



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 : R1			
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

<b>Service:</b> STEAM, BOILER FEED WATER, AND CONDENSATE. (850F INTERMITTENT) (FOR BRANCH CONNECTIONS SEE ATTACHMENT "A")			
<b>Gaskets :</b> SPIRAL WOUND GRAPHITE / S.S.304	<b>Rating/Facing :</b> CL300 RF	<b>Corrosion :</b> 0.063" (1.5MM) See Note 7	<b>Facing Finish :</b> ASME B16.5
		<b>Block Valve Trim :</b> API TRIM No. 8	<b>Weld Quality Insp :</b> PER JOB SPEC -52A1
			<b>Stress Relief :</b> NO (See Note 8)
<b>Materials :</b> CARBON STEEL PIPING & VALVES (SEE GENERAL NOTES 1 THRU 27)		<b>Temp/Press Limits :</b> 386 PSIG AT 100F; 386 PSIG AT 433F (1/2"-12") 200 PSIG AT 850F (1/2"-20") UPSET MAX. TEMP. (See Note 9 & 10)	

Item Name	Range		Det	Rev
Unique/Client* Code	from	to		
<b>GATE VALVE</b> 512GQ0004	<b>1/2"</b>	<b>2"</b>	<b>GAT</b>	
Body Mat'l : ASTM A105 Codes : API 602 Body constr. : WELDED BONNET <b>Rating : 800#</b> <b>Ends : S.W.</b> Trim constr. : PLAIN SOLID WEDGE, O.S.& Y. Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS) 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> 511GB0002	<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 : 300#</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.8 (STELLITE BODY SEATS) 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 : R1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	2
Compared with:	2	28 Feb 02	

**GATE VALVE N**      3"      24"      **GATN**  
 511GB0001

Body Mat'l : ASTM A216 GR.WCB  
 Codes : API 600  
 Body constr. : BOLTED BONNET  
**Rating : 300#**  
**Ends : RF**  
 Face finish : ASME B16.5  
 Trim constr. : PLAIN OR FLEXIBLE SOLID WEDGE, O.S. & Y.  
 Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)  
 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**  
 512GB0002

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.8 (STELLITE BODY SEATS)  
 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"      **GAFPS**  
 512GQ0003

Body Mat'l : ASTM A105  
 Codes : API 602  
 Body constr. : WELDED BONNET, FULL PORT.  
**Rating : 800#**  
**Ends : S.W.**  
 Trim constr. : PLAIN SOLID WEDGE, FULL PORT, O.S. & Y.  
 Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)  
 Bolt 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



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 : R1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	3
Compared with:		2	28 Feb 02

**DR/VE VALVE**      1/2"      2"      **GAD**  
 512EQ0007

Body Mat'l : ASTM A105  
 Codes : API 602  
 Body constr. : EXTENDED BODY, WELDED BONNET.  
**Rating : 800#**  
**Ends : MALE PE x FEMALE NPT**  
 Trim constr. : PLAIN SOLID WEDGE, O.S.& Y.  
 Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)  
 Bolt Mat'l : PER API STANDARD 602.  
 Packing : GRAPHITE PACKING .  
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9  
 Operator : HANDWHEEL

**INSTR. VALVE**      1/2"      3/4"      **GAI**  
 512EQ0009

Body Mat'l : ASTM A105  
 Codes : API 602  
 Body constr. : EXTENDED BODY, WELDED BONNET.  
**Rating : 800#**  
**Ends : MALE NPT x FEMALE NPT**  
 Trim constr. : PLAIN SOLID WEDGE, O.S.& Y.  
 Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)  
 Bolt Mat'l : PER API STANDARD 602.  
 Packing : GRAPHITE PACKING .  
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9  
 Operator : HANDWHEEL

**GATE V.SWxTH**      1/2"      2"      **GATST**  
 512GQ0002

Body Mat'l : ASTM A105  
 Codes : API 602  
 Body constr. : WELDED BONNET  
**Rating : 800#**  
**Ends : S.W. x THDD**  
 Trim constr. : PLAIN SOLID WEDGE, O.S.& Y.  
 Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)  
 Bolt 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', 'Class: R1', and revision information.

GATE V. FLG. 1/2" 2" 512GB0005 GAF

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.8 (STELLITE BODY SEATS)
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

GLOBE VALVE 1/2" 2" 512DQ0005 GLO

Body Mat'l : ASTM A105
Codes : API 602 / ASME B16.34
Body constr. : WELDED BONNET
Rating : 800#
Ends : S.W.
Trim constr. : LOOSE DISC, O.S. & Y.
Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)
Bolt Mat'l : PER API STANDARD 602.
Packing : GRAPHITE PACKING .
Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9
Operator : HANDWHEEL

GLOBE VALVE 3" 8" 511DB0001 GLO

Body Mat'l : ASTM A216 GR.WCB
Codes : API 600 / ASME B16.34
Body constr. : BOLTED BONNET
Rating : 300#
Ends : RF
Face finish : ASME B16.5
Trim constr. : PLUG DISC TYPE, O.S. & Y.
Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)
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)

Table with 4 columns: Client Ref., Rev. No., Issue Date, Page. Contains specification details like Spec. No.: 10087902-SP-50-03, Class: R1, and revision history.

Y GLOBE V. 3" 16" GLY
511DB0012

Body Mat'l :ASTM A216 GR.WCB
Codes : API 600 / ASME B16.34
Body constr. :GLOBE, STOP CHECK (NON-RETURN), BOLTED BONNET
Rating : 300#
Ends : RF
Face finish :ASME B16.5
Trim constr. :BODY-GUIDED DISC, Y-PATTERN, OS&Y.
Trim Mat'l :API TRIM N.8 (STELLITE BODY SEATS)
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

NON-RET.ANG 3" 8" GLANR
511DB0009

Body Mat'l :ASTM A216 GR.WCB
Codes : API 600 / ASME B16.34
Body constr. :ANGLE, STOP CHECK (NON-RETURN), BOLTED BONNET
Rating : 300#
Ends : RF
Face finish :ASME B16.5
Trim constr. :GUIDED DISC PISTON TYPE, O.S. & Y.
Trim Mat'l :API TRIM N.8 (STELLITE BODY SEATS)
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

NON-RET.GLO 3" 8" GLONR
511DB0010

Body Mat'l :ASTM A216 GR.WCB
Codes : API 600 / ASME B16.34
Body constr. :GLOBE, STOP CHECK (NON-RETURN), BOLTED BONNET
Rating : 300#
Ends : RF
Face finish :ASME B16.5
Trim constr. :GUIDED DISC PISTON TYPE, O.S. & Y.
Trim Mat'l :API TRIM N.8 (STELLITE BODY SEATS)
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 : R1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	6
Compared with:	2	28 Feb 02	

**NON-RET.GLO**      **10"**    **12"**      **GLONR**  
 511DB0011

Body Mat'l : ASTM A216 GR.WCB  
 Codes : API 600 / ASME B16.34  
 Body constr. : GLOBE, STOP CHECK (NON-RETURN), BOLTED BONNET  
**Rating : 300#**  
**Ends : RF**  
 Face finish : ASME B16.5  
 Trim constr. : GUIDED DISC PISTON TYPE, O.S. & Y.  
 Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)  
 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.

**NEEDLE VALVE**      **1/2"**    **2"**      **NED**  
 512NQ0004

Body Mat'l : ASTM A105  
 Codes : API 602 / ASME B16.34  
 Body constr. : WELDED BONNET  
**Rating : 800#**  
**Ends : S.W.**  
 Trim constr. : NEEDLE TYPE, O.S. & Y.  
 Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)  
 Bolt Mat'l : PER API STANDARD 602.  
 Packing : GRAPHITE PACKING .  
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9  
 Operator : HANDWHEEL

**CHECK VALVE**      **1/2"**    **2"**      **CHE**  
 512CQ0003

Body Mat'l : ASTM A105  
 Codes : API 602 / ASME B16.34  
 Body constr. : BOLTED CAP  
**Rating : 800#**  
**Ends : S.W.**  
 Trim constr. : PISTON TYPE,T-BODY,HORIZONTAL INSTALLATION  
 Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)  
 Bolt Mat'l : PER API STANDARD 602.  
 Gasket Mat'l : PER API STANDARD 602.  
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9

\* 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 : R1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	7
Compared with:	2	28 Feb 02	

**CHECK VALVE**      3"      24"      **CHE**  
 511CB0001

Body Mat'l : ASTM A216 GR.WCB  
 Codes : API 600 / ASME B16.34  
 Body constr. : BOLTED CAP  
**Rating : 300#**  
**Ends : RF**  
 Face finish : ASME B16.5  
 Trim constr. : SWING TYPE, HORIZONTAL & VERTICAL INSTALLATION  
 Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)  
 Bolt Mat'l : PER API STANDARD 600.  
 Gasket Mat'l : PER API STANDARD 600.  
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9

**CHECK V. FLG**      1/2"      2"      **CHEFL**  
 512CB0001

Body Mat'l : ASTM A105  
 Codes : API 602 / ASME B16.34  
 Body constr. : BOLTED CAP  
**Rating : 300#**  
**Ends : RF**  
 Face finish : ASME B16.5  
 Trim constr. : PISTON TYPE,T-BODY,HORIZONTAL INSTALLATION  
 Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)  
 Bolt Mat'l : PER API STANDARD 602.  
 Gasket Mat'l : PER API STANDARD 602.  
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9

**PIPE A/G**      1/2"      2"      **SCH. XS**      **PIP**  
 541SG0001

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.**

**PIPE A/G**      3"      24"      **SCH. STD**      **PIP**  
 541SG0002

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

\* 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. Title: Piping Material Specification, Spec. No.: 10087902-SP-50-03, Class: R1.

PIPE A/G 30" 36" SCH. STD PIP
541Wd0001
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.E.

PIPE A/G 3" 24" SCH. STD PIP2
541SGAAAC
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.E.

PIPE A/G 3" 24" SCH. STD PIP8 [\*]
541SGAAAE
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.E.

PIPE A/G 1/2" 2" SCH. 160 PIPP
541SG0003
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.

NIPPLES 1/2" 2" SCH. 160 NIP
551NC0001
Material: C.S. ASTM A106 GR.B
Codes: ASME B36.10
Note: FITTINGS SHALL COMPLY WITH JOB SPEC 52A2
Ends: T.O.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 : R1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	11
Compared with:	2	28 Feb 02	

**BLIND F.47/B**      **30"**    **36"**      **FBL7B**  
561BB0005

Material : ASTM A105  
Codes : ASME B16.47 "B" ( EX API-605 )  
Rating : **300#**  
Ends : **RF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**ORIFICE FLG**      **2"**    **2"**    **SCH. XS**      **FTR**  
561CB0007

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"**    **24"**    **SCH. STD**      **FTR**  
561CB0008

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**      **2"**    **2"**    **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 : R1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	12
Compared with:	2	28 Feb 02	

**ORIFICE FLG**      3"      24"      **SCH. STD**      **FTRI**  
 561CB0010

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**  
 551HB0001

Material : C.S. ASTM A105  
 Component : 90 DEGREES ELBOWS  
 Codes : ASME B16.11  
**Rating : 3000#**  
**Ends : S.W.**  
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

**90 ELBOW**      3"      24"      **SCH. STD**      **90E**  
 551EF0001

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

**90 ELBOW**      30"      36"      **SCH. STD**      **90E**  
 551EF0002

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

\* 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 : R1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	17
Compared with:	2	28 Feb 02	

**ELBOLET BW**      3"      8"      **SCH. STD**      **ELBBW**  
551WB0001

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**  
551LB0010

Material : C.S. ASTM A105  
Component : ELBOLET  
Codes : MSS SP97  
Ends : **S.W.**  
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2  
Rating : **3000#**

**SOCKOLET**      1/2"      36"      **SOL**  
551LB0011

Material : C.S. ASTM A105  
Component : SOCKOLET  
Codes : MSS SP97  
Ends : **S.W.**  
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2  
Rating : **3000#**

**FLAT SOL**      1/2"      36"      **SOF**  
551LB0025

Material : C.S. ASTM A105  
Component : FLAT SOCKOLET  
Codes : MSS SP97  
Ends : **S.W.**  
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2  
Rating : **3000#**

**WELDOLET**      3"      12"      **SCH. STD**      **WOL**  
551WB0002

Material : C.S. ASTM A105  
Component : WELDOLET  
Codes : MSS SP97  
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 : R1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	18
Compared with:	2	28 Feb 02	

**LATROLET BW**      3"      8"      **SCH. STD**      **LATBW**  
551WB0003

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

**LATROLET SW**      1/2"      36"      **LATS**  
551LB0012

Material : C.S. ASTM A105  
Component : LATROLET  
Codes : MSS SP97  
Ends : **S.W.**  
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2  
Rating : **3000#**

**FULL CPLG.**      1/2"      2"      **CPL**  
551HB0007

Material : C.S. ASTM A105  
Component : FULL COUPLING  
Codes : ASME B16.11  
Rating : **3000#**  
Ends : **S.W.**  
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

**STEAM TRAP**      3/4"      3/4"      **STR**  
579DA0002

Body Mat'l : ASTM A105  
Intern. Mat'l : S.S. TYPE 304  
Type : DISC-TYPE THERMODYNAMIC TRAP, INTEGRAL STRAINER WITH SS SCREEN AND INTEGRAL BLOW-OFF VALVE. SPIRAX/SARCO UTD-52L.  
Gasket Mat'l : AS PER MANUFACTURER'S STANDARD (ASBESTOS NOT PERMITTED)  
Rating : **600#**  
Ends : **S.W.**

\* 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 : R1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	19
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.

**Y STRAINER**      3"      4"      **SCH. STD**      **YST**  
 592YA0007

Body Mat'l : ASTM A216 GR.WCB  
 Codes : ACCORDING TO MANUFACTURER'S STD  
 Body constr. : BOLTED CAP  
**Rating : 300#**  
**Ends : B.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**  
 592TE0003

**Rating : 300#**  
 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.

**FIGURE 8**      6"      12"      **F8F**  
 561FP0003

Material : ASTM A516 GR.70  
 Codes : ASME B16.48  
**Rating : 300#**  
**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 : R1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	20
Compared with:	2	28 Feb 02	

**PADDLE BLIND**      1"      4"      **PBL**  
561PP0005

Material : ASTM A516 GR.70  
Codes : ASME B16.48  
**Rating : 300#**  
**Ends : RF**  
Face finish : ASME B16.5  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**PADDLE BLIND**      14"      24"      **PBL**  
561PP0005

Material : ASTM A516 GR.70  
Codes : ASME B16.48  
**Rating : 300#**  
**Ends : RF**  
Face finish : ASME B16.5  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**PAD.B16.47/B**      30"      36"      **PAD7B**  
561PP0012

Material : ASTM A516 GR.70  
Codes : ASME B16.47 "B" ( EX API-605 )  
**Rating : 300#**  
**Ends : RF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**DRIP RING**      1"      12"      **DRI**  
561DP0009

Material : ASTM A516 GR.70  
Codes : ASME B16.48  
**Rating : 300#**  
**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**  
561RP0005

Material : ASTM A516 GR.70  
Codes : ASME B16.48  
**Rating : 300#**  
**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 : R1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	21
Compared with:	2	28 Feb 02	

**SPACER RING**      14"      24"      SPA

561RP0005

Material : ASTM A516 GR.70  
 Codes : ASME B16.48  
**Rating : 300#**  
**Ends : RF**  
 Face finish : ASME B16.5  
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

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

561RP0012

Material : ASTM A516 GR.70  
 Codes : ASME B16.47 "B" ( EX API-605 )  
**Rating : 300#**  
**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

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**

\* 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 : R1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	22
Compared with:	2	28 Feb 02	

**GASK.16.47/A**      **30"**    **36"**      **GA2**  
 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**

**GASKET**      **1/2"**    **24"**      **GAS**  
 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**

**GASKET**      **1/2"**    **24"**      **GAS1**  
 574SA0003

Material : SPIRAL WOUND SS.304/GRAPHITE  
 Codes : DIMENSIONS PER ASME B16.20  
 Thickness : 3.2 MM (1/8")  
**Rating : 600#**  
 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 FF**      **1/2"**    **24"**      **GASFF**  
 574Cy0004

Material : FLEXIBLE GRAPHITE ENCAPSULATED GASKET. CORR-A-SEAL / GRAPHONICS  
 Codes : DIMENSIONS PER ASME B16.21  
 Thickness : 1.6 MM (1/16")  
**Rating : 300#**  
 Note : GASKETS SHALL COMPLY WITH JOB SPEC 52A3  
**Ends : FF**

\* Client codes only, not including sizes



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 : R1</b>			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	23
Compared with:	2	28 Feb 02	

**General Notes:**

1.) Use Extended Body Gate Valves, Threaded Outlet, For Branch 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.

5.) Check Valves When Installed InThe 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 0.05" 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 List.

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.) Where Pipe Schedule Is Shown, It Is Adequate For The Design Conditions Listed In Temp/Press Limited. Where "CALC" Is Shown, The Pressure Limit May Be Lower Than Flange Rating. See The Project Line List And Applicable Piping Drawing For Details.

10.) 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.

11.) 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.

12.) All Fabrication Shall Comply With 52A1.

13.) Pipe Supports And Spring Hangers Shall Comply With 59A2 And 59A3 Respectively.

14.) 'BEP' Nipples Shall Be Cut From Pipe.

15.) Det 'PIPP' To Be Used With SW x T Valves Only.

16.) The Crotch Thickness Of The Branch Outlet Of Butt weld Tees Shall Be No Less Than 150% Of The Nominal Wall Thickness Of The Tee. The Crotch Radius Of The Branch Outlet Of Butt weld Tees Shall Be No Less Than 12.5% Of The Branch Outlet OD.

17.) Use Coupling To Join Pipe. Flanged Joint To Be Used Only Where Required For Breakout.

18.) Couplings Shall Not Be Used For Branch Connections Use Inline Only.

19.) Use Flat Face Valve, Flange & Full Face Gaskett To Mate With Flat Face Nozzles Only.

20.) Flanges Shall Not Be Insulated.

21.) Temperature Instrument Connection Shall Be NPS 1-1/2" Flanged.

22.) Pressure Instrument Connection Shall Be NPS 3/4" Socket-weld.

\* 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 : R1</b>			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	<b>3</b>	<b>03 Jun 02</b>	<b>24</b>
Compared with:	<b>2</b>	<b>28 Feb 02</b>	

23.) 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.

24.) Branch Connections Should Follow The Guidelines Of Job Spec 52B2 And The Attachment Unless Specifically Overriden By The Pipe Stress Engineer.

25.) CORR-A-SEAL / GRAPHONICS Gaskets Shall Be Used For Flat Face Flanges.

26.) Concentric & Eccentric Reducers Are Limited To 2 Nominal Diameter Size Reductions Without Piping Engineer Approval.

27.) Remove Temporary Strainers After Flushing.

END OF DOCUMENT

\* Client codes only, not including sizes





Foster Wheeler USA Corporation

**Piping Material Specification**

**Spec. No.: 10087902-SP-50-03**  
**Class: R1**

**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) : R1																				
MATERIAL (S) : CARBON STEEL, SMLS ASTM A106 GR. B											P/SE :		C.A. : 0.063"							
CARBON STEEL, EFW, ASTM A672 GR. C70 CL.12																				
DESIGN LIMIT (S) : 155 PSIG AT 650F																				
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	XS	T																		
3/4	XS	RT	T																	
1	XS	RT	RT	T																
1 1/2	XS	RT	RT	RT	T															
2	XS	RT	RT	RT	RT	T														
3	STD	SK	SK	SK	SK	SK	T													
4	STD	SK	SK	SK	SK	SK	W	T												
6	STD	SK	SK	SK	SK	SK	W	W	T											
8	STD	SK	SK	SK	SK	SK	W	W	W	T										
10	STD	SK	SK	SK	SK	SK	W	W	W	W	T									
12	STD	SK	SK	SK	SK	SK	W	W	W	W	W	T								
14	STD	SK	SK	SK	SK	SK	W	W	W	W	W	W	T							
16	STD	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	T						
18	STD	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	T					
20	STD	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	CA	T				
24	STD	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	CA	CA	T			
30	STD	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	CA	CA	CA	T		
36	STD	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.**