



# Family of 4000's



# QUALITY STATEMENT



American Valve commits itself to consistently fulfill our customers needs and expectations by supplying products that are built with confidence and quality. This commitment is accomplished by achieving the following objectives:

- 
- **American Valve ensures continuous reliability and quality by using well-trained personnel and through the implementation of a quality system that meets international standard ISO 9001 2000.**
  - **American Valve Develops and maintains professional working relationships in all aspects of its business and builds customer confidence by consistently delivering quality products in a timely manner.**
  - **American Valve will continue to pursue a pioneering role in the industry by supplying products which focus on the customer's current and future needs and expectations.**

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Our goal at American Valve is to be fully responsive to the customers' needs, and to operate within a system which ensures our ability to provide our customers with quality products today and for the future.

# MODEL 4000

## Cast Iron Flanged End Ball Valve



- A126 Class B Cast Iron
- Teflon® Fused Solid Ball
- Blow-out Proof Stainless Steel Stem
- Reinforced Teflon® Seats
- Face to Face and Flanged Dimensions conform to ANSI Standard B16.10 which exactly match end to end dimensions of all Cast Iron Gate Valves
- Lockable in Full Open or Closed Positions
- Mounting Pad for Easy Actuation
- Adjustable Length/Removable Handles to Fit into Areas of Limited Space
- Full Port through 6"

Part	Material
Body	Cast Iron/A126 Class B
Ball	Cast Iron/Teflon® Fused
Stem	Stainless Steel
Gland Plate	Steel
Handle	Steel
Handle Bracket	Ductile Iron
Packing Follower	Stainless Steel
Stem Indicator	Steel
Handle Bracket Clip	Steel
Stem Stud	Carbon Steel
Gland Stud	Carbon Steel
Body Stud	Carbon Steel
Body Nut	Carbon Steel
Handle Bracket Bolt	Carbon Steel
Packing	PTFE (Chevron)
Body Gasket	PTFE
Seat Ring	RPTFE 15% GF
Handle Grip	Vinyl Rubber Foam

### SPECIFICATIONS:

MSS SP-72

ANSI B16.10

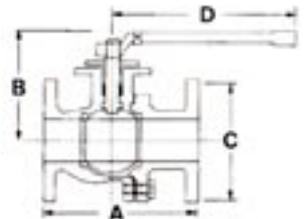
FED. SPEC. WW-V-35

### RATING:

125 psi WSP

200 psi WOG

353° F



This patented Cast Iron Ball Valve has been engineered to replace any IBBM or All Iron Gate Valve. Teflon® is a registered trademark of DuPont.

### DIMENSIONS:

	1/2	3/4	1	1 ½	2	2 ½	3	4	6	8	10
<b>A Face to Face</b>	4 ¼	4 5/8	5	6 ½	7	7 ½	8	9	10 ½	11 ½	13
<b>B Center of Port to Top</b>	3 ½	3 ½	4	5	5 ½	7	7 ½	8 ½	13	13	15
<b>C Flange Diameter</b>	3 ½	3 7/8	4 ¼	5	6	7	7 ½	9	11	13 ½	16
<b>D Center of Valve to Handle End</b>	9	9	9	12	12	13 ½	13 ½	15 ½	30	30	33
<b>E Port Diameter</b>	½	¾	1	1 ½	2	2 ½	3	4	6	6	8
<b>Bolt Holes</b>	4	4	4	4	4	4	4	8	8	8	12
<b>Weight lbs.</b>	6	8	10	16	22	36	46	75	131	185	276
<b>CV</b>	26	50	100	260	500	750	1245	2500	5470	4150	6700

### SAMPLE SPECIFICATION:

Ball valves shall be full bore of the floating-ball design capable of providing bi-directional, tight shutoff in accordance with MSS SP-72. The valves shall be rated at 125# WSP/200# WOG. Bodies shall be of cast iron per ASTM A126 Class B, With ANSI Class 125 flat-face flanges. The interior and exterior of the body shall be epoxy-coated. The ball shall be PTFE infused cast or ductile iron, with a 304 stainless steel blowout-proof stem. The seats and body seals shall be PTFE. The stem seal shall be PTFE, externally adjustable chevron type. Valves 1/2" to 6" shall be equipped with locking handles, valves 8" and larger shall be gear operated. Gear operators shall be totally enclosed and designed to produce sufficient torque to open and close the valves at the full rated working pressure with a maximum rim pull of 60 lbs. Valves shall be the Series 4000 as manufactured by American Valve, Inc. or as approved by the engineer.

# MODEL 4000D

## Ductile Iron Flanged End Ball Valve



- 65-45-12 Ductile Iron Body
- Teflon® Fused Solid Stainless Steel Ball
- Blow-out Proof Stainless Steel Stem
- Reinforced Teflon® Seats
- Face to Face and Flanged Dimensions conform to ANSI Standard B16.10 which exactly match end to end dimensions of all Ductile Iron Gate Valves
- Lockable in Full Open or Closed Positions
- Mounting Pad for Easy Actuation
- Adjustable Length/Removable Handles to Fit into Areas of Limited Space
- Full Port through 6"

### SPECIFICATIONS:

MSS SP-72  
ANSI B16.5 Raised Face  
FED. SPEC. WW-V-35

### RATING:

150 psi WSP  
300 psi WOG  
366° F

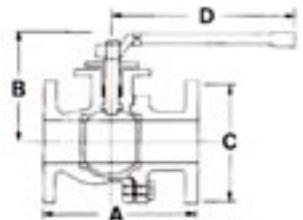
Part	Material
Body	Ductile Iron/A536
Ball	Stainless Steel/Teflon® Fused
Stem	Stainless Steel
Gland Plate	Steel
Handle	Steel
Handle Bracket	Ductile Iron
Packing Follower	Stainless Steel
Stem Indicator	Steel
Handle Bracket Clip	Steel
Stem Stud	Carbon Steel
Gland Stud	Carbon Steel
Body Stud	Carbon Steel
Body Nut	Carbon Steel
Handle Bracket Bolt	Carbon Steel
Packing	PTFE (Chevron)
Body Gasket	PTFE
Seat Ring	RPTFE 15% GF
Handle Grip	Vinyl Rubber Foam

This patented Ductile Iron Ball Valve has been Engineered to Replace any Eccentric Plug Valves, Carbon Steel Ball Valves, and Carbon Steel Gate Valves.

Teflon® is a registered trademark of DuPont.

### DIMENSIONS:

	2	2 ½	3	4	6	8	10
A Face to Face	7	7 ½	8	9	10 ½	11 ½	13
B Center of Port to Top	5 ½	7	7 ½	8 ½	13	13	15
C Flange Diameter	6	7	7 ½	9	11	13 ½	16
D Center of Valve to Handle End	12	13 ½	13 ½	15 ½	30	30	33
E Port Diameter	2	2 ½	3	4	6	6	8
Bolt Holes	4	4	4	8	8	8	12
Weight lbs.	22	36	46	75	131	185	276
CV*	500	750	1245	2500	5470	4150	6700



### SAMPLE SPECIFICATION:

Ball valves shall be full bore of the floating-ball design capable of providing bi-directional, tight shutoff in accordance with MSS SP-72. The valves shall be rated at 150# WSP/300# WOG. Bodies shall be ductile iron per ASTM A536, With ANSI Class 150 raised-face flanges. The interior and exterior of the body shall be epoxy-coated. The ball shall be PTFE infused ductile iron, with a 304 stainless steel blowout-proof stem. The seats and body seals shall be PTFE. The stem seal shall be PTFE, externally adjustable chevron type. Valves 2" to 6" shall be equipped with locking handles, valves 8" and larger shall be gear operated. Gear operators shall be totally enclosed and designed to produce sufficient torque to open and close the valves at the full rated working pressure with a maximum rim pull of 60 lbs. Valves shall be the Series 4000D as manufactured by American Valve, Inc. or as approved by the engineer.

# MODEL 4001

## Stainless Steel Flanged End Ball Valve



- Cast 316 Stainless Steel (CF8M)
- Teflon® Fused Solid Stainless Steel Ball
- Blow-out Proof Stainless Steel Stem
- Reinforced Teflon® Seats
- Full Opening for Unrestricted Flow
- Lockable in Full Open or Closed Positions
- API 607 Fire Safe Design
- Mounting Pad for Easy Actuation
- Adjustable Length/Removable Handles to Fit into Areas of Limited Space

Part	Material
Body	ASTM A351-CF8M
Ball	ASTM A351-CF8M /Teflon® Fused
Stem	A276-316
Gland Plate	AISI 304
Handle	ASTM A312 Schedule 40 GR 304
Handle Bracket	ASTM A351 CF8
Packing Follower	A276-316
Stem Indicator	AISI 304
Handle Bracket Clip	AISI 304
Stem Stud	A193-B8
Gland Stud	A193-B8
Body Stud	A193-B8
Body Nut	A194-B8
Handle Bracket Bolt	A193-B8
Packing	PTFE
Body Gasket	PTFE
Seat Ring	RPTFE-15% GF
Handle Grip	Vinyl Rubber Foam

### SPECIFICATIONS:

MSS SP-72  
 FED. SPEC. WW-V-35  
 ANSI B16.5 Raised Face

### RATING:

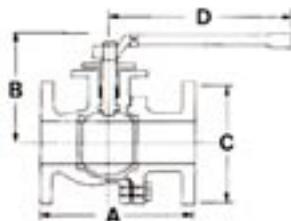
150 psi WSP  
 300 psi WOG  
 366° F

This patented Stainless Steel Ball Valve with Teflon fused ball has been Engineered to more effectively resist corrosion and prolong valve life.

Teflon® is a registered trademark of DuPont.

### DIMENSIONS:

	1 ½	2	2 ½	3	4	6
A Face to Face	6 ½	7	7 ½	8	9	10 ½
B Center of Port to Top	5	5 ½	7	7 ½	8 ½	13
C Flange Diameter	5	6	7	7 ½	9	11
D Center of Valve to Handle End	12	12	13 ½	13 ½	15 ½	30
E Port Diameter	1 ½	2	2 ½	3	4	6
Bolt Holes	4	4	4	4	8	8
Weight lbs.	16	22	36	46	75	131
CV*	260	500	750	1245	2500	5470



### SAMPLE SPECIFICATION:

Ball valves shall be full bore of the floating-ball design capable of providing bi-directional, tight shutoff in accordance with MSS SP-72. The valves shall be rated at 150# WSP/300# WOG. Bodies shall be stainless steel per ASTM A351-CF8M, With ANSI Class 150 raised-face flanges. The interior and exterior of the body shall be epoxy-coated. The ball shall be PTFE infused ductile iron, with a 304 stainless steel blowout-proof stem. The seats and body seals shall be PTFE. The stem seal shall be PTFE, externally adjustable chevron type. Valves 2" to 6" shall be equipped with locking handles. Valves shall be the Series 4001 as manufactured by American Valve, Inc. or as approved by the engineer.

# ADVANTAGES 4000 Series vs. Gate and Butterfly Valves



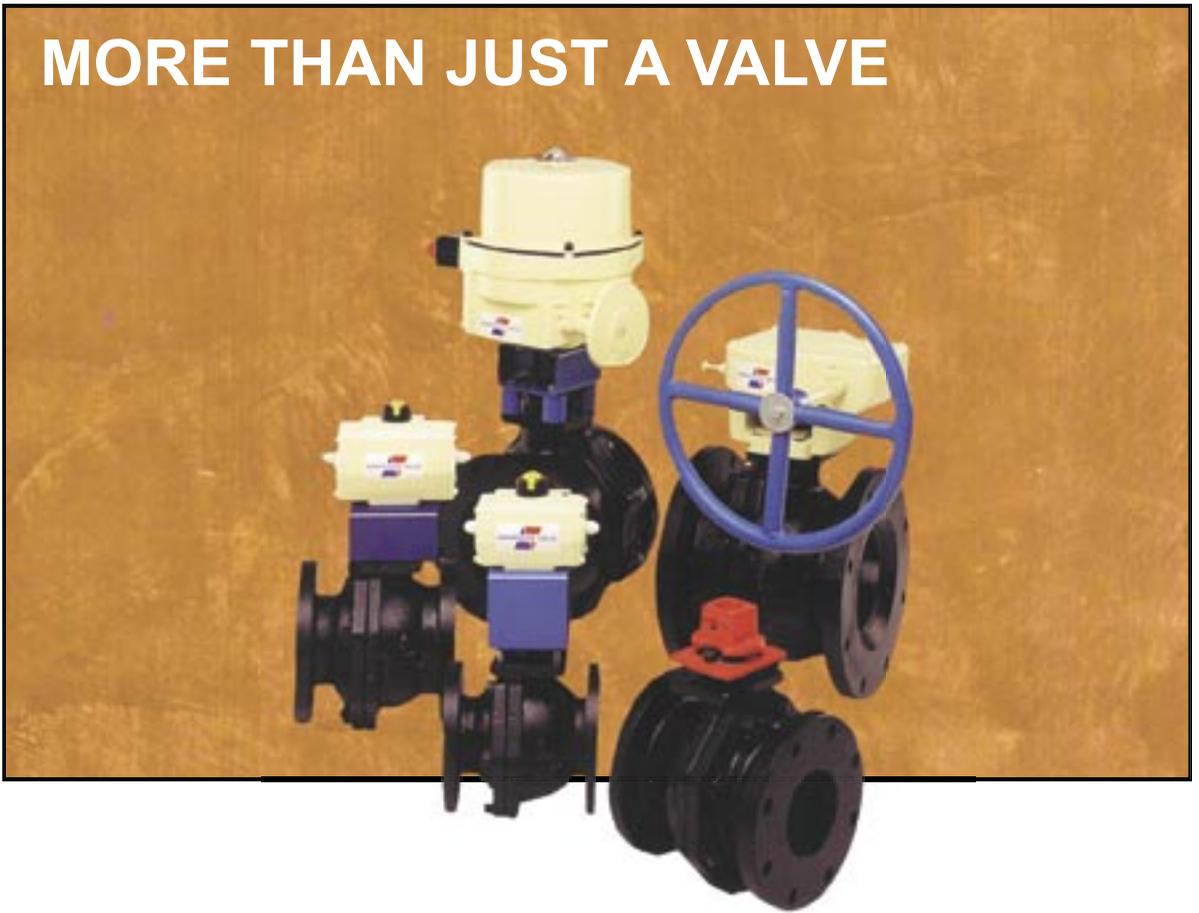
## ADVANTAGES OF 4000 SERIES VS. GATE VALVES

- ▼ Quarter turn provides instant shutoff.
- ▼ Full unobstructed opening provides superior flow rate.
- ▼ Easy to open and close, no cheater bar required.
- ▼ Positive shutoff- Exceeds Class VI.
- ▼ No bronze seat rings, bronze disc rings or bronze stems to wear out.
- ▼ Lighter than gate valves, making installation and handling easier.
- ▼ Handle shows whether open or closed.
- ▼ Ball wipes clean during opening and closing.
- ▼ No bronze parts enables use in all-iron gate valve applications.
- ▼ Compact design fits into areas of limited space.
- ▼ Throttling is permitted. Open and shut are not the only working positions
- ▼ Low profile design enables easier storage and shipping.
- ▼ Can be locked in either open or closed position.
- ▼ Patented Teflon® fused ball resists corrosion, in a wider range of applications
- ▼ Zero wear rate in the open position.
- ▼ Unique packaging prevents damage during shipping and facilities storage.

## ADVANTAGES OF 4000 SERIES VS. BUTTERFLY VALVES

- ▲ No disc in waterway to create turbulence.
- ▲ Same ANSI flanged dimensions as gate valves for easier retrofit.
- ▲ Teflon® seats, not Buna N or EPDM.
- ▲ More suitable for steam, petroleum, and corrosive applications.
- ▲ Main seating surface does not face upstream pressure in open position.
- ▲ Full opening provides superior flow characteristics.
- ▲ Teflon® packing instead of O-ring stem seals.
- ▲ Positive shutoff- exceeds Class VI.
- ▲ Blow out proof stainless steel stem.

# MORE THAN JUST A VALVE



American Valve offers a complete package of pneumatic, hydraulic and electric actuators, gear operators and operating nuts for the 5000 series. Our unique, patented Teflon® fused ball and lower operating torques make the 4000 series an effective alternative to cast iron gates, carbon steel ball valves and plug valves. The four bolt actuator mounting pad is ideal for applications requiring automation.

Pneumatic, hydraulic and electric actuators made for the 4000 series have an unmatched cycle life and are the industry-wide preference for even the most severe applications. These actuators offer adaptability to a variety of process conditions to accommodate your application needs.

The flexible, modular design of the patented 4000 series can be used to combine actuators, solenoid valves, limit switches and other accessories in a variety of applications. American Valve can deliver the 4000 series fully automated and factory tested.

Standard 2" square operating nuts are available to effectively satisfy underground requirements.

## A SPECIAL PACKAGE FOR WHOLESALE

American Valve has also created unique, prepackaged boxes for the patented family of 4000 ball valves. This exclusive packaging eliminates potential shipping damage and offers unparalleled storage capabilities to wholesalers.



# PATENTED TEFLON® FUSED BALL



Our patented Teflon® fused ball is more corrosion-resistant than balls made with unprotected metal surfaces. Refer to any manufacturer's chemical resistance guide for further information.

Our patented Teflon® fused ball inhibits the buildup of lime, calcium, sludge, etc. that accumulates on ball surfaces and thus prevents premature failure of the valve seats. Series 5000 valves with Teflon® fused balls can last up to ten times longer than valves made with unprotected ball surfaces.

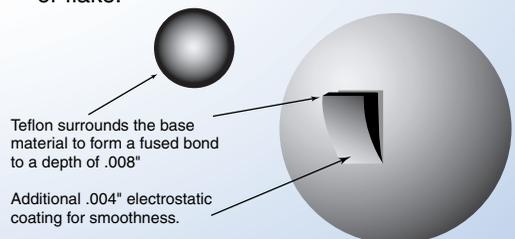


The lubricity of our patented Teflon® fused ball allows for lower torque ratings in any application.



This feature eliminates ball pitting, prevents build-up, lowers torque, and stops premature valve failure.

Since the Teflon is actually impregnated .008" into the metal, it can't wear, chip, or flake.



Teflon surrounds the base material to form a fused bond to a depth of .008"

Additional .004" electrostatic coating for smoothness.

Together they produce the strength of steel with the corrosion resistance of Teflon. Our patented process has gained the best of both worlds...Strength, Lubricity, and Bonding.

# METALLURGY and technical info for 4000 series

	Minimum Tensile Strength	Minimum Yield Point	Minimum Elongation
Grey Iron A126 Class B	31,000 psi	---	0.1%
Ductile Iron A536 Grade 65-45-12	65,000 psi	45,000 psi	12%
Carbon Steel A216 WCB	70,000 psi	30,000 psi	22%
304 Stainless Steel A-351 CF8	70,000 psi	28,000 psi	35%
316 Stainless Steel A-351 CF8M	70,000 psi	30,000 psi	30%

Model 4000 is made of cast iron (ASTM A126 Class B, standard grey iron). Model 4000D is made of ductile iron (ASTM 536, grade 65-45-12). Model 4001 is made of stainless steel (ASTMA351 CF8M).

It is useful to understand basic information about ferrous metals (cast irons, steels) and their relationships.

100% pure iron is never used as a cast metal because it is too soft and weak. When carbon is added, hardness and strength appear. When approximately 0.3% carbon is added, the resulting alloy is steel. Steel is a strong but difficult ferrous metal to manufacture from a production standpoint. Adding more carbon (up to about 2%) creates even more production problems. These “semi-steels” are seldom used.

When more carbon is added (between 2% and 3%), white iron is formed. White iron is true cast iron and is easy to produce. The problem with white iron is that it is very brittle because the carbon exists as iron carbide instead of pure carbon. Iron carbide (Fe<sub>3</sub>C) is a hard and brittle compound sometimes referred to as cementite. If white iron is subjected to a lengthy heat treatment, the Fe<sub>3</sub>C decomposes into iron and nodules of graphite. The end product is malleable iron.

When approximately 3.5% carbon is added, Fe<sub>3</sub>C exceeds its solubility in solid iron (the Fe<sub>3</sub>C is fully absorbed in the iron until there is no room left. The excess Fe<sub>3</sub>C is dispersed as graphite flakes). The result is grey iron. Grey iron (standard cast iron) delivers only moderate strength with almost no elongation because the excess Fe<sub>3</sub>C flakes act as stress raisers (they make cast iron easy to crack). Since grey iron is so economical to produce, its use has been widespread for centuries.

Cast Iron with spheroidal graphite (ductile iron) was first produced in 1948. Its chemical composition and percent of carbon is about the same as grey iron. The transformation to ductile iron occurs when molten grey iron is treated with magnesium. The insertion of magnesium into the pouring ladle (the process is called inoculation) transforms the Fe<sub>3</sub>C flakes into spheroids. These spheroids strengthen the metal by acting as crack arresters instead of crack facilitators. Ductile iron is sometimes referred to as spheroidal or nodular iron.

65-45-12 ductile iron is named for its physical properties (65,000 psi tensile strength, 45,000 psi yield, 12% elongation). Ductile iron chemically can be manufactured as Ferritic or Pearlitic. In Ferritic mixes, the graphite spheroids are in a matrix of pure iron. In Pearlitic mixes, the graphite spheroids are in a matrix of pure iron and cementite (Fe<sub>3</sub>C). The most common grade of ductile is Pearlitic-Ferritic, a combination of the two. American Valve's 4000D uses a predominately Ferritic mix (9:1) to take advantage of its high impact resistance and added tensile strength (80,000 psi).

Except where API 800° F fire safe standards are required for petrochemical refineries, ductile iron is generally preferable to a carbon steel because WCB has a tendency to flake, whereas ductile iron powders when subjected to liquid erosion. Ductile iron also possesses 50% higher yield strength properties and is more cost effective. Ductile iron castings have a maximum temperature rating of 650 degrees F. Traditional glass reinforced PTFE seats begin to deform at 360 degrees F.

ASTM A536-70 (MIL SPEC D-4512) requires each casting to be marked by its foundry heat number. Each heat is chemically tested prior to magnesium inoculation and also afterwards. Chemical certification by heat number is available upon request.

Standard cast steel (carbon steel) uses the symbol WCB and is defined under ASTM A-216. It contains a maximum of 0.3% carbon.

Stainless steel (ASTM A-351) has carbon levels even lower than WCB (0.08% maximum) making its production more costly. 304 Stainless Steel (CF8) adds 8% nickel, about 20% chromium, and a little more silicon. 316 stainless steel (CF8M) adds 2-3% molybdenum to the above. The addition of chromium, nickel and molybdenum enhances corrosion resistance, allowing CF8M to be utilized in a wide variety of chemical, petrochemical, and corrosive environments.

	GREY IRON	65-45-12 DUCTILE IRON	WCB	CF8	CF8M
Carbon % (max)	3.5	3.5	0.3	0.08	0.08
Manganese %	0.5	0.1	1.0	1.5	1.5
Phosphorous %	0.1	0.03	0.04	0.04	0.04
Sulfur %	0.1	0.005	0.05	0.04	0.04
Nickel %	0.02	0	0.5	8.0	9.0
Chromium %	0.05	0.025	0.04	18-21	18-21
Molybdenum %	0.05	0.002	0.25	-	2-3
Silicon %	2.1	3.2	0.3	2	2
Magnesium %	0.005	0.025	-	-	-

# OPERATING TORQUES

for 4000 series ball valves

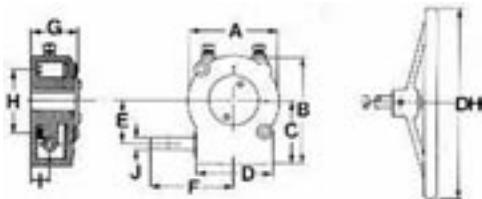
Size	Torque (ft. lbs)
1/2"	10
3/4"	10
1"	10
1 1/2"	20
2"	35
2 1/2"	48
3"	62
4"	130
6"	260
8"	360
10"	535

## 4000 Series Operating Torques

The actual amount of torque required to operate a valve is dependent upon many variables, such as line pressure, temperature, type of fluid, and frequency of operation. This table is based on average breakaway torque requirements for a valve handling a clean, particle-free liquid such as water. The following chart includes a safety allowance for service conditions. The torque figures listed should be further adjusted for dry or special service conditions. For fluids with high solids or abrasive content, consult factory for recommendations.

## GEAR OPERATOR DIMENSIONS:

Size	A	B	C	D	E	F	G	H	I	J	DH	Ratio	TOFP*	WT
1 1/2"- 2"	3 5/8	4 3/16	2 13/16	3	1 11/16	4 1/2	1 1/2	1 17/16	.67	.47	5	40:1	92	
2 1/2"- 4"	5 5/16	6 5/8	3 3/4	5 1/4	2 3/8	7 1/16	3	2 3/4	1.44	.59	7 3/4	45:1	367	6
6"-8"	7 3/8	8 1/2	5 1/4	6 3/8	3 1/8	6 9/16	3 3/8	3 1/2	1.57	.79	12 1/4	40:1	733	15
10"	7 3/8	8 1/2	5 1/4	6 3/8	3 1/8	6 9/16	3 3/8	3 1/2	1.57	.79	15 1/2	40:1	733	15

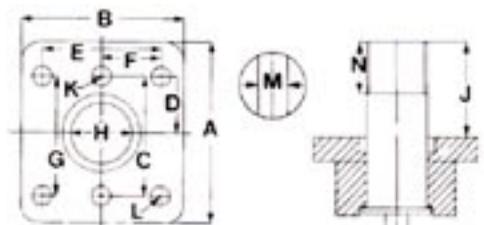


\* Torque Output Foot-Pounds

## MOUNTING PAD DIMENSIONS:

Size	A	B	C	D	E	F	G	H	J	K	L	M	N
1/2	2.370	1.750	1.565	.570	1.140	.570	1.140	.500	1.500	2pl M8	4pl 1/4unc	.310	1.100
3/4	2.370	1.750	1.565	.570	1.140	.570	1.140	.500	1.500	2pl M8	4pl 1/4unc	.310	1.100
1	2.370	1.750	1.565	.570	1.140	.570	1.140	.500	1.500	2pl M8	4pl 1/4unc	.310	1.100
1-1/2	3.620	2.745	2.310	.985	1.970	.985	1.970	.825	2.100	2pl M12	4pl M8	.470	1.495
2	3.620	2.745	2.310	.985	1.970	.985	1.970	.825	2.100	2pl M12	4pl M8	.470	1.495
2-1/2	4.725	3.740	2.935	1.415	2.835	1.40	2.835	1.100	2.400	2pl 1/2unc	4pl 7/16unc	.665	1.810
3	4.725	3.740	2.935	1.415	2.835	1.40	2.835	1.100	2.400	2pl 1/2unc	4pl 7/16unc	.665	1.810
4	4.725	3.740	2.935	1.415	2.835	1.40	2.835	1.100	2.400	2pl 1/2unc	4pl 7/16unc	.665	1.810
6	5.160	4.725	3.465	1.730	3.465	1.730	3.465	1.775	2.750	6pl 1/2unc	6pl 1/2unc	1.060	2.205
8	5.160	4.725	3.465	1.730	3.465	1.730	3.465	1.775	2.700	6pl 1/2unc	6pl 1/2unc	1.060	2.205
10	5.160	4.725	3.465	1.730	3.465	1.730	3.465	1.775	2.650	6pl 1/2unc	6pl 1/2unc	1.060	2.205

Dimensions and weights are given as approximates; consult factory for details.





# Certificate of Registration



by  
*Global Registrars, Inc.*  
*Pittsburgh, Pennsylvania*

*This is to certify that the Quality Management System at*

**American Valve, Inc.**  
**8717 West Market Street**  
**Greensboro, NC 27409**

*has been audited by qualified Global  
Registrars, Inc. auditors and found to comply  
with the requirements of*

**ISO 9001:2000**

*for the*

**Manufacture and Distribution of Industrial  
Valves and Domestic Commercial Valves and  
Distribution of Imported Commercial Valves**

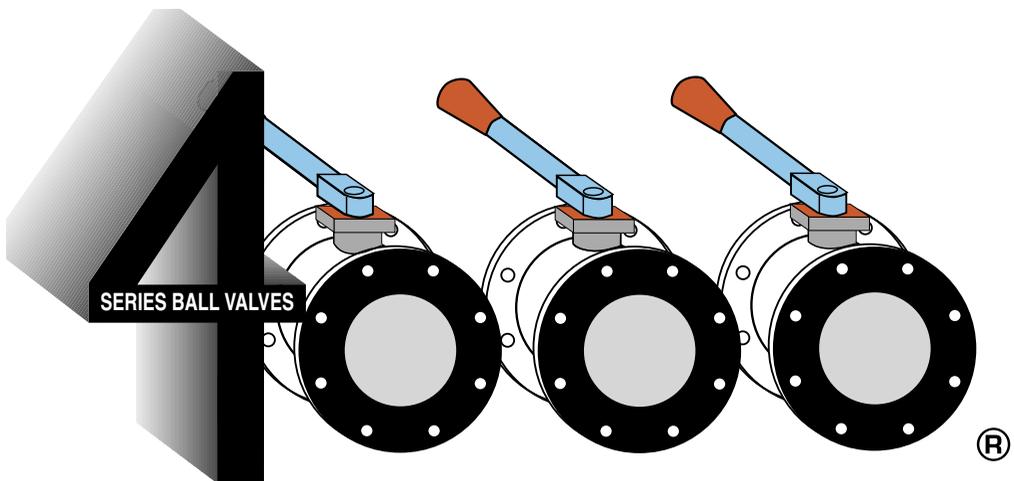
*This certification is granted subject to the system rules governing  
registration and the supplier hereby covenants with Global  
Registrars, Inc. duly to observe and comply with the said rules.*

*Certificate Number: 090*

*Date of Issuance: April 9, 1996*

*Expiration Date: April 9, 2004*

*Joseph A. Fabian*  
*on behalf of*  
*Global Registrars, Inc.*



*Member of the Valve Manufacturers Association of America*

***ISO 9001:2000 Certified***

P.O. Box 35229, Greensboro NC 27425  
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<http://www.americanvalve.com>