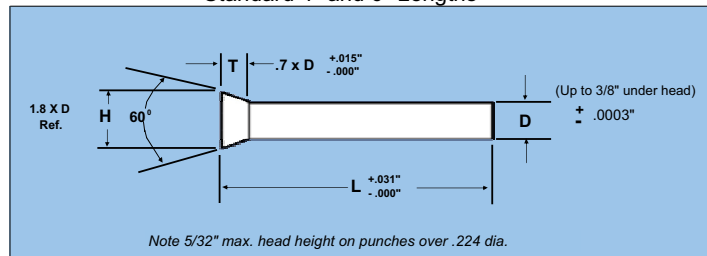
Used by tool, die, stamping, and mold manufacturers as perforators, punches, knock-out pins, gauge pins, ejectors and core pins.

When closer tolerance and better wear resistance is desired, please refer to Type RQA found on page 2. RQA Perforators/Core Pin Blanks are form-ground to $\pm .0003$ "/-0" diameter tolerance, and are offered in M-2 HSS in diameter increments from .010" through .375".



Royal

Standard 4" and 6" Lengths



HOW TO ORDER: EXAMPLES

QTY.	TYPE	DIA.	X	LENGTH	STEEL
100	BH	5/32	X	6	TS
50	BH	15/64	X	4	HSS

FRACTIONAL DIAMETERS											DECIMAL DIAMETERS TOOL STEEL ONLY - FOR DECIMAL DIAMETERS IN M-2 HSS PLEASE REFER TO RQA TYPE ON PAGE 2 (10 PC. MINIMUM)				ML MODIFY LENGTH ADD TO BASE PRICE		
D STANDARD DIAMETERS	L LENGTHS	NET PRICE EACH PER QUANTITY (US \$)										D NON-STANDARD DECIMAL DIA.	NET PRICE EACH PER QUANTITY (US \$)				
		TOOL STEEL					HIGH SPEED STEEL						TOOL STEEL				
		100	50-99	25-49	10-24	1-9	100	50-99	25-49	10-24	1-9		100	50-99	25-49	10-24	
1/16, 5/64	4"	1.29	1.51	1.83	2.14	2.57	2.30	2.63	3.01	3.48	4.10	.047"-.078"	2.75	3.37	4.89	8.79	\$0.20 EACH OR \$15.00 MIN.
	6"	1.64	1.87	2.19	2.56	3.01	2.93	3.30	3.74	4.26	5.00		Q	Q	Q	Q	
3/32, 7/64	4"	1.28	1.48	1.77	2.06	2.44	2.22	2.52	2.90	3.34	3.93	.079"-.109"	2.65	3.18	4.57	8.02	
	6"	1.63	1.82	2.14	2.45	2.87	2.64	2.96	3.36	3.83	4.49		3.05	3.95	5.72	9.25	
1/8	4"	1.12	1.30	1.56	1.80	2.14	2.14	2.39	2.73	3.13	3.68	.110"-.124"	2.33	2.80	4.02	7.07	
	6"	1.32	1.48	1.75	2.01	2.33	2.34	2.60	2.94	3.33	3.87		2.49	3.20	4.65	7.55	
9/64, 5/32	4"	1.14	1.32	1.58	1.82	2.15	2.39	2.67	3.00	3.39	3.94	.126"-.156"	2.40	2.89	4.08	7.14	
	6"	1.34	1.52	1.77	2.03	2.36	2.60	2.87	3.20	3.60	4.14		2.56	3.30	4.73	7.62	
11/64, 3/16	4"	1.21	1.35	1.61	1.88	2.21	2.80	3.07	3.39	3.80	4.34	.157"-.187"	2.49	2.97	4.17	7.38	\$0.26 EACH OR \$18.00 MIN.
	6"	1.37	1.56	1.80	2.06	2.38	3.00	3.28	3.60	4.00	4.54		2.65	3.71	6.10	8.98	
13/64, 7/32	4"	1.65	1.82	2.08	2.33	2.67	3.33	3.60	3.94	4.34	4.86	.188"-.218"	2.80	3.30	4.48	7.70	
	6"	2.03	2.19	2.45	2.69	3.03	3.53	3.80	4.14	4.54	5.06		3.12	4.17	6.58	9.47	
15/64, 1/4	4"	1.76	1.91	2.16	2.44	2.76	3.39	3.68	4.00	4.40	4.94	.219"-.249"	2.97	3.44	4.65	7.86	
	6"	2.14	2.32	2.57	2.81	3.16	3.60	3.87	4.20	4.61	5.13		3.20	4.26	6.66	9.53	
17/64, 9/32	4"	2.76	2.93	3.18	3.44	3.78	3.70	3.97	4.31	4.69	5.23	.251"-.281"	4.20	4.75	6.10	9.75	
	6"	3.13	3.30	3.55	3.80	4.15	4.66	4.94	5.27	5.67	6.20		4.82	5.86	8.25	11.14	
19/64, 5/16	4"	2.84	3.01	3.26	3.51	3.85	3.70	3.97	4.31	4.69	5.23	.282"-.312"	4.28	4.83	6.20	9.84	\$0.32 EACH OR \$23.00 MIN.
	6"	3.22	3.38	3.64	3.91	4.23	4.86	5.13	5.47	5.87	6.39		4.99	6.01	8.42	11.31	
21/64, 11/32	4"	3.12	3.28	3.54	3.79	4.14	3.92	4.19	4.53	4.91	5.45	.313"-.343"	4.57	5.11	6.47	10.12	
	6"	3.49	3.66	3.92	4.16	4.50	5.21	5.47	5.80	6.20	6.73		5.21	6.27	8.66	11.55	
23/64, 3/8	4"	3.35	3.50	3.77	4.01	4.35	3.92	4.19	4.53	4.91	5.45	.344"-.374"	4.75	5.30	6.66	10.31	
	6"	3.71	3.90	4.14	4.39	4.73	5.47	5.73	6.07	6.47	7.00		5.38	6.42	8.82	11.72	

QUANTITY DISCOUNTS

Based on one size, one shipment, and one destination

500 Pieces 100 pc. Price Less 10%

1,000 Pieces 100 pc. Price Less 15%

CUSTOM MODIFICATIONS PRICE AND DELIVERY PER QUOTATION	The following are some of the modifications which can be made to this product. Please refer to page 1 for more information on ordering this product with these modifications or use the worksheet templates provided on pages 25-28.		
	ML*	MT	MH

* ML Modification is priced in the price table above

Q = Price Per Quotation

EP SERIES



Royal

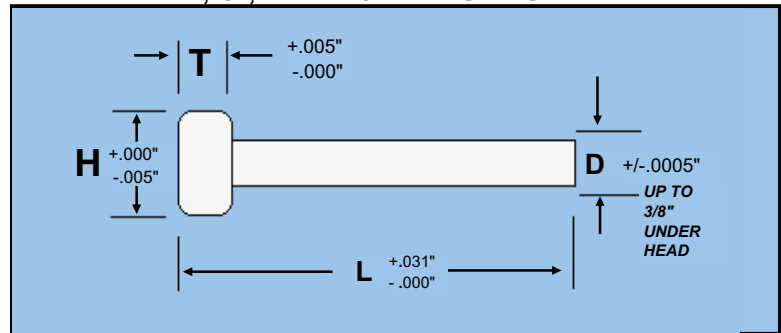
DIE KICKER PINS - FORGED HEADS

MATERIAL : OIL HARDENING TOOL STEEL

HARDNESS : 58-62 RC, HEADS ANNEALED

This series is not recommended for Molding or Die Casting applications. Please refer to pages 15-21 for Ejector Pins and Core Pins for use in Molding and Die Casting.

4", 6", AND 10" LENGTHS



HOW TO ORDER: EXAMPLES					
Qty.	Cat No.	Dia.	X	Length	
24	EP-9	1/8	X	6	

CATALOG NUMBER	D	H	T	NET PRICE EACH PER QUANTITY (US \$)									ML MODIFY LENGTH ADD TO BASE PRICE
	BODY DIA.	HEAD DIA.	HEAD THICK	L - LENGTHS									
				4"			6"			10"			
				100	50-99	1-49	100	50-99	1-49	100	50-99	1-49	
EP-5	1/16	7/64	3/64	2.20	2.42	2.63	2.90	3.09	3.31	Q	Q	Q	\$0.20 EACH OR \$15.00 MIN
EP-6	5/64	9/64	3/64	2.06	2.24	2.43	2.70	2.88	3.07	Q	Q	Q	
EP-7	3/32	5/32	5/64	1.97	2.17	2.35	2.59	2.77	2.97	Q	Q	Q	
EP-8	7/64	3/16	5/64	2.06	2.24	2.43	2.66	2.86	3.05	Q	Q	Q	
EP-9	1/8	7/32	3/32	1.82	1.97	2.13	2.35	2.51	2.68	3.17	3.37	3.54	
EP-10	9/64	1/4	7/64	1.82	1.97	2.13	2.35	2.51	2.68	3.17	3.37	3.54	\$0.26 EACH OR \$18.00 MIN
EP-11	5/32	17/64	1/8	1.82	1.97	2.13	2.35	2.51	2.68	3.17	3.37	3.54	
EP-12	11/64	5/16	1/8	1.91	2.08	2.24	2.44	2.63	2.78	3.28	3.45	3.64	
EP-13	3/16	5/16	9/64	1.91	2.08	2.24	2.44	2.63	2.78	3.28	3.45	3.64	
EP-14	13/64	11/32	5/32	2.10	2.26	2.42	2.53	2.70	2.86	3.38	3.56	3.74	
EP-15	7/32	3/8	5/32	2.27	2.43	2.61	2.72	2.88	3.05	3.58	3.75	3.94	
EP-16	15/64	13/32	11/64	2.35	2.51	2.68	2.90	3.07	3.23	3.66	3.86	4.04	
EP-17	1/4	7/16	3/16	2.35	2.51	2.68	2.90	3.07	3.23	3.66	3.86	4.04	
EP-18	17/64	7/16	1/4	2.79	2.97	3.14	3.08	3.25	3.41	3.77	3.95	4.13	\$0.32 EACH OR \$23.00 MIN
EP-19	9/32	7/16	1/4	2.79	2.97	3.14	3.08	3.25	3.41	3.77	3.95	4.13	
EP-20	19/64	1/2	1/4	2.99	3.16	3.31	3.17	3.32	3.50	3.96	4.15	4.32	
EP-21	5/16	1/2	1/4	2.99	3.16	3.31	3.17	3.32	3.50	3.96	4.15	4.32	
EP-22	21/64	9/16	1/4	3.08	3.25	3.42	3.34	3.52	3.69	4.47	4.65	4.84	
EP-23	11/32	9/16	1/4	3.08	3.25	3.42	3.34	3.52	3.69	4.47	4.65	4.84	
EP-24	23/64	5/8	1/4	3.17	3.32	3.50	3.54	3.72	3.87	4.87	5.05	5.24	
EP-25	3/8	5/8	1/4	3.17	3.32	3.50	3.54	3.72	3.87	4.87	5.05	5.24	

QUANTITY DISCOUNTS

Based on one size, one shipment, and one destination

500 Pieces 100 pc. Price Less 10%

1,000 Pieces 100 pc. Price Less 15%

CUSTOM MODIFICATIONS PRICE AND DELIVERY PER QUOTATION

The following are some of the modifications which can be made to this product. Please refer to page 1 for more information on ordering this product with these modifications or use the worksheet templates provided on pages 25-28.

ML*	MT	MH	COATINGS
			Dicronite

* ML Modification is priced in the price table above

Q = Price Per Quotation

EJ TYPE

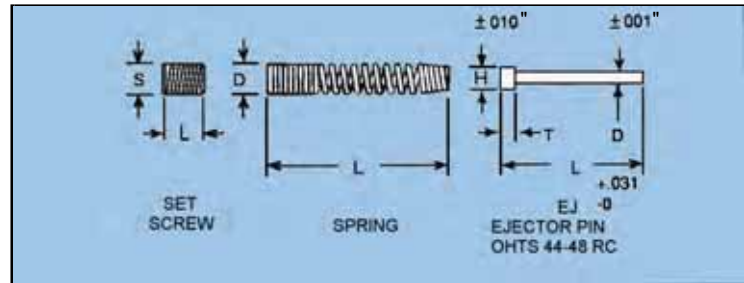
SLUG EJECTOR COMPONENTS



Royal

REPLACEMENT SLUG EJECTOR COMPONENTS
FOR SHOULDER HEAD AND BALL-LOCK TYPE
EJECTOR PUNCHES.

HOW TO ORDER: EXAMPLES	
Qty.	Cat. No.
20	EJ-3
50	CS-6



PINS ONLY (MINIMUM ORDER QTY. 10 PCS.)

CATALOG NUMBER	D	H	T	L	NET PRICE EACH PER QUANTITY (US \$)			
	PIN DIA.	HEAD DIA.	HEAD THICK	LENGTH	100	50-99	25-49	10-24
EJ-2	.015"	.048"	.031"	1.11"	2.32	2.65	3.03	3.48
EJ-2A	.020"	.048"	.031"	1.11"	1.20	1.58	2.03	2.54
EJ-3	.027"	.078"	.047"	1.38"	1.14	1.52	1.96	2.47
EJ-4	.041"	.094"	.062"	1.94"	1.14	1.52	1.96	2.47
EJ-6	.058"	.125"	.062"	1.94"	1.14	1.52	1.96	2.47
EJ-9	.089"	.156"	.094"	2.22"	1.20	1.59	2.03	2.54
EJ-12	.120"	.188"	.094"	2.22"	1.64	2.14	2.78	3.47

COMPONENT SETS (MINIMUM ORDER QTY. 10 PCS.)

(INCLUDES PINS, SPRINGS, & SET SCREWS)

CATALOG NUMBER	SPRING		SET SCREW		NET PRICE EACH PER QUANTITY (US \$)			
	D	L	S	L				
	DIA.	LENGTH	THREAD	LENGTH	100	50-99	25-49	10-24
CS-2	.062"	2"	2-56	.125"	3.37	3.70	4.08	4.53
CS-2A	.062"	2"	2-56	.125"	2.25	2.63	3.08	3.59
CS-3	.093"	2-1/2"	5-40	.125"	2.19	2.57	3.01	3.52
CS-4	.093"	2-1/2"	6-32	.125"	2.19	2.57	3.01	3.52
CS-6	.125"	3"	8-32	.125"	2.19	2.57	3.01	3.52
CS-9	.187"	3"	1/4-20	.250"	2.25	2.64	3.08	3.59

* Also available with 1/4-28 set screw at same price. Please specify when ordering

QUANTITY DISCOUNTS

Apply to EJ & CS , Based on one size, one shipment, and one destination

Over 300 Pieces Call For Pricing

GF-1000

RIGHT-ON™ PIN GRINDING FIXTURE

Why spend thousands of dollars on a pin cut-off machine?

This specialized precision-machined fixture is designed for fast and easy cut-off and grinding of ejector pins, cores, and sleeves, right on your surface grinder. It gives accurate and repeatable results when cutting pins and sleeves from 1/16" to 3/4" diameter, in lengths up to 14".

Jaw clamp has a 1-1/4" linear grip which holds pins firmly in position, thus preventing the nicks and dents that sometimes occur when using a single point V-Block.

Fixture can be used in the horizontal position or vertically, when clamped to an adequate right angle plate.



CATALOG NO.	NET PRICE EACH (US \$)
GF-1000	\$415

MPT TYPE

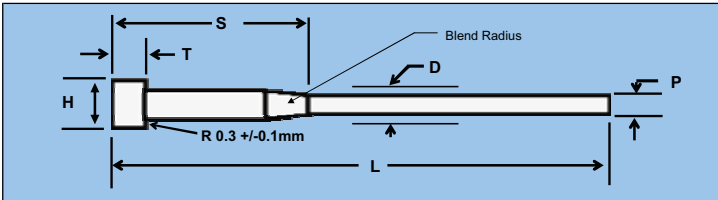
Royal

METRIC M-2 **TRUE-HARD**™ SERIES EJECTOR PINS NON-STANDARD

MATERIAL: M-2 HIGH SPEED STEEL
THROUGH-HARDENED TO 60-63 RC
HEADS DRAWN TO 40-55 RC



SHOULDER STYLE



TOLERANCES (METRIC ISO)

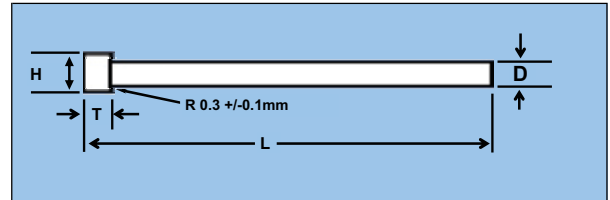
P	D	H	T	S	L
-0.002 mm	+0.00 mm	+0.00 mm	+0.00 mm	-1 mm	+1 mm
-0.008 mm	-0.02 mm	-0.2 mm	-0.05 mm	-2 mm	-0 mm

HOW TO ORDER: EXAMPLES

Qty.	Cat No.	Length
24	MPT-10-50	L-150
48	MPT-20-75	L-150

D	H	T	P	S	CATALOG NUMBER	NET PRICE EACH (US \$)		PKG. QTY.
SHLD. DIA.	HEAD DIA.	HEAD THICK	PIN DIA.	SHLD. LGTH.		LENGTHS		
						L-150	L-200	
2	4	2	0.8	50	MPT-08-50	10.19	Q	12
				75	MPT-08-75	10.19	Q	
			0.9	50	MPT-09-50	10.19	Q	
				75	MPT-09-75	10.19	Q	
			1.0	35	MPT-10-35	10.19	Q	
				50	MPT-10-50	10.19	12.34	
				75	MPT-10-75	9.92	10.76	
			1.1	50	MPT-11-50	10.19	10.71	
				75	MPT-11-75	9.92	10.19	
			1.2	50	MPT-12-50	10.19	10.71	
				75	MPT-12-75	9.92	10.19	
			1.3	50	MPT-13-50	9.35	10.61	
				75	MPT-13-75	9.08	10.08	
			1.4	50	MPT-14-50	9.35	10.50	
				75	MPT-14-75	9.08	9.98	
3	6	3	1.5	35	MPT-15-35	8.30	10.82	
				50	MPT-15-50	8.30	9.24	
				75	MPT-15-75	8.03	8.72	
			1.6	50	MPT-16-50	7.93	9.14	
				75	MPT-16-75	7.88	8.61	
			1.7	50	MPT-17-50	7.82	9.03	
				75	MPT-17-75	7.77	8.51	
			1.8	50	MPT-18-50	7.67	8.93	
				75	MPT-18-75	7.61	8.40	
			1.9	50	MPT-19-50	7.40	8.82	
				75	MPT-19-75	7.35	8.30	
			2.0	50	MPT-20-50	7.09	8.61	
				75	MPT-20-75	7.04	8.09	
			2.2	50	MPT-22-50	6.88	8.40	
				75	MPT-22-75	6.83	7.88	
			2.5	35	MPT-25-35	6.62	9.08	
				50	MPT-25-50	6.62	8.03	
				75	MPT-25-75	6.56	7.51	

STRAIGHT STYLE



TOLERANCES (METRIC ISO)

D	H	T	L
0 to 3	-0.002 mm -0.008 mm	+0.0 mm -0.2 mm	+0.00 mm -0.05 mm
3.5 to 6	-0.004 mm -0.012 mm		
			+1 mm -0 mm

HOW TO ORDER: EXAMPLE

Qty.	Cat No.	Length
24	MPT-35	L-150

D	H	T	CATALOG NUMBER	NET PRICE EACH (US \$)		PKG. QTY.
PIN DIA.	HEAD DIA.	HEAD THICK		LENGTHS		
				L-150	L-200	
2.0	4	2	MPT-20	6.93	12.18	12
2.5	5	2	MPT-25	6.62	10.50	
3.0	6	3	MPT-30	4.99	8.30	
3.5	7	3	MPT-35	5.04	8.35	
4.0	8	3	MPT-40	5.04	8.35	
5.0	10	3	MPT-50	6.30	9.45	
6.0	12	5	MPT-60	6.30	9.45	

QUANTITY DISCOUNTS

Based on one shipment and one destination.

Apply to all MPT's in catalog and are combinable with
PT, RHX, RX, ME, RC, and RCX Ejector Pins and Core Pins.

300 Pcs. (one size).....Less 5%
500 Pcs. (cumulative).....Less 5%
1200 Pcs. (cumulative).....Less 7%

Q = Price Per Quotation

PT AND PTD *TRUE-HARD*™ SERIES



Royal

M-2 EJECTOR/CORE PINS

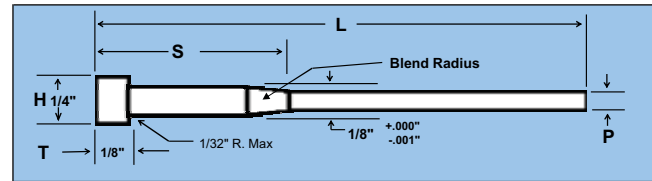
TIGHTEST TOLERANCE IN THE INDUSTRY (.0003")

MATERIAL : M-2 HIGH SPEED STEEL
THROUGH-HARDENED TO 60-63 RC

SHOULDER STYLE

STANDARD FRACTIONAL AND .0001" INCREMENT DIAMETERS

Royal **TRUE-HARD**™ Ejector/Core Pins are made from superior quality, wear resistant M-2 high speed steel, through hardened and double tempered to 60-63 RC in our specially developed vacuum heat treating equipment which is computer regulated to produce maximum toughness and durability. The diameters are precision ground after hardening to insure the high accuracy and finish.



TOLERANCES				
P	H	T	L	
PT -.0005" -.0008"	PTD +.0000" -.0003"	+.000" -.010"	+.000" -.002"	+.375" -.000"

HOW TO ORDER : EXAMPLES			
Qty.	Cat. No.	Length	P (If PTD)
12	PT-5-3	L-8	
36	PTD-7-2	L-6	P= .0925

PT TYPE STANDARD FRACTIONAL DIAMETERS 12 PINS PER PACKAGE						PTD TYPE NON-STANDARD DECIMAL DIAMETERS .0001" INCREMENTS												ML MODIFY LENGTH ADD TO BASE PRICE		
P -.0005" -.0008"		S	CAT. NO.	L-6"	L-8"	P +.0000" -.0003"	S	CAT. NO.	L-6"					L-8"						
NOM. PIN DIA.	ACTUAL PIN DIA.	SHL. LGTH.		STD. DIA.	STD. DIA.	DIA. RANGE	SHL. LGTH		NET PRICE EACH PER QUANTITY (US \$)					NET PRICE EACH PER QUANTITY (US \$)						
									50-99	25-49	10-24	5-9	1-4	50-99	25-49	10-24	5-9	1-4		
1/32	.0308" .0305"	1/2	PT-2-1/2	9.10	Q	UNDER .0312"	1/2	PTD-2-1/2	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q		
		2"	PT-2-2	8.37	8.98		2"	PTD-2-2	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q		
		3"	PT-2-3	Q	8.98		3"	PTD-2-3	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
		4"	PT-2-4	Q	7.65		4"	PTD-2-4	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
3/64	.0464" .0461"	1/2	PT-3-1/2	5.76	Q	.0313" THRU .0469"	1/2	PTD-3-1/2	7.25	8.75	11.25	13.25	16.25	Q	Q	Q	Q	Q		
		2"	PT-3-2	5.64	7.28		2"	PTD-3-2	7.15	8.65	11.15	13.15	16.15	10.00	11.50	14.00	16.00	19.00		
		3"	PT-3-3	Q	7.28		3"	PTD-3-3	Q	Q	Q	Q	Q	10.00	11.50	14.00	16.00	19.00		
		4"	PT-3-4	Q	6.55		4"	PTD-3-4	Q	Q	Q	Q	Q	9.40	10.90	13.40	15.40	18.40		
1/16	.0620" .0617"	1/2	PT-5-1/2	4.97	9.22	.0470" THRU .0625"	1/2	PTD-5-1/2	6.60	8.10	10.60	12.60	15.60	11.60	13.10	15.60	20.60	30.60		
		2"	PT-5-2	4.79	6.55		2"	PTD-5-2	6.45	7.95	10.45	12.45	15.45	9.40	10.90	13.40	15.40	18.40		
		3"	PT-5-3	Q	6.55		3"	PTD-5-3	Q	Q	Q	Q	Q	9.40	10.90	13.40	15.40	18.40		
		4"	PT-5-4	Q	5.94		4"	PTD-5-4	Q	Q	Q	Q	Q	8.90	10.40	12.90	14.90	17.90		
5/64	.0776" .0773"	1/2	PT-6-1/2	4.97	9.22	.0626" THRU .0781"	1/2	PTD-6-1/2	6.60	8.10	10.60	12.60	15.60	11.60	13.10	15.60	20.60	30.60		
		2"	PT-6-2	4.79	6.55		2"	PTD-6-2	6.45	7.95	10.45	12.45	15.45	9.40	10.90	13.40	15.40	18.40		
		3"	PT-6-3	Q	6.55		3"	PTD-6-3	Q	Q	Q	Q	Q	9.40	10.90	13.40	15.40	18.40		
		4"	PT-6-4	Q	5.94		4"	PTD-6-4	Q	Q	Q	Q	Q	8.90	10.40	12.90	14.90	17.90		
3/32	.0933" .0930"	1/2	PT-7-1/2	4.61	7.28	.0782" THRU .0938"	1/2	PTD-7-1/2	6.30	7.80	10.30	12.30	15.30	10.00	11.50	14.00	19.00	29.00		
		2"	PT-7-2	4.42	5.70		2"	PTD-7-2	6.15	7.65	10.15	12.15	15.15	8.70	10.20	12.70	14.70	17.70		
		3"	PT-7-3	Q	5.70		3"	PTD-7-3	Q	Q	Q	Q	Q	8.70	10.20	12.70	14.70	17.70		
		4"	PT-7-4	Q	5.46		4"	PTD-7-4	Q	Q	Q	Q	Q	8.50	10.00	12.50	14.50	17.50		
7/64	.1089" .1086"	1/2	PT-8-1/2	4.61	7.28	.0939" THRU .1094"	1/2	PTD-8-1/2	6.30	7.80	10.30	12.30	15.30	10.00	11.50	14.00	19.00	29.00		
		2"	PT-8-2	4.42	5.70		2"	PTD-8-2	6.15	7.65	10.15	12.15	15.15	8.70	10.20	12.70	14.70	17.70		
		3"	PT-8-3	Q	5.70		3"	PTD-8-3	Q	Q	Q	Q	Q	8.70	10.20	12.70	14.70	17.70		
		4"	PT-8-4	Q	5.46		4"	PTD-8-4	Q	Q	Q	Q	Q	8.50	10.00	12.50	14.50	17.50		
Q = Price Per Quotation						.1095" THRU .1245"	1/2	PTD-9-1/2	4.75	6.25	8.75	10.75	13.75	7.90	9.40	11.90	16.90	26.90	\$0.75 EACH OR \$50.00 MIN.	
							2"	PTD-9-2	4.60	6.15	8.60	10.60	13.60	7.75	9.25	11.75	13.75	16.75		
							3"	PTD-9-3	Q	Q	Q	Q	Q	7.75	9.25	11.75	13.75	16.75		
							4"	PTD-9-4	Q	Q	Q	Q	Q	7.55	9.05	11.55	13.55	16.55		

CUSTOM MODIFICATIONS PRICE AND DELIVERY PER QUOTATION	The following are some of the modifications which can be made to this product. Please refer to page 1 for more information on ordering this product with these modifications or use the worksheet templates provided on pages 25-28.															
	ML* CL	MT CT	MH	CS	CSD	SR	COATINGS									
							TiN Diconite									

* ML Modification is priced in price table above



M-2 EJECTOR/CORE PINS

MATERIAL : M-2 HIGH SPEED STEEL
THROUGH-HARDENED TO 60-63 RC

HEADS DRAWN TO 40-55 RC (PT-11 THROUGH PT-17)

TIGHTEST TOLERANCE IN THE INDUSTRY (.0003")

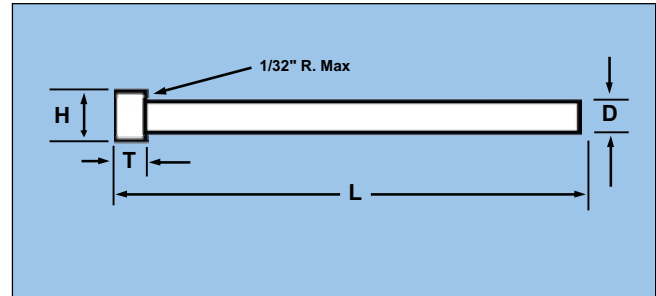
Royal **TRUE-HARD™** Ejector/Core Pins are made from superior quality, wear resistant M-2 high speed steel, through hardened and double tempered to 60-63 RC in our specially developed vacuum heat treating equipment which is computer regulated to produce maximum toughness and durability. The diameters are precision ground after hardening to insure the high accuracy and finish.

TOLERANCES				
D	H	T	L	
PT -.0005" -.0008"	PTD +.0000" -.0003"	+.000" -.010"	+.000" -.002"	+.375" -.000"

HOW TO ORDER : EXAMPLES			
Qty.	Cat. No.	Length	P (If PTD)
12	PT-9	L-8	
36	PTD-5	L-6	P= .0595

STRAIGHT STYLE

STANDARD FRACTIONAL AND .0001" INCREMENT DIAMETERS



PT TYPE							PTD TYPE													ML MODIFY LENGTH ADD TO BASE PRICE				
STANDARD FRACTIONAL DIAMETERS 12 PINS PER PACKAGE							NON-STANDARD DECIMAL DIAMETERS .0001" INCREMENTS																	
D	-.0005" -.0008"		H	T	CAT. NO.	L-6"	L-8"	D	+.0000" -.0003"		H	T	CAT. NO.	L-6"					L-8"					
NOM. PIN DIA.	ACTUAL PIN DIA.	HD. DIA.	HD. TK.	STD. DIA.		STD. DIA.	DIAETER RANGE	HD. DIA.	HD. THK.	NET PRICE EACH PER QUANTITY (US \$)					NET PRICE EACH PER QUANTITY (US \$)									
														50-99	25-49	10-24	5-9	1-4	50-99	25-49	10-24	5-9	1-4	
1/32	.0308" .0305"			PT-2	9.10	Q	UNDER .0312"						PTD-2	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
3/64	.0464" .0461"			PT-3	5.76	Q	.0313"-.0469"						PTD-3	7.60	9.20	11.80	13.80	16.80	Q	Q	Q	Q	Q	
1/16	.0620" .0617"			PT-5	4.98	9.22	.0470"-.0625"						PTD-5	6.95	8.50	11.15	13.15	16.15	12.20	13.75	16.40	21.40	31.40	
5/64	.0776" .0773"			PT-6	4.98	9.22	.0626"-.0781"						PTD-6	6.95	8.50	11.15	13.15	16.15	12.20	13.75	16.40	21.40	31.40	
3/32	.0933" .0930"	1/4	1/8	PT-7	4.61	7.28	.0782"-.0938"			1/4	1/8		PTD-7	6.60	8.20	10.80	12.80	15.80	10.50	12.10	14.70	19.70	29.70	
7/64	.1089" .1086"			PT-8	4.61	7.28	.0939"-.1094"						PTD-8	6.60	8.20	10.80	12.80	15.80	10.50	12.10	14.70	19.70	29.70	
1/8	.1245" .1242"			PT-9	3.12	4.91	.1095"-.1250"						PTD-9	5.00	6.55	9.20	11.20	14.20	8.30	9.85	12.50	17.50	27.50	
9/64	.1401" .1398"			PT-10	3.23	5.20	.1251"-.1406"						PTD-10	5.05	6.60	9.25	11.25	14.25	8.35	9.90	12.55	17.55	27.55	
5/32	.1558" .1555"	9/32	5/32	PT-11	3.23	6.06	.1407"-.1562"	9/32	5/32	PTD-11	5.05	6.60	9.25	11.25	14.25	8.35	9.90	12.55	17.55	27.55	\$0.75 EACH OR \$50.00 MIN.			
11/64	.1714" .1711"	11/32	3/16	PT-12	4.25	6.06	.1563"-.1719"	11/32	3/16	PTD-12	6.30	7.90	10.50	12.50	15.50	9.45	11.00	13.65	18.65	28.65				
3/16	.1870" .1867"	3/8	3/16	PT-13	4.25	6.06	.1720"-.1875"	3/8	3/16	PTD-13	6.30	7.90	10.50	12.50	15.50	9.45	11.00	13.65	18.65	28.65				
13/64	.2026" .2023"	3/8	3/16	PT-14	4.25	6.06	.1876"-.2031"	3/8	3/16	PTD-14	6.30	7.90	10.50	12.50	15.50	9.45	11.00	13.65	18.65	28.65				
7/32	.2183" .2180"	13/32	3/16	PT-15	4.25	6.06	.2032"-.2187"	13/32	3/16	PTD-15	6.30	7.90	10.50	12.50	15.50	9.45	11.00	13.65	18.65	28.65				
15/64	.2339" .2336"	13/32	3/16	PT-16	4.25	6.06	.2188"-.2343"	13/32	3/16	PTD-16	6.30	7.90	10.50	12.50	15.50	9.45	11.00	13.65	18.65	28.65				
1/4	.2495" .2492"	7/16	3/16	PT-17	4.25	6.06	.2344"-.2500"	7/16	3/16	PTD-17	6.30	7.90	10.50	12.50	15.50	9.45	11.00	13.65	18.65	28.65				

QUANTITY DISCOUNTS

ONE SHIPMENT AND ONE DESTINATION

APPLY TO PT ONLY AND ARE COMBINABLE WITH RHX, RX, RC, RCX, ME AND MPT EJECTOR AND CORE PINS

300 Pieces (ONE SIZE)..... Less 5%

500 Pieces (CUMULATIVE) ... Less 5%

1200 PCS. (CUMULATIVE)... Less 7%

H-13 "HARDENED-THROUGH" HOTWORK EJECTOR PINS

TIGHTEST TOLERANCE IN THE INDUSTRY (.0003")

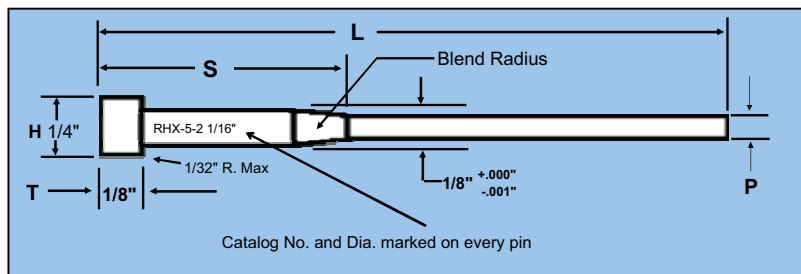
MATERIAL : H-13 HOTWORK DIE STEEL

CORE: THROUGH-HARDENED TO 50-55 RC

SURFACE: ION NITRIDED TO 65-74 RC

SHOULDER STYLE

FRACTIONAL AND .005" OVERSIZED DIAMETERS



TOLERANCES			
P	H	T	L
-.0005"	+.000"	+.000"	+.375"
-.0008"	-.010"	-.002"	-.000"

HOW TO ORDER: EXAMPLES			
Qty.	Cat No.	(IF .005" O.S.)	Length
24	RHX-7-1/2	+.005	L-10
48	RHX-3-2		L-6

CATALOG NUMBER	P		S	NET PRICE EACH PER QUANTITY (US \$)					PKG. QTY.
	PIN DIA.		SHOULDER LENGTH	L-6"	L-10"		L-14"		
	NOMINAL DIA.	DECIMAL EQUIV.		STANDARD DIA.	STANDARD DIA.	+.005" OVERSIZED DIA.	STANDARD DIA.	+.005" OVERSIZED DIA.	
RHX-2-1/2	1/32	0.03125	1/2	7.35	Q	Q	Q	Q	12
RHX-2-2			2"	7.25	Q	Q	Q	Q	
RHX-2-3			3"	Q	9.15	10.10	Q	Q	
RHX-2-4			4"	Q	9.15	10.10	Q	Q	
RHX-3-1/2	3/64	0.0469	1/2	4.25	Q	Q	Q	Q	
RHX-3-2			2"	4.05	4.65	5.40	Q	Q	
RHX-3-3			3"	Q	5.10	6.15	Q	Q	
RHX-3-4			4"	Q	5.70	6.15	Q	Q	
RHX-5-1/2	1/16	0.0625	1/2	3.95	4.90	5.60	Q	Q	
RHX-5-2			2"	3.85	4.50	5.40	6.20	7.15	
RHX-5-3			3"	Q	4.75	5.85	Q	Q	
RHX-5-4			4"	Q	5.30	6.45	Q	Q	
RHX-6-1/2	5/64	0.0781	1/2	3.95	4.90	5.70	Q	Q	
RHX-6-2			2"	3.85	4.50	5.10	6.20	7.15	
RHX-6-3			3"	Q	4.75	5.85	Q	Q	
RHX-6-4			4"	Q	5.30	6.45	Q	Q	
RHX-7-1/2	3/32	0.0938	1/2	3.60	4.55	5.10	Q	Q	
RHX-7-2			2"	3.40	4.30	4.90	5.80	6.75	
RHX-7-3			3"	Q	4.30	5.35	Q	Q	
RHX-7-4			4"	Q	4.75	5.85	Q	Q	
RHX-8-1/2	7/64	0.1094	1/2	3.60	4.55	5.10	Q	Q	
RHX-8-2			2"	3.40	4.05	4.60	5.80	6.75	
RHX-8-3			3"	Q	4.30	5.35	Q	Q	
RHX-8-4			4"	Q	4.75	5.85	Q	Q	

CUSTOM MODIFICATIONS PRICE AND DELIVERY PER QUOTATION	ML CL		MT CT		MH	CS	CSD	SR	COATINGS
									TIN DICRONITE

Q = Price Per Quotation

H-13 "HARDENED-THROUGH" HOTWORK EJECTOR PINS

TIGHTEST TOLERANCES IN THE INDUSTRY (.0003")

MATERIAL : H-13 HOTWORK DIE STEEL

STRAIGHT STYLE

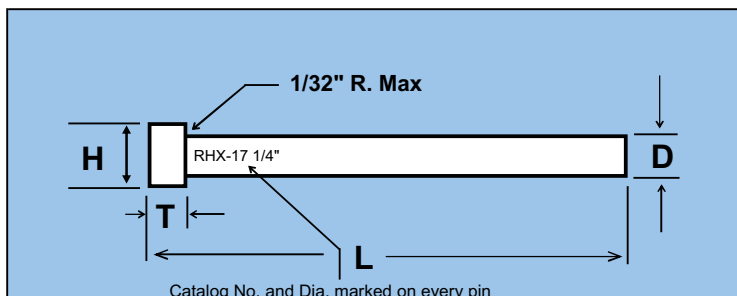
CORE: THROUGH-HARDENED TO 50-55 RC

SURFACE: ION NITRIDED TO 65-74 RC

FRACTIONAL AND .005" OVERSIZED DIAMETERS

TOLERANCES			
D	H	T	L
-.0005"	+.000"	+.000"	+.375"
-.0008"	-.010"	-.002"	-.000"

HOW TO ORDER: EXAMPLES			
Qty.	Cat No.	(IF .005" O.S.)	Length
24	RHX-13	+.005	L-10
48	RHX-9		L-10



Catalog No. and Dia. marked on every pin

CATALOG NUMBER	D		H	T	NET PRICE EACH PER QUANTITY (US \$)					PKG. QTY.
	PIN DIA.		HEAD DIA.	HEAD THICK.	L-6"	L-10"		L-14"		
	NOMINAL DIA.	DECIMAL EQUIV.			STANDARD DIA.	STANDARD DIA.	+.005" OVERSIZED DIA.	STANDARD DIA.	+.005" OVERSIZED DIA.	
RHX-3	3/64	0.0469	1/4	1/8	4.30	Q	Q	Q	Q	12
RHX-5	1/16	0.0625			4.05	4.75	5.30	Q	Q	
RHX-6	5/64	0.0781			4.05	4.75	5.30	Q	Q	
RHX-7	3/32	0.0938			3.65	4.10	4.85	Q	Q	
RHX-8	7/64	0.1094			3.65	4.10	4.85	Q	Q	
RHX-9	1/8	0.1250			1.95	2.15	2.25	2.50	2.80	
RHX-10	9/64	0.1406			2.15	2.35	3.15	3.05	Q	
RHX-11	5/32	0.1563	9/32	5/32	2.05	2.30	2.40	2.80	3.05	
RHX-12	11/64	0.1719	11/32	3/16	2.30	2.50	3.35	3.05	Q	
RHX-13	3/16	0.1875	3/8	3/16	2.10	2.45	2.55	3.10	3.30	
RHX-14	13/64	0.2031	3/8	3/16	2.55	2.70	Q	3.25	Q	
RHX-15	7/32	0.2188	13/32	3/16	2.30	2.70	2.95	3.35	Q	
RHX-16	15/64	0.2344	13/32	3/16	2.85	3.00	Q	3.70	Q	
RHX-17	1/4	0.2500	7/16	3/16	2.45	3.00	3.10	3.70	4.00	
RHX-18	17/64	0.2656	7/16	1/4	3.25	3.35	Q	4.05	Q	
RHX-19	9/32	0.2813	7/16	1/4	2.75	3.45	3.55	4.20	Q	
RHX-20	19/64	0.2969	1/2	1/4	3.65	3.80	Q	4.70	Q	
RHX-21	5/16	0.3125	1/2	1/4	3.05	3.80	3.90	4.75	5.25	
RHX-22	21/64	0.3281	9/16	1/4	4.00	4.20	Q	5.30	Q	
RHX-23	11/32	0.3438	9/16	1/4	3.40	4.30	4.55	5.50	Q	
RHX-24	23/64	0.3594	5/8	1/4	4.40	4.75	Q	5.95	Q	
RHX-25	3/8	0.3750	5/8	1/4	3.65	4.85	5.05	6.00	6.35	
RHX-26	25/64	0.3906	37/64	1/4	5.35	5.90	Q	Q	Q	
RHX-27	13/32	0.4063	11/16	1/4	4.00	5.30	5.70	6.90	Q	
RHX-28	27/64	0.4219	11/16	1/4	5.25	6.75	Q	Q	Q	
RHX-29	7/16	0.4375	11/16	1/4	4.35	5.90	6.15	7.60	8.40	
RHX-30	29/64	0.4531	45/64	1/4	5.70	7.05	Q	Q	Q	
RHX-31	15/32	0.4688	3/4	1/4	5.10	6.45	6.85	9.30	Q	
RHX-32	31/64	0.4844	3/4	1/4	6.20	8.15	Q	Q	Q	
RHX-33	1/2	0.5000	3/4	1/4	5.15	6.95	7.45	9.15	9.75	

QUANTITY DISCOUNTS

Apply to all standard RHX Shoulder and Straight Styles, and are combinable with PT, RX, RC, RCX, MPT, and ME Ejector and Core Pins

300 Pieces (one size).....Less 5%

500 Pieces (cumulative).....Less 5%

1200 Pieces (cumulative).....Less 7%

See previous page for custom modification information

Q = Price Per Quotation

H-13 HOTWORK EJECTOR PINS

TIGHTEST TOLERANCES IN THE INDUSTRY (.0003")

MATERIAL : H-13 HOTWORK DIE STEEL

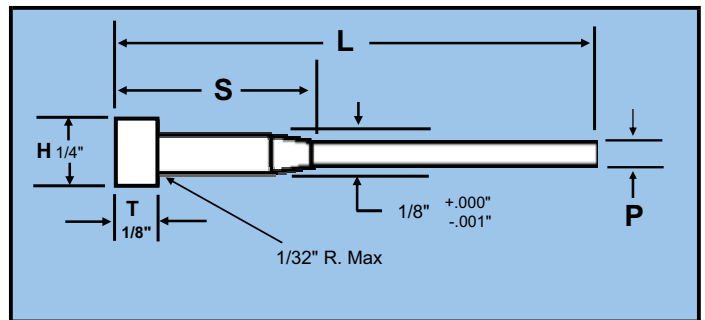
CORE: THROUGH-HARDENED TO 41-45 RC

SURFACE: ION NITRIDED TO 65-74 RC

Royal KNIGHTRIDE™ Series Ejector Pins are precision crafted from the finest grade of H-13 thermal shock resistant hotwork die steel. The heads are hot forged and stress relieved for uniform grain flow and high tensile strength. The core is hardened throughout to 41-45 RC and the surface is ion nitrided to 65-74 RC in a proprietary process, designed to create a diffusion layer between the nitrided case and the hardened core. The process produces the ideal combination of toughness and long life and it also prevents surface nicking and flaking which may be a problem with other nitrided pins. The diameters are precision ground to a high surface finish (5-10 Ra) and tight tolerance (.0003") which reduces friction and increases pin life.

SHOULDER STYLE

STANDARD FRACTIONAL AND .005" OVERSIZED DIAMETERS



HOW TO ORDER: EXAMPLES			
Qty.	Cat No.	(IF .005" O.S.)	Length
24	RX-3-2		L-6
48	RX-5-1/2	+.005	L-10

TOLERANCES			
P	H	T	L
-.0005"	+.000"	+.000"	+.375"
-.0008"	-.010"	-.002"	-.000"

P		S	CATALOG NUMBER	L-4"	L-6"	L-10"		L-14"	PKG. QTY.
NOMINAL PIN DIA.	ACTUAL PIN DIA.	SHOULDER LENGTH		STANDARD DIA.	STANDARD DIA.	STANDARD DIA.	+.005" DIA.	STANDARD DIA.	
1/32	.0308" .0305"	1/2	RX-2-1/2	Q	7.23	Q	Q	Q	12
		2"	RX-2-2	Q	7.12	Q	Q	Q	
		3"	RX-2-3	Q	Q	8.93	Q	Q	
		4"	RX-2-4	Q	Q	8.93	Q	Q	
3/64	.0464" .0461"	1/2	RX-3-1/2	4.15	4.20	5.42	5.98	6.94	
		2"	RX-3-2	4.06	4.11	4.79	5.76	6.72	
		3"	RX-3-3	Q	Q	4.79	Q	Q	
		4"	RX-3-4	Q	Q	4.79	Q	Q	
1/16	.0620" .0617"	1/2	RX-5-1/2	3.91	3.96	5.07	5.64	6.53	
		2"	RX-5-2	3.81	3.87	4.83	5.42	6.17	
		3"	RX-5-3	Q	Q	4.64	Q	Q	
		4"	RX-5-4	Q	Q	4.83	Q	Q	
5/64	.0776" .0773"	1/2	RX-6-1/2	3.91	3.96	5.07	5.64	6.62	
		2"	RX-6-2	3.81	3.87	4.83	5.42	6.27	
		3"	RX-6-3	Q	Q	4.64	Q	Q	
		4"	RX-6-4	Q	Q	4.83	Q	Q	
3/32	.0933" .0930"	1/2	RX-7-1/2	3.51	3.57	4.60	5.18	6.27	
		2"	RX-7-2	3.42	3.47	4.37	4.95	6.02	
		3"	RX-7-3	Q	Q	4.18	Q	Q	
		4"	RX-7-4	Q	Q	4.37	Q	Q	
7/64	.1089" .1086"	1/2	RX-8-1/2	3.51	3.57	4.60	5.18	6.27	
		2"	RX-8-2	3.42	3.47	4.37	4.95	5.90	
		3"	RX-8-3	Q	Q	4.18	Q	Q	
		4"	RX-8-4	Q	Q	4.37	Q	Q	

QUANTITY DISCOUNTS

Apply to all standard RX Shoulder and Straight Styles, and are combinable with PT, RHX, RC, RCX, MPT, and ME Ejector and Core Pins

300 Pieces (one size).....Less 5% 500 Pieces (cumulative).....Less 5% 1200 Pieces (cumulative).....Less 7%

CUSTOM MODIFICATIONS PRICE AND DELIVERY PER QUOTATION	ML CL		MT CT		MH		COATINGS
							Dicronite

Please refer to pages 15 and 16 for our M-2 High Speed Steel **TRUE-HARD** Series Ejector/Core Pins. The **TRUE-HARD** pins are stocked in standard fractional diameters, up to 1/4" (PT Type) and are available for quick delivery in .0001" increment diameters (PTD TYPE)

H-13 HOTWORK EJECTOR PINS

TIGHTEST TOLERANCES IN THE INDUSTRY(.0003")

MATERIAL: H-13 HOTWORK DIE STEEL

CORE: THROUGH-HARDENED TO 41-45 RC

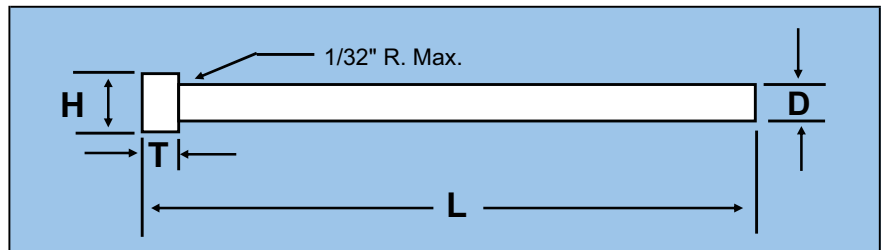
SURFACE: ION NITRIDED TO 65-74 RC

STRAIGHT STYLE

FRACTIONAL AND .005" OVERSIZED AND LETTER SIZE DIAMETERS

TOLERANCES				
D	H	T	L	
UP TO 1/2" DIA AND UP TO 14" LG.	-.0005" -.0008"	+0.000"	+0.000"	+0.375"
OVER 1/2" DIA OR OVER 14" LG.	-.0003" -.0008"	+0.010"	-.002"	-.000"

HOW TO ORDER: EXAMPLES			
Qty.	Cat No.	(IF .005" O.S.)	Length
25	RX-3	+0.005	L-10
50	RX-5		L-10



D		H	T	CATALOG NUMBER	L-4"	L-6"	L-10"		L-14"		L-18"		L-25"	L-36"	PKG. QTY.	
PIN DIA.		HEAD DIA.	HEAD THICK.		STD DIA.	STD DIA.	STD DIA.	+0.005" DIA.	STD DIA.	+0.005" DIA.	STD DIA.	+0.005" DIA.	STD DIA.	STD DIA.		
NOMINAL DIA.	DECIMAL EQUIV.				STD DIA.	STD DIA.	STD DIA.	STD DIA.	STD DIA.	STD DIA.	STD DIA.	STD DIA.	STD DIA.	STD DIA.		
1/32	0.0313	1/4	1/8	RX-2	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	12	
3/64	0.0469			RX-3	4.24	4.30	Q	Q	Q	Q	Q	Q	Q	Q		Q
1/16	0.0625			RX-5	3.95	4.00	5.17	6.02	Q	Q	Q	Q	Q	Q		Q
5/64	0.0781			RX-6	3.95	4.00	4.83	6.02	Q	Q	Q	Q	Q	Q		Q
3/32	0.0938			RX-7	3.56	3.61	4.06	5.28	Q	Q	Q	Q	Q	Q		Q
7/64	0.1094			RX-8	3.56	3.61	4.06	5.28	Q	Q	Q	Q	Q	Q		Q
1/8	0.1250			RX-9	1.90	1.96	2.20	2.48	2.75	2.95	6.38	Q	Q	Q		Q
9/64	0.1406			RX-10	Q	2.30	2.35	2.67	3.20	Q	6.07	Q	Q	Q		Q
5/32	0.1563	9/32	5/32	RX-11	1.99	2.05	2.30	2.59	2.96	3.26	4.13	Q	Q	Q		
11/64	0.1719	11/32	3/16	RX-12	2.39	2.45	2.50	2.84	3.32	Q	Q	Q	Q	Q		
3/16	0.1875	3/8	3/16	RX-13	2.05	2.10	2.45	2.76	3.26	3.50	4.28	Q	6.12	Q		
13/64	0.2031	3/8	3/16	RX-14	Q	Q	2.74	Q	3.52	Q	Q	Q	Q	Q		
7/32	0.2188	13/32	3/16	RX-15	2.19	2.24	2.73	3.06	3.62	Q	Q	Q	6.63	Q		
15/64	0.2344	13/32	3/16	RX-16	Q	Q	3.00	Q	3.88	Q	Q	Q	Q	Q		
B	0.2380	7/16	3/16	RX-B	Q	Q	4.39	Q	Q	Q	Q	Q	Q	Q		
C	0.2420	7/16	3/16	RX-C	Q	Q	4.44	Q	Q	Q	Q	Q	Q	Q		
D	0.2460	7/16	3/16	RX-D	Q	Q	4.59	Q	Q	Q	Q	Q	Q	Q		
1/4	0.2500	7/16	3/16	RX-17	2.34	2.39	2.98	3.34	3.86	4.27	4.95	5.60	7.13	Q		
F	0.2570	7/16	3/16	RX-F	Q	Q	4.64	Q	Q	Q	Q	Q	Q	Q		
G	0.2610	7/16	1/4	RX-G	Q	Q	4.69	Q	Q	Q	Q	Q	Q	Q		
17/64	0.2656	7/16	1/4	RX-18	Q	Q	3.52	Q	4.21	Q	Q	Q	7.55	Q		
I	0.2720	7/16	1/4	RX-I	Q	Q	4.85	Q	Q	Q	Q	Q	Q	Q		
J	0.2770	7/16	1/4	RX-J	Q	Q	4.90	Q	Q	Q	Q	Q	Q	Q		
9/32	0.2813	7/16	1/4	RX-19	2.77	2.87	3.65	3.75	4.35	Q	5.80	Q	8.05	Q		
L	0.2900	1/2	1/4	RX-L	Q	Q	5.20	Q	Q	Q	Q	Q	Q	Q		
M	0.2950	1/2	1/4	RX-M	Q	Q	5.25	Q	Q	Q	Q	Q	Q	Q		
19/64	0.2969	1/2	1/4	RX-20	Q	Q	3.86	Q	4.85	Q	Q	Q	Q	Q		
N	0.3020	1/2	1/4	RX-N	Q	Q	5.36	Q	Q	Q	Q	Q	Q	Q		
5/16	0.3125	1/2	1/4	RX-21	3.06	3.16	4.06	4.15	4.85	5.40	6.38	6.99	8.66	32.13		
P	0.3230	9/16	1/4	RX-P	Q	Q	5.66	Q	Q	Q	Q	Q	Q	Q		
21/64	0.3281	9/16	1/4	RX-22	Q	Q	4.35	Q	5.64	Q	Q	Q	9.37	Q		
Q DIA	0.3320	9/16	1/4	RX-Q	Q	Q	5.87	Q	Q	Q	Q	Q	Q	Q		
R	0.3390	9/16	1/4	RX-R	Q	Q	5.97	Q	Q	Q	Q	Q	Q	Q		
11/32	0.3438	9/16	1/4	RX-23	3.51	3.56	4.55	4.70	5.73	Q	Q	Q	9.70	Q		
23/64	0.3594	5/8	1/4	RX-24	Q	Q	4.85	Q	6.13	Q	Q	Q	Q	Q		
U	0.3680	5/8	1/4	RX-U	Q	Q	6.48	Q	Q	Q	Q	Q	Q	Q		
3/8	0.3750	5/8	1/4	RX-25	3.71	3.75	5.05	5.24	6.19	6.77	8.35	9.18	11.88	31.61		
V	0.3770	5/8	1/4	RX-V	Q	Q	6.63	Q	Q	Q	Q	Q	Q	Q		
W	0.3860	5/8	1/4	RX-W	Q	Q	6.63	Q	Q	Q	Q	Q	Q	Q		
X	0.3970	11/16	1/4	RX-X	Q	Q	6.99	Q	Q	Q	Q	Q	Q	Q		
Y	0.4040	11/16	1/4	RX-Y	Q	Q	7.14	Q	Q	Q	Q	Q	Q	Q		
13/32	0.4063	11/16	1/4	RX-27	4.11	4.15	5.63	5.90	7.28	Q	9.60	Q	13.82	Q		
7/16	0.4375	11/16	1/4	RX-29	4.46	4.55	6.19	6.43	7.87	8.62	10.70	Q	15.45	34.31		
15/32	0.4688	3/4	1/4	RX-31	5.73	5.83	6.78	7.02	11.29	Q	11.82	Q	17.58	Q		
1/2	0.5000	3/4	1/4	RX-33	5.29	5.44	7.37	7.71	9.69	10.29	12.80	Q	19.02	37.98		
9/16	0.5625	13/16	1/4	RX-35	Q	6.72	9.17	Q	11.68	Q	15.25	Q	21.82	Q		
5/8	0.6250	7/8	1/4	RX-37	Q	7.79	10.76	Q	13.56	Q	17.60	Q	24.63	Q		
11/16	0.6875	15/16	1/4	RX-39	Q	10.26	12.69	Q	17.89	Q	20.76	Q	28.75	Q		
3/4	0.7500	1	1/4	RX-41	Q	10.86	14.58	Q	18.55	Q	23.76	Q	32.69	Q		
7/8	0.8750	1-1/8	1/4	RX-45	Q	23.30	27.40	Q	46.55	Q	65.75	Q	84.85	Q		
1	1.0000	1-1/4	1/4	RX-47	Q	24.40	27.40	Q	53.95	Q	69.80	Q	90.35	Q		

See previous page for Custom Modification information and Quantity Discounts.

Q= Price Per Quota

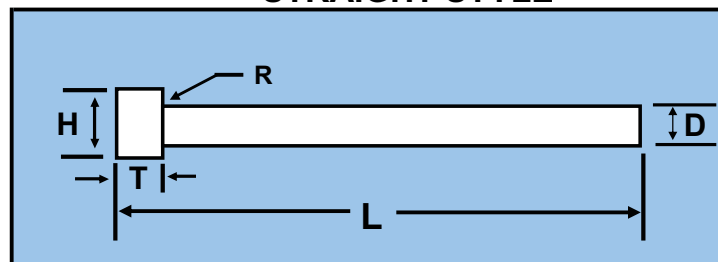
METRIC *KNIGHTRIDE*™ SERIES H-13 HOTWORK EJECTOR PINS

MATERIAL : H-13 HOTWORK DIE STEEL

CORE: THROUGH-HARDENED TO 41-45 RC

SURFACE: ION NITRIDED TO 65-74 RC

STRAIGHT STYLE



TOLERANCES (METRIC ISO)				
PIN DIA. (D)g6		R	Head Dia. (H)	+0.0 mm -0.2 mm
SIZE	TOLERANCE			
0 to 3 mm	-.002 mm -.008 mm	0.3 mm	Head Thick (T)	+0.00 mm -0.05 mm
3.5 to 6 mm	-.004 mm -.012 mm	0.3 mm		
6.5 to 10 mm	-.005 mm -.014 mm	0.5 mm		
11 to 18 mm	-.006 mm -.017 mm	0.8 mm	Length (L)	+2.0 mm -0.0 mm
20 to 25 mm	-.007 mm -.020 mm	0.8 mm		

HOW TO ORDER: EXAMPLE		
QTY.	CAT. NO.	LENGTH
24	ME-2.5	L-160

CATALOG NUMBER	D	H	T	NET PRICE EACH (US \$)				PKG. QTY
				LENGTHS				
	PIN DIA.	HEAD DIA.	HEAD THICK	L-160	L-250	L-315	L-400	
ME-2.0	2.0	4	2	3.32	3.42	Q	Q	12
ME-2.5	2.5	5	2	3.37	3.67	4.28	Q	
ME-3.0	3.0	6	3	2.60	3.83	4.08	4.56	
ME-3.5	3.5	7	3	3.98	4.69	5.66	Q	
ME-4.0	4.0	8	3	2.81	4.18	4.49	5.30	
ME-4.5	4.5	8	3	4.39	5.51	6.27	Q	
ME-5.0	5.0	10	3	3.01	3.88	4.95	6.14	
ME-5.5	5.5	10	3	4.64	5.87	6.73	Q	
ME-6.0	6.0	12	5	3.77	5.41	6.27	7.88	
ME-6.5	6.5	12	5	5.15	7.19	8.31	Q	
ME-7.0	7.0	12	5	5.51	7.85	8.98	Q	
ME-8.0	8.0	14	5	4.90	7.19	8.52	10.61	
ME-9.0	9.0	14	5	6.63	10.10	11.63	Q	
ME-10.0	10.0	16	5	5.76	8.67	10.15	12.50	
ME-11.0	11.0	16	5	8.77	13.46	15.91	Q	
ME-12.0	12.0	20	7	6.78	9.79	13.46	Q	
ME-12.5	12.5	20	7	8.26	11.73	15.35	Q	
ME-14.0	14.0	22	7	8.57	12.65	Q	Q	6
ME-16.0	16.0	22	7	9.59	14.59	Q	Q	
ME-18.0	18.0	26	7	Q	19.18	Q	Q	
ME-20.0	20.0	26	8	Q	22.44	Q	Q	4
ME-25.0	25.0	32	10	Q	39.22	Q	Q	2

Q = Price Per Quotation

QUANTITY DISCOUNTS

Apply to all standard ME Pins, and are combinable with PT, RHX, RC, RCX, MPT, and RX Ejector and Core Pins - One shipment, one destination

300 Pieces (one size).....Less 5% 500 Pieces (cumulative).....Less 5% 1200 Pieces (cumulative).....Less 7%

CUSTOM MODIFICATIONS PRICE AND DELIVERY PER QUOTATION	The following are some of the modifications which can be made to this product. Please refer to page 1 for more information on ordering this product with these modifications or use the worksheet templates provided on pages 25 - 28.									
	ML CL		MT CT				MH		COATINGS	
									Dicronite	

RC AND RCX TYPES

Royal

STANDARD H-13 CORE PINS

3", 6" and 10" Lengths

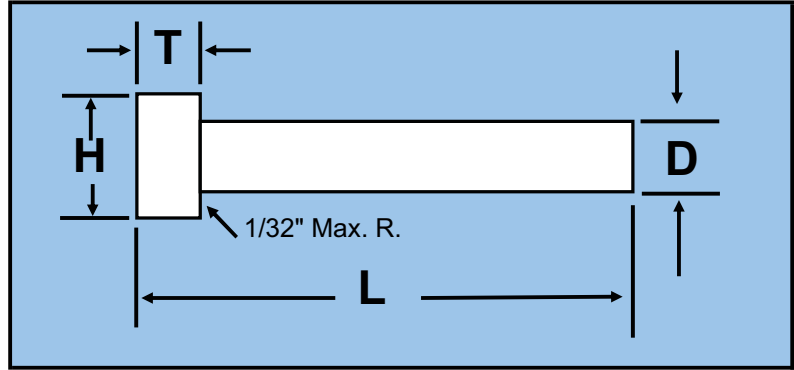
TWO HARDNESS RANGES

STANDARD HARDNESS - RC TYPE: 30-35 RC

HIGH HARDNESS - RCX TYPE: 50-55-RC

30 STOCK DIAMETERS *

HOW TO ORDER: EXAMPLES		
QTY.	CAT NO.	LENGTH
24	RC-9	L-6
12	RCX-13	L-3



RC TYPE STANDARD HARDNESS 30-35 RC				D	H	T	RCX TYPE HIGH HARDNESS 50-55 RC				PKG. QTY.			
CATALOG NUMBER	NET PRICE EACH (US \$)						BODY DIA.	HEAD DIA.	HEAD THICK.	CATALOG NUMBER		NET PRICE EACH (US \$)		
	STANDARD LENGTHS											STANDARD LENGTHS		
	L-3"	L-6"	L-10"									L-3"	L-6"	L-10"
RC-3	4.90	5.51	Q	3/64	1/4	1/8	RCX-3	5.10	5.76	Q	12			
RC-5	4.64	5.15	Q	1/16	1/4	1/8	RCX-5	4.85	5.41	Q				
RC-6	4.23	4.64	Q	5/64	1/4	1/8	RCX-6	4.44	4.90	Q				
RC-7	3.62	3.72	4.34	3/32	1/4	1/8	RCX-7	3.83	3.98	4.69				
RC-8	3.72	3.88	4.59	7/64	1/4	1/8	RCX-8	3.93	4.08	4.90				
RC-9	2.24	2.30	3.06	1/8	1/4	1/8	RCX-9	2.40	2.50	3.21				
RC-10	2.24	2.35	3.06	9/64	1/4	1/8	RCX-10	2.40	2.60	3.21				
RC-11	2.30	2.40	3.11	5/32	9/32	5/32	RCX-11	2.50	2.60	3.21				
RC-12	2.30	2.40	3.21	11/64	11/32	3/16	RCX-12	2.55	2.65	3.42				
RC-13	2.35	2.45	3.26	3/16	3/8	3/16	RCX-13	2.55	2.70	3.42				
RC-14	2.40	2.50	3.32	13/64	3/8	3/16	RCX-14	2.60	2.75	3.57				
RC-15	2.45	2.60	3.42	7/32	13/32	3/16	RCX-15	2.65	2.81	3.57				
RC-16	3.42	3.98	Q	15/64	13/32	3/16	RCX-16	3.62	4.23	Q				
RC-17	2.65	2.75	3.67	1/4	7/16	3/16	RCX-17	2.86	3.01	3.88				
RC-18	3.67	4.23	Q	17/64	7/16	1/4	RCX-18	3.93	4.54	Q				
RC-19	2.91	3.01	4.03	9/32	7/16	1/4	RCX-19	3.16	3.32	4.34				
RC-20	3.98	4.54	Q	19/64	1/2	1/4	RCX-20	4.23	4.85	Q				
RC-21	3.21	3.32	4.44	5/16	1/2	1/4	RCX-21	3.47	3.62	4.79				
RC-22	4.23	4.85	Q	21/64	9/16	1/4	RCX-22	4.54	5.20	Q				
RC-23	3.47	3.62	4.79	11/32	9/16	1/4	RCX-23	3.77	3.98	5.30				
RC-24	4.64	5.25	Q	23/64	5/8	1/4	RCX-24	4.90	5.61	Q				
RC-25	3.88	4.03	5.30	3/8	5/8	1/4	RCX-25	4.13	4.39	5.81				
RC-27	4.34	4.54	5.76	13/32	11/16	1/4	RCX-27	4.64	4.95	6.32				
RC-29	4.69	4.85	6.32	7/16	11/16	1/4	RCX-29	5.00	5.20	6.94				
RC-31	5.20	5.41	6.89	15/32	3/4	1/4	RCX-31	5.56	5.97	7.60				
RC-33	5.56	5.76	7.40	1/2	3/4	1/4	RCX-33	5.87	6.27	8.21				
RC-35	Q	6.89	9.18	9/16	13/16	1/4	RCX-35	Q	7.50	10.00	6			
RC-37	Q	8.21	10.76	5/8	7/8	1/4	RCX-37	Q	8.77	11.88				
RC-39	Q	13.26	Q	11/16	15/16	1/4	RCX-39	Q	14.18	Q				
RC-41	Q	11.12	14.69	3/4	1	1/4	RCX-41	Q	12.09	16.32				

Q = Price Per Quotation

TOLERANCES		
D	PIN DIA.	+ .001" - .000"
H	HEAD DIA.	+ .000" - .010"
T	HEAD THICK.	+ .000" - .002"
L	OVERALL LENGTH	+ .375" - .000"

QUANTITY DISCOUNTS	
Based on one shipment and one destination	
Combinable with PT, RX, ME, RHX, and MPT Ejector pins.	
300 Pcs. (one size)...Less 5%	
500 Pcs. (cumulative)...Less 5%	
1200 Pcs. (cumulative)...Less 7%	

* Decimal diameters can be made to order for prompt delivery. Also, please refer to pages 2, 3, 4, 5, & 6 for core pin blanks stocked in .001" increments from 0.010" diameter.

CUSTOM MODIFICATIONS PRICE AND DELIVERY PER QUOTATION	The following are some of the modifications which can be made to this product. Please refer to page 1 for more information on ordering this product with these modifications or use the worksheet templates provided on pages 25 - 28.						
	ML CL	MT CT	MH	CS	CSD	SR	COATINGS
							TiN Dicronite

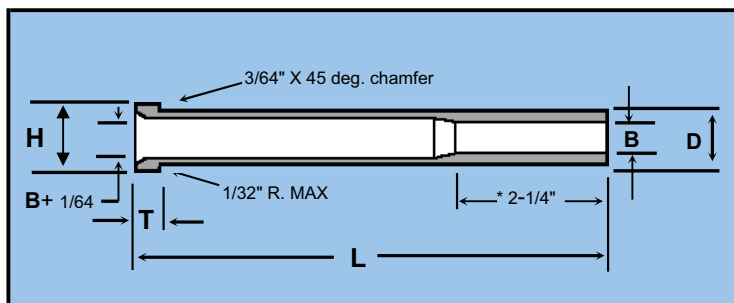
KNIGHTRIDE™ SERIES H-13 HOTWORK EJECTOR SLEEVES

MATERIAL: H-13 HOTWORK DIE STEEL
I. D. & O. D. NITRIDED TO 65-74 RC

NITRIDED O.D. & I.D.

TOLERANCES				
I.D.	O.D.	HEAD DIA.	HD. THICK	O.A.L.
B	D	H	T	L
+0.0005" -0.0000"	-0.0003" -0.0008"	+0.000" -0.010"	+0.000" -0.002"	+0.125" -0.000"

HOW TO ORDER: EXAMPLES		
QTY.	Cat. NO.	Length
10	RSL-15	L-4
6	RSL-29	L-7



*RSL-13 and RSL-15 have a 1-3/4" bearing length

CATALOG NUMBER	B	D	H	T	NET PRICE EACH PER QUANTITY (US \$)									
	I.D.	O.D.	HEAD DIA.	HEAD THICK	L-3"		L-4"		L-5"		L-6"		L-7"	
					1-24	25 +	1-24	25 +	1-24	25 +	1-24	25 +	1-24	25 +
RSL-13	3/32	3/16	3/8	3/16	26.35	25.03	28.65	27.22	31.45	29.88	33.95	32.25	37.00	35.15
RSL-15	1/8	7/32	13/32	3/16	25.10	23.85	27.90	26.51	30.90	29.36	33.45	31.78	36.50	34.68
RSL-17	5/32	1/4	7/16	3/16	Q	Q	21.30	20.24	22.30	21.19	24.10	22.90	26.35	25.03
RSL-21	3/16	5/16	1/2	1/4	Q	Q	21.80	20.71	23.05	21.90	25.10	23.85	27.65	26.27
RSL-23	7/32	11/32	9/16	1/4	Q	Q	22.05	20.95	23.60	22.42	25.60	24.32	28.40	26.98
RSL-25	1/4	3/8	5/8	1/4	Q	Q	22.55	21.42	24.10	22.90	26.35	25.03	28.90	27.46
RSL-29	5/16	7/16	11/16	1/4	Q	Q	23.05	21.90	25.60	24.32	28.15	26.74	30.90	29.36
RSL-33	3/8	1/2	3/4	1/4	Q	Q	23.60	22.42	27.90	26.51	30.40	28.88	33.45	31.78
RSL-37	7/16	5/8	7/8	1/4	Q	Q	25.35	24.08	30.40	28.88	35.50	33.73	38.50	36.58
RSL-39	1/2	11/16	15/16	1/4	Q	Q	26.60	25.27	31.45	29.88	37.00	35.15	40.55	38.52
RSL-41	9/16	3/4	1"	1/4	Q	Q	33.00	31.35	36.50	34.68	40.00	38.00	44.00	41.80
RSL-45	5/8	7/8	1-1/8	1/4	Q	Q	37.50	35.63	41.00	38.95	45.00	42.75	49.00	46.55
RSL-47	3/4	1"	1-1/4	1/4	Q	Q	41.50	39.43	45.50	43.23	49.50	47.03	54.00	51.30

CATALOG NUMBER	B	D	H	T	NET PRICE EACH PER QUANTITY (US \$)									
	I.D.	O.D.	HEAD DIA.	HEAD THICK	L-8"		L-9"		L-10"		L-11"		L-12"	
					1-24	25 +	1-24	25 +	1-24	25 +	1-24	25 +	1-24	25 +
RSL-17	5/32	1/4	7/16	3/16	28.90	27.46	31.95	30.35	36.00	34.20	Q	Q	Q	Q
RSL-21	3/16	5/16	1/2	1/4	30.40	28.88	33.45	31.78	37.50	35.63	41.50	39.43	46.50	44.18
RSL-23	7/32	11/32	9/16	1/4	31.45	29.88	35.50	33.73	39.05	37.10	Q	Q	Q	Q
RSL-25	1/4	3/8	5/8	1/4	31.95	30.35	36.00	34.20	40.05	38.05	44.50	42.28	49.50	47.03
RSL-29	5/16	7/16	11/16	1/4	34.45	32.73	38.50	36.58	42.55	40.42	47.50	45.13	52.50	49.88
RSL-33	3/8	1/2	3/4	1/4	37.00	35.15	44.05	41.85	45.60	43.32	50.50	47.98	56.00	53.20
RSL-37	7/16	5/8	7/8	1/4	42.55	40.42	46.60	44.27	51.20	48.64	56.50	53.68	62.00	58.90
RSL-39	1/2	11/16	15/16	1/4	44.60	42.37	49.15	46.69	54.20	51.49	59.50	56.53	65.00	61.75
RSL-41	9/16	3/4	1"	1/4	48.00	45.60	53.00	50.35	57.50	54.63	63.00	59.85	68.50	65.08
RSL-45	5/8	7/8	1-1/8	1/4	53.50	50.83	58.50	55.58	63.50	60.33	69.50	66.03	75.00	71.25
RSL-47	3/4	1"	1-1/4	1/4	58.50	55.58	64.00	60.80	69.50	66.03	75.00	71.25	81.50	77.43

NOTE: Quantity Prices on Ejector Sleeves are per size only and are based on one shipment and one destination.

Ejector Sleeves are not combinable with any other components for cumulative pricing.

Q = Price Per Quotation

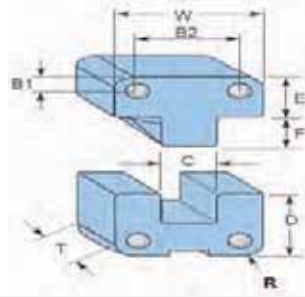
SIDE LOCKS

Royal

MALE - MATERIAL: Tool Steel With Black Oxide

HARDNESS: 58-62 RC

FEMALE - D-2: With Titanium Nitride Coating



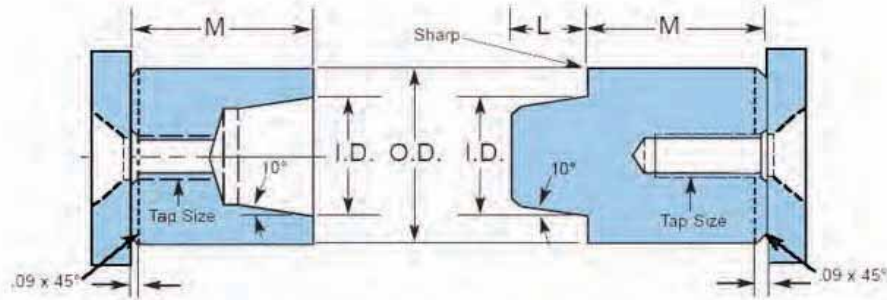
CATALOG NUMBER	W +.0000" -.0004"	T +.000" -.002"	C	E +.000" -.002"	F +.000" -.010"	OVERALL HEIGHT	B1 +.010" -.010"	B2 +.010" -.010"	D +.000" -.002"	R +.010" -.000" RADIUS	SHCS (4)	PRICE
SL-100	1.0000	.375	.500	.875	.530	2.000	.250	.500	1.125	.187	10-32 X 1/2	123.50
SL-125	1.2500	.500	.500	.875	.660	2.000	.250	.750	1.125	.187	8-32 X 5/8	134.45
SL-150	1.5000	.500	.563	.875	.560	1.750	.250	1.000	.875	.187	8-32 X 5/8	136.42
SL-200	2.0000	.500	.750	.875	.660	2.250	.312	1.375	1.375	.250	10-32 X 5/8	146.40
SL-300	3.0000	.750	1.250	.875	1.130	2.750	.375	2.250	1.875	.250	1/4-20 X 1	190.25
SL-400	4.0000	1.000	1.500	1.375	1.130	3.750	.500	3.000	2.7375	.500	3/8-16 X 1-1/4	235.95
SL-500	5.0000	1.250	2.0000	1.375	1.630	4.250	.625	3.750	2.875	.500	1/2-13 X 1-1/2	292.75
SL-600	6.0000	1.500	2.500	1.375	1.630	4.250	.625	4.750	2.875	.500	1/2-13 X 1-3/4	383.35

TAPERED INTERLOCKS (ROUND)

Royal

MATERIAL: D2

HARDNESS: 58-62 RC



FEMALE					
CATALOG NUMBER	PRICE	O.D. +.0000" -.0005"	I.D.	M +.015" -.020"	TAP SIZE
TIF-051	21.99	.5000	.312	.875	10-24
TIF-052	22.35			1.187	
TIF-053	22.55			1.375	
TIF-071	22.18	.7500	.500	.875	1/4-20
TIF-072	22.29			1.187	
TIF-073	22.37			1.375	
TIF-101	23.32	1.0000	.625	.875	1/4-20
TIF-102	23.47			1.187	
TIF-103	23.70			1.375	
TIF-150	29.88	1.5000	1.000	1.125	5/16-18
TIF-151	30.30			1.375	
TIF-152	30.75			1.625	

MALE					
CATALOG NUMBER	PRICE	O.D. +.0000" -.0005"	I.D.	L	TAP SIZE
TIM-051	20.66	.5000	.312	.312	10-24
TIM-052	20.99				
TIM-053	21.15				
TIM-071	20.80	.7500	.500	.281	1/4-20
TIM-072	20.90				
TIM-073	21.00				
TIM-101	22.05	1.0000	.625	.343	1/4-20
TIM-102	22.25				
TIM-103	22.40				
TIM-150	28.50	1.5000	1.000	.500	5/16-18
TIM-151	28.88				
TIM-152	29.31				

WORKSHEET MASTER COPY

Special Punches and Perforators

Special Ejector Sleeves

FIG. 1 STRAIGHT

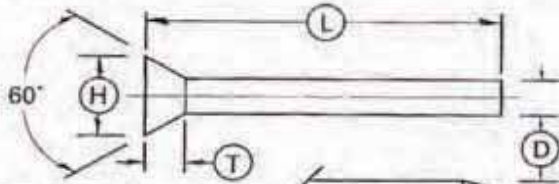


FIG. 1A STRAIGHT PILOT NOSE

FIG. 1B STEPPED

FIG. 1C STEPPED PILOT NOSE

FIG. 3 STRAIGHT

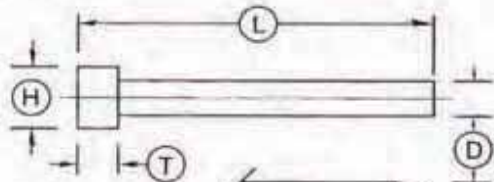


FIG. 3A STRAIGHT PILOT NOSE

FIG. 3B STEP

FIG. 3C STEP PILOT NOSE

FIG. 2 STRAIGHT

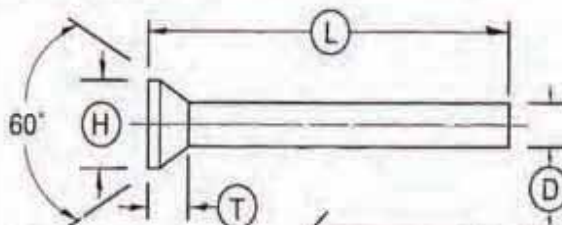


FIG. 2A STRAIGHT PILOT NOSE

FIG. 2B STEP

FIG. 2C STEP PILOT NOSE

FIG. 13 EJECTOR SLEEVE - STRAIGHT

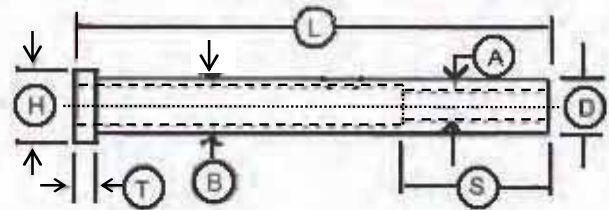
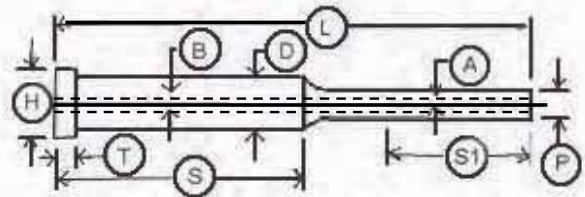


FIG. 14 EJECTOR SLEEVE - STEP



Please specify required tolerances on all dimensions.

FIG. _____ QTY. _____

MATL. _____ HDN. _____ RC

Modify Standard Catalog No. _____

COMMENTS:

DIM.	SIZE	TOL.	DIM.	SIZE	TOL.
D			S		
H			S1		
T			P		
L			A		
L1			B		
			G		
			B		
			P		
			R		

Company Name _____

Address _____

City, State, Zip _____

Phone _____ Fax _____

Contact _____

E-Mail Address _____

Reference: Request for Quote No. _____

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Royal®

ROYAL DIVERSIFIED PRODUCTS, INC.
287 MARKET ST., PO BOX 444, WARREN, RI 02885
PHONE (401) 245-6900

FAX (401) 247-2231

WORKSHEET MASTER COPY

CORE PINS

FIG. 5 CORE PIN STRAIGHT

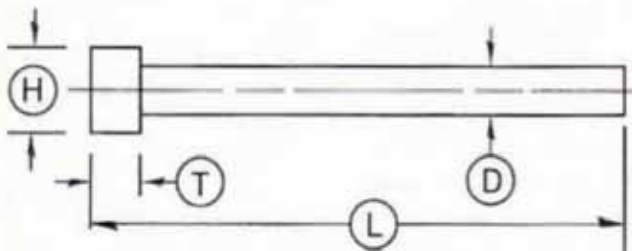


FIG. 5A CORE PIN STRAIGHT
SPHERICAL RADIUS

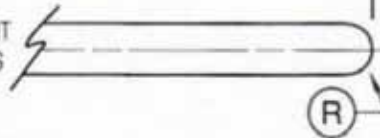


FIG. 6 CORE PIN-STEPPED

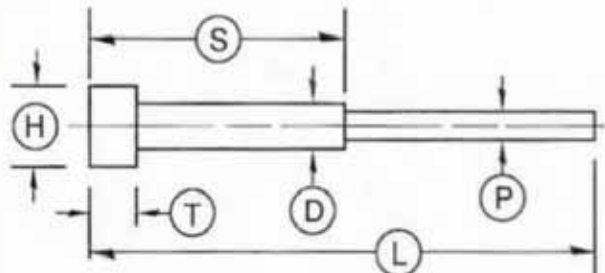


FIG. 6A CORE PIN-STEPPED
SPHERICAL RADIUS



FIG. 7 CORE PIN-STEPPED DRAFT

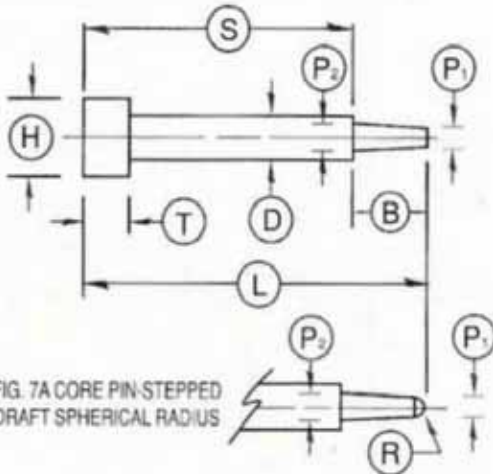
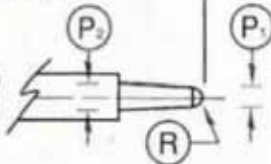


FIG. 7A CORE PIN-STEPPED
DRAFT SPHERICAL RADIUS



Please specify required tolerances on all dimensions.

FIG. _____ QTY. _____

MATL. _____ HDN. _____ RC

Modify Standard Catalog No. _____

COMMENTS:

DIM.	SIZE	TOL.	DIM.	SIZE	TOL.
D			S		
H			P		
T			P1		
L			P2		
B			R		

FIG. 8 SPECIAL TO YOUR SKETCH

Company Name _____

Address _____

City, State, Zip _____

Phone _____ Fax _____

Contact _____

E-Mail Address _____

Reference: Request for Quote No. _____

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EJECTOR PINS

FIG. 9 EJECTOR - STRAIGHT

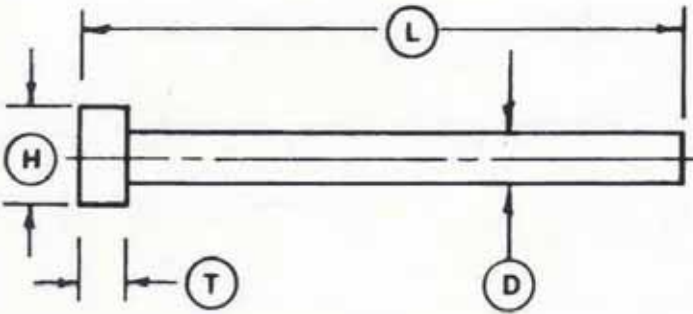


FIG. 10 EJECTOR - SHOULDER

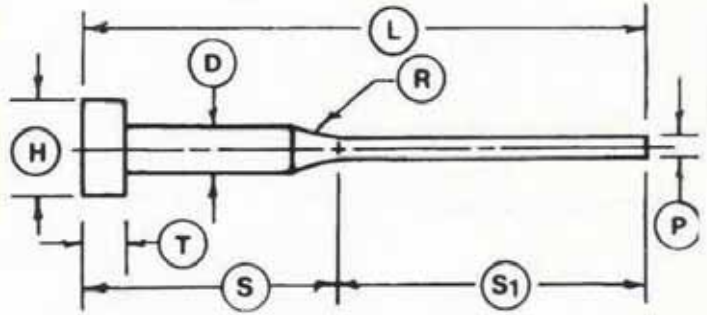
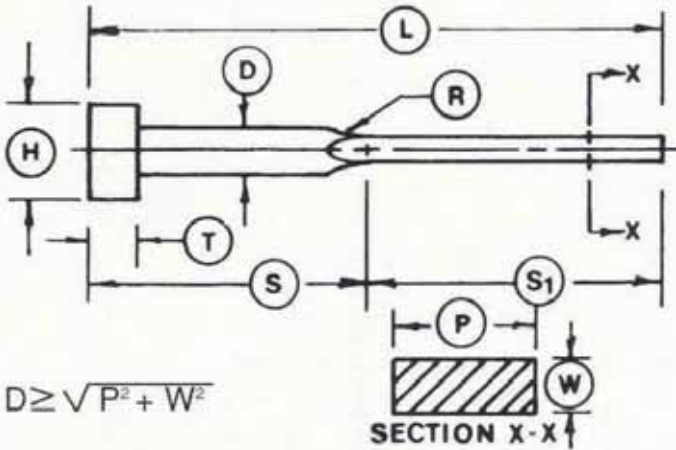


FIG. 11 EJECTOR - BLADE



Please specify required tolerances on all dimensions.

FIG. _____ QTY. _____

MATL. _____ HDN. _____ RC

Modify Standard Catalog No. _____

COMMENTS:

DIM.	SIZE	TOL.	DIM.	SIZE	TOL.
D			S		
H			S1		
T			R		
L			W		
P					

FIG. 12 SPECIAL TO YOUR SKETCH

Company Name _____

Address _____

City, State, Zip _____

Phone _____ Fax _____

Contact _____

E-Mail Address _____

Reference: Request for Quote No. _____

YOUR LOCAL DISTRIBUTOR

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PHONE (401) 245-6900

FAX (401) 247-2231



ROYAL DISTRIBUTORSHIP

Here at ROYAL we pride ourselves on being associated with well informed and knowledgeable distributors. It has become a ROYAL tradition to sell our line of products through local distributorships who stock large supplies of ROYAL pins. By doing this, a ROYAL distributor can quickly fill your molding or stamping product needs.

If you are interested in becoming a ROYAL distributor, or if you are a Royal customer and would like one of your vendors to become a stocking ROYAL distributor, please call us at 401-245-6900. We can help! Most of our present distributors were referred to us by satisfied customers of ROYAL DIVERSIFIED PRODUCTS!

TERMS: Net 30 days. 1-1/2% monthly late charge

Prices: Subject to change without notice.

Minimum Order: \$25

Shipments: F.O.B. Shipping Point. Unless otherwise instructed by customer, shipping will be via UPS or the least expensive carrier. We cannot assume Charges or responsibility due to transportation difficulties. **Please Note*** No parts will be accepted for replacement or return if we are not notified within 10 days of shipment receipt.

Quotations: Valid for 30 days only except by special arrangement. We reserve the right to advise the customer of any change in price upon receipt of order, if quoted incorrectly.

Confirmation/acknowledgements

Standard Catalog Products: Since most orders for catalog standard products are shipped before receipt of a mailed confirmation, ROYAL's policy on telephone orders is a verbal "read back" by our customer service representative.

Non-Standard Products: Orders containing non-standard products are acknowledged via fax within 24 hours from the time it is entered into our system. It is the customers responsibility to check the acknowledgement for correctness of billing and shipping address, terms, shipping instructions, order quantities, size and description and pricing of item(s) ordered. *The customer is to report any discrepancies immediately.* Otherwise ROYAL will assume order to be correct as acknowledged and will proceed accordingly.

Cancellations: Cancellations will be subject to a charge of 10% plus any applicable material and labor costs for work in progress. We do not ship partially finished goods on cancelled orders.

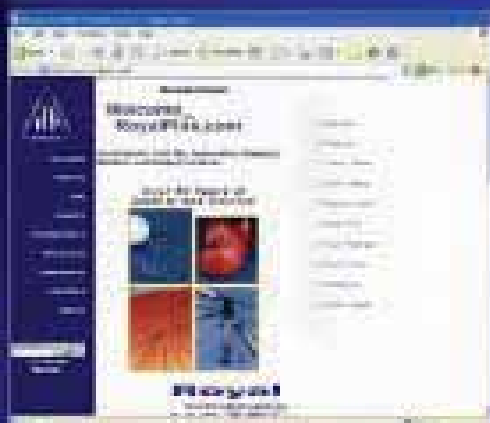
Returns: Prior approval must be obtained within 30 days from the shipping date for all returns. When permission is granted, there is a 15% re-stocking charge with a 5 dollar minimum. Return shipping is the customers responsibility. If the return proves to be the fault of ROYAL, the return shipping cost will be credited back to the customer. **Unless** there is a manufacturing discrepancy, specials are **not** returnable.

The following are not standard stock items and are not returnable:

- RQA TYPE PINS, 3" LENGTH AND OVER
- RQB TYPE PINS, 4" AND OVER OR WITH "OPTIONAL T" HD. THK. OF 3/16"
- AB STYLE PINS
- MQA and MQB TYPE PINS
- MPB TYPE PINS
- BH SERIES PINS - 4" AND 6" LENGTHS
- PTD TYPE PINS
- MPT YPE PINS
- ANY PRODUCTS WITH CUSTOM MODIFICATIONS
- ANY PIN WITH 4 PLACE DECIMAL DIAMETER
- ANY PRODUCT SUPPLIED IN LARGER QUANTITIES THAN NORMALLY STOCKED

OVER/UNDER SHIPMENTS: Royal reserves the right to overship or undership up to 10% of non-standard products. If an exact quantity is desired "DO NOT OVER OR UNDERSHIP" must be specified when the quotation is requested.

Warranty: Royal proudly guarantees that all a our products will conform to your requested physical specifications



Pay a visit to our website at www.royalpins.com. It provides a company overview and complete product information on our line of pins, punches, and perforators.

Visitors can view product and company information, place an order, request catalogs, view or download a digital version of this catalog, or

request a quotation with our easy to use "point-and-click" E-Quote system. After placing an order you can even track packages shipped via UPS or Federal Express.



Whether its one of our many thousands of standard parts in stock, or an intricate, high precision special pin, ROYAL DIVERSIFIED PRODUCTS has a precision crafted and economical solution to any of your pin requirements.



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