Precision Punches, Pilots, Die Buttons, & Retainers

Better performance, longer runs, less downtime

Versatile

Global leader in providing fabrication and stamping solutions

MISUMI Group Company

www.daytonlamina.com
Versatile Precision Products

Product Applications

Versatile Punches, Pilots, Die Buttons, and Retainers are built to exact tolerances and concentricity to provide superior alignment, better performance, longer runs, and less downtime. Dayton Versatile products are considered “top-of-the-line” by regular users, and are mainstays in heavy industries with high-demand applications, such as automotive and major appliance manufacturing.

Versatile punches and die buttons provide three times better alignment than other major brands, thus assuring longer runs and better part performance. Versatile die buttons with tapered relief have no overhand and no step (unlike conventional counter-bored relief); provide positive slug control; and never fail due to lack of support of the cutting edge.

Dayton’s Versatile precision product line includes: Jektole® Punches (slug ejection punches); Regular Punches; Regular Pilots; Positive Pick-Up Pilots; Compact Positive Pick-Up Pilots; Straight and Blank Punches; Clospace Punches; Die Buttons; Retainers; Guide Bushings; and others, including Quill Bushings, Micro Guides, Misfeed Detectors, and Locking Devices. Standard sizes and standard alterations are shown in this catalog within individual product sections.

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 buttons (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 reground practices.

Ordering Information

Each page contains detailed instructions on how to order specific Dayton Versatile 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 below, the type specified is “VPR.” “V” stands for Versatile, “P” stands for punch, and “R” stands for rectangle. 37 is the press-fit diameter, which is coded by the first two digits of the decimal equivalent (.375”). 12 is the shank length, which is coded by inches and quarter-inches (one inch and two quarters). 23 is the overall length, coded by inches and quarter-inches. Finally, P.1875 and W.1325 represent the point or hole size dimensions.

Standard Alterations

Punches, pilots, and die buttons are available in sizes other than those listed in the catalog.

When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the P and W dimensions are outside the standard range, an “X” is placed in front of the P or W dimension, e.g., “XP” and/or “XW.” If the point length is other than standard, designate “XB” for the point length. See the foldout tabs in the individual product sections for these and other special order designations.
Contents

Punches

Standard Shapes

<table>
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<tr>
<th>Punches</th>
<th>Series</th>
<th>Length</th>
<th>Point or Hole Size</th>
<th>Dimensions As Specified</th>
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<tbody>
<tr>
<td>VN_ / VR_ Die Buttons</td>
<td>18</td>
<td>Round/Shape</td>
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<td>KD_/KH_EDM Button Blanks</td>
<td>19</td>
<td>Round/Shape</td>
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<td>VJ_ Jektole®</td>
<td>4, 5</td>
<td>Round/Shape</td>
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<td>VP_ Regular</td>
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<td>VPT Pilots</td>
<td>8, 9</td>
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<td>VUAC/VPAC Pilots</td>
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<td>Compact Positive Pick-Up</td>
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<td>VJ_/VP_ Extended Range</td>
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Die Buttons

- VN_ / VR_ Die Buttons
- KD_/KH_EDM Button Blanks

Retainers

- VRP Retainers
- VRT/VRTS Retainers

Bushings/Guides

- VG/VF/VE Guide Bushings
- MEX/MFX/MGX Micro Guides
- MDX/MHX Micro Buttons
- VQX/VFQ Quill Bushings/Guides

Product Designation

Each page contains detailed instructions on how to order specific Dayton Versatile products. In addition, use the following chart to define the product as a part number.

Example:

<table>
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<tr>
<th>Line Product Shape</th>
<th>Press-Fit Dia. D (shank diameter)</th>
<th>Shank Length</th>
<th>Overall Length L</th>
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<tr>
<td>VPR 37 1223.P1875,W1325</td>
<td>V for Versatile, P for Punch</td>
<td>1 inch and 2 quarters</td>
<td>Coded by inches and quarter-inches (2 inches and 3 quarters).</td>
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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.

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Miscellaneous/Other

- Classified Shapes
- Shear Angles
- Locking Devices
- Form Shapes
- Jektole® Data

Classified Shapes

- Classified shapes (83 common shapes, no detailing required) are available on all punches, solid die buttons, and guide bushings as indicated in this catalog. See pp. 22, 23 for more information and special instructions. Also, see individual product pages and pp. 30, 31 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.

www.daytonlamina.com
### Jektole® Punches

#### Features/Benefits

- **Jektole®** punches permit doubling punch to die clearance, producing up to three times the number of hits between sharpenings, and reduce burr heights.

#### 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., "50X" or "75W." If the point length is other than standard, designate "ZK" as the point length. Also see "Standard Alterations" on the front of the punch list in the section for other special order designations.

#### Surface Treatments & Coatings

Some coating products can be cited to increase hardness, reduce friction, and improve wear and corrosion resistance.

- **DayTride** — Hard, high-temperature coating — excellent adhesion, high toughness, and good lubricity when used with a lubricant. Not recommended for stainless steel, copper, or nickel. Approx. hardness: **Volcano 60**.

- **DayKool**™—extra-hard, high-temperature PVD coating. Abrasion resistant, high temperature, excellent adhesion, and good toughness. For EX ductile steels, tool steels, and PH Trail steels. Approx. hardness: **Volcano 610**.

- **TiCN (XCN)** — Very hard PVD coating. Provides ultra hardness (harder than ceramic) and superior abrasive wear resistance.

- **KIM** — PVD, solid film. Provides lower coefficient of friction than other coatings. Provides excellent lubricity. Approx. hardness: **Xektole 2500**.

- **DayKool**™—Highly Spurcoated coating process, used primarily with hard, nickel materials. Improves strength, toughness, and dimensional stability.

- **CVD (CVD)** — Excellent adhesion, high toughness, and good corrosion resistance. Primary applications are metal bonding (copper, brass, bronze), metal die coating, and plastic injection moulding. Approx. hardness: **Xektole 2650**.

- **ZentraPlus**™ (XN3) — Excellent wear resistance, thermal shock stability and hot hardness. Approx. hardness: **Xektole 2625**.

- **Xektraverse (XN4)** — Highly Spurcoated PVD coating which absorbs shock energy, provides excellent high-temperature resistance in dies for stamping where tools are exposed to extreme stress profiles. A good alternative to TiCN coating without the dimensional changes associated with that process. Approx. hardness: **Xektole 2625**.

- **Diamond Like Carbon Coating** (XCD) — combines high hardness with an extremely thin film of diamond for protection against abrasive & adhesive wear. Approx. hardness: **Xektole 2600**.

#### Table: P&W Dimensions

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Features/Benefits
Regular 'V' punches provide three times better alignment than other major brands; offer longer tool life; and can significantly improve finished part quality.

Surface Coatings & Treatments
Some catalog products can be coated to increase hardness, reduce galling, and improve wear and corrosion resistance.

DayTak™ (920)—a low-cost surface application that treats all 'V' punches and die blocks. Provides high dimensional stability. Approx. hardness: RC71.

Zerton™—a surface treatment that provides high dimensional stability. Approx. hardness: RC73.

DayTak™ (920)—a low-cost surface application that treats all 'V' punches and die blocks. Provides high dimensional stability. Approx. hardness: RC71.

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### Regular Pilots

**Features/Benefits**

*Regular Pilots* are designed 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.

**Surface Coatings & Treatments**

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

- **DayTride** on a low-cost surface application that treats all exposed surfaces. Ideal for punches and die bodies. Provides high dimensional stability. Approx. hardness: **RC70**.

- **DayTiN**—applied via PVD (physical vapor deposition). Provides extreme hardness (hard as carbide) and excellent lubricty. Allows use with a tap in all materials. Not recommended for stainless steel, brass, copper, or nickel. Approx. hardness: **Vickers 2000**.

- **DayTAK** on a hard, high-alumina PVD coating. Allows dry drilling and provides excellent wear resistance. Ideal for mild steel, brass, and TRIP steels. Approx. hardness: **Vickers 2000**.

- **Titan (TCN)—very hard PVD, thin film. Provides ultra hardness (harder than carbide) and superior adhesive wear resistance. Approx. hardness: **Vickers 2000**.

- **XNM**—PVD, bi-lam. Produces lower coefficient of friction than other coatings. Provides excellent lubricity. Approx. hardness: **XNM 2000**.

**Diamond Like Carbon Coating (XDC)—combines high hardness with an extremely low coefficient of friction. Good protection against abrasive & adhesive wear. Approx. hardness: **Vickers 2000**.

### Standard Altersations

**Regular Pilots** are available in sizes other than those shown in the chart to the left.

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

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**Table 3-5**

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**Table 3-6**

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<tr>
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**Table 3-7**

<table>
<thead>
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBRLRB</td>
<td>N = [(P-.057)/.728]+.132 when &quot;P&quot; dimension is less than &quot;Pn&quot; shown in chart.</td>
</tr>
</tbody>
</table>

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**Table A-1**

<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
<th>Min. P (Rounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>XNP</td>
<td>1.00</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAT</td>
<td>1.25</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAK</td>
<td>1.50</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAX</td>
<td>1.75</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAC</td>
<td>2.00</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAS</td>
<td>2.25</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAM</td>
<td>2.50</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAO</td>
<td>2.75</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAS</td>
<td>3.00</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAN</td>
<td>3.25</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAO</td>
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<tr>
<td>XAT</td>
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<td>P = .175</td>
</tr>
<tr>
<td>XAX</td>
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</tr>
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</table>

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**Table B-1**

<table>
<thead>
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<th>Type</th>
<th>Min. P (Rounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>XNP</td>
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<td>P = .175</td>
</tr>
<tr>
<td>XAT</td>
<td>1.25</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAK</td>
<td>1.50</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAX</td>
<td>1.75</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAC</td>
<td>2.00</td>
<td>P = .175</td>
</tr>
<tr>
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<td>2.25</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAM</td>
<td>2.50</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAO</td>
<td>2.75</td>
<td>P = .175</td>
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<tr>
<td>XAS</td>
<td>3.00</td>
<td>P = .175</td>
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<tr>
<td>XAN</td>
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<td>P = .175</td>
</tr>
<tr>
<td>XAO</td>
<td>3.50</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAT</td>
<td>3.75</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAX</td>
<td>4.00</td>
<td>P = .175</td>
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</table>

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**Table C-1**

<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
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</tr>
</thead>
<tbody>
<tr>
<td>XNP</td>
<td>1.00</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAT</td>
<td>1.25</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAK</td>
<td>1.50</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAX</td>
<td>1.75</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAC</td>
<td>2.00</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAS</td>
<td>2.25</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAM</td>
<td>2.50</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAO</td>
<td>2.75</td>
<td>P = .175</td>
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<tr>
<td>XAS</td>
<td>3.00</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAN</td>
<td>3.25</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAO</td>
<td>3.50</td>
<td>P = .175</td>
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<td>XAT</td>
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<td>P = .175</td>
</tr>
<tr>
<td>XAX</td>
<td>4.00</td>
<td>P = .175</td>
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**Table D-1**

<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
<th>Min. P (Rounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>XNP</td>
<td>1.00</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAT</td>
<td>1.25</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAK</td>
<td>1.50</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAX</td>
<td>1.75</td>
<td>P = .175</td>
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<tr>
<td>XAC</td>
<td>2.00</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAS</td>
<td>2.25</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAM</td>
<td>2.50</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAO</td>
<td>2.75</td>
<td>P = .175</td>
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<tr>
<td>XAS</td>
<td>3.00</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAN</td>
<td>3.25</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAO</td>
<td>3.50</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAT</td>
<td>3.75</td>
<td>P = .175</td>
</tr>
<tr>
<td>XAX</td>
<td>4.00</td>
<td>P = .175</td>
</tr>
</tbody>
</table>
Positive Pick-Up Pilots

Features/Benefits
Dayton Verson® positive pick-up pilots provide smooth, gentle pick-up without the risk of distorting the hole. In addition, the unique design moves the stock farther than conventional pilots.

Surface Coatings & Treatments
Some coating products can be coated to increase hardness, reduce galling, and improve wear and/or corrosion resistance. Contacts with: Epoxy, Teflon, Teflon®/TiCN, and other surface treatments.

1. Read LRB value
2. Find (D-P)/2 value on left side of chart.
3. Shank Dia., D 18 25 31 37 43 50 62 75 87 100
4. Head diameter does not change with body diameter.

Material:
Shear: A2 M2 (RC 62-63) All heads are drawn in RC 45-45
Tolerance: ISO 13675
When P=2D, Tolerance is 2% When P<2D, should tolerance apply.

If you require a length other than shown, designate "XL" (original B length will be maintained). If the point length is other than shown, designate "XLB." Stock removal from point end which shortens B overall length. To maintain "B", specify "XLB."

Standard Alterations

Material

<table>
<thead>
<tr>
<th>Oxide</th>
<th>Grade</th>
<th>Range</th>
<th>Tolerance</th>
</tr>
</thead>
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<tr>
<td>2.25</td>
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<td>2.75</td>
<td>3.00</td>
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<tr>
<td>.299</td>
<td>.299</td>
<td>.299</td>
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<tr>
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<td>.399</td>
<td>.399</td>
</tr>
<tr>
<td>.499</td>
<td>.499</td>
<td>.499</td>
<td>.499</td>
</tr>
</tbody>
</table>

P Tolerance: +.0002
P to D: –.0000

1 Day

D Code
Min. XD .126 .188 .251 .313 .376 .438 .562 .688 .813 .938

D+.125 .1568 +.010 +.005 +.00 .0000 +.010 +.005 +.00 .0000 +.010

Positive Pick-up Pilots

Geometric provides smoothest pick-up with the risk of distorting the hole. In addition, the unique design moves the stock farther than conventional pilots.

Geometry provides smoothest pick-up with the risk of distorting the hole.

Greater positioning—moves stock farther than conventional pilots.

Features/Benefits
Dayton Verson® positive pick-up pilots provide smooth pick-up without the risk of distorting the hole; in addition, the unique design moves the stock farther than conventional pilots.

Surface Coatings & Treatments
Some coating products can be coated to increase hardness, reduce galling, and improve wear and/or corrosion resistance. Contacts with: Epoxy, Teflon, Teflon®/TiCN, and other surface treatments.

1. Read LRB value
2. Find (D-P)/2 value on left side of chart.
3. Shank Dia., D 18 25 31 37 43 50 62 75 87 100
4. Head diameter does not change with body diameter.

Material:
Shear: A2 M2 (RC 62-63) All heads are drawn in RC 45-45
Tolerance: ISO 13675
When P=2D, Tolerance is 2% When P<2D, should tolerance apply.

If you require a length other than shown, designate "XL" (original B length will be maintained). If the point length is other than shown, designate "XLB." Stock removal from point end which shortens B overall length. To maintain "B", specify "XLB."
### Compact Positive Pick-Up Pilots

**Material:**
- Steel: A2, 40Cr (GC-60-62), 60Cr (GC-63-65)

<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
<th>Shank Dia. (in)</th>
<th>Lgth. (in)</th>
<th>P</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>XP</td>
<td>2 Days</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Standard Allocations

- **2 Days**
- **Compact Positive Pick-Up Pilots**
- Versatile compact positive pick-up pilots are available in over 300 sizes other than those shown in the charts on pp. 12, 13.

When ordering, you are asked to specify different designators for various non-standard dimensions.

- **Example:** A2 25 VUAC — 75 4380 XLB5 A2

- **Point Code**
- **Type**
- **Min. P (Rounds)***

---

### Features/Benefits

Dayton Vessel Compact Positive Pick-Up Pilots—mounted in a guided strip—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 force on the pilot. Sometimes, the strength of the pilot—as well as the function of the other die set components—can be compromised.

- **Dayton Compact Pilots** provide virtually no unsupported surface that is susceptible to sideways movement, stress, or wear. Pilots always maintain the proper extension, and there is no need to move or adjust the pilot during reaming.

- **Dayton Compact Pilots** are light in weight, fast in operation, and are ideally suited for high-demand applications.

---

### Surface Coatings & Treatments

Visual appearance and tool cost can be controlled by a variety of coatings that improve tool life and overall performance, reduce galling, and improve wear and corrosion resistance.

- **DayTAN®**—thin carbon surface treatment that heats at even-expansion rate, ideal for punch and the like. Provides high-dimensional stability. Approx. hardness: Rockwell C 2.

- **DayTAN® (XT)**—plated-in-PVD (physical vapor deposition), provides extreme hardness (hard as carburized) and excellent quality when used with a suitably coated tool. Not recommended for high-volume, steel, copper, or nickel. Approx. hardness: *“XBR” 2006.*

- **DayTAN® (XJ**—thin—high altitude PVD coating. Achieves above wear and provides increased temperature resistance. Approx. hardness: 600HRC. Optimum use of 40Cr and 70Cr steels. Approx. hardness: *“XBR” 2006.*

- **TICN®**—very hard PVD, thin film. Provides ultra hardness (harder than carburized) and a greater abrasion wear resistance. Approx. hardness: 2000HRC.

- **XNM®**—PVD, solid film. Produces lower coefficient of friction than other coatings, provides excellent hardness. Approx. hardness: *“XBR” 2006.*

- **XNB®**—the ultimate coating for extrusion and forming applications. Also works well in shearing and forming operations. Tolerance is ± .0005. Approx. hardness: *“XBR” 2006.*

- **DayKool®**—moderate average coating process, used primarily with hard, high-carbon materials. Improves strength, toughness, and dimensional stability.

- **CIM®**—excellent adhesion, high toughness, and good corrosion resistance. Primary applications are metal forming (paper, brass, bronze), metal casting, and plastic injection molding. Approx. hardness: *“XBR” 1000-1200.

- **ZertoCarb®**—excellent wear resistance, thermal shock stability and resistance. Approx. hardness: *“XBR” 2006.*

- **XNA®**—ultra-hard PVD coating that absorbs stress shocks, provides excellent high-temperature resistance. Ideal for die-making where tools are exposed to extreme stress profiles. A good alternative to TD coating without the dimensional changes associated with that process. Approx. hardness: *“XBR” 2006.*

- **DiamondLike Carbon Coating (XDC)**—continuous high hard wear film on an extremely low coefficient of friction. Good protection against abrasive & adhesive wear. Approx. hardness: *“XBR” 2006.*

---

### Compact Positive Pick-Up Pilots

<table>
<thead>
<tr>
<th>Material</th>
<th>Type</th>
<th>Shank Dia.</th>
<th>Lgth.</th>
<th>P</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2</td>
<td></td>
<td>0.2500</td>
<td>0.3125</td>
<td>0.02</td>
<td>0.0002</td>
</tr>
<tr>
<td>40Cr</td>
<td></td>
<td>0.2500</td>
<td>0.3125</td>
<td>0.02</td>
<td>0.0002</td>
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<tr>
<td>60Cr</td>
<td></td>
<td>0.2500</td>
<td>0.3125</td>
<td>0.02</td>
<td>0.0002</td>
</tr>
</tbody>
</table>

---

**Features/Benefits**

Dayton Punch Blanks are an ideal cost-effective alternative in applications where Dayton standard shape configurations or our classified shapes do not meet customer requirements. Blanks—available in a full range of standard lengths from 1.250 to 7.000—can be custom-ground to meet virtually any customer requirement.

---

**Surface Coatings & Treatments**

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

**DayTride** (XH)—low-cost surface application that results in exposed schloer. Ideal for punches and die-bolts. Provides high dimensional stability. Approx. hardness: RC57.

**DayKool** (XK)—applied via PVD (physical vapor deposition). Provides extreme hardness (hard as carbides) and excellent lubricity when combined with a lubricant. Not recommended for stainless steel, copper, or nickel. Approx. hardness: *Vickers 3600.

**DayKool®** (XK)—ultra-hard, high-quality PVD coating. Achieves edge life and provides high thermal resistance. Ideal for high volume, high speed, and high toughness applications.

---

**Standard Alternations**

**Punch Blanks**

<table>
<thead>
<tr>
<th>Type</th>
<th>Jektole Standard Alterations</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VJB</td>
<td></td>
<td>Reduced Head Diameter</td>
</tr>
<tr>
<td>VPV</td>
<td></td>
<td>Stock removal from head end which shortens L1</td>
</tr>
</tbody>
</table>

---

**Material**

Steel: A2, M2, PS4 (RC 60-63), PS (RC 63-65)

All heads are drawn to RC 40-55.

---

**Notes**

*See p.32 for additional information.

---

**Punch Blanks**

<table>
<thead>
<tr>
<th>Type</th>
<th>Jektole Standard Alterations</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VJB</td>
<td></td>
<td>Reduced Head Diameter</td>
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<tr>
<td>VPV</td>
<td></td>
<td>Reduced Head Diameter</td>
</tr>
</tbody>
</table>

---

**Notes**

*See p.32 for additional information.
Surface Coatings & Treatments

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

DayTride™ — low-cost surface treatment that meets all annealing surfaces. Ideal for punches and die buttons. Provides high dimensional stability. Approx. hardness: RC73.

DayTiN™ — applied as PVD physical vapor deposition. Provides extra hardness (harder, solid), and excellent durability when used in a submicron, non-meltable coating. Ideal for stainless steel, cooper, or nickel. Approx. hardness: *Vickers 2000.


Steel: A2, M2 (RC 60-63)

Approx. hardness: *Vickers 3100.

Some catalog products can be coated to increase hardness, reduce galling, and improve wear and/or corrosion resistance. For an explanation of the alteration codes shown above, see the "Standard Alternatives, Regular Punches" on the p.3 pullout tab.

Standard Alternatives

Variable standard and closepace punches are available in sizes other than those shown in the chart above and on p.17. When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the P dimension is outside the standard range, an "X" is placed in front of the P dimension. e.g. "X-" also see "Standard Alternations" on the front of the pullout tab in this section for other special order designations.

When ordering, you are asked to specify different designations for various non-standard dimensions.

When P< .062 "P" is .062 and less.

DayTride™ — low-cost surface treatment that meets all annealing surfaces. Ideal for punches and die buttons. Provides high dimensional stability. Approx. hardness: RC73.

DayTiN™ — applied as PVD physical vapor deposition. Provides extra hardness (harder, solid), and excellent durability when used in a submicron, non-meltable coating. Ideal for stainless steel, cooper, or nickel. Approx. hardness: *Vickers 2000.


Steel: A2, M2 (RC 60-63)

Approx. hardness: *Vickers 3100.

Some catalog products can be coated to increase hardness, reduce galling, and improve wear and/or corrosion resistance. For an explanation of the alteration codes shown above, see the "Standard Alternatives, Regular Punches" on the p.3 pullout tab.

Standard Alternatives

Variable standard and closepace punches are available in sizes other than those shown in the chart above and on p.17. When ordering, you are asked to specify different designations for various non-standard dimensions. For example, if the P dimension is outside the standard range, an "X" is placed in front of the P dimension. e.g. "X-" also see "Standard Alternations" on the front of the pullout tab in this section for other special order designations.

When ordering, you are asked to specify different designations for various non-standard dimensions.

When P< .062 "P" is .062 and less.
## Standard Alterations

### Clospace Punches Alteration

- **XD**: Held to ±.0005.
- **XP**: Same as XT except head which shortens.
- **G**: Stock removal from point end.

### Product Specifications

- **Minimum head diameter**
- **Reduced Head Diameter**
- **Stock removal from point end.**

### Product Details

- **1.75**: .062 -.020 .031 -.093 -.020 .031 .31 .703
- **1.2500**: .062 -.020 .031 .125 -.020 .031 .37 .828
- **2.7500**: .125 -.020 .031 .125 -.020 .031 .37 2.230
- **1.7500**: .125 -.020 .031 .125 -.020 .031 .37 1.430

### Optional Features

- **Round Relief**: .004-.008/inch/side.
- **Round Relief (with or without XP)**: .004

### Additional Information

- **Material**: Steel.
- **P**: Optional P Std. (When ordering specify)
- **Alt.**: P/G Code

---

### EDM Die Button Blanks

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Your Specs</th>
</tr>
</thead>
<tbody>
<tr>
<td>VRX</td>
<td>YX</td>
</tr>
</tbody>
</table>

### How to Order

1. **Specified**: Qty. Type D Code L P Steel
2. **Optional**: P Std.
3. **Retainer Type**: Catalog No. 3 VJR 62 90° X2

---

### Dayton Slug Control

- **For additional information, contact your Dayton representative.**

---

### Dayton Standard Alterations

- **Standard "P"**: Will be provided, unless otherwise specified.
- **Headless Only**: *(with or without XP)*
- **Lead**: .  Relief hole (R)
- **Features/Benefits**: in wire cutting, a tapered relief through the relief. The use of guides and a surface treatment for M2 & PS only.
- **Our guarantee**: Our guarantee:
  - Headless Only
  - Our guarantee:
  - If a larger clearance (We cannot guarantee the retention of slugs when clearance exceeds 10% per side.)

---

### Dayton Slug Control (with body reduction).

- **Head diameter does not change** (see drawing).
- **There, the slugs are trapped until they fall freely designed inside the die button surface during withdrawal of the slug.)**
- **Our guarantee**: Our guarantee:
  - Headless Only
  - If a larger clearance (We cannot guarantee the retention of slugs when clearance exceeds 10% per side.)

---

### Dayton Slug Control (with body reduction).

- **Head diameter does not change** (see drawing).
- **There, the slugs are trapped until they fall freely designed inside the die button surface during withdrawal of the slug.)**
- **Our guarantee**: Our guarantee:
  - Headless Only
  - If a larger clearance (We cannot guarantee the retention of slugs when clearance exceeds 10% per side.)
### Multi-Location® Retainers

*Multiple Head Type Punch Retainer*

![Image](image1.png)

**See the back of the pull-out tab for additional information on VRP Locking Devices.**

**Multi-Location™ Retainers** require special order forms, which are available on request. Specify all dimensions from the datum. Use the drawing above for reference.

### True Location® Retainers

*Single Head*

![Image](image2.png)

**Locking Mechanism**

The locking mechanism for the Multi-Location™ VRP Retainer and the True Location™ VRTS Retainer (for shaped punches) is part of the retainer itself, and is used to lock the shaped punches, thus providing accurate radial location.

The flat for the VRTS Retainer is always located as shown in the drawing on the left. The flats for the VRP Retainer can be located at any angle by specifying the angle from 0°.

### Standard Alterations

*Multi-Location® Retainers*

**Standard Jackstrokes**

Jacquard makes it easier to pull retainers off the downs.

**Special Size**

Any amount of material can be removed from the sides of the retainer for a custom size. Edges are saw cut ± 0.025.

**Clearance Holes**

Clearance holes or tapped holes can be detailed, as shown in the order example.

**Location**

± 0.010

**Diameter**

± 0.005

The following alterations require detailed drawings:

**Notch**

Notches to clear other than cladding can be added to any side of the retainer. Notches are call out ± 0.025.

**Angles**

As with notches, angles can be added to clear other tooling in the die. Angles are saw cut ± 0.025.

**Retainer sets include:**

- **2 Dowels**
- **2 Screws**

**Retainer sets include:**

- **2 Dowels**
- **2 Screws**

**Shim/Backing Plate**

Shim Plates can also be used on any Dayton Progress triangular-shaped retainers.

**Shim Plates**

- **Clearance Holes or Tapped Holes**
- **Counterbored and Tapped**
- **Counterbored**

**Clearance**

± 0.005

**Tapped Holes**

± 0.0004

The Clearance holes or tapped holes can be detailed, as shown in the order example.

**Location**

± 0.010

**Diameter**

± 0.005

The following alterations require detailed drawings:

**Notch**

Notches to clear other than cladding can be added to any side of the retainer. Notches are call out ± 0.025.

**Angles**

As with notches, angles can be added to clear other tooling in the die. Angles are saw cut ± 0.025.
### Classified Shapes

#### Keys

- **C39**
- **C30**
- **C31**
- **C32**
- **C33**
- **C34**
- **C35**
- **C36**
- **C37**
- **C38**

#### Mono Lobes

- **C13**
- **C14**
- **C15**
- **C16**
- **C17**
- **C18**
- **C19**
- **C20**
- **C21**
- **C22**
- **C23**
- **C24**
- **C25**
- **C26**
- **C27**
- **C28**
- **C29**
- **C30**
- **C31**
- **C32**
- **C33**

#### Flatted Rounds

- **C69**
- **C67**
- **C68**
- **C66**
- **C65**
- **C64**
- **C63**
- **C62**
- **C61**
- **C59**
- **C58**
- **C57**
- **C56**
- **C55**
- **C54**
- **C53**
- **C52**
- **C51**
- **C49**

#### Triangles/Trapezoids

- **C47**
- **C48**
- **C49**
- **C50**
- **C51**
- **C52**
- **C53**
- **C54**
- **C55**
- **C56**
- **C57**
- **C58**
- **C59**
- **C60**
- **C61**
- **C62**

#### Multi Lobes

- **C63**
- **C64**
- **C65**
- **C66**
- **C67**
- **C68**
- **C69**
- **C70**
- **C71**
- **C72**
- **C73**
- **C74**
- **C75**
- **C76**
- **C77**
- **C78**
- **C79**
- **C80**

#### Flatted Rounds

- **C81**
- **C82**
- **C83**
- **C84**
- **C85**
- **C86**
- **C87**
- **C88**
- **C89**
- **C90**
- **C91**
- **C92**
- **C93**

#### Flatted Rounds

- **C94**
- **C95**
- **C96**
- **C97**
- **C98**
- **C99**
- **C100**
- **C101**
- **C102**
- **C103**
- **C104**
- **C105**
- **C106**
- **C107**
- **C108**
- **C109**
- **C110**
- **C111**

### Classified Shapes

#### Ordering Information

**Corner Dimensions**

- Dimensions should be the theoretical shape corners for shapes C22, C24, C26, C31, and C86. However, some reduction of these dimensions will result from fitting the punch and die button under conditions where the clearance is .0025 or less per side.

**Shape Center**

- Shapes are centered on the punch shanks as shown. Shapes in guide bushings and die buttons are also centered as shown with the exception of shapes C23 and C34. Due to clearance, the P dimension on these shapes will not be centered.

**Flatted Rounds**

- Radial offset at rounded ends.

### Classified Shapes

#### Miscellaneous

- **C60**
- **C61**
- **C62**
- **C63**
- **C64**
- **C65**
- **C66**
- **C67**
- **C68**
- **C69**
- **C70**
- **C71**
- **C72**
- **C73**
- **C74**
- **C75**
- **C76**
- **C77**
- **C78**
- **C79**
- **C80**

### Classified Shapes

#### Polygons

- **C10**
- **C11**
- **C12**
- **C13**
- **C14**
- **C15**
- **C16**
- **C17**
- **C18**
- **C19**
- **C20**
- **C21**
- **C22**
- **C23**
- **C24**
- **C25**
- **C26**
- **C27**
- **C28**
- **C29**

### Classified Shapes

#### Reflected View—Punches and Guides

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

#### Orientation and Locking

The locking device orientation is standard at 90°. For types of locking methods and custom lockrings, see p. 30.

#### Clearance

Normal grinding methods produce .002 max. filet on the punch and .007 max. filet on the die button with matching corner shape on the die button and punch, respectively. When ordering die buttons, please specify punch dimensions and clearance per side (L). If the clearance is .0025, Dayton will break sharp corners where the punches and die buttons are ordered together.
Guide Bushings

Material
Steel: A2 (RC 60-63)
P&W Tolerance +.0005 .0005
P to D 0003 00

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

Applications
Guide bushings should be ordered a minimum of .0005 larger than the punch point diameter with which they are to be used.

Alterations—Guide Bushings

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

Guide Chart

<table>
<thead>
<tr>
<th>Hole Range P or G</th>
<th>Land Length V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to .0650</td>
<td>2P</td>
</tr>
<tr>
<td>.0651-.0950</td>
<td>P + .065</td>
</tr>
<tr>
<td>.0951-.4250</td>
<td>.82P + .062</td>
</tr>
</tbody>
</table>

HOW TO ORDER

Specify: Qty. Type Code L P (or P&W)
Example: 4 VEX 37 62 P.146
2 VFO 50 50 P.250, W.075

www.daytonlamina.com
**Micro Guides/Die Buttons**

**Material**
Steel: A2 (RC 60-63)
P&W Tolerance \(+0.002\)
P to D \(-0.003\)

**Guide Chart**

<table>
<thead>
<tr>
<th>Hole Range</th>
<th>Land Length V</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to .0650</td>
<td>.065</td>
<td>P + .065</td>
</tr>
<tr>
<td>.0651-.0950</td>
<td>.082</td>
<td>P + .082</td>
</tr>
<tr>
<td>.0951-.4250</td>
<td>.125</td>
<td>P + .125</td>
</tr>
</tbody>
</table>

**Body**

<table>
<thead>
<tr>
<th>Type</th>
<th>Range P</th>
<th>C’Bore Dia. C</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEX Headless Guide</td>
<td>.1250</td>
<td>12</td>
<td>.031 - .062</td>
</tr>
<tr>
<td>MEX Head-Down Guide</td>
<td>.1875</td>
<td>18</td>
<td>.046 - .130</td>
</tr>
<tr>
<td>MFX Head-Up Guide</td>
<td>.1250</td>
<td>12</td>
<td>.031 - .062</td>
</tr>
<tr>
<td>MDX Headless Die Button</td>
<td>.1250</td>
<td>12</td>
<td>.031 - .062</td>
</tr>
<tr>
<td>MHX Headed Die Button</td>
<td>.1250</td>
<td>12</td>
<td>.031 - .062</td>
</tr>
</tbody>
</table>

**HOW TO ORDER**

Specify: Qty, Type Code L P (or P&W)

Example:
3 MEX 18 31 P.062
3 MGX 12 31 P.044
2 MFX 12 31 P.057
3 MHX 18 37 P.060
2 MDX 12 31 P.045

**FDS**
Firm Delivery Schedule
Guides, Die Buttons 3 Days

www.daytonlamina.com
Quill Bushings/Guides

**Material**
Steel: A2 (RC 60-63)
Bearing: Bronze (VFQ)

**Limitations**

<table>
<thead>
<tr>
<th>Body Code</th>
<th>XP Min. P</th>
<th>XP Max. P</th>
<th>XD Min. XD</th>
<th>XD Max. P</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>.0625</td>
<td>.094</td>
<td>.126</td>
<td>.0625</td>
</tr>
<tr>
<td>25</td>
<td>.0625</td>
<td>.125</td>
<td>.188</td>
<td>.0938</td>
</tr>
<tr>
<td>31</td>
<td>.0625</td>
<td>.156</td>
<td>.251</td>
<td>.1250</td>
</tr>
<tr>
<td>37</td>
<td>.0625</td>
<td>.188</td>
<td>.313</td>
<td>.1562</td>
</tr>
<tr>
<td>43</td>
<td>.0625</td>
<td>.219</td>
<td>.376</td>
<td>.1875</td>
</tr>
</tbody>
</table>

**Quill Bushing Alterations**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>VQX</td>
<td>Reduced Shank Diameter</td>
<td>XD .1875 to .2500 .500 to .750</td>
</tr>
<tr>
<td>VFQ</td>
<td>Reduced Head Diameter</td>
<td>XH .1875 to .2500 .500 to .750</td>
</tr>
<tr>
<td></td>
<td>Overall Length Shortened</td>
<td>XL .1875 to .2500 .500 to .750</td>
</tr>
<tr>
<td>XP</td>
<td>Dimensions Larger than Standard</td>
<td></td>
</tr>
</tbody>
</table>

**Matched Quill Sets**
Matched Quill Sets are ideal for small hole applications where the risk of punch breakage is extremely high and where replacement costs must be considered.

**Perfect Alignment**
Ground bearings at both ends of the Quill Bushing assure precise punch-to-punch alignment. This eliminates the bending influence of unrelieved bushing holes, which are difficult to manufacture straight. Dayton manufactures products with a .002 to .003 relief per side between bearing surfaces, which eliminates this problem.

**No Stock Distortion Risk**
During stripping, the punch tends to pull the stock into the stripper void, which may cause part distortion. Dayton eliminates the distortion potential by manufacturing the product with a controlled limit, i.e., .015 per side maximum. Distortion cannot occur when the space between the guides and the punch (.5 D-P) is less than the stock thickness.

**HOW TO ORDER**

Specify: Qty. Type Code L Steel
Example: 3 VQX 31 75 A2
4 VFQ 31 75 Bearing Bronze
Precision, High-Performance Punches and Pilots

VersaPlus® Punches and Pilots are a premium line of precision, high-performance products that offer more features and benefits to users in industries where higher-than-normal production runs occur—and where optimum performance is a MUST.

VersaPlus® is “setting the new standard in high performance,” according to tool companies and manufacturers who have field-tested the products. For example, a furniture hardware manufacturer realized a production run improvement from 250,000 to 375,000—a 150% increase. In another test, a tool and die company increased run-time-to-sharpening from 100,000 pieces to 200,000.

VersaPlus® gives users the real “plus” through improved production capabilities, increased uptime, and lower costs.

For additional information or a copy of our latest VersaPlus® catalog, contact your Dayton Progress Distributor.
Extended Range Punches

Shown here with optional key flat. See p. 31.

Material
Steel: A2, M2, PS4 (RC 60-63)
P&W Tolerance ± .0002
P to D .0003

HOW TO ORDER
Specify Qty. Type Shank L P (or P&W) Steel
Example: 3 VPR 200 1021 P1.206, W.582 M2

Surface Coatings

For more information on Dayton Progress surface coatings, see the back of the pullout tab on p. 5.

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Shear Angles

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

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

Standard head flat and dowel locations are at 0°.

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

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

**HOW TO ORDER**

*Type Code*  |  *L (or P&W)*  |  *Steel Alteration*
---|---|---
VPO | 50 2332 P:400, W:300 A2 | XS23 A3°
Locking Devices—Ordering Information

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 shown on p. 31.

Location Tolerance

Locking Devices—Flats vs. Dowel Slots

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

Locking Devices—Flats vs. Dowel Slots

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.

Additional Flats (From Top)

Additional Flats (From Top)

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.

Additional Flats (From Top)

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 shown on p. 31.

Location Tolerance

Locking Devices—Ordering Information

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Location Tolerance

Locking Devices—Ordering Information

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 shown on p. 31.

Location Tolerance
Form Punch Shapes

Dayton Progress Form Punches are available on round punches (i.e., those designated as standard “X” shaped punches). When ordering, change the “X” designator to a “W.” In addition, specify other dimensions, as shown in the example below. Specify alterations, if applicable. The shapes shown below are standard, but are not the only shapes Dayton provides. Others are available with a detailed drawing attached to the order.

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

HOW TO ORDER

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

Example: 2 VPW 37 1322 PS W201 P1875 PP1250 LA1235 XNT

*P is the point dimension of the product. When “P” = “D” Shank 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 punches. When ordering, please change the “X” designator to a “W.” Die Buttons are available as headed or headless with a counterbore relief, or as headed or headless with a tapered relief.

HOW TO ORDER

Specify: Qty., Type Code LL Steel W Shape P PP LA RS AN Alterations

Example: 4 VNW 100 100 M2 W935 .50 .625 .15 .05 .03 XNT

*B (Land Length) will be per catalog standard, unless X3 is ordered. O.A.L. will be held to LL tolerance, i.e., ± 0.001.
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 Δ5%, 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

<table>
<thead>
<tr>
<th>Punch</th>
<th>Set Screw</th>
<th>Spring</th>
<th>Jektole Pin RC 44-48</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.06</td>
<td></td>
<td>.01 Fillet</td>
</tr>
<tr>
<td></td>
<td>(.03 for J2 &amp; J3)</td>
<td></td>
<td>End Ground Square</td>
</tr>
<tr>
<td>E</td>
<td>D</td>
<td>L</td>
<td>-75</td>
</tr>
<tr>
<td>D</td>
<td>L</td>
<td>T</td>
<td>D</td>
</tr>
<tr>
<td>P</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.75 Min.</td>
<td></td>
</tr>
</tbody>
</table>

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 D</td>
<td>.1875</td>
<td>.2500</td>
<td>.3125</td>
<td>3750</td>
<td>.4375</td>
<td>.5000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.6250</td>
<td>.7500</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.250</td>
<td>and larger</td>
</tr>
<tr>
<td>Point Hole Diameter C</td>
<td>.020</td>
<td>.032</td>
<td>.046</td>
<td>.063</td>
<td>.094</td>
<td>.125</td>
</tr>
<tr>
<td>Shank Hole Diameter E</td>
<td>.086</td>
<td>.109</td>
<td>.141</td>
<td>.172</td>
<td>.221</td>
<td>.275</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. D</td>
<td>.172</td>
<td>.218</td>
<td>.282</td>
<td>.344</td>
<td>.442</td>
<td>.552</td>
</tr>
<tr>
<td>Min. Point Dia. P</td>
<td>.040</td>
<td>.064</td>
<td>.092</td>
<td>.126</td>
<td>.188</td>
<td>.250</td>
</tr>
<tr>
<td>Max. Point Lgth. B</td>
<td>1.25</td>
<td>1.50</td>
<td>1.62</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 L</td>
<td>1.11</td>
<td>1.38</td>
<td>1.94</td>
<td>1.94</td>
<td>2.22</td>
<td>2.22</td>
</tr>
<tr>
<td>Pin Diameter D</td>
<td>.017</td>
<td>.027</td>
<td>.041</td>
<td>.058</td>
<td>.089</td>
<td>.120</td>
</tr>
<tr>
<td>Head Diameter H</td>
<td>.048</td>
<td>.073</td>
<td>.094</td>
<td>.120</td>
<td>.156</td>
<td>.188</td>
</tr>
<tr>
<td>Hd. Thickness T</td>
<td>.031</td>
<td>.047</td>
<td>.062</td>
<td>.062</td>
<td>.094</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. D</td>
<td>.081</td>
<td>.104</td>
<td>.136</td>
<td>.167</td>
<td>.216</td>
<td>.270</td>
</tr>
<tr>
<td>Free Length L</td>
<td>2.38</td>
<td>2.38</td>
<td>3.19</td>
<td>3.00</td>
<td>3.03</td>
<td>2.56</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 D</td>
<td>#3-48</td>
<td>#5-40</td>
<td>#8-32</td>
<td>#10-32</td>
<td>#14-28</td>
<td>#16-24</td>
</tr>
<tr>
<td>Screw Length L</td>
<td>.19</td>
<td>.19</td>
<td>.19</td>
<td>.19</td>
<td>.25</td>
<td>.25</td>
</tr>
</tbody>
</table>
Commitment to Quality & Customer Satisfaction

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

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

DAYTON Lamina™
a MISUMI Group Company

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

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