

**Long-lasting
Punches,
Pilots,
Die Buttons,
& Retainers**

Kommercia



Global leader in
providing fabrication
and stamping solutions

a MISUMI Group Company

www.daytonlamina.com

**Top-rate
performance,
reduced
maintenance,
exceptional
value**



Kommerical Punches, Pilots, Die Buttons, and Retainers

Product Applications

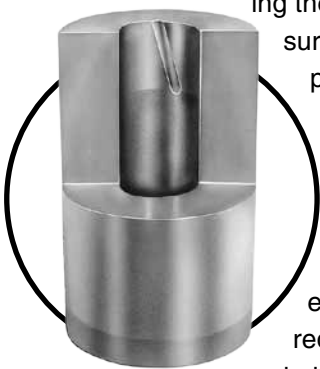
Dayton **Kommerical Punches, Pilots, Die Buttons,** and **Retainers** (inch) are built to exacting tolerances; are long-lasting, top-rated performers; help reduce downtime and minimize maintenance costs; and have a wide range of applications in various high-demand industries, including automotive and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

Dayton Kommerical punches add longer tool life and improve finished part quality. For example, **Dayton Jektole® Punches** (slug ejection punches) provide increased punch to die button 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 Kommerical 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; Die Buttons; 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 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 die button (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.

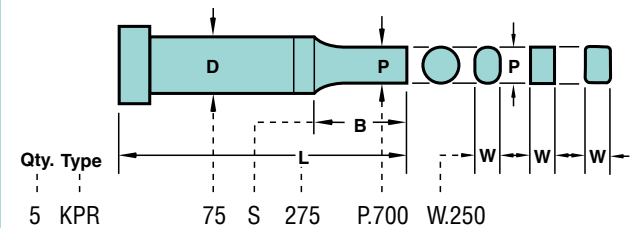


Ordering Information

Each page contains detailed instructions on how to order specific Dayton Kommerical 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 Kommerical, "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.

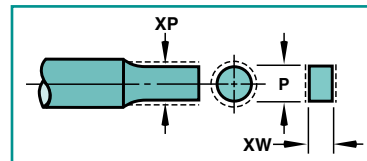
HOW TO ORDER



Standard Alterations

Punches, die buttons, 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

Standard Shapes

X

O

R

K

L

H

J

N

V

Y

Z

KJ_ Jektolē®

Round/Shape

4, 5

KP_ Regular

Round/Shape

6, 7

KPT Pilots

Regular

8, 9

KPA Pilots

Positive Pick-Up

10, 11

KUAC/KPAC Pilots

Compact Positive Pick-Up

12, 13

KJB & KPB Punch Blanks

Jektolē®/Regular

14

KPG Countersink

Round

15

KUX Straight

Round

16

KWX & KCX CloSPACE

Round

17

Die Buttons

KD_ & KH_ Die Buttons

Headless/Headed

18

KN_ & KR_ Die Buttons

Tapered Relief

19

KD_ & KH_ EDM Button Blanks

Headless/Headed

20

Retainers

PRT for Single Head Pilot

True Location™

21

Miscellaneous/Other

Classified Shapes

22, 23

Form Shapes

24, 25

Jektolē® Data

26

Locking Devices

Key Flats / Dowel Slots

27

Urethane Strippers

28

Shear Angles

29

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

75

Press-Fit Dia. D (shank diameter)

Coded by the first 2 digits of decimal equivalent (.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)

P.700, W.250

Point or Hole Size

Dimensions As Specified

Product

Series

Length

Point or Hole Size

KPR

75

S

275

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 die buttons as indicated in this catalog. See pp. 22, 23 for more information and special instructions. Also, see individual product pages and p. 27 for additional information on orientation and views.

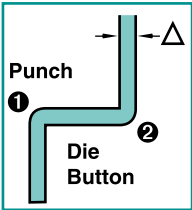
Clearance

Normal grinding methods produce:

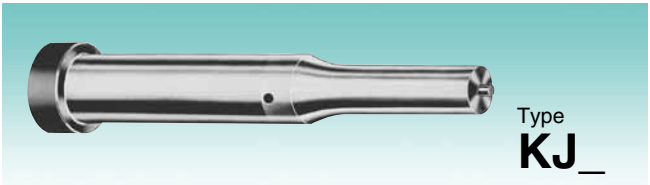
- 1

.007 max fillet on the punch — matching corner shape on the die button.
- 2

.007 max fillet on the die button — matching corner shape on the punch.



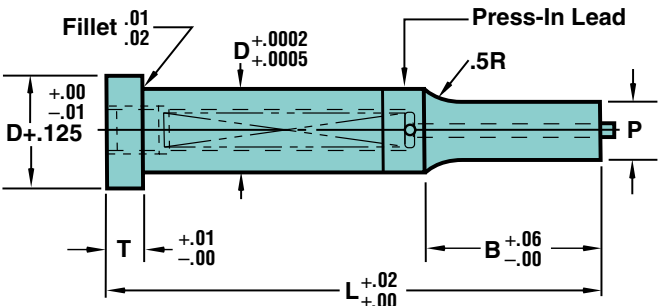
Jektol[®] Punches



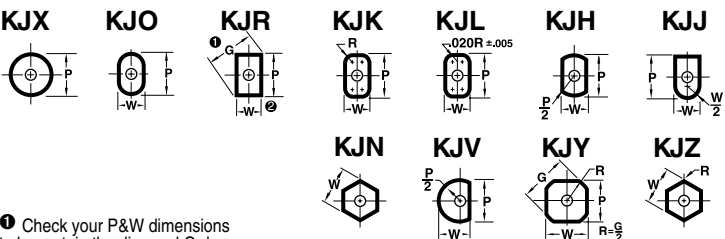
Type
KJ_

Material
Steel: A2, M2, RC 60-63
Heads RC 40-55 (1" and smaller)
Round P ^{+.0005}/_{-.0000}
Shape P, W ^{+.0005}/_{-.0000}

.0005 P to D
 .001 P to D



Jektol[®] Punches



- 1 Check your P&W dimensions to be certain the diagonal G does not exceed the maximum shown.
- 2 Sharp corners are typical. To assure proper clearance, Dayton will provide standard broken corners to eliminate interference with the button fillet when total clearance is .005 or less.

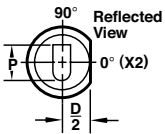
Features/Benefits

Jektol[®] punches permit doubling punch to die button 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. 27 for more information on flats and dowel slots.



Standard Alterations

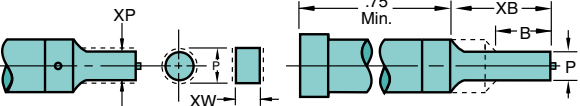
Jektol[®] punches are available in sizes other than those shown in the chart to the left.

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.

Standard Alterations Jektol[®] Punches

XP, XW P and W Dimensions
Smaller than Standard

XB Point Length
Other than Standard



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

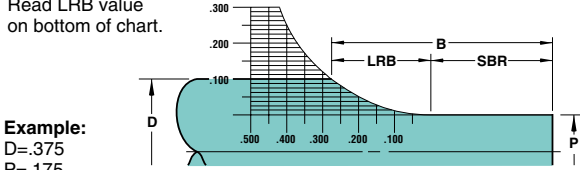
XL	Overall Length Shortened Stock removal from point end which shortens B length. To maintain "B," specify "XLB."
LL	Precision Overall Length Same as XL except overall length is held to ±.001.
XLB	Overall Length Shortened B length maintained. (min. shank length .75)
XT	Thinner Head than Standard Stock 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 Jektol Components See p. 26.

SBR Straight Before Radius

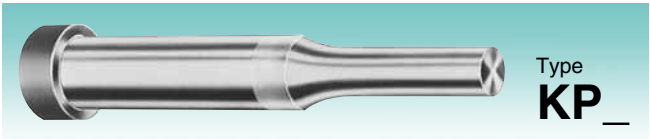
To determine Length of Radius Blend (LRB)

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

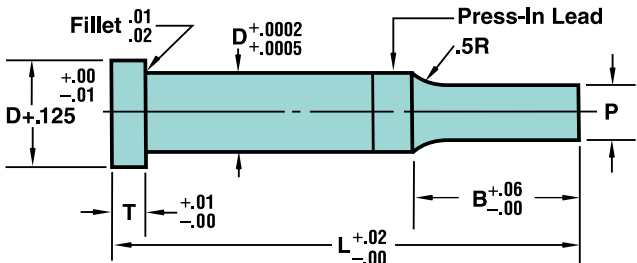


Material
Steel: A2, M2, RC 60-63
Heads RC 40-55 (1" and smaller)

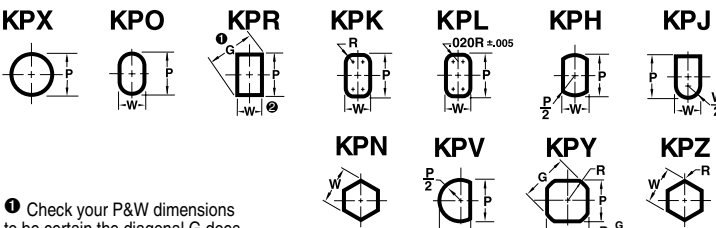
Round P $\pm .0005$
Shape P, W $\pm .0005$

P to D

P to D



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 die button fillet when total clearance is .005 or less.

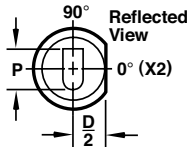
Features/Benefits

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

Note: The standard location of a key flat is at 0°. See p. 27 for more information on flats and dowel slots.



Standard Alterations

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

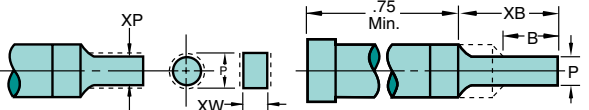
When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the P and W dimensions are outside the standard range, an "X" is placed in front of the P or W dimension, e.g., "XP" and/or "XW." If the point length is other than standard, designate "XB"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

Standard Alterations

Regular Punches

XP, XW P and W Dimensions Smaller than Standard

XB Point Length Other than Standard



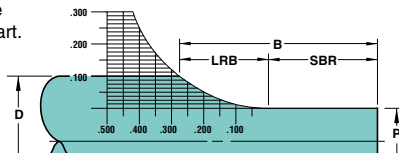
Point Length	XB					XB					XB					XB				
	.500-.750	1.000-1.250	1.500-1.625	2.000-2.500	3.000-3.750	.500-.750	1.000-1.250	1.500-1.625	2.000-2.500	3.000-3.750	.500-.750	1.000-1.250	1.500-1.625	2.000-2.500	3.000-3.750	.500-.750	1.000-1.250	1.500-1.625	2.000-2.500	3.000-3.750
Code Type	Min. P (Rounds)					Min. W (Shapes)					Min. P (Rounds)					Min. W (Shapes)				
18 KP	.042	.058	.075	.093							.062	.062	.093	.125		.062	.062	.093	.125	
25 KP	.062	.062	.080	.093							.062	.062	.093	.125		.062	.062	.093	.125	
31 KP	.062	.062	.093	.093	.125	.187					.062	.093	.093	.125	.195	.187	.062	.093	.093	.125
37 KP	.062	.062	.093	.125	.125	.187	.250	.312			.080	.109	.125	.125	.195	.187	.080	.109	.125	.125
43 KP		.062	.093	.125	.125	.187	.250	.312			.109	.125	.125	.195	.187		.109	.125	.125	.195
50 KP		.125	.125	.125	.125	.187	.250	.312			.125	.141	.172	.195	.187		.125	.141	.172	.195
62 KP		.235	.235	.235	.235	.235	.312	.375			.235	.235	.235	.235	.250		.235	.235	.235	.235
75 KP		.300	.300	.300	.300	.300	.343	.406			.300	.300	.300	.300	.250		.300	.300	.300	.300
87 KP		.350	.350	.350	.350	.400	.400	.437			.350	.350	.350	.350	.250		.350	.350	.350	.350
100 KP		.400	.400	.400	.400	.400	.400	.437			.400	.400	.400	.400	.250		.400	.400	.400	.400

XT	XL	LL	XT	TT	XH
Stock removal from point end which shortens B length. To maintain "B," specify "XLB."	Precision Overall Length Same as XL except overall length is held to $\pm .001$.	Overall Length Shortened B length maintained. (min. shank length .75)	Thinner Head than Standard Stock removal from head end which shortens overall length.	Precision Head Thickness Same as XT except head thickness tolerance is held to $\pm .0005$.	Reduced Head Diameter Minimum head diameter equals D $\pm .000$ - .001.

SBR Straight Before Radius

To determine Length of Radius Blend (LRB)

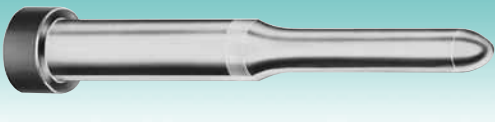
- Calculate (D-P)/2.
- Find (D-P)/2 value on left side of chart.
- Follow line over to intersection point on radius blend line.
- Read LRB value on bottom of chart.



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.

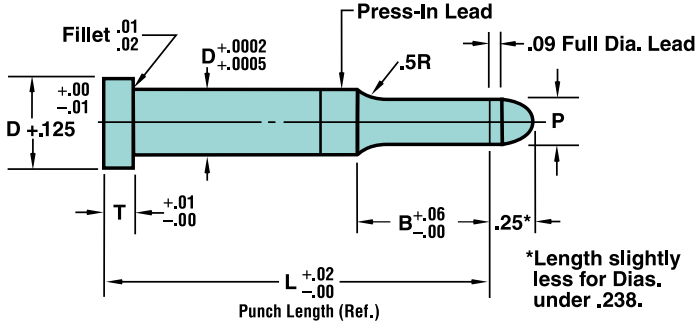
* Vickers used when RC exceeds 80.
® DayTride and DayTiN are registered trademarks of Dayton Progress.
™ DayTAN, DayKool, and ZertonPlus are trademarks of Dayton Progress.

Regular Pilots

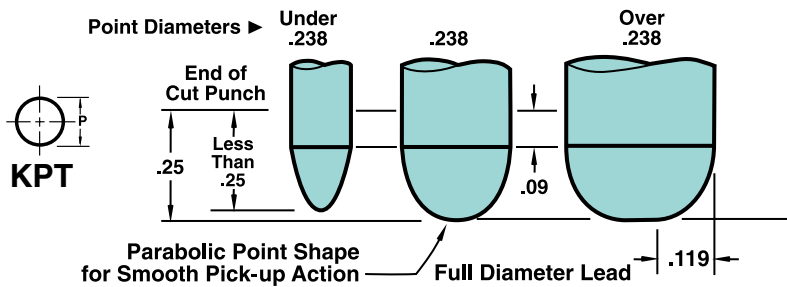


Type
KPT

Material
Steel: A2, M2, RC 60-63
Heads RC 40-55
Round P $\pm \begin{smallmatrix} .0005 \\ -.0000 \end{smallmatrix}$ © .0005 P to D



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

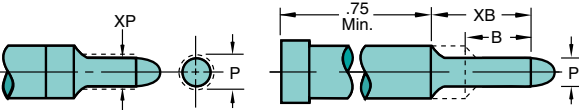
Shank D	Code	Head Dim. T	Point Length B					Min. XP	Round Range P	L														Code	L										
			ANSI S	Alternate						1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	5.00		5.25	5.50	5.75	6.00	6.25	6.50	6.75	7.00			
				B	C	D	E																												
.1250	12	.125	.43	.75				.041	.061-	.1250	150	175	200	225	250	275	300	325	350	375	400	425	450		12	475	500	525	550	575	600	625	650	675	700
.1875	18	.125	.43	.75			.041	.061-	.1875	18																									
.2500	25	.125	.50	.75			.061	.092-	.2500	25																									
.3125	31	.125	.56	.75	100*			.061	.092-	.3125															31										
.3750	37	.188	.62	.75	100	125**		.061	.124-	.3750															37										
.4375	43	.188	.75		100	125		.092	.186-	.4375				225	250	275	300	325	350	375	400	425	450		43										
.5000	50	.188	.81		100	125		.124	.186-	.5000															50										
.6250	62	.250	.93			125	150*	.234	.374-	.6250															62										
.7500	75	.250	1.06			125	150	.299	.499-	.7500															75										
.8750	87	.250	1.12			125	150	.349	.561-	.8750															87										
1.0000	100	.250	1.25			150		.399	.624-	1.0000															100										

*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.

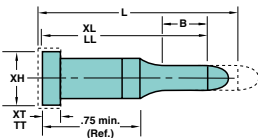
Standard Alterations

Regular Pilots

XP P Dimensions
Smaller than Standard **XB** Point Length
Other than Standard



Point Length	Code	Type	XB				XBB	X3B
			.500-.750	.751-1.000	1.001-1.250	1.251-1.500	1.501-1.625	1.626-2.000
			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

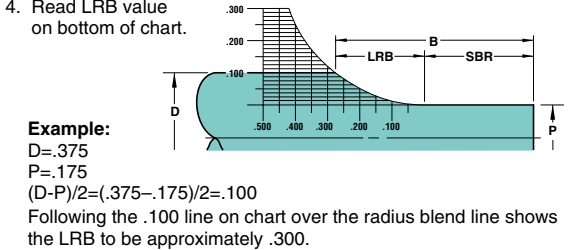


- XL Overall Length Shortened**
Stock removal from point end which shortens B length. To maintain "B," specify "XLB."
- XLB Overall Length Shortened**
B length maintained. (min. shank length .75)
- XT Thinner Head than Standard**
Stock removal from head end which shortens overall length.
- TT Precision Head Thickness**
Same as XT except head thickness tolerance is held to $\pm .0005$.
- XH Reduced Head Diameter**
Minimum head diameter equals D +.000 - .001.

SBR Straight Before Radius

To determine Length of Radius Blend (LRB)

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



Surface Coatings

Some catalog products can be coated to increase hardness, reduce galling, and improve wear and/or corrosion resistance.

DayTride® (XN)—a low-cost surface application that treats all exposed surfaces. Ideal for punches and die buttons. Provides high dimensional stability. Approx. hardness: RC65-73.

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.

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

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 $\pm .0002$. Approx. hardness: *Vickers 3100.

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

CrN (CRN)—excellent adhesion, high toughness, and good corrosion resistance. Primary applications are metal forming (copper, brass, bronze), metal die casting, and plastic injection molding. Approx. hardness: *Vickers 1800-2100.

ZertonPlus™ (XNA)—excellent wear resistance, thermal shock stability and hot hardness. Approx. hardness *Vickers 3200.

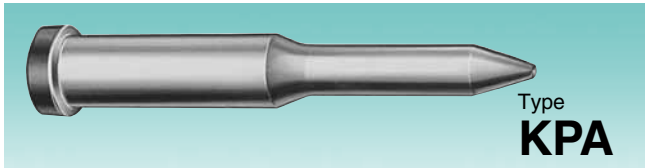
XNAProgress (XNAP)—ultra-hard PVD coating that absorbs shear stress; provides excellent high-temperature resistance. Ideal for stamping where tools are exposed to extreme stress profiles. A good alternative to TD coating without the dimensional changes associated with that process. Approx hardness: *Vickers 3200.

Diamond Like Carbon Coating (XCD)—combines high hardness with an extremely low coefficient of friction. Good protection against abrasive & adhesive wear. Approx. hardness *Vickers 5000.

Code	Material
XN —DayTride®	M2
XNT —DayTiN®	M2
XAN —DayTAN™	M2
XCN —TiCN	M2
XNM	M2
XNP	M2
XCR —DayKool™	M2
CRN	M2
XNA —ZertonPlus™	M2
XNAP —XNAProgress	M2
XCD	M2

* Vickers used when RC exceeds 80.
® DayTride and DayTiN are registered trademarks of Dayton Progress.
™ DayTAN, DayKool, and ZertonPlus are trademarks of Dayton Progress.

Positive Pick-Up Pilots



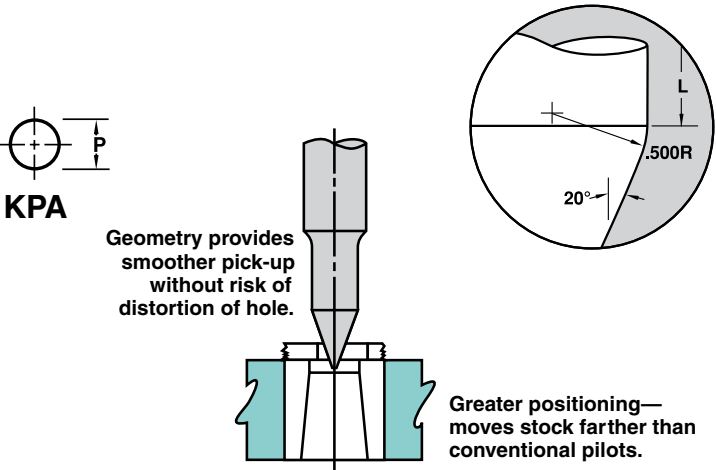
Material
Steel: M2, RC 60-63
Heads RC 40-55
Round P $\pm .0005$ $\text{©} .0005 [P \text{ to } D]$

If you require a length other than shown, designate “XL” (original B length will be maintained).
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 D	Code	Head Dim. T	Round					Range P	'N	Pn	L												L								
			Std. S	Alternate							Min. XP	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	Code	5.25	5.50	5.75	6.00	6.25	6.50	6.75	7.00
				B	C	D	E																								
.1875	18	.125	.43	.75				.050	.061 - .1875	.18	.0977										18										
.2500	25	.125	.50	.75				.061	.061 - .2500	.25	.1432										25										
.3125	31	.125	.56	.75				.061	.092 - .3125	.31	.1883										31										
.3750	37	.188	.62	.75	100*			.092	.186 - .3750	.37	.2342	250	275								37										
.4375	43	.188	.75	.75	100	1.25**		.092	.186 - .4375	.43	.2793			300	325	350	375	400	425	450	475	500	43								
.5000	50	.188	.81		100	1.25		.124	.249 - .5000	.50	.3252											50	525	550	575	600					
.6250	62	.250	.94		100	1.25	1.50	.234	.311 - .6250	.62	.4162											62					625	650	675	700	
.7500	75	.250	1.06			1.25	1.50	.299	.436 - .7500	.75	.5072											75									
.8750	87	.250	1.12			1.25	1.50	.349	.561 - .8750	.87	.5982											87									
1.0000	100	.250	1.25			1.25	1.50	.399	.749-1.0000	1.00	.6892											100									

*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



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	Alt.	Steel
Example:	4	KPA	100	525	P875	XL3.600	M2

Standard Alterations

Kommerical 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.

DayTride® (XN)—a low-cost surface application that treats all exposed surfaces. Ideal for punches and die buttons. Provides high dimensional stability. Approx. hardness: RC65-73.

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.

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

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 $\pm .0002$. Approx. hardness: *Vickers 3100.

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

CrN (CRN)—excellent adhesion, high toughness, and good corrosion resistance. Primary applications are metal forming (copper, brass, bronze), metal die casting, and plastic injection molding. Approx. hardness: *Vickers 1800-2100.

ZertonPlus™ (XNA)—excellent wear resistance, thermal shock stability and hot hardness. Approx. hardness *Vickers 3200.

XNAProgress (XNAP)—ultra-hard PVD coating that absorbs shear stress; provides excellent high-temperature resistance. Ideal for stamping where tools are exposed to extreme stress profiles. A good alternative to TD coating without the dimensional changes associated with that process. Approx hardness: *Vickers 3200.

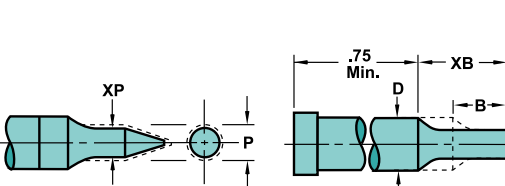
Diamond Like Carbon Coating (XCD)—combines high hardness with an extremely low coefficient of friction. Good protection against abrasive & adhesive wear. Approx. hardness *Vickers 5000.

Code	Material
XN —DayTride®	M2
XNT —DayTiN®	M2
XAN —DayTAN™	M2
XCN —TiCN	M2
XNM	M2
XNP	M2
XCR —DayKool™	M2
CRN	M2
XNA —ZertonPlus™	M2
XNAP —XNAProgress	M2
XCD	M2

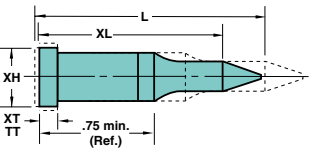
* Vickers used when RC exceeds 80.
® DayTride and DayTiN are registered trademarks of Dayton Progress.
™ DayTAN, DayKool, and ZertonPlus are trademarks of Dayton Progress.

Standard Alterations Positive Pick-Up Pilots

XP P Dimensions
Smaller than Standard



		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

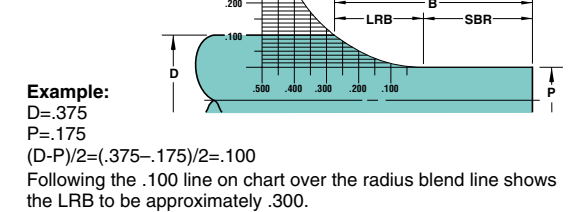


XL Overall Length Shortened
See note p. 10.
XT Thinner Head than Standard
Stock removal from head end which shortens overall length.
TT Precision Head Thickness
Same as XT except head thickness tolerance is held to $\pm .0005$.
XH Reduced Head Diameter
Minimum head diameter equals D +.000 –.001.

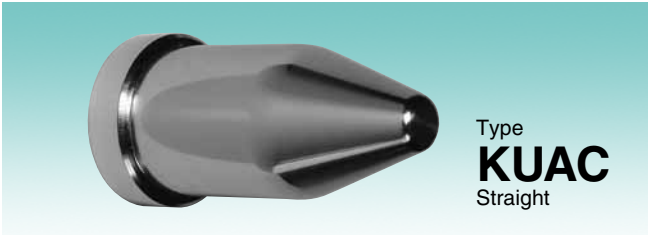
SBR Straight Before Radius

To determine Length of Radius Blend (LRB)

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



Compact Positive Pick-Up Pilots

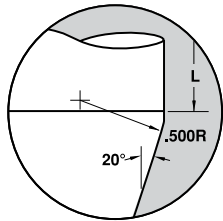
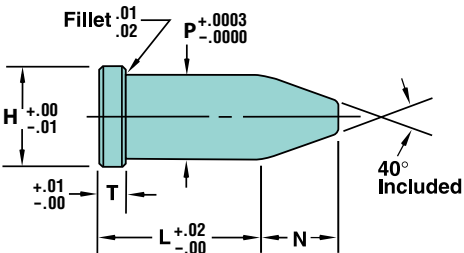


Type
KUAC
Straight

Material
Steel: A2, M2, RC 60-63

Type	Head		Range P	N	*L							
	T	H			.625	.750	.875	1.00	1.125	1.250	1.375	
KUAC Straight	.125	.375	.1865 - .2500	.25	62							
	.125	.438	.2501 - .3130	.31								
	.188	.500	.3131 - .3750	.37								
	.188	.562	.3751 - .4380	.43								
	.188	.625	.4381 - .5000	.50	75	87	100	112	125	137		
	.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 length is available within catalog range. Specify "XL" and length.

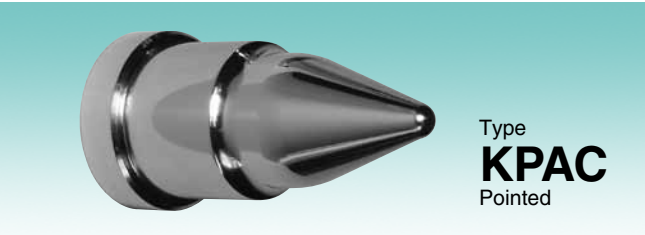


Standard Alterations

Kommerical 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 L₁ (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



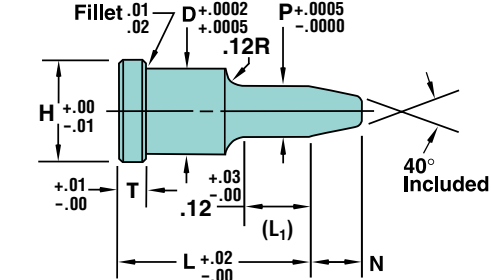
Type
KPAC
Pointed

Material
Steel: A2, M2, RC 60-63

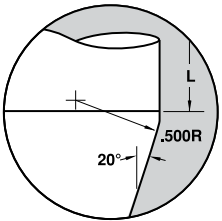
Type	Shank D	Code	Head		Min. XP	Range P	*N	Pn	**L						
			T	H					.625	.750	.875	1.00	1.125	1.250	1.375
KPAC Pointed	.2500	25	.125	.375	.092	.1650 - .2499	.25	.1432	62	75	87	100	112	125	137
	.3125	31	.125	.438	.092	.2100 - .3124	.31	.1883							
	.3750	37	.188	.500	.092	.2550 - .3749	.37	.2342							
	.4375	43	.188	.562	.092	.3000 - .4374	.43	.2793							
	.5000	50	.188	.625	.124	.3450 - .4999	.50	.3252							
	.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 length is available within catalog range. Specify "XL" and length. The L₁ .12 is maintained. Because L₁ .12 is standard, use alteration code "XBR" for different length (0.060 min.).



P to D $\pm .0005$



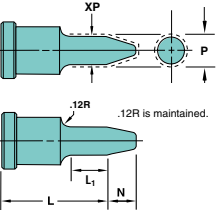
Features/Benefits

Dayton Kommerical 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.

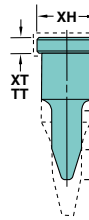
Dayton compact pilots are rigid during use; last longer; and are ideally suited for high-demand applications.

Standard Alterations Compact Pilots



XP P Dimension Smaller than Standard

XBR L₁ Longer than Standard



XL "L" Shortened
Stock removal from point end. L₁ 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.

Surface Coatings

Some catalog products can be coated to increase hardness, reduce galling, and improve wear and/or corrosion resistance.

DayTride® (XN)—a low-cost surface application that treats all exposed surfaces. Ideal for punches and die buttons. Provides high dimensional stability. Approx. hardness: RC65-73.

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.

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

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.

CrN (CRN)—excellent adhesion, high toughness, and good corrosion resistance. Primary applications are metal forming (copper, brass, bronze), metal die casting, and plastic injection molding. Approx. hardness: *Vickers 1800-2100.

ZertonPlus™ (XNA)—excellent wear resistance, thermal shock stability and hot hardness. Approx. hardness *Vickers 3200.

XNAProgress (XNAP)—ultra-hard PVD coating that absorbs shear stress; provides excellent high-temperature resistance. Ideal for stamping where tools are exposed to extreme stress profiles. A good alternative to TD coating without the dimensional changes associated with that process. Approx hardness: *Vickers 3200.

Diamond Like Carbon Coating (XCD)—combines high hardness with an extremely low coefficient of friction. Good protection against abrasive & adhesive wear. Approx. hardness *Vickers 5000.

Code	Material
XN —DayTride®	M2
XNT —DayTiN®	M2
XAN —DayTAN™	M2
XCN —TiCN	M2
XNM	M2
XNP	M2
XCR —DayKool™	M2
CRN	M2
XNA —ZertonPlus™	M2
XNAP —XNAProgress	M2
XCD	M2

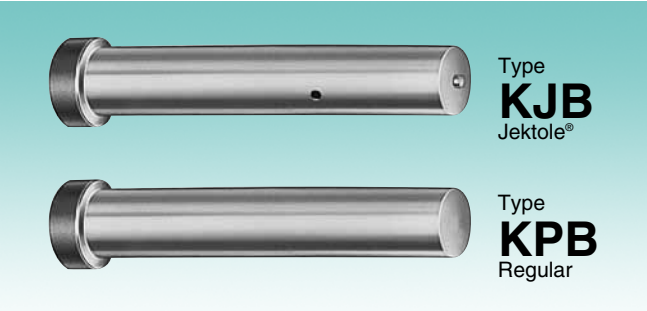
* Vickers used when RC exceeds 80.

® DayTride and DayTiN are registered trademarks of Dayton Progress.

™ DayTAN, DayKool, and ZertonPlus are trademarks of Dayton Progress.

Punch Blanks

Jektol[®]/Regular



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

Type	Shank D	Code	Head Dim. T	Point Length B					L																				** Jek- tole® Grp				
				ANSI					Alternate																								
				S	B	C	D	E	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	
KJB	.1875	18	.125	.43	.75																											J2	
	.2500	25	.125	.50	.75					150	175																					J3	
	.3125	31	.125	.56	.75	100*						200		225																		J4	
	.3750	37	.188	.62	.75	100																										J6	
	.4375	43	.188	.75		100																										J6	
	.5000	50	.188	.81		100								250	275	300	325	350	375	400												J6	
	.6250	62	.250	.93			1.25														425	450	475	500	525	550	575	600		625		J9	
	.7500	75	.250	1.06			1.25																										J9
	.8750	87	.250	1.12			1.25	1.50																							650		J9
	1.0000	100	.250	1.25																													J9
KPB	.1250	12	.125																														
	.1875	18	.125							150																							
	.2500	25	.125								175																						
	.3125	31	.125									200		225																			
	.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. 26 for additional information.

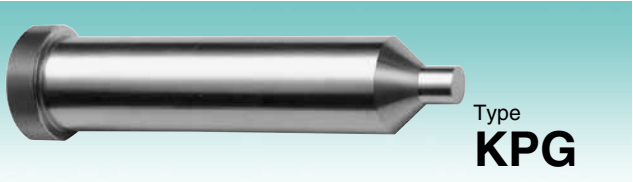
HOW TO ORDER						
Specify:	Qty.	Type	D Code	L	Steel	
Example:	9	KJB	37	B200	A2	

Standard Alterations

Kommerical 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



Material
Steel: A2, M2, RC 60-63
Heads RC 40-55
Round P $\begin{matrix} +.0005 \\ -.0000 \end{matrix}$ $\begin{matrix} \text{©} \\ \text{L} \end{matrix}$.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
Example:	6	KPG	75	300	P.275	2.450

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.

Standard Alterations

Kommerical 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.

Surface Coatings

Some catalog products can be coated to increase hardness, reduce galling, and improve wear and/or corrosion resistance.

DayTride[®] (XN)—a low-cost surface application that treats all exposed surfaces. Ideal for punches and die buttons. Provides high dimensional stability. Approx. hardness: RC65-73.

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.

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

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.

CrN (CRN)—excellent adhesion, high toughness, and good corrosion resistance. Primary applications are metal forming (copper, brass, bronze), metal die casting, and plastic injection molding. Approx. hardness: *Vickers 1800-2100.

ZertonPlus[™] (XNA)—excellent wear resistance, thermal shock stability and hot hardness. Approx. hardness *Vickers 3200.

XNAPprogress (XNAP)—ultra-hard PVD coating that absorbs shear stress; provides excellent high-temperature resistance. Ideal for stamping where tools are exposed to extreme stress profiles. A good alternative to TD coating without the dimensional changes associated with that process. Approx hardness: *Vickers 3200.

Diamond Like Carbon Coating (XCD)—combines high hardness with an extremely low coefficient of friction. Good protection against abrasive & adhesive wear. Approx. hardness *Vickers 5000.

Code	Material
XN —DayTride [®]	M2
XNT —DayTiN [®]	M2
XAN —DayTAN [™]	M2
XCN —TiCN	M2
XNM	M2
XNP	M2
XCR —DayKool [™]	M2
CRN	M2
XNA —ZertonPlus [™]	M2
XNAP—XNAPprogress	M2
XCD	M2

* Vickers used when RC exceeds 80.
® DayTride and DayTiN are registered trademarks of Dayton Progress.
™ DayTAN, DayKool, and ZertonPlus are trademarks of Dayton Progress.

Dayton Slug Control

Dayton Slug Control is a 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 die button (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.)*

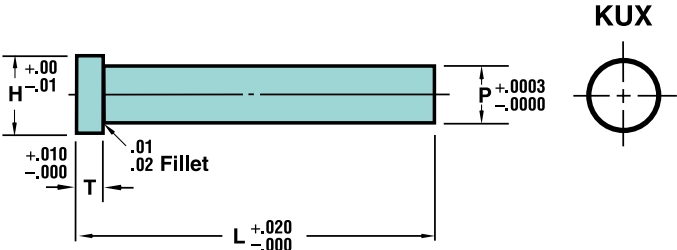
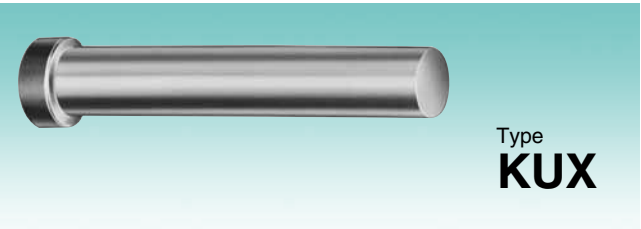
Ordering

Dayton Slug Control is easy to specify and order. Simply add the information that is unique to your application to the die button 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	KNX	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.

Straight Punches



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

Head Dim.		Range P	L																			
H	T		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

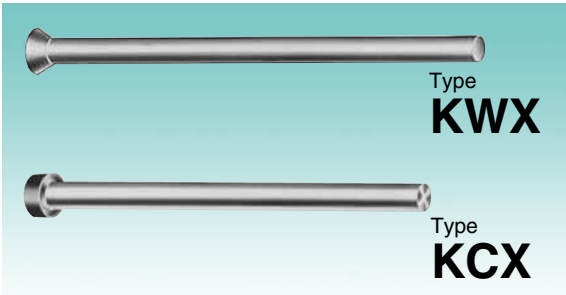
Specify:	Qty.	Type	P	L	Steel
Example:	5	KUX	P.1255	150	A2

Standard Alterations

Kommerical 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 dimen-sions. 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



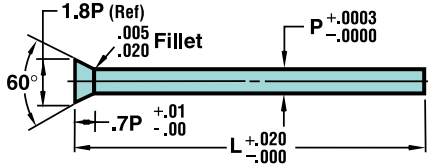
Material
Steel: M2, RC 60-63
Heads RC 40-55 (KCX)

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-.0500											
.125	.0501-.0630											
.156	.0631-.0940											
.188	.0941-.1250	150	175	200	225	250						
.219	.1251-.1570						275	300	325	350	375	400
.250	.1571-.1880											
.281	.1881-.2190											
.312	.2191-.2500											

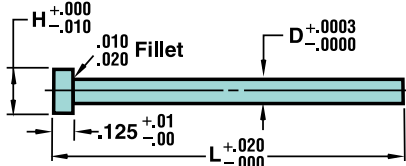
HOW TO ORDER

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

KWX



KCX



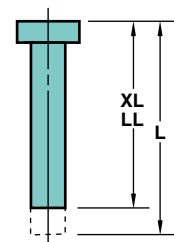
Standard Alterations

Kommerical cloSPACE punches are available in sizes other than those shown in the chart above.

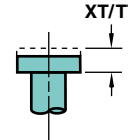
When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the P dimension is outside the standard range, an “X” is placed in front of the P dimension, e.g., “XP.” If the point length is other than standard, designate “XB” as the point length.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

Standard Alterations Straight and CloSPACE Punches

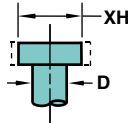
Straight Punches



- 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.

Surface Coatings

Some catalog products can be coated to increase hardness, reduce galling, and improve wear and/or corrosion resistance.

DayTride® (XN)—a low-cost surface application that treats all exposed surfaces. Ideal for punches and die buttons. Provides high dimensional stability. Approx. hardness: RC65-73.

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.

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

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.

CrN (CRN)—excellent adhesion, high toughness, and good corrosion resistance. Primary applications are metal forming (copper, brass, bronze), metal die casting, and plastic injection molding. Approx. hardness: *Vickers 1800-2100.

ZertonPlus™ (XNA)—excellent wear resistance, thermal shock stability and hot hardness. Approx. hardness *Vickers 3200.

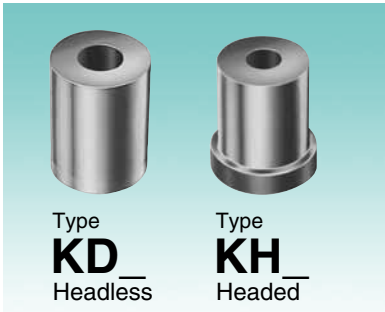
XNAProgress (XNAP)—ultra-hard PVD coating that absorbs shear stress; provides excellent high-temperature resistance. Ideal for stamping where tools are exposed to extreme stress profiles. A good alternative to TD coating without the dimensional changes associated with that process. Approx hardness: *Vickers 3200.

Diamond Like Carbon Coating (XCD)—combines high hardness with an extremely low coefficient of friction. Good protection against abrasive & adhesive wear. Approx. hardness *Vickers 5000.

Code	Material
XN —DayTride®	M2
XNT —DayTiN®	M2
XAN —DayTAN™	M2
XCN —TiCN	M2
XNM	M2
XNP	M2
XCR —DayKool™	M2
CRN	M2
XNA —ZertonPlus™	M2
XNAP —XNAProgress	M2
XCD	M2

* Vickers used when RC exceeds 80.
® DayTride and DayTiN are registered trademarks of Dayton Progress.
™ DayTAN, DayKool, and ZertonPlus are trademarks of Dayton Progress.

Die Buttons



Material
Steel: A2, M2, RC 60-63

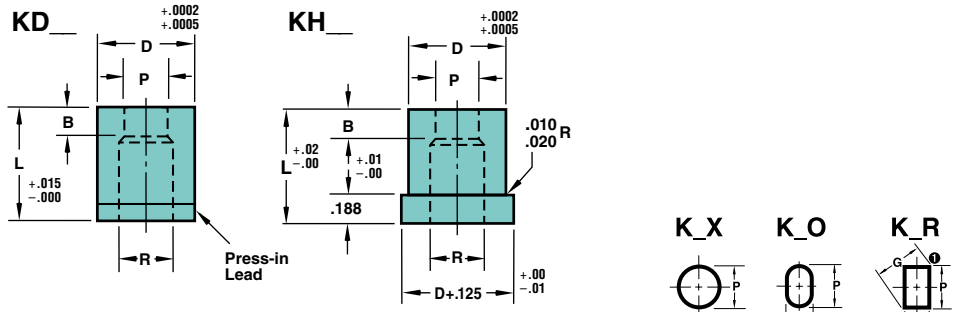
Round P $+ .0005$
 $- .0000$

Shape P, W $+ .001$
 $- .000$

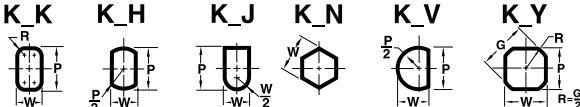
$D \geq 1.75$ $+ .0002$
 $- .0006$

P to D $.0005$

P to D $.001$



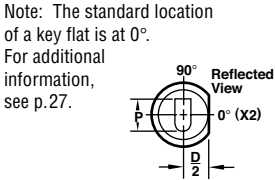
Check your P&W dimensions to be certain the diagonal G does not exceed the maximum shown.



	Body				Round	Shape	L							
Type	D	Code	Min. B	Max. R	Range P	Min. Max. W P/G	.750	.875	.937*	1.000	1.125	1.250	1.375	1.500
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								
	.7500	75	.187	.468	.136- .435	.118- .435								
KD_ KH_	.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								
	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								
KD_ KH_	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

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	



Standard Alterations

Kommerical die buttons 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 land length. Also see “Standard Alterations” on the front of the pullout tab in this section for other special order designators.

Die Buttons Tapered Relief



Shown here with optional key flat. See p. 27.

Material
Steel: A2, M2, RC 60-63

Round P $+ .0005$
 $- .0000$

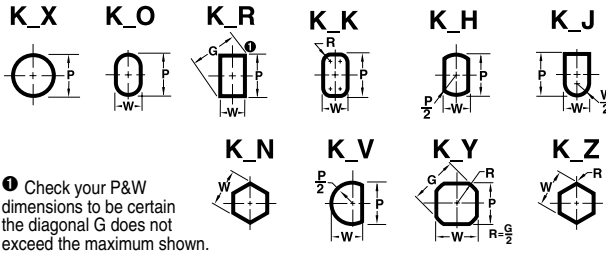
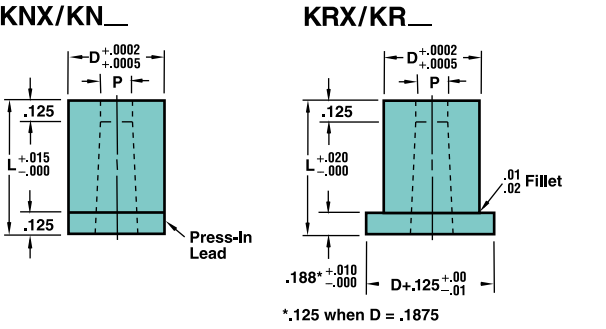
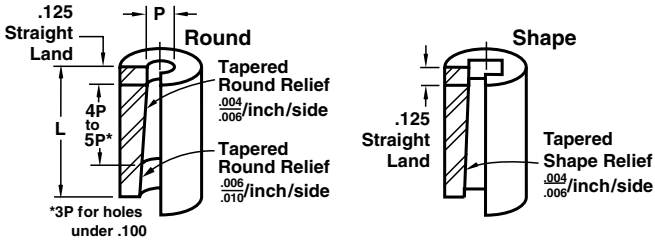
Shape P, W $+ .001$
 $- .000$

P to D $.0005$

P to D $.001$

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	

Die Button Construction



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

Standard Alterations

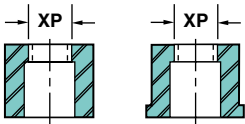
Kommerical tapered relief die buttons are available in sizes other than those shown in the chart below.

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 land 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											
	.2500	25	.062 - .170	.050 - .170											
	.3125	31	.062 - .212	.050 - .212											
	.3750	37	.075 - .255	.050 - .255											
	.4375	43	.130 - .297	.075 - .297											
	.5000	50	.150 - .344	.075 - .344											
	.6250	62	.188 - .425	.075 - .425											
	.7500	75	.225 - .510	.075 - .510											
	.8750	87	.300 - .595	.075 - .595											
	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										
		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											

Standard Alterations Headless and Headed Die Buttons

XP P Dimension Larger than Standard

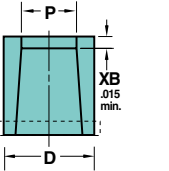


Body D	25	31	37	43	50	62	75	87	100	125	150
Max. P/G	.171	.206	.250	.285	.345	.470	.565	.675	.750	.935	1.200

XB

Land Length Shorter (no charge) or Longer than Standard

XB KN_ and KR_ Only

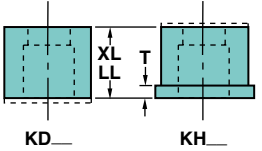


Rounds	Hole Range	Max B
.0310-.0620	.2P	
.0621-.0930	.187	
.0931-.1580	.250	
.1581-.2350	.312	
.2351-.3000	.375	
.3001-.4000	.437	
.4001- Over	.500	

*No max XB on shaped dies

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

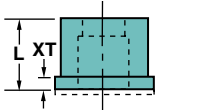


LL Precision Overall Length

Same as XL except overall length is held to $\pm .001$.

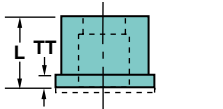
XT Reduced Head Thickness

Stock removal from head end which shortens overall length (L).



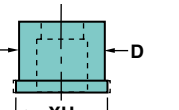
TT Precision Head Thickness

Same as XT except head thickness tolerance is held to $\pm .0005$.



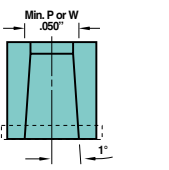
XH Reduced Head Diameter

Minimum head diameter equals D +.000 - .001.



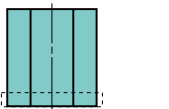
XAR Increased Taper Relief

(10° per side max) Standard. B length unless XB is specified. Default angle is 1° when an angle is not specified. (KN_ and KR_ only)



XBL Straight Through Land

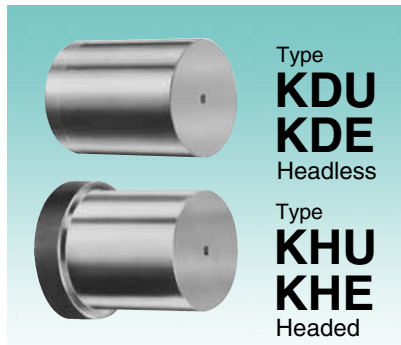
The land length (B) equals the overall length. Can be used for bushings, guides and a variety of other applications. *Round die buttons only



XN DayTride®

A unique wear-resistant surface treatment for M2 & PS only.

EDM Die Button Blanks



Material

Steel: M2, RC 60-63

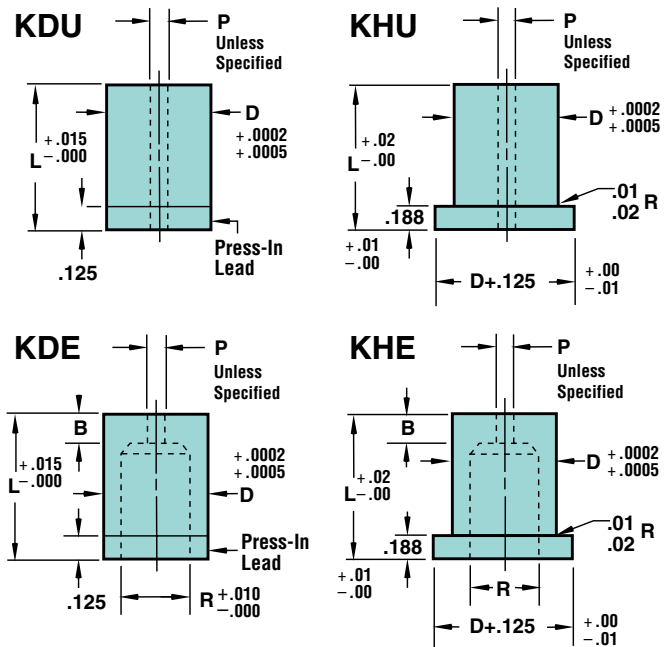
Round P $\pm .005$

$\text{P} \pm .005$ 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



	Body		K_U		K_E				L							
Type	D	Code	Std. P	Optional XP	Std. P	Optional XP	B	R	.75	.87	.93*	1.00	1.125	1.25	1.375	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	.31	.391	75	87	93	100	112	125	137
	.7500	75	.062	.020	.031	.093	.020	.31	.468							150
	.8750	87	.062	.020	.031	.093	.020	.31	.578							
	1.0000	100	.062	.020	.031	.093	.020	.31	.703							
	1.2500	125	.062	.020	.031	.125	.020	.37	.828							
KD_	1.5000	150	.062	.020	.031	.125	.020	.37	1.094							
	1.7500	175	.125	.020	.031	.125	.020	.37	1.430							
	2.0000	200	.125	.020	.031	.125	.020	.37	1.630							
	2.2500	225	.125	.020	.031	.125	.020	.37	1.830	75	87	93	100	112	125	137
	2.5000	250	.125	.020	.031	.125	.020	.37	2.030							150
	2.7500	275	.125	.020	.031	.125	.020	.37	2.230							

Standard "P" will be provided, unless otherwise specified.

*Headless Only

Features/Benefits

Select either round **KD_ Headless** or **KH_ Headed EDM Die Button Blanks**. Relief hole (R) 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 standard (P) dimension given in the chart. If an optional (P) dimension is desired, simply specify "XP" and indicate the dimension.

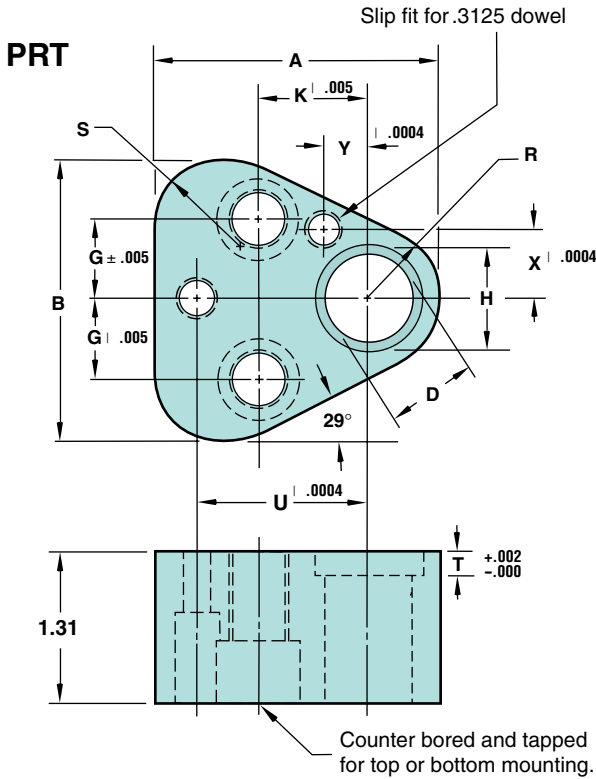


Features/Benefits

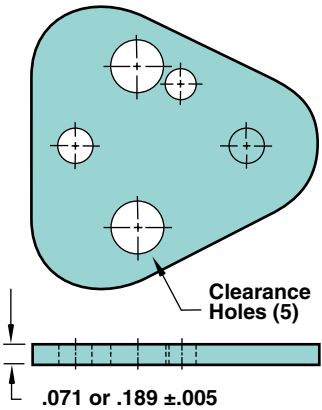
PRT single head pilot retainers (for round punches) provide a timesaving, cost-effective solution for fitting isolated punches or pilots onto a die set. They eliminate the need to design, build, and fit one-of-a-kind retainers.

HOW TO ORDER

Specify:	Qty.	Code	D
Example:	5	PRT	62



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.

PRT Retainer sets include:

- 2 Dowels
- 2 Screws

Classified Shapes

Classified shapes (83 common shapes, no detailing required) are available on all punches and die buttons, 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.

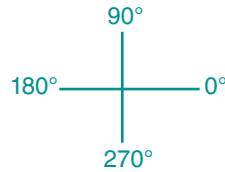
Ordering Information

*Corner Dimensions

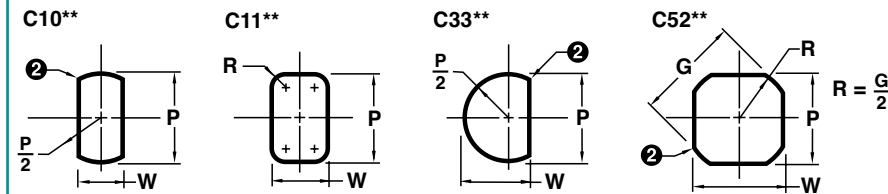
Dimension should be the theoretical sharp corners for shapes C22, C24, C34, C61, and C88. However, some reduction of these dimensions will result from fitting the punch and die buttons under conditions where the clearance is .0025 or less per side.

†Shape Center

Shapes are centered on the punch shanks as shown. Shapes in guide bushings and die buttons 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.



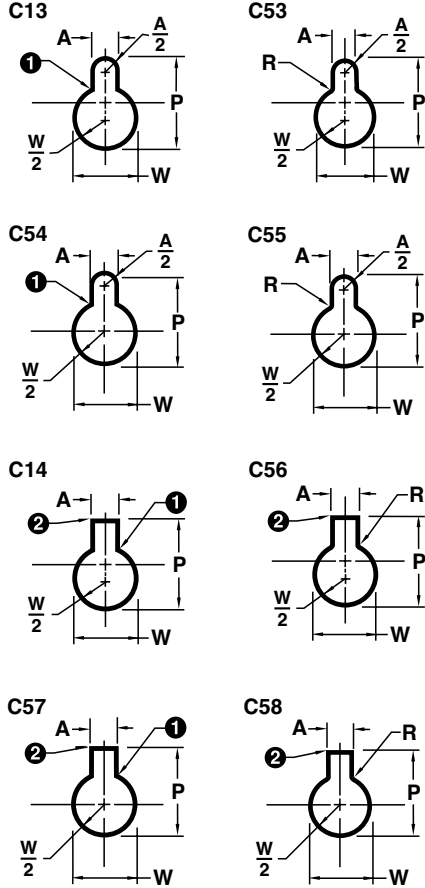
Flatted Rounds



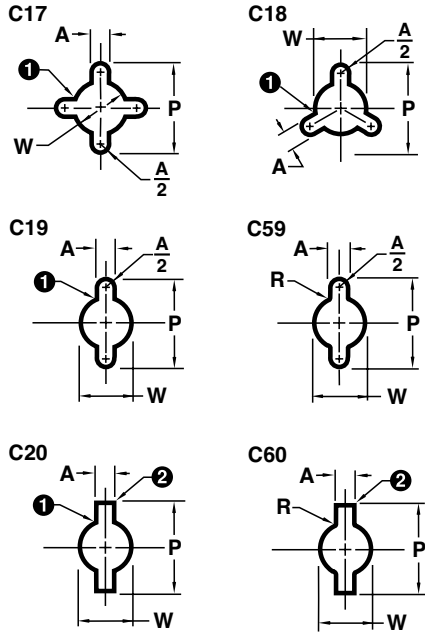
** Now standard. See product pages.

Kommerical

Mono Lobes

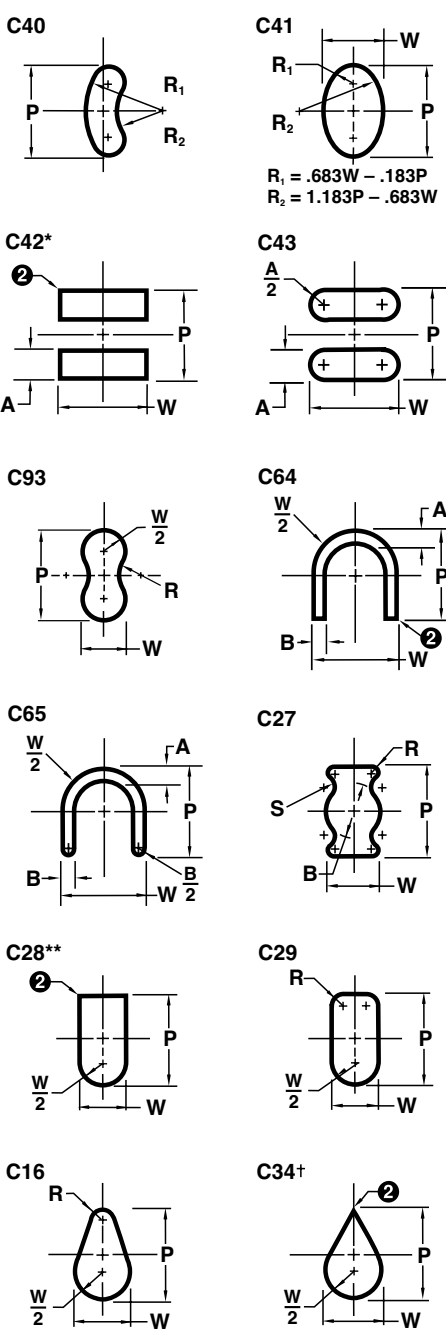


Multi Lobes

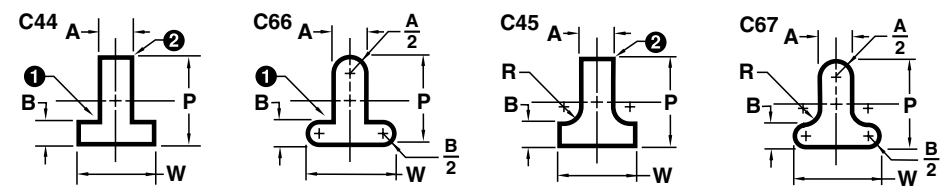


Classified Shapes

Miscellaneous



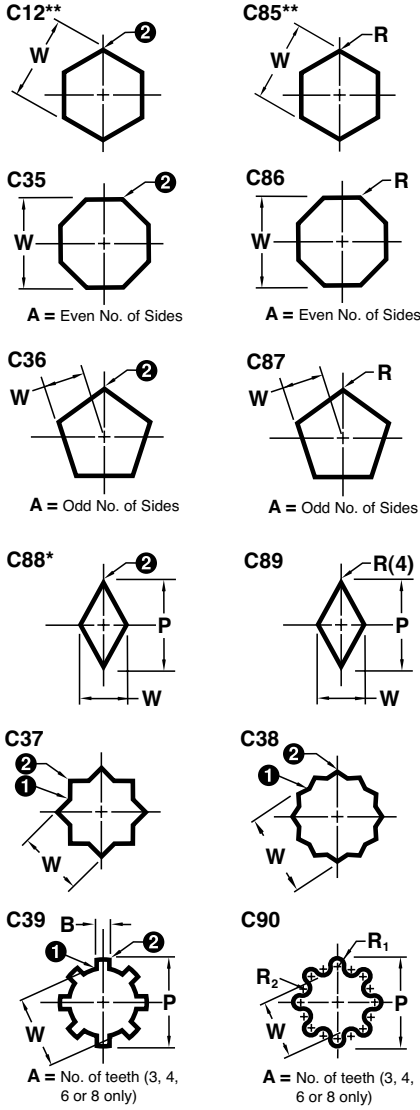
Ts



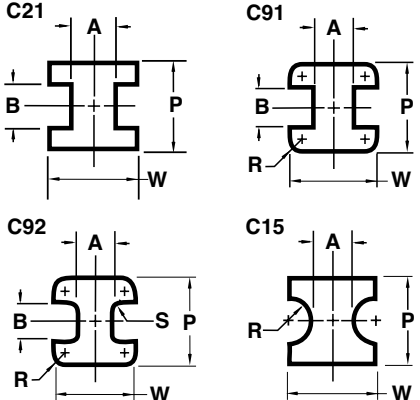
*See "Corner Dimensions" note on p. 22.

Kommerical

Polygons



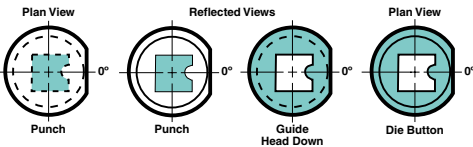
Duo Tees



Classified Shapes

Ordering Information

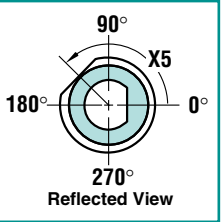
Reflected View—Punches and Guides



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.

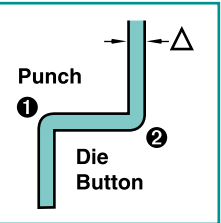
Orientation and Locking

The locking device orientation is standard at 0°. For types of locking methods and custom locations, see p. 27.



Clearance

Normal grinding methods produce ① .007 max. fillet on the punch and ② .007 max. fillet on the die button with matching corner shape on the die button and punch, respectively. When ordering die buttons, please specify punch dimensions and clearance per side (Δ). (If the clearance is .0025 Δ, Dayton will break sharp corners when the punches and die buttons are ordered together.)



Form Punch Shapes

Dayton Progress Form Punches are available on round punches (i.e., those designated as standard “X” shaped punches). When ordering, change the “X” designator to a “W.” In addition, specify other dimensions, as shown in

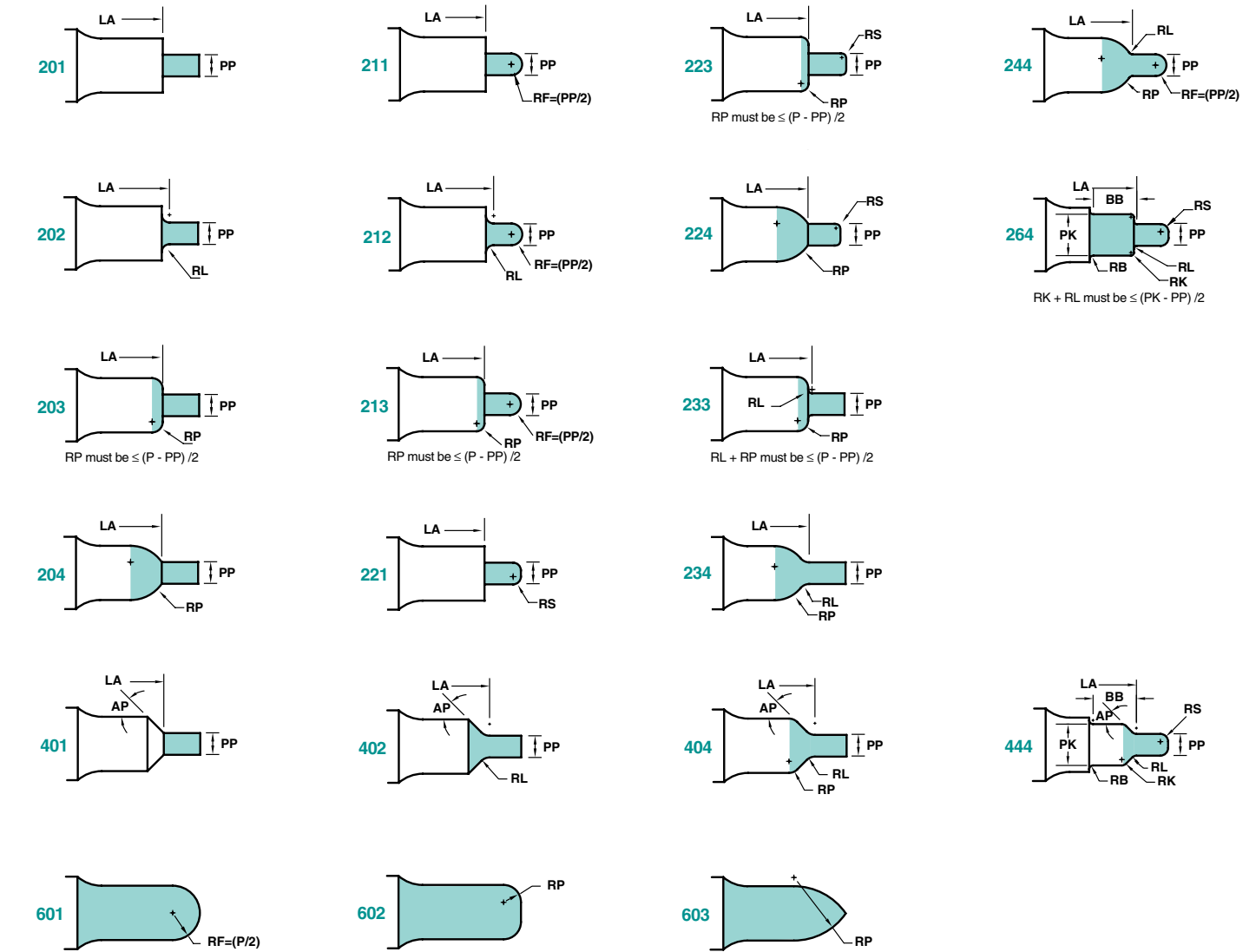
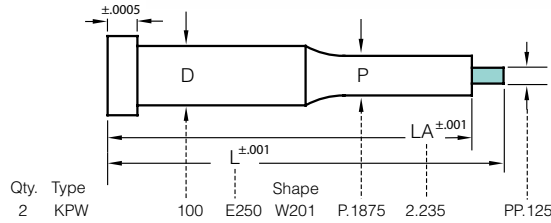
the example below. Specify alterations, if applicable. The shapes shown below are standard, but are not the only shapes Dayton provides. Others are available with a detailed drawing attached to the order.

Form Punches are also available on standard punch blanks. Form Punches other than those are available as specials.

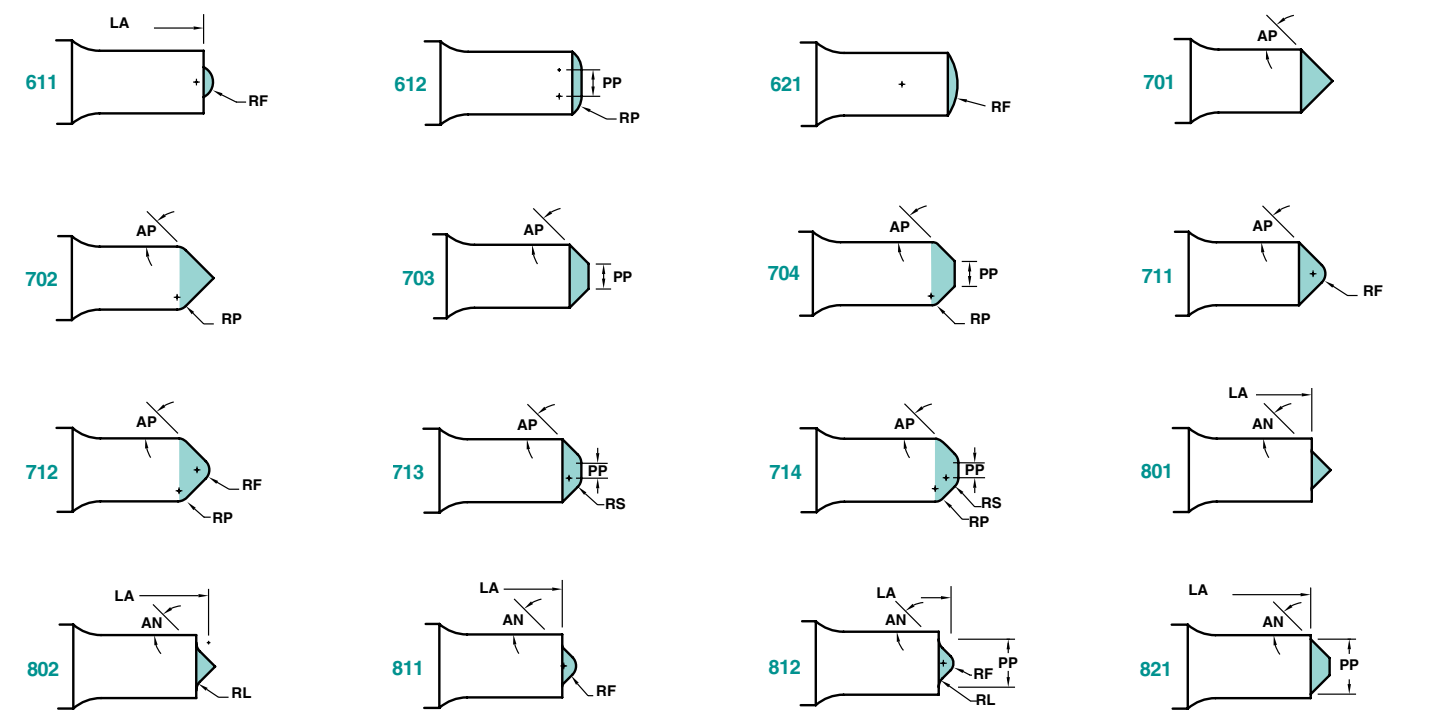


HOW TO ORDER										
Specify:	Qty.	Type	Code	L	Steel	W Shape	P	PP	LA	Alterations
Example:	2	KPW	100	E250	M2	W201	P.1875	PP.1250	LA2.235	XNT

“P” is the point dimension of the product. The “P” dimensions are not shown below. When “P” = “D,” shank tolerance applies.



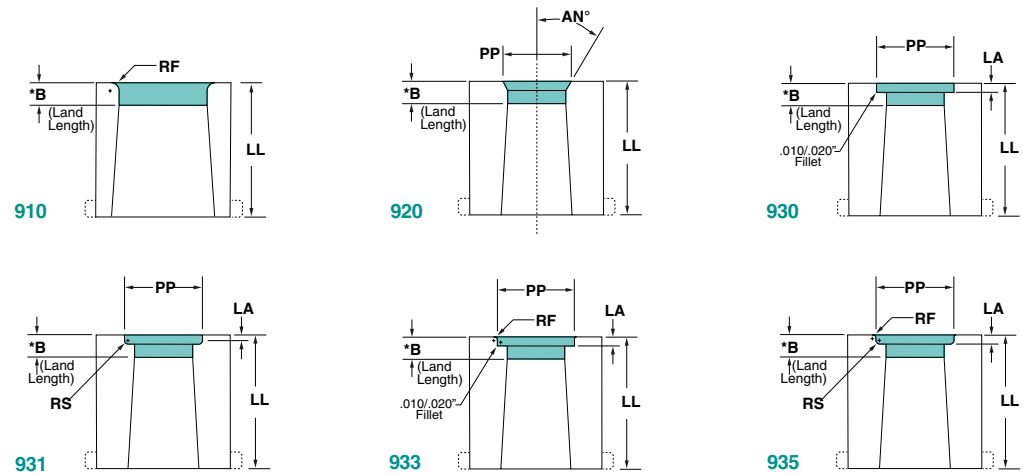
Form Punch Shapes



Form Die Button Shapes

Dayton Die Buttons are available for all the Form Punches shown here, i.e., round punches designated as standard “X” shaped punches. When ordering, please

change the “X” designator to a “W.” Die Buttons are available as headed or headless with a counterbore relief, or as headed or headless with a tapered relief.



*B (Land Length) will be per catalog standard, unless XB is ordered. O.A.L. will be held to LL tolerance, i.e., ±.001.

HOW TO ORDER													
Specify:	Qty.	Type	Code	LL	Steel	W Shape	P	PP	LA	RS	RF	AN°	Alterations
Example:	4	KNW	100	100	M2	W935	.50	.625	.15	.05	.03		XNT

Jektol[®] Data



The Engineered Clearance

Perforating punch-to-die button 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.

Jektol[®], 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 Jektol[®] **Engineered Clearance** provides many advantages and benefits.

Jektol[®] 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

Jektol[®] 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 Jektol[®] Data

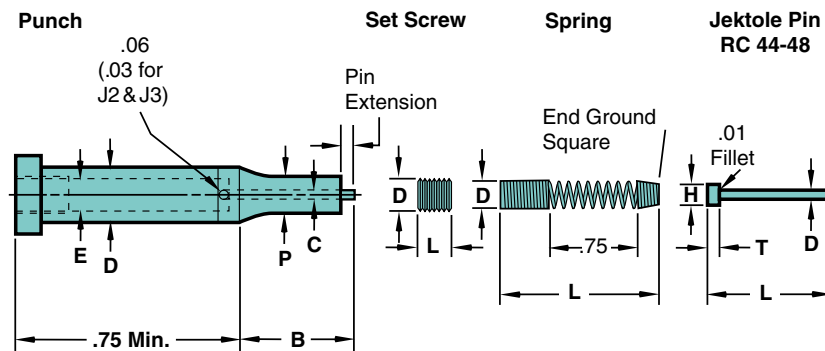
DIMENSION		J2	J3	J4	J6	J9	J12
Std. Shank Diameter	D	.1875	.2500	.3125	.3750 .4375 .5000	.6250 .7500 1.000	1.250 and larger
Point Hole Diameter	C	.020	.032	.046	.063	.094	.125
Shank Hole Diameter	E	.086	.109	.141	.172	.221	.275
Pin Extension		.03	.03	.06	.06	.06	.06
Keeper Key Number		920045			920053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

* Keeper Key not available

Jektol[®] 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

Jektol[®] Components

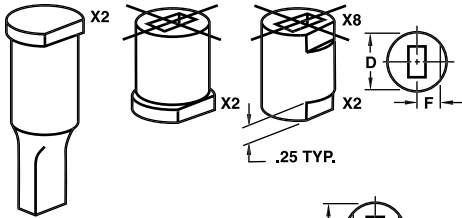


Universal Jektol[®] Components

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

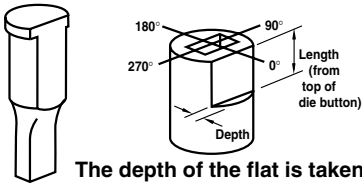
Locking Devices—Flats vs. Dowel Slots

Flats



F Dimension
(.5D on Headed Products)
Headless Die Buttons 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	



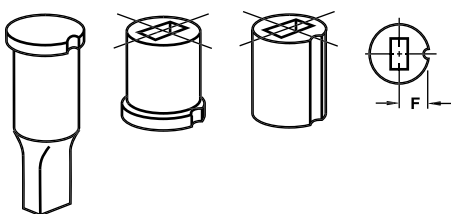
The depth of the flat is taken from the shank, not the head, on punches.

Key Flats vs. Dowel Slots

Maximum hole dimensions in die buttons were designed with key flats in mind. There are instances where, if using a dowel slot in a headless die button, 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 die button 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 Die Button construction.

Dowel Slots



Location Tolerance

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

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.

Single Flats: X2 & X8

Locking Devices	Punches	Die Buttons
X2	Top	Bottom
X8	N/A	Top

Order Example:

X2 — 90°

Double Flats: X3

Locking Devices	Punches	Die Buttons
X3	Top	Bottom

Order Example:

X3 — 90°

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

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	

Dowel Slots: X0**, X4, X41 & X43

Locking Devices	Dowel Diameter
X0**	.1250
X4	.1250
X41	.1875
X43	.2500

Order Example: X0 — 180°

**available on headless die buttons only

Custom Locations

Definitions:

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

Single Flats: X5 & X9

Locking Devices	Punches	Die Buttons
X5	Top	Bottom
X9	N/A	Top

Order Example:

X5 — 135°

Double Flats: X6

Locking Devices	Punches	Die Buttons
X6	Top	Bottom

Order Example:

X6 — 135°

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	

Dowel Slots: X1**, X7, X71 & X73

Locking Devices	Dowel Diameter
X1**	.1250
X7	.1250
X71	.1875
X73	.2500

Order Example: X71 — 135°

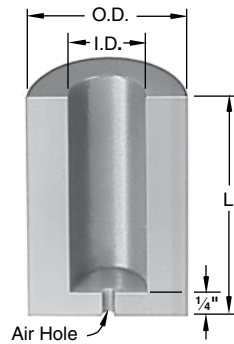
F Dimension for Headed Punches and Die Buttons

F = .5D + .5 Dowel Dia.

F Dimension for Headless Die Buttons Only

Body Diameter	25	31	37	43	50	62	75	87	100	125-275
X0, X1	.1250	.1562	.1875	.2188	.2500	.5D	.5D	.5D	.5D	.5D
X4, X7	.1625	.1875	.2125	.2375	.2625	.5D	.5D	.5D	.5D	.5D
X41, X71	.1938	.2188	.2438	.2688	.2938	.5D	.5D	.5D	.5D	.5D
X43, X73	.2250	.2500	.2750	.3000	.3250	.3438	.4063	.4688	.5313	.5D

Urethane Strippers



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

Features/Benefits

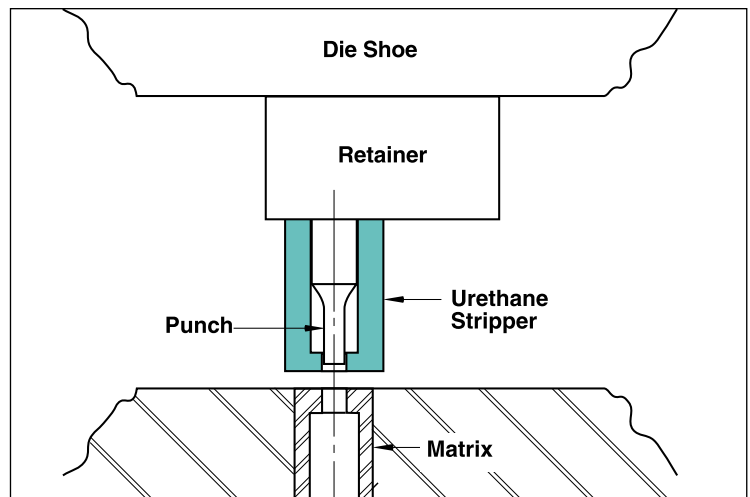
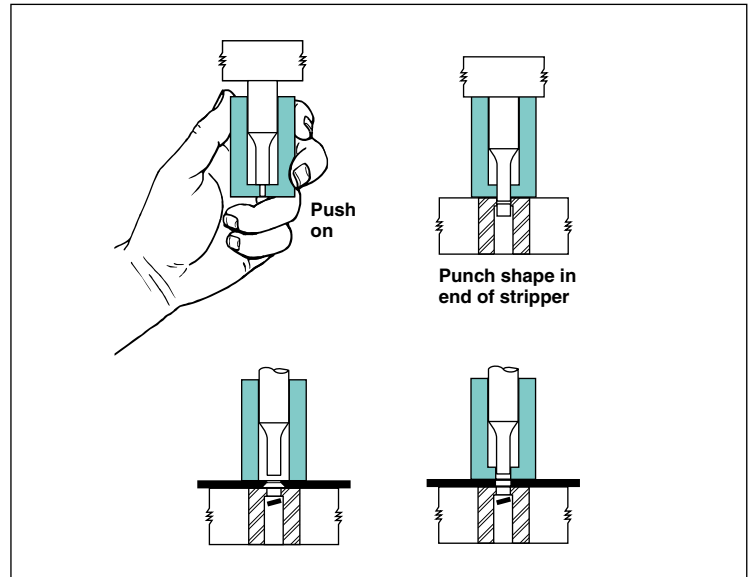
Dayton's durable, yet flexible, Urethane Strippers provide superior stripping over conventional strippers; develop higher load-bearing capacity due to the use of a unique curing agent; are tear- and oil-resistant; provide exceptional dampening of the punch, thus eliminating premature punch failure due 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 USE18-150	3/16	11/16	1 1/4 1 1/2	250 230	400 350	— —
USE25-125 USE25-150 USE25-175	1/4	3/4	1 1/4 1 1/2 1 3/4	280 275 220	475 465 375	— — 490
USE31-125 USE31-150 USE31-175 USE31-200	5/16	13/16	1 1/4 1 1/2 1 3/4 2	320 300 270 240	500 450 400 370	— — 575 600
USE37-125 USE37-150 USE37-175 USE37-200	3/8	7/8	1 1/4 1 1/2 1 3/4 2	420 385 355 310	695 625 575 515	— — 760 670
USE50-125 USE50-150 USE50-175 USE50-200 USE50-225	1/2	1	1 1/4 1 1/2 1 3/4 2 2 1/4	520 450 435 315 275	790 725 680 510 475	— — 875 650 600
USE62-125 USE62-150 USE62-175 USE62-200	5/8	1 1/8	1 1/4 1 1/2 1 3/4 2	600 520 480 440	925 835 775 730	— — 1000 935
USE75-175 USE75-200 USE75-225 USE75-250 USE75-275	3/4	1 1/2	1 3/4 2 2 1/4 2 1/2 2 3/4	500 400 350 325 300	800 700 650 600 550	1200 1100 1000 900 800
USE87-175 USE87-200 USE87-225 USE87-250 USE87-275	7/8	1 3/4	1 3/4 2 2 1/4 2 1/2 2 3/4	1500 1200 1150 900 850	2200 1900 1850 1450 1350	3400 2800 2400 1900 1800
USE100-175 USE100-200 USE100-225 USE100-250 USE100-275	1	2	1 3/4 2 2 1/4 2 1/2 2 3/4	2000 1600 1400 1200 1000	3000 2600 2300 2000 1800	3500 3400 3200 3000 2800



Shear Angles

Shear Angles can be applied to all punch points. These angles are used primarily to reduce slug pulling. Single and Double Shears can be used to reduce the punching force as well as minimize slug pulling. These alterations are prepriced and do not add to the standard delivery of the product.

Shear Angles are also available on Classified Shapes, but are available as special order only.

Standard head flat and dowel locations are at 0°.

Simply add the alteration code shown next to the drawings, and the angle desired, to your punch catalog number. Tolerance on all angles is ± 15 minutes.

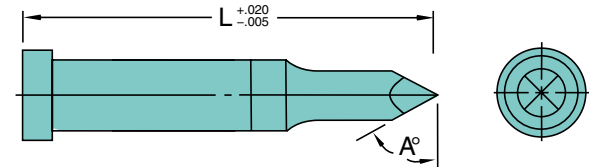
LL not available on XS19, XS21, XS22, and XS23.

HOW TO ORDER

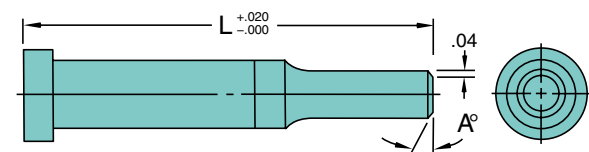
Type	Code	L	P (or P&W)	Steel	Alteration
KPL	100	E350	P.872, W.401	A2	XS23 A3°

For Round Punches Only

XS19 Nail Point

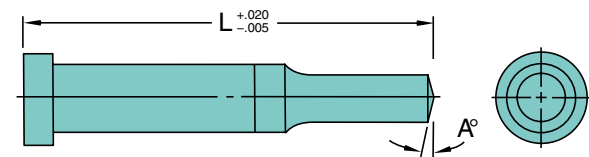


XS20 Chamfer

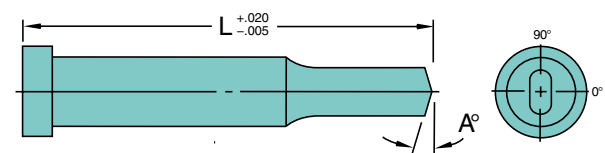


For Round & Shape Punches

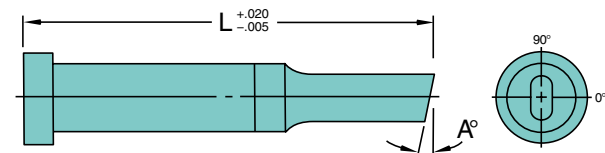
XS21 Conical



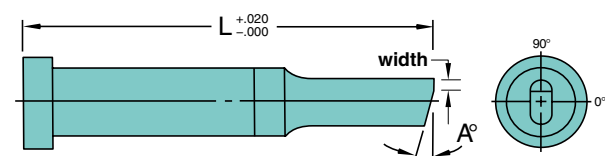
XS22 Double Shear



XS23 Single Shear



XS24 Single Shear Angle with Flat



Shown as reflected view.

Commitment to Quality & Customer Satisfaction

Dayton Lamina is a leading manufacturer of tool, die and mold components for the metal-working and plastics industries. As a customer-focused, world-class supplier of choice, we provide the brands, product breadth, distribution network and technical support for all your metal forming needs.

Our goal is to give our customers the most innovative and value-added products and services.



DAYTON Lamina™

a MISUMI Group Company



Lamina® LEMPCO

*Dayton Lamina's line of Danly products is available only to North America.

www.daytonlamina.com