



TRUSTED SOLUTIONS AND INNOVATION

ACCU-BEND™

- ◆ Holds $\pm 1/2^\circ$ angle tolerance
- ◆ Able to overbend up to 120°
- ◆ Designed for consistent production of angles
- ◆ Decreases forming tonnage by 40% – 80%



Service We Deliver and Quality You Can Depend On

DANLY IEM is a leading manufacturer of die sets and die component products supplied globally to the parts forming industry. Backed by years of tool and die experience, quality and innovation are some of the reasons why our name is respected throughout the world. We have taken the lead role in creating and bringing new products to customers and helping them find solutions that improve their operations. Based on the capabilities **DANLY IEM** offers, we can help you to meet the demands of quick deliveries, technical support, quality products and competitive prices. **DANLY IEM** and its' broad distribution channels and direct sales personnel will assist you in any way to make your product a better and more profitable one.

Whether you purchase on-line or in person, you will receive the same reliable service **DANLY IEM** is known for. We understand the demanding schedules of die builders and production personnel and have developed efficient manufacturing processes to shorten product lead times as well as put inventory on our shelves so you can have it in your facility when you need it. Put the **DANLY IEM** network to work for you. We've got the service you've been looking for.

Included in our full line offering are both inch and metric size die sets and die components that are designed to numerous die standards including ISO, NAAMS, JIS and many large automotive and appliance manufacturers' standards. The complete product offering includes:

- Ball bearing and friction style die sets including custom and catalog sets
- Machined plate
- Guide posts & bushings
- ISO and JIS Die springs
- In-die tapping units for both mechanical and hydraulic presses
- Formathane® Urethane springs, strippers, sheets, bars, rods and die cover film
- Diemakers' supplies such as pry bars, dowel pins, hoist rings, clamps and fasteners
- Standard and self-lubricating wear product including wear plate, wear strips, gibs, keeper plates and guide blocks
- Cam units, including Mini™, Aerial and Die Mount styles
- Accubend™ Rotary Benders
- Standard and Ball lock punches and retainers
- Air presses
- Pad retainers
- Nitrogen gas springs



Our facility has been Registered by Underwriters Laboratories, Inc. to the International Organization for Standardization ISO 9001 Series Standards for Quality.
Registered by UL to ISO 9001.

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Accu-Bend™ Rotary Benders are manufactured under U.S. Patent No. 6,983,634.

Accu-Bend™ – Simplifying Your Bending Process!

Product Features You Will Appreciate

The Accu-Bend™ is manufactured with the same precise methods and processes you put into your own designs. The bending lobes of the Accu-Bend™ are specifically treated to withstand the wear associated with a repetitive bending motion. The saddle is a low-friction alloy chosen for the ability to hold up to a bearing load with little to no wear.

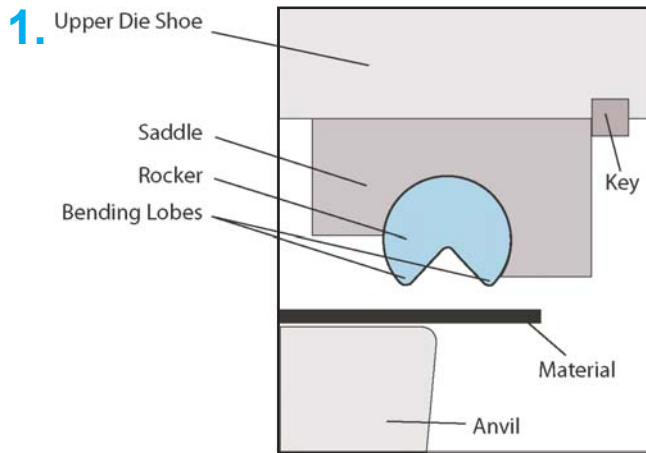
The Flexibility To Handle Custom Orders

Having a wide range of standard sizes is never enough. When you have an application that calls for something special, call us. Our team of engineering specialists are waiting to tackle your job head-on. They will work with you to quickly find solutions that fit your specific application.

Once designed, making your custom order(s) will be quick and easy, using our extensive production resources which utilize the latest in tooling.

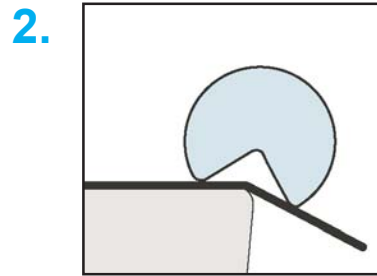
How Benders Work

Product Features



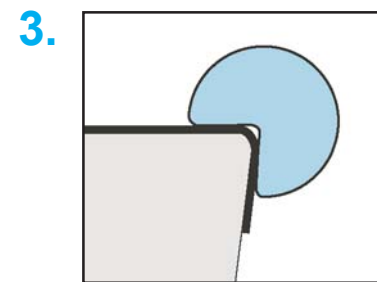
START POSITION

Downward pressure of the press clamps the part with the rocker's bending lobes before the bending action starts.



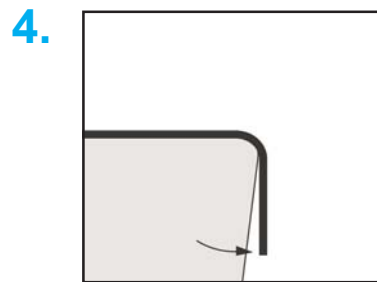
BEND

The rocker's natural rotation forms the material around the anvil with less pressure and material distortion than wipe tooling.



OVERBEND by 3°

Bending action continues to form the material around the anvil until desired angle is completed. The anvil should have 5° relief to allow for the 3° overbend.*



MATERIAL SPRINGBACK

Rockers bend past 90° to counteract material springback, leaving a 90° bent part ($\pm 1/2^\circ$).

**The 3° overbend applies to cold rolled steel only.*

CUSTOM ORDERS:

- ◆ Requests for custom orders can be made by completing a Special Request Quote Form (page 8) or contacting Customer Service.
- ◆ Shorter lengths or segmenting are possible. See pricer for cost.
- ◆ Pressure pads can be ordered with Accu-Bend™ units.

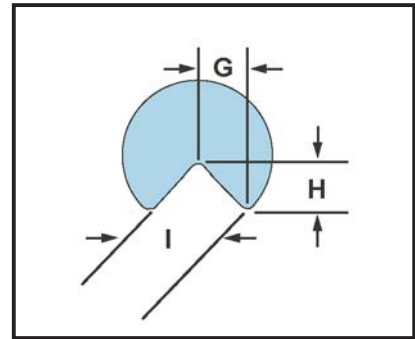
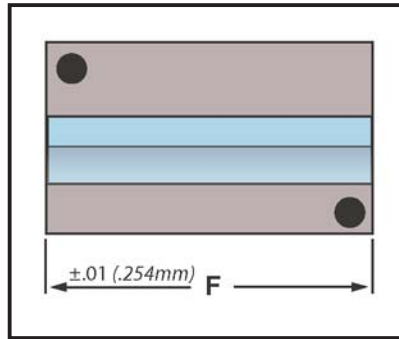
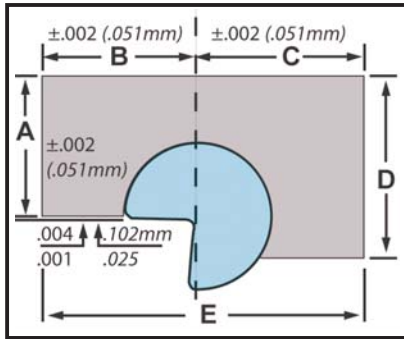
MAINTENANCE:

- ◆ Lubrication is recommended every 100K cycles, using a lightweight oil, such as SAE 10-20 or ISO 32.

FEATURES:

- ◆ Hardened bending surface (56Rc).
- ◆ 87° rocker for 90° bends. This allows a 3° overbend for material spring back.
- ◆ Rockers and saddles are machined for precision and interchangeability.
- ◆ Graphite plugs are included in the bronze saddle to provide lubrication.
- ◆ Mounting holes are left out for diemaker to locate where needed. If predrilled mounting holes are desired, then add a "-MH" to the end of the standard part number (Ex: HI-200-6-MH).

Standard Bender Specifications



Model Number	Part Thickness (in)(mm)	Minumum Part Height (in)(mm)	SHCS Size	A (in)(mm)	B (in)(mm)	C (in)(mm)	D (in)(mm)	E (in)(mm)	F (in)(mm)	G (in)(mm)	H (in)(mm)	I (in)(mm)
HI-62-2	.010 - .042 (.3 - 1.0)	.250 (6.4)	#10 M5	.875 (22.2)	.750 (19.1)	1.375 (34.9)	1.063 (27.0)	2.125 (54.0)	2 (50.8)	.198 (5.02)	.194 (4.93)	.256 (6.49)
HI-62-4									4 (101.6)			
HI-62-6									6 (152.4)			
HI-62-8									8 (203.2)			
HI-62-12									12 (304.8)			
HI-62-16									16 (406.4)			
HI-62-20									20 (508.0)			
HI-62-24									24 (609.6)			
HI-100-3	.043 - .075 (1.0 - 1.9)	.390 (9.9)	1/4 M6	1.375 (34.9)	1.125 (28.6)	1.750 (44.5)	1.680 (42.7)	2.875 (73.0)	3 (76.2)	.339 (8.61)	.329 (8.36)	.429 (10.91)
HI-100-6									6 (152.4)			
HI-100-9									9 (228.6)			
HI-100-12									12 (304.8)			
HI-100-15									15 (381.0)			
HI-100-18									18 (457.2)			
HI-100-21									21 (533.4)			
HI-100-24									24 (609.6)			
HI-150-3	.076 - .120 (1.9 - 3.0)	.580 (14.7)	5/16 M8	1.875 (47.6)	1.500 (38.1)	2.375 (60.3)	2.333 (59.2)	3.875 (98.4)	3 (76.2)	.484 (12.29)	.467 (11.87)	.608 (15.45)
HI-150-6									6 (152.4)			
HI-150-9									9 (228.6)			
HI-150-12									12 (304.8)			
HI-150-15									15 (381.0)			
HI-150-18									18 (457.2)			
HI-150-21									21 (533.4)			
HI-150-24									24 (609.6)			
HI-200-3	.121 - .164 (3.0 - 4.2)	.775 (19.7)	3/8 M10	2.375 (60.3)	1.875 (47.6)	3.000 (76.2)	2.992 (76.0)	4.875 (123.8)	3 (76.2)	.645 (16.39)	.623 (15.83)	.811 (20.60)
HI-200-6									6 (152.4)			
HI-200-9									9 (228.6)			
HI-200-12									12 (304.8)			
HI-200-15									15 (381.0)			
HI-200-18									18 (457.2)			
HI-200-21									21 (533.4)			
HI-200-24									24 (609.6)			

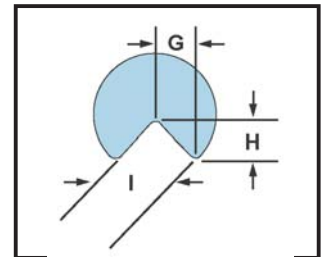
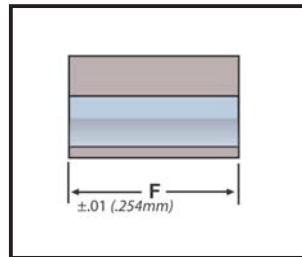
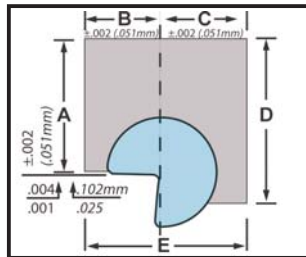
NOTE: Metric dimensions are soft conversions and are intended for reference purposes only.

Standard Bender Specifications *continued*

Model Number	Part Thickness (in)(mm)	Minimum Part Height (in)(mm)	SHCS Size	A (in)(mm)	B (in)(mm)	C (in)(mm)	D (in)(mm)	E (in)(mm)	F (in)(mm)	G (in)(mm)	H (in)(mm)	I (in)(mm)
HI-250-3	.165 – .209 (4.2 - 5.2)	.97 (24.6)	1/2 M12	2.875 (73.0)	2.250 (57.15)	3.625 (92.1)	3.655 (92.8)	5.875 (149.2)	3 (76.2)	.808 (20.51)	.780 (19.81)	1.015 (25.78)
HI-250-6									6 (152.4)			
HI-250-9									9 (228.6)			
HI-250-12									12 (304.8)			
HI-250-15									15 (381.0)			
HI-250-18									18 (457.12)			
HI-250-21									21 (533.4)			
HI-250-24									24 (609.6)			
HI-300-3	.210 – .250 (5.2 - 6.3)	1.16 (29.5)	1/2 M12	3.375 (85.7)	2.750 (69.85)	4.125 (104.8)	4.311 (109.5)	6.875 (174.6)	3 (76.2)	.969 (24.61)	.936 (23.77)	1.218 (30.94)
HI-300-6									6 (152.4)			
HI-300-9									9 (228.6)			
HI-300-12									12 (304.8)			
HI-300-15									15 (381.0)			
HI-300-18									18 (457.2)			
HI-300-21									21 (533.4)			
HI-300-24									24 (609.6)			

NOTE: Metric dimensions are soft conversions and are intended for reference purposes only.

Compact Bender Specifications



Model Number	Part Thickness (in)(mm)	Minimum Part Height (in)(mm)	A (in)(mm)	B (in)(mm)	C (in)(mm)	D (in)(mm)	E (in)(mm)	F (in)(mm)	G (in)(mm)	H (in)(mm)	I (in)(mm)
CB-62	.010 - .042 (.3 - 1.0)	.250 (6.4)	1.750 (44.5)	.500 (12.7)	.500 (12.7)	1.938 (49.2)	1.00 (25.4)	1.00 (25.4)	.221 (5.6)	.181 (4.6)	.254 (6.5)
CB-100	.043 - .075 (1.0 - 1.9)	.390 (9.9)	2.500 (63.5)	.750 (19.1)	.750 (19.1)	2.805 (71.2)	1.500 (38.1)	1.500 (38.1)	.355 (9.0)	.283 (7.2)	.399 (10.1)
CB-150	.076 - .120 (1.9 - 3.0)	.580 (14.7)	3.000 (76.2)	1.000 (25.4)	1.000 (25.4)	3.461 (87.9)	2.00 (50.8)	2.00 (50.8)	.535 (13.6)	.440 (11.2)	.601 (15.3)
CB-200	.121 - .164 (3.0 - 4.2)	.775 (19.7)	3.500 (88.9)	1.500 (38.1)	1.500 (38.1)	4.117 (104.6)	3.000 (76.2)	3.00 (76.2)	.714 (18.1)	.567 (14.4)	.800 (20.3)

NOTE: Metric dimensions are soft conversions and are intended for reference purposes only.

- ◆ Compact benders are recommended for medium to high production.
- ◆ The saddle is made from a low-friction, superior wear material..
- ◆ Custom lengths are available.
- ◆ Mounting holes are not included. Chase or yoke mounting supplied by diemaker.
- ◆ Rockers and saddles are equal length. Longer rockers are available by request.

Bender Design Information

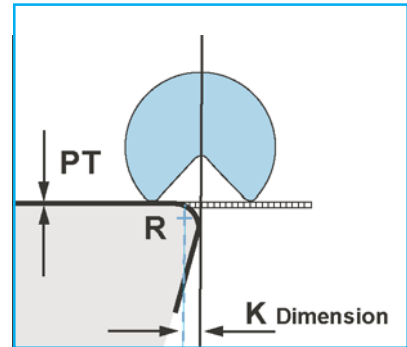
Bender Location

There are two ways to set an Accu-Bend™ into a die design for a 90° bend:

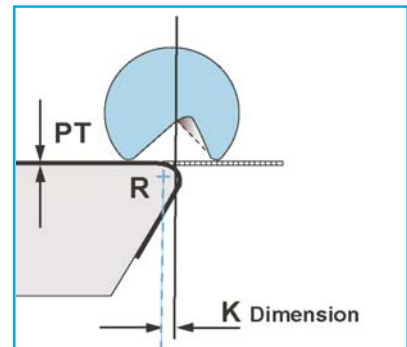
- ◆ The first would be to download a file from the website or call the customer service number on the back of the catalog and request a CAD template CD.
- ◆ The second would be to use the formula for setting the “K” dimension. Proper setting of the rocker centerline in relation to the anvil radius centerline is important for dimensioning the key slots needed to hold the backup key.

$$K = \frac{PT + PR}{\tan(A/2)}$$

Setting the "K" dimension for over bend or under bend applications is more complex and is best handled by working with our engineering department.



Standard Bend



Over Bend

Tonnage Formula for the Accu-Bend™

F = Force Required (Pounds and Tons)

TS = Ultimate Tensile Strength

W = Width of Bend

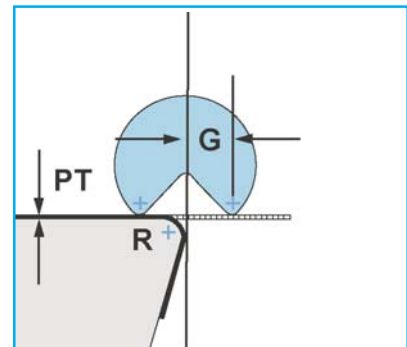
PT = Part Thickness

L = Span (Beam) $L = G + PT + R$

G = Rocker Dimension

R = Part Radius

$$F = 2.25 \times \frac{TS \times W \times (PT)^2}{L}$$

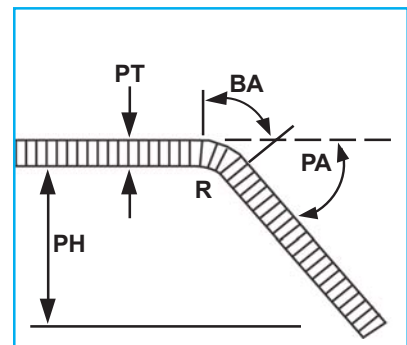


General Bend Allowance

The smooth rotary action of a bender requires a greater bend allowance than is typical with a coining or wipe bending operation. The formula for the bend allowance is:

$$BA = 0.01745 \times PA \times [PR + (PT \times .43)]$$

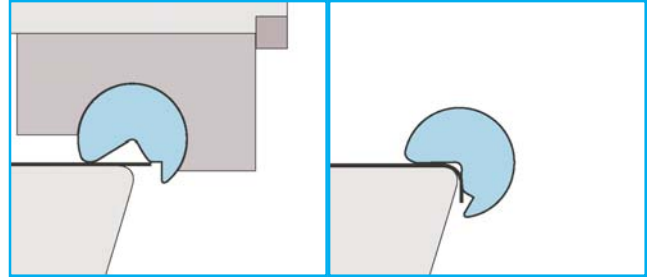
Important: Variances in material specifications and tolerances may require a change in the bend allowance when changing coils of the same material or changing material type altogether.



Modified Bends

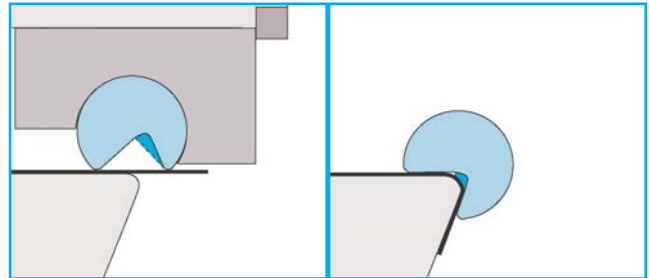
Short Leg

- ◆ Short leg bends require a recessed step in the bending lobe of the rocker to accommodate the shorter part height.
- ◆ Tonnage requirements will increase as compared to a standard bend.
- ◆ The formula to determine the shortest leg possible is:
$$2.6 \times (\text{part thickness}) + (\text{part radius}).$$



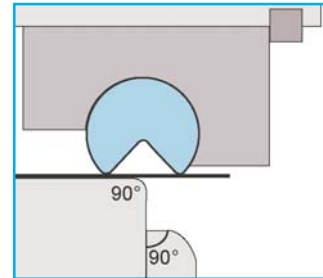
Over Square (up to 120°)

- ◆ Over square bends are perfect for pre-hemming applications.
- ◆ Over square bends require a modification of the rocker angle while maintaining a constant bending lobe radius.
- ◆ The use of a pressure pad is suggested for over square bends over 110° to keep the rocker from sticking to the part.



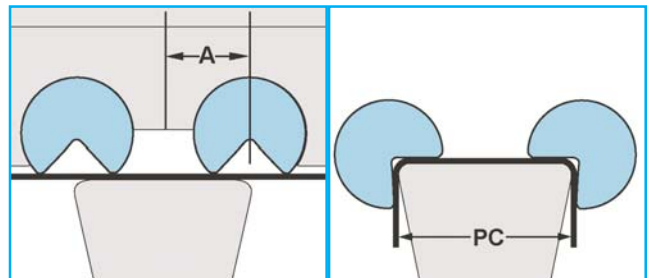
Zee Bend

- ◆ A true 90° rocker is used in Zee Bend applications.
- ◆ A pressure pad is usually required to make up the difference between the part height and the (I) dimension of the rocker.
- ◆ A slight modification to the bending lobe at the time of production of the bender may be required to obtain the desired part radius on the lower bend.



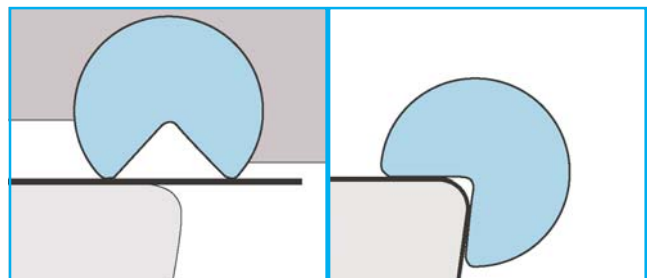
Channel Bend and Hat Bends

- ◆ Channel bends can be accomplished in one press stroke by pairing two benders face-to-face.
- ◆ In order to use standard benders, the spread or part channel must be greater than 2 times the (A) dimension.
- ◆ A pressure pad may be required to hold the part to keep the material from humping at the bend radius and in place.
- ◆ Hat bends can be handled with a two Zee Bend setup



Large Radius

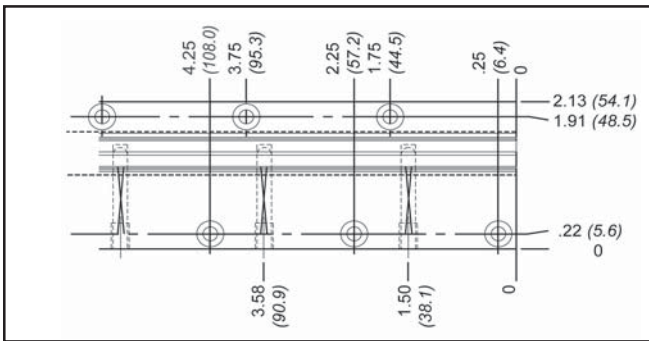
- ◆ A bend radius exceeding 3 times part thickness is considered a large radius bend.
- ◆ Large radius bends can be accomplished by using a larger size rocker.
- ◆ Adding a few extra degrees of over bend is required to compensate for material spring back.



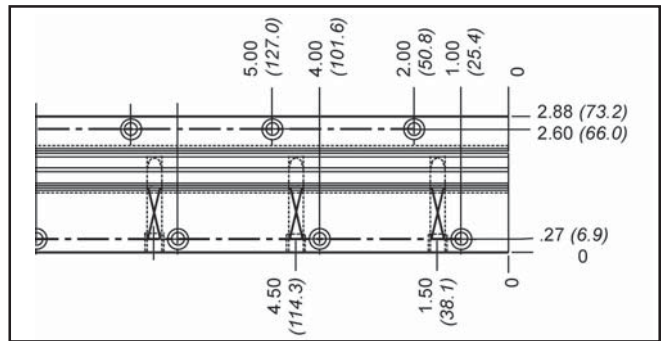
Available Options

Counter Bored Mounting Holes

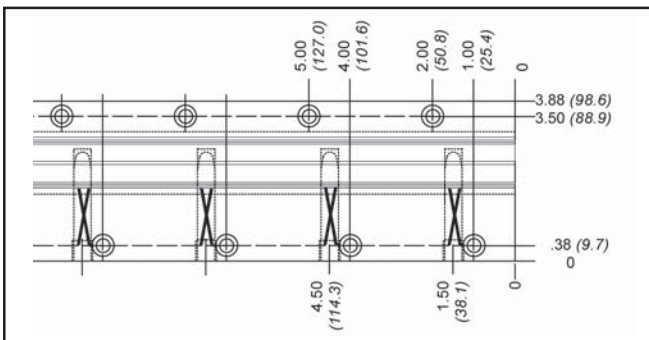
HI-62



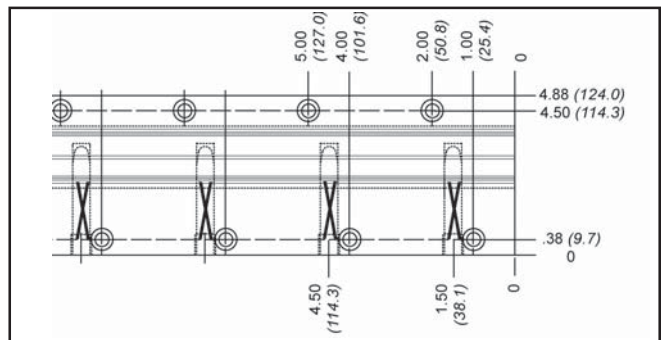
HI-100



HI-150



HI-200

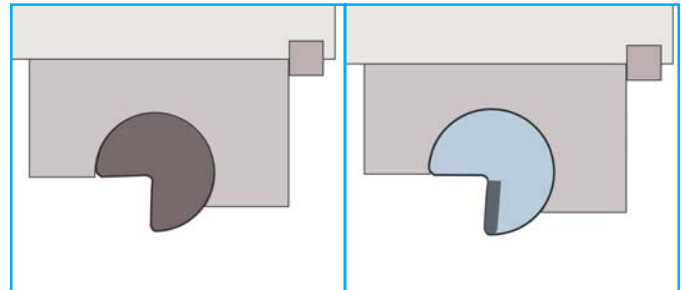


Hole patterns repeat up to 24".

NOTE: Metric dimensions are soft conversions and are intended for reference purposes only.
Mounting hole diagrams for HI-250 and HI-300 are available upon request.

Delrin® Rocker and Insert

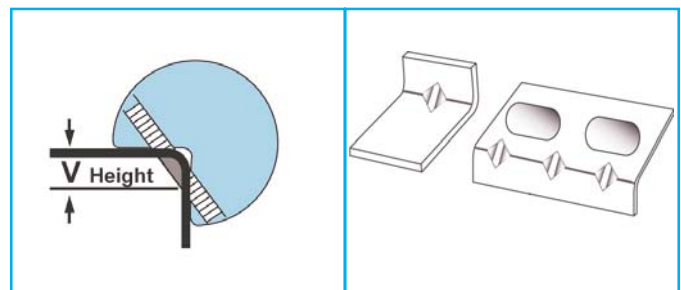
- ◆ Delrin® is a hard, low-friction polymer used as a contact material for stainless or pre-painted steel where slight tool marks are not acceptable.
- ◆ Life of the tool can be extended by using a Delrin® insert in combination with a pressure pad positioned between the part surface and the bending lobe of the rocker.
- ◆ Delrin® inserts are not available in the HI-62 and CB-62 models. However, we could provide a solid Delrin® rocker as a special.
- ◆ A solid Delrin® rocker is used in low production volumes under 100K parts.



Delrin® is a registered trademark of DuPont.

Dart Stiffener

- ◆ Dart Stiffeners are an easy way to add strength to any part and are formed using less tonnage with the rotary action of the Accu-Bend™.
- ◆ You can specify the size of the dart and a rocker with dowel(s) will be made to fit your application.
- ◆ A relief in the anvil is necessary to accommodate each dart.



Accu-Bend™ Quotation Form

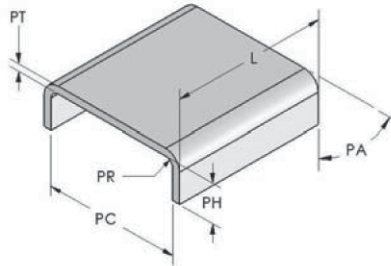
Quote No. (Assigned by Danly IEM): _____
Date: _____

COMPANY INFORMATION

Company Name: _____
 Contact: _____ Title: _____
 Address: _____
 City: _____ State: _____ Zip: _____
 Phone: _____ Fax: _____
 E-mail Address: _____

APPLICATION INFORMATION

Production Method:¹ Stamping Press Press Brake
 Order Quantity: _____ Material Type & Grade: _____
 Material Yield Strength: _____ Ann. Prod. Volume:² _____
 L = Length of Bend (bender length): _____ PT = Part Material Thickness: _____
 PH = Part Height (bent leg): _____ PR = Part Radius (inside):⁴ _____
 PC = Part Channel (inside): _____ PA = Part Angle (outside): _____
 Over Bend required (30° max):³ _____ Check here if tool marks are not acceptable
 Check here if you are interested in test bending this part No. of drawings attached: _____



Type of Bend (check one)

Square		<input type="checkbox"/>	Zee Bend		<input type="checkbox"/>
Over Square		<input type="checkbox"/>	Short Leg		<input type="checkbox"/>
Channel		<input type="checkbox"/>	Under Square		<input type="checkbox"/>
Hat Bend		<input type="checkbox"/>	"J" Bend (requires two hits)		<input type="checkbox"/>

- 1 Press Brake application may require special mounting plate to secure the Accu-Benders
- 2 Annual production volume will be assumed as 250,000, if it is not specified.
- 3 If the over bend angle is not specified by the customer, Danly IEM will recommend the over bend required. However, this recommendation is not a guarantee. Danly IEM can perform a variety of test bending. Please contact our customer service regarding our test bending service.
- 4 Due to material characteristics Danly recommends the part radius should be at least equal to material thickness. The final part radius is a result of anvil geometry and material behavior.

WITHIN THE USA & CANADA

CALL: 800-243-2659

FAX: 800-833-2659

quotes@danly.com

OUTSIDE THE USA & CANADA

CALL: 001-216-898-6280

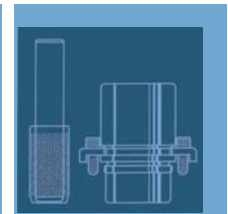
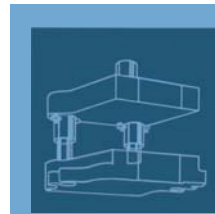
FAX: 001-216-898-6278

quotes@danly.com

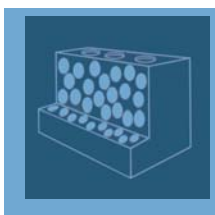
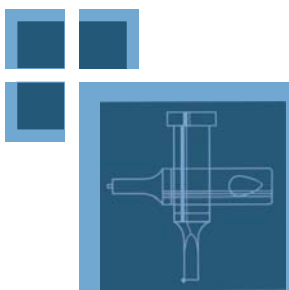
The Danly IEM Value Proposition

- I. **Danly IEM** is recognized as the leader in manufacturing quality die sets and related products to the global parts forming industry. Our reputation has been built by satisfying customer needs, and we are very strong in the automotive and appliance industries.
- II. **Danly IEM** offers outstanding delivery on a consistent basis. Choosing us as a supplier means that our customers have a competitive advantage in delivering their products to the market.
- III. **Danly IEM** has complex machining capabilities on die sets at several strategically located facilities. Locations throughout the USA means lower shipping costs and allowing **Danly IEM** to machine complex die sets means the customer's machining centers have additional capacity.
- IV. **Danly IEM's** vast breadth of products assures innovative solutions. We strive to address customer problems by utilizing our research and development department as well as other technical professionals.
- V. **Danly IEM** has a technically trained sales force and distributor channels with engineering support. Sales, marketing and engineering professionals are available to support our product lines.

- **Competitive Prices**
- **Reliability and Performance**



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