

ROLLER GUIDED BEND TESTER

MODEL BT1C

“The Model BT1C is ideal if you will be performing one particular bend test repeatedly.”

You won't be limited to the one test, but to do another, you will have to change some components. You will be able to perform tests in accordance with any of the ASME, AWS, API, or Military codes and standards. The Model BT1C comes standard with a 1.500 inch diameter mandrel which is the one most often used to bend 3/8 inch thick plain carbon and austenitic stainless steel welds. Additional mandrels and associated components may be obtained to bend test other materials and thicknesses (see the next page for more on how to choose a mandrel).

The Model BT1C is convertible to many other bend radii. You do not have to improvise or cut corners. On the other hand, if you know today that your bend testing program will require two or more bend radii, then the Model BT1D would be the better choice. It is designed to make changing bend radii a simple process. For other details on the BT1D, please refer to its brochure.

The Model BT1C will not become obsolete if your requirements change. To convert to a different radius, you disassemble the standard roller assembly so that you can use the existing rollers with optional roller plates. You also insert



Model BT1C

the corresponding mandrel and adapter. This entire process can take from 10 to 15 minutes, depending on how often you do it. You can decrease this time by purchasing a second set of roller plates as a complete assembly including rollers and bearings. In this way, the conversion time can be reduced to several minutes.

The Model BT1C incorporates the latest improvements allowed by the listed codes and standards.

The bending of a specimen is not impeded by the design of the bend tester. Unlike die-type jigs, which use solid rounded shoulders, the Model BT1C uses hardened steel rollers to support the specimen during bending. The rollers rotate on

heavy duty needle bearings so that there is no drag on placed on the specimen. Die-type jigs tend to pull as well as bend the specimen; thus creating a more severe test than is necessary.

The bent specimens bottom-eject into a foam cushion. The weld surface to be evaluated never contacts any hard surface during or after bending. The specimen cannot get stuck. You won't have to pry it out of a die, as is often the case with die-type benders.

The Model BT1C can bend up to the maximum 3/8 or 1/2 inch thick specimens required by the ASME, AWS, API, and military codes and standards. If you are testing thick material, you will use side bend specimens or face and root bend specimens reduced to 3/8 or 1/2 inch thick in accordance with the applicable code or standard.

The BT1C is portable and simple to use. It includes an integral hydraulic cylinder and a separate air-driven pump; all within a weight of 47 pounds. All that is required in a source of 6-9 cfm air at 90-120 psi. Optional electric and hand-powered versions of the BT1C are also available.

**FISCHER
ENGINEERING
COMPANY,
LLC**

SPECIFICATIONS

Code Compliance:	ASME, AWS, API, MIL
Specimen Thickness:	1/8 to 1/2 inch
Mandrel Range:	0.500 to 3.500 inch
Bending Force:	10,000 lb. maximum
Service Required:	90-120 psi air at 6-9 cfm (Pneumatic Version) 115 VAC, 50/60 Hz (Electric Version) 78 lb. max. handle effort (Hand Operated Version)
Weight:	47 lb. (Pneumatic Version)

Specification subject to change without notice.

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How to Determine the Bend Radius (and Mandrel) Required for Your Application

There are three factors that determine the bend radius to be used. These are 1) the code or standard, 2) the material being welded, and 3) its thickness. Each code and standard lists the required bend radius and the associated roller spacing to be used for a given material and thickness. The table below gives paragraph references from several popular codes and standards.

Interchangeable mandrels and accessory roller plates allow the Model BT1C to produce bend radii from 1/4 to 1-3/4 inches. The most common as-welded ferrous or nonferrous alloys are within this range.

None of the commercial or military codes or standards require you to bend any specimen thicker than 3/8 inch (1/2 inch for API 1104). If you are testing thick material to ASME Section IX, 1-1/2 inch thick steel for example, you are required to prepare side bend specimens which are only 3/8 inch x 1-1/2 inch side bend specimens, can be bent easily by the Model BT1C with the standard 1-1/2 inch diameter mandrel.



Close-up view of mandrel and rollers



Mandrels



Roller Plate Assembly (-WR)

BT1C Mandrel and Mandrel Adapters

(Optional)

All mandrels are hardened tool steel. They include our patented knurled surface to reduce the possibility that the specimen will slip sideways during bending. The numerical portion of the mandrel part number is the mean outside diameter, in inches, of the mandrel. The smaller mandrels require an adapter, as shown.

The mandrel listed are the most common ones. For sizes not listed, call for price and delivery.

Mandrel Part Number	Mandrel Adapter Required
BT1-M0.500	BT1-MA1
BT1-M0.625	BT1-MA1
BT1-M0.750	BT1-MA1
BT1-M0.872	BT1-MA2
BT1-M1.000	BT1-MA2
BT1-M1.120	BT1-MA2
BT1-M1.250	BT1-MA0
BT1-M2.000	BT1-MA0
BT1-M2.063	BT1-MA0
BT1-M2.500	BT1-MA0
BT1-M3.000	BT1-MA0
BT1-M3.500	BT1-MA0

WHERE TO LOOK IT UP

Code or Standard	Bend Radius	Description of Test
ASME Section IX:2021	Fig. QW-466.1	Parag. QW-160
AWS D1.1:2020	Fig. 6.13	Parag. 6.10.3.1
AWS B2.1:2021	Fig. A.5A	Parag. A5
AWS B4.0:2016	Fig. 6.1	Parag. 6.8.2
API 1104:22nd Edition	Fig. 8	Parag. 5.6.4, 5.6.5

HOW TO ORDER

Part No.	Description	Part No.	Description
BT1C	Roller Guided Bend Tester. Includes separate air-driven pump, BT1-M1.500 mandrel and BT1-MA0 mandrel adapter (set up as shown in this brochure). If you want the unit set up with a different mandrel and adapter, add X.XXX after the model part number, where X.XXX indicates the desired mandrel diameter in inches, for example BT1C-2.063. 20"H x 11"W x 6"D (Bender), 5.7"H x 5.6"W x 14.7"D (Pump) 47 lbs. total	BT1C-E	Same as BT1C except for electric-driven pump. 14"H x 9.6"W x 9.6"D (Pump), 47 lbs. total
		BT1C-HO	Same as BT1C except for hand-operated pump. 5.6"H x 3.8"W x 13.3"D (Pump), 38 lbs. total
		BT1-RPX.XXX	Roller Plates; set of 2 (X.XXX indicates the mandrel dia., inches, with which it is to be used)
		-WR	-WR added to any roller plate part number denotes a complete assembly (with 2 rollers) see photo.