



Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	1
Compared with:	2	28 Feb 02	

Appr. by: L.SMITH

Issued for : E  
Issued by: T.WILLIAMSON

Checked by: T.WILLIAMSON

**Service:**  
SOUR PROCESS FLUIDS,  
(FOR BRANCH CONNECTIONS SEE ATTACHMENT "A" )

<b>Gaskets :</b> SPIRAL WOUND GRAPHITE / S.S.304	<b>Rating/Facing :</b> CL150 RF	<b>Corrosion :</b> 0.250" (6.3MM) See Note 7	<b>Facing Finish :</b> ASME B16.5	<b>Block Valve Trim :</b> API TRIM No. 10	<b>Weld Quality Insp :</b> PER JOB SPEC -52A1	<b>Stress Relief :</b> NO (See Note 8 & 9)
---	------------------------------------	---	--------------------------------------	--	--	---

<b>Materials :</b> CARBON STEEL PIPING & VALVES (SEE GENERAL NOTES 1 THRU 28)	<b>Temp/Press Limits :</b> 285 PSIG AT 100F ; 200 PSIG AT 400F ; (See Note 10 & 11)
---	--

Item Name	Range		Det	Rev
Unique/Client* Code	from	to		
<b>GATE VALVE</b> 512GF0016	<b>1/2"</b>	<b>2"</b>	<b>GAT</b>	
Body Mat'l : ASTM A105 Codes : API 602 Body constr. : BOLTED BONNET <b>Rating : 1500#</b> <b>Ends : S.W.</b> Trim constr. : PLAIN SOLID WEDGE, O.S.& Y. Trim Mat'l : API TRIM N.10 (SS.316 TRIM) Bolt Mat'l : PER API STANDARD 602. Packing : GRAPHITE PACKING . Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9 Operator : HANDWHEEL				
<b>GATE VALVE</b> 511GA0003	<b>3"</b>	<b>24"</b>	<b>GAT</b>	
Body Mat'l : ASTM A216 GR.WCB Codes : API 600 Body constr. : BOLTED BONNET <b>Rating : 150#</b> <b>Ends : RF</b> Face finish : ASME B16.5 Trim constr. : PLAIN OR FLEXIBLE SOLID WEDGE, O.S.& Y. Trim Mat'l : API TRIM N.10 (SS.316 TRIM) Bolt Mat'l : PER API STANDARD 600. Gasket Mat'l : PER API STANDARD 600. Packing : GRAPHITE PACKING . Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9 Operator : HANDWHEEL				

\* Client codes only, not including sizes



Contract N.: 1310087902  
 Client: Valero Refining Company - Texas  
 Location: Texas City, Texas  
 Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	2
Compared with:	2	28 Feb 02	

**GATE VALVE N**      **14"    24"**      **GATN**  
 511GA0004

Body Mat'l : ASTM A216 GR.WCB  
 Codes : API 600  
 Body constr. : BOLTED BONNET  
**Rating : 150#**  
**Ends : RF**  
 Face finish : ASME B16.5  
 Trim constr. : PLAIN OR FLEXIBLE SOLID WEDGE, O.S. & Y.  
 Trim Mat'l : API TRIM N.10 (SS.316 TRIM)  
 Bolt Mat'l : PER API STANDARD 600.  
 Gasket Mat'l : PER API STANDARD 600.  
 Packing : GRAPHITE PACKING .  
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9  
 Operator : GEAR OP (N) PINION SHAFT AT RIGHT ANGLE TO RUN OF VALVE.

**GATE V.FP**      **1/2"    2"**      **GAFP**  
 512GA0003

Body Mat'l : ASTM A105  
 Codes : API 602  
 Body constr. : BOLTED BONNET, FULL PORT.  
**Rating : 150#**  
**Ends : RF**  
 Face finish : ASME B16.5  
 Trim constr. : PLAIN SOLID WEDGE, FULL PORT, O.S. & Y.  
 Trim Mat'l : API TRIM N.10 (SS.316 TRIM)  
 Bolt Mat'l : PER API STANDARD 602.  
 Gasket Mat'l : PER API STANDARD 602.  
 Packing : GRAPHITE PACKING .  
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9  
 Operator : HANDWHEEL

**GATE V.FP**      **1/2"    2"**      **GAFP1**  
 512GB0004

Body Mat'l : ASTM A105  
 Codes : API 602  
 Body constr. : BOLTED BONNET, FULL PORT.  
**Rating : 300#**  
**Ends : RF**  
 Face finish : ASME B16.5  
 Trim constr. : PLAIN SOLID WEDGE, FULL PORT, O.S. & Y.  
 Trim Mat'l : API TRIM N.10 (SS.316 TRIM)  
 Bolt Mat'l : PER API STANDARD 602.  
 Gasket Mat'l : PER API STANDARD 602.  
 Packing : GRAPHITE PACKING .  
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9  
 Operator : HANDWHEEL

\* Client codes only, not including sizes





Contract N.: 1310087902  
Client: Valero Refining Company - Texas  
Location: Texas City, Texas  
Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	4
Compared with:	2	28 Feb 02	

GATE V.SWxTH 1/2" 2" GATST  
512GF0018

Body Mat'l :ASTM A105  
Codes : API 602  
Body constr. :BOLTED BONNET  
Rating : 1500#  
Ends : S.W. x THDD  
Trim constr. :PLAIN SOLID WEDGE, O.S.& Y.  
Trim Mat'l :API TRIM N.10 (SS.316 TRIM)  
Bolt Mat'l :PER API STANDARD 602.  
Packing : GRAPHITE PACKING .  
Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9  
Operator : HANDWHEEL

GATE V. FLG. 1/2" 2" GAF  
512GA0006

Body Mat'l :ASTM A105  
Codes : API 602  
Body constr. :BOLTED BONNET  
Rating : 150#  
Ends : RF  
Face finish :ASME B16.5  
Trim constr. :PLAIN SOLID WEDGE, O.S.& Y.  
Trim Mat'l :API TRIM N.10 (SS.316 TRIM)  
Bolt Mat'l :PER API STANDARD 602.  
Gasket Mat'l :PER API STANDARD 602.  
Packing : GRAPHITE PACKING .  
Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9  
Operator : HANDWHEEL

GATE V. FLG. 1/2" 2" GAF1  
512GB0006

Body Mat'l :ASTM A105  
Codes : API 602  
Body constr. :BOLTED BONNET  
Rating : 300#  
Ends : RF  
Face finish :ASME B16.5  
Trim constr. :PLAIN SOLID WEDGE, O.S.& Y.  
Trim Mat'l :API TRIM N.10 (SS.316 TRIM)  
Bolt Mat'l :PER API STANDARD 602.  
Gasket Mat'l :PER API STANDARD 602.  
Packing : GRAPHITE PACKING .  
Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9  
Operator : HANDWHEEL

\* Client codes only, not including sizes





Contract N.: 1310087902
Client: Valero Refining Company - Texas
Location: Texas City, Texas
Project: Valero Refinery Reconfiguration (TCRR)

Table with 4 columns: Client Ref., Rev. No., Issue Date, Page. Contains specification details like 'Piping Material Specification', 'Spec. No.: 10087902-SP-50-03', and 'Class: A4S'.

CHECK VALVE 1/2" 2"
512CF0003

CHE

Body Mat'l :ASTM A105
Codes : API 602 / ASME B16.34
Body constr. :BOLTED CAP
Rating : 1500#
Ends : S.W.
Trim constr. : PISTON TYPE,T-BODY,HORIZONTAL INSTALLATION
Trim Mat'l :API TRIM N.10 (SS.316 TRIM)
Bolt Mat'l :PER API STANDARD 602.
Gasket Mat'l :PER API STANDARD 602.
Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9

CHECK VALVE 3" 24"
511CA0003

CHE

Body Mat'l :ASTM A216 GR.WCB
Codes : API 600 / ASME B16.34
Body constr. :BOLTED CAP
Rating : 150#
Ends : RF
Face finish :ASME B16.5
Trim constr. : SWING TYPE, HORIZONTAL & VERTICAL INSTALLATION
Trim Mat'l : API TRIM N.10 (SS.316 TRIM)
Bolt Mat'l :PER API STANDARD 600.
Gasket Mat'l :PER API STANDARD 600.
Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9

CHECK WAFER 3" 24"
511CA0006

CHW

Body Mat'l :ASTM A216 GR.WCB
Codes : API 594
Body constr. :LUG TYPE
Rating : 150#
Ends : RF
Face finish :ASME B16.5
Trim constr. :DUO-CHECK TYPE HORIZONTAL & VERTICAL INSTALLATION
Trim Mat'l :SS.316 SHAFT,SS.304 DISC,INCONEL SPRING
Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9. VENDOR TO FURNISH B7 CAP SCREWS.

PIPE A/G 1/2" 2" SCH. XXS
541SG0004

PIP

Material : KILLED C.S. ASTM A106 GR.B
Manufact. :SMLS
Codes : ASME B36.10
Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2
Ends : P.E.

\* Client codes only, not including sizes





Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	8
Compared with:		2	28 Feb 02

<u>PIPE A/G</u> 541SGAAAL	<u>3"</u>	<u>3"</u>	<b>SCH. 160</b>	<b>PIP2</b>	[*] [*] [*] [*] [*] [*]
Material : KILLED C.S. ASTM A106 GR.B Manufact. : SMLS Coating : PAINTING SYSTEM NO. 2, PER VALERO JOB SPEC NO. SP-80-02. Codes : ASME B36.10 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2 Ends : <b>B.E.</b>					
<b>PIPE A/G</b> 541SGAAAH	<b>3"</b>	<b>3"</b>	<b>SCH. 160</b>	<b>PIP8</b>	
Material : KILLED C.S. ASTM A106 GR.B Manufact. : SMLS Coating : PAINTING SYSTEM NO. 8, PER VALERO JOB SPEC NO. SP-80-02. Codes : ASME B36.10 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2 Ends : <b>B.E.</b>					
<b>PIPE A/G</b> 541Wd0002	<b>30"</b>	<b>36"</b>	<b>SCH. XS</b>	<b>PIPJ</b>	
Material : C.S. ASTM A672 GR.C70 CL.12 Manufact. : E.F.W. Codes : ASME B36.10 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2 Ends : <b>B.E.</b>					
<b>NIPPLES</b> 551NC0002	<b>1/2"</b>	<b>2"</b>	<b>SCH. XXS</b>	<b>NIP</b>	
Material : C.S. ASTM A106 GR.B Codes : ASME B36.10 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2 Ends : <b>T.O.E.</b>					
<b>FLANGE</b> 561NB0018	<b>1/2"</b>	<b>2"</b>	<b>SCH. XXS</b>	<b>FLG</b>	
Type : S.W. Material : ASTM A105 Codes : ASME B16.5 Rating : <b>150#</b> Ends : <b>RF</b> Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2					

\* Client codes only, not including sizes





Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	9
Compared with:	2	28 Feb 02	

<b>FLANGE</b> 561WB0019	3"	3"	<b>SCH. 160</b>	<b>FLG</b>
<p>Type : W.N.  Material : ASTM A105  Codes : ASME B16.5  Rating : <b>150#</b>  Ends : <b>RF</b>  Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2</p>				
<b>FLANGE</b> 561WB0020	4"	4"	<b>SCH. 120</b>	<b>FLG</b>
<p>Type : W.N.  Material : ASTM A105  Codes : ASME B16.5  Rating : <b>150#</b>  Ends : <b>RF</b>  Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2</p>				
<b>FLANGE</b> 561WB0021	6"	12"	<b>SCH. XS</b>	<b>FLG</b>
<p>Type : W.N.  Material : ASTM A105  Codes : ASME B16.5  Rating : <b>150#</b>  Ends : <b>RF</b>  Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2</p>				
<b>FLANGE</b> 561WB0022	14"	14"	<b>SCH. 40</b>	<b>FLG</b>
<p>Type : W.N.  Material : ASTM A105  Codes : ASME B16.5  Rating : <b>150#</b>  Ends : <b>RF</b>  Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2</p>				
<b>FLANGE</b> 561WB0021	16"	24"	<b>SCH. XS</b>	<b>FLG</b>
<p>Type : W.N.  Material : ASTM A105  Codes : ASME B16.5  Rating : <b>150#</b>  Ends : <b>RF</b>  Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2</p>				

\* Client codes only, not including sizes



Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	10
Compared with:		2	28 Feb 02

**FLANGE W.N.      30"    36"    CALC      FWN7A**

Type : W.N.  
 Material : ASTM A105  
 Codes : ASME B16.47 "A" ( EX MSS-SP44 )  
 Rating : **150#**  
 Ends : **RF**  
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**FLANGE W.N.      30"    36"    CALC      FWN7B**

Type : W.N.  
 Material : ASTM A105  
 Codes : ASME B16.47 "B" ( EX API-605 )  
 Rating : **150#**  
 Ends : **RF**  
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**FLANGE            1/2"    2"    SCH. XXS      FL1**  
 561NB0016

Type : S.W.  
 Material : ASTM A105  
 Codes : ASME B16.5  
 Rating : **300#**  
 Ends : **RF**  
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**FLANGE            3"      3"    SCH. 160      FL1**  
 561WB0015

Type : W.N.  
 Material : ASTM A105  
 Codes : ASME B16.5  
 Rating : **300#**  
 Ends : **RF**  
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**FLANGE            4"      4"    SCH. 120      FL1**  
 561WB0016

Type : W.N.  
 Material : ASTM A105  
 Codes : ASME B16.5  
 Rating : **300#**  
 Ends : **RF**  
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

\* Client codes only, not including sizes





Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	12
Compared with:	2	28 Feb 02	

**FLANGE F.F.**      4"      4"      **SCH. 120**      **FLGFF**  
561WB0024

Type : W.N.  
Material : ASTM A105  
Codes : ASME B16.5  
**Rating : 150#**  
**Ends : FF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**FLANGE F.F.**      6"      12"      **SCH. XS**      **FLGFF**  
561WB0025

Type : W.N.  
Material : ASTM A105  
Codes : ASME B16.5  
**Rating : 150#**  
**Ends : FF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**FLANGE F.F.**      14"      14"      **SCH. 40**      **FLGFF**  
561WB0026

Type : W.N.  
Material : ASTM A105  
Codes : ASME B16.5  
**Rating : 150#**  
**Ends : FF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**FLANGE F.F.**      16"      24"      **SCH. XS**      **FLGFF**  
561WB0025

Type : W.N.  
Material : ASTM A105  
Codes : ASME B16.5  
**Rating : 150#**  
**Ends : FF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**FLANGE W.N.**      30"      36"      **SCH. XS**      **FWAJ**  
561WB0049

Type : W.N.  
Material : ASTM A105  
Codes : ASME B16.47 "B" ( EX API-605 )  
**Rating : 150#**  
**Ends : RF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

\* Client codes only, not including sizes



Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	13
Compared with:		2	28 Feb 02

**BLIND FLANGE**      **1/2"**      **24"**      **FBL**  
561BB0001

Material : ASTM A105  
Codes : ASME B16.5  
**Rating : 150#**  
**Ends : RF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**BLIND F.47/A**      **30"**      **36"**      **FBL7A**  
561BB0003

Material : ASTM A105  
Codes : ASME B16.47 "A" ( EX MSS-SP44 )  
**Rating : 150#**  
**Ends : RF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**BLIND F.47/B**      **30"**      **36"**      **FBL7B**  
561BB0002

Material : ASTM A105  
Codes : ASME B16.47 "B" ( EX API-605 )  
**Rating : 150#**  
**Ends : RF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**ORIFICE FLG**      **2"**      **2"**      **SCH. XXS**      **FTR**  
561CB0018

Material : ASTM A105  
Component : ORIFICE FLANGE SET, WELD NECK TYPE  
Codes : ASME B16.36  
**Rating : 300#**  
**Ends : RF**  
Hole Tape : N.2 HOLES 180 DEGREES 1/2" S.W.  
Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

**ORIFICE FLG**      **3"**      **3"**      **SCH. 160**      **FTR**  
561CB0022

Material : ASTM A105  
Component : ORIFICE FLANGE SET, WELD NECK TYPE  
Codes : ASME B16.36  
**Rating : 300#**  
**Ends : RF**  
Hole Tape : N.2 HOLES 180 DEGREES 1/2" S.W.  
Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

\* Client codes only, not including sizes



Contract N.: 1310087902
Client: Valero Refining Company - Texas
Location: Texas City, Texas
Project: Valero Refinery Reconfiguration (TCRR)

Table with 4 columns: Client Ref., Rev. No., Issue Date, Page. Contains revision history for Piping Material Specification.

ORIFICE FLG 4" 4" SCH. 120 561CB0026 FTR

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : 300#
Ends : RF
Hole Tape : N.2 HOLES 180 DEGREES 1/2" S.W.
Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

ORIFICE FLG 6" 12" SCH. XS 561CB0007 FTR

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : 300#
Ends : RF
Hole Tape : N.2 HOLES 180 DEGREES 1/2" S.W.
Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

ORIFICE FLG 14" 14" SCH. 40 561CB0027 FTR

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : 300#
Ends : RF
Hole Tape : N.2 HOLES 180 DEGREES 1/2" S.W.
Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

ORIFICE FLG 16" 16" SCH. XS 561CB0007 FTR

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : 300#
Ends : RF
Hole Tape : N.2 HOLES 180 DEGREES 1/2" S.W.
Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

\* Client codes only, not including sizes



Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	15
Compared with:	2	28 Feb 02	

**ORIFICE FLG**      2"      2"      **SCH. XXS**      **FTRI**  
561CB0019

Material : ASTM A105  
Component : ORIFICE FLANGE SET, WELD NECK TYPE  
Codes : ASME B16.36  
**Rating : 300#**  
**Ends : RF**  
Hole Tape : N.4 HOLES 90 DEGREES 1/2" S.W.  
Note : USE ONLY FOR SPECIAL INSTR. CONNECTIONS. WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

**ORIFICE FLG**      3"      3"      **SCH. 160**      **FTRI**  
561CB0023

Material : ASTM A105  
Component : ORIFICE FLANGE SET, WELD NECK TYPE  
Codes : ASME B16.36  
**Rating : 300#**  
**Ends : RF**  
Hole Tape : N.4 HOLES 90 DEGREES 1/2" S.W.  
Note : USE ONLY FOR SPECIAL INSTR. CONNECTIONS. WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

**ORIFICE FLG**      4"      4"      **SCH. 120**      **FTRI**  
561CB0028

Material : ASTM A105  
Component : ORIFICE FLANGE SET, WELD NECK TYPE  
Codes : ASME B16.36  
**Rating : 300#**  
**Ends : RF**  
Hole Tape : N.4 HOLES 90 DEGREES 1/2" S.W.  
Note : USE ONLY FOR SPECIAL INSTR. CONNECTIONS. WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

**ORIFICE FLG**      6"      12"      **SCH. XS**      **FTRI**  
561CB0009

Material : ASTM A105  
Component : ORIFICE FLANGE SET, WELD NECK TYPE  
Codes : ASME B16.36  
**Rating : 300#**  
**Ends : RF**  
Hole Tape : N.4 HOLES 90 DEGREES 1/2" S.W.  
Note : USE ONLY FOR SPECIAL INSTR. CONNECTIONS. WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

\* Client codes only, not including sizes



Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	16
Compared with:	2	28 Feb 02	

**ORIFICE FLG**      **14"**    **14"**    **SCH. 40**      **FTRI**  
561CB0029

Material : ASTM A105  
 Component : ORIFICE FLANGE SET, WELD NECK TYPE  
 Codes : ASME B16.36  
**Rating : 300#**  
**Ends : RF**  
 Hole Tape : N.4 HOLES 90 DEGREES 1/2" S.W.  
 Note : USE ONLY FOR SPECIAL INSTR. CONNECTIONS. WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

**ORIFICE FLG**      **16"**    **16"**    **SCH. XS**      **FTRI**  
561CB0009

Material : ASTM A105  
 Component : ORIFICE FLANGE SET, WELD NECK TYPE  
 Codes : ASME B16.36  
**Rating : 300#**  
**Ends : RF**  
 Hole Tape : N.4 HOLES 90 DEGREES 1/2" S.W.  
 Note : USE ONLY FOR SPECIAL INSTR. CONNECTIONS. WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

**90 ELBOW**      **1/2"**    **2"**      **90E**  
551HB0016

Material : C.S. ASTM A105  
 Component : 90 DEGREES ELBOWS  
 Codes : ASME B16.11  
**Rating : 9000#**  
**Ends : S.W.**  
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

**90 ELBOW**      **3"**      **3"**    **SCH. 160**      **90E**  
551EF0021

Material : C.S. ASTM A234 WPB  
 Component : 90 DEGREES LONG RADIUS  
 Codes : ASME B16.9  
 Manufact. : SMLS  
**Ends : B.W.**  
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

\* Client codes only, not including sizes







Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	18
Compared with:		2	28 Feb 02

**90 ELBOW**      **30"**    **36"**    **SCH. XS**      **90EJ**  
551EF0080

Material : C.S. ASTM A234 WPB  
 Component : 90 DEGREES LONG RADIUS  
 Codes : ASME B16.9  
 Manufact. : WELDED  
 Ends : **B.W.**  
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

**90 S.R.ELBOW**      **30"**    **36"**    **CALC**      **90R**

Material : C.S. ASTM A234 WPB  
 Component : 90 DEGREES SHORT RADIUS  
 Codes : ASME B16.9  
 Manufact. : WELDED  
 Ends : **B.W.**  
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

**90 S.R.ELBOW**      **30"**    **36"**    **SCH. XS**      **90RJ**  
551EF0078

Material : C.S. ASTM A234 WPB  
 Component : 90 DEGREES SHORT RADIUS  
 Codes : ASME B16.9  
 Manufact. : WELDED  
 Ends : **B.W.**  
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

**45 ELBOW**      **1/2"**    **2"**      **45E**  
551HB0017

Material : C.S. ASTM A105  
 Component : 45 DEGREES ELBOWS  
 Codes : ASME B16.11  
 Rating : **9000#**  
 Ends : **S.W.**  
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

**45 ELBOW**      **3"**      **3"**      **SCH. 160**      **45E**  
551EF0017

Material : C.S. ASTM A234 WPB  
 Component : 45 DEGREES LONG RADIUS  
 Codes : ASME B16.9  
 Manufact. : SMLS  
 Ends : **B.W.**  
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

\* Client codes only, not including sizes





Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	20
Compared with:	2	28 Feb 02	

<b>CAP</b> 551HB0018	1/2"	2"		<b>CAP</b>
<p>Material : C.S. ASTM A105  Component : CAP  Codes : ASME B16.11  Rating : <b>9000#</b>  Ends : <b>S.W.</b>  Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2</p>				
<b>CAP</b> 551EF0025	3"	3"	<b>SCH. 160</b>	<b>CAP</b>
<p>Material : C.S. ASTM A234 WPB  Component : CAP  Codes : ASME B16.9  Manufact. : SMLS  Ends : <b>B.W.</b>  Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2</p>				
<b>CAP</b> 551EF0026	4"	4"	<b>SCH. 120</b>	<b>CAP</b>
<p>Material : C.S. ASTM A234 WPB  Component : CAP  Codes : ASME B16.9  Manufact. : SMLS  Ends : <b>B.W.</b>  Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2</p>				
<b>CAP</b> 551EF0027	6"	12"	<b>SCH. XS</b>	<b>CAP</b>
<p>Material : C.S. ASTM A234 WPB  Component : CAP  Codes : ASME B16.9  Manufact. : SMLS  Ends : <b>B.W.</b>  Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2</p>				
<b>CAP</b> 551EF0028	14"	14"	<b>SCH. 40</b>	<b>CAP</b>
<p>Material : C.S. ASTM A234 WPB  Component : CAP  Codes : ASME B16.9  Manufact. : SMLS  Ends : <b>B.W.</b>  Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2</p>				

\* Client codes only, not including sizes





Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	22
Compared with:	2	28 Feb 02	

CONC. RED. 3" 24" CALC CRE

Material : C.S. ASTM A234 WPB  
 Component : CONCENTRIC REDUCER  
 Codes : ASME B16.9  
 Manufact. : SMLS  
 Ends : **B.W.**  
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

CONC. RED. 30" 36" CALC CRE

Material : C.S. ASTM A234 WPB  
 Component : CONCENTRIC REDUCER  
 Codes : ASME B16.9  
 Manufact. : WELDED  
 Ends : **B.W.**  
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

CONC. RED. 30" 36" SCH. XS CREJJ

551RF0043

Material : C.S. ASTM A234 WPB  
 Component : CONCENTRIC REDUCER  
 Codes : ASME B16.9  
 Manufact. : WELDED  
 Ends : **B.W.**  
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

ECC.RED. 3" 3" SCH. 160 ERE

551RF0015

Material : C.S. ASTM A234 WPB  
 Component : ECCENTRIC REDUCER  
 Codes : ASME B16.9  
 Manufact. : SMLS  
 Ends : **B.W.**  
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

ECC.RED. 4" 4" SCH. 120 ERE

551RF0016

Material : C.S. ASTM A234 WPB  
 Component : ECCENTRIC REDUCER  
 Codes : ASME B16.9  
 Manufact. : SMLS  
 Ends : **B.W.**  
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

\* Client codes only, not including sizes





Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	24
Compared with:	2	28 Feb 02	

<b>TEE</b> 551HB0019	1/2"	2"			<b>TEE</b>
<p>Material : C.S. ASTM A105  Component : TEE  Codes : ASME B16.11  Rating : <b>9000#</b>  Ends : <b>S.W.</b>  Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2</p>					
<b>TEE</b> 551EF0029	3"	3"	<b>SCH. 160</b>		<b>TEE</b>
<p>Material : C.S. ASTM A234 WPB  Component : TEE  Codes : ASME B16.9  Manufact. : SMLS  Ends : <b>B.W.</b>  Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2</p>					
<b>TEE</b> 551EF0030	4"	4"	<b>SCH. 120</b>		<b>TEE</b>
<p>Material : C.S. ASTM A234 WPB  Component : TEE  Codes : ASME B16.9  Manufact. : SMLS  Ends : <b>B.W.</b>  Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2</p>					
<b>TEE</b> 551EF0031	6"	12"	<b>SCH. XS</b>		<b>TEE</b>
<p>Material : C.S. ASTM A234 WPB  Component : TEE  Codes : ASME B16.9  Manufact. : SMLS  Ends : <b>B.W.</b>  Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2</p>					
<b>TEE</b> 551EF0032	14"	14"	<b>SCH. 40</b>		<b>TEE</b>
<p>Material : C.S. ASTM A234 WPB  Component : TEE  Codes : ASME B16.9  Manufact. : SMLS  Ends : <b>B.W.</b>  Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2</p>					

\* Client codes only, not including sizes







Contract N.: 1310087902  
Client: Valero Refining Company - Texas  
Location: Texas City, Texas  
Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	26
Compared with:	2	28 Feb 02	

**CONC.SWAGE**      1/2"      4"      **SCH. XXS**      **CSC**  
551SC0013

Material : C.S. ASTM A106 GR.B  
Component : CONCENTRIC SWAGE  
Codes : MANUFACTURED TO ASTM A234  
Manufact. : SMLS  
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2  
Ends : **LEB-SEP**

**ECC.SWAGE**      1/2"      2"      **SCH. XXS**      **ESA**  
551SC0032

Material : C.S. ASTM A106 GR.B  
Component : ECCENTRIC SWAGE  
Codes : MANUFACTURED TO ASTM A234  
Manufact. : SMLS  
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2  
Ends : **P.E.**

**ECC.SWAGE**      1/2"      4"      **SCH. XXS**      **ESC**  
551SC0015

Material : C.S. ASTM A106 GR.B  
Component : ECCENTRIC SWAGE  
Codes : MANUFACTURED TO ASTM A234  
Manufact. : SMLS  
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2  
Ends : **LEB-SEP**

**ELBOLET BW**      3"      36"      **CALC**      **ELBBW**

Material : C.S. ASTM A105  
Component : ELBOLET  
Codes : MSS SP97  
Ends : **B.W.**  
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

**ELBOLET SW**      1/2"      36"      **ELBS**  
551LB0013

Material : C.S. ASTM A105  
Component : ELBOLET  
Codes : MSS SP97  
Ends : **S.W.**  
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2  
Rating : **9000#**

\* Client codes only, not including sizes







Foster Wheeler USA Corporation

Contract N.: 1310087902  
 Client: Valero Refining Company - Texas  
 Location: Texas City, Texas  
 Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	29
Compared with:	2	28 Feb 02	

**Y STRAINER**      1/2"      2"      **YST**  
 592YA0012

Body Mat'l : ASTM A216 GR.WCB  
 Codes : ACCORDING TO MANUFACTURER'S STD  
 Body constr. : BOLTED CAP  
**Rating : 600#**  
**Ends : S.W.**  
 Screen Mat'l : S.S.304, .033" PERFORATION  
 Bolt Mat'l : BODY BOLTING AND GLAND BOLTING PER MANUFACTURER'S STANDARD  
 Gasket Mat'l : SPIRAL WOUND SS.304/GRAPHITE  
 Note : TO BE SUPPLIED WITH S.W. BLOW-OFF CONNECTION.

**TEMP. CONIC.**      2"      24"      **TCS**  
 592TE0001

**Rating : 150#**  
 Codes : ASME B16.5  
**Ends : RF**  
 Material : C.S. CONICAL SCREEN.  
 Mesh size : 14 GA PERFORATED PLATE WITH 1/8" DIA. HOLES ON 3/16" CENTERS,  
 200% OPEN AREA.

**TEMP. CONIC.**      30"      36"      **TCS**  
 592TE0002

**Rating : 150#**  
 Codes : ASME B16.47 "B" ( EX API-605 )  
**Ends : RF**  
 Material : C.S. CONICAL SCREEN.  
 Mesh size : 14 GA PERFORATED PLATE WITH 1/8" DIA. HOLES ON 3/16" CENTERS,  
 200% OPEN AREA.

**FIGURE 8**      6"      12"      **F8F**  
 561FP0002

Material : ASTM A516 GR.70  
 Codes : ASME B16.48  
**Rating : 150#**  
**Ends : RF**  
 Face finish : ASME B16.5  
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

\* Client codes only, not including sizes



Contract N.: 1310087902  
Client: Valero Refining Company - Texas  
Location: Texas City, Texas  
Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	30
Compared with:	2	28 Feb 02	

**PADDLE BLIND**      1"      4"      **PBL**  
561PP0003

Material : ASTM A516 GR.70  
Codes : ASME B16.48  
**Rating : 150#**  
**Ends : RF**  
Face finish : ASME B16.5  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**PADDLE BLIND**      14"      24"      **PBL**  
561PP0003

Material : ASTM A516 GR.70  
Codes : ASME B16.48  
**Rating : 150#**  
**Ends : RF**  
Face finish : ASME B16.5  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**PAD.B16.47/B**      30"      36"      **PAD7B**  
561PP0011

Material : ASTM A516 GR.70  
Codes : ASME B16.47 "B" ( EX API-605 )  
**Rating : 150#**  
**Ends : RF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**DRIP RING**      1"      12"      **DRI**  
561DP0008

Material : ASTM A516 GR.70  
Codes : ASME B16.48  
**Rating : 150#**  
**Ends : RF**  
Face finish : ASME B16.5  
Hole on body : HOLE 3/4" SOCKET WELD  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**SPACER RING**      1"      4"      **SPA**  
561RP0003

Material : ASTM A516 GR.70  
Codes : ASME B16.48  
**Rating : 150#**  
**Ends : RF**  
Face finish : ASME B16.5  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

\* Client codes only, not including sizes



Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	31
Compared with:		2	28 Feb 02

**SPACER RING**      14"      24"      SPA

561RP0003

Material : ASTM A516 GR.70  
 Codes : ASME B16.48  
**Rating : 150#**  
**Ends : RF**  
 Face finish : ASME B16.5  
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**SPA.R.47/B**      30"      36"      SPA7B

561RP0011

Material : ASTM A516 GR.70  
 Codes : ASME B16.47 "B" ( EX API-605 )  
**Rating : 150#**  
**Ends : RF**  
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**STUD BOLTS**      1/2"      4"      STU

572SC0002

Material : ASTM A193 GR.B7 / WITH (2) HEAVY HEX NUTS ASTM A194 GR.2H  
 Thr'd Code : ANSI B18.2.1 & B18.2.2  
 Note : BOLTING SHALL COMPLY WITH JOB SPEC 52A3

**GASK.16.47/B**      30"      36"      GA1

574SC0001

Material : SPIRAL WOUND SS.304/GRAPHITE  
 Codes : GASKET DIMENSIONS PER ASME B16.20 ; FLANGES DIMENSIONS PER ASME B16.47 "B" (API-605)  
 Thickness : 3.2 MM (1/8")  
**Rating : 150#**  
 Ring Out/In : 3.2 MM (1/8") THK. OUTER C.S. RING / INNER SS.304 RING  
 Note : GASKETS SHALL COMPLY WITH JOB SPEC 52A3. GASKETS TO BE SUPPLIED W/O TAPE, STRING OR OTHER WRAPPING AROUND SPIRAL WINDING.  
**Ends : RF**

\* Client codes only, not including sizes



Contract N.: 1310087902
Client: Valero Refining Company - Texas
Location: Texas City, Texas
Project: Valero Refinery Reconfiguration (TCRR)

Table with 4 columns: Client Ref., Rev. No., Issue Date, Page. Row 1: VALERO, 3, 03 Jun 02, 32. Row 2: Compared with: 2, 28 Feb 02.

GASK.16.47/A 30" 36" GA2
574SC0002

Material : SPIRAL WOUND SS.304/GRAPHITE
Codes : GASKET DIMENSIONS PER ASME B16.20 ; FLANGES DIMENSIONS PER ASME B16.47 "A" (MSS-SP44)
Thickness : 3.2 MM (1/8")
Rating : 150#
Ring Out/In : 3.2 MM (1/8") THK. OUTER C.S. RING / INNER SS.304 RING
Note : GASKETS SHALL COMPLY WITH JOB SPEC 52A3. GASKETS TO BE SUPPLIED W/O TAPE, STRING OR OTHER WRAPPING AROUND SPIRAL WINDING.
Ends : RF

GASKET 1/2" 24" GAS
574SA0001

Material : SPIRAL WOUND SS.304/GRAPHITE
Codes : DIMENSIONS PER ASME B16.20
Thickness : 3.2 MM (1/8")
Rating : 150#
Ring Out/In : 3.2 MM (1/8") THK. OUTER C.S. RING
Note : GASKETS SHALL COMPLY WITH JOB SPEC 52A3. GASKETS TO BE SUPPLIED W/O TAPE, STRING OR OTHER WRAPPING AROUND SPIRAL WINDING.
Ends : RF

GASKET 1/2" 24" GAS1
574SA0002

Material : SPIRAL WOUND SS.304/GRAPHITE
Codes : DIMENSIONS PER ASME B16.20
Thickness : 3.2 MM (1/8")
Rating : 300#
Ring Out/In : 3.2 MM (1/8") THK. OUTER C.S. RING
Note : GASKETS SHALL COMPLY WITH JOB SPEC 52A3. GASKETS TO BE SUPPLIED W/O TAPE, STRING OR OTHER WRAPPING AROUND SPIRAL WINDING.
Ends : RF

\* Client codes only, not including sizes





Foster Wheeler USA Corporation

Contract N.: 1310087902  
 Client: Valero Refining Company - Texas  
 Location: Texas City, Texas  
 Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : A4S			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	33
Compared with:	2	28 Feb 02	

**GASK.16.47/A**      30"    36"      **GAS1A**  
 574SC0009

Material : SPIRAL WOUND SS.304/GRAPHITE  
 Codes : GASKET DIMENSIONS PER ASME B16.20 ; FLANGES DIMENSIONS PER ASME B16.47 "A" (MSS-SP44)  
 Thickness : 3.2 MM (1/8")  
 Rating : **300#**  
 Ring Out/In : 3.2 MM (1/8") THK. OUTER C.S. RING / INNER SS.304 RING  
 Note : GASKETS SHALL COMPLY WITH JOB SPEC 52A3. GASKETS TO BE SUPPLIED W/O TAPE, STRING OR OTHER WRAPPING AROUND SPIRAL WINDING.  
 Ends : **RF**

**GASK.16.47/B**      30"    36"      **GAS1B**  
 574SC0010

Material : SPIRAL WOUND SS.304/GRAPHITE  
 Codes : GASKET DIMENSIONS PER ASME B16.20 ; FLANGES DIMENSIONS PER ASME B16.47 "B" (API-605)  
 Thickness : 3.2 MM (1/8")  
 Rating : **300#**  
 Ring Out/In : 3.2 MM (1/8") THK. OUTER C.S. RING / INNER SS.304 RING  
 Note : GASKETS SHALL COMPLY WITH JOB SPEC 52A3. GASKETS TO BE SUPPLIED W/O TAPE, STRING OR OTHER WRAPPING AROUND SPIRAL WINDING.  
 Ends : **RF**

**GASKET FF**      1/2"    24"      **GASFF**  
 574Cy0001

Material : FLEXIBLE GRAPHITE ENCAPSULATED GASKET. CORR-A-SEAL / GRAPHONICS  
 Codes : DIMENSIONS PER ASME B16.21  
 Thickness : 1.6 MM (1/16")  
 Rating : **150#**  
 Note : GASKETS SHALL COMPLY WITH JOB SPEC 52A3  
 Ends : **FF**

**General Notes:**

- 1.) Use Extended Body Gate Valves, Threaded Outlet, For Branches Not In Process Flow (Such As Vent, Drain, PI, Orifice Taps Etc. Connections). Piping Downstream, If Any, Shall Usually Be In Accord With The Applicable Instrument Piping Material Specification. If No Piping, Insert A Plug In The Threaded Outlet. Other Valves, Such As SW x T Should Only Be Used When Spaced Restrictions Are Encountered.
- 2.) Det 'GATST' To Be Use Only Where Extended Body Valves Do Not Fit The Design Situation.
- 3.) Dets 'GAF' And 'GAF1' Are To Be Used At Flanged Equipment Or When Required At Instrument.
- 4.) Globe Valves Shall Be Sized Such That Its Minimum % Open Is Not Less Than 20%. These Valves Shall Not Be Subject To Pressure Differential Greater Than 30% Of Its Cold Working Pressure.

\* Client codes only, not including sizes

Continue....



Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

<b>Piping Material Specification</b>			
<b>Spec. No. : 10087902-SP-50-03</b>			
<b>Class : A4S</b>			
Client Ref. VALERO	Rev. No. <b>3</b>	Issue Date <b>03 Jun 02</b>	Page <b>34</b>
Compared with:		<b>2</b>	<b>28 Feb 02</b>

- 5.) Check Valves When Installed In The Horizontal Position Shall Be Bonnet Cover Up & Those Install In The Vertical Position Shall Be Flow Up Only.
- 6.) Gear Operated Valves Shall Be Used When Indicated On The EFD'S.
- 7.) A Minimum Of 0.20" Corrosion Allowance May Be Used To Substantiate Wall Schedule Selection For Boderline Cases. Such Cases Must Be Approved By The Project Engineering Manager And A Remark Added To The Line Llst.
- 8.) Heat Treatment Noted Is For General Fabrication. Weld Size For Fillet And/Or Branch Connections Shall Govern Per ASME B31.3 Para. 331.1.3. Heat Treatment For Bends Shall Be Per ASME B31.3 Para. 332.4.1 & 332.4.2 And Specs 52A5 And 52A6 Accordingly.
- 9.) Maximum Allowable Hardness Of 200 BHN. PWHT Required For Welds Above 200 BHN.
- 10.) Where Pipe Schedule Is Shown, It Is Adequate For The Full Flange Rating. Where "CALC" Is Shown, The Pressure Limit May Be Lower Than Flange Rating. See The Project Line List And Applicable Piping Drawing For Details.
- 11.) Typical Hydrotest Limiting Factor Is 1.5 x ASME Class Rating Cold Working Pressure Exception To This Include:  
 \* 1.1 x CWP For Closed Valves (Test Against Seat. This Method Is Not Preferred.)  
 \* Check Manufactures Data For Ball Valves.
- 12.) Pipe And Components > 1/2" Thickness May Require Impact Tested Materials When The Minimum Design Metal Temperature Is Below 100F Per ASME B31.3 Para. 323.2.2.
- 13.) All Fabrication Shall Comply With 52A1.
- 14.) Pipe Supports And Spring Hangers Shall Comply With 59A2 And 59A3 Respectively.
- 15.) 'BEP' Nipples Shall Be Cut From Pipe.
- 16.) Pipe Size 1/2" - 3/4" To Be Use In No Flow Condition.
- 17.) The Crotch Thickness Of The Branch Outlet Of Buttweld Tees Shall Be No Less Than 150% Of The Nominal Wall Thickness Of The Tee. The Crotch Radius Of The Branch Outlet Of Buttweld Tees Shall Be No Less Than 12.5% Of The Branch Outlet OD.
- 18.) Use Union Or Coupling To Join Pipe. Flanged Joint To Be Used Only Where Indicated On EFD'S.
- 19.) Couplings Shall Not Be Used For Branch Connections Use Inline Only.
- 20.) Use Flat Face Valve, Flange & Full Face Gasket To Mate With Flat Face Nozzles Only.
- 21.) Flanges Shall Not Be Insulated.
- 22.) Temperature Instrument Connection Shall Be NPS 1-1/2" Flanged.
- 23.) Pressure Instrument Connection Shall Be NPS 3/4" Socket-weld.
- 24.) In Sizes Above NPS 24", Flanges In Accord With ASME B16.47 Series B (API-605) Preferred. Where Required To Match Equipment Or Wafer Style Valves, Flanges Per ASME B16.47 Series A (MSS-SP44) May Be Used.
- 25.) Branch Connections Should Follow The Guidelines Of Job Spec 52B2 And The Attachment Unless Specifically Overriden By The Pipe Stress Engineer.
- 26.) CORR-A-SEAL / GRAPHONICS Gaskets Shall Be Used For Flat Face Flanges.
- 27.) Concentric & Eccentric Reducers Are Limited To 2 Nominal Diameter Size Reductions Without Piping Engineer Approval.
- 28.) Remove Temporary Strainers After Flushing.

\* Client codes only, not including sizes



Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

<b>Piping Material Specification</b>			
<b>Spec. No. : 10087902-SP-50-03</b>			
<b>Class : A4S</b>			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	<b>3</b>	<b>03 Jun 02</b>	<b>35</b>
Compared with:	<b>2</b>	<b>28 Feb 02</b>	

---

END OF DOCUMENT

\* Client codes only, not including sizes

..IQRPD320G4P1.QRP Rev. 0 printed on 03 Jun 2002 15:41 As of: 6/3/02 Compare with: 2/28/02



Foster Wheeler USA Corporation

### Piping Material Specification

Spec. No.: 10087902-SP-50-03  
Class: A4S

Contract #: 1310087902  
Client: Valero Refining Company - Texas  
Location: Texas City, Texas  
Project: Valero Refinery Reconfiguration (TCRR)

Client Ref. VALERO	Rev. No. 3	Issue Date 3-Jun-02	Page 1
Compared with:			

ATTACHMENT "A"

REINFORCEMENT CHART																				
APPLICABLE TO PIPE SPECIFICATION (S) : A4S																				
MATERIAL (S) : CARBON STEEL, SMLS ASTM A106 GR. B												P/SE :		C.A. : 0.250"						
CARBON STEEL, EFW, ASTM, A672 GR. C70 CL. 12																				
DESIGN LIMIT (S) : 285 PSIG AT -20F TO 100F; 95 PSIG AT 750F MAX. TEMP.																				
NOM. SIZE	NOM. THICK.	NOMINAL SIZE OF BRANCH CONNECTION (INCHES)																		
		1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	30	36	
1/2	XXS	T																		
3/4	XXS	RT	T																	
1	XXS	RT	RT	T																
1 1/2	XXS	RT	RT	RT	T															
2	XXS	RT	RT	RT	RT	T														
3	160	SK	SK	SK	SK	SK	T													
4	120	SK	SK	SK	SK	SK	W	T												
6	XS	SK	SK	SK	SK	SK	W	W	T											
8	XS	SK	SK	SK	SK	SK	W	W	W	T										
10	XS	SK	SK	SK	SK	SK	W	W	W	W	T									
12	XS	SK	SK	SK	SK	SK	W	W	W	W	W	T								
14	40	SK	SK	SK	SK	SK	W	W	W	W	W	W	T							
16	XS	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	T						
18	XS	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	T					
20	XS	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	CA	T				
24	XS	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	CA	CA	T			
30	CALC	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	CA	CA	CA	T		
36	CALC	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	CA	CA	CA	CA	T	

**LEGEND :**

T = TEE  
RT = REDUCING TEE  
RE = TEE AND REDUCER OR REDUCING INSERT  
SK = SOCKOLET, SW ELBOLET OR LATROLET  
TH = THREDOLET, THD ELBOLET OR LATROLET  
W = WELDOLET, BW ELBOLET OR LATROLET  
LW = LONG WELD NECK FLANGE  
TB = TEE AND BUSHING

CA = CALCULATE  
F1 = STUB IN WITH 3/8" FILLET WELD  
P2 = STUB IN WITH 2" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)  
P3 = STUB IN WITH 3" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)  
P4 = STUB IN WITH 4" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)  
P5 = STUB IN WITH 5" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)  
P6 = STUB IN WITH 6" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)  
P7 = STUB IN WITH 7" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)

**NOTE : ANY SITUATION NOT COVERED BY THE ABOVE CHART SHOULD BE BROUGHT TO THE ATTENTION OF THE ASSIGNED PIPING ENGINEER.**