VALVE SOLUTIONS

PBV® 58/68

TWO-PIECE TRUNNION BALL VALVES

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P.B.V.®

MANUFACTURER OF QUALITY VALVE PRODUCTS AROUND THE GLOBE

Forum Energy Technologies (FET) is committed to improving our clients' operational and financial performance by supplying the most comprehensive range of valve products in the industry through our family of trusted valve brands.

ABOUT FET

Engineering Expertise
FET uses the latest state-of-the-art engineering software to provide custom design services for any application. Finite element analysis is just one of many Design Verification Tools FET uses to design valves to specific customer requirements.

CAD & CNC Capabilities
With FET's fast and efficient workflow, CAD drawings are releasable to the network for manufacturing and purchasing. Computer-generated machine programs can be quickly changed for weld overlays or other processes, resulting in faster deliveries.

Accurate Inventories
Daily cycle counting and order picking using barcode and automated part delivery systems results in more accurate inventories and faster product delivery.

Quality Control
All FET Companies manufacture quality products designed and tested to meet the standards of Qualifying Authorities worldwide. Advanced engineering and our Quality Management System ensure that our valve products continue to exceed your expectations for performance.

Customer Service
FET staffs its Customer Service Department with trained representatives ready to help you with ordering information, technical specifications, and logistics.

Contents

Due to upgrades in industry standards, material innovations, and FET/PBV's constant commitment to product advancement, data presented in this brochure are subject to change. Please contact your PBV sales representative for updated and current drawings and material compliance.

Note: Data contained in this document is for informational purposes and shall not be used for design purposes.

DESIGN STANDARDS & SPECIFICATIONS

Certification of Quality and Design

Quality systems are a way of life at PBV. In addition, PBV functions under the requirements of an API Q1 quality program. Our facilities and quality programs are always open to customer audits. PBV maintains active involvement in API, ASME, and MSS standards organizations.

PBV Quality Procedures

Tests and inspections on every valve are performed throughout production to ensure products meet PBV quality standards. Quality holdpoints include receiving inspection, pressure testing, and final inspection to confirm the performance of all marking, tagging, and processing according to PBV and leading industry standards.

PBV Trunnion Ball Valves are designed to meet the following industry standards.

American National Standards

ASME/ANSI B16.34 • Valves — Flanged, Threaded, and Welding Ends

ASME/ANSI B16.10 • Face-to-Face and End-to-End Dimensions on Ferrous Valves

ASME/ANSI B16.5 • Steel Pipe Flanges and Flanged Fittings

American Petroleum Institute

API 6D • Specifications for Pipeline Valves

API 607 • Fire Test for Soft-Seated Ball Valves

API Q1 • Specifications for Quality Programs

API 6FA • Fire Test for Valves*

International Standards Organization

ISO 15848-1 • Industrial Valves Measurement, Test and Qualification Procedures for Fugitive Emissions

ISO 9001 • Quality Management Systems — Requirements

ISO 5211 • Industrial Valves — Part-Turn Actuator Attachments

Manufacturers Standardization Society

MSS SP-25 • Standard Marking System for Valves

MSS SP-55 • Quality Standard for Steel Castings for Valves

National Association of Corrosion Engineers

NACE MR0175 • Sulfide Stress Cracking Resistant Metallic Materials for Oilfield Equipment

NACE MR0103 • Metallic Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments*

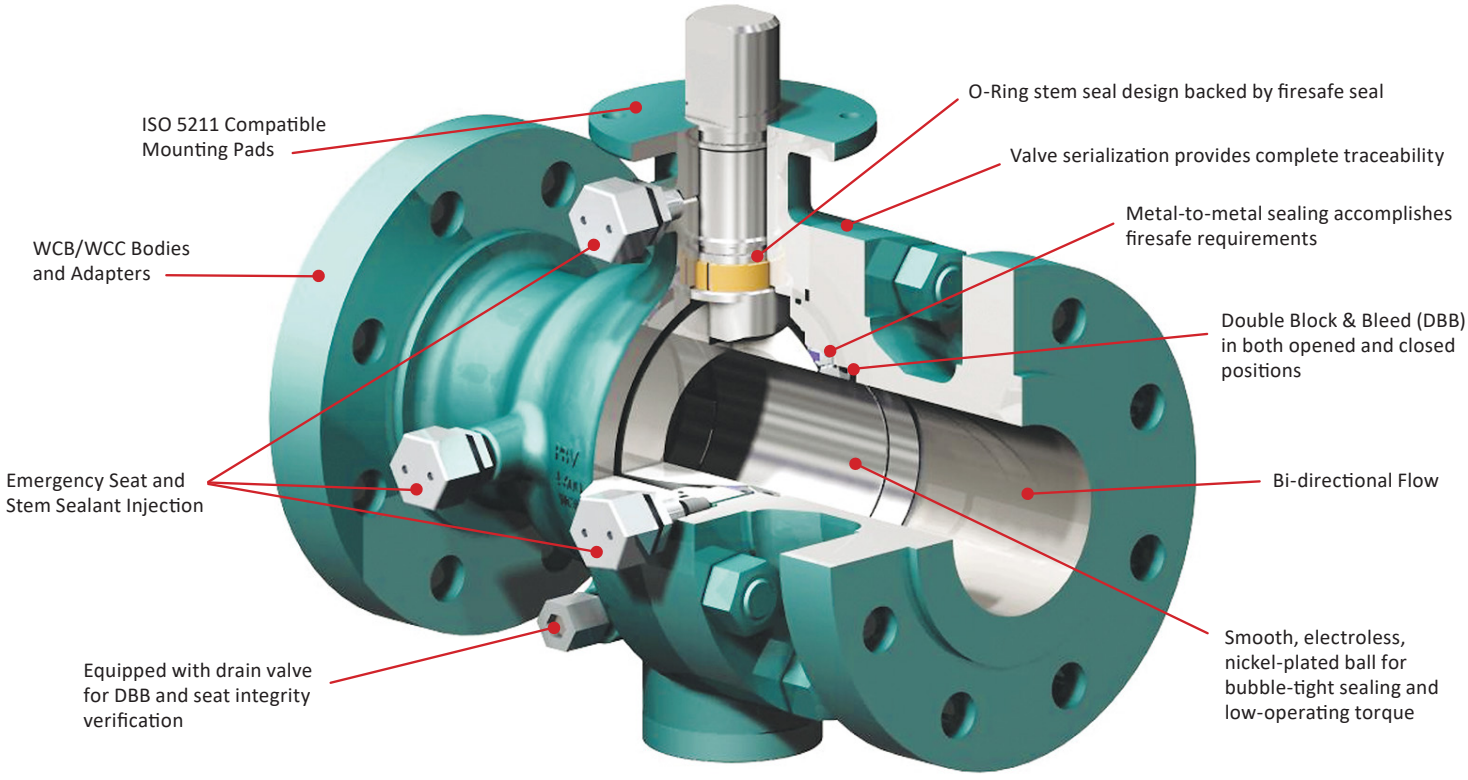
European Community

PED • Pressure Equipment Directive / CE*

International Certifications

CSA Z245.15 • Canadian Standards Association — Canadian Registration Number (CRN)*

**** Available upon request***



HOW TO ORDER

Specifying PBV 58/68 Trunnion Ball Valve, Figure Number

Example: 6" C-6830-71-2200-DH-NG This number represents a 6" ANSI Class 300, Full Port, Two-Piece Trunnion Ball Valve, Fire Tested with Emergency Grease Seals, with Raised Face, WCB Body Material, Carbon Steel with ENP Trim, Devlon® Seats, HNBR Seals, for NACE MR0175 Service and Gear Operated.

C - 6 8 30 - 7 1 - 22 00 - D H - N G

Material Code	Port	Valve Type	Pressure Class	Fire Tested	End Conn.	Body Material	Trim Material	Seat Material	Seal Material	NACE Option	Operator
C/S International Carbon Steel **D** Domestic Carbon Steel	**5** Reduced **6** Full	**8** 2-Piece Trunnion	**10** 150 **30** 300 **60** 600 **90** 900	**7** Fire Tested w/Emerg. Grease Seals	**1** RF **3** RTJ	**22** WCB/ WCC **28**[1] LCC	**00** Same as Body **36**[3] 316SS	**D** DEVLON or Equiv. **G** Reinforced PTFE	**H**[2] HNBR **U**[1][2] Viton® GLT	**N** NACE	**A** Actuator **B** Bare Stem **G** Gear Operator **L** Lever

NOTES: 1) Low Temperature Service
2) Explosive Decompression Compliant
3) Standard seat materiel for 150-300 GPTFE, Class 600 and above is DEVLON.

Consult factory for materials not listed.
Lever mounting pads are designed to dimensions in ISO 5211.

PRODUCT RANGE

Size (in.)	58 Two-Piece			68 Two-Piece			
	Pressure Class			Pressure Class			
	150	300	600	150	300	600	900
2	—	—	—	•	•	•	•
3	•	•	•	•	•	•	•
4	•	•	•	•	•	•	•
6	•	•	•	•	•	•	•
8	•	•	•	•	•	•	•
10	•	•	•	•	•	•	•
12	•	•	•	•	•	•	•
16	—	—	—	•	•	•	—

FLOW COEFFICIENTS (Cv)

By definition, Cv is the volume of water in gallons per minute at 60°F that will flow through a given element with a pressure drop of 1 psi.

Size (in.)	57 Three-Piece			67 Three-Piece			
	Pressure Class			Pressure Class			
	150	300	600	150	300	600	900
2	—	—	—	500	460	400	330
3	180	195	180	1350	1150	1050	935
4	545	535	550	2500	2200	1850	1760
6	790	765	745	5300	5290	4460	4405
8	1945	1945	2220	10,500	9600	8730	8475
10	4050	4040	4065	17,500	16,750	14,250	14,205
12	6900	7100	7050	26,300	25,500	22,550	21,430
16	—	—	—	43,300	41,700	38,150	—

BALL VALVE STEM TORQUES

Stem Break Torque at Maximum Operating Pressure (in-lbs)

Example: A 4" full port (68) or 6" reduced port (58) class 300 valve with G/PTFE seats has a stem torque of 2605 in-lbs at maximum allowable working pressure.

Bore Size (in.)	Pressure Class			
	150 285 PSI	300 740 PSI	600 1480 PSI	900 2220 PSI
	R/PTFE		DEVLON	
2	536	1070	1431	1838
3	1089	1678	2322	2966
4	1895	2605	3759	4914
6	2854	5181	8963	9568
8	8286	16,108	23,463	27,723
10	12,974	24,235	31,418	44,163
12	15,860	26,210	46,670	54,238
16	25,605	33,891	63,004	—

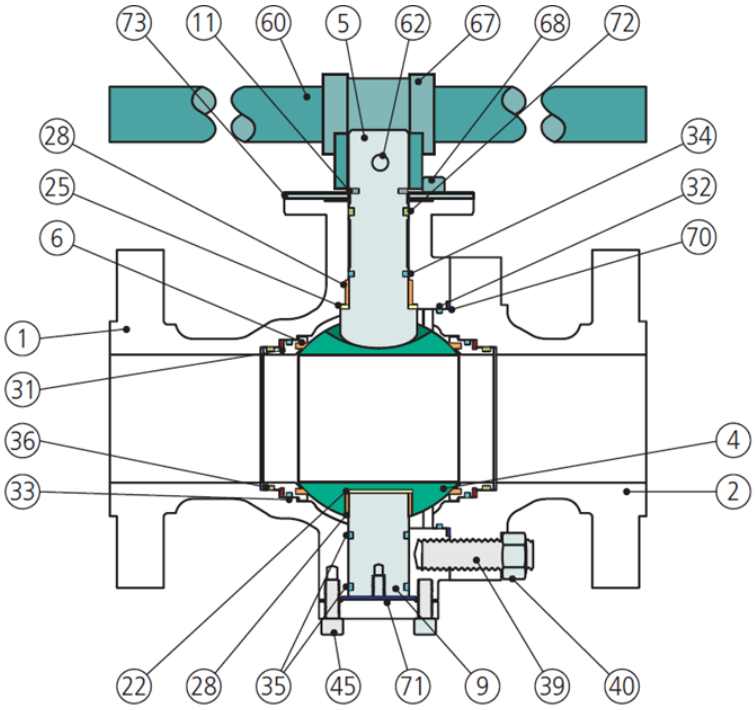
NOTES:
1) Torque values are for new valves with clean water service. No additional safety factors have been added.
2) For powered actuators, multiply values x 1.25
3) For dirty service, multiply values x 1.3
4) For dry gas service, multiply values x 1.25
5) To prevent stem side loading and eliminate potential stem galling, we recommend the following tolerances for mounting actuators:
   a) Actuator mounting bracket flanges must be parallel within .015"
   b) The maximum allowed run out on the stem coupling bores is .008"

PRESSURE/TEMPERATURE

The chart below depicts pressure and temperature ratings for common plastics and elastomers used in PBV ball valves. Other materials are available upon request.

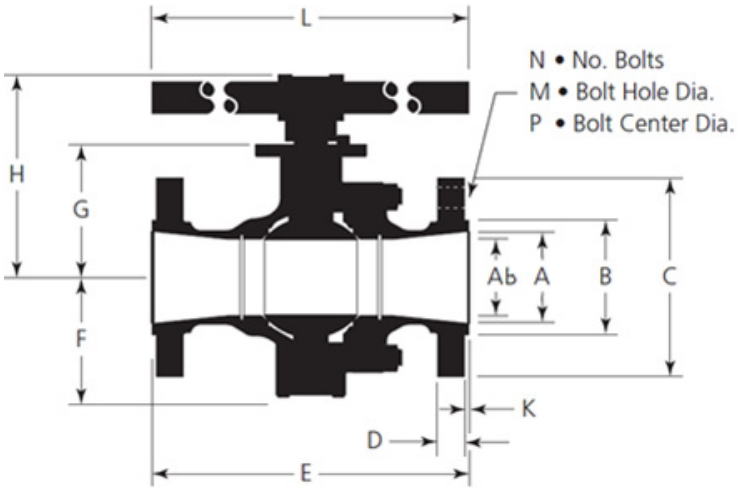
PARTS & MATERIALS

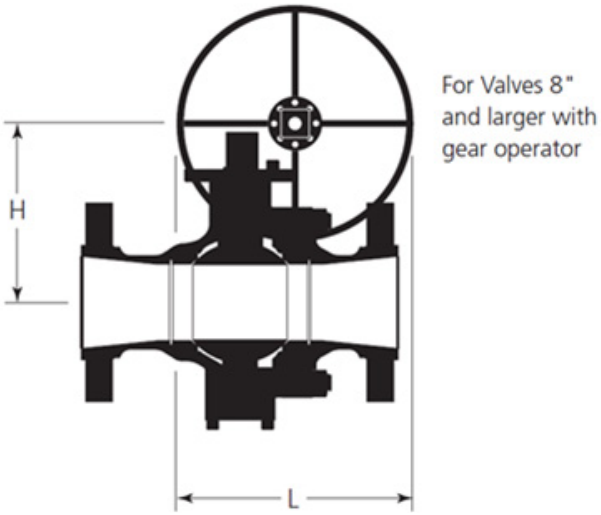
No.	Description	Material	Spare
1	Body	A216-WCB/WCC	
2	Adapter Cap	A216-WCB/WCC	
4	Ball	A105/A350 LF2 ENP	
5	Stem	A105/A350 LF2 ENP	
6	Seat Assembly	A105/A350 LF2 G/PTFE or Devlon	S
9	Trunnion	A105/A350 LF2 ENP	
10	Trunnion Plate	A352-LCC	
11	Snap Ring	Stainless Steel	S
22	Bearing	TFMC	S
25	Stem Thrust Washer	TFMC	S
28	Bearing Washer	Steel/PTFE	S
31	Spring	X-750	S
32	Body O-ring	HNBR	S
33	Seat O-ring	HNBR	S
34	Stem O-ring	HNBR	S
35	Trunnion O-ring	HNBR	S
36	Packing	Graphite	S
39	Stud	A193-B7M	
40	Nut	A194-2HM	
45	Trunnion Cap Screw	A574 Modified	
60	Handle	Carbon Steel	
62	Handle Screw	Carbon Steel	
67	Handle Adapter	Ductile Iron	
68	Stop Cap Screw	A574 Modified	
70	Body Gasket	Graphite	S
71	Trunnion Gasket	Graphite	S
72	Stem Packing	Graphite	S
73	Stop Plate	Carbon Steel	



DIMENSIONAL DATA

PBV 58 Two-Piece, 3” - 12” Reduced Port



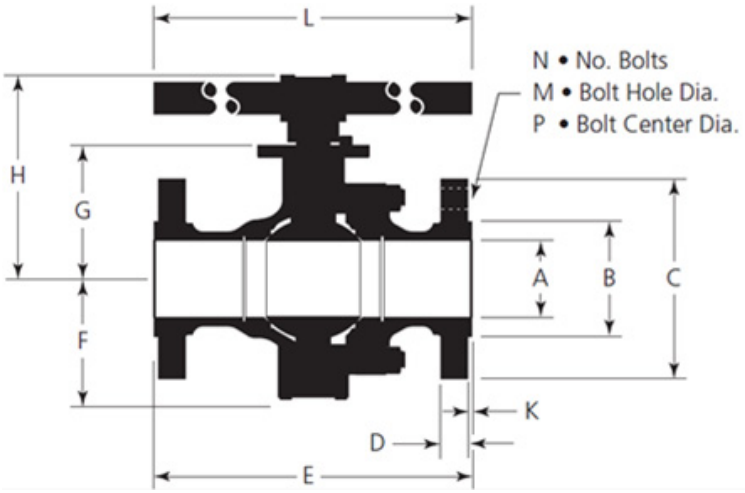


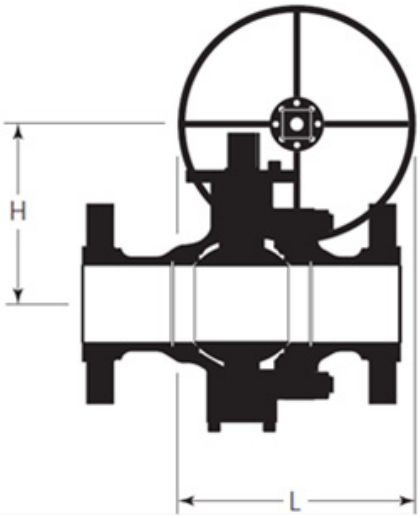
Dimensional Data, 58 Two-Piece

Size (in.)	Class	A	Ab	B	C	D	E1-RF	F	G	H	K	N	M	P	L	Weight (lbs.)
3	150	3.00	2.00	5.00	7.50	0.88	8.00	4.30	3.94	6.53	0.06	4	0.75	6.00	17	49
	300	3.00	2.00	5.00	8.25	1.06	11.12	4.30	3.94	6.53	0.06	8	0.88	6.62	17	62
	600	3.00	2.00	5.00	8.25	1.25	14.00	4.30	4.13	7.43	0.25	8	0.88	6.62	20	75
4	150	4.00	3.00	6.19	9.00	0.88	9.00	5.80	4.88	7.08	0.06	8	0.75	7.50	20	75
	300	4.00	3.00	6.19	10.00	1.19	12.00	5.80	4.88	8.19	0.06	8	0.88	7.88	20	111
	600	4.00	3.00	6.19	10.75	1.50	17.00	5.80	5.38	9.28	0.25	8	1.00	8.50	30	155
6	150	6.00	4.00	8.50	11.00	0.94	15.50	6.86	6.10	8.70	0.06	8	0.88	9.50	24	141
	300	6.00	4.00	8.50	12.50	1.38	15.88	6.86	7.06	9.22	0.06	12	0.88	10.62	30	190
	600	6.00	4.00	8.50	14.00	1.88	22.00	6.86	7.06	10.35	0.25	12	1.12	11.50	18	291
8	150	8.00	6.00	10.62	13.50	1.06	18.00	8.27	8.75	10.91	0.06	8	0.88	11.75	18	300
	300	8.00	6.00	10.62	15.00	1.56	19.75	8.27	8.75	10.91	0.06	12	1.00	13.00	18	406
	600	8.00	6.00	10.62	16.50	2.19	26.00	8.27	8.75	10.91	0.25	12	1.25	13.75	18	569
10	150	10.00	8.00	12.75	16.00	1.12	21.00	10.38	11.92	14.05	0.06	12	1.00	14.25	24	586
	300	10.00	8.00	12.75	17.50	1.81	22.38	10.38	11.92	14.05	0.06	16	1.12	15.25	24	721
	600	10.00	8.00	12.75	20.00	2.50	31.00	10.38	11.92	14.05	0.25	16	1.38	17.00	24	1205
12	150	12.00	10.00	15.00	19.00	1.19	24.00	10.38	13.76	15.89	0.06	12	1.00	17.00	24	1058
	300	12.00	10.00	15.00	20.50	1.94	25.50	12.05	13.76	15.89	0.06	16	1.25	17.75	24	1225
	600	12.00	10.00	15.00	22.00	2.62	33.00	12.05	13.76	15.89	0.25	20	1.38	19.25	24	1685

DIMENSIONAL DATA

PBV 68 Two-Piece, 2” - 16” Full Port





Dimensional Data, 68 Two-Piece

Size (in.)	Class	A	B	C	D	E1-RF	E2-RTJ	F	G	H	K	N	M	P	L	Weight (lbs)
2	150	2.00	3.62	6.00	0.69	7.00	—	4.30	3.94	6.53	0.06	4	0.75	4.75	17	36
	300	2.00	3.62	6.50	0.81	8.50	—	4.30	3.94	6.53	0.06	8	0.75	5.00	17	49
	600	2.00	3.62	6.50	1.00	11.50	—	4.30	4.13	7.43	0.25	8	0.75	5.00	20	58
	900	2.00	3.62	8.50	1.50	14.50	14.62	4.30	4.13	5.76	0.25	8	1.00	6.50	12	86
3	150	3.00	5.00	7.50	0.88	8.00	—	5.80	4.88	7.08	0.06	4	0.75	6.00	20	62
	300	3.00	5.00	8.25	1.06	11.12	—	5.80	4.88	8.19	0.06	8	0.88	6.62	20	84
	600	3.00	5.00	8.25	1.25	14.00	—	5.80	5.38	9.28	0.25	8	0.88	6.62	18	120
	900	3.00	5.00	9.50	1.50	15.00	15.12	5.80	5.38	9.28	0.25	8	1.00	7.50	18	139
4	150	4.00	6.19	9.00	0.88	9.00	—	6.86	6.10	8.70	0.06	8	0.75	7.50	30	115
	300	4.00	6.19	10.00	1.19	12.00	—	6.86	7.06	9.22	0.06	8	0.88	7.88	18	141
	600	4.00	6.19	10.75	1.50	17.00	—	6.86	7.06	10.35	0.25	8	1.00	8.50	18	212
	900	4.00	6.19	11.50	1.75	18.00	18.12	6.88	7.06	10.35	0.25	8	1.25	9.25	18	243
6	150	6.00	8.50	11.00	0.94	15.50	—	8.27	8.75	10.91	0.06	8	0.88	9.50	18	269
	300	6.00	8.50	12.50	1.38	15.88	—	8.27	8.75	10.91	0.06	12	0.88	10.62	18	340
	600	6.00	8.50	14.00	1.88	22.00	—	8.27	8.75	10.91	0.25	12	1.12	11.50	18	455
	900	6.00	8.50	15.00	2.19	24.00	24.12	8.27	9.80	10.91	0.25	12	1.25	12.50	24	569
8	150	8.00	10.62	13.50	1.06	18.00	—	10.38	11.92	14.05	0.06	8	0.88	11.75	24	547
	300	8.00	10.62	15.00	1.56	19.75	—	10.38	11.92	14.05	0.06	12	1.00	13.00	24	684
	600	8.00	10.62	16.50	2.19	26.00	—	10.38	11.92	14.05	0.25	12	1.25	13.75	24	905
	900	8.00	10.62	18.50	2.50	29.00	29.12	10.38	12.02	17.82	0.25	12	1.50	15.50	24	1129
10	150	10.00	12.75	16.00	1.12	21.00	—	10.38	13.76	15.89	0.06	12	1.00	14.25	24	825
	300	10.00	12.75	17.50	1.81	22.38	—	12.05	13.76	15.89	0.06	16	1.12	15.25	24	1015
	600	10.00	12.75	20.00	2.50	31.00	—	12.05	13.76	15.89	0.25	16	1.38	17.00	24	1407
	900	10.00	12.75	21.50	2.75	33.00	33.12	12.75	13.90	19.65	0.25	16	1.50	18.50	24	1865
12	150	12.00	15.00	19.00	1.19	24.00	—	12.05	13.76	15.89	0.06	12	1.00	17.00	30	1490
	300	12.00	15.00	20.50	1.94	25.50	—	14.17	16.34	22.91	0.06	16	1.25	17.75	30	1725
	600	12.00	15.00	22.00	2.62	33.00	—	14.17	16.34	22.91	0.25	20	1.38	19.25	30	2160
	900	12.00	15.00	24.00	3.112	38.00	38.12	14.96	16.53	22.91	0.25	20	1.50	21.00	30	2845
16	150	15.25	18.50	23.50	1.38	30.00	—	17.38	19.68	22.71	0.06	16	1.12	21.25	30	2343
	300	15.25	18.50	25.50	2.19	33.00	—	17.38	19.68	22.71	0.06	20	1.38	22.50	30	2712
	600	15.25	18.50	27.00	3.00	39.00	—	17.38	19.68	23.75	0.25	20	1.62	23.75	30	3585

OUR CORE VALUES

No One Gets Hurt

The safety of our employees and customers is our first priority coupled with a healthy respect for the environment.

Integrity

In everything we do, in every interaction, both internally and externally, we strive to operate with the utmost integrity and mutual respect.

Customer Focused

Our products enhance our customer's performance and we listen to their needs and work with them to solve their challenges.

Good Place To Work

We are committed to creating a workplace that fosters innovation, teamwork and pride. Every team member is integral to our success and is treated equally and fairly.

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