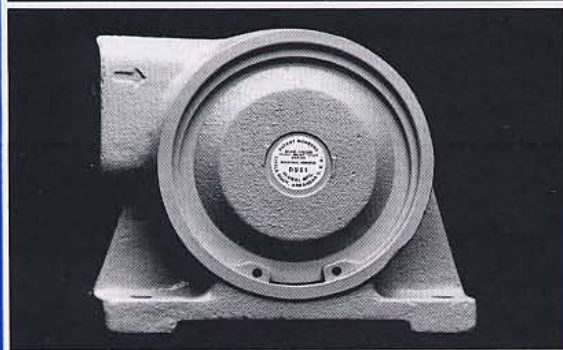
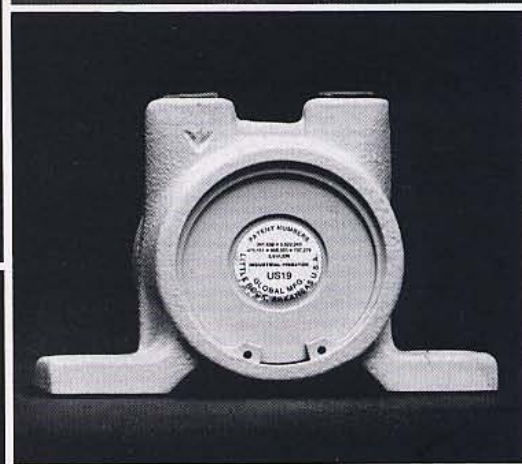
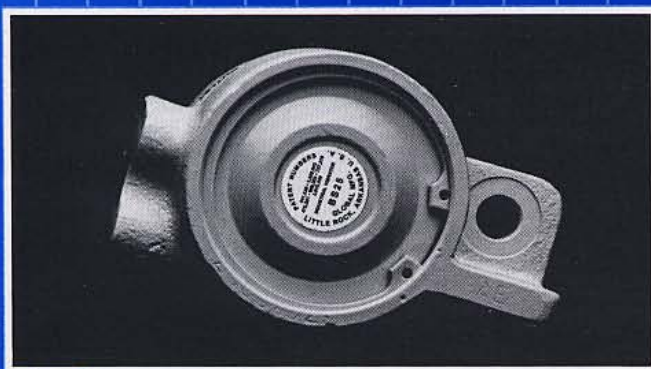


# Global Ball Vibrators



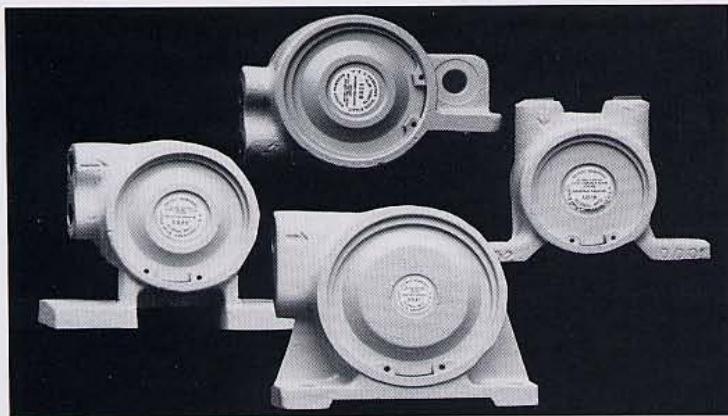
High-frequency rotary vibration for handling powders, chemicals, and other fine bulk solids. Enhances material flow. Provides quiet, reliable operation. Reduces operating costs and minimizes down-time.

# Global Rotary Vibrators

## Provide an Effective, Economical Solution to the Challenge of Moving Fine Bulk Solids... Quietly, Efficiently and Reliably.

**I**f you need an efficient, reliable, cost-effective method of handling bulk solids in your plant, we can help.

We're Global Manufacturing, and we design, build, and support a full-line of rotary and linear vibrators and Air Blasters to meet virtually any bulk solids handling requirement—regardless of the type of material or weight load.



Global makes industrial ball vibrators capable of handling loads from 300 (136 kg) to 6500 (2951 kg) pounds. Multiple ball vibrators can be used on a single hopper or bin to handle even greater loads.

### A COMPLETE LINE OF BALL VIBRATORS TO MEET YOUR APPLICATION'S REQUIREMENT

The Global product family includes a complete line of rugged, high-performance ball vibrators featuring a patented sealed construction. There are 4 basic types and 14 models to choose from, rated from 25 force pounds to 680 force pounds (110N to 3000N) and from 3,100 to 22,000 vibrations per minute. Global ball vibrators can handle hopper loads ranging from 250 pounds to 6800 pounds (113 kg to 3087 kg) (more when multiple ball vibrators and higher pressures than 60 psi (4.14 BAR) are used) at temperatures up to 250°F (121°C).

### WHAT APPLICATIONS ARE GLOBAL BALL VIBRATORS DESIGNED TO HANDLE?

Because they operate at high vibrational frequencies, Global ball vibrators are especially well-suited to applications that require the handling of fine materials.

#### TYPICAL APPLICATIONS INCLUDE:

- dry sand
- foundry match plate
- flour hoppers
- fine chemicals
- sugar
- cement
- powders
- spices
- food industry
- fine clay
- coal by-products
- dust bins

### GLOBAL ROTARY BALL VIBRATOR SELECTION GUIDE

**NOMENCLATURE KEY:** Number refers to diameter of ball in millimeters (e.g., BS-10 has a 10 mm diameter ball).

BS = single-bolt base ball vibrator, with side ports

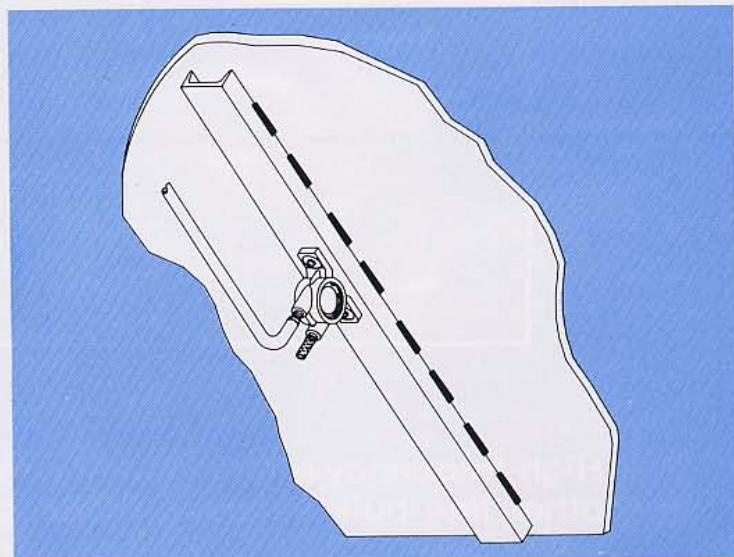
US = two-bolt base ball vibrator with inlet and exhaust ports coming from top of unit

CS = two-bolt base ball vibrator with inlet and exhaust ports coming from side of unit

DS = four-bolt base ball vibrator with inlet and exhaust ports coming from side of unit

WEIGHT OF MATERIAL IN SLOPE PORTION OF BIN OR HOPPER (IN LBS.)	MODEL NUMBERS OF VIBRATORS RECOMMENDED
300 (136 kg)	BS-10
700 (318 kg)	US-13
900 (409 kg)	BS-16
1300 (590 kg)	BS-19, CS-19, US-19
2000 (908 kg)	BS-25, CS-25, US-25
3000 (1362 kg)	CS-35
4000 (1816 kg)	US-38
4400 (1998 kg)	DS-41*
5000 (2270 kg)	US-44
6000 (2724 kg)	DS-51*
6500 and over (2951 kg)	Use multiple Global ball vibrators. Consult our Engineering Department for assistance.

\*Produces higher amplitudes often required for materials with bulk densities greater than 100 lbs. per cu. ft.



Global ball vibrators are used to enhance the flow of fine bulk solids in hoppers, bins, chutes, and flow pipes.

## Benefits & Advantages of Global Technology

What are the advantages of using a Global ball vibrator vs. sledge hammers, piston vibrators, or electro-magnetic linear vibrators?

**Dispersed vibration.** The Global ball vibrator should be mounted on a channel iron to distribute a rotary vibration evenly throughout the hopper. Localized vibration is avoided. Material flows more uniformly.

**Directional vibration.** The Global ball vibrator induces flow in the direction in which the ball is moving. You can enhance the flow of bulk solids by properly aligning the vibrator so that the ball travels in the same direction as the material flow. To reverse flow direction, turn the vibrator 180° and remount.

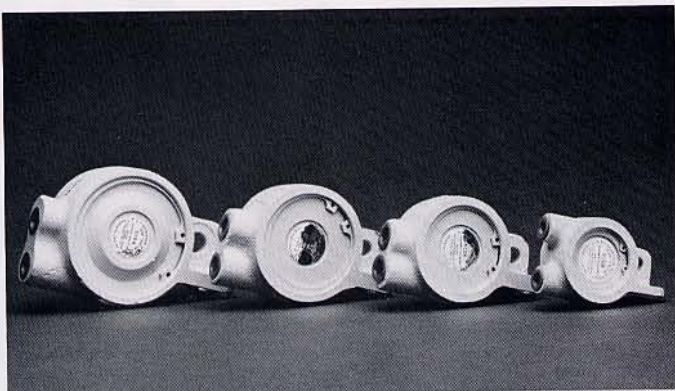
**Eliminates damage to hoppers and bins.** Unlike linear vibrators, which induce flow by shaking the sides of the hopper or bin, Global ball vibrators do not strike or flex container walls. Instead, they generate a frequency which passes *through* the hopper wall, then resonates with the material inside, causing the bulk solids to vibrate. The potential for structural damage to hopper and bin walls is eliminated, resulting in longer container life.

**Minimizes plant noise levels.** With Global ball vibrators, the only sounds are from the compressed air source, the smooth metal ball as it glides along the raceway, and the air as it exits the exhaust port. There's no hitting or pounding of the hopper wall. And, Global offers an optional muffler to reduce airborne noise from the exhaust. As a result, use of Global ball vibrators can significantly reduce noise levels in your plant.

**Long operating life.** Once the Global ball vibrator's high-frequency vibrations start the material flowing, gravity can do the rest. This means you can cycle the ball vibrator on and off. By not running continuously at full throttle, you reduce ball and raceway wear and extend equipment life.

**Rugged construction.** The only moving part is a chrome-plated ball, which travels around a raceway. Both are made of hardened steel to minimize friction and increase durability. The vibrator body is fabricated from ductile iron that is strong but malleable—it will bend, but not break.

**Easy repair and maintenance.** Global offers repair kits that allow you to change-out worn raceway rings, balls, and O-rings. Replacing these items refurbishes the ball vibrator to like-new condition, enabling extended use of the equipment and eliminating the need to purchase new vibrators.



The Global BS series ball vibrator is attached with a single bolt, making it ideal for such applications as foundry match plate and bulk transport trucks. Repair kits enable plant personnel to perform routine maintenance and repair on-site. This minimizes down-time and saves you money.

## How Do Global Ball Vibrators Work?

### PRINCIPLE OF OPERATION

1. The Global ball vibrator is not mounted directly on the hopper or bin wall. Instead it is mounted to channel iron stiffeners to achieve the desired degree of rigidity.
2. The length of the channel should be at least  $\frac{2}{3}$  the length of the sloped portion of the hopper but not greater than 6 feet (1.8m). The width of the channel iron should be equal or greater to the base width of the vibrator.
3. Rigid mounting is required because the ball vibrator, a rotary device, helps the flow of bulk solids by vibrating the material, not the hopper. Therefore, the vibrator, when mounted properly, should appear motionless. It should not shake the hopper or make a lot of noise.
4. The ball vibrator creates a sinusoidal wave of energy. Every material has a "natural frequency"—a frequency at which it most easily vibrates. By selecting a ball vibrator capable of generating the vibrations per minute to match this natural frequency, you cause the bulk solid inside the hopper or bin to vibrate *without* vibrating the container wall.
5. Another factor to consider in vibrator selection is weight of the load. For optimum performance, the ball vibrator should produce one pound of force for every 10 pounds (5 kg) of material in the hopper. This means you should select a Global ball vibrator capable of generating force-pounds equal to one-tenth the weight of your load while operating at medium pressure (40 to 60 psi) (2.8 BAR to 4.1 BAR).
6. The ball vibrator induces material flow in the direction in which the ball is rotating. Mounting the vibrator so that the ball travels in a vertical plane enhances performance but requires higher air pressure to start the machine than when the vibrator is mounted in a horizontal plane.
7. Compressed air or another inert gas is injected into the inlet port at pressures ranging from 20 to 80 psi (1.4 BAR to 5.5 BAR). Vibrator speed is controlled using an air regulator or needle valve installed with a filter in the air line.
8. The air pushes the chrome-plated steel ball around the raceway. The larger the ball, the more force-pounds the vibrator is capable of producing. Global ball vibrators have balls with diameters ranging from 10 to 51 millimeters.
9. The frequency (vibrations per minute) generated by the ball vibrator is equal to the number of times per minute the ball circles the raceway, which is adjustable via the air regulator. The smaller the ball, the higher the frequency generated.
10. Causing the bulk solid to vibrate starts the flow of material. Once the solid flows freely, gravity takes over. Therefore, the Global ball vibrator may be cycled on and off rather than operated continuously.
11. Compressed air exits the raceway via the vibrator's outlet port. Inlet and exhaust ports may be located on the top or side of the device. Exhaust ports can be equipped with a muffler to reduce noise levels.
12. Global's standard O-ring design creates a seal to prevent air leakage from the side caps. Some competitors charge extra for this feature.

# Global's Engineering Expertise

## Can Make a Difference

Global has a staff of Applications Engineers who are ready to assist you in sizing, specifying, and installing the right industrial vibrator to meet your needs.

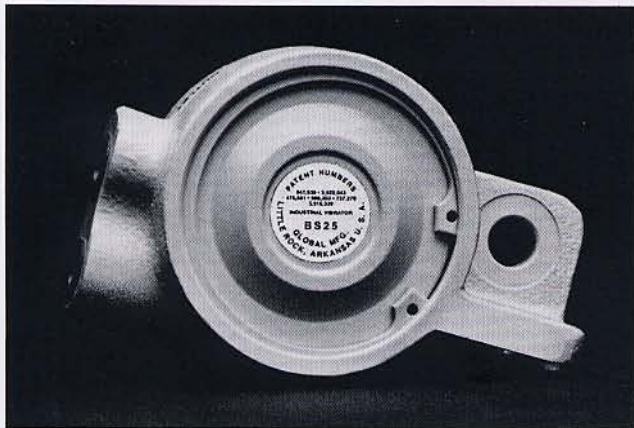
The two most common installation errors are *incorrect sizing* and *improper mounting*. An oversized vibrator can damage hoppers and bins, while an undersized unit provides insufficient force pounds to

move the mass. A weak mounting may have a low resonant frequency which will trap vibration and prevent the ball vibrator from reaching optimum speed. At Global, we work closely with our customers to ensure proper selection and mounting for optimum performance and results. It is this knowledge and experience that can help you solve your material-handling problems—quickly and correctly.

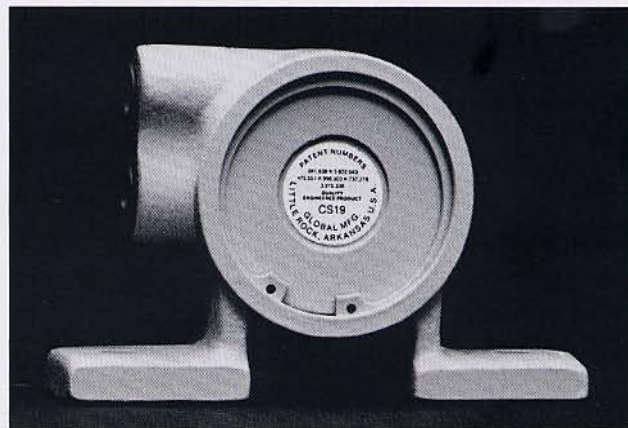
### GLOBAL BALL VIBRATORS • SPECIFICATIONS

MODEL	UNBAL LB-IN (KG-MM)	PSI (BAR) REQUIRED TO START		20 PSI (1.37 BAR)			40 PSI (2.75 BAR)			60 PSI (4.14 BAR)		
		VERT	HORZ	SPEED RPM	FLOW SCFM (LPS)	FORCE LB (N)	SPEED RPM	FLOW SCFM (LPS)	FORCE LB (N)	SPEED RPM	FLOW SCFM (LPS)	FORCE LB (N)
BS-10	.0034 (.039)	5 (.34)	2 (.14)	16000	4.3 (2.0)	25 (110)	20000	7.0 (3.3)	38 (170)	22000	9.0 (4.3)	45 (200)
BS-16	.020 (.23)	15 (1.0)	7 (.48)	9400	4.1 (1.9)	50 (220)	13000	6.4 (3.0)	93 (410)	14000	8.2 (3.9)	110 (510)
BS-19	.043 (.50)	20 (1.4)	10 (.69)	8600	5.5 (2.6)	89 (400)	11000	8.4 (3.9)	150 (670)	13000	11. (5.3)	200 (880)
BS-25	.12 (1.4)	30 (2.1)	15 (1.0)	5700	7.5 (3.5)	110 (490)	6900	12. (5.7)	160 (710)	8200	16. (7.7)	230 (1000)
US-13	.0093 (.11)	5 (.34)	2 (.14)	13000	6.5 (3.1)	45 (200)	18000	11. (5.0)	84 (370)	20000	15. (7.3)	110 (490)
US-19	.043 (.50)	20 (1.4)	10 (.69)	8700	5.5 (2.6)	92 (410)	11000	8.4 (3.9)	160 (700)	13000	12. (5.8)	210 (920)
US-25	.12 (1.4)	30 (2.1)	15 (1.0)	6300	7.0 (3.3)	140 (600)	8400	12. (5.8)	240 (1100)	9100	16. (7.7)	280 (1200)
US-38	.52 (6.0)	50 (3.4)	25 (1.7)	4300	12. (5.7)	270 (1200)	5600	19. (9.1)	470 (2100)	6000	25. (12.)	540 (2400)
US-44	.97 (11.)	60 (4.1)	25 (1.7)	3500	17. (8.1)	330 (1500)	4300	27. (13.)	520 (2300)	4700	35. (17.)	600 (2700)
CS-19	.043 (.50)	20 (1.4)	10 (.69)	9100	5.7 (2.7)	100 (450)	12000	8.4 (3.9)	170 (760)	14000	12. (5.7)	220 (990)
CS-25	.12 (1.4)	30 (2.1)	15 (1.0)	6300	7.8 (3.7)	130 (590)	8100	13. (5.9)	220 (990)	9200	18. (8.4)	290 (1300)
CS-35	.24 (2.8)	50 (3.4)	25 (1.7)	5300	7.8 (3.7)	190 (850)	6700	13. (5.9)	310 (1400)	7600	16. (7.7)	390 (1700)
DS-41	.82 (9.4)	55 (3.8)	25 (1.7)	3200	13. (6.1)	240 (1100)	4000	21 (9.7)	370 (1700)	4400	27. (13.)	450 (2000)
DS-51	1.3 (15.)	60 (4.1)	30 (2.1)	3100	13. (6.2)	350 (1500)	4000	20. (9.3)	580 (2600)	4300	27. (13.)	680 (3000)

## Four Configurations to Choose From



**1 BS SERIES.** Ball vibrator with single-bolt base. Inlet and exhaust ports located on side of device. Ball diameters from 10 to 25 millimeters. Force pounds from 25 to 230 (110N to 1000N), vibrations per minute from 5,700 to 22,000, at pressures from 20 to 60 psi (1.37 BAR to 4.14 BAR).



**2 CS SERIES.** Ball vibrator with two-bolt base. Inlet and exhaust ports located on the side. Ball diameters from 19 to 35 millimeters. Force pounds from 100 to 390 (450N to 1700N), vibrations per minute from 5,300 to 14,000, at pressures from 20 to 60 psi (1.37 BAR to 4.14 BAR).



**3 US SERIES.** Ball vibrator with two-bolt base. Inlet and exhaust ports on top. Ball diameters from 13 to 44 millimeters. Force pounds from 45 to 600 (200N to 2700N), vibrations per minute from 3,500 to 20,000, at pressures from 20 to 60 psi (1.37 BAR to 4.14 BAR).



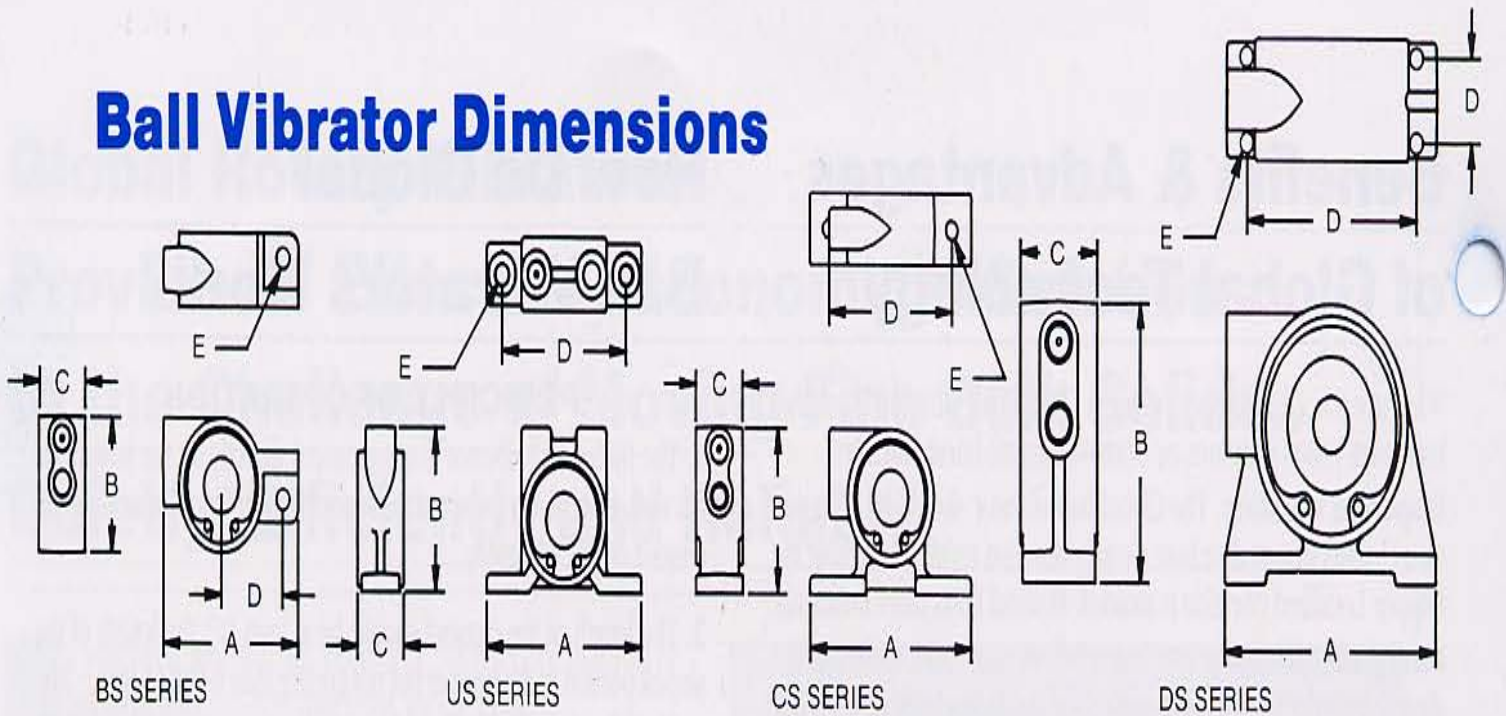
**4 DS SERIES.** Ball vibrator with four-bolt base. Inlet and exhaust ports located on the side. Ball diameters from 41 to 51 millimeters. Force pounds from 240 to 680 (1100N to 3000N), vibrations per minute from 3,100 to 4,400, at pressures from 20 to 60 psi (1.37 BAR to 4.14 BAR).

### GLOBAL BALL VIBRATORS CAN BE CUSTOMIZED TO MEET SPECIALIZED APPLICATION NEEDS

In addition to a diversity of configurations and sizes, Global ball vibrators can be customized to fit the application. Special features include:

- high-temperature O-rings for applications where temperatures exceed 250°F (121°C).
- nickel-plated vibrator bodies for use in the food industry
- special brackets for clamping vibrators to containers when mounting is to be temporary.

# Ball Vibrator Dimensions



VIBRATOR MODEL	A IN (MM)	B IN (MM)	C IN (MM)	D IN (MM)	E IN (MM)	PORT SIZE NPT	LBS (KGS)
BS-10	3.1 ( 79)	1.9 ( 48)	1.1 (28)	*	.34 (8.7)	1/8"	0.7 (.32)
BS-16	4.0 (102)	2.5 ( 64)	1.3 (33)	*	.41 (10)	1/4"	1.4 (.64)
BS-19	4.5 (114)	2.8 ( 71)	1.5 (38)	*	.41 (10)	1/4"	1.9 (.86)
BS-25	5.2 (132)	3.2 ( 81)	1.8 (46)	*	.53 (13)	1/4"	3.1 (1.4)
US-13	5.2 (132)	2.7 ( 68)	1.2 (30)	4 (100)	.41 (10)	1/8"	1.2 (.54)
US-19	5.1 (130)	3.4 ( 86)	1.5 (38)	4 (100)	.41 (10)	1/4"	2.2 (1.0)
US-25	6.6 (167)	3.9 ( 99)	1.8 (45)	5 (127)	.53 (13)	1/4"	3.5 (7.6)
US-38	7.9 (200)	5.4 (137)	2.3 (58)	6 (152)	.69 (17)	3/8"	7.6 (3.5)
US-44	8.9 (226)	5.8 (147)	2.6 (66)	7 (177)	.69 (17)	1/2"	10.2 (4.6)
CS-19	5.3 (135)	3.4 ( 86)	1.5 (38)	4 (102)	.41 (10)	1/4"	2.4 (1.1)
CS-25	5.4 (137)	4.4 (112)	2.1 (53)	4 (102)	.53 (13)	1/4"	4.3 (2.0)
CS-35	5.4 (137)	4.4 (112)	2.1 (53)	4 (102)	.53 (13)	1/4"	4.6 (2.1)
DS-41	6.8 (172)	5.7 (145)	2.5 (63)	5.5 (140) by	0.41 (10)	1/2"	10.4 (4.7)
DS-51	6.8 (172)	5.7 (145)	2.5 (63)	1.8 (45) * *	0.41 (10)	1/2"	10.8 (4.9)