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

Top-rate performance, reduced maintenance, exceptional value
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.

Ordering Information

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

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

How to Order

<table>
<thead>
<tr>
<th>Qty.</th>
<th>Type</th>
<th>L</th>
<th>W</th>
<th>W</th>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>KPR</td>
<td>75</td>
<td>275</td>
<td>.700</td>
<td>.250</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>KPR</th>
<th>Line</th>
<th>Product Shape</th>
<th>Press-Fit Dia. D (shank diameter)</th>
<th>Overall Length L</th>
<th>Point or Hole Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPR</td>
<td>K</td>
<td>K for Kommercial</td>
<td>Coded by the first 2 digits of decimal equivalent (.750)</td>
<td>Coded by the first two digits of dec. equiv. (2.750)</td>
<td>Point or Hole Diameter</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Code</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>.1250</td>
</tr>
<tr>
<td>16</td>
<td>.1875</td>
</tr>
<tr>
<td>20</td>
<td>.2500</td>
</tr>
<tr>
<td>25</td>
<td>.3125</td>
</tr>
<tr>
<td>30</td>
<td>.3750</td>
</tr>
<tr>
<td>40</td>
<td>.4375</td>
</tr>
</tbody>
</table>

Classified Shapes

Classified shapes (83 common shapes, no detailing required) are available on all punches and die buttons as indicated in this catalog. See pp. 22, 23 for more information and special instructions. Also, see individual product pages and p. 27 for additional information on orientation and views.

Clearance

Normal grinding methods produce:

1. .007 max fillet on the punch — matching corner shape on the die button.
2. .007 max fillet on the die button — matching corner shape on the punch.
### Jektole™ Punches

#### Countersink Punches

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Point Clearance</th>
<th>Shank Code</th>
<th>Head Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5000</td>
<td>0.2500</td>
<td>250</td>
<td>L</td>
</tr>
<tr>
<td>1.2500</td>
<td>0.2500</td>
<td>200</td>
<td>L</td>
</tr>
<tr>
<td>1.0000</td>
<td>0.2500</td>
<td>125</td>
<td>L</td>
</tr>
<tr>
<td>0.7500</td>
<td>0.2500</td>
<td>75</td>
<td>L</td>
</tr>
<tr>
<td>0.5000</td>
<td>0.2500</td>
<td>31</td>
<td>L</td>
</tr>
</tbody>
</table>

#### Features/Benefits

Jektole™ punches permit doubling punch to die button clearance, produces up to three times the number of hits between sharpenings, and reduce burr heights.

### Surface Coatings

- **DayTitanium (XT)**: Low-cost titanium coating. Ideal for precision applications. flytitanium.com/xt
- **DayTitanium (XPR)**: Provides excellent wear resistance, high hardness, and chemical stability. Flytitanium.com/xpr

### 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., "31" and "37". If the point length is other than standard, designate "X" as the point length. Also see "Standard Allocations" on the front of the pullout tab in this section for other special order designations.

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**Note:** The standard location of a key is at A°. See p. 37 for more information on tabs and slotted holes.
**Regular Punches**

**Features/Benefits**

Regular Commercial punch presses provide three times better alignment than other major brands. Offer longer tool life and can significantly improve finished part quality.

**Surface Coatings**

Some coating products can be coated to increase hardness, reduce galling, and improve wear and/or corrosion resistance. Ideal for stamping where tools are exposed to extreme stress or conditions.

- **XNP**—Excellent wear resistance, thermal shock stability, and high hardness. Approx. hardness: *Vickers 8000.
- **KXP**—Excellent wear resistance, thermal shock stability, and high hardness. Approx. hardness: *Vickers 1000.
- **TNT**—Excellent wear resistance, thermal shock stability, and high hardness. Approx. hardness: *Vickers 1000.

**Standard Alterations**

Regular Commercial punch presses are available in standard sizes. 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., "X90.30" and "X.400.200." The point length is either standard or designate "XP" as the point length. Also see "Standard Alterations" on the front of the pull tab in the section for other special order designations.

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**How to Order**

- **Example:** 9 KPL 100 E350 P.872, W.401 A2

---

**Regular Punches**

**Surface Coatings**

- **DayTride**—features an as-polished, high-surface finish that improves tool life and reduces galling. Approx. hardness: *Vickers 5000.
- **DayMetalX**—results in reduced galling and improved wear characteristics. Approx. hardness: *Vickers 1800-2100.
- **DayToride**—results in reduced galling and improved wear characteristics. Approx. hardness: *Vickers 1800-2100.
- **DayTek**—results in reduced galling and improved wear characteristics. Approx. hardness: *Vickers 1800-2100.
- **DayTec**—results in reduced galling and improved wear characteristics. Approx. hardness: *Vickers 1800-2100.

**Standard Alterations**

Regular Commercial punch presses provide three times better alignment than other major brands. Offer longer tool life and can significantly improve finished part quality.

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**How to Order**

- **Example:** 9 KPL 100 E350 P.872, W.401 A2

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- **DayToride**—results in reduced galling and improved wear characteristics. Approx. hardness: *Vickers 1800-2100.
- **DayTek**—results in reduced galling and improved wear characteristics. Approx. hardness: *Vickers 1800-2100.
- **DayTec**—results in reduced galling and improved wear characteristics. Approx. hardness: *Vickers 1800-2100.

**Standard Alterations**

Regular Commercial punch presses provide three times better alignment than other major brands. Offer longer tool life and can significantly improve finished part quality.

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**How to Order**

- **Example:** 9 KPL 100 E350 P.872, W.401 A2

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- **DayTec**—results in reduced galling and improved wear characteristics. Approx. hardness: *Vickers 1800-2100.

**Standard Alterations**

Regular Commercial punch presses provide three times better alignment than other major brands. Offer longer tool life and can significantly improve finished part quality.
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.

Standard Altersations
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 designs 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 smaller than standard, designate an "XLB" on the point length. Also see "Standard Altersations" on the front of the pulled tab in this section for other special order designations.

Surface Coatings

Some coating products can be coated to increase hardness, reduce galling, and improve wear and corrosion characteristics. Refer to these tables for coating applications.

DayTiAl® (XTA)—a low-cost surface treatment that yields all exposed flats. Ideal for punch and die action. Provides high dimensional stability. Approx. hardness: XTA-35.

DayTiAl® (XTA)™—Balanced edge pilot with TiAlN coating. Provides excellent hardness (hard as carbide) and excellent lubricity at the point (not just oxide). Designed for stainless steel, copper, or nickel.

DayTiN® (XTN)—applies a PVD (physical vapor deposition) coating. Provides extreme hardness (hard as carbide) and excellent lubricity. Not recommended for stainless steel, copper, or nickel. Approx. hardness: XTN-3-4.

TCN (XCN)—very hard PVD coating. Provides ultra hardness (harder than carbide) and superior abrasive wear resistance. Both TiCN and TiCN-H coatings are available. Approx. hardness: XCN-3-4.


XK-N (XKN)—the ultimate coating for extrusion and forming applications. Also works well in shaving operations. Tolerance is ±.0002. Approx. hardness: XK-N-3-4.

DayTiAl® (XPA)-coatings used on extrusion and forming. Provides excellent lubricity. Also works very well in shaving operations. Approx. hardness: DayTiAl®-95.


XHMPro® (XNP)—ultra hard PVD coating that adheres even when coated on hard materials, provides excellent high temperature resistance ideal for stamping where tools are exposed to extreme stress conditions. A good alternative to TD coating without the dimensional changes associated with that tooling. Approx. hardness: XHMPro®-2-3.


Material

<table>
<thead>
<tr>
<th>Coating/Finish</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>XK-3</td>
<td>3</td>
</tr>
<tr>
<td>XK-4</td>
<td>4</td>
</tr>
<tr>
<td>XKM-3</td>
<td>3</td>
</tr>
<tr>
<td>XKN-3</td>
<td>3</td>
</tr>
<tr>
<td>XAF-2-3</td>
<td>2-3</td>
</tr>
<tr>
<td>XNP-2-3</td>
<td>2-3</td>
</tr>
<tr>
<td>XLD-3</td>
<td>3</td>
</tr>
</tbody>
</table>

Notes:
* Tolerances are approximate. Material is Acme 360.
** No material is coated. Not recommended for stainless steel, copper, or nickel.

Specify

<table>
<thead>
<tr>
<th>Std Code</th>
<th>Type</th>
<th>P</th>
<th>L</th>
<th>F</th>
<th>Skel</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>KPT</td>
<td>50</td>
<td>500</td>
<td>750</td>
<td>M2</td>
</tr>
</tbody>
</table>

Example: 2 KPT 50 C250 P30E M2

Dayton Progress Corporation
Dayton, Ohio 45417
(937) 426-4000
fax: (937) 426-5020
www.daytonprogress.com

DayTiAl® (XTA)™—Balanced edge pilot with TiAlN coating. Provides excellent hardness (hard as carbide) and excellent lubricity. Not recommended for stainless steel, copper, or nickel. Approx. hardness: XTN-3-4.

TCN (XCN)—very hard PVD coating. Provides ultra hardness (harder than carbide) and superior abrasive wear resistance. Both TiCN and TiCN-H coatings are available. Approx. hardness: XCN-3-4.


XHMPro® (XNP)—ultra hard PVD coating that adheres even when coated on hard materials, provides excellent high temperature resistance ideal for stamping where tools are exposed to extreme stress conditions. A good alternative to TD coating without the dimensional changes associated with that tooling. Approx. hardness: XHMPro®-2-3.

Standard Alterations

To determine Length of Radius Blend (LRB) from point 100.

<table>
<thead>
<tr>
<th>P</th>
<th>.175</th>
</tr>
</thead>
</table>

Example:

KPT on bottom of chart.

<table>
<thead>
<tr>
<th>Code Type</th>
<th>Min. P (Rounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>XP</td>
<td>.750</td>
</tr>
<tr>
<td>XT</td>
<td>.349</td>
</tr>
<tr>
<td>KPT</td>
<td>KPT</td>
</tr>
<tr>
<td>KPT</td>
<td>KPT</td>
</tr>
<tr>
<td>KPT</td>
<td>KPT</td>
</tr>
</tbody>
</table>

P Dimensions

<table>
<thead>
<tr>
<th>XP</th>
<th>.750</th>
</tr>
</thead>
<tbody>
<tr>
<td>XT</td>
<td>.349</td>
</tr>
<tr>
<td>XNB</td>
<td>.299</td>
</tr>
<tr>
<td>XCD</td>
<td>.234</td>
</tr>
</tbody>
</table>

Same as XT except head thickness tolerance.

<table>
<thead>
<tr>
<th>L</th>
<th>.399</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>.349</td>
</tr>
<tr>
<td>L</td>
<td>.311</td>
</tr>
</tbody>
</table>

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

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

| Day/Value (XN) | A low-cost surface treatment that applies a thin layer of metal that provides longer tool life and reduced galling.
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>Provides extreme hardness (harder than carbide) and excellent wear and/or corrosion resistance.</td>
</tr>
<tr>
<td>Head Diameter</td>
<td>Provides extreme hardness (harder than carbide) and superior abrasive wear resistance.</td>
</tr>
<tr>
<td>Shank Code</td>
<td>XN:—the ultimate choice for vanadium and forming applications. Also used for piercing and hardening.</td>
</tr>
<tr>
<td>Shank Code</td>
<td>XK:—extraordinary strength and toughness.</td>
</tr>
<tr>
<td>Shank Code</td>
<td>XCD:—TiCN coating.</td>
</tr>
<tr>
<td>Shank Code</td>
<td>XCD:—cryogenic steel conditioning process, used primarily for cold, finish materials.</td>
</tr>
<tr>
<td>Shank Code</td>
<td>XCD:—cryogenic steel conditioning process, used primarily for cold, finish materials.</td>
</tr>
<tr>
<td>Shank Code</td>
<td>XNY:—cryogenic wear resistance, thermal shock stability and hot hardness.</td>
</tr>
<tr>
<td>Shank Code</td>
<td>XNY:—cryogenic wear resistance, thermal shock stability and hot hardness.</td>
</tr>
<tr>
<td>Shank Code</td>
<td>XH:— colloidal silicon carbide coating.</td>
</tr>
<tr>
<td>Shank Code</td>
<td>XH:— colloidal silicon carbide coating.</td>
</tr>
</tbody>
</table>

Features/Benefits

Dayton Commercial positive pick-up pilots provide an improved pick-up without the risk of damaging the hole; in addition, the unique design moves the stock farther from conventional pilots.

<table>
<thead>
<tr>
<th>Type</th>
<th>D (in.)</th>
<th>L (in.)</th>
<th>P (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>XN</td>
<td>.900</td>
<td>.650</td>
<td>.125</td>
</tr>
<tr>
<td>XN</td>
<td>.900</td>
<td>.650</td>
<td>.125</td>
</tr>
</tbody>
</table>

Surface Coatings

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

Day/Value (XN) —a low-cost surface treatment that applies a thin layer of metal that provides longer tool life and reduced galling.

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Day/Value (XN) —a low-cost surface treatment that applies a thin layer of metal that provides longer tool life and reduced galling.
**Compact Positive Pick-Up Pilots**

**How to Order**

<table>
<thead>
<tr>
<th>Type</th>
<th>Shank Code</th>
<th>Head Code</th>
<th>Material</th>
<th>Grp</th>
</tr>
</thead>
<tbody>
<tr>
<td>KUAC</td>
<td>4300</td>
<td>XL/058</td>
<td>A2</td>
<td>J6</td>
</tr>
<tr>
<td>KPAC</td>
<td>1000</td>
<td>1500</td>
<td>200</td>
<td>225</td>
</tr>
</tbody>
</table>

**Standard Alterations**

- **KUAC**
  - **KPB**
  - **KPC**
  - **KPD**

**Compact Positive Pick-Up Pilots**

**Surface Coatings**

- **DayTride**
  - **DayTiN**
  - **XCR**
  - **XNT**
  - **XNP**

**Features/Benefits**

Dayton 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 orientation, and there is no need to move or adjust the pilot during regrounding.

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

**Steel Coatings**

- **Steel: A2, M2, RC 60-63**

**Material**

- **Type**: Steel 4300, MC 60-63
- **Grp**: 100
- **L**: 150

**XP**

- **P Dimension**: Smaller than Standard
- **XBB**: Longer than Standard
- **XBR**: Shortest than Standard

**Tolerance**

- **±0.0005 in. (±0.01 mm)**

**Notes**

- **XNP**: Add three days to delivery.
- **XNT**: Other than Standard
- **XBB**: Steel: A2, M2, RC 60-63
- **KUAC**: Material
- **KUAC**: Grp
- **KUAC**: J6

**Regression**

- **DayTiN**: Ultra-hard PVD coating.
  - **XBB**: Harder than XBR.
  - **XNP**: Add three days to delivery.
  - **XBB**: Ultra-hard, high-aluminum PVD coating.

**Specifications**

- **DayTride**
  - **DayTiN**: Ultra-hard, high-aluminum PVD coating.
  - **XCR**: Cryogenic steel conditioning process, used with hard, thin films. Provides ultra hardness
  - **XNT**: Cryogenic steel conditioning process, used with thin films. Provides ultra hardness

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- **Material**: Steel 4300, MC 60-63
- **Grp**: 100
- **L**: 150

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**Steel Coatings**

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- **Material**: Steel 4300, MC 60-63
- **Grp**: 100
- **L**: 150

**XP**

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**Tolerance**

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- **KUAC**: Grp
- **KUAC**: J6

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- **DayTiN**: Ultra-hard PVD coating.
  - **XBB**: Harder than XBR.
  - **XNP**: Add three days to delivery.
  - **XBB**: Ultra-hard, high-aluminum PVD coating.
### Punch Blanks

#### Jektais/Regular

<table>
<thead>
<tr>
<th>Material: Steel: A2, M2, P8 60-63 Heads RC 40-55</th>
<th>P8/2</th>
<th>75</th>
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<th>125</th>
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</thead>
<tbody>
<tr>
<td>L1 100</td>
<td>105</td>
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<tr>
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<td>190</td>
<td>195</td>
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<tr>
<td>L1 200</td>
<td>205</td>
<td>210</td>
<td>215</td>
<td>220</td>
<td>225</td>
</tr>
</tbody>
</table>

*Not available on 1.00 overall length. *Sies* to 38 for additional information.

### Countersink Punches

#### Features/Benefits

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

### Standard Alterations

Kommersial 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 P dimension, e.g. "XP." If the point length is other than standard, designate "XR" as the point length.

### Surface Coatings

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

**DayTride®** (XN) — screw point surface application often used in all applications. Ideal for punch and die work. Provides high dimensional stability. Approx hardness: RC 70.

**DayTAN®** (XNT) — applies via FDS (physical gas deposition). Provides extra hardness (hard as carbide) and excellent lubricity when used with a lubricant. Not recommended for stainless steel, copper, or nickel. Approx hardness: *Vickers 2500.


**XNM** — excellent for extraction, forming and turning applications. Also works well in shaving operations. Tolerance ± .0002. Approx hardness: *Vickers 1500.

**DayKool™ CRN** — cryogenic steel conditioning process, used primarily with hard, thick materials. Improves strength, toughness, and chemical stability.

**CRN** — excellent adhesion, high toughness, and good corrosion resistance. FINARY applicaions are made forming (copper, brass, bronze), metal die casting, and plastic injection molding. Approx hardness: *Vickers 1000-1900.

### 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 bolts (see drawing). There, the slugs are trapped until they fall freely through the tail. The use of this device has no effect on hole size, and will not require any changes in current required positions.

Our guarantee: Use Dayton Slug Control in a stamping die no pull slug. 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 blank catalog number. Please specify XSC for all additional information and show material thickness (inch) and clearance per side (percentage).

### Surface Coatings

- **DayTride®** (XN) — screw point surface application often used in all applications. Ideal for punch and die work. Provides high dimensional stability. Approx hardness: RC 70.
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- **CRN** — excellent adhesion, high toughness, and good corrosion resistance. FINARY applicaions are made forming (copper, brass, bronze), metal die casting, and plastic injection molding. Approx hardness: *Vickers 1000-1900.
- **ZertalPhas®** (XNP) — excellent wear resistance, thermal shock stability and toughness. Approx hardness *Vickers 2500.
- **XNA™ Progress** (XNA) — ultra-hard PVD coating that adheres shear stress provides excellent high-temperature resistance. Ideal for stamping where tools are exposed to extreme stress profiles. A great alternative to Ti coating when the dimensional changes associated with that process. Approx hardness: *Vickers 2000-2200.
- **Sanned Like Carbon Coating (XCD)™** combines high hard- ness with an extremely low coefficient of friction. Good perfor- mance under abrasive & adhesive wear. Approx. hardness *Vickers 5000.

### Dayton Slug Control

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- **XNM** — excellent for extraction, forming and turning applications. Also works well in shaving operations. Tolerance ± .0002. Approx hardness: *Vickers 1500.
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- **XNA™ Progress** (XNA) — ultra-hard PVD coating that adheres shear stress provides excellent high-temperature resistance. Ideal for stamping where tools are exposed to extreme stress profiles. A great alternative to Ti coating when the dimensional changes associated with that process. Approx hardness: *Vickers 2000-2200.
- **Sanned Like Carbon Coating (XCD)™** combines high hard- ness with an extremely low coefficient of friction. Good perfor- mance under abrasive & adhesive wear. Approx. hardness *Vickers 5000.
Straight Punches

Dayton Slug Control is easy to specify and order.

Coding:

- **X** for XSC alteration

**Table:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Thickness</th>
<th>Per Side</th>
<th>Catalog Number</th>
<th>Your Specs</th>
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</thead>
<tbody>
<tr>
<td>16</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dayton Slug Control**

- **Steel:** A2, M2, RC 60-63
- **Material:**
  - .188
  - .1250-.1880

**Standard Alterations**

- **XNA**—standard, used for punches and die buttons. Provides high dimensional stability. Approx. hardness: **XNA**
- **XNM**—stainless steel, copper, or nickel. Approx. hardness: **XNM**
- **XNP**—steel, M2. Produces lower coefficient of friction than other coatings. Provides excellent lubricity. Approx. hardness: **XNP**
- **XCN**—cryogenic steel conditioning process. Used primarily for hard, thick materials. Improves strength, toughness, and dimensional stability. Approx. hardness: **XCN**
- **XNT**—ultra-hard, high-aluminum PVD coating. **XNT**
- **XNT**—DayKool™—cryogenic steel conditioning process, used primarily for hard, thick materials. Improves strength, toughness, and dimensional stability. Approx. hardness: **XNT**
- **XNAP**—an excellent wear resistance, tolerant of shock or bending. Approx. hardness: **XNAP**
- **XNAProgress**—ultra-hard PVD coating that absorbs shock energy, provides excellent high-temperature resistance ideal for hot forming. Approx. hardness: **XNAProgress**
- **Diamond**—coatings that combine high hardness with an extremely low coefficient of friction. Good protection against abrasive & adhesive wear. Approx. hardness: **Diamond**
- **DayTiN**—very-high-efficiency, hard coating. Approx. hardness: **DayTiN**
- **DayTride**—combines high hardness with an extremely low coefficient of friction. Good protection against abrasive & adhesive wear. Approx. hardness: **DayTride**

**Surface Coatings**

DayTride (X1)—a low-cost surface application that heats 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 that is cost-effective and excellent lubricity when used with a lubricant. Not recommended for stainless steel, copper, or nickel. Approx. hardness: **XNM**

DayKool™ (X2K)—achieves ultra hardness (binder than standard) and superior damage wear resistance. Approx. hardness: **XNP**

TCM (XCN)—very hard PVD, thin films. Provides ultra hardness (binder than standard) and superior damage wear resistance. Approx. hardness: **XCN**

XNM (XCM)—alloyed PVDs. Produce lower coefficient of friction than other coatings. Provides excellent lubricity. Approx. hardness: **XNM**

XNP (XCN)—the ultimate coating for extrusion and forming applications. Also works with the above applications. Approx. hardness: **XNP**. Approx. hardness: **XNP**

XNT (XNT)—-cryogenic steel conditioning process. Used primarily for hard, thick materials. Improves strength, toughness, and dimensional stability. Approx. hardness: **XNT**

ZerrnPlus™ (XAN)—excellent wear resistance, thermal shock stability and hot hardness. Approx. hardness: **XAN**

XNAProgress (XANP)—ultra-hard PVD coating that absorbs shock energy, provides excellent high-temperature resistance ideal for hot forming. Approx. hardness: **XNAProgress**

**Standard Alterations**

**DayTride**—straight and Clospace Punches

**Table:**

<table>
<thead>
<tr>
<th>Type</th>
<th>P</th>
<th>L</th>
<th>Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>KWX</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**HOW TO ORDER**

Specify:

- **Qty.**
- **Type**
- **P**
- **L**
- **Steel**

Dayton Progress Corporation

Clospace Punches

For an explanation of the alterations codes shown above, see the “Standard Alterations, Regular Punches” on the p.7 pullout tab.
**Die Button Construction**

Commerical tapered relief 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 "XL" as the land length. Also see "Standard Alterations" on the front of the pull tab in this section for other special order designators.

**Standard Alterations**

Commercial 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 "XL" as the land length. Also see "Standard Alterations" on the front of the pull tab in this section for other special order designators.
**EDM Die Button Blanks**

**How to Order**

<table>
<thead>
<tr>
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<th>Type</th>
<th>D Code</th>
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<tr>
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<td>100</td>
<td>XP.020</td>
<td>M2</td>
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<tr>
<td>5</td>
<td>KDU</td>
<td>50</td>
<td>112</td>
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<td>M2</td>
</tr>
</tbody>
</table>

**Firm Delivery Schedule**

- **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)

### 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.

---

**Material**

- **Steel**: M2, RC 60-63
- **Round P**: 0.005
- **D ≥ 1.75**: 0.006

**Standard Alterations**

- **XB KN_ and KR_ Only or Longer than Standard**
- **Land Length Shorter (no charge)**

**Max. P/G**

<table>
<thead>
<tr>
<th>.171</th>
<th>.206</th>
<th>.250</th>
<th>.285</th>
<th>.345</th>
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<th>.565</th>
<th>.675</th>
<th>.750</th>
<th>.935</th>
<th>1.200</th>
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<tbody>
<tr>
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<td>.0005</td>
<td>.005</td>
<td>.005</td>
<td>.005</td>
<td>.005</td>
<td>.005</td>
<td>.005</td>
<td>.005</td>
<td>.005</td>
<td>.005</td>
</tr>
</tbody>
</table>

**Precision Overall Length**

- **Headed = .25+T**
- **Headless = .25**

**Tolerance**

- **D = ± .001**
- **Min. P or W = ± .0005**

**Key Dimensions**

<table>
<thead>
<tr>
<th>KDU</th>
<th>KDE</th>
<th>KHU</th>
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<tbody>
<tr>
<td><strong>D</strong></td>
<td><strong>L</strong></td>
<td><strong>R</strong></td>
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<td>.015</td>
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<tr>
<td>.0005</td>
<td>.0005</td>
<td>.0005</td>
</tr>
</tbody>
</table>

**Spark Gap**

- **Specified**
- **Unless Specified**

**Relief**

- **Unless Specified**
- **Round die buttons only**

---

**DayTride**

- **®**
- A unique wear-resistant wire cutting tool with a variety of overall length. Can be used for EDM applications, the land length (B) equals the length is held to ± .001.

**Dayton Progress Corporation**

www.daytonlamina.com
**Pilots**

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 theoretical sharp corners for shapes C22, C24, C34, C61, and C88. However, some reduction of theoretical sharp corners for shapes A/E, A/F, A/C, A/B, and on p. 23. Also, see the exception of shapes C22 and C24.

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.

**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.

**PRT Retainer**

sets include:
- 2 Dowels
- 2 Screws

**Ordering Information**

<table>
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<tr>
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<td>1.250</td>
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<td>5/32-16</td>
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</tbody>
</table>

* Now standard. See product pages.

**PRT Retainers**

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.
Ordering Information

Corner Dimensions
Dimension should be the theoretical sharp corner for shapes C12, C24, C34, C61, and C88. However, some reduction of these dimensions will result from filing 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 bores and die buttons are also centered as shown with the exception of shapes C25 and C34. Due to clearance, the P dimension on these shapes will not be centered.

Triangles/Trapezoids

Multi Lobes

Miscellaneous

Us

Polygons

Reflected View—Punches and Guides

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 ±.007 max. File off the punch and .007 max. file off the die button with matching corner shape on the die button and punch, respectively. When ordering die buttons, please specify punch dimensions and clearance per side (usually 0.0025). If the clearance is .0025, Dayton will break sharp corners when the punches and die buttons are ordered together.

Punches are available on stock. Specify: Qty. Type Code L Steel W Shape P PP LA Alterations

Triangles/Trapezoids

Multi Lobes

Miscellaneous

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Polygons

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

Clearance
Normal grinding methods produce ±.007 max. File off the punch and .007 max. file off the die button with matching corner shape on the die button and punch, respectively. When ordering die buttons, please specify punch dimensions and clearance per side (usually 0.0025). If the clearance is .0025, Dayton will break sharp corners when the punches and die buttons are ordered together.

Punches are available on stock. Specify: Qty. Type Code L Steel W Shape P PP LA Alterations

Triangles/Trapezoids

Multi Lobes

Miscellaneous

Us

Polygons

Reflected View—Punches and Guides

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 ±.007 max. File off the punch and .007 max. file off the die button with matching corner shape on the die button and punch, respectively. When ordering die buttons, please specify punch dimensions and clearance per side (usually 0.0025). If the clearance is .0025, Dayton will break sharp corners when the punches and die buttons are ordered together.

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Multi Lobes

Miscellaneous

Us

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Reflected View—Punches and Guides

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Triangles/Trapezoids

Multi Lobes

Miscellaneous

Us

Polygons

Reflected View—Punches and Guides

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 ±.007 max. File off the punch and .007 max. file off the die button with matching corner shape on the die button and punch, respectively. When ordering die buttons, please specify punch dimensions and clearance per side (usually 0.0025). If the clearance is .0025, Dayton will break sharp corners when the punches and die buttons are ordered together.

Punches are available on stock. Specify: Qty. Type Code L Steel W Shape P PP LA Alterations

Triangles/Trapezoids

Multi Lobes

Miscellaneous

Us

Polygons

Reflected View—Punches and Guides

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 ±.007 max. File off the punch and .007 max. file off the die button with matching corner shape on the die button and punch, respectively. When ordering die buttons, please specify punch dimensions and clearance per side (usually 0.0025). If the clearance is .0025, Dayton will break sharp corners when the punches and die buttons are ordered together.
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 standard punch blanks. Form Punches other than those are available as specials.

<table>
<thead>
<tr>
<th>Qty</th>
<th>Type Code</th>
<th>L</th>
<th>Steel</th>
<th>W Shape</th>
<th>P</th>
<th>PP</th>
<th>LA</th>
<th>Alterations</th>
</tr>
</thead>
</table>

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

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 punch-es. When ordering, please change the “X” designator to a “W.” Die Buttons are available as headed or headless with a counterbore relief, or as headed or headless with a tapered relief.

| Qty | Type Code | LL | Steel | W Shape | P | PP | LA | RS | RF | Alterations |

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

- **Punch**
  - .06 (.03 for J2 & J3)

- **Set Screw**
  - Pin Extension

- **Spring**
  - End Ground Square
  - .01 Fillet

- **Jektole Pin**
  - RC 44-48

- **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**

<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>J2</th>
<th>J3</th>
<th>J4</th>
<th>J6</th>
<th>J9</th>
<th>J12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Std. Shank Diameter</td>
<td>D</td>
<td>.1875</td>
<td>.2500</td>
<td>.3125</td>
<td>.3750</td>
<td>.4375</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5000</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>6250</td>
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<td>7500</td>
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<td></td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>1250</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>and larger</td>
</tr>
<tr>
<td>Point Hole Diameter</td>
<td>C</td>
<td>.020</td>
<td>.032</td>
<td>.046</td>
<td>.063</td>
<td>.094</td>
</tr>
<tr>
<td>Shank Hole Diameter</td>
<td>E</td>
<td>.086</td>
<td>.109</td>
<td>.141</td>
<td>.172</td>
<td>.221</td>
</tr>
<tr>
<td>Pin Extension</td>
<td>.03</td>
<td>.03</td>
<td>.06</td>
<td>.06</td>
<td>.06</td>
<td>.06</td>
</tr>
<tr>
<td>Keeper Key Number</td>
<td>920045</td>
<td>920053</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Keeper Key not available

**Jektole® Design Limits**

<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>J2</th>
<th>J3</th>
<th>J4</th>
<th>J6</th>
<th>J9</th>
<th>J12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. Shank Dia.</td>
<td>D</td>
<td>.172</td>
<td>.218</td>
<td>.282</td>
<td>.344</td>
<td>.442</td>
</tr>
<tr>
<td>Min. Point Dia.</td>
<td>P</td>
<td>.040</td>
<td>.064</td>
<td>.092</td>
<td>.126</td>
<td>.188</td>
</tr>
<tr>
<td>Max. Point Lgth.</td>
<td>B</td>
<td>1.25</td>
<td>1.50</td>
<td>1.62</td>
<td>1.62</td>
<td>1.62</td>
</tr>
</tbody>
</table>

**Universal Jektole® Components**

<table>
<thead>
<tr>
<th>EJECTOR PINS</th>
<th>J2</th>
<th>J3</th>
<th>J4</th>
<th>J6</th>
<th>J9</th>
<th>J12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Length</td>
<td>L</td>
<td>1.11</td>
<td>1.38</td>
<td>1.94</td>
<td>1.94</td>
<td>2.22</td>
</tr>
<tr>
<td>Pin Diameter</td>
<td>D</td>
<td>.017</td>
<td>.027</td>
<td>.041</td>
<td>.058</td>
<td>.089</td>
</tr>
<tr>
<td>Head Diameter</td>
<td>H</td>
<td>.048</td>
<td>.073</td>
<td>.094</td>
<td>.120</td>
<td>.156</td>
</tr>
<tr>
<td>Hd. Thickness</td>
<td>T</td>
<td>.031</td>
<td>.047</td>
<td>.062</td>
<td>.062</td>
<td>.094</td>
</tr>
<tr>
<td>SPRINGS</td>
<td>J2</td>
<td>J3</td>
<td>J4</td>
<td>J6</td>
<td>J9</td>
<td>J12</td>
</tr>
<tr>
<td>Outside Dia.</td>
<td>D</td>
<td>.081</td>
<td>.104</td>
<td>.136</td>
<td>.167</td>
<td>.216</td>
</tr>
<tr>
<td>Free Length</td>
<td>L</td>
<td>2.38</td>
<td>2.38</td>
<td>3.19</td>
<td>3.00</td>
<td>3.03</td>
</tr>
<tr>
<td>Pressure (12° Pre-load) lbs.</td>
<td>.5</td>
<td>.75</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>SCREWS</td>
<td>J2</td>
<td>J3</td>
<td>J4</td>
<td>J6</td>
<td>J9</td>
<td>J12</td>
</tr>
<tr>
<td>Screw Size</td>
<td>D</td>
<td>#3-48</td>
<td>#5-40</td>
<td>#8-32</td>
<td>#10-32</td>
<td>#14-28</td>
</tr>
<tr>
<td>Screw Length</td>
<td>L</td>
<td>.19</td>
<td>.19</td>
<td>.19</td>
<td>.19</td>
<td>.25</td>
</tr>
</tbody>
</table>

---

Dayton Progress Corporation

www.daytonlamina.com
Locking Devices—Flats vs. Dowel Slots

Flats

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

<table>
<thead>
<tr>
<th>Body Dia.</th>
<th>18</th>
<th>25</th>
<th>31</th>
<th>37</th>
<th>43</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>.080</td>
<td>.110</td>
<td>.135</td>
<td>.165</td>
<td>.190</td>
<td>.220</td>
</tr>
<tr>
<td>Body Dia.</td>
<td>62</td>
<td>75</td>
<td>87</td>
<td>100</td>
<td>125</td>
<td>150</td>
</tr>
<tr>
<td>F</td>
<td>.270</td>
<td>.325</td>
<td>.380</td>
<td>.435</td>
<td>.540</td>
<td>.650</td>
</tr>
<tr>
<td>Body Dia.</td>
<td>175</td>
<td>200</td>
<td>225</td>
<td>250</td>
<td>275</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>.775</td>
<td>.900</td>
<td>1.025</td>
<td>1.150</td>
<td>1.275</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Flat</th>
<th>Dowel</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Radial</td>
<td>Radial</td>
</tr>
<tr>
<td>+.0005</td>
<td>+.0005</td>
</tr>
<tr>
<td>-.0000</td>
<td>-.0000</td>
</tr>
</tbody>
</table>

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

Order Example: X2 — 90°

Double Flats: X3

Order Example: X3 — 90° Second Flat is always parallel to the first flat.

Additional Flats (From Top)

<table>
<thead>
<tr>
<th>Code</th>
<th>Depth</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>X81</td>
<td>.060</td>
<td>.500</td>
</tr>
<tr>
<td>X82</td>
<td>.060</td>
<td>.625</td>
</tr>
<tr>
<td>X83</td>
<td>.060</td>
<td>.750</td>
</tr>
<tr>
<td>X84</td>
<td>.060</td>
<td>Full Length</td>
</tr>
<tr>
<td>X85</td>
<td>.093</td>
<td>.500</td>
</tr>
<tr>
<td>X86</td>
<td>.093</td>
<td>.625</td>
</tr>
<tr>
<td>X87</td>
<td>.093</td>
<td>.750</td>
</tr>
<tr>
<td>X88</td>
<td>.093</td>
<td>Full Length</td>
</tr>
<tr>
<td>X89</td>
<td></td>
<td>Specify Dimensions</td>
</tr>
</tbody>
</table>

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

Order Example: X0 — 180°** available on headless die buttons only

Custom Locations

Definitions:

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

Single Flats: X5 & X9

Order Example: X5 — 135°

Double Flats: X6

Order Example: X6 — 135°

Additional Flats (From Top)

<table>
<thead>
<tr>
<th>Code</th>
<th>Depth</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>X91</td>
<td>.060</td>
<td>.500</td>
</tr>
<tr>
<td>X92</td>
<td>.060</td>
<td>.625</td>
</tr>
<tr>
<td>X93</td>
<td>.060</td>
<td>.750</td>
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<tr>
<td>X94</td>
<td>.060</td>
<td>Full Length</td>
</tr>
<tr>
<td>X95</td>
<td>.093</td>
<td>.500</td>
</tr>
<tr>
<td>X96</td>
<td>.093</td>
<td>.625</td>
</tr>
<tr>
<td>X97</td>
<td>.093</td>
<td>.750</td>
</tr>
<tr>
<td>X98</td>
<td>.093</td>
<td>Full Length</td>
</tr>
<tr>
<td>X99</td>
<td></td>
<td>Specify Dimensions</td>
</tr>
</tbody>
</table>

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

Order Example: X71 — 135°

F Dimension

For Headed Punches and Die Buttons

<table>
<thead>
<tr>
<th>Locking Devices</th>
<th>Dowel Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>X0**</td>
<td>.1250</td>
</tr>
<tr>
<td>X4</td>
<td>.1250</td>
</tr>
<tr>
<td>X41</td>
<td>.1875</td>
</tr>
<tr>
<td>X43</td>
<td>.2500</td>
</tr>
</tbody>
</table>

F Dimension

For Headless Die Buttons Only

<table>
<thead>
<tr>
<th>Locking Devices</th>
<th>Dowel Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>X0, X1</td>
<td>.1250</td>
</tr>
<tr>
<td>X4, X7</td>
<td>.1625</td>
</tr>
<tr>
<td>X41, X71</td>
<td>.1938</td>
</tr>
<tr>
<td>X43, X73</td>
<td>.2250</td>
</tr>
</tbody>
</table>

Body Diameter 25 31 37 43 50 62 75 87 100 125-275

X0, X1 .1250 .1562 .1875 .2188 .2500 .5D .5D .5D .5D .5D
X4, X7 .1625 .1875 .2125 .2375 .2625 .5D .5D .5D .5D .5D
X41, X71 .1938 .2188 .2438 .2688 .2938 .5D .5D .5D .5D .5D
X43, X73 .2250 .2500 .2750 .3000 .3250 .3438 .4063 .4688 .5313 .5D

www.daytonlamina.com
Urethane Strippers

Features/Benefits

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

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

### HOW TO ORDER

Specify: Qty. Type I.D. L

Example: 12 USE 37 125

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>I.D.</th>
<th>O.D.</th>
<th>L</th>
<th>Pressure at Deflection of</th>
<th>⅛</th>
<th>⅛-⅜</th>
<th>⅜</th>
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</thead>
<tbody>
<tr>
<td>USE18-125</td>
<td>⅛</td>
<td>⅛</td>
<td>⅛</td>
<td></td>
<td>250</td>
<td>400</td>
<td>—</td>
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<tr>
<td>USE18-150</td>
<td>⅛</td>
<td>⅛</td>
<td>⅛</td>
<td></td>
<td>230</td>
<td>350</td>
<td>—</td>
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<tr>
<td>USE25-125</td>
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<td>⅛</td>
<td>⅛</td>
<td></td>
<td>280</td>
<td>475</td>
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<td>⅛</td>
<td>⅛</td>
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<td>⅛</td>
<td>⅛</td>
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<td>320</td>
<td>500</td>
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<tr>
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<td>⅛</td>
<td>⅛</td>
<td></td>
<td>300</td>
<td>450</td>
<td>—</td>
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<td>⅛</td>
<td>⅛</td>
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<td>270</td>
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<td>575</td>
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<td>⅛</td>
<td>⅛</td>
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<td>695</td>
<td>—</td>
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<td>625</td>
<td>—</td>
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<td>⅛</td>
<td>⅛</td>
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<td>575</td>
<td>760</td>
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<td>⅛</td>
<td>⅛</td>
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<td>310</td>
<td>515</td>
<td>670</td>
</tr>
<tr>
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<td>⅛</td>
<td>⅛</td>
<td>⅛</td>
<td></td>
<td>520</td>
<td>790</td>
<td>—</td>
</tr>
<tr>
<td>USE50-150</td>
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<td>⅛</td>
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Dayton Progress Corporation

www.daytonlamina.com
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.

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For Round Punches Only

XS19 Nail Point

XS20 Chamfer

XS21 Conical

For Round & Shape Punches

XS22 Double Shear

XS23 Single Shear

XS24 Single Shear Angle with Flat

Shown as reflected view.
Commitment to Quality & Customer Satisfaction

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

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

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

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