Durable, Long-lasting Punches & Punch Blanks

Heads-above-the-rest performance
TuffPunch® Heavy-Duty Punches and Punch Blanks

Product Applications
Dayton Progress TuffPunch® Punches and Punch Blanks are Kommercial quality products manufactured with thicker, larger, and 10° angled diameter heads, and are designed to reduce punch load and significantly lower failure rates when using heavy gauge and high tensile material. (See p. 3 for additional information.) TuffPunch® products are well-suited for high-demand industries where frequency and heavier-than-normal impact punching activity occurs and where optimum performance is required. Dayton’s TuffPunch® product line includes: Dayton Jektole® Punches; Regular Punches; and Punch Blanks. Both standard sizes and standard alterations are shown in this catalog.

Unique Head Design
All Dayton TuffPunch® products are designed with a 10° angled head with a diameter equal to the shank diameter (see photo). This design allows the perforating forces to travel up from the shank and completely through the head. This eliminates the lateral shock waves that would otherwise put stress on the outer edge of the head, resulting in frequent failures—especially in heavy-duty applications.

In addition, Dayton TuffPunch® products are available in common shear angle configurations to reduce punch load and minimize the risk of slug pulling. Shear angle configurations include: chamfer; conical; double shear; and single shear. For more information, see “Standard Alterations” on p. 6.

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

The DayKool™ process utilizes a liquid nitrogen vapor to cool the steel to -300°F, which creates metallurgical changes in the structure that disperse carbides throughout the metal. The result: increased wear resistance (finely dispersed carbides provide more evenly distributed wear); less sharpening time; no loss of resistance after sharpening; longer die runs; and less downtime.

Surface Treatments
All products listed in this catalog can be treated to increase material hardness, reduce galling, and improve wear and/or corrosion resistance. A surface treatment chart is included on each product page.

DayTride® (XN)—a low-cost surface application that treats all exposed surfaces. Ideal for punches and matrixes. Provides high dimensional stability. Approx. Hardness: RC73.

DAYTiN® (XNT)—applied via PVD (physical vapor deposition). Provides extreme hardness (hard as carbide) and excellent lubricity when used with a lubricant. Not recommended for stainless steel, copper, or nickel. Approx. Hardness: *Vickers 2300.

TiCN (XCN)—very hard PVD, thin film. Provides ultra hardness (harder than carbide) and superior abrasive wear resistance. Approx. Hardness: *Vickers 3000.

The Dayton Difference
Since 1946, innovation has been the key at Dayton Progress to bringing leading-edge products to the marketplace. Dayton has developed hundreds of proprietary, value-added metal stamping and fabricating tools, and we hold numerous international patents and trademarks.

Today, Dayton designers, engineers, and product managers continue this long-standing tradition by developing, manufacturing, and supplying innovative application-specific products for thousands of customers around the world.

*Vickers used when RC exceeds 80.

TuffPunch®, DayKool™, DayTride®, and DAYTiN® are trademarks of Dayton Progress Corporation.

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

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

**Standard Alterations**

Punches and punch blanks are available in sizes other than those listed in the catalog. These special order products can be manufactured for a slight additional charge. Unless otherwise noted, there is no additional delivery charge.

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

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

**Product Designation**

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Line</th>
<th>Product Shape</th>
<th>Press-Fit Dia. D (shank diameter)</th>
<th>Point Length</th>
<th>Overall Length L</th>
<th>Point or Hole Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPRF</td>
<td>T for TuffPunch®</td>
<td>P for Punch (Regular)</td>
<td>R for Rectangle</td>
<td>F is additional product code</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coded by the first 2 digits of decimal equivalent (.750).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>75</td>
<td></td>
<td>L1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>350</td>
<td>P.872, W.401</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Code</th>
<th>D</th>
<th>Code</th>
<th>D</th>
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<tbody>
<tr>
<td>37</td>
<td>.3750</td>
<td>75</td>
<td>.7500</td>
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<tr>
<td>43</td>
<td>.4375</td>
<td>87</td>
<td>.8750</td>
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<td>50</td>
<td>.5000</td>
<td>100</td>
<td>1.0000</td>
</tr>
<tr>
<td>62</td>
<td>.6250</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Special Features**

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

**Material**

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

**Round P**

<table>
<thead>
<tr>
<th>Shank D</th>
<th>Code</th>
<th>Point Length Lₜ</th>
<th>Round</th>
<th>Shape</th>
<th>Min.</th>
<th>Min. XP</th>
<th>Min. X</th>
<th>Min. W</th>
<th>Min. Max. P/G</th>
<th>L</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>.3750</td>
<td>37</td>
<td>.30 .75</td>
<td>100</td>
<td>158</td>
<td>158</td>
<td>.3749</td>
<td>158</td>
<td>158</td>
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<td>.20</td>
<td>225</td>
</tr>
<tr>
<td>.4375</td>
<td>43</td>
<td>.50 .75</td>
<td>100</td>
<td>158</td>
<td>158</td>
<td>.3749</td>
<td>158</td>
<td>158</td>
<td>.375</td>
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<td>225</td>
</tr>
<tr>
<td>.5000</td>
<td>50</td>
<td>.50 .75</td>
<td>100</td>
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<td>158</td>
<td>.3749</td>
<td>158</td>
<td>158</td>
<td>.375</td>
<td>.20</td>
<td>225</td>
</tr>
<tr>
<td>.6250</td>
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<td>.50 .75</td>
<td>100</td>
<td>158</td>
<td>158</td>
<td>.3749</td>
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<td>158</td>
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<td>87</td>
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<td>.3749</td>
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<td>.375</td>
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<td>225</td>
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<td>158</td>
<td>158</td>
<td>.375</td>
<td>.20</td>
<td>225</td>
</tr>
</tbody>
</table>

**Surface Treatments**

- XCN — TiCN +4 days
- XN — DayTiN® +4 days
- XNT — DayTiN® +4 days

**HOW TO ORDER**

Specify: Qty. Type D Code L P (or P&W) Dimension

Example: 6 TJXF 37 C225 P.204

**Standard Alterations**

See p.6 for additional ordering instructions.

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# TuffPunch® Jektole® Punch Blanks

**Material**

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

**Round P**

<table>
<thead>
<tr>
<th>Shank D</th>
<th>Code</th>
<th>Point Length Lₜ</th>
<th>Round</th>
<th>Shape</th>
<th>Min.</th>
<th>Min. XP</th>
<th>Min. X</th>
<th>Min. W</th>
<th>Min. Max. P/G</th>
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</thead>
<tbody>
<tr>
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<td>37</td>
<td>.50 .75</td>
<td>100</td>
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<td>158</td>
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<td>225</td>
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<tr>
<td>.4375</td>
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<td>.50 .75</td>
<td>100</td>
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<td>158</td>
<td>.3749</td>
<td>158</td>
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<td>.375</td>
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<td>.5000</td>
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<td>.50 .75</td>
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<td>158</td>
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<td>158</td>
<td>158</td>
<td>.375</td>
<td>.20</td>
<td>225</td>
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<tr>
<td>.6250</td>
<td>62</td>
<td>.50 .75</td>
<td>100</td>
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<td>.3749</td>
<td>158</td>
<td>158</td>
<td>.375</td>
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<td>.7500</td>
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<td>.50 .75</td>
<td>100</td>
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<td>.3749</td>
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<td>.375</td>
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<td>.8750</td>
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<td>.50 .75</td>
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<td>158</td>
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<tr>
<td>1.0000</td>
<td>100</td>
<td>.50 .75</td>
<td>100</td>
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<td>158</td>
<td>.3749</td>
<td>158</td>
<td>158</td>
<td>.375</td>
<td>.20</td>
<td>225</td>
</tr>
</tbody>
</table>

**Surface Treatments**

- XCN — TiCN +4 days
- XN — DayTiN® +4 days
- XNT — DayTiN® +4 days

**HOW TO ORDER**

Specify: Qty. Type D Code L

Example: 9 TJBF 37 B200

**Standard Alterations**

See p.6 for additional ordering instructions.

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**Note:**

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

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

**Shank D**

<table>
<thead>
<tr>
<th>Code</th>
<th>Point Length L</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Min. XP</th>
<th>Range P</th>
<th>Min. W</th>
<th>Max. P/G</th>
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</thead>
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<td>006</td>
<td>125</td>
<td>001</td>
<td>.592</td>
<td>.56 - 1.18</td>
<td>1.058</td>
<td>1.255</td>
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<tr>
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<td>006</td>
<td>125</td>
<td>001</td>
<td>.800</td>
<td>.56 - 1.18</td>
<td>1.058</td>
<td>1.255</td>
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<tr>
<td>0.500</td>
<td>.50 - .75</td>
<td>006</td>
<td>125</td>
<td>001</td>
<td>.800</td>
<td>.56 - 1.18</td>
<td>1.058</td>
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<td>.56 - 1.18</td>
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<td>.800</td>
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<td>1.255</td>
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<tr>
<td>1.000</td>
<td>.875 - 1.00</td>
<td>006</td>
<td>125</td>
<td>001</td>
<td>.800</td>
<td>.56 - 1.18</td>
<td>1.058</td>
<td>1.255</td>
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</tbody>
</table>

**Round**

- **TP_F**
- **TP_XF**
- **TP_OF**
- **TP_RF**
- **TP_KF**
- **TP_LF**
- **TP_HF**
- **TP_JF**
- **TP_NF**
- **TP_VF**
- **TP_YF**
- **TP_ZF**

**Surface Treatments**

- **XCN** — TiCN
- **XN** — DayTride®
- **XNT** — DayTiN®

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

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TuffPunch® Regular Punch Blanks

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

**Shank D**

<table>
<thead>
<tr>
<th>Code</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.375</td>
<td>2.00</td>
</tr>
<tr>
<td>0.4375</td>
<td>2.25</td>
</tr>
<tr>
<td>0.500</td>
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<td>0.025</td>
<td>2.75</td>
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<tr>
<td>0.750</td>
<td>3.00</td>
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<tr>
<td>0.875</td>
<td>3.25</td>
</tr>
<tr>
<td>1.000</td>
<td>3.75</td>
</tr>
</tbody>
</table>

**Surface Treatments**

- **XCN** — TiCN
- **XN** — DayTride®
- **XNT** — DayTiN®

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

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

Jektole®, Regular, and Punch Blanks

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

TuffPunch® products are available in common shear angle configurations for all standard shapes. Shear angles are also available for classified shapes as special orders.

Shear angles are available in any angle. Specify angle in whole degrees. If half degree is necessary, specify as a decimal, e.g., 8.5°. (Tolerance on all angles is ±15 minutes.) Use the chart below to determine the product designation, then simply add the alteration code shown next to the drawings, along with the angle desired. Example: TPXF 50, C300, P400, XS20, A5°.

Shear Angles (XS)

TuffPunch® products are available in common shear angle configurations for all standard shapes. Shear angles are also available for classified shapes as special orders.

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

Example: TPXF 50, C300, P400, XS20, A5°.

For Round Punches Only

Views are reflected view.

For Round and Shape Punches

Views are reflected view.
Locking Devices—Flats vs. Dowel Slots

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

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

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

Single Flats: X2
Order Example: X2 — 90°

Single Flats: X5
Order Example: X5 — 135°

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

Double Flats: X6
Locking Devices: X6
Order Example: X6 — 135°

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

Additional Flats
<table>
<thead>
<tr>
<th>Code</th>
<th>Depth</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>X61</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>
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<td>X87</td>
<td>.093</td>
<td>.750</td>
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<td>X88</td>
<td>.093</td>
<td>Full Length</td>
</tr>
<tr>
<td>X89</td>
<td>Specify Dimensions</td>
<td></td>
</tr>
</tbody>
</table>

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

Dowel Slots: X4 & X41
For standard locations, specify X4 (.125 Dowel) or X41 (.1875 Dowel). For alternate locations, specify X4 or X41 and degree required.
Order Example: X4 — 90°

Dowel Slots: X7 & X71
Specify X7 (.125 Dowel) or X71 (.1875 Dowel). For custom locations, specify X7 or X71 and degree required.
Order Example: X71 — 135°

Location Tolerance
<table>
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<tr>
<th>Flat</th>
<th>Dowel</th>
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<tbody>
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<td>F Radial</td>
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<tr>
<td>-.0000</td>
<td>-.0000</td>
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<tr>
<td>.04°</td>
<td>.04°</td>
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Dowel Slots: X4 & X41
<table>
<thead>
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<th>Length</th>
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</thead>
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Dowel Slots: X7 & X71

HOW TO ORDER
Specify: Qty. Type D Code P (or P&W) Dimension Locking Device
Example: 1 TJRF 37 P.321, W.189 X2
DAYTON PROGRESS CORPORATION
500 Progress Road
P.O. Box 39
Dayton, Ohio 45449-0039 USA
Telephone: (937) 859-5111
Fax: (937) 859-5353

Dayton Progress Canada, Ltd.
861 Rowntree Dairy Road
Woodbridge, Ontario L4L 5W3
Telephone: (905) 264-2445
Fax: (905) 264-1071

Dayton Progress Ltd.
G1 Holly Farm Business Park
Honiley, Kenilworth
Warwickshire CV8 1NP UK
Telephone: 44 1 926 484192
Fax: 44 1 926 484172

Dayton Progress Corporation of Japan
2-7-35 Hashimotodai
Sagamihara-Shi, Kanagawa-Ken
229-1132 Japan
Telephone: 81 427 74 0821
Fax: 81 427 73 4955

Dayton Progress GmbH
Im Heidegraben 8
Postfach 1165
61401 Oberursel/Ts., Germany
Telephone: 49 61 71 924201
Fax: 49 61 71 924220

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