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

Top-rate

reduced

value

performance,

maintenance, exceptional



Global leader in providing fabrication and stamping solutions

a MISUMI Group Company

www.daytonlamina.com

Kommercial Punches, Pilots, Die Buttons, and Retainers

Product Applications

Dayton *Kommercial 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 Kommercial 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 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; 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.

 $^{(\!g\!)}$ Jektole is a registered trademark of Dayton Progress Corporation. $^{\rm w}$ All Triliteral Designators are trademarks of Dayton Progress Corporation.

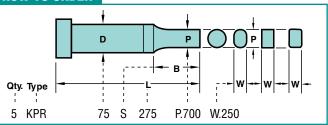
Ordering Information

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.

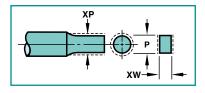




Standard Alterations

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.



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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	
	ss-Fit Dia. D (shank o led by the first 2 digits	liameter) of decimal equivilent (.750)
<u>S</u>	"B" Point Length	S=Standard Alt. lengths available
	275 Overall Lengt Coded by who digits of dec. e	le number and the first two
Product Series	Length Point or Hole S	
	275 P.700, W.	
Type Catalog Nun	nber Dimensions As S	pecified

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

Cod	e D	Code	e 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

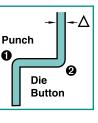
Classified Shapes

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

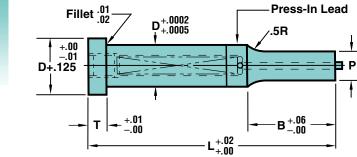
 .007 max fillet on the die button — matching corner shape on the punch.



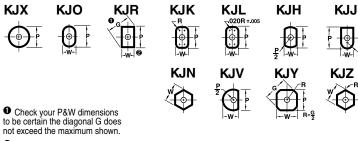




Material	
Steel: A2, M2, RC	60-63
Heads RC 40-55 (1" and smaller)
Round P ^{+.0005}	© .0005 P to D
Shape P, W ± .0005	001 P to D







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.

Shank	Codo	Head	I	Point	Leng	th B	3		Round		Shape							L													L					** .®
Shank	Coue	Dim.	ANSI			nate		Min.	Range	Min.		1 50	1 75	2 00	2 25	2 50	2 75	3.00 3.2	25 21	50 2	75 4 0	0 4 2	25	1 50	Code	4 75	5 00	5.25	5 50	5.75	6.00	6.25	6.50	6 75	7.00	Jektole Group
D		Т	S	B	С	D	E	XP	P	XW	W P/G	1.50	1.73	2.00	2.25	2.50	2.75	3.00 3.2	20 3.0	50 3	5.75 4.0	4.2	20 1	4.50	Coue	4.75	5.00	5.25	5.50	5.75	0.00	0.25	0.50	0.75	7.00	Group
.1875	18	.125	.43	.75				.050	.062187	4 .062	.0621875	450													18											J2
.2500	25	.125	.50	.75				.080	.093249	9 .080	.093250) 150	175												25											J3
.3125	31	.125	.56	.75 1	.00*			.115	.125312	4 .115	.1253125			200											31											J4
.3750	37	.188	.62	.75 1	.00			.158	.187374	9 .158	.1873750														37											J6
.4375	43	.188	.75	1	.00			.158	.187437	4 .158	.1874375				225										43											J6
.5000	50	.188	.81	1	.00			.158	.250499	9.158	.1875000														50											J6
.6250	62	.250	.93			1.25		.235	.375624	9.235	.250625)													62											J9
.7500	75	.250	1.06			1.25		.300	.500749	9 .235	.3127500					250	275	300 32	25 25		275 40	<u>_</u>			75											J9
.8750	87	.250	1.12			1.25	1.50	.350	.562874	9 .235	.3128750)				250	2/5	300 32	0 00		575 40	42	5	450	87	475	500	525			000					J9
1.0000	100	.250	1.25				1.50	.400	.687999	9 .235	.312-1.000											42	.5	450	100	475	500	525	550	575	600	625				J9
1.2500	125	.250	1.25				1.50	.450	.625-1.249	9 .281	.312-1.2500)													125											J12
1.5000	150	.250	1.25				1.50	.450	.750-1.499	9 .281	.312-1.5000)													150								050			J12
1.7500	175	.250	1.25				1.50	.450	1.000-1.749	9 .281	.350-1.750)													175								650	CZE	700	J12
2.0000	200	.250	1.25				1.50	.450	1.187-1.999	9 .281	.400-2.000	0													200									675	700	J12
2.2500	225	.250	1.25				1.50	.450	1.375-2.249	99 .281	.450-2.250	D													225											J12
2.5000	250	.250	1.25				1.50	.450	1.625-2.49	99 .281	.500-2.500	0													250											J12

*Not available on 1.50 overall length.

**See p. 26 for additional information.

Features/Benefits

Jektole[®] 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

KJJ

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 $\langle \diamond \rangle$

Specify:	Qty.	Туре	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

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.

DayTride® (XN)—a low-cost surface application that treats all exposed surfaces. Ideal for punches and die buttons. 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.

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 / Delivery		Material
XN —DayTride®	+ 3 days	M2
XNT —DayTiN®	+ 3 days	M2
XAN —DayTAN™	+ 4 days	M2
XCN — TICN	+ 3 days	M2
XNM	+12 days	M2
XNP	+ 8 days	M2
XCR —DayKool™	+ 1 day	M2
CRN	+ 7 days	M2
XNA —ZertonPlus™	+ 7 days	M2
XNAP—XNAProgress	s +12 days	M2
XCD	+8 days	M2

* Vickers used when RC exceeds 80.

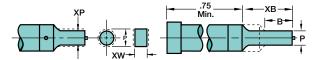
® DayTride and DayTiN are registered trademarks of Dayton Progress. ™ DayTAN, DayKool, and ZertonPlus are trademarks of Dayton Progress.



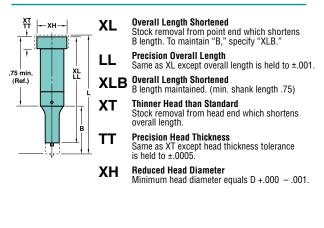
Standard Alterations

Jektole[®] Punches

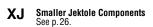
For XBB, add three days to delivery.



				ХВ			XBB			ХВ			XBB
Point Lengt	h	.500- .750	.751- 1.000	1.001- 1.250		1.501- 1.625	1.626- 2.000	.500- .750	.751- 1.000		1.251- 1.500		1.626- 2.000
Code	Туре		Min.	P (Ro	unds)				Min.	W (Sł	napes)	
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
87	KJ_{-}		.350	.350	.350	.350	.250		.235	.235	.235	.235	.250
100	KJ_{-}		.400	.400	.400	.400	.250		.235	.235	.235	.235	.250

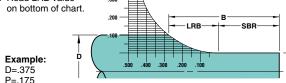


XK No Side Hole For air ejection. No cost.



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



(D-P)/2=(.375-.175)/2=.100



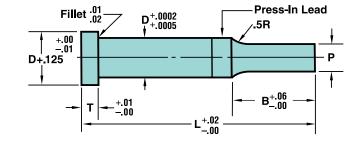


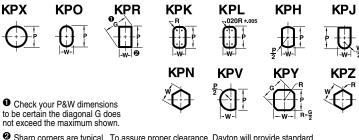


Regular Punches



Steel: A2, M2, R0 Heads RC 40-55	
Round P ^{+ .0005} Shape P, W ^{± .0005}	Image: 0.0005 P to D Image: 0.001 P to D





Regular Punches

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.

Shank	Codo	Head		Poin	t Len	gth B			Round		Shape							L													L					
Shank	Coue	Dim.	ANSI		Alte	rnate		Min.	Range	Min.	Min. Max.	1 50	1 75	2 00	2 25	2 50	2 75	3 00	3 25	3 50	3 75	1 00	1 25	4.50	0	ode 4	75	5.00	5 25	5 50	5.75	6.00	6 25	6 50	6 75	7.00
D		T	S	В	С	D	E	XP	P	XW	W P/G	1.50	1.75	2.00	2.20	2.50	2.13	5.00	3.23	3.30	5.75	4.00	4.23	4.30	, v	,oue 4.	.75	5.00	5.25	5.50	5.75	0.00	0.25	0.50	0.75	7.00
.1250	12	.125	.43	.75				.042	.0621249	.062	.0621250															12										
.1875	18	.125	.43	.75				.042	.0621874	.062	.0621875															18										
.2500	25	.125	.50	.75				.062	.0622499	.062	.0932500	150	175													25										
.3125	31	.125	.56	.75	1.00*			.062	.0933124	.062	.1253125			200												31										
.3750	37	.188	.62	.75	1.00	1.25**	*	.062	.1253749	.080	.1873750				225											37										
.4375	43	.188	.75		1.00	1.25		.158	.1874374	.158	.1874374				225											43										
.5000	50	.188	.81		1.00	1.25		.158	.2504999	.158	.1875000															50										
.6250	62	.250	.93			1.25	1.50	.235	.3756249	.235	.2506250															62										
.7500	75	.250	1.06			1.25	1.50	.300	.5007499	.235	.3127500					250	275	300	325	350	375	400	125	450		75	75	500								
.8750	87	.250	1.12			1.25	1.50	.350	.5628749	.235	.3128750												425	450		87 4	15	500	525	550	575	600				
1.0000	100	.250	1.25				1.50	.400	.6259999	.235	.312-1.0000														1	00							625	650	675	700
1.2500	125	.250	1.25				1.50	.450	.625-1.2499	.250	.312-1.2500														1	25							025	050	0/5	700
1.5000	150	.250	1.25				1.50	.450	.750-1.4999	.250	.312-1.5000														1	50										
1.7500	175	.250	1.25				1.50	.450	1.000-1.7499	.250	.350-1.7500														1	75										
2.0000	200	.250	1.25				1.50	.450	1.187-1.9999	.250	.400-2.0000														2	200										
2.2500	225	.250	1.25				1.50	.450	1.375-2.2499	.250	.450-2.2500														2	225										
2.5000	250	.250	1.25				1.50	.450	1.625-2.4999	.250	.500-2.5000														2	250										

*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.)



Exar

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



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.

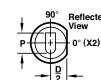
Standard Alterations Regular Punches

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

ecify:	Qty.	Туре	D Code	L	P (or P&W)	Steel	
ample:	9	KPL	100	E350	P.872, W.401	A2	



Standard Alterations

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: 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.

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 / Delivery			Material
XN —DayTride®	+	3 days	M2
XNT —DayTiN [®]	+	3 days	M2
XAN —DayTAN™	+	4 days	M2
XCN — TICN	+	3 days	M2
XNM	+1	2 days	M2
XNP	+	8 days	M2
XCR —DayKool™	+	1 day	M2
CRN	+	7 days	M2
XNA —ZertonPlus™	+	7 days	M2
XNAP—XNAProgress	s +1	2 days	M2
XCD	+	8 days	M2

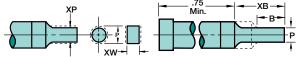
* Vickers used when RC exceeds 80.

® DayTride and DayTiN are registered trademarks of Dayton Progress.

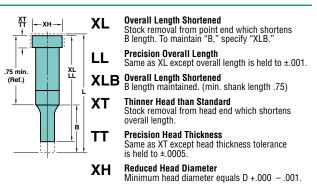
[™] DayTAN, DayKool, and ZertonPlus are trademarks of Dayton Progress.

XP, XW P and W Dimensions Smaller than Standard

XB Point Length Other than Standard For XBB and X3B, add three days to delivery

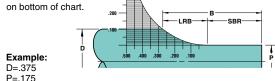


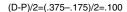
				XB			XBB	ХЗВ			ХВ			XBB
Point Leng		.500- .750			1.251- 1.500	1.501- 1.625		2.001- 2.50 2.500 3.00				1.251- 1.500	1.501- 1.625	1.626-2.000
Ű				P (Ro			2.000	2.000 0.00		Min.				2.000
18	KP_	.042	.058	.075	.093				.062	.062	.093	.125		
25	KP_	.062	.062	.080	.093				.062	.062	.093	.125		
31	KP_	.062	.062	.093	.093	.125	.187		.062	.093	.093	.125	.195	.187
37	KP_	.062	.062	.093	.125	.125	.187	.250 .31	2 .080	.109	.125	.125	.195	.187
43	KP_		.062	.093	.125	.125	.187	.250 .31	2	.109	.125	.125	.195	.187
50	KP_		.125	.125	.125	.125	.187	.250 .31	2	.125	.141	.172	.195	.187
62	KP_		.235	.235	.235	.235	.235	.312 .37	5	.235	.235	.235	.235	.250
75	KP_		.300	.300	.300	.300	.300	.343 .40	6	.235	.235	.235	.235	.250
87	KP_		.350	.350	.350	.350	.400	.400 .43	7	.235	.235	.235	.235	.250
100	KP_		.400	.400	.400	.400	.400	.400 .43	7	.235	.235	.235	.235	.250



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





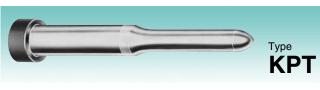




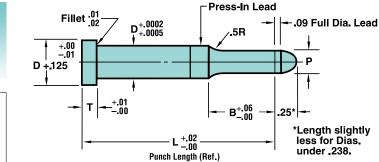


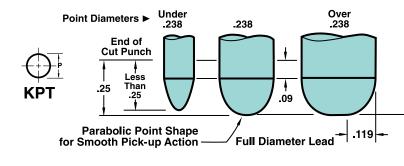


Regular Pilots



Material Steel: A2, M2, RC 60-63 Heads RC 40-55 Round P + .0005 O .0005 P to D







Chank	Cada	Head		Point	Len	gth B			Round							L										-		L					
Shank	Code	Dim.	ANSI		A	İterna		Min.	Range	1.50	1 75	2 00	2 25	2 50	2 75	3 00	3 25	3 50	3 75	1 00	1 25	4.50	Co	la /1 75	5.00	5 25	5 50	5 75	6 00	6 25	6 50	6 75	7.00
D		T	S	В	С	D	E	XP	P	1.50	1.75	2.00	2.25	2.30	2.75	3.00	5.25	3.30	5.75	4.00	4.23	4.50		4.75	5.00	5.25	5.50	5.75	0.00	0.23	0.50	0.75	1.00
.1250	12	.125	.43	.75				.041	.0611250														1	2									
.1875	18	.125	.43	.75				.041	.0611875	150													1	8									
.2500	25	.125	.50	.75				.061	.0922500	150	175												2	5									
.3125	31	.125	.56	.75	1.00*			.061	.0923125			200											3	1									
.3750	37	.188	.62	.75	1.00	1.25**		.061	.1243750			200	225										3	7									
.4375	43	.188	.75		1.00	1.25		.092	.1864375				225	250	275	300	325	350	375	400	425	450	4	3 475	500								
.5000	50	.188	.81		1.00	1.25		.124	.1865000												425	450	5	0 475	500	525	550	575	600				
.6250	62	.250	.93			1.25	1.50**	.234	.3746250														6	2						625	650	675	700
.7500	75	.250	1.06			1.25	1.50	.299	.4997500														7	5						025	050	075	700
.8750	87	.250	1.12			1.25	1.50	.349	.5618750														8	7									
1.0000	100	.250	1.25				1.50	.399	.624-1.0000														10	0									

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

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



Standard Alterations 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.

W TO ORDE	ER					
pecify:	Qty.	Туре	D Code	L	Р	Steel
xample:	2	KPT	50	C250	P.390	M2



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.

DayTride® (XN)—a low-cost surface application that treats all exposed surfaces. Ideal for punches and die buttons. 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.

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.

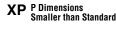
Diamond Like Carbon Coating (XCD)—combines high hardness with an extremely low coefficient of friction. Good protection against abrasive & adhesive wear. Approx. hardness *Vickers 5000.

Code / Delivery			Material
XN —DayTride®	+	3 days	M2
XNT —DayTiN [®]	+	3 days	M2
XAN —DayTAN™	+	4 days	M2
XCN —TICN	+	3 days	M2
XNM	+1	2 days	M2
XNP	+	8 days	M2
XCR —DayKool™	+	1 day	M2
CRN	+	7 days	M2
XNA —ZertonPlus™	+	7 days	M2
XNAP—XNAProgress	s +1	2 days	M2
XCD	+	8 days	M2

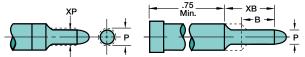
* Vickers used when RC exceeds 80.

[®] DayTride and DayTiN are registered trademarks of Dayton Progress.

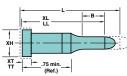
[™] DayTAN, DayKool, and ZertonPlus are trademarks of Dayton Progress.



XB Point Length Other than Standard For XBB and X3B, add three days to delivery.



				ХВ			XBB	X	3 B
Poin Leng		.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	(Round	s)			
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



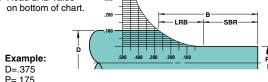


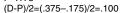
SBR Straight Before Radius

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.











Positive Pick-Up Pilots

There is no additional charge for XL.

1.0000 100 .250 1.25

*Not available on 1.50 overall length.

**Not available on 1.75 overall length

Positive Pick-Up Pilots



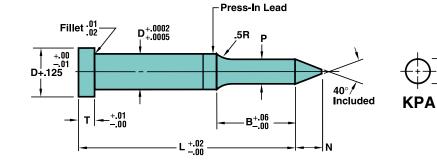
If you require a length other than shown, designate "XL" (original B length will be maintained).

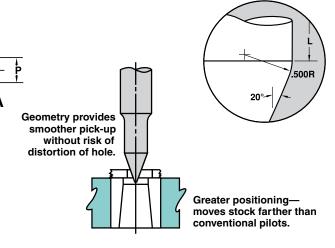
Example: You require a length of 3.600. Order 375, then show XL 3.600. See "How to Order"

example on the next page. XL is available down to 1.375. Note shank length limitation of .75.

1.25 1.50 .399 .749-1.0000 1.00 .6892

(B length may be shorter than shown when XL is under the shortest length shown.)









Shank	Code	Head Dim.				Rour	nd										L										L				
D		т	Std.	В	Alte	rnate D	E	Min. XP	Range	⁺N	Pn	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
.1875	18	.125	.43						.0611875	.18	.0977												18								
.2500	25	.125	.50	.75				.061	.0612500	.25	.1432												25							ĺ .	
.3125	31	.125	.56	.75				.061	.0923125	.31	.1883												31							l l	
.3750	37	.188	.62	.75	1.00*			.092	.1863750	.37	.2342	250	275										37							1	
.4375	43	.188	.75	.75	1.00	1.25**		.092	.1864375	.43	.2793			300	325	350	375	400	425	450	475	500	43								
.5000	50	.188	.81		1.00	1.25		.124	.2495000	.50	.3252			300	325	350	375	400	425	450	475	500	50	525	550	575	600				
.6250	62	.250	.94		1.00	1.25	1.50	.234	.3116250	.62	.4162												62					COF	CE0	GZE	700
.7500	75	.250	1.06			1.25	1.50	.299	.4367500	.75	.5072												75					625	650	675	700
.8750	87	.250	1.12			1.25	1.50	.349	.5618750	.87	.5982												87								

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

Dayton Progress Corporation

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Standard Alterations 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

ecify:	Qty.	Туре	D Code	L	Р	Alt.	Steel	
ample:	4	KPA	100	525	P.875	XL3.600	M2	

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.

DayTride® (XN)—a low-cost surface application that treats all exposed surfaces. Ideal for punches and die buttons. 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.

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.

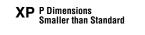
Diamond Like Carbon Coating (XCD)—combines high hardness with an extremely low coefficient of friction. Good protection against abrasive & adhesive wear. Approx. hardness *Vickers 5000.

Code / Delivery		Material
XN —DayTride®	+ 3 days	M2
XNT —DayTiN®	+ 3 days	M2
XAN —DayTAN™	+ 4 days	M2
XCN —TiCN	+ 3 days	M2
XNM	+12 days	M2
XNP	+ 8 days	M2
XCR —DayKool™	+ 1 day	M2
CRN	+ 7 days	M2
XNA —ZertonPlus™	+ 7 days	M2
XNAP—XNAProgress	s +12 days	M2
XCD	+8 days	M2

* Vickers used when RC exceeds 80.

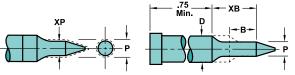
[®] DayTride and DayTiN are registered trademarks of Dayton Progress.

[™] DayTAN, DayKool, and ZertonPlus are trademarks of Dayton Progress

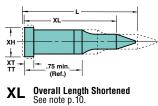


XB Point Length Other than Standard For XBB and X3B, add three days to delivery

11



	XB Point 500- 751- 1 001- 1 251-						XBB	X	3 B
Poin Leng		.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	s)			
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



Precision Head Thickness TT

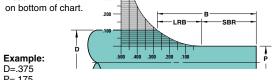
XT Thinner Head than Standard Stock removal from head end which shortens overall length. Same as XT except head thickness tolerance is held to ± 0005

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



P=.175 (D-P)/2=(.375-.175)/2=.100

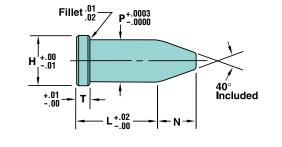


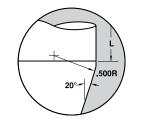


Compact Positive Pick-Up Pilots



Material Steel: A2, M2, RC 60-63





Turne	He	ead	Range P	N				*L			
Туре	Т	Н	nalige P	IN	.625	.750	.875	1.00	1.125	1.250	1.375
KUAC		.375 .438 .500 .562	.18652500 .25013130 .31313750 .37514380	.25 .31 .37 .43	62						
Straight	.188 .250 .250	.625 .750 .875	.43815000 .50016250 .62517500	.50 .62 .75		75	87	100	112	125	137
	.250 .250	1.000 1.125	.75018750 .8751 -1.0000	.87 1.00							

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

Compact Positive Pick-Up Pilots



Material	
Steel: A2, M2, RC 60-63	

D	÷.
	ιu

Turne	Shank	Codo	He	ead	Min.	Dongo D	*NI	Dm				**L	
Туре	D	Code	Т	н	ХР	Range P	*N	Pn	.625	.750	.875	1.00	Γ
	.2500	25	.125	.375	.092	.16502499	.25	.1432					Γ
	.3125	31	.125	.438	.092	.21003124	.31	.1883					L
	.3750	37	.188	.500	.092	.25503749	.37	.2342	62				
KPAC	.4375	43	.188	.562	.092	.30004374	.43	.2793					
Pointed	.5000	50	.188	.625	.124	.34504999	.50	.3252		75	87	100	
	.6250	62	.250	.750	.234	.44006249	.62	.4162					
	.7500	75	.250	.875	.299	.53007499	.75	.5072					
	.8750	87	.250	1.000	.349	.62008749	.87	.5982					
	1.0000	100	.250	1.125	.399	.71009999	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.).

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.

IOW TO ORDE	R						
Specify:	Qty.	Туре	D Code	L	Р	Alt.	Steel
Example:	25	KUAC	_	87	.4380	XL.695	A2
	11	KPAC	62	100	.6200	_	A2



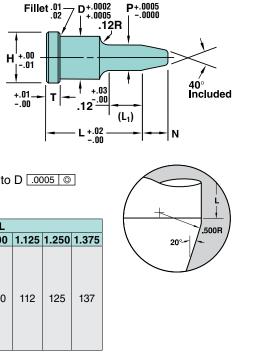
Standard Alterations

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 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.

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Standard Alterations Compact Pilots



Surface Coatings

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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.

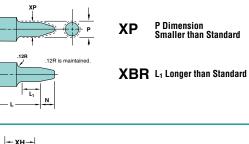
Diamond Like Carbon Coating (XCD)—combines high hardness with an extremely low coefficient of friction. Good protection against abrasive & adhesive wear. Approx. hardness *Vickers 5000.

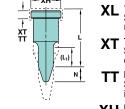
Code / Delivery		Material
XN —DayTride®	+ 3 days	M2
XNT —DayTiN®	+ 3 days	M2
XAN —DayTAN™	+ 4 days	M2
XCN —TiCN	+ 3 days	M2
XNM	+12 days	M2
XNP	+ 8 days	M2
XCR —DayKool™	+ 1 day	M2
CRN	+ 7 days	M2
XNA —ZertonPlus™	+ 7 days	M2
XNAP—XNAProgress	s +12 days	M2
XCD	+8 days	M2

* Vickers used when RC exceeds 80.

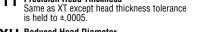
® DayTride and DayTiN are registered trademarks of Dayton Progress.

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

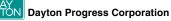








XH Reduced Head Diameter Minimum head diameter equals H +.000 – .001.

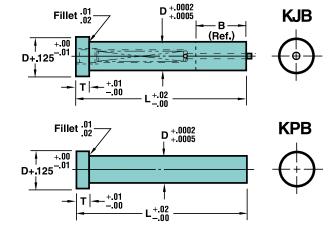




Punch Blanks Jektole[®]/Regular



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







	Shank	Codo	Head	P	oint	Leng	gth E	3												L												Je
Туре	Shahk	Coue	Dim.	ANSI		Alte	rnat		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	700	to
	D		Т	S	В	С	D	E	1.50	1.75	2.00	2.25	2.50	2.75	5.00	5.25	5.50	5.75	4.00	4.2J	4.50	4.75	5.00	J.2J	5.50	5.75	0.00	0.23	0.50	0.75	1.00	to Gi
KJB	.1875	18	.125	.43	.75																											J
	.2500	25	.125	.50	.75				150	175																						J
	.3125	31	.125	.56	.75	1.00*				175	200																					J
	.3750	37	.188	.62	.75	1.00					200	225																				J
	.4375	43	.188	.75		1.00								275	300	325	350	375	400													J
	.5000	50	.188	.81		1.00							200	270	000	020	000	0/0			450	475	500	525	550	575	600					J
	.6250	62	.250	.93			1.25													120	-00	10		020		010		625				J
	.7500	75	.250	1.06			1.25																					020				J
	.8750	87	.250	1.12			1.25																						650			J
	1.0000	100	.250	1.25				1.50																								J
KPB	.1250	12	.125																													
	.1875	18	.125						150																							
	.2500	25	.125							175																						
	.3125	31	.125								200	225																				
	.3750	37	.188									225																				
	.4375	43	.188			N/A							250	275	300	325	350	375	400	425	450	475	500									N
	.5000	50	.188																					525	550	575	600					
	.6250	62	.250																									625	650	675	700	
	.7500	75	.250																													
	.8750	87	.250																													
	1.0000	100	.250																													

HOW TO	ORDER						
1.0000	100	.250		.374500			
.8750	87	.250		.312406			
.7500	75	.250	increments	.264359			
.6250	62	.250	increments	.200281		225	
.5000	50	.188	specify in .001"	.140250		225	250

Range P

.050-.125

.076-.140

.090-.187

150

175

200

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



Shank Code Head

31

.3750 37 .188

D

.3125

.2500 25

Dim.

Т

.125

.125

S

0-----

*Not available on 1.50 overall length. **See p. 26 for additional information.

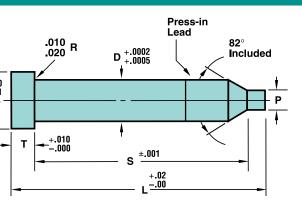
HOW TO ORD	ER				
Specify:	Qty.	Туре	D Code	L	Steel
Example:	9	KJB	37	B200	A2

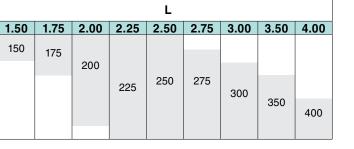


Standard Alterations

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."





L

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

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.

Surface Coatings

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

15

DayTride® (XN)—a low-cost surface application that treats all exposed surfaces. Ideal for punches and die buttons. 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.

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 / Delivery		Material
XN —DayTride®	+ 3 days	M2
XNT —DayTiN®	+ 3 days	M2
XAN —DayTAN™	+ 4 days	M2
XCN —TiCN	+ 3 days	M2
XNM	+12 days	M2
XNP	+ 8 days	M2
XCR —DayKool™	+ 1 day	M2
CRN	+ 7 days	M2
XNA —ZertonPlus™	+ 7 days	M2
XNAP—XNAProgress	s +12 days	M2
XCD	+8 days	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

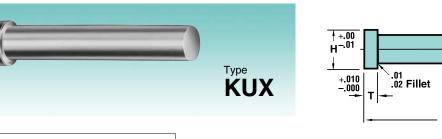
	Cat	alog	g Nur	nber		Your Spec	s
Inch	KNX	62	100	P.250	XSC	MT.0125	CS 5
	Туре	D	L	Ρ	Alt. Code	Mat'l Thickness (inches)	

For additional information, contact your Dayton distributor.





Straight Punches



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

Head	Dim.	Range										I	_									
Н	Т	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	.12501880	150																			
.375	.125	.18812500	150	175	200	225	250	275	300	325	350	375	400									
.438	.125	.25013130		175	200	225	250	275	300	325	350	375	400	425	450	475	500					
.500	.188	.31313750																525	550	575	600	625

HOW TO ORDER

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



Standard Alterations

+.020

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

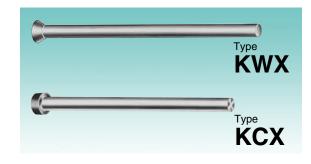
KUX

-+-

+.0003

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



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

КСХ	Banga																
Head H	Range P	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00					
.125	.04000630																
.156	.06310940																
.188	.09411250																
.219	.12511570	150	175	200	225	250	275	300	325	350	375	400					
.250	.15711880																
.281	.18812190																
.312	.21912500																

HOW TO ORDER

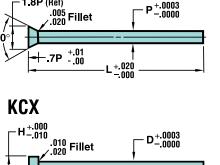
Specify:	Qty.	Туре	Р	L	Steel
Example:	25	KCX	P.2200	175	M2



Standard Alterations Straight and Clospace Punches

KWX 1 8P (Bef

+ 125⁺⁰¹



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.

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: 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.

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.

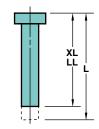
Code / Delivery		Material
XN —DayTride®	+ 3 days	M2
XNT —DayTiN®	+ 3 days	M2
XAN —DayTAN™	+ 4 days	M2
XCN —TiCN	+ 3 days	M2
XNM	+12 days	M2
XNP	+ 8 days	M2
XCR —DayKool™	+ 1 day	M2
CRN	+ 7 days	M2
XNA —ZertonPlus™	+ 7 days	M2
XNAP—XNAProgress	s +12 days	M2
XCD	+8 days	M2

* Vickers used when RC exceeds 80.

[®] DayTride and DayTiN are registered trademarks of Dayton Progress. [™] DayTAN, DayKool, and ZertonPlus are trademarks of Dayton Progress.

TON Dayton Progress Corporation

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.









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

Clospace Punches

Alteration	Pro	duct
Code	KWX	КСХ
ХВ		•
XD		•
ХН		•
XL	•	•
LL	•	•
ХР		•
ХТ		•
TT		•

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





Die Buttons



Material			
Steel: A2, M2, R	C 60	0-63	
Round P ^{+ .0005}			P to D
Shape P, W ^{+ .001}	\bigcirc	.001	P to D
$D \geq 1.75 ^{+.0002}_{+.0006}$			

Min. B

.156

.156

.156

.156

.156

.187

.187

.187

.250

.250

.312

.312

.312

87

37

Qty. Type D Code L

Max. R

.156

.191

.281

.312

.391

.468

.578

.703

.828

1.094

1.430

1.630

1.830

2.030

2.230

100

125

.064- .285

.136- .365

.136- .435

.276- .545

.356- .675

.500- .800

.616-1.050

.750-1.400

.875-1.600

1.000-1.800

1.125-2.000

1.250-2.200

P (or P&W)

P. 175

Body

.2500

.3125

.3750

.4375

.5000

.6250

.7500

.8750

1.2500 125

1.5000 150

1.7500 175

2.0000 200

2.7500 275

D Code

25

31

37

43

50

62

75

87

1.0000 100 .250

2.2500 225 .312

2.5000 250 .312

KDR

KHX

Туре

KD

KH

KD

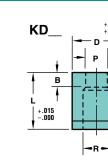
Headless Only

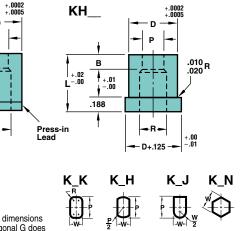
HOW TO ORDER

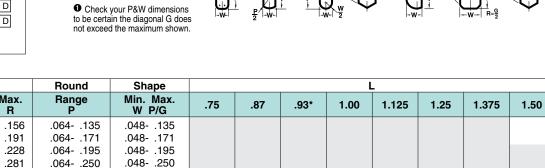
Example: 5

3

Specify:







87

87

93

93

100

100

112

112

125

125

137

137

150

150

K_O ΚR КΧ $\mathbf{0}$ \bigcirc

ΚV ΚZ ΚΥ ×Ð

Die Buttons Tapered Relief

Tvpe



.125

L +.015

K_X

 \bigcirc

Material Steel: A2, M2, RC 60-63 Round P + .0005 0.0005 P to D Shape P, W^{+.001} O .001 P to D

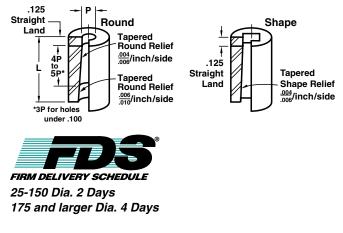
HOW TO ORDER

Type

KNX

Specify: Qty.	Туре	D Code	L	P (or P&W)	Steel
Example: 4	KNR	37	112	P.207, W.126	A2
3	KR0	50	137	P.3125, W.1562	M2

Die Button Construction



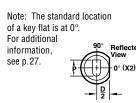
Standard Alterations

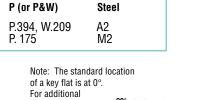
Kommercial die buttons are available in sizes other than those shown in the chart above.

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.

	Body		Round	Shape		L								
Туре	D	Code	Range P	Min.W Max. P/G	.500	.625	.750	.875	1.000	1.125	1.250	1.375	1.500	
KN	.1875 .2500	18 25	.062130 .062170	.050130 .050170	50		75	07	100	110				
KR	.3125 .3750	31 37	.062212 .075255	.050212 .050255	50	62	75	87	100	112	125	137	150	
	.4375 .5000	43 50	.130297 .150344	.075297 .075344	50	62	75	87	100	112	105	107	150	
	.6250 .7500	62 75	.188425 .225510	.075425 .075510			75	07	100	112	125	137	150	
	.8750 1.0000 1.2500 1.5000	87 100 125 150	.300595 .400680 .500850 .600 - 1.050	.075595 .075680 .075850 .075 - 1.050			75	87	100	112	125	137	150	
A2, M2 only D Tolerance +.0002 +.0006	1.7500 2.0000 2.2500 2.5000	175 200 225 250	.750 - 1.400 .875 - 1.600 1.000 - 1.800 1.125 - 2.000	.130 - 1.400 .130 - 1.600 .130 - 1.800 .130 - 2.000			75	87	100	112	125	137	150	
	2.7500	275	1.250 - 2.200	.130 - 2.200										







.064- .285

.095- .365

.118- .435

.125- .545

.125- .675

.187- .800

.187-1.050

.187-1.400

.187-1.600

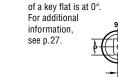
.187-1.800

.187-2.000

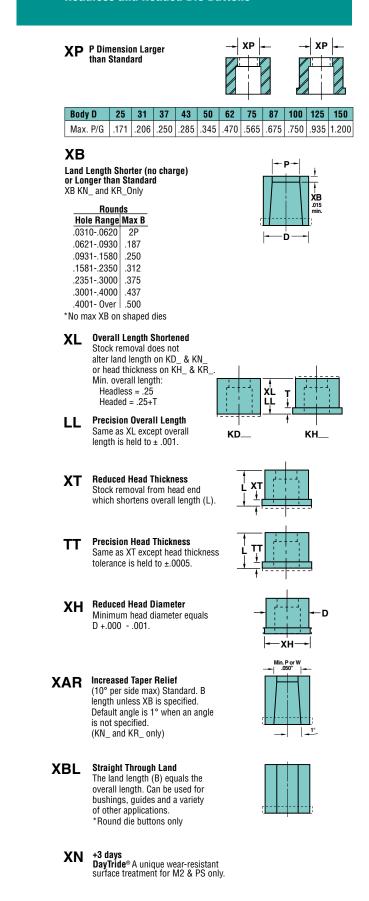
.187-2.200

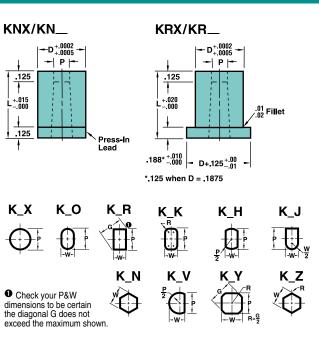
75

75



Standard Alterations Headless and Headed Die Buttons





Standard Alterations

Kommercial 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.

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.

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 die button catalog number. Please specify XSC for alteration and show material thickness (inches) and clearance per side (percentage).

HOW TO ORDER

	Cat	alog	g Nur	nber		Your Spec	s
Inch	KHX	37	125	P.125	XSC	MT.0125	CS 5
	Туре	D	L	Ρ	Alt. Code	Mat'l Thickness	
						(inches)	(%)



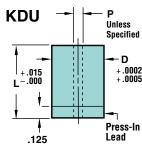
EDM Die Button Blanks

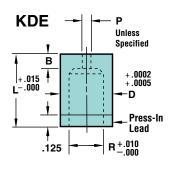


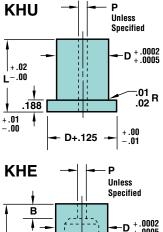
Material	
Steel: M2, RC	60-63
	005 P to D
$D \geq 1.75 ^{+.0002}_{+.0006}$	

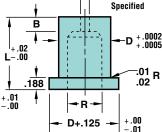
HOW TO ORDER

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











D≤ 1.00 1 Day 1.00 < D≤ 1.50 2 Days (with XP, add 2 Days)

D > 1.50 4 Days (with or without XP)

	Body	K_U				K_E									L			
Туре	D	Code	Std. P	Opti X		Std. P	Optio XI		В	R	.75	.87	.93*	1.00	1.125	1.25	1.375	1.50
1/10	.2500	25	.031	.020	_	_	.020	—	.15	.156								
KD_	.3125	31	.031	.020	—	.031	.020	—	.25	.191								
KH_	.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								
	1.7500	175	.125	.020	.031	.125	.020	.031	.37	1.430								
KD_	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 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.

Single Head Pilot Retainers True Location™

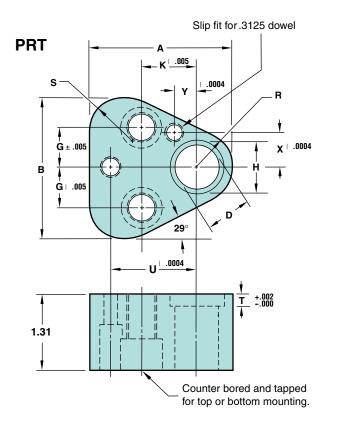


Features/Benefits

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.







Туре	Code	D	Α	В	G	н	к	R	S	т	U	х	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

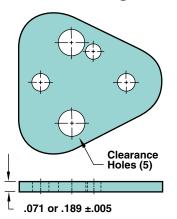
PRT Retainer

sets include:

2 Dowels

• 2 Screws





Shim 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									





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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

Keys

C30

Kommercial

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.

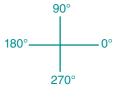
Ordering Information

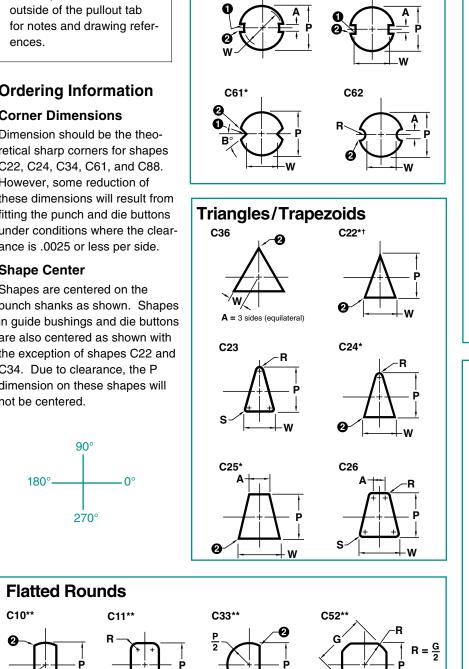
***Corner Dimensions**

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.

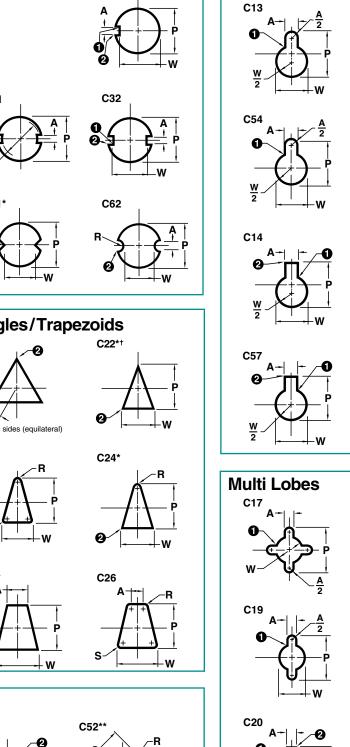


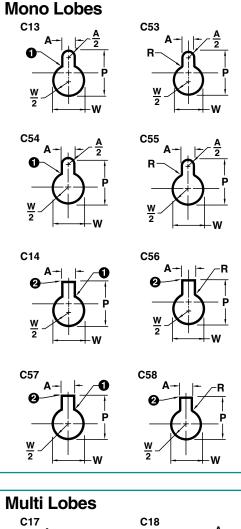


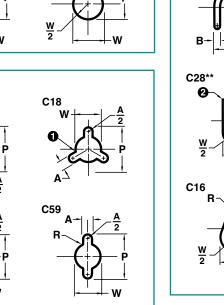
* Now standard. See product pages.

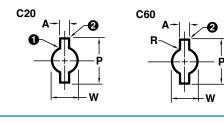
|-<u>-</u>--|-w

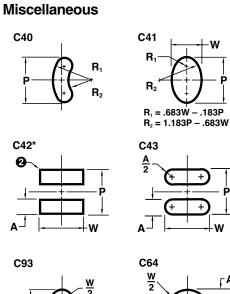
C10**







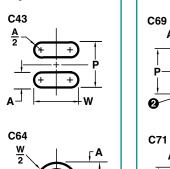


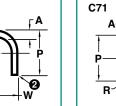


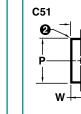
C27

C29

C34+

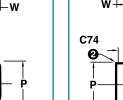






Us

C50





C68

C70

ø

C72

C73

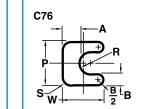
C75

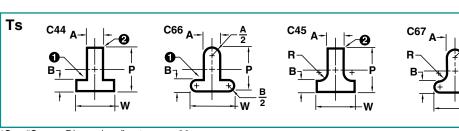
0-

-⊢A

Δ---

∕0





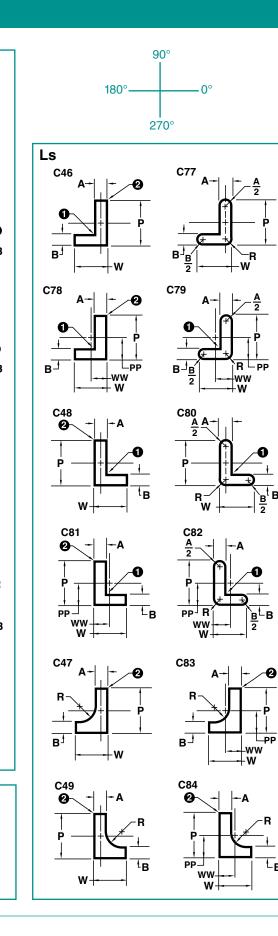
*See "Corner Dimensions" note on p. 22.

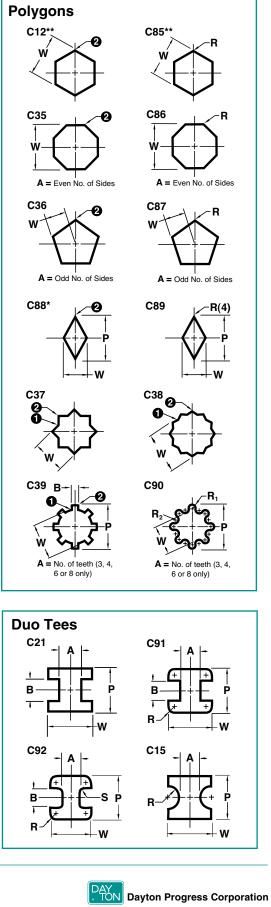
C65

Kommercial

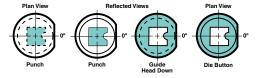
23

Classified Shapes Ordering Information





Reflected View— **Punches and Guides**



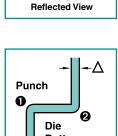
The reflected view is used for punches and guides. It is the view as seen in a mirror held below a punch or guide in its operating position. It is the same as a plan view from the head end, in which the point shape is shown dotted. A reflected view is shown with solid lines.

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



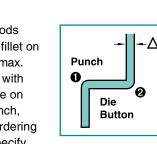
90°

 (\bigcirc)

270°

X5

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.)



180°-



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.



Qty. Type

2 KPW

±.0005

D



202

203

24

Specify: Qty. Type Code L Steel W Shape P LA Alterations PP 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.





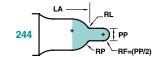
224

233

404

603

RL



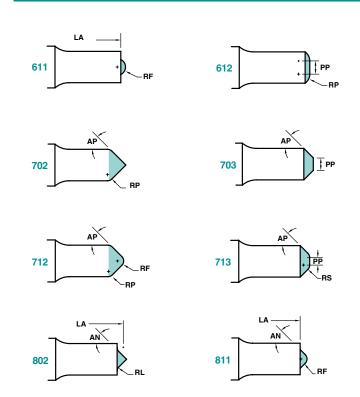
Ρ

LA^{±.001}

PP.125



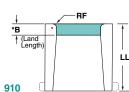
Form Punch Shapes



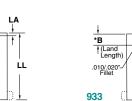
Form Die Button Shapes

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 able as headed or headless as headed or headless with a







LL

HOW TO ORDER Specify: Qty. Type Code LL Steel W Shape Ρ PP LA 4 KNW 100 100 M2 W935 .50 .625 .15 Example:

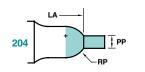


212

+) PP

RF=(PP/2)

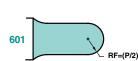
-+) | PP

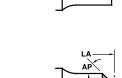


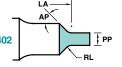
BP must be $\leq (P - PP)/2$



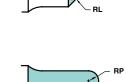
FPP

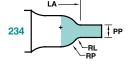




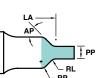


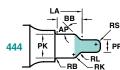






 $BI + BP must be \leq (P - PP)/2$





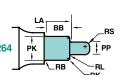


FPP

±.001

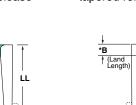
Shape

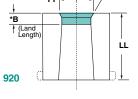
100 E250 W201 P.1875 2.235

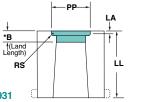


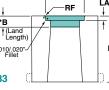
RK + RL must be \leq (PK - PP) /2

a "W." Die Buttons are availwith a counterbore relief, or tapered relief.



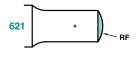


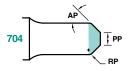


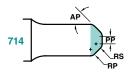


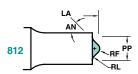
931

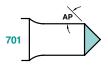
DAY TON Dayton Progress Corporation

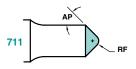


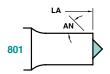


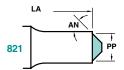




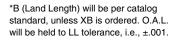


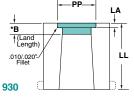


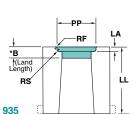












RS	RF	AN°	Alterations
.05	.03		XNT





Jektole[®] Data



The Engineered Clearance

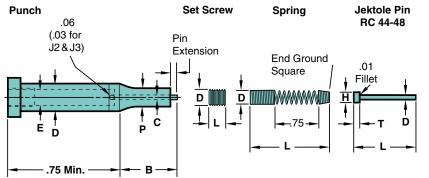
Perforating punch-to-die button clearances in metal stamping dies has been universally expressed as a percentage of stock thickness, and for clarity should be articulated as percent per side (Δ =clearance per side).

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.

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[®] Components



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	с	.020	.032	.046	.063	.094	.125
Shank Hole Diameter	Е	.086	.109	.141	.172	.221	.275
Pin Extension		.03	.03	.06	.06	.06	.06
Keeper Key Number		920045			9200	053	*

^{*} 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.	Ρ	.040	.064	.092	.126	.188	.250
Max. Point Lgth.	В	1.25	1.50	1.62	1.62	1.62	1.62

Universal Jektole® Components

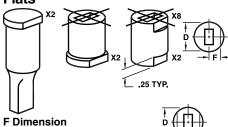
			-				
EJECTOR PIN	S	J2	J3	J4	J6	J9	J12
Overall Length	L	1.11	1.38	1.94	1.94	2.22	2.22
Pin Diameter	D	.017	.027	.041	.058	.089	.120
Head Diameter	Н	.048	.073	.094	.120	.156	.188
Hd. Thickness	Т	.031	.047	.062	.062	.094	.094
SPRINGS		J2	J3	J4	J6	J9	J12
Outside Dia.	D	.081	.104	.136	.167	.216	.270
Free 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



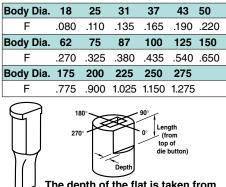
Locking Devices—Flats vs. Dowel Slots

TYP.

Flats



(.5D on Headed Products)



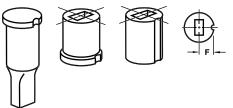
The depth of the flat is taken from the shank, not the head, on punches.

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

F	lat	Do	wel	
F	Radial	F	Radial	
+ .0005	.001/	+ .0005	0°-4'	
0000	inch	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	Тор	Bottom		
X8	N/A	Тор		

Order Example:

X2 — 90°

Double Flats: X3

Locking Devices	Punches	Die Buttons
Х3	Тор	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

F Dimension for Headed Punches and Die Buttons

F = .5D + .5 Dowel Dia.

F Dimension for Headless Die Buttons Only

Body Diam	eter	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	Г	.1938	.2188	.2438	.2688	.2938	.5D	.5D	.5D	.5D	.5D
X43, X73		.2250	.2500	.2750	.3000	.3250	.3438	.4063	.4688	.5313	.5D

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	Тор	Bottom
X9	N/A	Тор

Order Example: X5 — 135°

Double Flats: X6

Locking Devices	Punches	Die Buttons
X6	Тор	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			

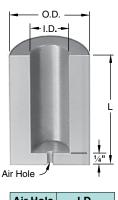
Dowel Slots: X1**, X7, X71 & X73

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

Order Example: X71 — 135°

Urethane Strippers





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

Catalog	I.D.	O.D.	•	Pressure at Deflection of		
Number	1.0.	0.0.	L	1⁄8	1⁄4	³ /8
USE18-125 USE18-150	3/16	11/16	1¼ 1½	250 230	400 350	
USE25-125 USE25-150 USE25-175	1⁄4	3⁄4	1 ¼ 1 ½ 1 ¾	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 ¼ 1 ½ 1 ¾ 2 2 ¼	520 450 435 315 275	790 725 680 510 475	— 875 650 600
USE62-125 USE62-150 USE62-175 USE62-200	5/8	11/8	1¼ 1½ 1¾ 2	600 520 480 440	925 835 775 730	 1000 935
USE75-175 USE75-200 USE75-225 USE75-250 USE75-275	3⁄4	1½	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	1¾	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

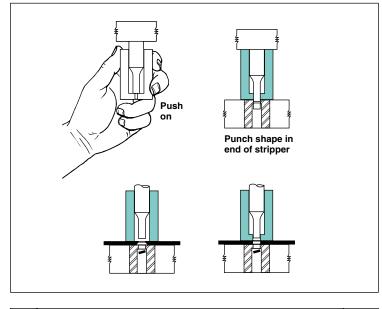
Features/Benefits

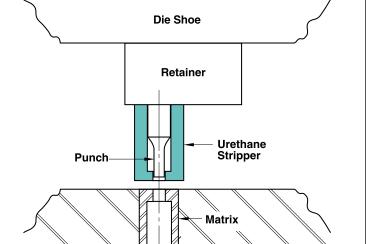
Dayton's durable, yet flexible, Urethane Strippers provide superior stripping over conventional strippers; develop higher load-bearing capacity due to the use of a unique curing agent; are tear- and oilresistant; provide exceptional dampening of the punch, thus eliminating premature punch failure due 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	
10W IU UNDEN	

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





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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.

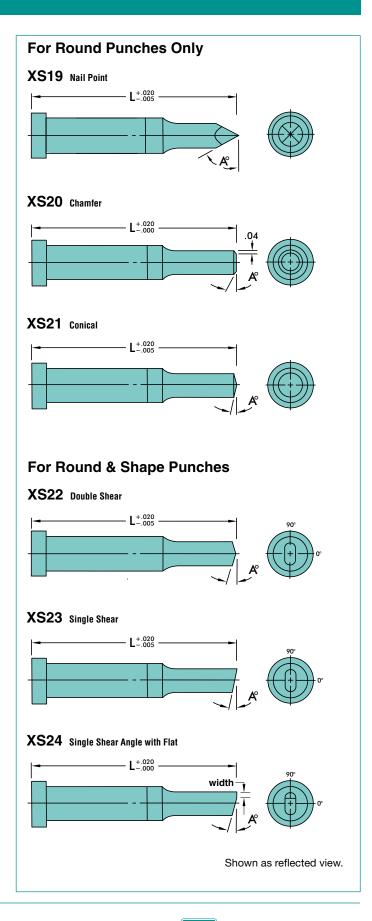
Shear Angles are also available on Classified Shapes, but are available as special order only.

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°	



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 valueadded products and services.

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