

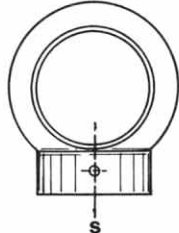
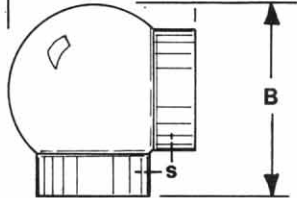
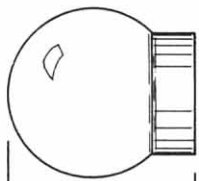
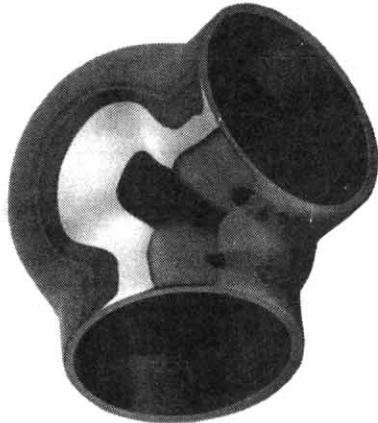
# TSM

**TUBULAR SPECIALTIES MFG., INC.**

13011 S. SPRING ST., LOS ANGELES, CA 90061-1685 • 213/515-4801 TOLL FREE 800/421-2961 CA ONLY 800/521-7548  
DESIGNER SERVICE: 7:00 A.M. TO 5:00 P.M. PACIFIC TIME • TELEX II: 910-346-6362 • FAX: 213/217-0653

**414,417,  
420,421**

## Ball Elbow



	A	B
BH-414	2½"	2½"
	64mm	64mm
BT-414	3½"	3½"
	89mm	89mm

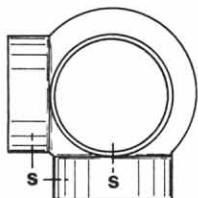
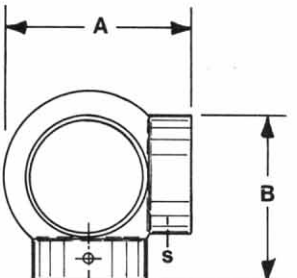
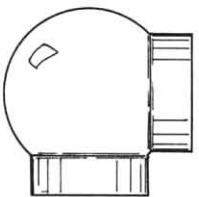
## BRASS BALL ELBOWS



### DESIGN CONSIDERATIONS

- TSM brass components (angles, brackets and tubing lengths) can be combined to create upright, wall-hung, stair, and ramp railings which are decorative as well as utilitarian.
- The flexibility of the TSM brass component system gives a custom look to any application.
- Components are simple to work with in the field, making even stairway and ramp configurations easy to install. Brass tubing can be cut easily with a tube cutter, a circular saw with an abrasive wheel, or a hack saw.
- The natural beauty of the bright brass finish is maintained by regular, frequent cleaning and polishing. For strictly decorative applications or where access for cleaning isn't possible, clear coating is available as an option to prevent oxidation of the finish. However, the clear coating will lose its effectiveness if it becomes scratched. For further information, see Care of Metal Finishes, Reference Section B.
- TSM has the capability of producing custom brass wall hung railing as well as upright, crowd control, and queue rails. Round brass tubing is available in 1" (25mm), 1-1/4" (32mm), 1-1/2" (38mm), and 2" (51mm) O.D. with 12" (305mm) or larger radii.
- TSM can also produce specially designed brass items such as salad bar sneeze guards, slides for buffets/cafeterias, wine bottle storage racks, and custom stemware racks. Please contact the factory with questions regarding custom designs.
- TSM recommends midsupports at maximum 48" (1219mm) intervals for strength in upright and wall hung brass railing.
- It is important to evaluate wall or floor conditions, for any railing is only as strong as its anchoring devices and the surface on which it is mounted.
- TSM recommends that brass handrail work be specified in a separate subsection of Division 5, "Metals," to ensure competent and competitive bids from experienced railing suppliers.

## Ball Elbow, Side Outlet



	A	B
BH-417	2½"	2½"
	64mm	64mm
BT-417	3½"	3½"
	89mm	89mm

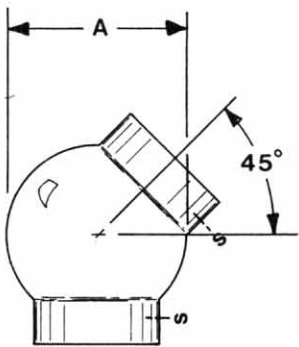
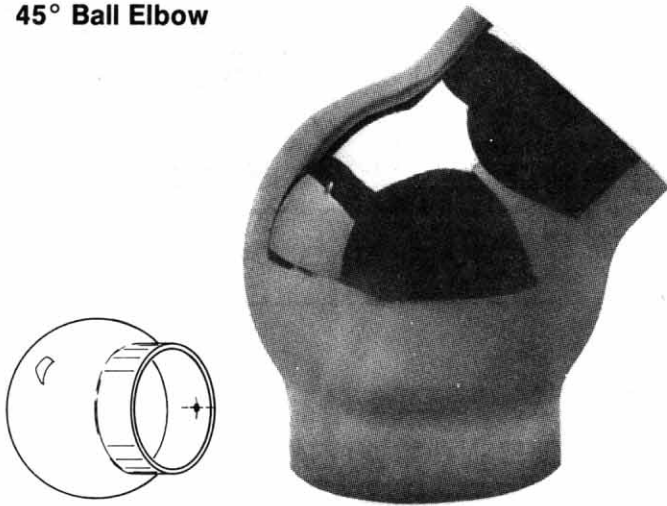
### MODEL NUMBERS

See chart below for description of model numbers.

<input type="checkbox"/> BH-414	<input type="checkbox"/> BH-420
<input type="checkbox"/> BT-414	<input type="checkbox"/> BT-420
<input type="checkbox"/> BH-417	<input type="checkbox"/> BH-421
<input type="checkbox"/> BT-417	<input type="checkbox"/> BT-421

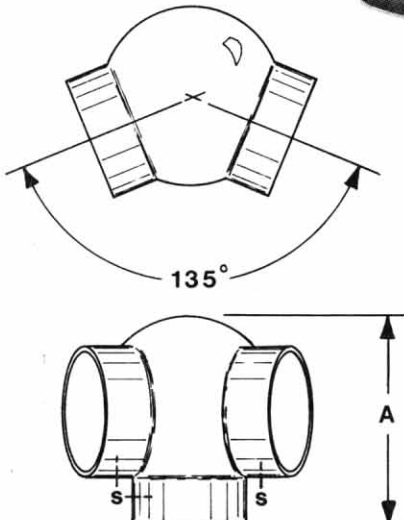
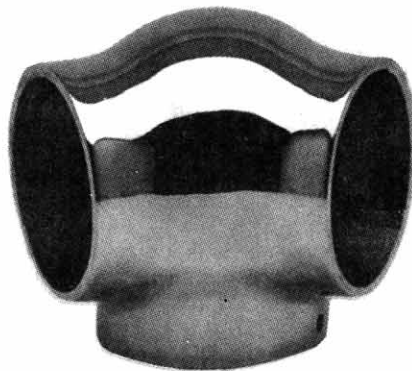


### 45° Ball Elbow



	A
BH-420	2½" 64mm
BT-420	3" 76mm

### 45° Ball Elbow, Side Outlet



	A
BH-421	2¾" 70mm
BT-421	3½" 89mm



### FINISH (select one)

- Uncoated Bright Brass (standard)
- Other (additional charge; see Finish Schedule, Reference Section A, for options)



### SUGGESTED ARCHITECTURAL SPECIFICATION

TSM model(s) \_\_\_\_\_ (fill in model number[s]) Brass Ball Elbow(s) from Tubular Specialties Manufacturing, Inc., Los Angeles, California, (213) 515-4801. Construction: sand cast of brass and machined to controlled dimensions. Finish: \_\_\_\_\_ (select from Finish Schedule). Installation Hardware: 1-1/2" (38mm) x #10 (5mm) Phillips oval head brass wood screws and 1/4" (6mm) x 8/32 (6mm) pan head brass machine screws. Size: for \_\_\_\_\_ (1-1/2" [38mm] or 2" [51mm]) O.D. tubing.



### MATERIAL/WORKMANSHIP

Sand cast brass (copper alloy—approximately 60% copper and 40% zinc) machined to controlled dimensions.



### INSTALLATION

TSM recommends the Drill and Tap Set, TSM model BDT, which contains a #29 bit and 8/32 tap. Drill through elbow and tubing with bit, thread tubing with tap, and fasten the elbow to the tubing with set screw provided by TSM.

If railing will be subjected to heavy use, TSM recommends using Brass Adhesive, TSM model B-Lok, in conjunction with the set screws for extra strength.



### DISTRIBUTION

TSM maintains a worldwide network of distributors. Call your sales representative listed in Reference Section O for the names of those nearest you.

Brass Ball Elbow Model Numbers		
	1½" O.D.	2" O.D.
Ball Elbow	BH-414	BT-414
Ball Elbow, Side Outlet	BH-417	BT-417
45° Ball Elbow	BH-420	BT-420
45° Ball Elbow, Side Outlet	BH-421	BT-421