



Kamweld Technologies, Inc.  
781-762-6922

## KAMWELD BENDING DEVICE

### HEATING TOOL FOR ANGLE-FORMING AND BENDING OF THERMOPLASTICS

The use of heated tools for bending and angle forming has a decided advantage in fabrication. Assemblies are easier formed, larger pieces handled by the heated tool technique resulting in cost reduction for large assemblies.

Specially designed forming and bending heaters are available to heat a sheet of plastic for bending or forming into any desired angle. The Kamweld Heating Device is an excellent type of heating tool for forming all angle bends.

#### Method of Making Angle Bends

The heating device consists of two rectangular aluminum-heating bars — a top section and a bottom section. These bars are electrically heated by metal-encased elements that assure long element life. Each heater-bar has two heating faces: ½", and 1" to accommodate sheet material gauges from 1/16 thru ¾ inch. Each bar has two insulated handles, 10 feet of two wire electrical cord, and plug. The top heating section has a bar with *long* handles and *short* steel guide clips mounted on an aluminum base.



The bottom heating section has a bar with *short* handles and *tall* guide clips mounted on an aluminum base.

#### Using Kamweld's Bending Device to Make Crisp Bends

There are two different steps in bending plastics. The first step is to heat uniformly the area to be bent. This is easily accomplished with the KAMWELD Heating Device. The second step is forming the heated sheet material into any desired angle. We recommend the use of metal or wooden guides. The heated plastic is held in the desired position until sufficiently cooled, and the bend is complete. You can prepare plastic sheet material for single or double bends at the same time.



Kamweld Technologies, Inc.  
781-762-6922

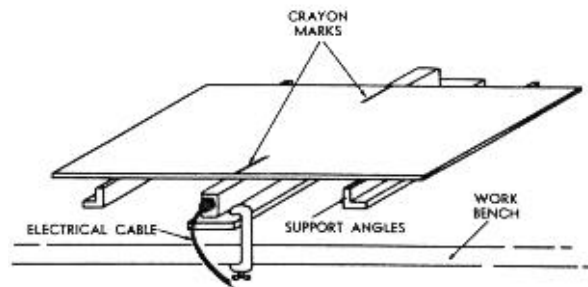
### Single-Bend Operation

1. Place heating bar sections on a flat, level bench.
2. Connect to a standard 115-volt A.C. outlet. Allow approximately 5 minutes for warm-up time.
3. Mark the exact position of areas to be heated, using a marking crayon.
4. Select one of the two heating faces on each bar according to specification chart.

The ½" face is referred to as Side A

The 1" face is referred to as Side B

5. The selected heating surface of the bottom section should be facing up. The sheet is then placed on the bar with the crayon marks centered.
6. Use supporting angles to keep the plastic sheet level during the heating period.



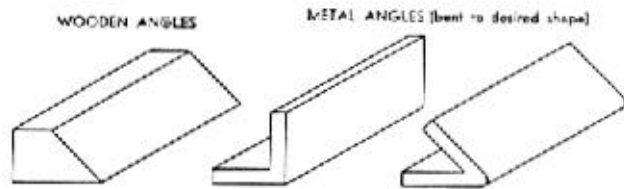
7. Place the top heating bar with the selected heating surface on top of the plastic sheet and insert between the high-guide clips.
8. Leave plastic sheet between bars for a period of time as shown in specification chart. You can test the sheet during heating time by holding one end of the sheet and flexing the other end. When it flexes easily, it is sufficiently heated for bending.
9. Remove top bar and place it back into the clips on its base. The sheet is now ready for bending.



Kamweld Technologies, Inc.  
781-762-6922

## Bending

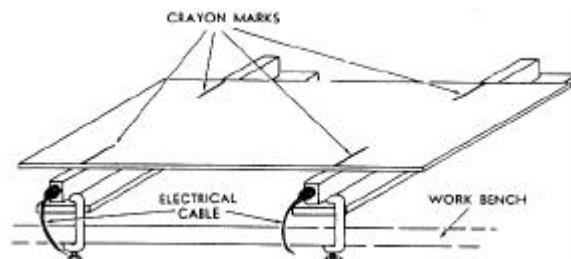
There are various methods of bending, depending on the gauge and type of the material. Sheet-metal brakes or any other positive forms can be used to make bends. However, you can place the sheet with the heated area over the edge of a straight bench and hold it at the desired angle until the heated area is sufficiently cooled. You can make your own forms of either metal or wood for various bends as needed. Metal is preferable because it speeds up the cooling.



## Double-Bend Operation

You can heat sheet material up to 1/2 inch thick for double bends as close as 1 inch to any desired measurement.

1. Follow instructions as shown in paragraph 1 through 4 (Single-Bend Operation).
2. Clamp one heater section to bench with spring clamp or C-clamp.
3. Place other section at desired measurements and secure with clamp.
4. Place plastic sheet on top of heating bars and center the crayon marks.
5. Leave sheet on the heater bars for the time indicated in specification chart.
6. The plastic sheet is now ready for bending.



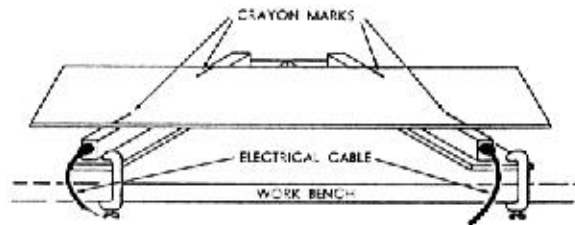
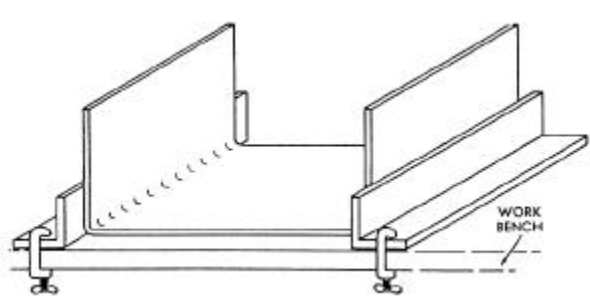


Kamweld Technologies, Inc.  
781-762-6922

### Bending

Use two steel angles, clamped to the bench (at the desired measurements) to prevent spreading. The heated sheet is placed between the two angles, pushed down, and held until sufficiently cooled. Cool-off time is 1 to 3 minutes, depending on the gauge of the material.

For angles other than 90° we recommend use of suitable wooden blocks or steel angles. You can also make bends that are not parallel simply by placing the heating device and the forms into corresponding positions.



### Extra-Wide Bends

This device permits heating of an area up to 2 inches wide by resting both bar sections with the 1-inch faces up on the bottom-section base with one bar inside the guide clips, and the other bar is alongside on the extended aluminum pads.





Kamweld Technologies, Inc.  
781-762-6922

**SPECIFICATION CHART  
PVC Type I & II**

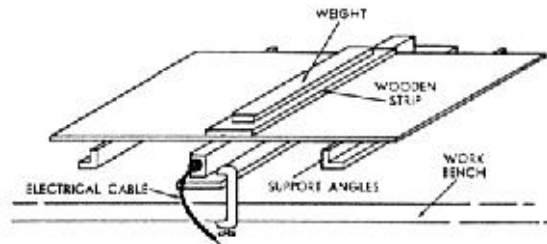
Sheet Gauge	Single Bends			Double Bends	
	Heating Face of Bottom Section	Heating Face of Top Section	Heating Time*	Heating Faces of Both Sections	Heating Time
1/4"				A and A	1/2 min.
1/8"	A	A	1 min.	A and A	2 min.
3/16"	A	A	2 min.	A and A	4 min.
1/4"	A	A	10 min.	A and A	14 min.
3/8"	B	B	15 min.	A and A	> 14 min.
1/2"	B	B	18 min	A and A	>> 14 min.

\* Actual Times May Vary

**Heating of Polyethylene and Polypropylene**

These types of plastics can be satisfactorily heated by following these simple instructions.

1. Follow instructions as shown in paragraph 1 through 4 (Single Bend Operation).
2. Apply a thin coat of vegetable oil on the heating bars for each heating operation. Note: The heating bars should be cleaned with fine steel wool after use daily, to remove irregular build-up, caused by the vegetable oil.
3. Use only the bottom heater-section for a time duration as shown in specification chart.
4. The selected heating surface of the bottom section should be facing up. The sheet is then placed on the bar with the crayon marks centered.



5. Place a smooth wooden strip across the entire area that is to be heated and place a weight on top or hold it down. The use of the wooden strip concentrates the heat in that area and, at the same time, assures that the plastic sheet rests flat and evenly against the heating bar. Material of this type tends to bow during the heating period.

Important: The inside radius of the bend requires more heat than the outside radius.

6. When the sheet shows signs of softening on the bottom side, remove the wooden strip and place the other heater bar on top of the sheet.



Kamweld Technologies, Inc.  
781-762-6922

7. Leave the sheet in this position for the period of time shown in specification chart.



8. The sheet is not ready for bending. It will be softer on the bottom side, and this side is the inside radius of the bend.

### SPECIFICATION CHART

Sheet Gauge	Single Bends		Double Bends		
	Heating Face of Bottom Section	Heating Time	Heating Faces of Top Section	Heating Time	Total Heating Time of Sheet
1/8"	A	3 min.	A	2 min.	5 min.
3/16"	A	4 min.	A	3 min.	7 min.
1/4"	A	6 min.	A	4 min.	10 min.

\* Actual Times May Vary

Above chart also applies to polypropylene, except that slightly less heating time is required.

The charts show the approximate heating times required for a 48 inch wide sheet. Narrow sheets should always be placed in the center of the heating device to maintain balance of top heating bar for uniform heat. The Exact heating time will depend upon the variations of the materials and gauges as well as the electrical voltage supply. It is recommended that test bends be made to determine the exact heating time needed for best results, especially for other thermoplastic materials that require more or less heat for forming than materials shown in the charts.

Heavier gauge sheet not shown on the charts can be heated on top of the bars and turned over once or twice for even heat penetration. Covering the heated area with a wooden strip can reduce heating time.

Typical applications for localized heating would be in the fabrication of angles, channels, tank-corner bends, and square or rectangular duct, as well as hoods and sinks. A formed corner is stronger than a fabricated corner.

