Durable, Long-lasting Punches & Punch Blanks



Global leader in providing fabrication and stamping solutions

a MISUMI Group Company

www.daytonprogress.com



TuffPunch® Heavy-Duty Punches and Punch Blanks

Product Applications

Dayton Progress TuffPunch® Punches and Punch Blanks are Kommercial quality products manufactured with thicker, larger, 10° angled diameter heads, and are designed to reduce punch load and significantly lower failure rates when using heavy gauge and high tensile material. TuffPunch® products are well-suited for high-demand industries where frequency and heavier-than-normal impact punching activity occurs and where optimum performance is required.

Dayton's TuffPunch® product line includes: Dayton Jektole® Punches; Regular Punches; and Punch Blanks. Both standard sizes and standard alterations are shown in this catalog.

Unique Head Design

All Dayton TuffPunch® products are designed with a 10° angled head with a diameter equal to the shank diameter (see photo). This design allows the perforating forces to travel up from the shank and completely through the head. This eliminates the lateral shock

waves that would otherwise put stress on the outer edge of the head, resulting in frequent failures—especially in heavy-duty applications.

In addition, Dayton
TuffPunch® products
are available in common
shear angle configurations to reduce punch load
and minimize the risk of slug

pulling. Shear angle configurations include: nail point; chamfer; conical; double shear; and single shear. For more information, see "Standard Alterations" on p. 6.

Cryogenic Treatment Standard

DayKool™ (XCR)—a cryogenic steel conditioning process used primarily with hard, thick materials to improve strength, toughness, and dimensional stability—is standard on all Dayton TuffPunch® products.

The DayKool™ process utilizes a liquid nitrogen vapor to cool the steel to -300° F, which creates metallurgical changes in the structure that disperse carbides throughout the metal. The result: increased wear resistance (finely



dispersed carbides provide more evenly distributed wear); less sharpening time; no loss of resistance after sharpening; longer die runs; and less downtime.

Surface Coatings

Punches can be coated to increase material hardness, reduce galling, and improve wear/ and or corrosion resistance.

Abrasive Wear

DayTiN® (XNT)—PVD coating provides excellent wear resistance and lubricity. Not recommended for stainless steel, copper, or nickel. A good general-purpose coating. Approx. hardness: *Vickers 2300.

TiCN (XCN)—ultra-hard (harder than carbide), thin PVD coating. Provides superior abrasive wear resistance and lubricity. Well-suited for stainless steel, nickel, and copper. Approx. hardness: *Vickers 3000.

DayTAN™ (XAN)—ultra-hard (harder than carbide), high-aluminum PVD coating.

Provides high temperature resistance. Wellsuited for applications where surface heat is generated. Ideal for HSLA, dual phase, and TRIP steels. Approx. hardness: *Vickers 3400.

ZertonPlus™ (XNA)—PVD coating with superior hardness (harder than carbide); provides superior abrasive wear resistance and excellent lubricity. Provides highest temperature resistance, thermal shock stability, & hot hardness. Approx. hardness: *Vickers 3200.

Adhesive Wear

XNM—a solid PVD lubricant coating. Provides both lubricity and wear resistance not available from other PVD or CVD processes. Ideal for aluminum, pre-painted, and galvanized steels. Approx. hardness: *Vickers 2000.

XCD—diamond-like carbon coating. Combines high hardness with an extremely low coefficient of friction. Good protection against abrasive and adhesive wear. Ideal for aluminum. Approx. hardness: *Vickers 2500.

Extrusion Coatings

XNP—the ultimate coating for improved resistance to galling; excellent wear resistance, superior surface finish, and high lubricity. Ideal for extruding and forming applications. Tolerance is ±.0002". Approx. hardness: *Vickers 3100.

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.

Miscellaneous Coating

DayTride® (XN)—a low temperature, costeffective surface application that treats all exposed surfaces. Provides increased dimensional stability. Ideal for punches and die buttons. Approx. hardness: RC73.

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.

Special Features

There are several features that contribute to minimize failures. In addition to the head design and large fillet (.040"-.060" radius) under the head, all punch shapes with sharp corners will have a carefully blended .005" radius ground to reduce loading on the punch. The reduced load and standard cryogenic treatment result in fewer punch point problems caused by chipping, wear, or breakage.

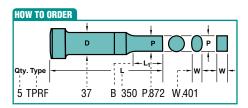
*Vickers used when RC exceeds 80.

TuffPunch®, DayKool™, DayTAN™, ZertonPlus™, Daytride® and DAYTiN® are trademarks of Dayton Progress Corp.

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Ordering Information

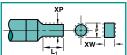
Each page contains detailed instructions on how to order specific Dayton TuffPunch® products. Individual drawings show product shape, dimensions, tolerances, and concentricity. When ordering, you are asked to specify quantity, type, shank and length codes (for example), and other applicable data.



In the example above, the type specified is "TPRF." "T" stands for TuffPunch®, "P" stands for punch, and "R" stands for rectangle. "F" is an additional product code. 37 is the press-fit diameter, which is coded by the first two digits of the decimal equivalent (.375). B350 stands for the point and overall length with the "B" as the code for .75" point length and 350 as the code for punch length in inches (three and one-half inches). Finally, P.872 and W.401 represent the point or hole size dimensions.

Standard Alterations

Punches and punch blanks are available in sizes other than those listed in the catalog. These special order products can be manufactured for a slight additional charge.



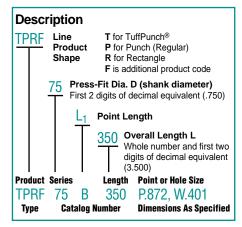
When ordering, you are asked to specify different designations

for various non-standard dimensions. For example, if the P & W dimensions are smaller than standard, an "X" must be placed in front of the P or W dimensions, e.g., "XP" and "XW." If the point length is longer than standard, designate "XBR(L1)" for the point length. The sample drawing above is from the "Standard Alterations" section on p. 6.

Other special order designations include: "XL" for overall length shortened; "XK" for no side hole and no components (for air ejection of slugs); and special designations for surface treatments and coatings.

Product Designation

When ordering, you are asked to specify quantity, product type, length codes, and point or hole size (for example). In addition, use the following chart to define the product as a part number.



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

Code	D	Code	D
37	.3750	75	.7500
43	.4375	87	.8750
50	.5000	100	1.0000
62	6250		

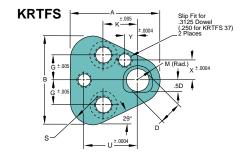
TuffPunch® Retainers



TuffPunch® retainers offer precise dowel locations allowing CNC machining of the punch and die plates. The dimensional accuracy also permits interchangeability of retainers that before could not have been done without plugging holes and re-machining for dowels.

NK IF	±.005 3.125 Dowel (.250 for KRTF 37)
G ±.005	R x ± .0004
B	The state of the s
s	U ±.0004
1.250	3130 -0.000
	Counterbored and Tapped for Top or Bottom Mounting

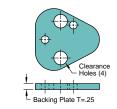
KKIF	±.005 3.125 Dowel (.250 for KRTF 37 2 Places
Ğ ±.005	R x ± .0004
B G ±.005	Ť T
s	U ± .0004
1.250	3130 -0.000
	Counterbored and Tapped for Top or Bottom Mounting



HOW TO ORDER Specify: Qty. Catalog No. Example: 13 KRTFS62 13 TRBP1663

Next Day

Retainer sets include 2 dowels and 2 screws.



Ba	acking Plate
D	Catalog No.
37	TRBP 10 63
50	TRBP 13 63
62	TRBP 16 63
75	TRBP 20 63
87	TRBP 22 63
100	TRBP 25 63

Catalo	g No.				KRTF			KRTFS						Screw	Tapped
Type	Code	D	Α	В	Н	G	K	M	R	S	U	X	Υ	Size	Hole
	37	.3750	1.75	1.72	.59	.438	.750	.296	.38	.47	1.060	.3543	.2953	⁵ /16 -18	3/8-16
	50	.5000	2.00	1.97	.72	.563	.750	.359	.50	.60	1.180	.4724	.2559	5/16 -18	3/8-16
KRTF	62	.6250	2.12	2.09	.84	.625	.750	.422	.56	.66	1.250	.5315	.2362	⁵ /16 -18	3/8-16
KRTFS	75	.7500	2.37	2.34	.97	.688	.750	.484	.69	.79	1.320	.6496	.1968	⁵ /16 -18	3/8-16
	87	.8750	2.50	2.47	1.09	.688	.750	.546	.75	.85	1.400	.7284	.1970	5/16 -18	3/8-16
	100	1.0000	2.75	2.72	1.22	.781	.938	.609	.88	.97	1.600	.8661	.2756	1/2-13	⁵ /8 -11

TuffPunch®Jektole® Punches



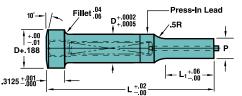
Material

Steel: PS4 (CPM M4), RC 60-62

Heads RC 40-55

Round P + .0005 Shape P, W±.0005

① .0005 P to D ◎ .001 P to D



TJXF TJOF TJRF

• Check your P&W dimensions to be

certain the diagonal G does not

exceed the maximum shown. ② Centerline to flat minimum = .025 for J2, .040 for J3, .058 for J4, .079 for

J6 and .118 for J9.











TJJF

Standard shapes with sharp corners will have a .005" radius to reduce loading on the punch.

Shank		Poin	t Leng	th L ₁		Round		Shape	L													
D	Code	A	В	C	Min. XP	Range P	Min. XW	Min. Max. W P/G	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	Jektole [®] Group
.3750	37	.50	.75	1.00	.158 .158	.1583749 .1583749	.158 .172	.158375 .158375	200	225	250	275	300	325	350	375	400	425	450	475	500	J6
.4375	43	.50	.75	1.00	.158 .158	.1874374 .1874374	.158 .172	.1874375 .1874375	200	225	250	275	300	325	350	375	400	425	450	475	500	J6
.5000	50	.50	.75	1.00	.158 .158	.2504999 .2504999	.158 .172	.187500 .187500	200	225	250	275	300	325	350	375	400	425	450	475	500	J6
.6250	62	.50	.75	1.00	.235 .235	.3756249 .3756249	.235 .235	.250625 .250625		225			300									J9
.7500	75	.50	.75	1.00	.300 .300	.5007499 .5007499	.235 .235	.312750 .312750	200	225	250	275	300	325	350	375	400	425	450	475	500	J9
.8750	87	.50	.75	1.00	.400 .400	.5628749 .5628749	.235 .235		200	225	250	275	300	325	350	375	400	425	450	475	500	J9
1.0000	100	.50	.75	1.00	.400 .400	.6259999 .6259999	.235 .235	.375-1.000 .375-1.000	200	225	250	275	300	325	350	375	400	425	450	475	500	J9

Note: DayKool™ (XCR)—a cryogenic steel conditioning process used primarily with hard, thick materials to improve strength, toughness, and dimensional stability—is standard on all Dayton TuffPunch® products. For additional information, see p. 2.

HOW TO ORDER

P (or P&W) Specify: Qty. D Code L Dimension Example: 6 37 C225 P.204

> Note: The standard location of a key flat is parallel to the P dimension. For additional information, see p.7.



Standard Alterations

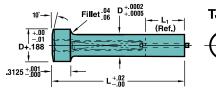
See p.6 for additional ordering instructions.



TuffPunch[®]Jektole[®] Punch Blanks



Steel: PS4 (CPM M4), RC 60-62 Heads RC 40-55



10°—-	Fillet: 04 D +.0002 +.0005 (Ref.)	TJBF
+.00 01 D+.188 -		
125 + 001 -	-	Т

HOW TO ORDER

Specify:	Qty.	Type	D Code	L	
Example:	9	TJBF	37	B200	

Standard Alterations

See p.6 for additional ordering instructions.



Shank	0-4-	Poin	t Leng	th L ₁		L												Jektole®
D	Code	Α	В	C	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	Group
.3750	37	.50	.75	1.00	200	225	250	275	300	325	350	375	400	425	450	475	500	J6
.4375	43	.50	.75	1.00	200	225	250	275	300	325	350	375	400	425	450	475	500	J6
.5000	50	.50	.75	1.00	200	225	250	275	300	325	350	375	400	425	450	475	500	J6
.6250	62	.50	.75	1.00	200	225	250	275	300	325	350	375	400	425	450	475	500	J9
.7500	75	.50	.75	1.00	200	225	250	275	300	325	350	375	400	425	450	475	500	J9
.8750	87	.50	.75	1.00	200	225	250	275	300	325	350	375	400	425	450	475	500	J9
1.0000	100	.50	.75	1.00	200	225	250	275	300	325	350	375	400	425	450	475	500	J9

Note: DayKoolTM (XCR)—a cryogenic steel conditioning process used primarily with hard, thick materials to improve strength, toughness, and dimensional stability—is standard on all Dayton TuffPunch® products. For additional information, see p. 2.

TuffPunch® Regular Punches

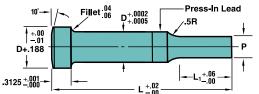


Material

Steel: PS4 (CPM M4), RC 60-62

Heads RC 40-55

Round P + .0005 O .0005 P to D







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

Standard shapes with sharp corners will have a .005" radius to reduce loading on the punch

L ^{+.02}			
TPKF	TPLF	TPHF	TPJF
-W-	- 1020H 2.005	P	







HOW TO ORDER

P (or P&W) D Code L Specify: Qty. Dimension Example: 9 100 B350 P.872, W.401

> Note: The standard location of a key flat is parallel to the P dimension. For additional information, see p.7.



Standard Alterations

See p.6 for additional ordering instructions.



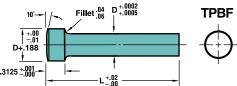
Shank		Poin	t Leng	th L ₁		Round		Shape							L						
D	Code	A	В	C	Min. XP	Range P	Min. XW	Min. Max. W P/G	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00
.3750	37	.50	.75	1.00	.062 .093 .125	.1583749 .1583749 .1583749	.109 .125 .125	.158375 .158375 .158375	200	225	250	275	300	325	350	375	400	425	450	475	500
.4375	43	.50	.75	1.00	.080 .109 .125	.1874374 .1874374 .1874374	.109 .125 .172	.1874375 .1874375 .1874375	200	225	250	275	300	325	350	375	400	425	450	475	500
.5000	50	.50	.75	1.00	.125 .125 .125	.2504999 .2504999 .2504999	.125 .141 .172	.187500 .187500 .187500	200	225	250	275	300	325	350	375	400	425	450	475	500
.6250	62	.50	.75	1.00	.235	.3756249 .3756249	.235	.250625 .250625	200	225	250	275	300	325	350	375	400	425	450	475	500
.7500	75	.50	.75	1.00	.300 .300	.5007499 .5007499	.235 .235	.312750 .312750	200	225	250	275	300	325	350	375	400	425	450	475	500
.8750	87	.50	.75	1.00	.350 .350	.5628749 .5628749	.235 .235	.312875 .312875	200	225	250	275	300	325	350	375	400	425	450	475	500
1.0000	100	.50	.75	1.00	.400 .400	.6259999 .6259999	.235 .235	.375-1.000 .375-1.000	200	225	250	275	300	325	350	375	400	425	450	475	500

Note: DayKoolTM (XCR)—a cryogenic steel conditioning process used primarily with hard, thick materials to improve strength, toughness, and dimensional stability—is standard on all Dayton TuffPunch® products. For additional information, see p. 2.

TuffPunch® Regular Punch Blanks



Steel: PS4 (CPM M4), RC 60-62, Heads RC 40-55



.3125 ± .001

Specify: Qty. D Code L Type Example: 9 **TPBF** 37 200

Standard Alterations

See p.6 for additional ordering instructions.



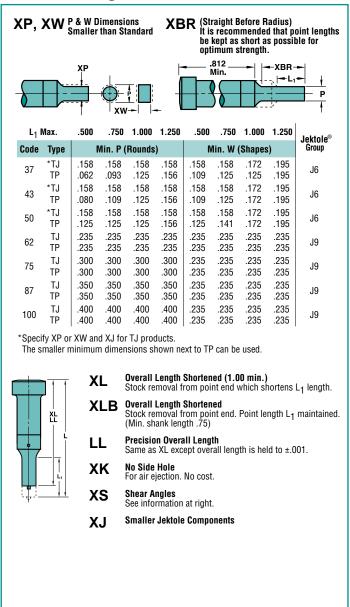
Shank	Code							L						
D	oout	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00
.3750	37													
.4375	43													
.5000	50													
.6250	62	200	225	250	275	300	325	350	375	400	425	450	475	500
.7500	75													
.8750	87													
1.0000	100													

Note: DayKoolTM (XCR)—a cryogenic steel conditioning process used primarily with hard, thick materials to improve strength, toughness, and dimensional stability—is standard on all Dayton TuffPunch® products. For additional information, see p. 2.

Standard Alterations—Punches and Punch Blanks

Punches are available in sizes other than those listed in the front of the catalog.

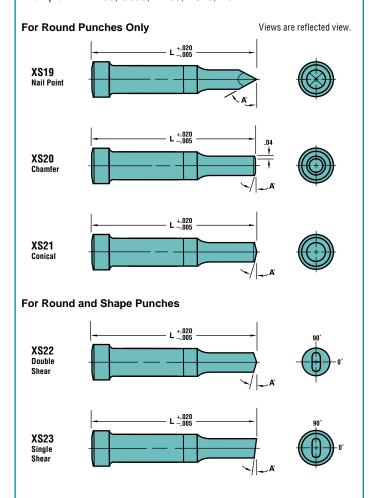
Jektole®, Regular, & Punch Blanks



Shear Angles (XS)

 $\label{thm:common} {\it TuffPunch}^@\ products\ are\ available\ in\ common\ shear\ angle\ configurations\ for\ all\ standard\ shapes.$

Shear angles are available in any angle. Specify angle in whole degrees. If half degree is necessary, specify as a decimal, e.g., 8.5°. (Tolerance on all angles is ± 15 minutes.) Use the chart below to determine the product designation, then simply add the alteration code shown next to the drawings, along with the angle desired. Example: TPXF 50, C300, P.400, XS20, A5°.



Coatings & Treatments

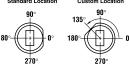
Code/Delivery					
XN —DayTride®	+ 3 days	XNM	+ 12 days		
XNT — DayTiN®	+ 3 days	XCD	+ 12 days		
XCN —TICN	+ 3 days	XNP	+ 8 days		
XAN —DayTAN™	+ 4 days	XNAP— XNAProgress	+ 12 days		
XNA —ZertonPlus™	+ 7 days	CRN	+ 7 days		

See page 2 for additional coating information.

Locking Devices—Flats vs. Dowel Slots

Orientation

The standard location for all locking devices is 0°, and is always on the long side (P) of the shape. Custom locations are measured counterclockwise from 0°.



All views are reflected views.

Standard and **Alternate Locations**

Standard Location is at 0°. Alternate Location is 90°, 180°, or 270°. Alternate locations are available at no additional charge.

Custom Locations

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

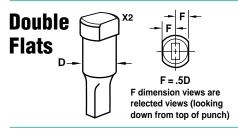
Single **Flats** D_{-}

Single Flats: X2

Order Example: X2 — 90°

Single Flats: X5

Order Example: X5 — 135°



Double Flats: X3

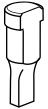
Locking Devices: X3 Order Example: X3 — 90°

Second Flat is always parallel to the first flat.

Double Flats: X6

Locking Devices: X6 Order Example: X6 — 135°

Additional **Flats**



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

Additional Flats

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

Additional Flats

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 + 1/2 Dowel Dia.

Dowel Slots: X4 & X41

For standard locations, specify X4 (.125 Dowel) or X41 (.1875 Dowel). For alternate locations, specify X4 or X41 and degree required.

Order Example: X4 — 90°

Dowel Slots: X7 & X71

Specify X7 (.125 Dowel) or X71 (.1875 Dowel). For custom locations, specify X7 or X71 and degree required.

Order Example: X71 — 135°

Location Tolerance

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

How To Specify

The most common locking devices—flat, double flat, and dowel-are available. Simply select the type, then add the code to the component description.

HOW TO ORDER

P (or P&W) Locking Specify: Qty. Type D Code Dimension Device Example: 1 **TJRF** 37 P.321, W.189



Dayton Progress Corporation 500 Progress Road P.O. Box 39 Dayton, OH 45449-0039 USA

Dayton Progress Detroit 34488 Doreka Dr. Fraser, MI 48026

Dayton Progress Portland 1314 Meridian St. Portland, IN 47371 USA

Dayton Progress Canada, Ltd. 861 Rowntree Dairy Road Woodbridge, Ontario L4L 5W3

Dayton Progress Mexico, S. de R.L. de C.V. Access II Number 5, Warehouse 9 Benito Juarez Industrial Park Querétaro, Qro. Mexico 76130

Dayton Progress, Ltd. G1 Holly Farm Business Park Honiley, Kenilworth Warwickshire CV8 1NP UK

Dayton Progress Corporation of Japan 2-7-35 Hashimotodai, Midori-Ku Sagamihara-Shi, Kanagawa-Ken 252-0132 Japan

Dayton Progress GmbH Adenauerallee 2 61440 Oberursel/TS, Germany

Dayton Progress Perfuradores Lda Zona Industrial de Casal da Areia Lote 17 Cós, 2460-392 Alcobaça, Portugal

Dayton Progress SAS 105 Avenue de l'Epinette BP 128 Zone Industrielle 77107 Meaux Cedex, France

Dayton Progress Czech sro Hala G Pražská 707 CZ-294 71 Benátky nad Jizerou Czech Republic



Global leader in providing fabrication and stamping solutions