MTB-ASME Horizontal Foam Bladder Tank

Description

The SKUM MTB-ASME Horizontal Foam Bladder Tank is a steel pressure vessel that stores foam concentrate in an elastomeric bladder. As incoming water applies pressure to the bladder, the foam concentrate discharges from the tank. This energy transfers to the concentrate and supplies pressurized concentrate to a proportioner. For details on the bladder tank proportioners, refer to the latest revisions of the following data sheets:

- *FDS-2017094: TPW MK3 Wide-Range Bladder Tank Proportioner*
- *FDS-2016058: TP MK2 Bladder Tank Proportioner*

Features

- UL Listed and FM Approved for use with various proportioners and foam concentrates
- 175 psi (12.1 bar) maximum allowable working or design pressure
- Nominal capacities of up to 3,000 gal (11,356 L) with larger tanks available on special request
- Tanks that are up to 800 gal (3,028 L) in size meet the design requirements for Seismic Zone 4 earthquake resistance
- Brass or 316 stainless steel (SS) trim piping and valves
- Grooved, NPT, and flanged connection options
- Standard or corrosion-resistant epoxy exterior paint is available in various colors
- Optional sight gauge and thermal pressure relief valves

Application

The SKUM MTB-ASME Horizontal Foam Bladder Tank is one component of a balanced pressure proportioning system. For operation, SKUM bladder tanks only require a pressurized water supply. They do not require other sources of external power. To create a complete foam system, use the SKUM MTB-ASME Horizontal Foam Bladder Tank with one or more SKUM proportioners and any suitable discharge device. You can use most SKUM foam concentrates with SKUM bladder tanks.

SKUM bladder tanks have numerous applications, including the following examples:

- Aircraft hangars
- Foam-water sprinkler systems
- Truck-loading racks
- Helipads

Operation and maintenance

For installation, operation, inspection, and maintenance procedures, refer to the SKUM Vertical and Horizontal Bladder Tank operation and maintenance manual (Part No. 10401E or 446214). SKUM provide a copy of this manual with every tank.

Approvals and certifications

UL Listing and FM Approval

SKUM bladder tanks are UL Listed and FM Approved for use with various SKUM foam concentrates and proportioners. SKUM apply the UL mark and FM Approval diamond at the factory along with a label that identifies the required SKUM foam concentrate for use in the tank.

UL LISTED

FM APPROVED

ASME

Every tank bears a permanently affixed ASME data plate that shows the National Board number. This number identifies the tank as compliant with *ASME code Section VIII, Division 1* for unfired pressure vessels.

European Pressure Equipment Directive, 2014/68/EU

200 gal (757 L) and larger SKUM bladder tanks are CE marked in conformance with the *European Pressure Equipment Directive, 2014/68/EU*. Under the *European Pressure Equipment Directive 2014/68/EU*, tanks smaller than 200 gal (757 L) are acceptable based on the sound engineering practices of the ASME code and cannot be CE marked.

Seismic Zone 4 earthquake resistance

SKUM bladder tanks that are up to 800 gal (3,028 L) in size meet the minimum requirements for Seismic Zone 4 earthquake-resistant design as calculated according to the *1997 Uniform Building Code*.

Tyco Park | Grimshaw Lane | Newton Heath | Manchester | M40 2WL | Tel: +44 (0) 161 259 4000 | www.skum.com
 | Form No. FDS-2016071-05

Components

Trim piping and connections

SKUM horizontal bladder tanks are available in sizes up to 3,000 gal (11,356 L). All models feature top discharge foam concentrate connections and the option to pipe using either grooved or NPT threaded connections. SKUM supply adaptors for flanged connections separately. Trim piping is available in brass or stainless steel.

Nameplates

Permanently attached nameplates identify all of the valves. You can secure the nameplates in position with the supplied ring pins and tamper seals.

Protective coatings

All SKUM bladder tanks feature a high-build epoxy internal coating. The exterior paint is available in the following two grades:

- Standard
- Corrosion-resistant epoxy (epoxy CR)

The paint systems used on SKUM bladder tanks are subject to and pass salt spray corrosion testing in compliance with *ASTM B117-90*. The standard paint is tested to a minimum of 240 hours in accordance with *UL 162*, *UL 139*, and *FM 5130*. Epoxy CR paint has been tested to a minimum of 3,000 hours and is suitable for marine and offshore use.

Support and mounting

Two saddles with slotted holes for mounting support the horizontal bladder tanks. For dimensions and mounting hole spacing, see Figure 1 in Dimensions.

Horizontal tanks

SKUM fit each tank with two lifting lugs to lift the empty weight of the tank with a minimum safety factor of 2. When lifting an empty tank, use appropriate slings rigged at a lifting angle of not less than 30° from horizontal. All lifting lugs have a minimum clear hole size of 2 in. (50 mm). Table 1 lists the horizontal tank specifications.

Table 1: Horizontal tanks

Diameter	Nominal capacity	Mounting slot size
24 in. to 42 in. (610 mm to 1,067 mm)	100 gal to 400 gal (379 L to 1,514 L)	5/8 in. x 1 1/4 in. (16 mm x 32 mm)
48 in. (1,219 mm)	500 gal to 800 gal (1,893 L to 3,028 L)	7/8 in. x 1 1/4 in. (22 mm x 32 mm)
60 in. to 72 in. (1,524 mm to 1,829 mm)	900 gal to 3,000 gal (3,407 L to 11,356 L)	1 in. x 1 1/4 in. (25 mm x 32 mm)

Internal components

SKUM bladder tanks contain a UL Listed and FM Approved elastomeric bladder for use with SKUM foam concentrates. All SKUM bladder tanks utilize a center tube to facilitate the discharge of agent. The center tubes are constructed with materials compatible with SKUM foam concentrates. The horizontal tanks contain two center tubes, one oriented horizontally and one oriented vertically, connected by a cross fitting.

Sight gauge

To estimate the fill level in the bladder tank, SKUM can supply a sight gauge as an optional accessory. SKUM equip the sight gauge with a clear 1 in. (25 mm) PVC tube. SKUM ship the sight gauge as a separate item and the installer must assemble it onto the tank during the installation process.

Thermal relief valve

SKUM can supply an optional thermal relief valve for bladder tanks. Use a thermal relief valve to relieve pressure due to thermal expansion when storing the bladder tank in an isolated or hydraulically locked condition. The thermal relief valve is factory set to 175 psi (12.1 bar). To avoid a seat leakage and early valve maintenance, maintain the design pressure of the system at least 5 psi (0.34 bar) or 10% below the set pressure of the valve. **Do not** use this valve as a substitute for a correctly sized ASME pressure relief valve to protect the entire system from overpressure.

ASME information

The SKUM MTB-ASME Horizontal Bladder Tanks are designed and constructed in accordance with the latest revisions to *ASME Code Section VIII, Division 1* for unfired pressure vessels with a maximum allowable working pressure (MAWP) of 175 psi (12.1 bar). The bladder tanks are tested to the pressure specified by the applicable codes and standards. Bladder tanks designed to the ASME code are tested to at least 230 psi (15.9 bar). CE marked tanks are tested to at least 255 psi (17.6 bar). All SKUM bladder tanks are constructed of steel complying with ASME specifications. The tank heads are 2:1 elliptical, unless otherwise specified.

All SKUM bladder tanks include a permanently affixed stainless steel ASME data plate. The data plate includes the following information:

- Year of manufacture
- MAWP
- Nominal volume
- Part number
- National Board number
- Minimum material thickness
- Minimum design metal temperature (MDMT)
- Type of head

Custom engineering

SKUM can customize the bladder tanks to accommodate a variety of special requirements, including but not limited to the following requirements:

- Ladders
- Platforms
- Alternate materials of construction
- Higher design pressures
- Spacial constraints
- Larger capacities
- Seismic rated tanks

For additional information or to obtain a quote, contact Johnson Controls Technical Services or a SKUM Regional Sales Manager.

Note: Limit UL Listed horizontal tanks to maximum capacities of 4,000 gal (15,142 L) with maximum working pressures of 175 psi to 250 psi (12.1 bar to 17.2 bar). Limit FM Approved tanks to maximum capacities of 3,000 gal (11,356 L).

Ordering information

When ordering a SKUM MTB-ASME Horizontal Foam Bladder Tank, specify the following information:

- Part number for the required bladder tank size and orientation (see Table 3)
- Foam concentrate type (see note 1)
- One option from each of the categories listed in the following table (see note 2)

Table 2: Ordering information

Component	Category
Exterior paint	Option 1: Standard Option 2: CR epoxy
Exterior paint color[3]	Option 1: Red (RAL 3001) Option 2: Blue (RAL 5019) Option 3: Yellow (RAL 1021) Option 4: Other[4]
Trim piping and valve material	Option 1: Brass piping and brass valves Option 2: 316 SS piping and SS valves
Sight gauge	Option 1: Sight gauge included Option 2: No sight gauge
Thermal relief valve[5]	Option 1: No thermal relief valve Option 2: Thermal relief valve included
Packaging	Option 1: Domestic packaging Option 2: Export crating

Notes: 1. The tanks are marked as UL Listed or FM Approved based on the specified foam concentrate type. If you do not specify the foam concentrate type, the tank is not marked as UL Listed or FM Approved.

2. If you do not specify an option from a category, Option 1 is the default order.

3. UL Listing of the paint systems is color specific. The red, blue, and yellow color shade options shown in this table are UL Listed. Contact Johnson Controls Technical Services to determine if other color shades are UL Listed.

4. If you select **Other**, you must supply the specific paint shade. The availability of the paint shade that you select may impact the lead time.

5. The set pressure is 175 psi (12.1 bar). The set pressure cannot exceed the design pressure of the tank in accordance with the ASME code.

Expediting service

For optional expediting services, SKUM supply selected sizes of SKUM bladder tanks, including most of the standard options listed in Table 2. SKUM can ship these tanks in two weeks or less after the order confirmation. See the list of part numbers in Table 3 for the specific sizes eligible for this service. Due to availability, expedited tanks are only available in RAL 3001 Red. For additional information and limitations on this service, contact Johnson Controls Technical Services or a SKUM Regional Sales Manager.

Touch-up paint

SKUM can supply RAL 3001 touch-up paint for red equipment in a convenient 7 oz spray can. SKUM do not supply touch-up paint for other colors in spray cans. Contact Johnson Controls Technical Services for touch-up paint in other colors.

- Red (RAL 3001) touch-up paint part number: 405581

Table 3: Bladder tank part numbers

Nominal capacity gal	(L)	Part number	Expediting available
100	(379)	444124E	
150	(568)	444125E	
200	(757)	444126E	√
300	(1,136)	444127E	√
400	(1,514)	444128E	
500	(1,893)	444129E	√
600	(2,271)	444130E	
700	(2,650)	444131E	
800	(3,028)	444132E	
900	(3,407)	444133E	
1,000	(3,785)	444134E	
1,200	(4,542)	444135E	
1,400	(5,300)	444136E	
1,600	(6,057)	444137E	
1,800	(6,814)	444138E	
2,000	(7,571)	444139E	
2,200	(8,328)	444140E	
2,400	(9,085)	444141E	
2,600	(9,842)	444142E	
2,800	(10,599)	444143E	
3,000	(11,356)	444144E	

Flange adaptors

For field installations, SKUM supply flange adaptors as tank accessories to adapt the grooved fittings supplied with the bladder tanks to the flanged piping. The sizes listed in Table 4 have a maximum pressure rating of 300 psi (20.7 bar). The flange adaptor body is ductile iron and uses a Grade **E** EPDM gasket, finished with red (RAL 3000) non-lead paint.

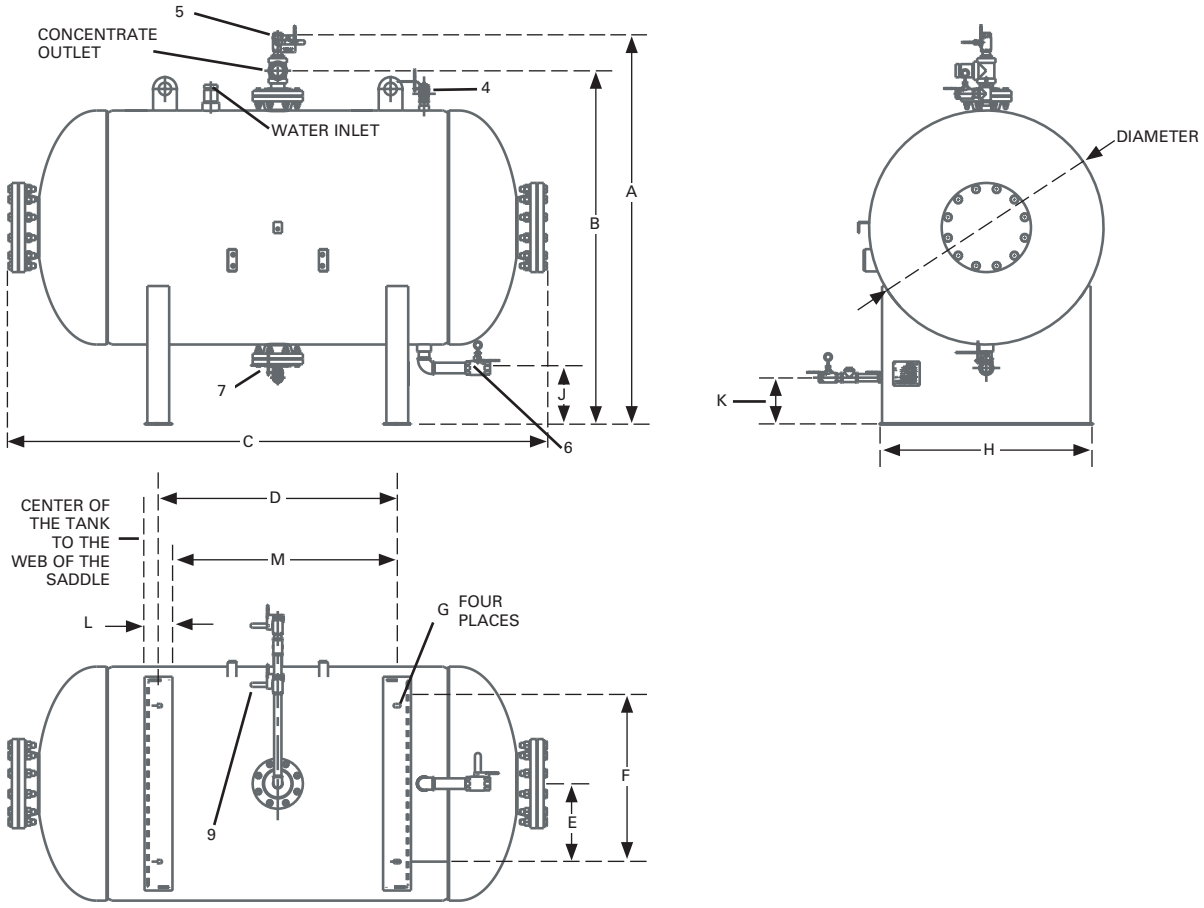
Table 4: Flange adaptors

Adaptor size		Flange mating bolts				
Grooved in. (mm)	ANSI flange (DIN)	Size Dia x L in.	Qty.	Bolt torque range lb-ft (N•m)	Approx. weight lb (kg)	Ordering Part No.
2 (50)	2 (DN50)	5/8 x 3	4	110 to 140 (149 to 190)	3.0 (1.4)	7120TS
2 1/2 (65)	2 1/2 (DN65)	5/8 x 3	4	110 to 140 (149 to 190)	5.0 (2.3)	7125TS
3 (80)	3 (DN80)	5/8 x 3	4	110 to 140 (149 to 190)	5.6 (2.5)	7130TS
4 (100)	4 (DN100)	3/4 x 3 1/2	8	220 to 250 (298 to 339)	7.0 (3.2)	7140TS
6 (150)	6 (DN150)	3/4 x 3 1/2	8	220 to 250 (298 to 339)	10.0 (4.5)	7160TS
8 (200)	8 (DN200)	3/4 x 3 1/2	8	220 to 250 (298 to 339)	16.6 (7.5)	7180TS

Dimensions

For the bladder tank dimensions, see Figure 1. Table 6 on the following page lists the dimensional data for each of the dimensions in Figure 1.

Figure 1: Bladder tank dimensions and valve positions



Valve No.	Description	Normal valve position	
		Manual system	Automatic system
1	Manual foam concentrate shutoff (not shown)	N.C.	N.O.
2	Water supply shutoff (not shown)	N.C.	N.O.
3	Sight gauge shutoff (not shown)	N.C.	N.C.
4	Tank shell vent valve	N.C.	N.C.
5	Bladder vent valve	N.C.	N.C.
6	Tank shell drain valve	N.C.	N.C.
7	Bladder drain/fill valve	N.C.	N.C.
8	Automatic foam concentrate isolation (not shown)	–	N.C.
9	Isolation valve	N.C.	N.C.

Notes: N.C. = Normally closed

N.O. = Normally open

Valves listed as **not shown** are either supplied as loose items or supplied by others.

Dimension and installation notes

1. Table 6 lists **approximate** dimensions. These dimensions are subject to change without notice.
2. Any rooms or buildings that house a bladder tank should have accommodations to ensure the removal of the internal center tubes. The center tubes are approximately the full height and width of the bladder tank.
3. Table 5 lists the various pipework options.

Table 5: Pipework

Pipe	Tank size	Connection
Foam concentrate discharge pipe	50 gal to 400 gal (189 L to 1,514 L)	2 in. female NPT or grooved
	500 gal to 3,000 gal (1,893 L to 11,356 L)	3 in. female NPT or grooved
Water inlet pipe	50 gal to 400 gal (189 L to 1,514 L)	2 in. female NPT or grooved
	500 gal to 3,000 gal (1,893 L to 11,356 L)	3 in. female NPT or grooved

Dimensions (Continued)

Table 6: Dimensions

Part No.	Nominal capacity gal (L)	Dia. in. (mm)	Tank weight (empty) lb (kg)	Water inlet – NPT or grooved in.	Conc. outlet – NPT or grooved in.	Tank shell vent – NPT in.	Bladder vent/ fill – NPT in.	Bladder drain/ fill – NPT in.	Tank shell drain – NPT in.	Dim. A in. (mm)	Dim. B in. (mm)	Dim. C in. (mm)
444124	100 (379)	24 (610)	598 (271)	2	2	1	1	1	1	53 (1,346)	45 3/4 (1,162)	74 1/2 (1,892)
444125	150 (568)	30 (762)	824 (374)	2	2	1	1	1	1 1/2	58 1/2 (1,486)	51 3/4 (1,314)	74 (1,880)
444126	200 (757)	30 (762)	929 (421)	2	2	1	1	1	1 1/2	58 1/2 (1,486)	51 3/4 (1,314)	93 1/2 (2,375)
444127	300 (1,136)	42 (1,067)	1,429 (648)	2	2	1	1	1	1 1/2	70 1/2 (1,791)	63 3/4 (1,619)	76 1/2 (1,943)
444128	400 (1,514)	42 (1,067)	1,668 (757)	2	2	1	1	1	1 1/2	70 1/2 (1,791)	63 3/4 (1,619)	96 1/2 (2,451)
444129	500 (1,893)	48 (1,219)	2,053 (931)	3	3	1	1	1	1 1/2	78 (1,981)	71 (1,803)	94 (2,388)
444130	600 (2,271)	48 (1,219)	2,261 (1,026)	3	3	1	1	1	1 1/2	78 (1,981)	71 (1,803)	109 (2,769)
444131	700 (2,650)	48 (1,219)	2,467 (1,119)	3	3	1	1	1	1 1/2	78 (1,981)	71 (1,803)	123 1/2 (3,137)
444132	800 (3,028)	48 (1,219)	2,702 (1,226)	3	3	1	1	1	1 1/2	78 (1,981)	71 (1,803)	140 (3,556)
444133	900 (3,407)	60 (1,524)	3,075 (1,395)	3	3	1	1	1	1 1/2	90 (2,286)	82 1/4 (2,089)	108 (2,743)
444134	1,000 (3,785)	60 (1,524)	3,275 (1,486)	3	3	1	1	1	1 1/2	90 (2,286)	82 1/4 (2,089)	118 (2,997)
444135	1,200 (4,542)	60 (1,524)	3,571 (1,620)	3	3	1	1	1	1 1/2	90 (2,286)	82 1/4 (2,089)	132 (3,353)
444136	1,400 (5,300)	60 (1,524)	3,991 (1,810)	3	3	1	1	1	1 1/2	90 (2,286)	82 1/4 (2,089)	151 (3,835)
444137	1,600 (6,057)	73 (1,854)	5,308 (2,408)	3	3	1	1	1	1 1/2	103 1/2 (2,629)	95 3/4 (2,432)	122 1/2 (3,112)
444138	1,800 (6,814)	73 (1,854)	5,704 (2,587)	3	3	1	1	1	1 1/2	103 1/2 (2,629)	95 3/4 (2,432)	135 (3,429)
444139	2,000 (7,571)	73 (1,854)	6,330 (2,871)	3	3	1	1	1	1 1/2	103 1/2 (2,629)	95 3/4 (2,432)	153 (3,886)
444140	2,200 (8,328)	73 (1,854)	6,633 (3,009)	3	3	1	1	1	1 1/2	103 1/2 (2,629)	95 3/4 (2,432)	162 (4,115)
444141	2,400 (9,085)	73 (1,854)	7,048 (3,197)	3	3	1	1	1	1 1/2	103 1/2 (2,629)	95 3/4 (2,432)	174 1/2 (4,432)
444142	2,600 (9,842)	73 (1,854)	7,463 (3,385)	3	3	1	1	1	1 1/2	103 1/2 (2,629)	95 3/4 (2,432)	187 (4,750)
444143	2,800 (10,599)	73 (1,854)	7,878 (3,573)	3	3	1	1	1	1 1/2	103 1/2 (2,629)	95 3/4 (2,432)	199 1/2 (5,067)
444144	3,000 (11,356)	73 (1,854)	8,289 (3,760)	3	3	1	1	1	1 1/2	103 1/2 (2,629)	95 3/4 (2,432)	212 (5,385)

Nominal capacity gal (L)	Dim. D in. (mm)	Dim. E in. (mm)	Dim. F in. (mm)	Dim. G in. (mm)	Dim. H in. (mm)	Dim. J in. (mm)	Dim. K in. (mm)	Dim. L in. (mm)	Dim. M in. (mm)
100 (379)	31 1/2 (800)	5 (127)	10 (254)	5/8 x 1 1/4 (16 x 32)	23 (584)	11 1/4 (286)	8 1/4 (210)	5 (127)	26 1/2 (673)
150 (568)	25 11/16 (652)	8 (203)	16 (406)	5/8 x 1 1/4 (16 x 32)	28 (711)	10 (254)	8 1/4 (210)	5 (127)	20 11/16 (525)
200 (757)	45 1/4 (1,149)	8 (203)	16 (406)	5/8 x 1 1/4 (16 x 32)	28 (711)	10 (254)	8 1/4 (210)	5 (127)	40 1/4 (1,022)
300 (1,136)	22 1/2 (572)	14 (356)	28 (711)	5/8 x 1 1/4 (16 x 32)	38 3/8 (975)	10 (254)	8 1/4 (210)	5 (127)	17 1/2 (445)
400 (1,514)	42 3/4 (1,086)	14 (356)	28 (711)	5/8 x 1 1/4 (16 x 32)	38 3/8 (975)	10 (254)	8 1/4 (210)	5 (127)	37 3/4 (959)
500 (1,893)	35 1/8 (892)	17 (432)	34 (864)	7/8 x 1 1/4 (22 x 32)	44 (1,118)	10 (254)	8 (203)	7 (178)	28 1/8 (714)
600 (2,271)	47 5/8 (1,210)	17 (432)	34 (864)	7/8 x 1 1/4 (22 x 32)	44 (1,118)	10 (254)	8 (203)	7 (178)	40 5/8 (1,032)
700 (2,650)	65 (1,651)	17 (432)	34 (864)	7/8 x 1 1/4 (22 x 32)	44 (1,118)	10 (254)	8 (203)	7 (178)	58 (1,473)
800 (3,028)	81 1/8 (2,061)	17 (432)	34 (864)	7/8 x 1 1/4 (22 x 32)	44 (1,118)	10 (254)	8 (203)	7 (178)	74 1/8 (1,883)
900 (3,407)	42 15/16 (1,091)	23 (584)	46 (1,168)	1 x 1 1/4 (25 x 32)	54 1/2 (1,384)	10 (254)	8 (203)	7 (178)	35 15/16 (913)
1,000 (3,785)	52 5/8 (1,337)	23 (584)	46 (1,168)	1 x 1 1/4 (25 x 32)	54 1/2 (1,384)	10 (254)	8 (203)	7 (178)	45 5/8 (1,159)
1,200 (4,542)	66 7/8 (1,699)	23 (584)	46 (1,168)	1 x 1 1/4 (25 x 32)	54 1/2 (1,384)	10 (254)	8 (203)	7 (178)	59 7/8 (1,521)
1,400 (5,300)	66 (1,676)	23 (584)	46 (1,168)	1 x 1 1/4 (25 x 32)	54 1/2 (1,384)	10 (254)	8 (203)	7 (178)	59 (1,499)
1,600 (6,057)	48 1/2 (1,232)	29 (737)	46 (1,168)	1 x 1 1/4 (25 x 32)	66 1/4 (1,683)	10 (254)	7 1/2 (191)	9 (229)	39 1/2 (1,003)
1,800 (6,814)	60 5/8 (1,540)	29 (737)	58 (1,473)	1 x 1 1/4 (25 x 32)	66 1/4 (1,683)	10 (254)	7 1/2 (191)	9 (229)	51 5/8 (1,311)
2,000 (7,571)	72 15/16 (381)	29 (737)	58 (1,473)	1 x 1 1/4 (25 x 32)	66 1/4 (1,683)	10 (254)	7 1/2 (191)	9 (229)	63 15/16 (1,624)
2,200 (8,328)	63 3/4 (1,853)	29 (737)	58 (1,473)	1 x 1 1/4 (25 x 32)	66 1/4 (1,683)	10 (254)	7 1/2 (191)	9 (229)	54 3/4 (1,391)
2,400 (9,085)	100 1/2 (2,553)	29 (737)	58 (1,473)	1 x 1 1/4 (25 x 32)	66 1/4 (1,683)	10 (254)	7 1/2 (191)	9 (229)	91 1/2 (2,324)
2,600 (9,842)	113 1/16 (2,872)	29 (737)	58 (1,473)	1 x 1 1/4 (25 x 32)	66 1/4 (1,683)	10 (254)	7 1/2 (191)	9 (229)	104 1/16 (2,643)
2,800 (10,599)	125 9/16 (3,189)	29 (737)	58 (1,473)	1 x 1 1/4 (25 x 32)	66 1/4 (1,683)	10 (254)	7 1/2 (191)	9 (229)	116 9/16 (2,961)
3,000 (11,356)	137 15/16 (3,504)	29 (737)	58 (1,473)	1 x 1 1/4 (25 x 32)	66 1/4 (1,683)	10 (254)	7 1/2 (191)	9 (229)	128 15/16 (3,275)

Note: The converted values in this document are provided for dimensional reference only and do not reflect an actual measurement.