Durable, Long-lasting Punches & Punch Blanks

Heads-above-the-rest performance

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 Treatments

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

XVP—a thin film coating provides superior hardness (harder than carbide). Super-smooth finish on the point helps reduce galling and maintenance. Ideal for higher-than-normal punching frequency.

XPS—Super-smooth polish on the point to reduce galling and improve punch life. Use with the appropriate coating for your application to maximize punch life and reduce maintenance costs. Excellent for extruding applications.

Abrasive Wear


ZertonPlus™ (XNA)—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


XCDH—Super-smooth finish combined with advanced DLC coating for a very low coefficient of friction with extremely high wear resistance. Approx. hardness: *Vickers 5000.


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 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
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.
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 punch 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.

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 punch 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 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.

<table>
<thead>
<tr>
<th>Description</th>
<th>TPRF</th>
<th>Product Type</th>
<th>Press-Fit Dia. D (shank diameter)</th>
<th>Point Length</th>
<th>Overall Length L</th>
<th>Point or Hole Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code D</td>
<td>Code D</td>
<td></td>
<td></td>
<td></td>
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<tr>
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</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Screw Size</th>
<th>Tapped Hole</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/16-18</td>
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<td></td>
</tr>
<tr>
<td>1/8-16</td>
<td>1/16-18</td>
<td></td>
</tr>
</tbody>
</table>

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

### 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.

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>D</th>
<th>A</th>
<th>B</th>
<th>KRTF</th>
<th>G</th>
<th>K</th>
<th>KRTFS</th>
<th>M</th>
<th>R</th>
<th>S</th>
<th>U</th>
<th>X</th>
<th>Y</th>
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<th>Tapped Hole</th>
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<td>.296</td>
<td>.38</td>
<td>.47</td>
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<td>.2953</td>
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<td>1/8-16</td>
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<td></td>
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<tr>
<td>50</td>
<td>2.00</td>
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<td>5/16-11</td>
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</tbody>
</table>

Retainer sets include 2 dowels and 2 screws.
**TuffPunch® Jektole® Punches**

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

**Round P: .005”**
- 0005 P to D

**Shape P: .001”**
- 001 P to D

**HOW TO ORDER**
- Specify: Qty. Type D Code L P (or P&W) Dimension
- Example: 6 TJXF 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**

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

**Shank D Code**
- 0.3750 37
- 0.4375 43
- 0.5000 50
- 0.6250 62
- 0.7500 75
- 0.8750 87
- 1.0000 100

**Point Length L**
- 0.50”
- 0.75”

**Round Shape**
- Standard shapes with sharp corners will have a .005” radius to reduce loading on the punch.

**D Code**
- 0.3750 37
- 0.4375 43
- 0.5000 50
- 0.6250 62
- 0.7500 75
- 0.8750 87
- 1.0000 100

**Point Length L**
- 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**
- J6
- J9

**Standard Alterations**
- See p. 6 for additional ordering instructions.

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**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.
**TuffPunch® Regular Punches**

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

**Round**  

<table>
<thead>
<tr>
<th>Shank D</th>
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<th>Point Length A</th>
<th>Point Length B</th>
<th>Point Length C</th>
<th>Minimum Point Length A</th>
<th>Minimum Point Length B</th>
<th>Minimum Point Length C</th>
<th>Maximum Point Length A</th>
<th>Maximum Point Length B</th>
<th>Maximum Point Length C</th>
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<th>Minimum Width G</th>
<th>Minimum Width W</th>
<th>Minimum XW</th>
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</tbody>
</table>

**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**  
Specify: Qty, Type, D Code, L  
Example: 9 TPF 100 B350 P872, W401

**Standard Alterations**  
See p. 6 for additional ordering instructions.

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**TuffPunch® Regular Punch Blanks**

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

**How to Order**  
Specify: Qty, Type, D Code, L  
Example: 9 TPBF 37 200

**Standard Alterations**  
See p. 6 for additional ordering instructions.

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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**

XP, XW P & W Dimensions
Smaller than Standard

XP (Straight Before Radius)
It is recommended that point lengths be kept as short as possible for optimum strength.

**Shear Angles (XS)**

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°.

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

**Coatings & Treatments**

<table>
<thead>
<tr>
<th>Code/Select</th>
<th>Delivery</th>
<th>Code/Select</th>
<th>Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>XN — DayTride®</td>
<td>+ 3 days</td>
<td>XNM</td>
<td>+ 12 days</td>
</tr>
<tr>
<td>XVP</td>
<td>+ 3 days</td>
<td>XANL</td>
<td>+ 15 days</td>
</tr>
<tr>
<td>XPS</td>
<td>+ 0 days</td>
<td>XCD</td>
<td>+ 8 days</td>
</tr>
<tr>
<td>XNT — DayTiN®</td>
<td>+ 3 days</td>
<td>XCDH</td>
<td>+ 8 days</td>
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<tr>
<td>XCN — TiCN</td>
<td>+ 3 days</td>
<td>XCDP</td>
<td>+ 14 days</td>
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<td>XAN — DayTiN®</td>
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<td>XNA — ZertonPlus®</td>
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<td>XNA — ZertonPlus®</td>
<td>+ 7 days</td>
<td>CRN</td>
<td>+ 7 days</td>
</tr>
</tbody>
</table>

See page 2 for additional coating information.

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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°.

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: 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Depth</th>
<th>Length</th>
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<tbody>
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<td>.500</td>
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<td>X84</td>
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<td>X86</td>
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<td>X89</td>
<td>Specify Dimensions</td>
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Additional Flats

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<tr>
<td>X99</td>
<td>Specify Dimensions</td>
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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

<table>
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<tr>
<td>+ .0005</td>
<td>.001/ inch</td>
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</tbody>
</table>

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
Specify: Qty. Type D Code P (or P&W) Dimension Locking Device
Example: 1 TJRF 37 P.321, W.189 X2

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°

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: 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

<table>
<thead>
<tr>
<th>Code</th>
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</tr>
<tr>
<td>X89</td>
<td>Specify Dimensions</td>
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</table>

Additional Flats

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<tr>
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<tr>
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<tr>
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<tr>
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<td>Full Length</td>
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<td>X99</td>
<td>Specify Dimensions</td>
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</table>

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

<table>
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<tr>
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<th>Dowel</th>
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<tbody>
<tr>
<td>F</td>
<td>Radial</td>
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<tr>
<td>+ .0005</td>
<td>.001/ inch</td>
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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.
Commitment to Quality & Customer Satisfaction

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

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

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