	<b>Calcgen Solutions</b> <b>Project Specifications</b>	<b>Document No.: 75</b>	
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<b>VesselExpress</b>			

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**Revision Log**

Rev. No	Description of Change	Date:
<b>01</b>	Initial Release	2019-Feb-02



**Calcgen Solutions**  
**Project Specifications**

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**VesselExpress**

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## 1.0 Deficiencies Summary

No Deficiencies were found.

## 2.0 DEFINITION

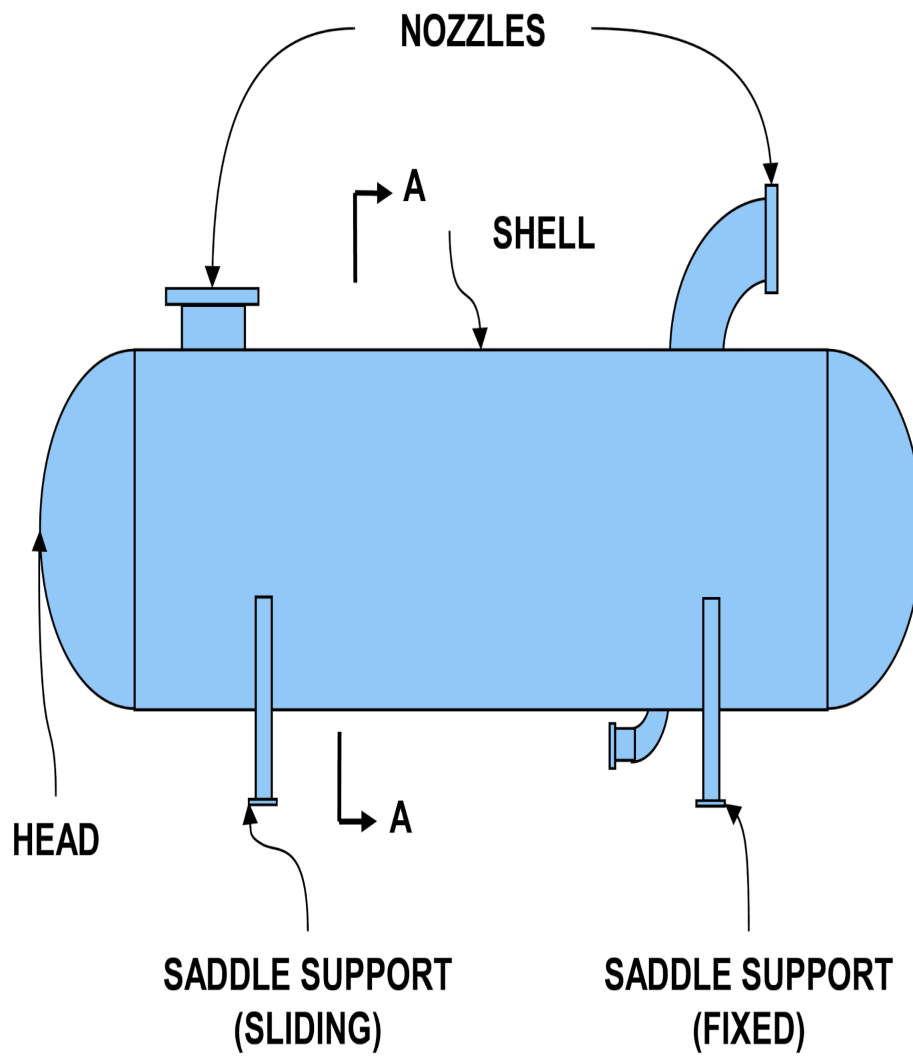
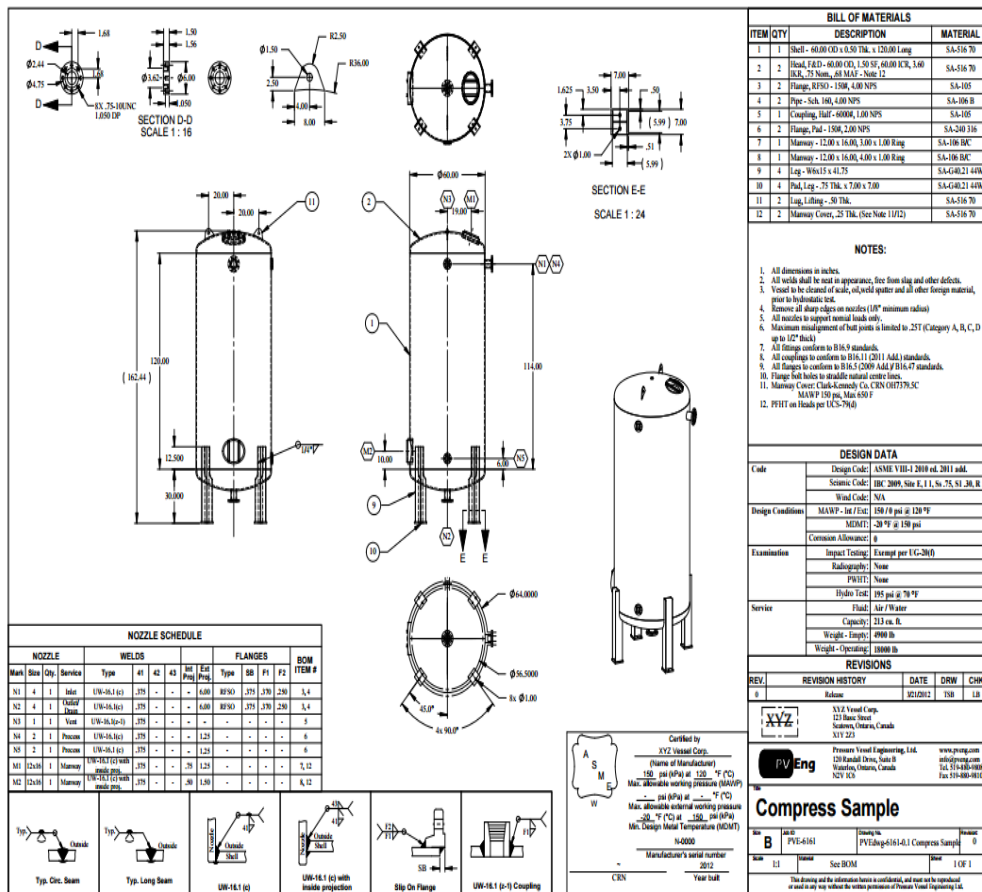


Fig. 1

Fig. 2

NOTE - ALL DIMENSION IN MILLIMETERS



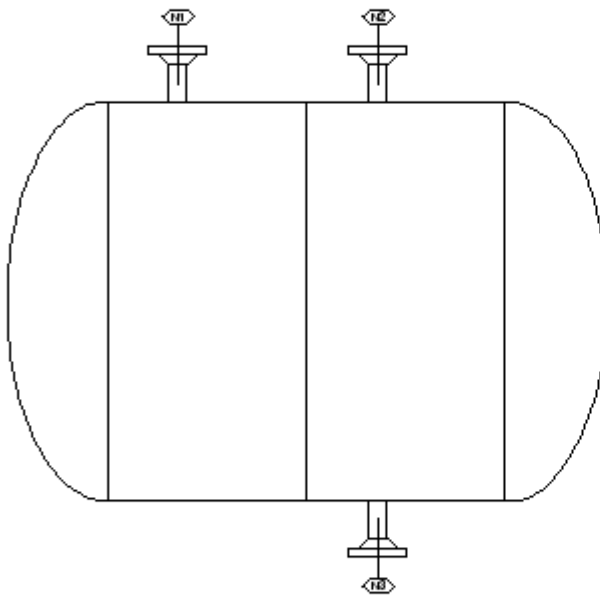
### 3.0 PIPE AND FLANGE DATA NEEDED

Pipe data should come from a pipe chart. A pipe chart like [this\(link\)](#) needs to be available to pull the property based on the pipe and selected pipe schedule. For VesselExpress, we will only use ASME B16.5 welding neck flanges. The flange data is also available on [this link](#). All classes (150, 300, 400, 600, 900, 1500 and 2500) classes of flange data shall be available. The flange dimensions should also be stored on database. The pipe and flange data do not change frequently so it should be on read only database for the users. Admins should be able to modify the information if required. Many other application need to pull these information as well.

## 4.0 COMPONENTS REQUIRED

ASME 2:1 Ellip. Head

Cylinder(s)



Nozzles (Built with Pipe and Flange)

Skirt (Applicable to Vertical Vessel Only)

Saddle (Applicable to Horizontal Vessel Only)

## 5.0 OUTPUT REQUIRED

### 6.0 VESSEL CALCULATIONS

#### Cylinder1

##### Calculations for Internal Pressure

###### Thickness of Cylindrical Shell as per UG-27

$$t = (P \cdot R) / (S \cdot E - 0.6 \cdot P) = (45.0 \cdot 150.0) / (17.1 \cdot 1.0 - 0.6 \cdot 45.0) = 0.395690564048498 \text{ in}$$

$$t = 0.395690564048498 + \text{Corrosion Allowance} = 0.395690564048498 + 0.125 = 0.520690564048498 \text{ in}$$

#### Cylinder2

##### Calculations for Internal Pressure

###### Thickness of Cylindrical Shell as per UG-27

$$t = (P \cdot R) / (S \cdot E - 0.6 \cdot P) = (45.0 \cdot 150.0) / (17.1 \cdot 1.0 - 0.6 \cdot 45.0) = 0.395690564048498 \text{ in}$$

$$t = 0.395690564048498 + \text{Corrosion Allowance} = 0.395690564048498 + 0.125 = 0.520690564048498 \text{ in}$$

#### Cylinder3

##### Calculations for Internal Pressure

###### Thickness of Cylindrical Shell as per UG-27

$$t = (P \cdot R) / (S \cdot E - 0.6 \cdot P) = (45.0 \cdot 150.0) / (17.1 \cdot 1.0 - 0.6 \cdot 45.0) = 0.395690564048498 \text{ in}$$

$$t = 0.395690564048498 + \text{Corrosion Allowance} = 0.395690564048498 + 0.125 = 0.520690564048498 \text{ in}$$

#### Cylinder4

##### Calculations for Internal Pressure

###### Thickness of Cylindrical Shell as per UG-27

$$t = (P \cdot R) / (S \cdot E - 0.6 \cdot P) = (45.0 \cdot 150.0) / (17.1 \cdot 1.0 - 0.6 \cdot 45.0) = 0.395690564048498 \text{ in}$$

$$t = 0.395690564048498 + \text{Corrosion Allowance} = 0.395690564048498 + 0.125 = 0.520690564048498 \text{ in}$$

MAWP

Weight of Pressure Vessel (entire Weight)

Center of Gravity with Fluid or without fluid

Nozzle Schedule Table

An outline drawing

## AREA

	Abbreviation	Unit
0	km <sup>2</sup>	square kilometer
1	m <sup>2</sup>	square meter
2	dm <sup>2</sup>	square decimeter
3	cm <sup>2</sup>	square centimeter
4	mm <sup>2</sup>	square millimeter
5	ha	hectare
6	a	are
7	ca	centiare
8	mile <sup>2</sup>	square mile
9	in <sup>2</sup>	square inch
10	yd <sup>2</sup>	square yard
11	ft <sup>2</sup>	square foot
12	ro	rood
13	acre	acre
14	nautical mile <sup>2</sup>	square nautical mile

## TEMP

	Abbreviation	Unit
0	°C	Celsius
1	°F	Fahrenheit
2	K	Kelvin
3	°Ré	Reaumur
4	°N	Newton
5	°Ra	Rankine

## ANGLE



DISTANCE

## FREQUENCY

MAX

## PIPE

## PRESSURE

	Abbreviation	Unit
0	psi	Pound Per Square Inch
1	in Hg	Inch of Mercury
2	mm Hg	Millimeters of Mercury
3	ft H2O	Ftch of Mercury
4	in H2O	Milimeters of Mercury
5	torr	Torr
6	atm	Atmosphere
7	bar	Bar

	Abbreviation	Unit
8	mbar	millibar
9	kg / cm <sup>2</sup>	kg per square centimeter
10	kPa	kilopascal
11	Pa	pascal

## WEIGHT

	Abbreviation	Unit
0	t	tonne
1	kg	kilogram
2	hg	hectogram
3	g	gram
4	dg	decigram
5	cg	centigram
6	mg	milligram
7	µg	microgram
8	carat	carat
9	grain	grain
10	oz (av)	ounce avoirdupois
11	lb (av)	pound avoirdupois
12	cwt(UK)	long hundredweight
13	cwt(US)	short hundredweight
14	ton(UK)	long ton
15	ton(US)	short ton
16	st(UK)	stone

## SPEED

	Abbreviation	Unit
0	km/h	kilometer per hour
1	m/s	meter per second
2	mph	mile per hour

## VOLUME

	Abbreviation	Unit
0	m <sup>3</sup>	cubic meter
1	dm <sup>3</sup>	cubic decimeter
2	cm <sup>3</sup>	cubic centimeter
3	l	liter
4	dl	deciliter
5	cl	centiliter
6	ml	milliliter
7	fl oz(UK)	fluid ounce(UK)
8	fl oz(US)	fluid ounce(US)
9	in <sup>3</sup>	cubic inch
10	ft <sup>3</sup>	cubic foot
11	yd <sup>3</sup>	cubic yard
12	gal(UK)	gallon uk
13	gal(US)	gallon us
14	bbl	petroleum barrel
15	pt(imp)	pint(UK)
16	pt(US fl)	fluid pint(US)
17	pt(US dry)	dry pint(US)