Long-lasting

Punches, Pilots, Matrixes, & Retainers

Kommercial

DAYTON®

Global leader in providing fabrication and stamping solutions

Subsidiary Federal Signal Corporation

www.daytonprogress.com

Top-rate performance, reduced maintenance, exceptional value

Kommercial Punches, Pilots, Matrixes, and Retainers

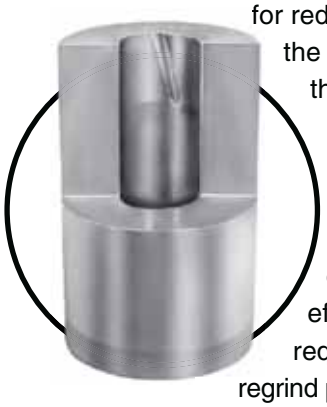
Product Applications

Dayton ***Kommercial Punches, Pilots, Matrixes,*** and ***Retainers*** (inch) are built to exacting tolerances; are long-lasting, top-rated performers; help reduce downtime and minimize maintenance costs; and have a wide range of applications in various high-demand industries, including automotive and major appliance manufacturing.

Dayton Kommercial punches add longer tool life and improve finished part quality. For example, ***Dayton Jektole® Punches*** (slug ejection punches) provide increased punch to matrix clearance, and can triple the number of cycles between regrinds. Dayton's unique Keeper Key allows sharpening of the punch and ejector pin as a unit, saving the time it normally takes to disassemble and reassemble pins, springs, and screws.

Dayton's Kommercial product line includes: ***Dayton Jektole® Punches; Regular Punches; Countersink Punches; Punch Blanks; Straight Punches; Regular Pilots; Positive Pick-Up Pilots; Compact Positive Pick-Up Pilots; Matrixes; Retainers;*** and ***Locking Devices***. Both standard sizes and standard alterations are shown in this catalog. ***Urethane Strippers***—complementary die component products which dampen punch vibration and help prevent premature punch failure—are also shown.

Dayton Slug Control is a patented, guaranteed method for reducing the risk of pulling slugs to the die surface during withdrawal of the punch. A series of grooves is designed inside the matrix (see drawing). There, the slugs are trapped until they fall freely through the relief. The use of Dayton Slug Control has no effect on hole size, and will not require any changes in current regrind practices.

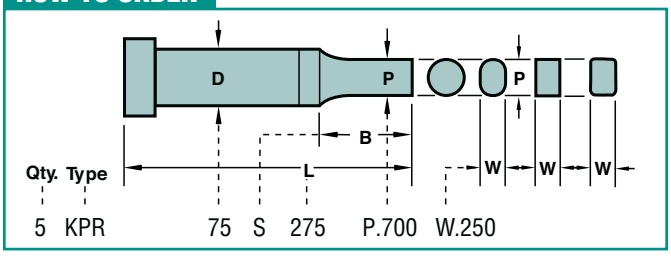


Ordering Information

Each page contains detailed instructions on how to order specific Dayton Kommercial products. Individual product drawings show product shape, dimensions, tolerances, and concentricity. When ordering, you are asked to specify quantity, type, shank and length codes (for example), and other applicable data.

In the example below, the type specified is "KPR." "K" stands for Kommercial, "P" stands for punch, and "R" stands for rectangle. 75 is the press-fit diameter, which is coded by the first two digits of the decimal equivalent (.750). "S" designates the "B" standard point length. 275 is the overall length, coded by inches and quarter-inches (2.75). Finally, P.700 and W.250 represent the point or hole size dimensions.

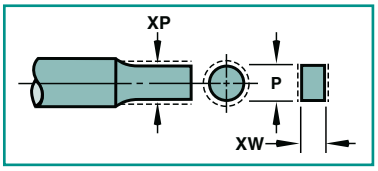
HOW TO ORDER



Standard Alterations

Punches, matrixes, and retainers are available in sizes other than those listed in the catalog.

When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the P and W dimensions are outside the standard range, an "X" is placed in front of the P or W dimension, e.g., "XP" and/or "XW." If the point length is other than standard, designate "XB" for the point length. See the foldout tabs in the individual product sections for these and other special order designations.



Contents

Punches

Matrixes

Retainers

Miscellaneous/Other

Product Designation

Each page contains detailed instructions on how to order specific Dayton Kommercial products. In addition, use the following chart to define the product as a part number.

Example:

KPR **Line Product Shape** — **K** for Kommercial, **P** for Punch (Regular), **R** for Rectangle

75 **Press-Fit Dia. D (shank diameter)** Coded by the first 2 digits of decimal equivilent (.750)

S **"B" Point Length** S=Standard, Alt. lengths available

275 **Overall Length L** Coded by whole number and the first two digits of dec. equiv. (2.750)

Product	Series		Length	Point or Hole Size
KPR	75	S	275	P.700, W.250
Type	Catalog Number			Dimensions As Specified

Diameter (D) is shown on the order as a two- or three-digit code. To convert the shank diameter to the appropriate code, use the following chart.

Code	D	Code	D	Code	D
12	.1250	50	.5000	150	1.5000
18	.1875	62	.6250	175	1.7500
25	.2500	75	.7500	200	2.0000
31	.3125	87	.8750	225	2.2500
37	.3750	100	1.0000	250	2.5000
43	.4375	125	1.2500	275	2.7500

Classified Shapes

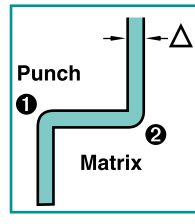
Classified shapes (83 common shapes, no detailing required) are available on all punches and matrixes as indicated in this catalog. See pp. 22, 23 for more information and special instructions. Also, see individual product pages and p. 25 for additional information on orientation and views.

Clearance

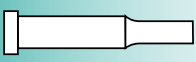
Normal grinding methods produce:

❶ .007 max fillet on the punch—matching corner shape on the matrix.

❷ .007 max fillet on the matrix—matching corner shape on the punch.



Jektole® Punches



Regular Punches

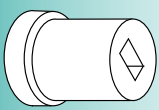
Regular Pilots

Positive Pick-Up Pilots

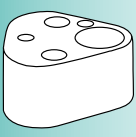
Compact Pilots

Punch Blanks & Countersink Punches

Straight & Clospace Punches



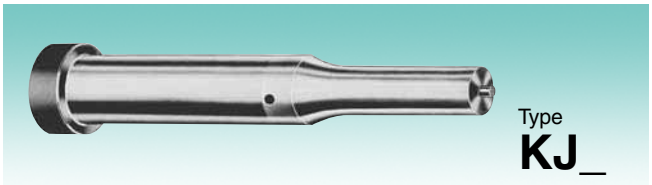
Matrixes

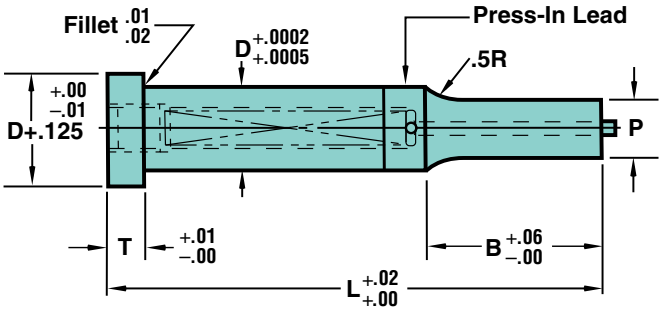


Retainers

Classified Shapes/ Miscellaneous

Jektole® Punches





Material
Steel: A2, M2, RC 60-63
Heads RC 40-55 (1" and smaller)

Round P $^{+.0005}_{-.0000}$	◎	.0005	P to D
Shape P, W ± .0005	◎	.001	P to D

Shank	Code	Head Dim.	Point Length B					Round		Shape			L											
			ANSI	Alternate				Min.	Range	Min.	Min. Max.													
D		T	S	B	C	D	E	XP	P	XW	W	P/G	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50
.1875	18	.125	.43	.75				.050	.062- .1874	.062	.062- .1875		150	175	200	225	250	275	300	325	350	375	400	425	450
.2500	25	.125	.50	.75				.080	.093- .2499	.080	.093- .2500														
.3125	31	.125	.56	.75	1.00*			.115	.125- .3124	.115	.125- .3125														
.3750	37	.188	.62	.75	1.00			.158	.187- .3749	.158	.187- .3750														
.4375	43	.188	.75		1.00			.158	.187- .4374	.158	.187- .4375														
.5000	50	.188	.81		1.00			.158	.250- .4999	.158	.187- .5000														
.6250	62	.250	.93			1.25		.235	.375- .6249	.235	.250- .6250														
.7500	75	.250	1.06			1.25		.300	.500- .7499	.235	.312- .7500														
.8750	87	.250	1.12			1.25	1.50	.350	.562- .8749	.235	.312- .8750														
1.0000	100	.250	1.25				1.50	.400	.687- .9999	.235	.312-1.0000														
1.2500	125	.250	1.25				1.50	.450	.625-1.2499	.281	.312-1.2500														
1.5000	150	.250	1.25				1.50	.450	.750-1.4999	.281	.312-1.5000														
1.7500	175	.250	1.25				1.50	.450	1.000-1.7499	.281	.350-1.7500														
2.0000	200	.250	1.25				1.50	.450	1.187-1.9999	.281	.400-2.0000														
2.2500	225	.250	1.25				1.50	.450	1.375-2.2499	.281	.450-2.2500														
2.5000	250	.250	1.25				1.50	.450	1.625-2.4999	.281	.500-2.5000														

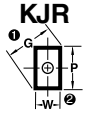
*Not available on 1.50 overall length.
**See p. 24 for additional information.

Jektole® Punches

KJX

KJO

KJR



KJK

KJL

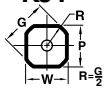
KJH

KJJ

KJN

KJV

KJY



KJZ

❶ Check your P&W dimensions to be certain the diagonal G does not exceed the maximum shown.

❷ Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners to eliminate interference with matrix fillet when total clearance is .005 or less.

	L										** Jektole® Group
	Code	4.75	5.00	5.25	5.50	5.75	6.00	6.25	6.50	6.75	7.00	
	18											J2
	25											J3
	31											J4
	37											J6
	43											J6
	50											J6
	62											J9
	75											J9
	87											J9
	100	475	500	525	550	575	600	625				J9
	125											J12
	150											J12
	175								650			J12
	200									675	700	J12
	225											J12
	250											J12

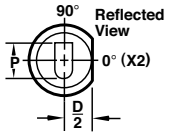
Features/Benefits

Jektole® punches permit doubling punch to matrix clearance; produce up to three times the number of hits between sharpenings; and reduce burr heights.

HOW TO ORDER

Specify:	Qty.	Type	D Code	L	P (or P&W)	Steel
Example:	6	KJX	37	C225	P.204	A2

Note: The standard location of a key flat is at 0°. See p. 25 for more information on flats and dowel slots.



FIRM DELIVERY SCHEDULE

1 Day

Standard Alterations

Jektole® punches are available in sizes other than those shown in the chart to the left.

When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the P and W dimensions are outside the standard range, an “X” is placed in front of the P or W dimension, e.g., “XP” and/or “XW.” If the point length is other than standard, designate “XB” as the point length. Also see “Standard Alterations” on the front of the pullout tab in this section for other special order designators.

Surface Coatings

Some catalog products can be coated to increase hardness, reduce galling, and improve wear and/or corrosion resistance. The available coatings are listed below. Also, see the chart at the bottom of this page for delivery times.

***DayTride®* (XN)**—a low-cost surface application that treats all exposed surfaces. Ideal for punches and matrixes. Provides high dimensional stability. Approx. hardness: RC73.

***DayTiN®* (XNT)**—applied via PVD (physical vapor deposition). Provides extreme hardness (hard as carbide) and excellent lubricity when used with a lubricant. Not recommended for stainless steel, copper, or nickel. Approx. hardness: *Vickers 2300.

***DayTAN*™ (XAN)**—ultra-hard, high-aluminum PVD coating. Absorbs shear stress and provides high temperature resistance. Ideal for HSLA, dual phase, and TRIP steels. Approx. hardness: *Vickers 3400.

***DayKote*™ (XND)**—used for extrusion/forming applications. Should not be used with a lubricant. Not recommended for stainless steel, copper, or nickel. Tolerance is ± .0002". Approx. hardness: *Vickers 2300.

TiCN (XCN)—very hard PVD, thin film. Provides ultra hardness (harder than carbide) and superior abrasive wear resistance. Approx. hardness: *Vickers 3000.

***MoST*™ (XNM)**—PVD, solid film. Produces lower coefficient of friction than other coatings. Provides excellent lubricity. Approx. hardness: *Vickers 2000.

XNP—the ultimate coating for extrusion and forming applications. Also works well in shaving operations. Tolerance is ± .0002". Approx. hardness: *Vickers 3100.

***DayKool*™ (XCR)**—cryogenic steel conditioning process, used primarily with hard, thick materials. Improves strength, toughness, and dimensional stability.

Code / Delivery		Material
XN —DayTride®	+ 3 days	M2
XNT —DayTiN®	+ 3 days	M2
XAN —DayTAN™	+ 4 days	M2
XND —DayKote™	+ 8 days	M2
XCN —TiCN	+ 3 days	M2
XNM —MoST™	+ 7 days	M2
XNP	+ 8 days	M2
XCR —DayKool™	+ 1 day	M2

*Vickers used when RC exceeds 80.

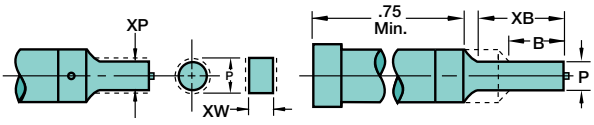
® DayTride and DayTiN are registered trademarks of Dayton Progress.
™ DayTAN, DayKote, and DayKool are trademarks of Dayton Progress. MoST is a trademark of IonBond® Inc.

Standard Alterations
Jektole® Punches

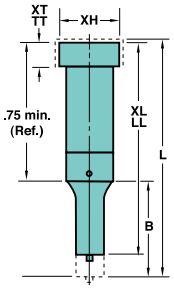
XP, XW **P and W Dimensions Smaller than Standard**

XB **Point Length Other than Standard**

For XBB, add three days to delivery.



		XB					XBB	XB					XBB
Point Length		.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625	1.626-2.000	.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625	1.626-2.000
Code	Type	Min. P (Rounds)						Min. W (Shapes)					
18	KJ_	.050	.058					.062	.093				
25	KJ_	.080	.080	.080				.080	.093	.093			
31	KJ_	.115	.115	.115	.115	.125	.187	.115	.115	.125	.172	.195	.187
37	KJ_	.158	.158	.158	.158	.158	.187	.158	.158	.158	.172	.195	.187
43	KJ_		.158	.158	.158	.158	.187		.158	.158	.172	.195	.187
50	KJ_		.158	.158	.158	.158	.187		.158	.158	.172	.195	.187
62	KJ_		.235	.235	.235	.235	.235		.235	.235	.235	.235	.235
75	KJ_		.300	.300	.300	.300	.250		.235	.235	.235	.235	.250
85	KJ_		.350	.350	.350	.350	.250		.235	.235	.235	.235	.250
100	KJ_		.400	.400	.400	.400	.250		.235	.235	.235	.235	.250



XL **Overall Length Shortened**
Stock removal from point end which shortens B length.

LL **Precision Overall Length**
Same as XL except overall length is held to ±.001.

XT **Thinner Head than Standard**
Stock removal from head end which shortens overall length.

TT **Precision Head Thickness**
Same as XT except head thickness tolerance is held to ±.0005.

XH **Reduced Head Diameter**
Minimum head diameter equals D +.000 – .001.

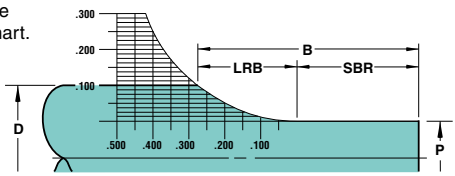
XK **No Side Hole**
For air ejection. No cost.

XJ **Smaller Jektole Components**
See p. 24.

SBR Straight Before Radius

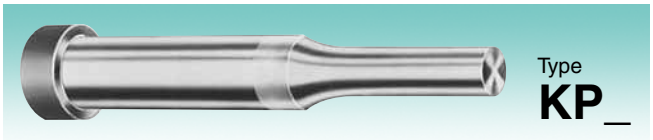
To determine Length of Radius Blend (LRB)

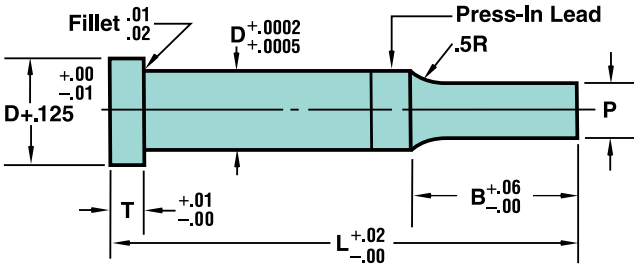
1. Calculate (D-P)/2.
2. Find (D-P)/2 value on left side of chart.
3. Follow line over to intersection point on radius blend line.
4. Read LRB value on bottom of chart.



Example:
D=.375
P=.175
(D-P)/2=(.375–.175)/2=.100
Following the .100 line on chart over the radius blend line shows the LRB to be approximately .300.

Regular Punches





Material
Steel: A2, M2, RC 60-63
Heads RC 40-55 (1" and smaller)

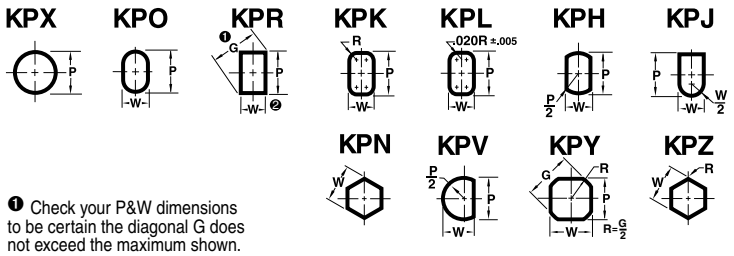
Round P +.0005 −.0000	◎	.0005	P to D
Shape P, W ±.0005	◎	.001	P to D

Shank	Code	Head Dim.	Point Length B					Round		Shape			L											
			ANSI	Alternate				Min.	Range	Min.	Min.	Max.												
D		T	S	B	C	D	E	XP	P	XW	W	P/G	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50
.1250	12	.125	.43	.75				.042	.062- .1249	.062	.062-	.1250													
.1875	18	.125	.43	.75				.042	.062- .1874	.062	.062-	.1875													
.2500	25	.125	.50	.75				.062	.062- .2499	.062	.093-	.2500	150	175	200	225									
.3125	31	.125	.56	.75	1.00*			.062	.093- .3124	.062	.125-	.3125													
.3750	37	.188	.62	.75	1.00	1.25**		.062	.125- .3749	.080	.187-	.3750													
.4375	43	.188	.75		1.00	1.25		.158	.187- .4374	.158	.187-	.4374													
.5000	50	.188	.81		1.00	1.25		.158	.250- .4999	.158	.187-	.5000													
.6250	62	.250	.93			1.25	1.50	.235	.375- .6249	.235	.250-	.6250													
.7500	75	.250	1.06			1.25	1.50	.300	.500- .7499	.235	.312-	.7500					250	275	300	325	350	375	400	425	450
.8750	87	.250	1.12			1.25	1.50	.350	.562- .8749	.235	.312-	.8750													
1.0000	100	.250	1.25				1.50	.400	.625- .9999	.235	.312-1.0000														
1.2500	125	.250	1.25				1.50	.450	.625-1.2499	.250	.312-1.2500														
1.5000	150	.250	1.25				1.50	.450	.750-1.4999	.250	.312-1.5000														
1.7500	175	.250	1.25				1.50	.450	1.000-1.7499	.250	.350-1.7500														
2.0000	200	.250	1.25				1.50	.450	1.187-1.9999	.250	.400-2.0000														
2.2500	225	.250	1.25				1.50	.450	1.375-2.2499	.250	.450-2.2500														
2.5000	250	.250	1.25				1.50	.450	1.625-2.4999	.250	.500-2.5000														

*Not available on 1.50 overall length.
**Not available on 1.75 overall length.

Min. XP, XW applies to S point length. (See Standard Alterations.)

Regular Punches



❶ Check your P&W dimensions to be certain the diagonal G does not exceed the maximum shown.

❷ Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners to eliminate interference with matrix fillet when total clearance is .005 or less.

Features/Benefits

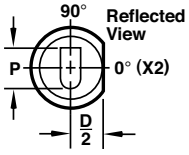
Regular Kommercial punches provide three times better alignment than other major brands; offer longer tool life; and can significantly improve finished part quality.

HOW TO ORDER

Specify:	Qty.	Type	D Code	L	P (or P&W)	Steel
Example:	9	KPL	100	E350	P.872, W.401	A2

	L									
	Code	4.75	5.00	5.25	5.50	5.75	6.00	6.25	6.50	6.75	7.00
	12										
	18										
	25										
	31										
	37										
	43										
	50										
	62										
	75	475	500	525	550	575	600	625	650	675	700
	87										
	100										
	125										
	150										
	175										
	200										
	225										
	250										

Note: The standard location of a key flat is at 0°. See p. 25 for more information on flats and dowel slots.



FDS® FIRM DELIVERY SCHEDULE
1 Day

Standard Alterations

Regular Kommercial punches are available in sizes other than those shown in the chart to the left.

When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the P and W dimensions are outside the standard range, an “X” is placed in front of the P or W dimension, e.g., “XP” and/or “XW.” If the point length is other than standard, designate “XB” as the point length. Also see “Standard Alterations” on the front of the pullout tab in this section for other special order designators.

Surface Coatings

Some catalog products can be coated to increase hardness, reduce galling, and improve wear and/or corrosion resistance. The available coatings are listed below. Also, see the chart at the bottom of this page for delivery times.

***DayTride®* (XN)**—a low-cost surface application that treats all exposed surfaces. Ideal for punches and matrixes. Provides high dimensional stability. Approx. hardness: RC73.

***DayTiN®* (XNT)**—applied via PVD (physical vapor deposition). Provides extreme hardness (hard as carbide) and excellent lubricity when used with a lubricant. Not recommended for stainless steel, copper, or nickel. Approx. hardness: *Vickers 2300.

***DayTAN*™ (XAN)**—ultra-hard, high-aluminum PVD coating. Absorbs shear stress and provides high temperature resistance. Ideal for HSLA, dual phase, and TRIP steels. Approx. hardness: *Vickers 3400.

***DayKote*™ (XND)**—used for extrusion/forming applications. Should not be used with a lubricant. Not recommended for stainless steel, copper, or nickel. Tolerance is ± .0002". Approx. hardness: *Vickers 2300.

TiCN (XCN)—very hard PVD, thin film. Provides ultra hardness (harder than carbide) and superior abrasive wear resistance. Approx. hardness: *Vickers 3000.

***MoST*™ (XNM)**—PVD, solid film. Produces lower coefficient of friction than other coatings. Provides excellent lubricity. Approx. hardness: *Vickers 2000.

XNP—the ultimate coating for extrusion and forming applications. Also works well in shaving operations. Tolerance is ± .0002". Approx. hardness: *Vickers 3100.

***DayKool*™ (XCR)**—cryogenic steel conditioning process, used primarily with hard, thick materials. Improves strength, toughness, and dimensional stability.

Code / Delivery		Material
XN —DayTride®	+ 3 days	M2
XNT —DayTiN®	+ 3 days	M2
XAN —DayTAN™	+ 4 days	M2
XND —DayKote™	+ 8 days	M2
XCN —TiCN	+ 3 days	M2
XNM —MoST™	+ 7 days	M2
XNP	+ 8 days	M2
XCR —DayKool™	+ 1 day	M2

*Vickers used when RC exceeds 80.

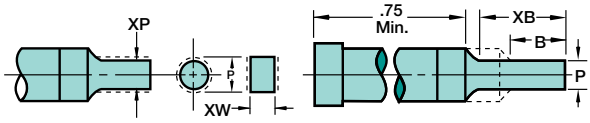
® DayTride and DayTiN are registered trademarks of Dayton Progress.
™ DayTAN, DayKote, and DayKool are trademarks of Dayton Progress. MoST is a trademark of IonBond® Inc.

Standard Alterations
Regular Punches

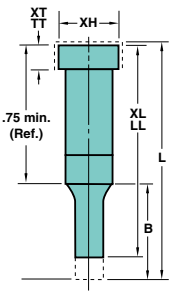
XP, XW P and W Dimensions Smaller than Standard

XB Point Length Other than Standard

For XBB and X3B, add three days to delivery.



	XB					XBB	X3B		XB					XBB
Point Length	.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625	1.626-2.000	2.001-2.500	2.501-3.000	.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625	1.626-2.000
Code Type	Min. P (Rounds)								Min. W (Shapes)					
18 KP_	.042	.058	.075	.093					.062	.062	.093	.125		
25 KP_	.062	.062	.080	.093					.062	.062	.093	.125		
31 KP_	.062	.062	.093	.093	.125	.187			.062	.093	.093	.125	.195	.187
37 KP_	.062	.062	.093	.125	.125	.187	.250	.312	.080	.109	.125	.125	.195	.187
43 KP_		.062	.093	.125	.125	.187	.250	.312		.109	.125	.125	.195	.187
50 KP_		.125	.125	.125	.125	.187	.250	.312		.125	.141	.172	.195	.187
62 KP_		.235	.235	.235	.235	.235	.312	.375		.235	.235	.235	.235	.250
75 KP_		.300	.300	.300	.300	.300	.343	.406		.235	.235	.235	.235	.250
87 KP_		.350	.350	.350	.350	.400	.400	.437		.235	.235	.235	.235	.250
100 KP_		.400	.400	.400	.400	.400	.400	.437		.235	.235	.235	.235	.250



XL **Overall Length Shortened**
Stock removal from point end which shortens B length.

LL **Precision Overall Length**
Same as XL except overall length is held to ±.001.

XT **Thinner Head than Standard**
Stock removal from head end which shortens overall length.

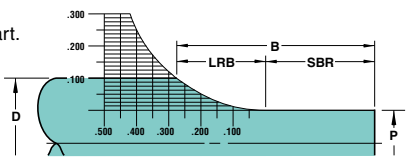
TT **Precision Head Thickness**
Same as XT except head thickness tolerance is held to ±.0005.

XH **Reduced Head Diameter**
Minimum head diameter equals D +.000 – .001.

SBR Straight Before Radius

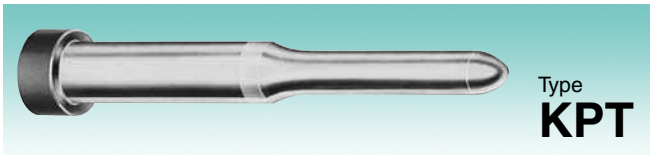
To determine Length of Radius Blend (LRB)

1. Calculate (D-P)/2.
2. Find (D-P)/2 value on left side of chart.
3. Follow line over to intersection point on radius blend line.
4. Read LRB value on bottom of chart.

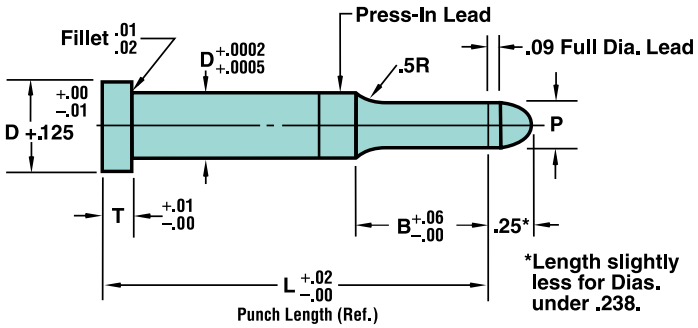


Example:
D=.375
P=.175
(D-P)/2=(.375–.175)/2=.100
Following the .100 line on chart over the radius blend line shows the LRB to be approximately .300.

Regular Pilots



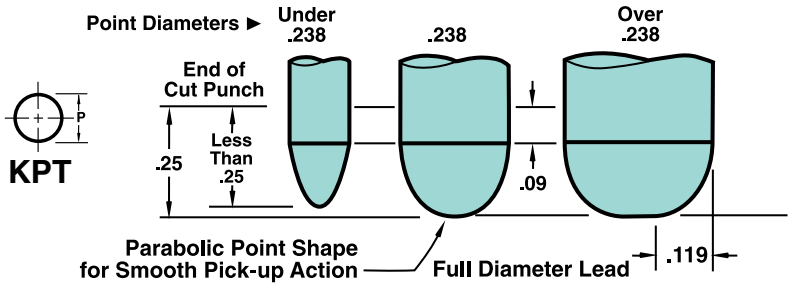
Material
Steel: A2, M2, RC 60-63
Heads RC 40-55
Round P $^{+.0005}_{-.0000}$ ⌀ .0005 P to D



Shank	Code	Head Dim.	Point Length B					Round		L											
			ANSI	Alternate				Min.	Range	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50
D		T	A	B	C	D	E	XP	P													
.1250	12	.125	.43	.75				.041	.061- .1250	150	175	200	225	250	275	300	325	350	375	400	425	450
.1875	18	.125	.43	.75				.041	.061- .1875													
.2500	25	.125	.50	.75				.061	.092- .2500													
.3125	31	.125	.56	.75	1.00*			.061	.092- .3125													
.3750	37	.188	.62	.75	1.00	1.25**		.061	.124- .3750													
.4375	43	.188	.75		1.00	1.25		.092	.186- .4375													
.5000	50	.188	.81		1.00	1.25		.124	.186- .5000													
.6250	62	.250	.93			1.25	1.50**	.234	.374- .6250													
.7500	75	.250	1.06			1.25	1.50	.299	.499- .7500													
.8750	87	.250	1.12			1.25	1.50	.349	.561- .8750													
1.0000	100	.250	1.25				1.50	.399	.624-1.0000													

*Not available on 1.50 overall length. **Not available on 2.00 overall length. Min. XP applies to S point length. (See Standard Alterations.)
**Not available on 1.75 overall length.

Regular Pilots



Features/Benefits

Regular Kommercial pilots are built to exact tolerances; the parabolic point shape allows for smooth pick-up action; and pilots offer a wide range of unique punching and fabrication applications.

HOW TO ORDER

Specify:	Qty.	Type	D Code	L	P	Steel
Example:	2	KPT	50	C250	P.390	M2

		L								
	Code	4.75	5.00	5.25	5.50	5.75	6.00	6.25	6.50	6.75	7.00
	12										
	18										
	25										
	31										
	37										
	43	475	500	525	550	575	600	625	650	675	700
	50										
	62										
	75										
	87										
	100										

FDS® FIRM DELIVERY SCHEDULE
1 Day

Standard Alterations

Regular Kommercial pilots are available in sizes other than those shown in the chart to the left.

When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the P dimension is outside the standard range, an “X” is placed in front of the P dimension, e.g., “XP.” If the point length is other than standard, designate “XB” as the point length. Also see “Standard Alterations” on the front of the pullout tab in this section for other special order designators.

Surface Coatings

Some catalog products can be coated to increase hardness, reduce galling, and improve wear and/or corrosion resistance. The available coatings are listed below. Also, see the chart at the bottom of this page for delivery times.

***DayTride®* (XN)**—a low-cost surface application that treats all exposed surfaces. Ideal for punches and matrixes. Provides high dimensional stability. Approx. hardness: RC73.

***DayTiN®* (XNT)**—applied via PVD (physical vapor deposition). Provides extreme hardness (hard as carbide) and excellent lubricity when used with a lubricant. Not recommended for stainless steel, copper, or nickel. Approx. hardness: *Vickers 2300.

***DayTAN*™ (XAN)**—ultra-hard, high-aluminum PVD coating. Absorbs shear stress and provides high temperature resistance. Ideal for HSLA, dual phase, and TRIP steels. Approx. hardness: *Vickers 3400.

***DayKote*™ (XND)**—used for extrusion/forming applications. Should not be used with a lubricant. Not recommended for stainless steel, copper, or nickel. Tolerance is ± .0002". Approx. hardness: *Vickers 2300.

TiCN (XCN)—very hard PVD, thin film. Provides ultra hardness (harder than carbide) and superior abrasive wear resistance. Approx. hardness: *Vickers 3000.

***MoST*™ (XNM)**—PVD, solid film. Produces lower coefficient of friction than other coatings. Provides excellent lubricity. Approx. hardness: *Vickers 2000.

XNP—the ultimate coating for extrusion and forming applications. Also works well in shaving operations. Tolerance is ± .0002". Approx. hardness: *Vickers 3100.

***DayKool*™ (XCR)**—cryogenic steel conditioning process, used primarily with hard, thick materials. Improves strength, toughness, and dimensional stability.

Code / Delivery		Material
XN —DayTride®	+ 3 days	M2
XNT —DayTiN®	+ 3 days	M2
XAN —DayTAN™	+ 4 days	M2
XND —DayKote™	+ 8 days	M2
XCN —TiCN	+ 3 days	M2
XNM —MoST™	+ 7 days	M2
XNP	+ 8 days	M2
XCR —DayKool™	+ 1 day	M2

*Vickers used when RC exceeds 80.

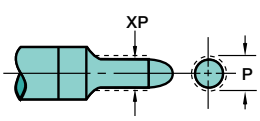
® DayTride and DayTiN are registered trademarks of Dayton Progress.
™ DayTAN, DayKote, and DayKool are trademarks of Dayton Progress. MoST is a trademark of IonBond® Inc.

Standard Alterations
Regular Pilots

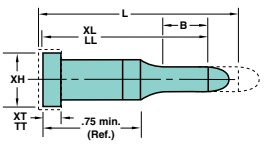
XP **P Dimensions Smaller than Standard**

XB **Point Length Other than Standard**

For XBB and X3B, add three days to delivery.



		XB					XBB	X3B	
Point Length		.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625	1.626-2.000	2.001-2.500	2.501-3.000
Code	Type	Min. P (Rounds)							
18	KPT	.050	.057	.074	.092				
25	KPT	.061	.061	.079	.092				
31	KPT	.061	.061	.092	.092	.124	.186		
37	KPT	.092	.092	.092	.124	.157	.186	.249	.311
43	KPT	.092	.092	.092	.124	.157	.186	.249	.311
50	KPT	.124	.124	.124	.124	.157	.186	.249	.311
62	KPT	.234	.234	.234	.234	.234	.234	.374	.374
75	KPT	.299	.299	.299	.299	.299	.299	.342	.405
87	KPT	.349	.349	.349	.349	.349	.399	.399	.436
100	KPT	.399	.399	.399	.399	.399	.399	.399	.436



XL **Overall Length Shortened**
Stock removal from point end which shortens B length.

XT **Thinner Head than Standard**
Stock removal from head end which shortens overall length.

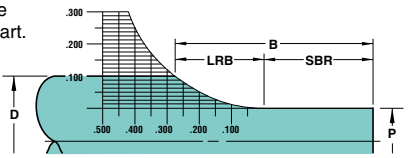
TT **Precision Head Thickness**
Same as XT except head thickness tolerance is held to ±.0005.

XH **Reduced Head Diameter**
Minimum head diameter equals D +.000 – .001.

SBR Straight Before Radius

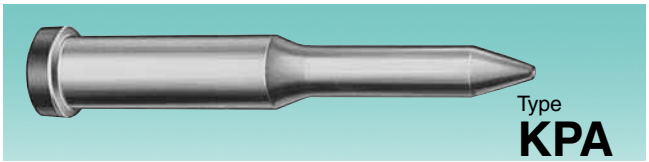
To determine Length of Radius Blend (LRB)

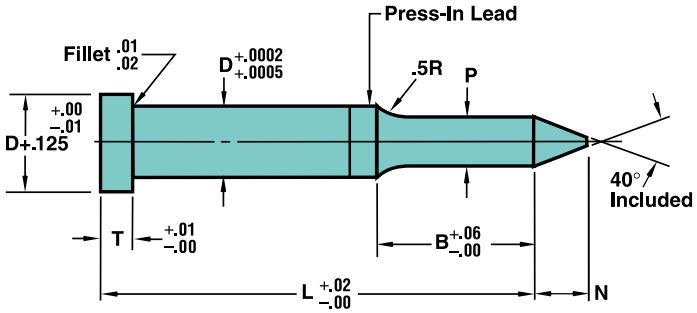
1. Calculate (D-P)/2.
2. Find (D-P)/2 value on left side of chart.
3. Follow line over to intersection point on radius blend line.
4. Read LRB value on bottom of chart.



Example:
D=.375
P=.175
(D-P)/2=(.375–.175)/2=.100
Following the .100 line on chart over the radius blend line shows the LRB to be approximately .300.

Positive Pick-Up Pilots





Material
Steel: M2, RC 60-63
Heads RC 40-55
Round P $^{+.0005}_{-.0000}$ ◎ .0005 P to D

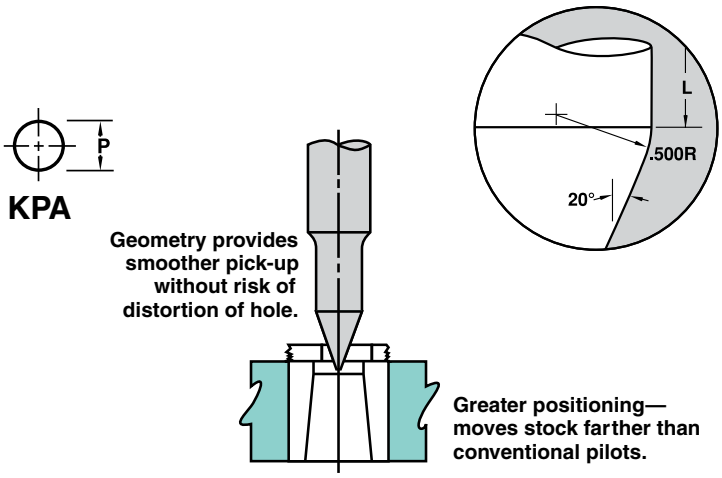
Order any length shown. If you require a length between those shown, designate "XL."
Example: You require a length of 3.600. Order 375, then show XL 3.600. See "How to Order" example on the next page. XL is available down to 1.375. Note shank length limitation of .75.
(B length may be shorter than shown when XL is under the shortest length shown.)
There is no additional charge for XL.

Shank	Code	Head Dim.	Round									L									
D		T	Std. S	Alternate B	C	D	E	Min. XP	Range P	†N	Pn	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00
.1875	18	.125	.43	.75				.050	.061 - .1875	.18	.0977											
.2500	25	.125	.50	.75				.061	.061 - .2500	.25	.1432											
.3125	31	.125	.56	.75				.061	.092 - .3125	.31	.1883											
.3750	37	.188	.62	.75	1.00*			.092	.186 - .3750	.37	.2342	250	275									
.4375	43	.188	.75	.75	1.00	1.25**		.092	.186 - .4375	.43	.2793											
.5000	50	.188	.81		1.00	1.25		.124	.249 - .5000	.50	.3252			300	325	350	375	400	425	450	475	500
.6250	62	.250	.94		1.00	1.25	1.50	.234	.311 - .6250	.62	.4162											
.7500	75	.250	1.06			1.25	1.50	.299	.436 - .7500	.75	.5072											
.8750	87	.250	1.12			1.25	1.50	.349	.561 - .8750	.87	.5982											
1.0000	100	.250	1.25			1.25	1.50	.399	.749-1.0000	1.00	.6892											

*Not available on 1.50 overall length.
**Not available on 1.75 overall length.

†N =[(P-.057)/.728]+.132 when "P" dimension is less than "Pn" shown in chart.

Positive Pick-Up Pilots



	L							
Code	5.25	5.50	5.75	6.00	6.25	6.50	6.75	7.00
18								
25								
31								
37								
43								
50	525	550	575	600	625	650	675	700
62								
75								
87								
100								

Features/Benefits

Dayton Kommercial positive pick-up pilots provide smoother pick-up without the risk of distorting the hole; in addition, the unique design moves the stock farther than conventional pilots.

HOW TO ORDER

Specify:	Qty.	Type	D Code	L	P	XL	Steel
Example:	4	KPA	100	C525	P.875	3.600	M2

FDS® FIRM DELIVERY SCHEDULE

1 Day

Standard Alterations

Kommercial positive pick-up pilots are available in sizes other than those shown in the chart to the left.

When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the P dimension is outside the standard range, an “X” is placed in front of the P dimension, e.g., “XP.” If the point length is other than standard, designate “XB” as the point length. Also see “Standard Alterations” on the front of the pullout tab in this section for other special order designators.

Surface Coatings

Some catalog products can be coated to increase hardness, reduce galling, and improve wear and/or corrosion resistance. The available coatings are listed below. Also, see the chart at the bottom of this page for delivery times.

DayTride®* *(XN)—a low-cost surface application that treats all exposed surfaces. Ideal for punches and matrixes. Provides high dimensional stability. Approx. hardness: RC73.

DayTiN®* *(XNT)—applied via PVD (physical vapor deposition). Provides extreme hardness (hard as carbide) and excellent lubricity when used with a lubricant. Not recommended for stainless steel, copper, or nickel. Approx. hardness: *Vickers 2300.

DayTAN™* *(XAN)—ultra-hard, high-aluminum PVD coating. Absorbs shear stress and provides high temperature resistance. Ideal for HSLA, dual phase, and TRIP steels. Approx. hardness: *Vickers 3400.

DayKote™* *(XND)—used for extrusion/forming applications. Should not be used with a lubricant. Not recommended for stainless steel, copper, or nickel. Tolerance is ± .0002". Approx. hardness: *Vickers 2300.

TiCN (XCN)—very hard PVD, thin film. Provides ultra hardness (harder than carbide) and superior abrasive wear resistance. Approx. hardness: *Vickers 3000.

MoST™* *(XNM)—PVD, solid film. Produces lower coefficient of friction than other coatings. Provides excellent lubricity. Approx. hardness: *Vickers 2000.

XNP—the ultimate coating for extrusion and forming applications. Also works well in shaving operations. Tolerance is ± .0002". Approx. hardness: *Vickers 3100.

DayKool™* *(XCR)—cryogenic steel conditioning process, used primarily with hard, thick materials. Improves strength, toughness, and dimensional stability.

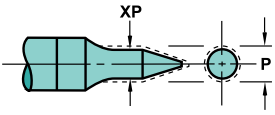
Code / Delivery		Material
XN —DayTride®	+ 3 days	M2
XNT —DayTiN®	+ 3 days	M2
XAN —DayTAN™	+ 4 days	M2
XND —DayKote™	+ 8 days	M2
XCN —TiCN	+ 3 days	M2
XNM —MoST™	+ 7 days	M2
XNP	+ 8 days	M2
XCR —DayKool™	+ 1 day	M2

*Vickers used when RC exceeds 80.

® DayTride and DayTiN are registered trademarks of Dayton Progress.
™ DayTAN, DayKote, and DayKool are trademarks of Dayton Progress. MoST is a trademark of IonBond® Inc.

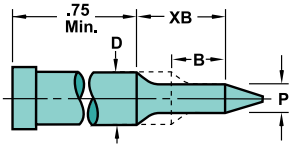
Standard Alterations
Positive Pick-Up Pilots

XP **P Dimensions Smaller than Standard**

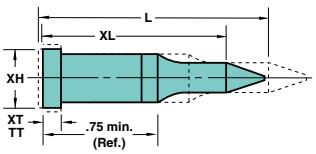


XB **Point Length Other than Standard**

For XBB and X3B, add three days to delivery.



		XB					XBB	X3B	
Point Length		.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625	1.626-2.000	2.001-2.500	2.501-3.000
Code	Type	Min. P (Rounds)							
18	KPA	.050	.057	.074	.092				
25	KPA	.061	.061	.079	.092				
31	KPA	.061	.061	.092	.092	.124	.186		
37	KPA	.092	.092	.092	.124	.157	.186	.249	.311
43	KPA	.092	.092	.092	.124	.157	.186	.249	.311
50	KPA	.124	.124	.124	.124	.157	.186	.249	.311
62	KPA	.234	.234	.234	.234	.234	.234	.311	.374
75	KPA	.299	.299	.299	.299	.299	.299	.342	.405
87	KPA	.349	.349	.349	.349	.349	.399	.399	.436
100	KPA	.399	.399	.399	.399	.399	.399	.399	.436



XL **Overall Length Shortened**
See note p.10.

XT **Thinner Head than Standard**
Stock removal from head end which shortens overall length.

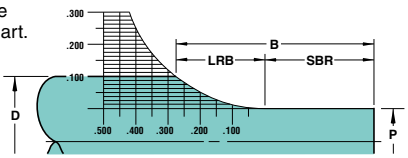
TT **Precision Head Thickness**
Same as XT except head thickness tolerance is held to ±.0005.

XH **Reduced Head Diameter**
Minimum head diameter equals D +.000 – .001.

SBR Straight Before Radius

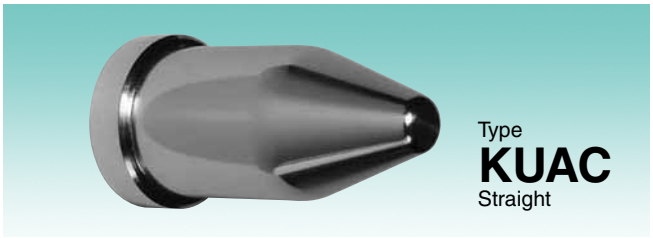
To determine Length of Radius Blend (LRB)

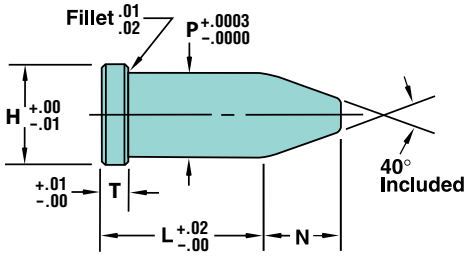
1. Calculate (D-P)/2.
2. Find (D-P)/2 value on left side of chart.
3. Follow line over to intersection point on radius blend line.
4. Read LRB value on bottom of chart.



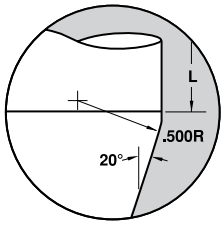
Example:
D=.375
P=.175
(D-P)/2=(.375–.175)/2=.100
Following the .100 line on chart over the radius blend line shows the LRB to be approximately .300.

Compact Positive Pick-Up Pilots





Material
Steel: A2, M2, RC 60-63



Type	Head		Range P	N	*Overall Length L						
	T	H			.625	.750	.875	1.00	1.125	1.250	1.375
KUAC Straight	.125	.375	.1865 - .2500	.25	62	75	87	100	112	125	137
	.125	.438	.2501 - .3130	.31							
	.188	.500	.3131 - .3750	.37							
	.188	.562	.3751 - .4380	.43							
	.188	.625	.4381 - .5000	.50							
	.250	.750	.5001 - .6250	.62							
	.250	.875	.6251 - .7500	.75							
	.250	1.000	.7501 - .8750	.87							
	.250	1.125	.8751 -1.0000	1.00							

*Any overall length is available within catalog range. Specify "XL" and length.

HOW TO ORDER

Specify:	Qty.	Type	D Code	L	P	Alt.	Steel
Example:	25	KUAC	—	87	.4380	XL.695	A2
	11	KPAC	62	100	.6200	—	A2

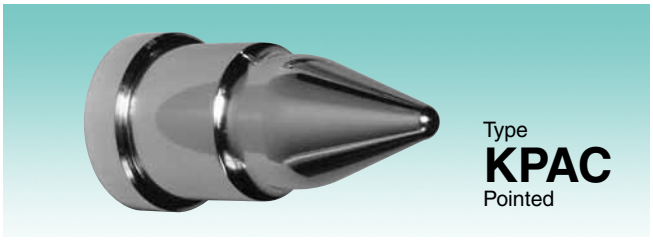
FDS® FIRM DELIVERY SCHEDULE
2 Days

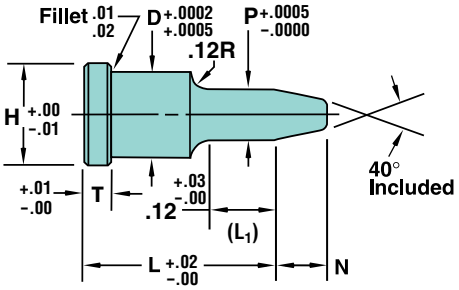
Standard Alterations

Kommercial compact positive pick-up pilots are available in sizes other than those shown in the charts on pp. 12, 13.

When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the P dimension is outside the standard range, an "X" is placed in front of the P dimension, e.g, "XP." If the L_1 (KPAC only) is other than standard, designate "XBR" as the variable length. Also see "Standard Alterations" on the front of the pullout tab in this section for other special order designators.

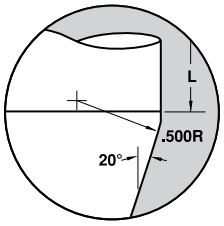
Compact Positive Pick-Up Pilots





Material
Steel: A2, M2, RC 60-63

P to D .0005 Ⓜ



Type	Shank D	Code	Head T	Head H	Min. XP	Range P	*N	Pn	**Overall Length L .625	.750	.875	1.00	1.125	1.250	1.375
KPAC Pointed	.2500	25	.125	.375	.092	.1650 - .2499	.25	.1432	62						
	.3125	31	.125	.438	.092	.2100 - .3124	.31	.1883							
	.3750	37	.188	.500	.092	.2550 - .3749	.37	.2342							
	.4375	43	.188	.562	.092	.3000 - .4374	.43	.2793							
	.5000	50	.188	.625	.124	.3450 - .4999	.50	.3252		75	87	100	112	125	137
	.6250	62	.250	.750	.234	.4400 - .6249	.62	.4162							
	.7500	75	.250	.875	.299	.5300 - .7499	.75	.5072							
	.8750	87	.250	1.000	.349	.6200 - .8749	.87	.5982							
	1.0000	100	.250	1.125	.399	.7100 - .9999	1.00	.6892							

*N =[(P-.057)/.728]+.132 when "P" dimension is less than "Pn" shown in chart.

**Any overall length is available within catalog range. Specify "XL" and length. The L_1 .12 is maintained. Because L_1 .12 is standard, use alteration code "XBR" for different length (0.060 min.).

Features/Benefits

Dayton Kommercial compact positive pick-up pilots—mounted in a guided stripper—provide exceptional resistance to lateral deflection. A typical longer pilot may have several inches of exposed, unsupported surface. As bending or forming takes place, this lateral deflection can create excessive forces on the pilot. Sometimes, the strength of the pilot—as well as the function of the other die set components—can be compromised.

Dayton compact pilots provide virtually no unsupported surface that is susceptible to sideways movement, stress, or wear. Pilots always maintain the proper extension, and there is no need to move or adjust the pilot during regrinding.

Dayton compact pilots are rigid during use; last longer; and are ideally suited for high-demand applications.

Surface Coatings

Some catalog products can be coated to increase hardness, reduce galling, and improve wear and/or corrosion resistance. The available coatings are listed below. Also, see the chart at the bottom of this page for delivery times.

DayTiN® (XNT)—applied via PVD (physical vapor deposition). Provides extreme hardness (hard as carbide) and excellent lubricity when used with a lubricant. Not recommended for stainless steel, copper, or nickel. Approx. hardness: *Vickers 2300.

TiCN (XCN)—very hard PVD, thin film. Provides ultra hardness (harder than carbide) and superior abrasive wear resistance. Approx. hardness: *Vickers 3000.

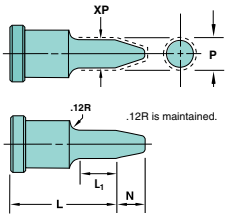
DayTAN™ (XAN)—ultra-hard, high-aluminum PVD coating. Absorbs shear stress and provides high temperature resistance. Ideal for HSLA, dual phase, and TRIP steels. Approx. hardness: * Vickers 3400.

Code / Delivery		Material
XNT —DayTiN®	+ 3 days	M2
XCN —TiCN	+ 3 days	M2
XAN —DayTAN™	+ 4 days	M2

*Vickers used when RC exceeds 80.

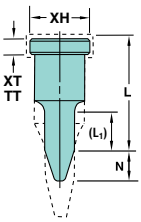
® DayTiN is a registered trademark of Dayton Progress.
™ DayTAN is a trademark of Dayton Progress.

Standard Alterations
Compact Pilots



XP **P Dimension Smaller than Standard**

XBR **L_1 Longer than Standard**



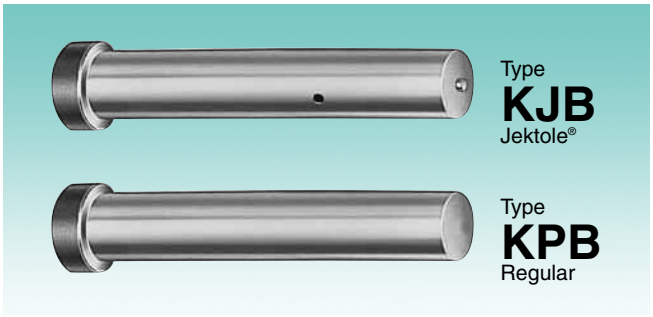
XL **Overall Length Shortened**
Stock removal from point end. L_1 length is maintained.

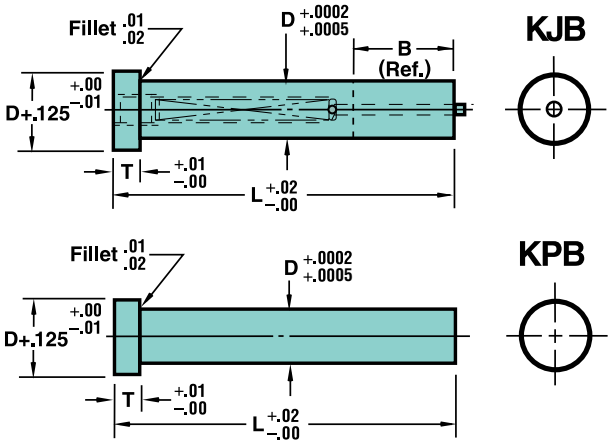
XT **Thinner Head than Standard**
Stock removal from head end which shortens overall length.

TT **Precision Head Thickness**
Same as XT except head thickness tolerance is held to ±.0005.

XH **Reduced Head Diameter**
Minimum head diameter equals H +.000 – .001.

Punch Blanks
Jektole®/Regular





Material
Steel: A2, M2, RC 60-63
Heads RC 40-55

Type	Shank D	Code	Head Dim. T	Point Length B ANSI S	Alternate B	C	D	E	L 1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00	6.25	6.50	6.75	7.00	** Jek-tole® Grp
KJB	.1875	18	.125	.43	.75				150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600	625	650			J2
	.2500	25	.125	.50	.75																											J3
	.3125	31	.125	.56	.75	100*																										J4
	.3750	37	.188	.62	.75	100																										J6
	.4375	43	.188	.75		100																										J6
	.5000	50	.188	.81		100																										J6
	.6250	62	.250	.93			1.25																									J9
	.7500	75	.250	1.06			1.25																									J9
	.8750	87	.250	1.12			1.25	1.50																								J9
	1.0000	100	.250	1.25				1.50																								J9
KPB	.1250	12	.125	N/A					150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600	625	650	675	700	N/A
	.1875	18	.125																													
	.2500	25	.125																													
	.3125	31	.125																													
	.3750	37	.188																													
	.4375	43	.188																													
	.5000	50	.188																													
	.6250	62	.250																													
	.7500	75	.250																													
	.8750	87	.250																													
	1.0000	100	.250																													

*Not available on 1.50 overall length. **See p. 24 for additional information.

HOW TO ORDER

Specify:	Qty.	Type	D Code	L	Steel
Example:	9	KJB	37	B200	A2

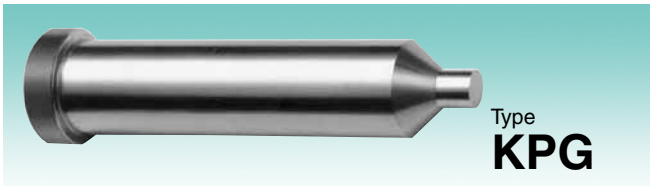
FDS® FIRM DELIVERY SCHEDULE
1 Day

Standard Alterations

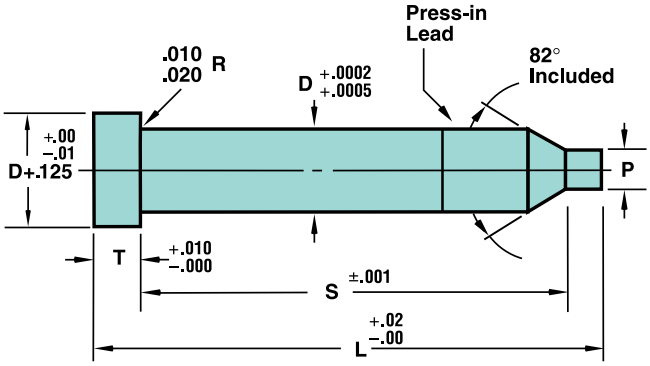
Kommercial punch blanks are available in sizes other than those shown in the chart above.

When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the L dimension is outside the standard range, an “X” is placed in front of the L dimension, e.g., “XL.”

Countersink Punches



Type
KPG



Material
Steel: A2, M2, RC 60-63
Heads RC 40-55
Round P $^{+.0005}_{-.0000}$ ◎ .0005 P to D

Shank D	Code	Head Dim. T	S	Range P	L 1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.50	4.00
.2500	25	.125	Specify in .001" increments	.050-.125	150	175	200	225	250	275	300	350	400
.3125	31	.125		.076-.140									
.3750	37	.188		.090-.187									
.5000	50	.188		.140-.250									
.6250	62	.250		.200-.281									
.7500	75	.250		.264-.359									
.8750	87	.250		.312-.406									
1.0000	100	.250		.374-.500									

HOW TO ORDER

Specify:	Qty.	Type	D Code	L	P	S	Steel
Example:	6	KPG	75	300	P.275	2.450	A2

Features/Benefits

Precision countersink punches have an accurate length (±.001") from under the head to the bottom of the countersink for precise timing of the die.

FDS® FIRM DELIVERY SCHEDULE
3 Days

Standard Alterations

Kommercial countersink punches are available in sizes other than those shown in the chart above.

When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the P dimension is outside the standard range, an "X" is placed in front of the P dimension, e.g., "XP." If the point length is other than standard, designate "XB" as the point length.

Dayton Slug Control

Dayton Slug Control is a patented, guaranteed method for reducing the risk of pulling slugs to the die surface during withdrawal of the punch. A series of grooves is designed inside the matrix (see drawing). There, the slugs are trapped until they fall freely through the relief. The use of Dayton Slug Control has no effect on hole size, and will not require any changes in current regrind practices.

Our guarantee: *Use Dayton Slug Control in a stamping die now pulling slugs. If, for any reason, you are not completely satisfied, we will refund the full cost of the Slug Control alteration.* (We cannot guarantee the retention of slugs when clearance exceeds 10% per side.)

Ordering

Dayton Slug Control is easy to specify and order. Simply add the information that is unique to your application to the matrix catalog number. Please specify XSC for alteration and show material thickness (inches) and clearance per side (percentage).

HOW TO ORDER

	Catalog Number				Your Specs		
Inch	VAX	62	100	P.250	XSC	MT.0125	CS 5
	Type	**D**	**L**	**P**	**Alt. Code**	**Mat'l Thickness (inches)**	**Clear Per Side (%)**

For additional information, contact your Dayton distributor.

Standard Alterations

Surface Coatings

Some catalog products can be coated to increase hardness, reduce galling, and improve wear and/or corrosion resistance. The available coatings are listed below. Also, see the chart at the bottom of this page for delivery times.

DayTride® (XN)—a low-cost surface application that treats all exposed surfaces. Ideal for punches and matrixes. Provides high dimensional stability. Approx. hardness: RC73.

DayTiN® (XNT)—applied via PVD (physical vapor deposition). Provides extreme hardness (hard as carbide) and excellent lubricity when used with a lubricant. Not recommended for stainless steel, copper, or nickel. Approx. hardness: *Vickers 2300.

DayTAN™ (XAN)—ultra-hard, high-aluminum PVD coating. Absorbs shear stress and provides high temperature resistance. Ideal for HSLA, dual phase, and TRIP steels. Approx. hardness: *Vickers 3400.

DayKote™ (XND)—used for extrusion/forming applications. Should not be used with a lubricant. Not recommended for stainless steel, copper, or nickel. Tolerance is ± .0002". Approx. hardness: *Vickers 2300.

TiCN (XCN)—very hard PVD, thin film. Provides ultra hardness (harder than carbide) and superior abrasive wear resistance. Approx. hardness: *Vickers 3000.

MoST™ (XNM)—PVD, solid film. Produces lower coefficient of friction than other coatings. Provides excellent lubricity. Approx. hardness: *Vickers 2000.

XNP—the ultimate coating for extrusion and forming applications. Also works well in shaving operations. Tolerance is ± .0002". Approx. hardness: *Vickers 3100.

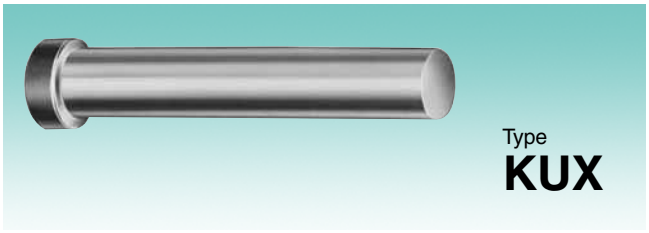
DayKool™ (XCR)—cryogenic steel conditioning process, used primarily with hard, thick materials. Improves strength, toughness, and dimensional stability.

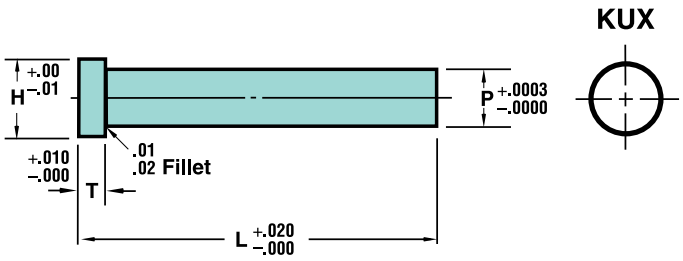
Code / Delivery		Material
XN —DayTride®	+ 3 days	M2
XNT —DayTiN®	+ 3 days	M2
XAN —DayTAN™	+ 4 days	M2
XND —DayKote™	+ 8 days	M2
XCN —TiCN	+ 3 days	M2
XNM —MoST™	+ 7 days	M2
XNP	+ 8 days	M2
XCR —DayKool™	+ 1 day	M2

*Vickers used when RC exceeds 80.

® DayTride and DayTiN are registered trademarks of Dayton Progress.
™ DayTAN, DayKote, and DayKool are trademarks of Dayton Progress. MoST is a trademark of IonBond® Inc.

Straight Punches





Material
Steel: A2, M2, RC 60-63
Heads RC 40-55

Head Dim.		Range	L																	
H	T	P	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00	6.25
.312	.125	.1250-.1880	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600	625
.375	.125	.1881-.2500																				
.438	.125	.2501-.3130																				
.500	.188	.3131-.3750																				

HOW TO ORDER

Specify:	Qty.	Type	P	L	Steel
Example:	5	KUX	P.1255	150	A2

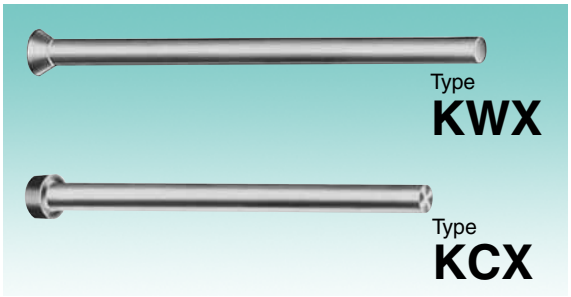
FDS® FIRM DELIVERY SCHEDULE
1 Day

Standard Alterations

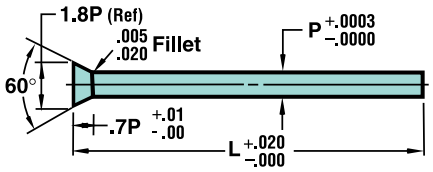
Kommercial straight punches are available in sizes other than those shown in the chart above.

When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the P dimension is outside the standard range, an “X” is placed in front of the P dimension, e.g., “XP.” If the point length is other than standard, designate “XB” as the point length. Also see “Standard Alterations” on the front of the pullout tab in this section for other special order designators.

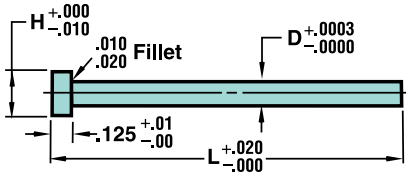
Clospace Punches



KWX



KCX



Material
Steel: M2, RC 60-63
Heads RC 40-55 (KCX)

KCX Head H	Range P	L										
		1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
.125	.0400 -.0630	150	175	200	225	250	275	300	325	350	375	400
.156	.0631 -.0940											
.188	.0941 -.1250											
.219	.1251-.1570											
.250	.1571-.1880											
.281	.1881-.2190											
.312	.2191-.2500											

Standard Alterations

Kommercial clospace punches are available in sizes other than those shown in the chart above.

When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the P dimension is outside the standard range, an “X” is placed in front of the P dimension, e.g., “XP.” If the point length is other than standard, designate “XB” as the point length. Also see “Standard Alterations” on the front of the pullout tab in this section for other special order designators.

HOW TO ORDER

Specify:	Qty.	Type	P	L	Steel
Example:	25	KCX	P.2200	175	M2

FDS® FIRM DELIVERY SCHEDULE
1 Day

Surface Coatings (KUX)

Some catalog products can be coated to increase hardness, reduce galling, and improve wear and/or corrosion resistance. The available coatings are listed below. Also, see the chart at the bottom of this page for delivery times.

***DayTride®* (XN)**—a low-cost surface application that treats all exposed surfaces. Ideal for punches and matrixes. Provides high dimensional stability. Approx. hardness: RC73.

***DayTiN®* (XNT)**—applied via PVD (physical vapor deposition). Provides extreme hardness (hard as carbide) and excellent lubricity when used with a lubricant. Not recommended for stainless steel, copper, or nickel. Approx. hardness: *Vickers 2300.

***DayTAN*™ (XAN)**—ultra-hard, high-aluminum PVD coating. Absorbs shear stress and provides high temperature resistance. Ideal for HSLA, dual phase, and TRIP steels. Approx. hardness: *Vickers 3400.

***DayKote*™ (XND)**—used for extrusion/forming applications. Should not be used with a lubricant. Not recommended for stainless steel, copper, or nickel. Tolerance is ± .0002". Approx. hardness: *Vickers 2300.

TiCN (XCN)—very hard PVD, thin film. Provides ultra hardness (harder than carbide) and superior abrasive wear resistance. Approx. hardness: *Vickers 3000.

***MoST*™ (XNM)**—PVD, solid film. Produces lower coefficient of friction than other coatings. Provides excellent lubricity. Approx. hardness: *Vickers 2000.

XNP—the ultimate coating for extrusion and forming applications. Also works well in shaving operations. Tolerance is ± .0002". Approx. hardness: *Vickers 3100.

***DayKool*™ (XCR)**—cryogenic steel conditioning process, used primarily with hard, thick materials. Improves strength, toughness, and dimensional stability.

Code / Delivery		Material
XN —DayTride®	+ 3 days	M2
XNT —DayTiN®	+ 3 days	M2
XAN —DayTAN™	+ 4 days	M2
XND —DayKote™	+ 8 days	M2
XCN —TiCN	+ 3 days	M2
XNM —MoST™	+ 7 days	M2
XNP	+ 8 days	M2
XCR —DayKool™	+ 1 day	M2

*Vickers used when RC exceeds 80.

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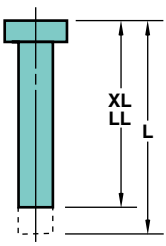
™ DayTAN, DayKote, and DayKool are trademarks of Dayton Progress. MoST is a trademark of IonBond® Inc.

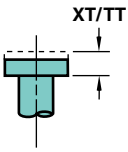
Standard Alterations
Straight and Clospace Punches

Straight Punches



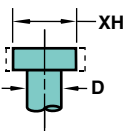
XL **Overall Length Shortened**
Stock removal from point end.

LL **Precision Overall Length**
Same as XL except overall length is held to ±.001.



XT **Thinner Head than Standard**
Stock removal from head end which shortens overall length.

TT **Precision Head Thickness**
Same as XT except head thickness tolerance is held to ±.0005.



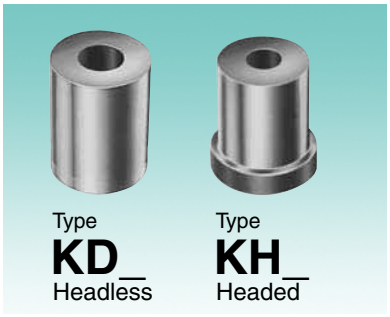
XH **Reduced Head Diameter**
Minimum head diameter equals D+.000 - .001.

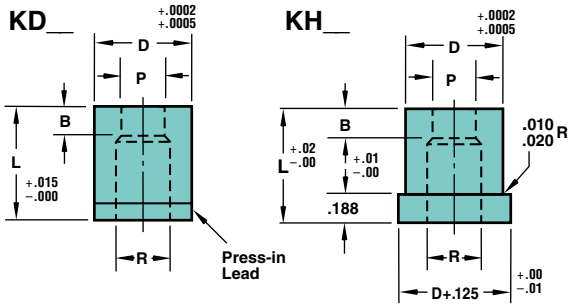
Clospace Punches

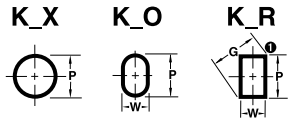
Alteration Code	Product	
	KWX	KCX
XB		●
XD		●
XH		●
XL	●	●
LL	●	●
XP		●
XT		●
TT		●

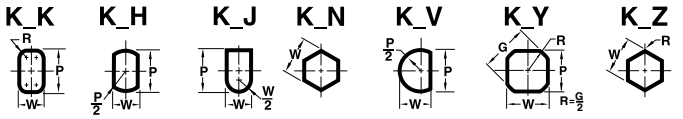
For an explanation of the alteration codes shown above, see the “Standard Alterations, Regular Punches” on the p.7 pullout tab.

Matrixes









Material
Steel: A2, M2, RC 60-63
Round P $^{+.0005}_{-.0000}$ ◎ .0005 P to D
Shape P, W $^{+.001}_{-.000}$ ◎ .001 P to D
D ≧ 1.75 $^{+.0002}_{+.0006}$

❶ Check your P&W dimensions to be certain the diagonal G does not exceed the maximum shown.

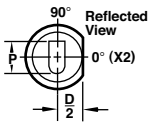
	Body				Round	Shape	L							
Type	D	Code	Min. B	Max. R	Range P	Min. W P/G	Max. W P/G	.75	.87	.93*	1.00	1.12	1.25	1.37	1.50
KD_ KH_	.2500	25	.156	.156	.064- .135	.048- .135									
	.3125	31	.156	.191	.064- .171	.048- .171									
	.3750	37	.156	.228	.064- .195	.048- .195									
	.4375	43	.156	.281	.064- .250	.048- .250									
	.5000	50	.156	.312	.064- .285	.064- .285									
	.6250	62	.187	.391	.136- .365	.095- .365		75	87	93	100	112	125	137	150
	.7500	75	.187	.468	.136- .435	.118- .435									
	.8750	87	.187	.578	.276- .545	.125- .545									
	1.0000	100	.250	.703	.356- .675	.125- .675									
	1.2500	125	.250	.828	.500- .800	.187- .800									
	1.5000	150	.250	1.094	.616-1.050	.187-1.050									
KD_	1.7500	175	.312	1.430	.750-1.400	.187-1.400									
	2.0000	200	.312	1.630	.875-1.600	.187-1.600									
	2.2500	225	.312	1.830	1.000-1.800	.187-1.800		75	87	93	100	112	125	137	150
	2.5000	250	.312	2.030	1.125-2.000	.187-2.000									
	2.7500	275	.312	2.230	1.250-2.200	.187-2.200									

*Headless Only

HOW TO ORDER

Specify:	Qty.	Type	D Code	L	P (or P&W)	Steel
Example:	5	KDR	87	100	P.394, W.209	A2
	3	KHX	37	125	P. 175	M2

Note: The standard location of a key flat is at 0°. For additional information, see p.25.



FDS® FIRM DELIVERY SCHEDULE
25-150 Dia. 2 Days
175 and larger Dia. 4 Days

Standard Alterations

Kommercial matrixes are available in sizes other than those shown in the chart above.

When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the P and W dimensions are outside the standard range, an “X” is placed in front of the P or W dimension, e.g., “XP” and/or “XW.” If the point length is other than standard, designate “XB” as the point length. Also see “Standard Alterations” on the front of the pullout tab in this section for other special order designators.

Matrixes
Tapered Relief

Shown here with optional key flat. See p. 25.

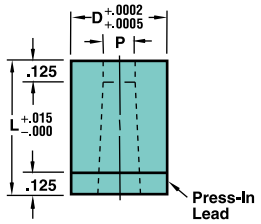
Material
Steel: A2, M2, RC 60-63

Round P $^{+.0005}_{-.0000}$ | ◎ .0005 P to D
Shape P, W $^{+.001}_{-.000}$ | ◎ .001 P to D

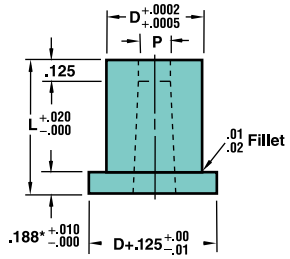
HOW TO ORDER

Specify:	Qty.	Type	D Code	L	P (or P&W)	Steel
Example:	4	KNR	37	112	P.207, W.126	A2
	3	KRO	50	137	P.3125, W.1562	M2

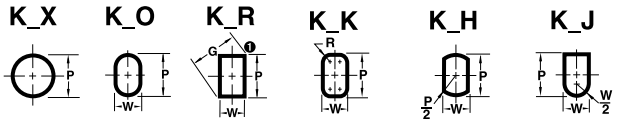
KNX/KN__



KRX/KR__

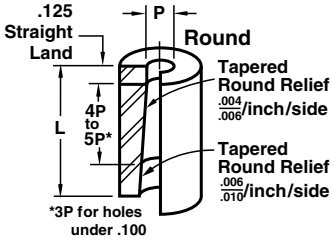


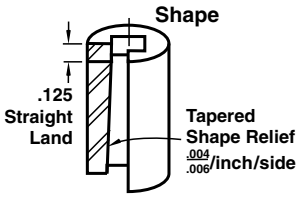
*.125 when D = .1875



❶ Check your P&W dimensions to be certain the diagonal G does not exceed the maximum shown.

Matrix Construction





FDS® FIRM DELIVERY SCHEDULE

25-150 Dia. 2 Days
175 and larger Dia. 4 Days

Standard Alterations

Kommercial tapered relief matrixes are available in sizes other than those shown in the chart below.

When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the P and W dimensions are outside the standard range, an "X" is placed in front of the P or W dimension, e.g., "XP" and/or "XW." If the point length is other than standard, designate "XB" as the point length. Also see "Standard Alterations" on the front of the pullout tab in this section for other special order designators.

	Body		Round	Shape	L								
Type	**D**	**Code**	**Range P**	**Min. W Max. P/G**	**.500**	**.625**	**.750**	**.875**	**1.000**	**1.125**	**1.250**	**1.375**	**1.500**
KN__ **KR__**	.1875	18	.062 - .130	.050 - .130	50	62	75	87	100	112	125	137	150
	.2500	25	.062 - .170	.050 - .170									
	.3125	31	.062 - .212	.050 - .212									
	.3750	37	.075 - .255	.050 - .255									
	.4375	43	.130 - .297	.075 - .297	50	62	75	87	100	112	125	137	150
	.5000	50	.150 - .344	.075 - .344									
	.6250	62	.188 - .425	.075 - .425									
	.7500	75	.225 - .510	.075 - .510									
	.8750	87	.300 - .595	.075 - .595			75	87	100	112	125	137	150
	1.0000	100	.400 - .680	.075 - .680									
	1.2500	125	.500 - .850	.075 - .850									
	1.5000	150	.600 - 1.050	.075 - 1.050									
A2, M2 only D Tolerance $^{+.0002}_{+.0006}$	1.7500	175	.750 - 1.400	.130 - 1.400			75	87	100	112	125	137	150
	2.0000	200	.875 - 1.600	.130 - 1.600									
	2.2500	225	1.000 - 1.800	.130 - 1.800									
	2.5000	250	1.125 - 2.000	.130 - 2.000									
	2.7500	275	1.250 - 2.200	.130 - 2.200									

Dayton Slug Control

Dayton Slug Control is a patented, guaranteed method for reducing the risk of pulling slugs to the die surface during withdrawal of the punch. A series of grooves is designed inside the matrix (see drawing). There, the slugs are trapped until they fall freely through the relief. The use of Dayton Slug Control has no effect on hole size, and will not require any changes in current regrind practices.

XSC Dayton Slug Control

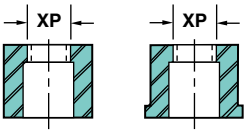
Dayton Slug Control is easy to specify and order. Simply add the information that is unique to your application to the matrix catalog number. Please specify XSC for alteration and show material thickness (inches) and clearance per side (percentage).

HOW TO ORDER

	Catalog Number				Your Specs		
Inch	KHX	37	125	P.125	XSC	MT.0125	CS 5
	Type	**D**	**L**	**P**	**Alt. Code**	**Mat'l Thickness (inches)**	**Clear Per Side (%)**

Standard Alterations
Headless and Headed Matrixes

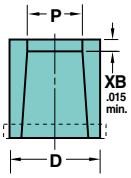
XP **P Dimension Larger than Standard**



Body D	25	31	37	43	50	62	75	87	100	125	150
Max. P/G	.171	.206	.250	.285	.345	.470	.565	.675	.750	.935	1.200

XB

Land Length Shorter (no charge) or Longer than Standard
XB KN_ and KR_Only

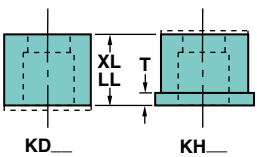


Rounds

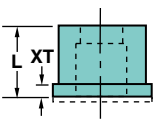
Hole Range	Max B
.0310-.0620	2P
.0621-.0930	.187
.0931-.1580	.250
.1581-.2350	.312
.2351-.3000	.375
.3001-.4000	.437
.4001- Over	.500

XL **Overall Length Shortened**
Stock removal does not alter land length on KD_ & KN_ or head thickness on KH_ & KR_.
Min. overall length:
Headless = .25
Headed = .25+T

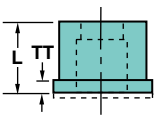
LL **Precision Overall Length**
Same as XL except overall length is held to ± .001.



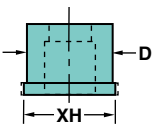
XT **Reduced Head Thickness**
Stock removal from head end which shortens overall length (L).



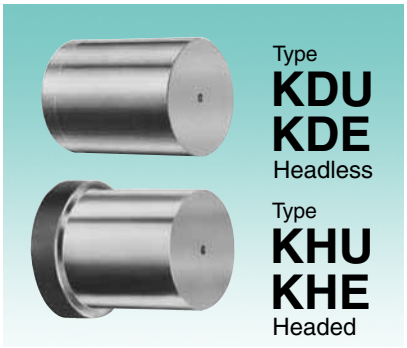
TT **Precision Head Thickness**
Same as XT except head thickness tolerance is held to ±.0005.



XH **Reduced Head Diameter**
Minimum head diameter equals D +.000 - .001.



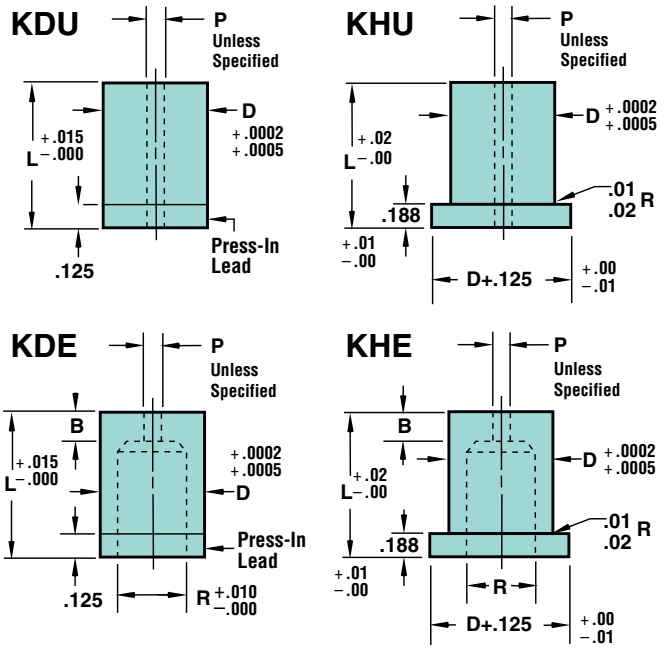
EDM Matrix Blanks



Material
Steel: M2, RC 60-63
Round P $^{+.005}$ | ◎ .0005 P to D
D ≅ 1.75 $^{+.0002}_{+.0006}$

HOW TO ORDER

Specify:	Qty.	Type	D Code	L	P	Steel
Example:	6	KDE	37	100	XP.020	M2
	5	KDU	50	112		M2



FDS®
FIRM DELIVERY SCHEDULE
Standard P 1 Day
Larger P 3 Days
1.7500 and larger (any P) 4 Days

	Body		K_U			K_E					L							
Type	D	Code	Std. P	Optional P		Std. P	Optional P		B	R	.75	.87	.93*	1.00	1.12	1.25	1.37	1.50
KD_ KH_	.2500	25	.031	.020	—	—	.020	—	.15	.156								
	.3125	31	.031	.020	—	.031	.020	—	.25	.191								
	.3750	37	.031	.020	—	.031	.020	—	.25	.228								
	.4375	43	.031	.020	—	.031	.020	—	.25	.281								
	.5000	50	.062	.020	—	.031	.020	—	.25	.312								
	.6250	62	.062	.020	.031	.093	.020	.031	.25	.391	75	87	93	100	112	125	137	
	.7500	75	.062	.020	.031	.093	.020	.031	.31	.468								150
	.8750	87	.062	.020	.031	.093	.020	.031	.31	.578								
	1.0000	100	.062	.020	.031	.093	.020	.031	.31	.703								
	1.2500	125	.062	.020	.031	.125	.020	.031	.37	.828								
	1.5000	150	.062	.020	.031	.125	.020	.031	.37	1.094								
KD_	1.7500	175	.125	.020	.031	.125	.020	.031	.37	1.430								
	2.0000	200	.125	.020	.031	.125	.020	.031	.37	1.630								
	2.2500	225	.125	.020	.031	.125	.020	.031	.37	1.830	75	87	93	100	112	125	137	150
	2.5000	250	.125	.020	.031	.125	.020	.031	.37	2.030								
	2.7500	275	.125	.020	.031	.125	.020	.031	.37	2.230								

Standard "P" will be provided, unless otherwise specified. *Headless Only

Features/Benefits

Select either round ***KD__ Headless*** or ***KH__ Headed EDM Matrix Blanks***. Relief hole (P) provides sufficient clearance for slug removal during the stamping process in both versions of both types.

KDU and KHU Blanks are provided with a small straight through hole. They are commonly used for wire and vertical EDM operations. There are two key advantages with this type of blank: in wire cutting, a tapered relief can be cut instead of a round straight relief; in conventional EDM applications, you can customize the size of the relief to the shape you are cutting.

KDE and KHE Blanks are used with conventional (vertical) EDM machines. The hole (P) is used to introduce dielectric to the spark gap to flush away eroded particles of steel. For the fastest delivery, use the hole (P) dimension given in the chart. If a larger hole is desired, simply specify "XP" and indicate the dimension.

Single Head Pilot Retainers
True Location™

Type
PRT
For Round Pilots

HOW TO ORDER

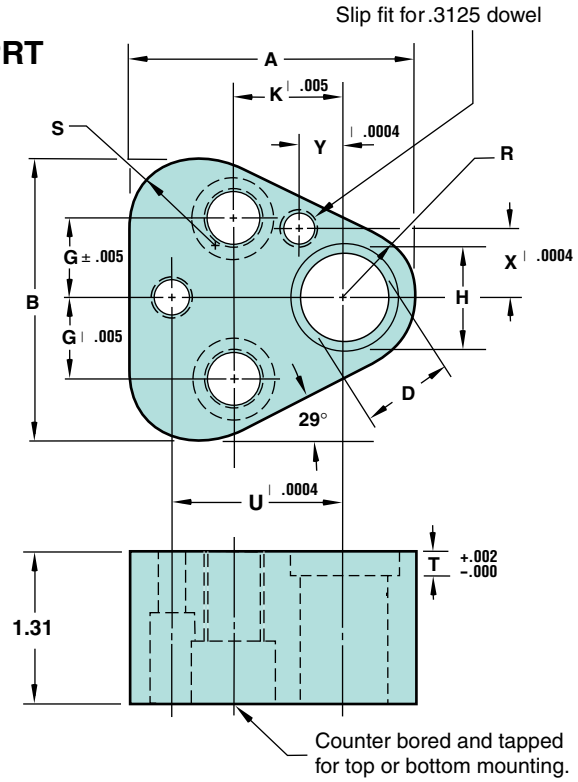
Specify:	Qty.	Code	D
Example:	5	PRT	62

Features/Benefits

PRT single head pilot retainers (for round punches) provide a timesaving, cost-effective solution for fitting isolated punches or pilots onto a die set. They eliminate the need to design, build, and fit one-of-a-kind retainers.

FDS® FIRM DELIVERY SCHEDULE
1 Day

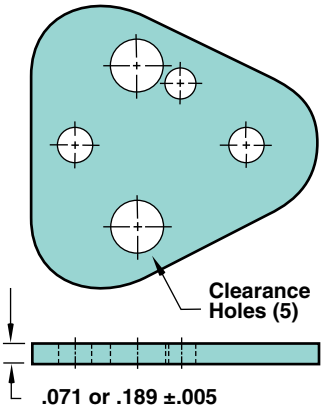
PRT



Type	Code	D	A	B	G	H	K	R	S	T	U	X	Y	Screw Size	Tapped Hole
PRT	50	.5000	2.00	1.97	.562	.66	.750	.50	.60	.188	1.180	.472	.256	5/16-18	3/8-16
	62	.6250	2.12	2.09	.625	.78	.750	.56	.66	.250	1.250	.532	.236	5/16-18	3/8-16
	75	.7500	2.37	2.34	.688	.91	.750	.69	.79	.250	1.320	.650	.197	5/16-18	3/8-16

PRT Retainer sets include:
- 2 Dowels
- 2 Screws

Shim/Backing Plate



Shim Plates can be used as an effective way to accurately time pilot entry, or used as a backing plate.

Shim Plates can also be used on any Dayton Progress triangular-shaped retainers.

	Thickness T	
D	**.189 (Rc54-56)**	**.071 (Soft)**
50	URBP 1348	URSP 1318
62	URBP 1648	URSP 1618
75	URBP 2048	URSP 2018

Pilot Retainers

Pilots are critical tools used in a die set—ones that can ultimately determine the quality of a stamping or fabricating operation. Because they are the primary locating devices, pilots need to be mounted properly to avoid unwanted lateral deflection. As bending or forming of the metal takes place, this lateral deflection can create excessive force on the pilot. Often, the strength of the pilot—as well as the function of the other die set components—is compromised.

PRT Retainers are thicker than other retainers, therefore, offer more support and reliability in locating the fabricating strip. In addition, PRT Retainers are ground top and bottom; hardened to approximately RC 42; and include precision dowel locations, which allow them to be used in CNC applications.

All PRT Retainers are ready to mount, thus saving you time and money over building your own retainers. Build your next die with standard Dayton Progress PRT Retainers.

Classified Shapes — Kommercial

Classified shapes (83 common shapes, no detailing required) are available on all punches and matrixes, as indicated in this catalog. The 83 available common shapes are shown here and on p. 23. Also, see the outside of the pullout tab for notes and drawing references.

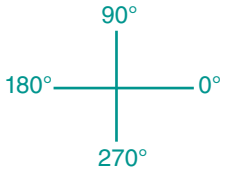
Ordering Information

*Corner Dimensions

Dimension should be the theoretical sharp corners for shapes C22, C24, C34, C61, and C88. However, some reduction of these dimensions will result from fitting the punch and matrix under conditions where the clearance is .0025 or less per side.

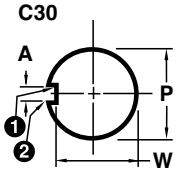
†Shape Center

Shapes are centered on the punch shanks as shown. Shapes in guide bushings and matrixes are also centered as shown with the exception of shapes C22 and C34. Due to clearance, the P dimension on these shapes will not be centered.

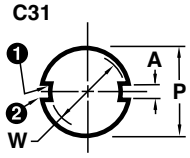


Keys

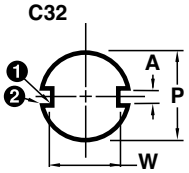
C30



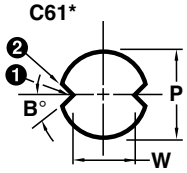
C31



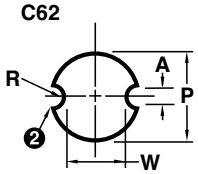
C32



C61*

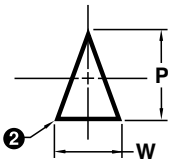


C62

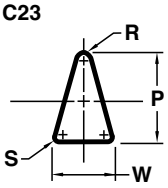


Triangles/ Trapezoids

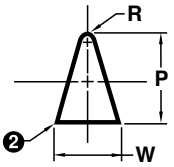
C22*†



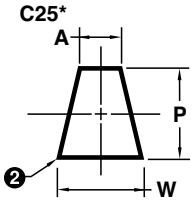
C23



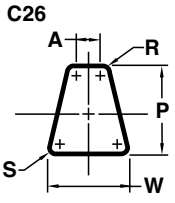
C24*



C25*

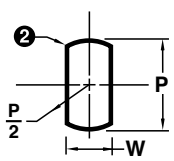


C26

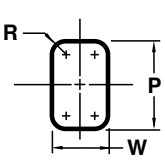


Flatted Rounds

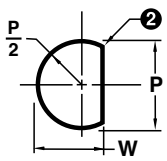
C10**



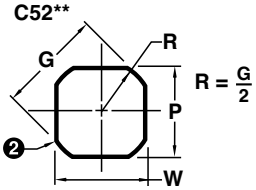
C11**



C33**



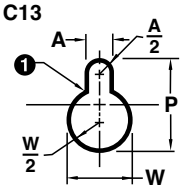
C52**



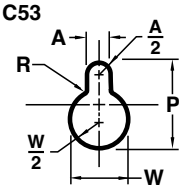
** Now standard. See product pages.

Mono Lobes

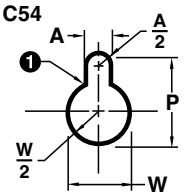
C13



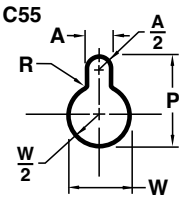
C53



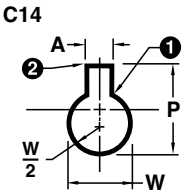
C54



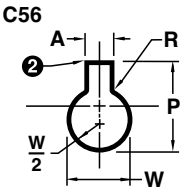
C55



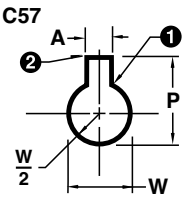
C14



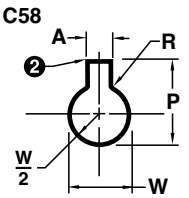
C56



C57

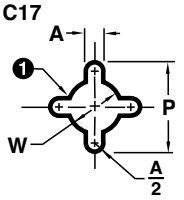


C58

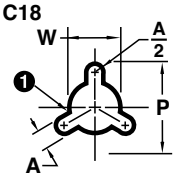


Multi Lobes

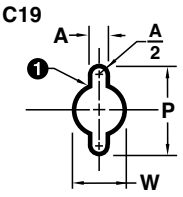
C17



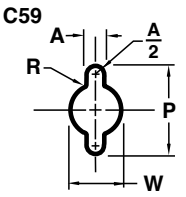
C18



C19



C59



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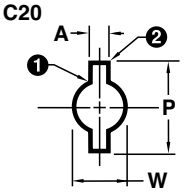
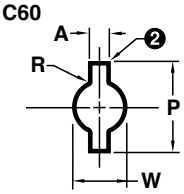


C60

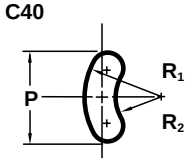


Classified Shapes

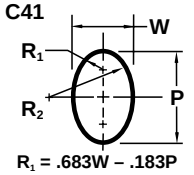
Kommercial

Miscellaneous

C40

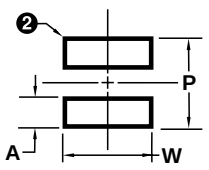


C41

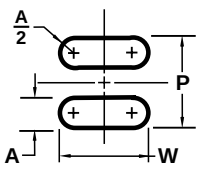


$R_1 = .683W - .183P$
$R_2 = 1.183P - .683W$

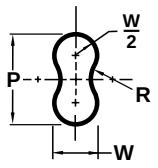
C42*



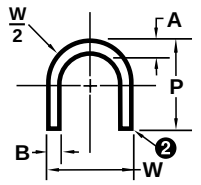
C43



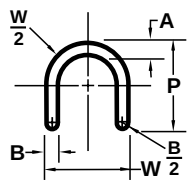
C93



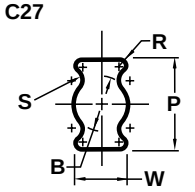
C64



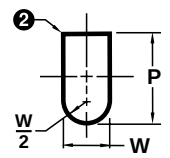
C65



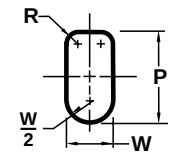
C27



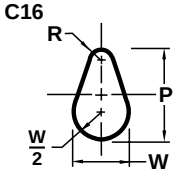
C28**



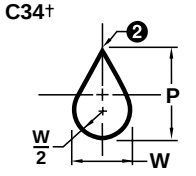
C29



C16

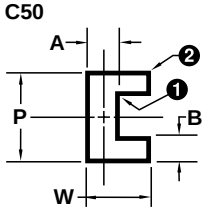


C34†

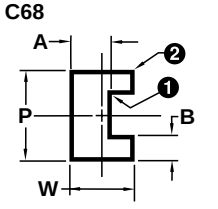


Us

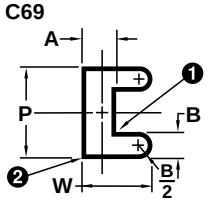
C50



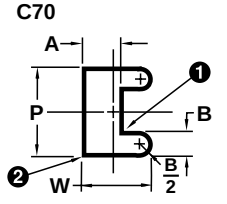
C68



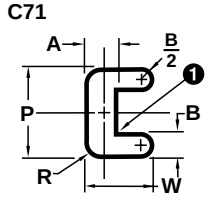
C69



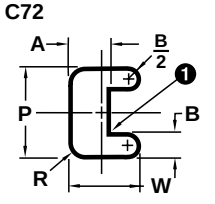
C70



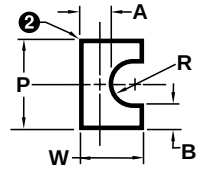
C71



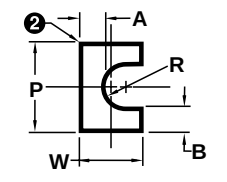
C72



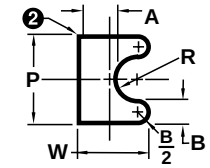
C51



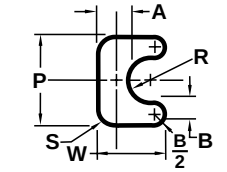
C73



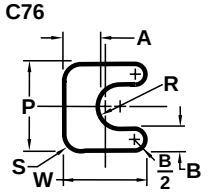
C74



C75

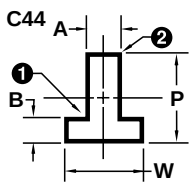


C76

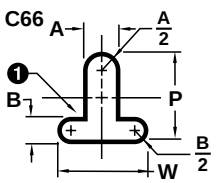


Ts

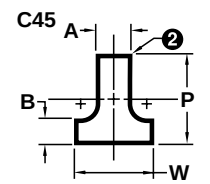
C44



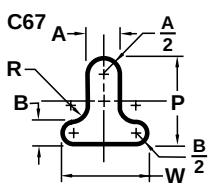
C66

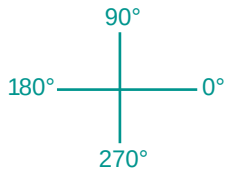


C45



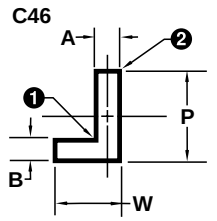
C67



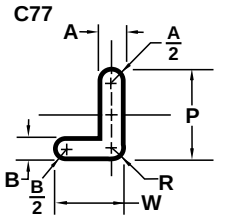


Ls

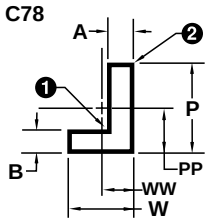
C46



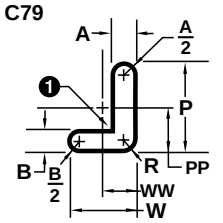
C77



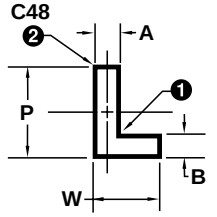
C78



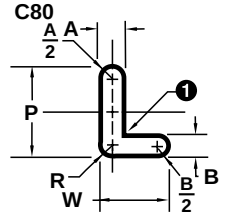
C79



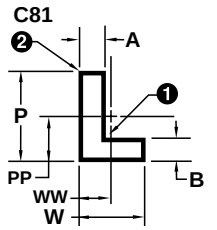
C48



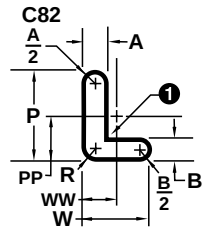
C80



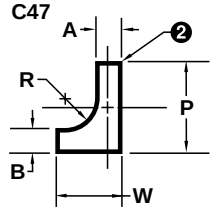
C81



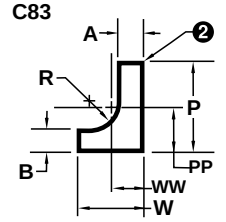
C82



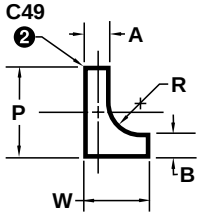
C47



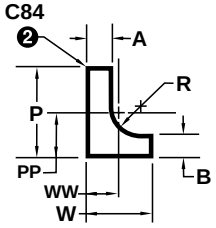
C83



C49



C84



Polygons

C12**

C85**

C35

A = Even No. of Sides

C86

A = Even No. of Sides

C36

A = Odd No. of Sides

C87

A = Odd No. of Sides

C88*

C89

C37

C38

C39

A = No. of teeth (3, 4, 6 or 8 only)

C90

A = No. of teeth (3, 4, 6 or 8 only)

Duo Tees

C21

C91

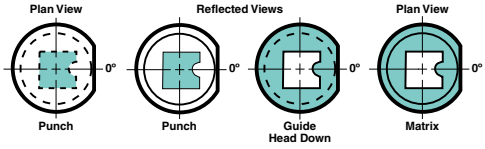
C92

C15

*See “Corner Dimensions” note on p. 22.

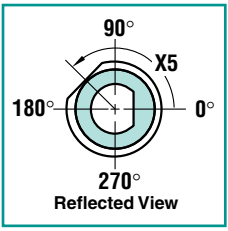
Classified Shapes
Ordering Information

Reflected View—Punches and Guides



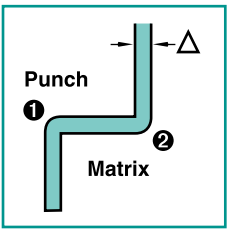
The reflected view is used for punches and guides. It is the view as seen in a mirror held below a punch or guide in its operating position. It is the same as a plan view from the head end, in which the point shape is shown dotted. A reflected view is shown with solid lines.

Orientation and Locking



The locking device orientation is standard at 0°. For types of locking methods and custom locations, see p. 25.

Clearance



Normal grinding methods produce ❶ .007 max. fillet on the punch and ❷ .007 max. fillet on the matrix with matching corner shape on the matrix and punch, respectively. When ordering matrixes, please specify punch dimensions and clearance per side (Δ). (If the clearance is .0025 Δ, Dayton will break sharp corners when the punches and matrixes are ordered together.)

Jektole® Data

The Engineered Clearance

Perforating punch-to-matrix clearances in metal stamping dies has been universally expressed as a percentage of stock thickness, and for clarity should be articulated as percent per side (Δ=clearance per side).

Standard practice has called for Δ 5%, and is commonly known as "regular clearance." Regular clearance has been applied almost universally to all applications involving the perforation of ferrous materials.

Jektole®, the ***Engineered Clearance***, is approximately twice regular clearance, i.e., Δ 10-12%. This means greater productivity, improved maintenance, and a better return on your tooling investment.

In addition, clearances of up to Δ 50% are not uncommon with some hard materials. Clearance tests have been performed by Dayton Progress to prove that increasing the clearance does not lessen hole quality—a common thought by some designers and engineers. Dayton clearance tests do, in fact, prove that the Jektole® ***Engineered Clearance*** provides many advantages and benefits.

Jektole® In Production

- Requires less press tonnage
- Reduces the pressure required to strip the punch, which, in turn, reduces punch wear
- Produces minimal burr
- Doubles—often triples—piece output per grind
- Reduces total punch costs

Jektole® In Maintenance

- Keeper Key holds pin in retracted position (see photo at left)
- Eliminates the need for disassembly before grinding
- Helps maintain proper pin extension
- Reduces downtime for regrinding

Standard Jektole® Data

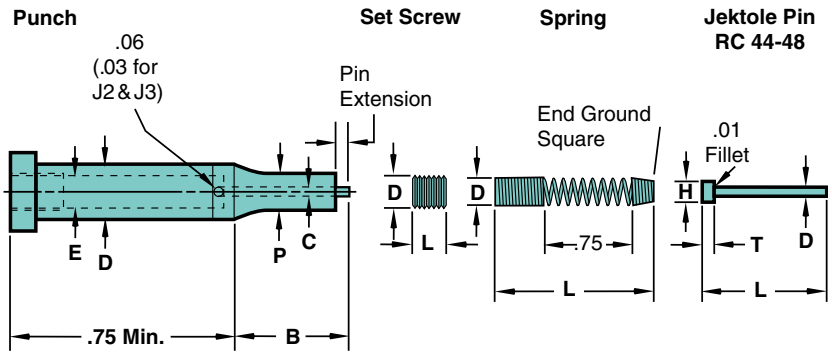
DIMENSION		J2	J3	J4	J6	J9	J12
Std. Shank Diameter	D	.1875	.2500	.3125	.3750 .4375 .5000	.6250 .7500 1.000	1.250 and larger
Point Hole Diameter	C	.020	.032	.046	.063	.094	.125
Shank Hole Diameter	E	.086	.109	.141	.172	.221	.275
Pin Extension		.03	.03	.06	.06	.06	.06
Keeper Key Number		920045			920053		*

* Keeper Key not available

Jektole® Design Limits

DIMENSION		J2	J3	J4	J6	J9	J12
Min. Shank Dia.	D	.172	.218	.282	.344	.442	.552
Min. Point Dia.	P	.040	.064	.092	.126	.188	.250
Max. Point Lgth.	B	1.25	1.50	1.62	1.62	1.62	1.62

Jektole® Components

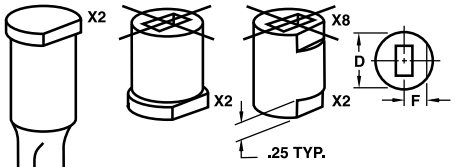


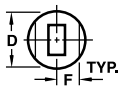
Universal Jektole® Components

EJECTOR PINS		J2	J3	J4	J6	J9	J12
Overall Length	L	1.11	1.38	1.94	1.94	2.22	2.22
Pin Diameter	D	.017	.027	.041	.058	.089	.120
Head Diameter	H	.048	.073	.094	.120	.156	.188
Hd. Thickness	T	.031	.047	.062	.062	.094	.094
SPRINGS		**J2**	**J3**	**J4**	**J6**	**J9**	**J12**
Outside Dia.	D	.081	.104	.136	.167	.216	.270
Free Length	L	2.38	2.38	3.19	3.00	3.03	2.56
Pressure (.12" Pre-load)	lbs.	.5	.75	1	1.5	2	2.5
SCREWS		**J2**	**J3**	**J4**	**J6**	**J9**	**J12**
Screw Size	D	#3-48	#5-40	#8-32	#10-32	1/4-28	5/16-24
Screw Length	L	.19	.19	.19	.19	.25	.25

Locking Devices—Flats vs. Dowel Slots

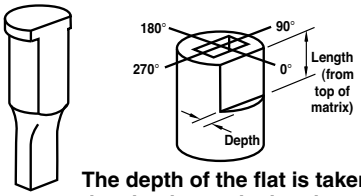
Flats





F Dimension
(.5D on Headed Products)
Headless Matrixes and Guides

Body Dia.	18	25	31	37	43	50
F	.080	.110	.135	.165	.190	.220
Body Dia.	**62**	**75**	**87**	**100**	**125**	**150**
F	.270	.325	.380	.435	.540	.650
Body Dia.	**175**	**200**	**225**	**250**	**275**	
F	.775	.900	1.025	1.150	1.275	



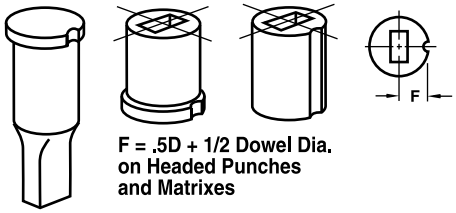
The depth of the flat is taken from the shank, not the head, on punches.

Key Flats vs. Dowel Slots

Maximum hole dimensions in matrixes were designed with key flats in mind. There are instances where, if using a dowel slot in a headless matrix, the dowel hole could break into the relief. For this reason, there are two ways to specify the location of the dowel. **X0** (standard/alternate location) and **X1** (custom location) are located .5D from centerline. However, when hole dimensions are approaching the high limit of "P," **X4** (standard/alternate location) or **X7** (custom location) may be specified. This relocates the dowel outward to assure no interference between the dowel and the relief hole. Note: When the matrix diameter is over .5000, the centerline dimension is .5D on all dowels.

To determine if you have an interference problem, see pp. 18-19 for information on Matrix construction.

Dowel Slots



F = .5D + 1/2 Dowel Dia. on Headed Punches and Matrixes

Location Tolerance

Flat		Dowel	
F	**Radial**	**F**	**Radial**
+ .0005 – .0000	.001/ inch	+ .0005 – .0000	0°-4'

HOW TO ORDER

Specify:	Qty.	Type	D Code	L	P (or P&W)	Steel	Alteration
Example:	5	KPL	50	S300	P.384, W.199	A2	X2
	9	KDR	87	100	P.394, W.209	A2	X2

Standard and Alternate Locations

Definitions:
Standard Location is at 0°.
Alternate Location is 90°, 180°, or 270°.

Alternate Locations are available at no additional charge.

Custom Locations

Definitions:
Custom Location is ***any angle other than:*** 0°, 90°, 180°, or 270°.

Single Flats: X2 & X8

Locking Devices	Punches	Matrixes
X2	Top	Bottom
X8	N/A	Top

Order Example:
X2 — 90°

Single Flats: X5 & X9

Locking Devices	Punches	Matrixes
X5	Top	Bottom
X9	N/A	Top

Order Example:
X5 — 135°

Double Flats: X3

Locking Devices	Punches	Matrixes
X3	Top	Bottom

Order Example:
X3 — 90°

Second Flat is *always parallel* to the first flat.

Double Flats: X6

Locking Devices	Punches	Matrixes
X6	Top	Bottom

Order Example:
X6 — 135°

Additional Flats (From Top)

Code	Depth	Length
X81	.060	.500
X82	.060	.625
X83	.060	.750
X84	.060	Full Length
X85	.093	.500
X86	.093	.625
X87	.093	.750
X88	.093	Full Length
X89	Specify Dimensions	

Additional Flats (From Top)

Code	Depth	Length
X91	.060	.500
X92	.060	.625
X93	.060	.750
X94	.060	Full Length
X95	.093	.500
X96	.093	.625
X97	.093	.750
X98	.093	Full Length
X99	Specify Dimensions	

HEADLESS MATRIXES ONLY

Dowel Slots: X0, X4, & X41

Locking Devices	Dowel Diameter
X0	.1250
X4	.1250
X41	.1875

Order Example:
X0 — 180°

F Dimension

Body Diameter		25	31	37	43	50	62-275
X0	F	.1250	.1562	.1875	.2188	.2500	.5D
X4		.1625	.1875	.2125	.2375	.2625	.5D
X41		.1938	.2188	.2438	.2688	.2938	.5D

Dowel Slots: X1, X7, & X71

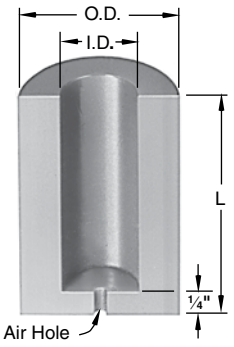
Locking Devices	Dowel Diameter
X1	.1250
X7	.1250
X71	.1875

Order Example:
X71 — 135°

F Dimension

Body Diameter		25	31	37	43	50	62-275
X1	F	.1250	.1562	.1875	.2188	.2500	.5D
X7		.1625	.1875	.2125	.2375	.2625	.5D
X71		.1938	.2188	.2438	.2688	.2938	.5D

Urethane Strippers



Air Hole	I.D.
1/16	3/16-1/4
3/32	5/16
1/8	3/8-1

Features/Benefits

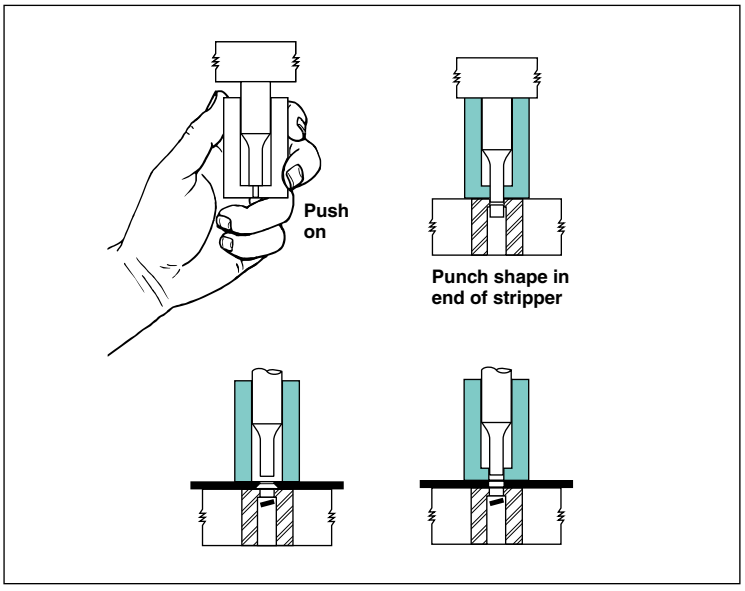
Dayton's durable, yet flexible, Urethane Strippers provide superior stripping over conventional strippers; develop higher load-bearing capacity due to the use of a unique curing agent; are tear- and oil-resistant; provide exceptional dampening of the punch, thus eliminating premature punch failure due to vibration; and are easy to install and replace.

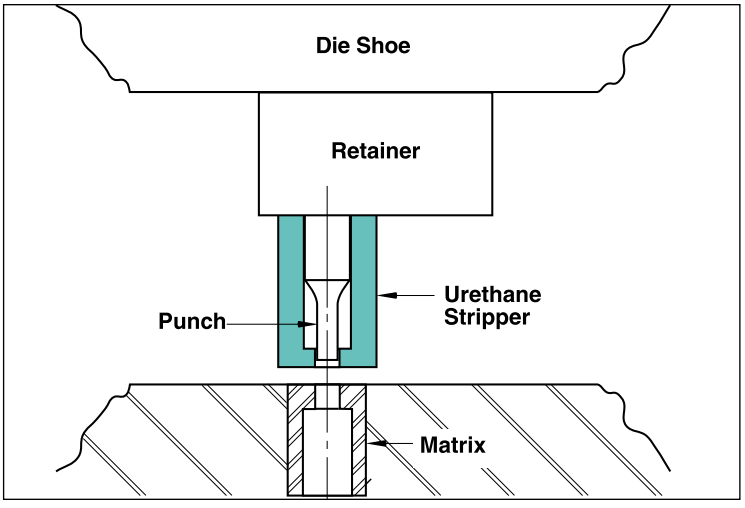
Strip-shape Dayton Urethane Strippers assure positive stripping and dampen punch vibration by gripping around the punch point. The closed-end feature holds the thin stock flat during the stripping cycle, and helps eliminate the potential for rejected parts.

HOW TO ORDER

Specify:	Qty.	Type	I.D.	L
Example:	12	USE	37	125

Catalog Number	I.D.	O.D.	L	Pressure at Deflection of		
				1/8	1/4	3/8
USE18-125	3/16	11/16	1 1/4	250	400	—
USE18-150			1 1/2	230	350	—
USE25-125	1/4	3/4	1 1/4	280	475	—
USE25-150			1 1/2	275	465	—
USE25-175			1 3/4	220	375	490
USE31-125	5/16	13/16	1 1/4	320	500	—
USE31-150			1 1/2	300	450	—
USE31-175			1 3/4	270	400	575
USE31-200			2	240	370	600
USE37-125	3/8	7/8	1 1/4	420	695	—
USE37-150			1 1/2	385	625	—
USE37-175			1 3/4	355	575	760
USE37-200			2	310	515	670
USE50-125	1/2	1	1 1/4	520	790	—
USE50-150			1 1/2	450	725	—
USE50-175			1 3/4	435	680	875
USE50-200			2	315	510	650
USE50-225			2 1/4	275	475	600
USE62-125	5/8	1 1/8	1 1/4	600	925	—
USE62-150			1 1/2	520	835	—
USE62-175			1 3/4	480	775	1000
USE62-200			2	440	730	935
USE75-175	3/4	1 1/2	1 3/4	500	800	1200
USE75-200			2	400	700	1100
USE75-225			2 1/4	350	650	1000
USE75-250			2 1/2	325	600	900
USE75-275			2 3/4	300	550	800
USE87-175	7/8	1 3/4	1 3/4	1500	2200	3400
USE87-200			2	1200	1900	2800
USE87-225			2 1/4	1150	1850	2400
USE87-250			2 1/2	900	1450	1900
USE87-275			2 3/4	850	1350	1800
USE100-175	1	2	1 3/4	2000	3000	3500
USE100-200			2	1600	2600	3400
USE100-225			2 1/4	1400	2300	3200
USE100-250			2 1/2	1200	2000	3000
USE100-275			2 3/4	1000	1800	2800





VersaPlus® Premium Products

PUNCHES

Standard features on all Dayton VersaPlus® punch products include precision concentricity between the point and the shank (resulting in better punch and die alignment); a super-smooth finish on the point (resulting in less galling and reduced maintenance costs); and state-of-the-art-coatings that provide superior hardness.

Jektole® Punches

VersaPlus® Jektole® Punches permit doubling punch to matrix clearance; produce up to three times (or more) the number of hits between sharpenings; and reduce burr heights.

Regular Punches

VersaPlus® Regular Punches provide three times better alignment than other major brands; offer longer tool life; and can significantly improve finished part quality.

Straight Punches

VersaPlus® Straight Punches—Jektole® and Regular—are available in a wide range of sizes; can be designed and formed to accommodate your specific punching needs; and provide longer die runs, less downtime, and reduced maintenance costs.

PILOTS

Standard features on all Dayton VersaPlus® pilots include smoother pick-up action; less hole distortion; and state-of-the-art coatings to provide superior hardness.

Regular Pilots

VersaPlus® Regular Pilots are built to exact tolerances; the parabolic point shape allows for smooth pick-up action; and pilots offer a wide range of unique punching and fabricating applications.

Positive Pick-Up Pilots

VersaPlus® Positive Pick-Up Pilots provide smoother pick-up without the risk of distorting the hole; in addition, the unique design moves the stock farther than conventional pilots.

If optimum performance is a MUST, this may be the only punch you'll ever need!

® VersaPlus is a registered trademark of Dayton Progress.

VersaPlus® sets the new industry standard for high-performance punches and pilots. VersaPlus® means less downtime, longer production runs, and better value for your stamping dollar.

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Global leader in providing fabrication and stamping solutions