READY Benders®

A Unique Off-the-shelf Forming Tool
READY Is Proud to Offer Its Enhanced Line of Patented READY Benders®

Precise Rotary Forming Motion
• “Benders” transfer the vertical movement of any press into a precise, rotary forming motion. This allows the bender to easily overbend past 90° to counter material springback, a distinct mechanical advantage.
• READY Benders® give tool designers and metal stampers a way to produce tooling that holds consistent part angle tolerances, especially when higher volume production is required.

Standard In Stock Benders
• This catalog explains how standard benders form 90° bends in virtually any press working situation, from intricate progressive dies running at 250 spm, to large, fully automated panel forming machines.

• Our READY Bender® is designed specifically to replace most wipe tooling applications. This catalog explains why Benders are the better choice for you.
• Almost any length bend in practically any thickness of metal can be made using either in stock benders or by specifying your special requirements.

Special READY Benders®
• The bender is a highly efficient method of producing a wide range of different forms in metal. We make special benders, quoted by application. Use the worksheet on the back cover and fax prints for a quotation.

READY Benders® are now available in longer lengths, up to 36” in most sizes.
Our Test-Bending Service Takes the Guesswork Away

For a modest fee, we’ll test-bend your material using our benders. This test is ideal for evaluating compatibility with pre-painted metals, checking for cutout distortion and determining the spring-back characteristics with your material.

READY Technology will test-bend your material (between .010” and .250”) using our standard 87° rocker and 3° overbend.

Tell us the goal of the test bending and we will structure a test to give you answers. Send ten pieces of your material, 4” x 12” (max. length). A report and three pieces will be returned to you.

Special test-bends are available but may be expensive due to the special tooling required, averaging $300.00, USD, each and several weeks for tooling.

We can now test bend “The Hemmer” to flatten 90° bends to 180°; see page 11.

Forming 5/8” thick high strength steel pipe hangers for naval ships.

Form high strength channels with less force and increased consistency.

READY Benders® are ideal for a wide range of stamping dies.
Three Reasons Toolmakers and Stampers Specify READY Benders®

1. Benders increase part quality
   - Hold ± 1/2° angle tolerance, no “coining” required
   - Overbend up to 135° in one press stroke
   - Benders are more tolerant of material thickness variations
   - Hold consistent leg heights, eliminate cams and re-strikes
   - Hole locations near bends are usually not distorted
   - Form prepainted and decorative metal without tool marks
   - Ideal for forming high strength steel and aluminum
   - Form narrow channels and short leg bends

2. Benders reduce tooling costs
   - Less expensive than wipe tooling - compare the costs for yourself.
   - Reduce operations and eliminate die stations
   - Decrease forming tonnage by 50% to 80%
   - The “Hemmer”, page 11, reduces operations and costs

3. Benders work better in production and form metal consistently
   - Compare the forming action:

   READY Benders® - standard off the shelf
   - self-contained form station
   - rotary action is gentle
   - overbend for springback
   - consistent angles, leg heights, hole locations
   - internal spring returns rocker

   Wipe Tooling - tryout and regrind
   - costly extras needed
   - material can hump or slide
   - bottom to “coin” radii
   - inconsistent angles, leg heights, hole locations
   - scrapes and galls on up strokes

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READY Benders® - Metric: In Stock Lengths

READY Benders® - Inch

READY High Production Benders - Inch

READY High Production Benders - Inch: In Stock Lengths

READY High Production Benders - Inch: Custom Lengths

Ready High Production Benders - Metric

Ready High Production Benders - Metric: In Stock Lengths

Ready High Production Benders - Metric: Custom Lengths

READY Bender Applications and Test Bending Service

Index
1. Find the PT you are forming in top row of chart below. Read down (vertically) for all data. Verify the PH check (specials can bend shorter PH's).

2. Note minimum and maximum lengths (X) in chart below. Custom lengths are available. Use in stock lengths whenever possible for quick delivery. Longer lengths achieved by butting units end-to-end, .010” gap between.

**Features:**
1. **Rockers:** fully hardened (Rc 56 to 62), S-7 tool steel.
2. **Saddles:** machinable thru hardened steel; mounting holes left for diemaker to locate where needed. Contact Ready Engineering for suggestions.
3. Saddle socket is coated for lubrication and long life. Saddle has flush mount lube fittings.
4. Rockers and saddles are CNC ground for precision and interchangeability.
5. Rocker angle is 87° on all standard benders. This allows for 3° of overbend to produce consistent 90° forms in mild steel. Harder steel or larger part radii may require more overbend. Rocker angles can be specified at time of order or altered by the diemaker. See page 10 about oversquare bends.

**Benders are now less expensive than wipe tooling.**
- Designed to produce up to one million parts, ideal for most stamping dies.
- In stock lengths: 12”, 24” and up to 36” long.
- Segment stock lengths to reduce your tooling budget; quick delivery.
- Custom lengths available, specify.

**Selecting Standard Benders:**
1. **Part Thickness (PT):**
   - .010”-.042”
   - .043”-.075”
   - .076”-.120”
   - .121”-.164”
   - .165”-.209”
   - .210”-.250”

**Gage Thickness**
- 25 to 19
- 19 to 14
- 14 to 11
- 11 to 8
- 8 to 5
- 5 to 1/4”

**Part Height Check (PH):**
- .250”
- .390”
- .580”
- .775”
- .970”
- 1.160”

<table>
<thead>
<tr>
<th>Minimum Length (X)</th>
<th>12”, 24”</th>
<th>12”, 24”, 36”</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.125”</td>
<td>.010”-.042”</td>
<td>.043”-.075”</td>
</tr>
<tr>
<td>1.500”</td>
<td>.043”-.075”</td>
<td>.076”-.120”</td>
</tr>
<tr>
<td>2.000”</td>
<td>.076”-.120”</td>
<td>.121”-.164”</td>
</tr>
<tr>
<td>2.500”</td>
<td>.121”-.164”</td>
<td>.165”-.209”</td>
</tr>
<tr>
<td>3.000”</td>
<td>.165”-.209”</td>
<td>.210”-.250”</td>
</tr>
</tbody>
</table>

**In Stock Lengths, X =**
- 12”, 24”
- 12”, 24”, 36”
- 12”, 24”, 36”, 3”
- 12”, 24”, 36”, 3.5”

**Minimum Length (X) (Gib Length - GL):**
- 1.125”
- 1.500”
- 2.000”
- 2.500”
- 3.000”
- 3.500”

**Maximum Length (X):**
- 24”
- 24”, 36”
- 24”, 36”, 3”
- 24”, 36”, 3.5”

**MODEL CALLOUT**
- HIB 62
- HIB 100
- HIB 150
- HIB 200
- HIB 250
- HIB 300

**Standard READY Bender® - Inch**

<table>
<thead>
<tr>
<th>Rocker Diameter 87° Angle</th>
<th>.625”</th>
<th>1.000”</th>
<th>1.500”</th>
<th>2.000”</th>
<th>2.500”</th>
<th>3.000”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saddle Width (SW)</td>
<td>2.125”</td>
<td>2.875”</td>
<td>3.875”</td>
<td>4.875”</td>
<td>5.875”</td>
<td>6.875”</td>
</tr>
<tr>
<td>Saddle to Front (SF)</td>
<td>.750”</td>
<td>1.125”</td>
<td>1.500”</td>
<td>1.875”</td>
<td>2.250”</td>
<td>2.750”</td>
</tr>
<tr>
<td>Saddle to Key (SK)</td>
<td>1.375”</td>
<td>1.750”</td>
<td>2.375”</td>
<td>3.000”</td>
<td>3.625”</td>
<td>4.125”</td>
</tr>
<tr>
<td>Saddle Height (SH)</td>
<td>.875”</td>
<td>1.375”</td>
<td>1.875”</td>
<td>2.375”</td>
<td>2.875”</td>
<td>3.375”</td>
</tr>
<tr>
<td>Gib Length (GL)</td>
<td>1.125”</td>
<td>1.500”</td>
<td>2.000”</td>
<td>2.500”</td>
<td>3.000”</td>
<td>3.500”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rocker Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rocker X = .010” X</td>
</tr>
<tr>
<td>Saddle X = .000” X</td>
</tr>
<tr>
<td>Gib X = .010” X</td>
</tr>
</tbody>
</table>

* Spring Return
READY Benders® - Inch: in stock lengths 12”, 24” and in some styles 36” long.

- Designed so you can segment to shorter custom lengths.
- Minimum segment size is the Gib Length (GL).
- Custom lengths available, specify.

HIB 62: 12” and 24” lengths in stock, 5/8” Diameter Rocker

HIB 100: 12” & 24” lengths in stock, 1” Diameter Rocker

HIB 150: 12”, 24” & 36” lengths in stock, 1 1/2” Diameter Rocker

HIB 200, 250 and 300: 12”, 24” & 36” lengths in stock, 2”, 2 1/2” and 3” Diameter Rockers

Length Segmenting:
1. 12” lengths are shown (left), 24” and 36” lengths are a repeating pattern of the 12” length.
2. Minimum segmenting size is the GL (gib length) dimension. Each segment needs a gib to retain rocker. Spring returns are marked by § and are under gibs.

How to Segment:
1. Remove rocker by taking out set screw/lube fitting. Rotate rocker to remove the spring return plunger mechanism and rocker.
2. Rocker is fully hardened (Rc 56-62). Cut with wire machine or best way to precise length/size.
3. Saddle is machinable. Cut with wire machine or best way to precise length.
4. CAUTION: Thoroughly de-burr and clean saddle and rocker. Make sure no chips or dirt remain in saddle/rocker spring return pockets before reassembly.
5. Reassemble and check to make sure rocker returns easily when rotated.

READY Can Segment:
1. You must purchase the entire 12”, 24” or 36” length and specify the segment dimensions. The remaining pieces are shipped with the tooling unless specified otherwise. No rebates on unused pieces.
2. For precision cuts, call READY for pricing - 1-800-543-4355.

Order Example:

<table>
<thead>
<tr>
<th>HIB</th>
<th>100</th>
<th>X = 24”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ready Model Callout</td>
<td>Rocker Diameter 1”</td>
<td>Specify Length of Bender</td>
</tr>
</tbody>
</table>

§ = spring return
GL = gib length
Flush mount lube fittings at end of spring return.
READY High Production Benders

- Use when production exceeds a million parts, ideal for most stamping dies.
- In stock lengths, see page 7. Now available up to 36” long.
- For custom lengths, see page 8.

Features:
1. Rockers: fully hardened (Rc 56 to 62), S-7 tool steel.
3. Rockers and saddles are CNC ground for precision and interchangeability.
4. Rocker angle is 87° on all standard benders. This allows for 3° of overbend to produce consistent 90° forms in mild steel. Harder steel or larger part radii may require more overbend. Rocker angles can be specified at time of order or altered by the diemaker. See page 10 about oversquare bends.

Selecting Standard Benders:
1. Find the PT you are forming in top row of chart below. Read down (vertically) for all data. Verify the PH check (specials can bend shorter PH's).
2. Note minimum and maximum lengths (X) in chart below. Custom lengths are available. Use in stock lengths whenever possible for quick delivery. Longer lengths achieved by butting units end-to-end, .010” gap between.

Standard READY High Production Bender

<table>
<thead>
<tr>
<th>Gage Thickness</th>
<th>25 to 19</th>
<th>19 to 14</th>
<th>14 to 11</th>
<th>11 to 8</th>
<th>8 to 5</th>
<th>5 to 1/4”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part Thickness (PT)</td>
<td>.010”-.042”</td>
<td>.043”-.075”</td>
<td>.076”-.120”</td>
<td>.121”-.164”</td>
<td>.165”-.209”</td>
<td>.210”-.250”</td>
</tr>
<tr>
<td>Part Height Check (PH)</td>
<td>.250”</td>
<td>.390”</td>
<td>.580”</td>
<td>.775”</td>
<td>.970”</td>
<td>1.160”</td>
</tr>
<tr>
<td>In Stock Lengths, X = (see page 7)</td>
<td>1.125”</td>
<td>1.500”</td>
<td>2.000”</td>
<td>2.500”</td>
<td>3.000”</td>
<td>3.500”</td>
</tr>
<tr>
<td>Minimum Length (X) (Gib Length - GL)</td>
<td>24”</td>
<td>24”</td>
<td>36”</td>
<td>36”</td>
<td>36”</td>
<td>36”</td>
</tr>
<tr>
<td>Maximum Length X</td>
<td>24”</td>
<td>24”</td>
<td>36”</td>
<td>36”</td>
<td>36”</td>
<td>36”</td>
</tr>
<tr>
<td>MODEL CALLOUT</td>
<td>REC 62</td>
<td>REC 100</td>
<td>REC 150</td>
<td>REC 200</td>
<td>REC 250</td>
<td>REC 300</td>
</tr>
</tbody>
</table>

- Tapped mounting holes available as specials.
- For metric mounting holes, see READY High Production Benders, pages 16 to 18.
READY High Production Benders - Inch: in stock lengths

- Our highest production bender.
- Custom lengths up to 24” or 36” long available, see page 8.

Mounting Hole Locations

<table>
<thead>
<tr>
<th>Model Callout</th>
<th>Length Style</th>
<th>X Length</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>SHCS size</th>
</tr>
</thead>
<tbody>
<tr>
<td>REC 62</td>
<td>AA</td>
<td>1.125”</td>
<td>.562”</td>
<td>.354”</td>
<td>.354”</td>
<td>1.181”</td>
<td>.551”</td>
<td>#10</td>
</tr>
<tr>
<td></td>
<td>CC</td>
<td>3.500”</td>
<td>1.750”</td>
<td>1.514”</td>
<td>.875”</td>
<td>1.181”</td>
<td>.551”</td>
<td>#10</td>
</tr>
<tr>
<td></td>
<td>DD</td>
<td>6.000”</td>
<td>3.000”</td>
<td>2.764”</td>
<td>1.500”</td>
<td>1.181”</td>
<td>.551”</td>
<td>#10</td>
</tr>
<tr>
<td>REC 100</td>
<td>AA</td>
<td>1.500”</td>
<td>.750”</td>
<td>.472”</td>
<td>.472”</td>
<td>1.476”</td>
<td>.846”</td>
<td>1/4”</td>
</tr>
<tr>
<td></td>
<td>BB</td>
<td>4.000”</td>
<td>2.000”</td>
<td>1.724”</td>
<td>1.724”</td>
<td>1.476”</td>
<td>.846”</td>
<td>1/4”</td>
</tr>
<tr>
<td></td>
<td>CC</td>
<td>6.000”</td>
<td>3.000”</td>
<td>2.645”</td>
<td>1.500”</td>
<td>1.476”</td>
<td>.846”</td>
<td>1/4”</td>
</tr>
<tr>
<td></td>
<td>DD</td>
<td>9.000”</td>
<td>4.500”</td>
<td>4.146”</td>
<td>2.250”</td>
<td>1.476”</td>
<td>.846”</td>
<td>1/4”</td>
</tr>
<tr>
<td>REC 150</td>
<td>AA</td>
<td>2.000”</td>
<td>1.000”</td>
<td>.669”</td>
<td>.669”</td>
<td>1.969”</td>
<td>1.181”</td>
<td>5/16”</td>
</tr>
<tr>
<td></td>
<td>BB</td>
<td>5.000”</td>
<td>2.500”</td>
<td>2.028”</td>
<td>2.028”</td>
<td>1.969”</td>
<td>1.181”</td>
<td>5/16”</td>
</tr>
<tr>
<td></td>
<td>CC</td>
<td>8.000”</td>
<td>4.000”</td>
<td>3.409”</td>
<td>2.000”</td>
<td>1.969”</td>
<td>1.181”</td>
<td>5/16”</td>
</tr>
<tr>
<td>REC 200</td>
<td>AA</td>
<td>2.500”</td>
<td>1.250”</td>
<td>.846”</td>
<td>.846”</td>
<td>2.598”</td>
<td>1.476”</td>
<td>3/8”</td>
</tr>
<tr>
<td></td>
<td>BB</td>
<td>7.000”</td>
<td>3.500”</td>
<td>2.909”</td>
<td>2.909”</td>
<td>2.598”</td>
<td>1.476”</td>
<td>3/8”</td>
</tr>
<tr>
<td>REC 250</td>
<td>AA</td>
<td>3.000”</td>
<td>1.500”</td>
<td>.984”</td>
<td>.984”</td>
<td>3.110”</td>
<td>1.732”</td>
<td>1/2”</td>
</tr>
<tr>
<td></td>
<td>BB</td>
<td>7.000”</td>
<td>3.500”</td>
<td>2.791”</td>
<td>2.791”</td>
<td>3.110”</td>
<td>1.732”</td>
<td>1/2”</td>
</tr>
<tr>
<td>REC 300</td>
<td>AA</td>
<td>3.500”</td>
<td>1.750”</td>
<td>1.280”</td>
<td>1.280”</td>
<td>3.642”</td>
<td>2.244”</td>
<td>1/2”</td>
</tr>
<tr>
<td></td>
<td>BB</td>
<td>6.000”</td>
<td>3.000”</td>
<td>2.291”</td>
<td>2.291”</td>
<td>3.642”</td>
<td>2.244”</td>
<td>1/2”</td>
</tr>
</tbody>
</table>

Tolerances Held
X = saddle length
+ .000” / −.010”

X = rocker length
+ .010” / −.000”

Screw locations held ± .005”

Order Example:
REC 100 X = DD

READY Model Callout
Rocker Diameter 1” Specify Length of Bender
READY High Production Benders - Inch: Custom Lengths

• READY’s CNC grinding technology delivers custom lengths up to 36” long at attractive prices.
• Longer lengths achieved by butting two or more units end-to-end, .010” gap.

Now available up to 36” long.
Specify your desired length (X) and READY will deliver.

Minimum/Maximum Lengths:
1. Charts and drawings showing hole locations start at nominal lengths. Custom lengths start very short, at catalog Gib Length (GL) dimensions.
2. Mounting hole patterns for shorter, custom lengths are available upon request by application.

REC 62, 100 and 150 Repeating Hole Patterns
(for 5/8”, 1”, and 1 1/2” Diameter Rockers)

REC 200, 250 and 300 Repeating Hole Patterns
(for 2”, 2 1/2”, and 3” Diameter Rockers)

Minimum/Maximum Lengths:
1. Charts and drawings showing hole locations start at nominal lengths. Custom lengths start very short, at catalog Gib Length (GL) dimensions.
2. Mounting hole patterns for shorter, custom lengths are available upon request by application.

Minimum/Maximum Lengths:
1. Charts and drawings showing hole locations start at nominal lengths. Custom lengths start very short, at catalog Gib Length (GL) dimensions.
2. Mounting hole patterns for shorter, custom lengths are available upon request by application.

NOTE:
• Counterbored holes standard, tapped available as specials.
• READY High Production Bender - Inch, pages 4 and 5, is available in custom lengths and can further reduce your tooling budget.
Compact READY Benders®

• Designed to fit “tight” die spaces, small footprint.

• Recommended for high production applications.
• Standards in stock for fast delivery. Special compact benders can be made to your height and length requirements upon request.

The original compact benders called CBT and CLT are not discontinued. See earlier catalog or request a fax sheet to detail the parameters.

Selection and Ordering:
1. Locate the material thickness you are forming on the top row. Read down the column for your data.
2. Longer lengths are achieved by butting units end-to-end.
3. We make special compact benders. Fax the worksheet on the back cover with prints.

The Latest Bender Technology

READY encourages upgrading to the improved designs detailed in this catalog for best performance, delivery, and lowest tooling costs. We now offer longer one piece full hard benders in lengths up to 36” long.

We make specials too ... use the worksheet on back cover and fax prints.

### PART MATERIAL

<table>
<thead>
<tr>
<th>PART MATERIAL</th>
<th>Mild Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness Ranges (inches)</td>
<td>.010&quot; - .042&quot;</td>
</tr>
</tbody>
</table>

### REGULAR BENDERS

<table>
<thead>
<tr>
<th>Catalog Callout (stocked)</th>
<th>HCBT 62</th>
<th>HCBT 100</th>
<th>HCBT 150</th>
<th>HCBT 200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rocker Diameter</td>
<td>.625</td>
<td>1.000</td>
<td>1.500</td>
<td>2.000</td>
</tr>
<tr>
<td>Regular Benders (SW x SL)</td>
<td>1.000&quot; x 1.000&quot;</td>
<td>1.500&quot; x 1.500&quot;</td>
<td>2.000&quot; x 2.000&quot;</td>
<td>3.000&quot; x 3.000&quot;</td>
</tr>
<tr>
<td>Height</td>
<td>2.000&quot;</td>
<td>2.000&quot;</td>
<td>2.750&quot;</td>
<td>3.000&quot;</td>
</tr>
<tr>
<td>Rocker Extension (special)</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>3/8&quot;</td>
<td>1/2&quot;</td>
</tr>
</tbody>
</table>

### LONG BENDERS

<table>
<thead>
<tr>
<th>Catalog Callout (special)</th>
<th>HCLT 62</th>
<th>HCLT 100</th>
<th>HCLT 150</th>
<th>HCLT 200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Benders, width (SW)</td>
<td>1.000&quot;</td>
<td>1.500&quot;</td>
<td>2.000&quot;</td>
<td>3.000&quot;</td>
</tr>
<tr>
<td>Length (specify)</td>
<td>1.500&quot; - 3.000&quot;</td>
<td>2.000&quot; - 4.000&quot;</td>
<td>2.750&quot; - 5.500&quot;</td>
<td>4.000&quot; - 5.500&quot;</td>
</tr>
<tr>
<td>Height (specify)</td>
<td>2.000&quot; - 3.000&quot;</td>
<td>2.000&quot; - 3.000&quot;</td>
<td>2.750&quot; - 3.750&quot;</td>
<td>3.000&quot; - 4.000&quot;</td>
</tr>
<tr>
<td>Rocker Dimensions</td>
<td>B .212&quot;</td>
<td>.339&quot;</td>
<td>.508&quot;</td>
<td>.678&quot;</td>
</tr>
<tr>
<td>C .195&quot;</td>
<td>.312&quot;</td>
<td>.468&quot;</td>
<td>.624&quot;</td>
<td></td>
</tr>
<tr>
<td>J .246&quot;</td>
<td>.393&quot;</td>
<td>.590&quot;</td>
<td>.786&quot;</td>
<td></td>
</tr>
<tr>
<td>SHCS screws</td>
<td>1/4 - 20</td>
<td>5/16 - 18</td>
<td>5/16 - 18</td>
<td>1/2 - 13</td>
</tr>
</tbody>
</table>
Popular Bender Options

1. Dart Stiffeners ... Benders Make it Easy

Standard darts are shown below or you can specify your own angle and dowel size. Darts are rolled into the part during bending, reducing springback and stiffening the part. Darts are produced using dowels through the rocker and require relief grooves in the anvil. The side angles of the darts are a function of the angle and size of the dowel.

Darts are available as specifiable extras on all READY Benders®. Darts are central on a 45° angle unless detailed.

<table>
<thead>
<tr>
<th>Vee Height</th>
<th>Rocker Diameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8</td>
<td>1</td>
</tr>
<tr>
<td>1-1/2</td>
<td>2</td>
</tr>
<tr>
<td>2-1/2</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standards Dent Spec. Numbers</th>
<th>.100&quot;</th>
<th>.200&quot;</th>
<th>.350&quot;</th>
<th>.500&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>V1</td>
<td>V2</td>
<td>V3</td>
<td>V5</td>
</tr>
<tr>
<td>V1</td>
<td>V2</td>
<td>V3</td>
<td>V3</td>
<td>V5</td>
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<tr>
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<td>V5</td>
<td>V5</td>
</tr>
<tr>
<td>V5</td>
<td>V5</td>
<td>V5</td>
<td>V5</td>
<td>V5</td>
</tr>
</tbody>
</table>

Dowel | .093 | .156 | .250 | .312 | .375 | .500

*Dowel may be upsized to avoid a gap between the rocker and the dowel.

Benders gently roll stiffening "darts" into a wide range of formed parts.

How to Specify

Add your selection of Dart Spec. No. after Catalog Number:

<table>
<thead>
<tr>
<th>Qty</th>
<th>Cat. No.</th>
<th>Length</th>
<th>Dart Callout</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>REC 150</td>
<td>X = 2&quot;</td>
<td></td>
</tr>
</tbody>
</table>

2 RE C150 X = 2" 2 V3, Darts, G = 1"

2. Tooth Benders ... Eliminate Part/Die Interferences

Tooth benders use special rockers to eliminate die/part interferences. Often the saddle needs to be made special without gibs in one piece. Send prints for a quotation.

How to Specify

Add TW dimension after Catalog Number:

<table>
<thead>
<tr>
<th>Qty</th>
<th>Cat. No.</th>
<th>TW dim.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>HCTT 62</td>
<td>.400&quot;</td>
</tr>
<tr>
<td>1</td>
<td>RETT 100</td>
<td>.500&quot;</td>
</tr>
<tr>
<td>2</td>
<td>RETC 100</td>
<td>.500&quot;</td>
</tr>
</tbody>
</table>

2 HCTT 62 TW .400" 1 RETT 100 TW .500" 2 RETC 100 TW .500"

*TW central unless detailed.

Please note: The saddle is special (gib built-in) to accept a narrow rocker tooth width. Tooth benders are available on all types of READY Benders® as specials.

3. Over Square Bends ... up to 135° in one press stroke

The READY Bender® ability to bend 45° beyond ninety (135° PA) is one of its greatest features. Customers buy standards and do this simple alteration themselves, adding a degree or two of overbend to the rocker. This easy alteration is done by grinding the bending jaw of the rocker, while not disturbing the working radius of the bending lobe (grind past centerline).

For assistance, call READY Technology and we will give you the necessary dimensions to make this alteration.

Note: Severe overbend (over 109° PA) with a small radius (less than PT) can create a situation where the rocker may catch on the anvil.
Pad Benders

This patented tool can form a slightly open bend completely flat in one vertical press stroke. Use it to form UP or DOWN in high production stamping dies and automated machines. Eliminate the cam action “pre-hem” operation and do hems in two stations instead of three.

We use full hard D-2 rockers and special READY High Production style saddles. This is a special bender, yet attractively priced.

All hem applications should be quoted by READY. Fax prints and the worksheet on the back cover. We usually suggest a test-bend using your material to accurately predict results and select the right hemmer design. We charge a modest fee for this service, based upon the application.

The “Hemmer”

- Eliminate Die Stations and Operations;
- Use in Progressive Dies, Automated Machines

Important Hemmer Functions
1. Diameter may be chosen more by leg height than material thickness.
2. Testing is highly recommended on all hem applications to help determine proper positioning.
3. Pressure pad needed to avoid sliding as hemmer contacts and flattens.
4. Maximum hemmer length is 12”. For longer lengths, butt end-to-end with .010” gap between saddles.

Not Just for Elimination of Tool Marks

Important Pad Functions
1. Pads can be designed to match a part’s “irregular” shape on one side yet be flat and parallel on the surface that the bender contacts.
2. Eliminates rocker contact and impact on part holddown surface.
3. To protect a part cutout or hole from distortion due to its proximity to the bend line.
4. To eliminate humping of the material when the application dictates upsizing the rocker diameter. The pad provides holddown pressure close to the bend radius.
5. To match a standard rocker diameter to the Zee bend or offset vertical height. Allows use of standard rockers versus making specials.

When Using Pads, READY Technology Recommends:
1. Locate the pad and its shoulder screws/spools as close as possible to the tangency point of the radius. This location and bushings or guides will prevent the pad from tipping.
2. Springs to lift the pad should work separately from the spring return of the bender.
3. Additional part holddown may be required in some applications (pilots, die springs or nitrogen cylinders).

Bending Without Tool Marks

READY Benders® normally leave a slight burnish or shine mark on both part surfaces. This is a big improvement over wipe tool scrapes and gouges.

Elimination of tool marks is not just for prepainted metal - one of our big success areas. Use of pads (bottom, left) and highly polished steel rockers are very successful on prepaint and other decorative surfaces.

Depending on acceptable tool mark criteria, we have the solution to most situations. Test-bending (page 19) is the safe approach. For a modest fee, we will form your material using our benders and send you a report with your sample for evaluation.

Solid Delrin® Rockers or Delrin® Inserted Rockers are used without pads on low to medium production applications.

Delrin® is a registered trademark of E.I. DuPont.
Bender Location and Design Formulas:

1. Bender location ... CAD compatible “K” Dimension

The “K” Dimension is the distance between the centerline of the anvil radius and the centerline of a fully closed rocker. Its purpose is to aid the designer in dimensioning the key slots needed to locate the READY Bender® easily.

When the toolmaker actually sets the READY Bender®, he is in fact setting to the “K” Dimension. Correct setting of the bender will provide for longer tool life and better parts. The “K” Dimension changes as an overbend is added to or subtracted from the bending lobe. Though the centerline of the rocker is constant, it will move closer to or further from the anvil radius.

These formulas are only valid for square 90° bend angles. For overbends up to 135° or underbends down to 60°, please consult READY. Due to the trigonometric variations, the formulas are completely changed and can not be generalized.

The formula for the “K” dimension of a 87° standard rocker is:

\[ K = PT + PR \tan \left( \frac{A}{2} \right) \]

2. Tonnage Formula for READY Benders®

READY Benders® require 50-80% less tonnage than wipe bending tools. The clamping lobe provides part hold down from first contact, the bending lobe has greater bending leverage. The ability to overbend up to 135° eliminates the need for coining and bottoming.

\[ F = 2.25 \times \frac{SWT^2}{L} \]

\[ L = B_1 + T + R = 0.343 + 0.060 + 0.060 = 0.463 \] (1” DIAMETER ROCKER)

\[ F = 2.25 \times \frac{50,000 \times 1” \times 0.060^2}{0.463} = 875 \text{ lb.} = 0.44 \text{ ton} \]

3. General Bend Allowance Formula

READY Benders® overbend to allow for springback instead of coining the part material to “set” the bend. As a result, benders leave more material within the bend radius so the bend allowance is greater than wipe bending.

The general formula is:

\[ \text{Bend Allowance (BA)} = 0.01745 \times \text{PA} \times (PR + (PT \times 0.43)) \]

Caution. As we all know, bend allowance may change with different materials and even within different coils of the same material. The only way to be sure of the bend allowance is to test bend the material and measure the BA. (See Test Bending Service, page 19).
How To Install READY Benders®

1. Release the return spring(s) and plunger(s) by releasing the lube fitting or set screw so the rocker can rotate freely. Do not remove the gib from the saddle.
2. Using two pieces of the part material, place one piece on the holddown side of the anvil near to but not into the anvil radius (see drawing right). Put the bender into approximate position.
3. Keeping the second piece of material flush to the bending lobe of the rocker like a feeler gage (moving up and down minorly), set the opening between the tangency of the anvil radius and the bending jaw of the rocker. The anvil should be ground with 2° to 3° more back taper relief than the rocker’s angle “A” being used.
4. Locate the bender with a key for proper location and resistance to side load.
5. Tighten the fastening screws. Lubricate the bender with light oil. Make sure no debris has lodged in spring return area, especially aftermachining mounting holes.

6. Bender Adjustment. You can vary overbend by minor shut height adjustments. Progressive dies are usually best adjusted by moving the bender slightly in (closer to anvil) for more overbend, or out (away from anvil) for less overbend. The standard 87° rocker only has 3° overbend. Anvil inserts can be shimmed or reground to avoid moving the bender.
7. For more details to properly locate READY Benders®, see page 12.

Troubleshooting Guide

**Problems** | **Possible Reasons** | **Solutions**
--- | --- | ---
1. UNDERBENT | A. Bender is set “too open”| Reset bender per instructions.
B. Material is too thick | Use the next larger bender.
C. Part radius is too large | Use the next larger bender, or reduce the part radius.
D. Material is “springy” | Decrease angle A per Fig. 1 below and reset bender per instructions.

2. OVERBENT | A. The bender is set too tight | Reset bender per instructions.
B. Part material is too soft | Increase angle A per Fig. 2 below and reset bender per instructions.
C. Part radius is too small | Increase angle A per Fig. 2 below. Another option is to match rocker and anvil to 90°. No coining.

3. HOOK | A. Material is being “trapped” | Reset bender per instructions. Check anvil radius, it may be too small. Call READY Technology.
B. Rocker is too large for the material thickness | Refer to catalog page for correct rocker size and set per instructions.

4. EXCESSIVE MARKING | A. Bender is set too tight | Reset bender per instructions.
B. Material is too thick or too strong for rocker diameter | Refer to catalog page for correct rocker size and set per instructions.
C. Not enough relief on the anvil | Increase relief angle to 2° - 3° less than angle A of rocker

5. SADDLE IMPRINTING ONTO THE PART | **BENDER IS SET MUCH TOO DEEP! STOP!** | Once the holddown jaw is parallel to the material, ALL adjustments must be in or out. The rocker can be reground to add overbend. See bender adjustment top of page.

*NOTE: The back taper relief ground on the anvil is to allow for the overbend required without pinching the material at full closure. (85° minimum anvil angle suggested for all 90° bends). Always grind 2° to 3° more back taper on anvil than the rocker’s angle “A” being used.

Critical - Once the holddown jaw is parallel to the material, ALL adjustments must be in or out. The rocker can be reground to add overbend...

**Ordering Replacements**

Keep a back-up unit in the crib!

Bender ID No. for replacement and back-up. Reference this when ordering replacements. To order service kit, state model number or bender ID number followed by “K”.

**READY Can Help You**

A copy of bender installation instructions are packaged with every bender shipped. We can assist you if you have technical questions or concerns.

Please note, most problems with benders are easy to fix!

- The #1 biggest problem is not enough back taper relief on the anvil or insert that we form material around. Do not assume - please check 85° minimum for all 90° bends (2° to 3° more relief than the rocker’s angle A which is 87° standard).
- Too often the bender is improperly located either too close or too far away from the anvil. Check the “K” dimension as per the setting instructions.
READY Benders® - Metric

Metric Benders are now less expensive than wipe tooling.

Selecting Standard Benders:

1. Find the PT you are forming in top row of chart below. Read down (vertically) for all data. Verify the PH check (specials can bend shorter PH’s).

2. Note minimum and maximum lengths (X) in chart below. Custom lengths are available. Use in stock lengths whenever possible for quick delivery. Longer lengths achieved by butting units end-to-end, .254 mm gap between.

Features:

1. Rockers: fully hardened (Rc 56 - Rc 62), S-7 tool steel. Rockers and gibbs are held to inch dimensions.

2. Saddles: machine thru hardened steel; mounting holes left for diemaker to locate where needed. Contact Ready Engineering for suggestions.

3. Saddle socket is coated for lubrication and long life. Saddle has flush mount lube fittings.

4. Rockers and saddles are CNC ground for precision and interchangeability.

5. Rocker angle is 87° on all standard benders. This allows for 3° of overbend to produce consistent 90° forms in mild steel. Harder steel or larger part radii may require more overbend. Rocker angles can be specified at time of order or altered by the diemaker. See page 10 about oversquare bends.

### Standard READY Bender® - Metric

![Diagram of a READY Bender with dimensions]

---

### Table: Standard READY Benders - Metric

<table>
<thead>
<tr>
<th>Part Material Thickness (PT)</th>
<th>0.25-1</th>
<th>1-1.9</th>
<th>1.9-3</th>
<th>3-4.1</th>
<th>4.1-5.3</th>
<th>5.3-6.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part Height Check (PH)</td>
<td>6.35</td>
<td>9.9</td>
<td>14.8</td>
<td>19.7</td>
<td>24.6</td>
<td>29.5</td>
</tr>
</tbody>
</table>

*In Stock Lengths, X =*

- 304.8
- 609.6

*Minimum Length (X) (Gib Length - GL)*

- 28.6
- 38.1
- 50.8
- 63.5
- 76.2
- 88.9

*Maximum Length (X)*

- 609.6
- 609.6
- 914.4
- 914.4
- 914.4
- 914.4

**Model Callout**

- RBM 62
- RBM 100
- RBM 150
- RBM 200
- RBM 250
- RBM 300

*All dimensions are in millimeters.*

---

### Standard Benders Form a 90° Bend in Mild Steel

The PR should roughly equal the PT. If you have questions or need a special quotation, please fax the worksheet on back cover with prints.
**READY **

**READY Benders® - Metric: in stock lengths**

**304.8, 609.6, and some styles 914.4 mm long**

- Designed so you can segment to shorter custom lengths.
- Minimum segment size is the Gib Length (GL).
- Custom lengths available, specify.

**RBM 62: 304.8 & 609.6 mm lengths in stock, 15.88 mm diameter rocker**

**RBM 100: 304.8 & 609.6 mm lengths in stock, 25.4 mm diameter rocker**

**RBM 150: 304.8, 609.6 and 914.4 mm lengths in stock, 38.1 mm diameter rocker**

**RBM 200, 250 and 300: 304.8, 609.6 and 914.4 mm lengths in stock, 50.8, 63.5 and 76.2 mm dia rockers**

**Length Segmenting:**

1. 304.8 mm lengths are shown (left). 609.6 and 914.4 mm lengths are a repeating pattern of the 304.8 mm length.
2. Minimum segmenting size is the GL (gib length) dimension. Each segment needs a gib to retain rocker. Spring returns are marked by a and are under gibs.

**How to Segment:**

1. Remove rocker by taking out set screw/lube fitting. Rotate rocker to remove the spring return plunger mechanism and rocker.
2. Rocker is fully hardened (Rc 56-62). Cut with wire machine or best way to precise length/size.
3. Saddle is machinable. Cut with wire machine or best way to precise length.
4. CAUTION: Thoroughly de-burr and clean saddle and rocker. Make sure no chips or dirt remain in saddle/rocker spring return pockets before reassembly.
5. Reassemble and check to make sure rocker returns easily when rotated.

**READY Can Segment:**

1. You must purchase the entire 304.8, 609.6 or 914.4 mm length and specify the segment dimensions. The remaining pieces are shipped with the tooling unless specified otherwise. No rebates on unused pieces.
2. For precision cuts, call READY for pricing - 1-800-543-4355.

**Order Example:**

<table>
<thead>
<tr>
<th>RBM</th>
<th>READY Model Callout</th>
<th>X = 609.6mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Rocker Diameter 25.4 mm</td>
<td>Specify Length of Bender 609.6 mm</td>
</tr>
</tbody>
</table>

\(\$$ = spring return

GL = gib length

Flush mount lube fittings at end of spring return.
Ready High Production Benders - Metric

- Our highest production bender - now available up to 914.4 mm long.
- This is an inch product, the same as READY High Production Benders - Inch, on pages 6 to 8, except with metric mounting holes.

Selecting Standard Benders:
1. Find the PT you are forming in top row of chart below. Read down (vertically) for all data. Verify the PH check (specials can bend shorter PH’s).
2. Note minimum and maximum lengths (X) in chart below. Custom lengths are available. Use in stock lengths whenever possible for quick delivery. Longer lengths achieved by butting units end-to-end, .254 mm gap between.

Standard READY High Production Bender - Metric

- Tapped mounting holes available as specials.
**READY High Production Benders - Metric: in stock lengths**

- Our highest production bender.
- Custom lengths up to 609.6 or 914.4 mm long available, see page 18.
- This is an inch product, the same as READY High Production Benders - Inch, on pages 6 to 8, except with metric mounting holes.

---

**Mounting Hole Locations**

<table>
<thead>
<tr>
<th>Model Callout</th>
<th>Length Style</th>
<th>X Length</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>SHCS size</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMC 62</td>
<td>AA</td>
<td>28.58</td>
<td>14.29</td>
<td>9.00</td>
<td>9.00</td>
<td>30.00</td>
<td>14.00</td>
<td>M4</td>
</tr>
<tr>
<td></td>
<td>CC</td>
<td>88.90</td>
<td>44.45</td>
<td>38.46</td>
<td>22.23</td>
<td>30.00</td>
<td>14.00</td>
<td>M4</td>
</tr>
<tr>
<td></td>
<td>DD</td>
<td>152.40</td>
<td>76.20</td>
<td>70.21</td>
<td>38.10</td>
<td>30.00</td>
<td>14.00</td>
<td>M4</td>
</tr>
<tr>
<td>RMC 100</td>
<td>AA</td>
<td>38.10</td>
<td>19.05</td>
<td>12.00</td>
<td>12.00</td>
<td>37.50</td>
<td>21.50</td>
<td>M6</td>
</tr>
<tr>
<td></td>
<td>BB</td>
<td>101.60</td>
<td>50.80</td>
<td>44.25</td>
<td>44.25</td>
<td>37.50</td>
<td>21.50</td>
<td>M6</td>
</tr>
<tr>
<td></td>
<td>CC</td>
<td>152.40</td>
<td>76.20</td>
<td>67.18</td>
<td>38.10</td>
<td>37.50</td>
<td>21.50</td>
<td>M6</td>
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<tr>
<td></td>
<td>DD</td>
<td>228.60</td>
<td>114.30</td>
<td>105.31</td>
<td>57.15</td>
<td>37.50</td>
<td>21.50</td>
<td>M6</td>
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<tr>
<td>RMC 150</td>
<td>AA</td>
<td>50.80</td>
<td>25.40</td>
<td>17.00</td>
<td>17.00</td>
<td>50.00</td>
<td>30.00</td>
<td>M8</td>
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<tr>
<td></td>
<td>BB</td>
<td>127.00</td>
<td>63.50</td>
<td>51.51</td>
<td>51.51</td>
<td>50.00</td>
<td>30.00</td>
<td>M8</td>
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<tr>
<td></td>
<td>CC</td>
<td>203.20</td>
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<td>86.59</td>
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<td>50.00</td>
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<tr>
<td>RMC 200</td>
<td>AA</td>
<td>63.50</td>
<td>31.750</td>
<td>21.50</td>
<td>21.50</td>
<td>65.00</td>
<td>37.50</td>
<td>M10</td>
</tr>
<tr>
<td></td>
<td>BB</td>
<td>177.80</td>
<td>88.90</td>
<td>73.89</td>
<td>73.89</td>
<td>65.00</td>
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<td>M10</td>
</tr>
<tr>
<td>RMC 250</td>
<td>AA</td>
<td>76.20</td>
<td>38.10</td>
<td>25.00</td>
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<td>79.00</td>
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<td></td>
<td>BB</td>
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<tr>
<td>RMC 300</td>
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<td>88.90</td>
<td>44.45</td>
<td>32.50</td>
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<td></td>
<td>BB</td>
<td>152.40</td>
<td>76.20</td>
<td>58.19</td>
<td>58.19</td>
<td>92.50</td>
<td>57.00</td>
<td>M12</td>
</tr>
</tbody>
</table>

Tolerances Held

- X = saddle length
  - +0mm / −0.25mm;
- X = rocker length
  - +0.25mm / −0mm;
- Screw locations held
  - ± 0.13mm;

Order Example:

```
READY  Rocker  X = DD
Model  Diameter  Callout  25.4 mm  Specify  Length  Bender
RMC   100  X = DD
      Model  Callout  25.4 mm  Specify  Length  Bender
```

---

All dimensions are in millimeters.
READY High Production Benders - Metric: Custom Lengths

- Now available up to 914.4 mm long.
- Specify your desired length (X) and READY will deliver.
- This is an inch product, the same as READY High Production Benders - Inch on pages 6 to 8, except with metric mounting holes.

Minimum/Maximum Lengths:
1. Charts and drawings showing hole locations, etc., start at nominal lengths. Custom lengths start very short, at catalog Gib Length (GL) dimensions.
2. Mounting hole patterns for shorter, custom lengths are available upon request by application.

RMC 62
- Minimum 29 mm (GL)
- Maximum 609.6 mm

RMC 100
- Minimum 39 mm (GL)
- Maximum 609.6 mm

RMC 150
- Minimum 51 mm (GL)
- Maximum 914.4 mm

RMC 200
- Minimum 64 mm (GL)
- Maximum 914.4 mm

RMC 250
- Minimum 77 mm (GL)
- Maximum 914.4 mm

RMC 300
- Minimum 89 mm (GL)
- Maximum 914.4 mm

3. PLEASE NOTE: Standard in stock lengths of READY High Production Benders are cataloged on page 17. These ship fast and cost less. The READY Bender® - Metric, pages 14 and 15, is available in custom lengths and can further reduce your tooling budget.

NOTE:
- Counterbored holes standard, tapped available as specials.

Minimum/Ma ximum Lengths:
1. Charts and drawings showing hole locations, etc., start at nominal lengths. Custom lengths start very short, at catalog Gib Length (GL) dimensions.
2. Mounting hole patterns for shorter, custom lengths are available upon request by application.

RMC 62
- Minimum 29 mm (GL)
- Maximum 609.6 mm

RMC 100
- Minimum 39 mm (GL)
- Maximum 609.6 mm

RMC 150
- Minimum 51 mm (GL)
- Maximum 914.4 mm

RMC 200
- Minimum 64 mm (GL)
- Maximum 914.4 mm

RMC 250
- Minimum 77 mm (GL)
- Maximum 914.4 mm

RMC 300
- Minimum 89 mm (GL)
- Maximum 914.4 mm

3. PLEASE NOTE: Standard in stock lengths of READY High Production Benders are cataloged on page 17. These ship fast and cost less. The READY Bender® - Metric, pages 14 and 15, is available in custom lengths and can further reduce your tooling budget.

NOTE:
- Counterbored holes standard, tapped available as specials.
Selecting the right Bender is as easy as 1...2...3
Fax or email this worksheet for FAST QUOTES
benders@readytechnology.com

1 Company: __________________________
Contact Name: ______________________ Title: ______________________
Address: ____________________________
City, State, Zip: ______________________
Telephone: ______________________ Fax: ______________________
Other Contacts: ______________________

2 Please describe your application
This will be formed in (please check)
☐ Stamping Die ☐ Automated Machine ☐ Press Brake, tonnage of press brake _______

Here are some of the most popular applications:

- Square Bend CB1
- Over Square CB3
- Channel Bend CB7
- Zee Bend CB5

90° Bend Form 135° In One Hit Even Narrow Channels Form Offsets In One Hit

Annual production __________________________
Type of material formed __________________________
Tensile strength __________________________

CB = Classified Bend # __________________________
PT = Part Material Thickness __________________________
PL = Part Length (bent leg) __________________________
PA = Part Angle (degrees of bend) __________________________
PH = Part Height (bent leg) __________________________
PR = Part Radius __________________________
PC = Part Channel (inside) __________________________

Are tool marks* on part acceptable? __________________________
*We specialize in forming even prepaint without tool marks.

3 Please Quote:

- Stamping Dies
  ☐ Ready makes determination
  ☐ The READY Bender
  ☐ Ready High Production Bender
  ☐ Ready Bender - Metric
  ☐ Ready High Production Bender - Metric
  ☐ Compact Benders

- Press Brake Tooling
  ☐ Rotary Bender Press Brake Tools
  ☐ Conventional Vee Die Brake Tools
  ☐ Special Brake Tooling per print

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Fax 937-866-7226 • www.readytechnology.com

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