

# Tubing Tools and Accessories



## Products

- Electric, bench top, and hand tube benders
- Tube preparation tools

## Contents

### Tube Benders

|                 |   |
|-----------------|---|
| Electric .....  | 2 |
| Bench Top ..... | 3 |
| Hand .....      | 5 |

### Tube Preparation Tools

|                            |   |
|----------------------------|---|
| Tube Cutter .....          | 6 |
| Tube Sawing Guide .....    | 6 |
| Tube Deburring Tools ..... | 6 |
| Tube Gripper Pad .....     | 6 |

## Tube Benders

Swagelok® benders provide high-quality bends on fractional and metric tubing made from materials that can be used with Swagelok tube fittings. These easy-to-use tube benders reduce installation time and effort as well as the potential for wrinkling or other damage to the tubing during bending.

### Electric Tube Benders



See the Swagelok *Electric Tube Bender User's Manual*, MS-13-138, for complete setup and operating instructions.

#### Features

- Electronic control
- 1 to 110° bending range
- 1 to 2 in. outside diameter (0.049 to 0.220 in. wall thickness) and 25 to 50 mm outside diameter (1.2 to 5.0 mm wall thickness) tubing range
- One bend shoe for 1, 1 1/4, 1 1/2, and 2 in. sizes
- One bend shoe for 25, 32, 38, and 50 mm sizes
- CE compliant

#### Technical Data

- Dimensions—vertical position:  
44 in. (112 cm) high, 29 in. (74 cm) wide, 30 in. (76 cm) deep
- Weight—420 lb (191 kg)
- Power requirements  
MS-TBE-1—115 V (ac), 50/60 Hz;  
maximum current—13 A  
MS-TBE-2—230 V (ac), 50/60 Hz;  
maximum current—7 A

**See Ordering Information, page 4.**

### Tubing Data

Minimum tube length, bend radius, and wall thickness limits required to make a 90° bend in annealed tubing are listed below. Some applications require specific bend radii; consult applicable codes for bend radius requirements. See Swagelok *Tubing Data* (MS-01-107) for suggested tubing wall thickness for use with Swagelok tube fittings.

#### Fractional Tubing

| Tube<br>OD      | Min<br>Tube<br>Length | Approx<br>Bend<br>Radius | Wall Thickness, Min/Max |                 |
|-----------------|-----------------------|--------------------------|-------------------------|-----------------|
|                 |                       |                          | Carbon Steel            | Stainless Steel |
| Dimensions, in. |                       |                          |                         |                 |
| 1               | 20.5                  | 4                        | 0.049/0.120             | 0.065/0.120     |
| 1 1/4           | 22.8                  | 5                        | 0.065/0.180             | 0.083/0.156     |
| 1 1/2           | 25.5                  | 6                        | 0.083/0.220             | 0.095/0.188     |
| 2               | 32.0                  | 8                        | 0.095/0.220             | 0.109/0.188     |

#### Metric Tubing

| Tube<br>OD     | Min<br>Tube<br>Length | Approx<br>Bend<br>Radius | Wall Thickness, Min/Max |                 |
|----------------|-----------------------|--------------------------|-------------------------|-----------------|
|                |                       |                          | Carbon Steel            | Stainless Steel |
| Dimensions, mm |                       |                          |                         |                 |
| 25             | 520                   | 103                      | 1.2/3.0                 | 1.8/3.0         |
| 32             | 582                   | 126                      | 2.0/4.0                 | 2.0/4.0         |
| 38             | 648                   | 152                      | 2.2/4.5                 | 2.2/4.5         |
| 50             | 810                   | 203                      | —                       | 3.0/5.0         |

## Tube Benders

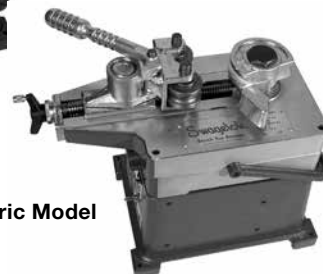
### Bench Top Tube Benders

#### Features

- Rugged, lightweight aluminum construction
- 1 to 180° bending range
- 1/4 to 1 1/4 in. outside diameter (0.028 to 0.120 in. wall thickness) and 6 to 30 mm outside diameter (0.8 to 3.0 mm wall thickness) tubing range
- Steel bend shoes required for:
  - 1 in. outside diameter tubing with greater than 0.095 in. wall thickness
  - 25 mm tubing with greater than 2.4 mm wall thickness
  - all sizes of Alloy 2507 tubing
  - all sizes of heavy-wall annealed stainless steel tubing
  - all sizes of cold-drawn 1/8-hard stainless steel seamless tubing.
  - all sizes of IPT medium and high pressure tubing.
- Includes grease gun and metal carrying case for storage
- Manual model can be operated with a 1/2 in. drill motor using optional torque clutch and support arm.
- CE compliant



Manual Model



Electric Model

#### Technical Data

- Dimensions—tube bender in case:
  - 14 1/2 in. (37 cm) high, 21 in. (53 cm) wide, 11 in. (28 cm) deep
- Weight—tube bender in case, excluding tools:
  - Manual model—75 lb (34 kg)
  - Electric model—79 lb (36 kg)
- Power requirements (electric model)
  - MS-BTB-1—110 V (ac), 50/60 Hz; maximum current—10 A
  - MS-BTB-2—230 V (ac), 50/60 Hz; maximum current—5 A

**See Ordering Information, page 4, and Options and Accessories, page 4.**

#### Tubing Data

The bend radius and wall thickness limits for making a bend in annealed tubing are listed below. Some applications require specific bend radii; consult applicable codes for bend radius requirements. See Swagelok *Tubing Data* (MS-01-107) for suggested tubing wall thickness for use with Swagelok tube fittings.

#### Fractional Tubing

| Tube OD         | Approx Bend Radius | Wall Thickness, Min/Max |                 |                        |                        | IPT Series Tubing  |                  |
|-----------------|--------------------|-------------------------|-----------------|------------------------|------------------------|--------------------|------------------|
|                 |                    | Carbon Steel            | Stainless Steel | Heavy-Wall Annealed SS | Cold Drawn 1/8 Hard SS | Medium Pressure SS | High Pressure SS |
| Dimensions, in. |                    |                         |                 |                        |                        |                    |                  |
| 1/4             | 1.42               | 0.028/0.065             |                 | 0.065/0.095            | 0.028/0.065            | 0.071              | 0.084            |
| 3/8             |                    | 0.035/0.065             | 0.035/0.083     | 0.083/0.134            | 0.035/0.083            | —                  | —                |
| 1/2             |                    | 0.035/0.083             |                 | 0.083/0.188            | 0.049/0.109            | —                  | —                |
| 5/8             | 1.81               | 0.035/0.095             | 0.049/0.095     | —                      | —                      | —                  | —                |
| 1/2             | 2.20               | 0.035/0.065             |                 | —                      | —                      | —                  | —                |
| 3/8             |                    | 0.035/0.065             | 0.035/0.083     | 0.083/0.134            | 0.035/0.083            | 0.086              | 0.125            |
| 3/4             |                    | 0.049/0.109             |                 | —                      | —                      | —                  | —                |
| 7/8             | 2.64               | 0.049/0.109             |                 | —                      | —                      | —                  | —                |
| 9/16            | 3.23               | —                       | —               | —                      | —                      | 0.125              | 0.187            |
| 1               |                    | 0.049/0.120             | 0.065/0.120     | —                      | —                      | —                  | —                |
| 1 1/4           | 4.41               | 0.065/0.120             | 0.083/0.120     | —                      | —                      | —                  | —                |

#### Metric Tubing

| Tube<br>OD     | Approx<br>Bend<br>Radius | Wall Thickness, Min/<br>Max |                    |
|----------------|--------------------------|-----------------------------|--------------------|
|                |                          | Carbon<br>Steel             | Stainless<br>Steel |
| Dimensions, mm |                          |                             |                    |
| 6              | 36                       | 0.8/1.2                     |                    |
| 10             |                          | 1.0/1.5                     |                    |
| 12             |                          | 1.0/2.2                     | 1.0/2.0            |
| 15             | 46                       | 1.0/2.2                     |                    |
| 16             |                          | 1.0/2.5                     | 1.0/2.2            |
| 18             | 55                       | 1.2/2.5                     |                    |
| 20             | 67                       | 1.2/2.8                     |                    |
| 22             | 67                       | 1.2/2.8                     |                    |
| 25             | 82                       | 1.2/3.0                     | 1.8/3.0            |
| 28             | 112                      | 1.8/3.0                     |                    |
| 30             |                          | 2.0/3.0                     |                    |

See the Swagelok *Bench Top Tube Bender User's Manual*, MS-13-145, for complete setup and operating instructions.

## Tube Benders









### Ordering Information, Electric and Bench Top Tube Benders

1. Select a basic ordering number.

| Bender Type         | Basic Ordering Number |
|---------------------|-----------------------|
| <b>Electric</b>     |                       |
| 115 V (ac)          | MS-TBE-1-             |
| 230 V (ac)          | MS-TBE-2-             |
| <b>Bench Top</b>    |                       |
| Manual              | MS-BTB-M-             |
| Electric—110 V (ac) | MS-BTB-1-             |
| Electric—230 V (ac) | MS-BTB-2-             |

Example: **MS-BTB-1-**

2. Add a power cord designator (electric models).

| Region                        | Voltage               | Plug Type   | Designator |
|-------------------------------|-----------------------|---|------------|
| Australia, China, New Zealand | 230 V<br>50/60 Hz     | AS 3112      | 8          |
| Continental Europe, Korea     | 230 V<br>50/60 Hz     | CEE 7/7      | 7          |
| Japan, Taiwan                 | 100/115 V<br>50/60 Hz | NEMA 5-15    | 3          |
|                               | 200/230 V<br>50/60 Hz | NEMA L6-20   | 4          |
| North America                 | 115 V<br>50/60 Hz     | NEMA 5-15  | 1          |
|                               | 230 V<br>50/60 Hz     | NEMA 6-15  | 2          |
| United Kingdom                | 115 V<br>50/60 Hz     | IEC 309    | 5          |
|                               | 230 V<br>50/60 Hz     | BS 1363    | 6          |

Example: **MS-BTB-1-1**

3. Add a user's manual language designator.

| Language             | Designator |
|----------------------|------------|
| Chinese (simplified) | -C         |
| English              | -E         |
| French               | -F         |
| German               | -G         |
| Japanese             | -J         |
| Spanish              | -S         |

Example: **MS-BTB-1-1-E**

4. Add a tool kit designator.

| Tool Kit  | Designator |
|---|------------|
| <b>Electric</b>   |            |
| Fractional bend shoe, roller towers, and tube clamps (1, 1 1/4, 1 1/2, and 2 in.) | -FKIT      |
| Metric bend shoe, roller towers, and tube clamps (25, 32, 38, and 50 mm)          | -MKIT      |
| <b>Bench Top</b>  |            |
| Aluminum fractional bend shoes and steel rollers (1/2, 5/8, 3/4, 7/8, and 1 in.)  | -FKIT      |
| Aluminum metric bend shoes and steel rollers (12, 16, 18, 20, 22, and 25 mm)      | -MKIT      |

Example: **MS-BTB-1-1-E-FKIT**

### Bench Top Tube Bender Kits

To substitute a steel bend shoe for a 1 in. or 25 mm aluminum bend shoe, add **-S16** to the fractional kit ordering number or **-S25M** to the metric kit ordering number.

Example: **MS-BTB-1-1-E-FKIT-S16**

Kits contain tooling for the tubing sizes listed in the table above *only*. Individual tool kits with aluminum or steel bend shoes for 1/4 in., 6 mm, and 10 mm tubing must be ordered separately; see **Options and Accessories, Bench Top Tube Benders**, below.

### Options and Accessories, Bench Top Tube Benders

- Individual tool kits with aluminum or steel bend shoes are available for all tubing sizes listed in the tables below and must be ordered to obtain tooling for 1/4 in., 6 mm, and 10 mm tubing. Steel bend shoes are required for select tubing, as listed on page 3.

Kits contain bend shoe, guide, and roller.

To order, replace **XX** with a size designator from the tables below.

Example: **MS-BTT-K-4**

| Fractional Size, in. | Size Designator |
|----------------------|-----------------|
| 1/4                  | 4               |
| 3/8                  | 6               |
| 1/2                  | 8               |
| 9/16                 | 9               |
| 5/8                  | 10              |
| 3/4                  | 12              |
| 7/8                  | 14              |
| 1                    | 16              |
| 1 1/4                | 20              |

| Individual Tool Kit | Basic Ordering Number    |
|---------------------|--------------------------|
| Aluminum            | MS-BTT-K-XX <sup>①</sup> |
| Steel               | MS-BTT-K-SXX             |

<sup>①</sup> Not available in 1 1/4 in., 28 mm, and 30 mm sizes.

| Metric Size, mm | Size Designator |
|-----------------|-----------------|
| 6               | 6M              |
| 10              | 10M             |
| 12              | 12M             |
| 14              | 14M             |
| 15              | 15M             |
| 16              | 16M             |
| 18              | 18M             |
| 20              | 20M             |
| 22              | 22M             |
| 25              | 25M             |
| 28              | 28M             |
| 30              | 30M             |

## Tube Benders

- The tripod provides portable support for the tube bender.  
Ordering number: **MS-BTB-A-TP**
- The torque clutch and support arm kit allows the manual model to be operated with a 1/2 in. drill motor.  
Ordering number: **MS-BTB-A-TCSA**
- The foot pedal can be used in place of the toggle switch to operate the electric model.  
Ordering number: **MS-BTB-A-FS**

See the Swagelok *Bench Top Tube Bender User's Manual*, MS-13-145, for additional accessories.

### Heavy-Duty Shipping Case

The upgraded, rugged plastic custom shipping case provides maximum protection of the manual or electric bench top tube bender during transport and enhances portability with an extendable handle and wheels. The case can also accommodate an aluminum fractional or metric tool kit.

Case dimensions, with handles folded and retracted:

30.5 H by 20.5 W by 15.5 D in.  
approx (77.5 by 52.1 by 39.4 cm approx)

Ordering number:  
**MS-BTB-CASE-SHIP**



## Hand Tube Benders

Swagelok hand tube benders provide consistent, high-quality bends in tubing made from materials that can be used with Swagelok tube fittings.



### Features

- The hand tube bender is available in 1/8, 1/4, 5/16, 3/8, and 1/2 in., as well as 3, 6, 8, 10, and 12 mm tubing sizes.
- Clevis handle design provides enhanced leverage for bends greater than 90°.
- Roll dies reduce bending force and tube ovality, as compared to conventional slide block design.
- 1 to 180° bending range.

**The hand tube bender cannot be used for Alloy 2507 tubing over 1/4 in. or for medium-pressure tubing.**

See the Swagelok *Hand Tube Bender Manual*, MS-13-43, for more information.

### Tubing Data

See **Ordering Information**, below, for bend radius data. Some applications require specific bend radii; consult applicable codes for bend radius requirements. See Swagelok *Tubing Data* (MS-01-107) for suggested tubing wall thickness for use with Swagelok tube fittings.

### Ordering Information

| Tube OD         | Bend Radius | Ordering Number |
|-----------------|-------------|-----------------|
| Dimensions, in. |             |                 |
| 1/8             | 0.56        | MS-HTB-2        |
| 1/4             | 0.56        | MS-HTB-4T       |
| 1/4             | 0.75        | MS-HTB-4        |
| 5/16            | 0.94        | MS-HTB-5        |
| 3/8             | 0.94        | MS-HTB-6T       |
| 1/2             | 1.50        | MS-HTB-8        |
| Dimensions, mm  |             |                 |
| 3               | 15          | MS-HTB-3M       |
| 6               | 15          | MS-HTB-6M       |
| 8               | 24          | MS-HTB-8M       |
| 10              | 24          | MS-HTB-10M      |
| 12              | 38          | MS-HTB-12M      |

## Tube Preparation Tools

### Tube Cutter

The Swagelok tube cutter cuts stainless steel, soft copper, and aluminum tubing from 3/16 to 1 in. and 6 to 25 mm outside diameter.

#### Features

- Flare-out and work hardening of tube end is reduced.
- Knobs on handle are spaced in 1/8-turn increments to provide easy reference when advancing cutter wheel.



Ordering Number:

**MS-TC-308**

Replacement Cutting  
Wheel Ordering  
Number:

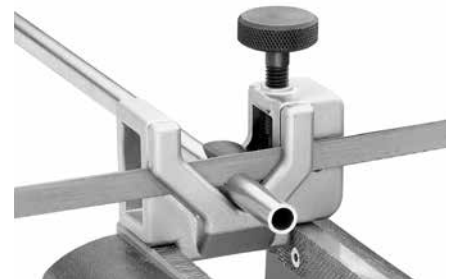
**MS-TCW-308**

### Tube Sawing Guide

The tube sawing guide holds tubing to enable fast, accurate cutting with a hacksaw. The guide helps reduce tubing preparation time, thereby speeding system assembly.

#### Features

- Specially designed clamp holds tubing accurately, without distorting or scratching the tube surface.
- Precision guides easily position blade for all cuts.
- Recess under guide plates provides blade clearance at end of stroke.
- Retractable spring-loaded clamp allows tubing to be inserted easily.
- Guide accepts tubing sizes from 3/16 to 1 in. and 4 to 25 mm outside diameter.
- Design permits easy mounting in vise.



Ordering Number:

**MS-TSG-16**

### Tube Deburring Tools

After use of the tube cutter or tube sawing guide, Swagelok deburring tools deburr stainless steel, steel, and hard alloy tube ends.

#### Features

- For deburring the inside and outside diameters of 3/16 to 1 1/2 in. and 4 to 38 mm tubing
- Steel blades for long life
- Rugged, heavy-duty die-cast housing



Ordering Number:

**MS-TDT-24**

For deburring the inside diameter of 1/4, 3/8, and 9/16 in. stainless steel tubing.



Ordering Number: **MS-44CT-27**

### Tube Gripper Pad

The Swagelok tube gripper pad allows users to hold tubing with a firm, secure grip while using the tube cutter or tube deburring tool.



## About this document

Thank you for downloading this electronic catalog, which is part of General Product catalog Swagelok published in print. This type of electronic catalog is updated as new information arises or revisions, which may be more current than the printed version.

Swagelok Company is a major developer and provider of fluid system solutions, including products, integration solutions and services for industry research, instrumentation, pharmaceutical, oil and gas, power, petrochemical, alternative fuels, and semiconductor. Our manufacturing facilities, research, service and distribution facilities support a global network of more than 200 authorized sales and service centers in 57 countries.

Visit [www.swagelok.com](http://www.swagelok.com) to locate your Swagelok representative and obtain any information on features, technical information and product references, or to learn about the variety of services available only through authorized sales centers and service Swagelok.

### Safe Product Selection

**When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.**

## Warranty Information

Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit your Swagelok Web site or contact your authorized Swagelok representative.

Swagelok, Ferrule-Pak, Goop, Hinging-Colleting, IGC, Kenmac, Micro-Fit, Nupro, Snoop, Sno-Trik, SWAK, VCO, VCR, Ultra-Torr, Whitey—TM Swagelok Company  
Aflas—TM Asahi Glass Co. Ltd.  
AL-6XN—TM Allegheny Ludlum Corporation  
AutoCAD—TM Autodesk, Inc.  
CSA—TM Canadian Standards Association  
DeviceNet—TM ODVA  
Kalrez, Krytox—TM DuPont  
Elgiloy—TM Elgiloy Specialty Metals  
FM—TM FM Global  
Grafoil—TM GrafTech International Holdings, Inc.  
MAC—TM MAC Valves Inc.  
Microsoft, Windows—TM Microsoft Corp.  
NACE—TM NACE International  
Nitronic—TM AK Steel Corporation  
picofast—TM HansTurck KG  
Pillar—TM Nippon Pillar Packing Company, Ltd.  
Rapid Tap—TM Relton Corporation  
15-7 PH, 17-7 PH—TM AK Steel Corp.  
Sandvik—TM SandvikAB  
Silconert—TM Silcotek Corporation  
Simriz—TM Freudenberg-NOK  
SolidWorks—TM SolidWorks Corporation  
© 2017 Swagelok Company