



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 : L1			
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:**  
PROCESS FLUIDS, LARGE BORE INSTRUMENT AIR, COOLING WATER, PLANT AND UTILITY AIR.  
(FOR BRANCH CONNECTIONS SEE ATTACHMENT "A" )

<b>Gaskets :</b> SPIRAL WOUND GRAPHITE / S.S.304	<b>Rating/Facing :</b> CL150 RF	<b>Corrosion :</b> 0.063" (1.5MM) See Note 9	<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 10)
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<b>Materials :</b> CARBON STEEL PIPING & VALVES (SEE GENERAL NOTES 1 THRU 29)	<b>Temp/Press Limits :</b> 285 PSIG AT -20F TO 100F ; 260 PSIG AT 200F ; 230 PSIG AT 300F ; 200 PSIG AT 400F ; 170 PSIG AT 500F ; 140 PSIG AT 600F ; 125 PSIG AT 650F ; 110 PSIG AT 700F ; 95 PSIG AT 750F MAX. TEMP. (See Note 12)
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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> 511GA0001	<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.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



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**GATE VALVE N**      **14"    24"**      **GATN**  
 511GA0002

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.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**  
 512GA0001

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.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"**      **GAFP1**  
 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

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GATE V. FLG. 1/2" 2" 512GB0005 GAF1

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" 511DA0002 GLO

Body Mat'l : ASTM A216 GR.WCB
Codes : API 600 / ASME B16.34
Body constr. : BOLTED BONNET
Rating : 150#
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

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NEEDLE VALVE 1/2" 2"
512NQ0004

NED

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"
512CQ0003

CHE

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

CHECK VALVE 3" 24"
511CA0002

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.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

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BUTTERFLY 3" 10" BUL
511FA0003
Body Mat'l :ASTM A216 GR.WCB
Codes : API 609
Body constr. : LUG TYPE (THDD)
Rating : 150#
Ends : RF
Face finish : ASME B16.5
Shaft const. : SOFT SEATS
Shaft Mat'l : CS DISC, BUNA N SEAT, SS STEM
Packing : MANUFACTURER STANDARD PACKING .
Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9. VENDOR TO FURNISH B7 CAP SCREWS.
Operator : WRENCH

BUTTERFLY 12" 24" BULN
511FA0004
Body Mat'l :ASTM A216 GR.WCB
Codes : API 609
Body constr. : LUG TYPE (THDD)
Rating : 150#
Ends : RF
Face finish : ASME B16.5
Shaft const. : SOFT SEATS
Shaft Mat'l : CS DISC, BUNA N SEAT, SS STEM
Packing : MANUFACTURER STANDARD PACKING .
Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9. VENDOR TO FURNISH B7 CAP SCREWS.
Operator : GEAR OP (N) PINION SHAFT AT RIGHT ANGLE TO RUN OF VALVE.

BALL VALVE 1/2" 2" BAL
512BD0001
Body Mat'l :ASTM A105 OR ASTM A216 GR.WCB.
Codes : ASME B16.34 / API 607
Body constr. : REDUCED BORE
Rating : 600#
Ends : S.W.
Trim constr. : FLOATING BALL, FIRESAFE DESIGN, ANTISTATIC DEVICE, ANTI-BLOW OUT STEM
Trim Mat'l : CHROME PLATED BALL & STEM, REINFORCED TFE SEAT AND SEALS.
Packing : GRAPHITE PACKING .
Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9
Operator : LEVER
Note : USE FOR FLUIDS MAX. TEMP. 450F.

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**BALL VALVE**      3"      8"      **BAL**  
 511BA0001

Body Mat'l : ASTM A216 GR.WCB  
 Codes : ASME B16.34 / API 607  
 Body constr. : REDUCED BORE, SHORT PATTERN  
**Rating : 150#**  
**Ends : RF**  
 Face finish : ASME B16.5  
 Trim constr. : FLOATING BALL, FIRESAFE DESIGN, ANTISTATIC DEVICE, ANTI-BLOW  
 OUT STEM  
 Trim Mat'l : CHROME PLATED BALL & STEM, REINFORCED TFE SEAT AND SEALS.  
 Packing : GRAPHITE PACKING .  
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9  
 Operator : LEVER  
 Note : USE FOR FLUIDS MAX. TEMP. 300F.

**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.**

**PIPE A/G**      30"      42"      **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.**

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**FLANGE F.F.**      **1/2"**    **2"**    **SCH. XS**      **FLGFF**  
561NB0003

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

**FLANGE F.F.**      **3"**      **24"**    **SCH. STD**      **FLGFF**  
561WB0001

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

**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"**    **42"**      **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"**    **42"**      **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

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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" 16" 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 FTR
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).

ORIFICE FLG 3" 16" SCH. STD FTR
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).

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**CONC.SWAGE**      1/2"      4"      **SCH. XS**      **CSC**  
 551SC0002

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. XS**      **ESA**  
 551SC0030

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. XS**      **ESC**  
 551SC0007

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"      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"      42"      **SCH. STD**      **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#**

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**SOCKOLET**      1/2"      42"      **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#**

**WELDOLET**      3"      24"      **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

**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"      42"      **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

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<b>UNION</b> 551HB0009	<b>1/2"</b>	<b>2"</b>	<b>GRO</b>
<p>Material : C.S. ASTM A105  Component : UNION, GROUND JOINT, INTEGRAL CS SEATS  Codes : MSS SP83  <b>Rating : 3000#</b>  <b>Ends : S.W.</b>  Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2</p>			

<b>Y STRAINER</b> 592YA0012	<b>1/2"</b>	<b>2"</b>	<b>YST</b>
<p>Body Mat'l : ASTM A216 GR.WCB  Codes : ACCORDING TO MANUFACTURER'S STD  Body constr. : BOLTED CAP  <b>Rating : 600#</b>  <b>Ends : S.W.</b>  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.</p>			

<b>TEMP. CONIC.</b> 592TE0001	<b>2"</b>	<b>24"</b>	<b>TCS</b>
<p><b>Rating : 150#</b>  Codes : ASME B16.5  <b>Ends : RF</b>  Material : C.S. CONICAL SCREEN.  Mesh size : 14 GA PERFORATED PLATE WITH 1/8" DIA. HOLES ON 3/16" CENTERS,  200% OPEN AREA.</p>			

<b>TEMP. CONIC.</b> 592TE0002	<b>30"</b>	<b>42"</b>	<b>TCS</b>
<p><b>Rating : 150#</b>  Codes : ASME B16.47 "B" ( EX API-605 )  <b>Ends : RF</b>  Material : C.S. CONICAL SCREEN.  Mesh size : 14 GA PERFORATED PLATE WITH 1/8" DIA. HOLES ON 3/16" CENTERS,  200% OPEN AREA.</p>			

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**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

**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"      42"      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"      42"      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

Continue....



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 : L1			
Client Ref.	Rev. No.	Issue Date	Page
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Compared with:	2	28 Feb 02	

**GASK.16.47/A**      **30"    42"**      **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)

Table with Piping Material Specification header, Spec. No.: 10087902-SP-50-03, Class: L1, and a revision table with columns for Client Ref., Rev. No., Issue Date, and Page.

GASK.16.47/A 30" 42" 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" 42" 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)

Table with 4 columns: Client Ref., Rev. No., Issue Date, Page. Row 1: VALERO, 3, 03 Jun 02, 24. Row 2: Compared with: 2, 28 Feb 02.

- 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.) Use Ball Valves For Heater Fuel Oil & Gas Service Only.
7.) Use Butterfly Valves For Cooling Water Service Only.
8.) Gear Operated Valves Shall Be Used When Indicated On The EFD'S.
9.) 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.
10.) 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.
11.) Use API 5L Pipe For Cooling Water Service Only.
12.) 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.
13.) 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.
14.) All Fabrication Shall Comply With 52A1.
15.) Pipe Supports And Spring Hangers Shall Comply With 59A2 And 59A3 Respectively.
16.) 'BEP' Nipples Shall Be Cut From Pipe.
17.) Det 'PIPP' To Be Used With SW x T Valves Only.
18.) 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.
19.) Use Union Or Coupling To Join Pipe. Flanged Joint To Be Used Only Where Indicated On EFD'S.
20.) Couplings Shall Not Be Used For Branch Connections Use Inline Only.
21.) Use Flat Face Valve, Flange & Full Face Gasket To Mate With Flat Face Nozzles Only.
22.) Flanges Shall Not Be Insulated.
23.) Temperature Instrument Connection Shall Be NPS 1-1/2" Flanged.
24.) Pressure Instrument Connection Shall Be NPS 3/4" Socket-weld.
25.) 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.
26.) Branch Connections Should Follow The Guidelines Of Job Spec 52B2 And The Attachment Unless Specifically Overriden By The Pipe Stress Engineer.
27.) CORR-A-SEAL / GRAPHONICS Gaskets Shall Be Used For Flat Face Flanges.
28.) Concentric & Eccentric Reducers Are Limited To 2 Nominal Diameter Size Reductions Without Piping Engineer Approval.

\* 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 : L1</b>			
Client Ref.	Rev. No.	Issue Date	Page
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29.) 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: L1**

**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
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**ATTACHMENT "A"**

REINFORCEMENT CHART																				
APPLICABLE TO PIPE SPECIFICATION (S) : L1																				
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) : 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	42	
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	P2	T						
18	STD	SK	SK	SK	SK	SK	W	W	W	W	W	W	P2	P2	T					
20	STD	SK	SK	SK	SK	SK	W	W	W	W	W	W	P2	P2	P2	T				
24	STD	SK	SK	SK	SK	SK	W	W	W	W	W	W	P3	P3	P4	P4	T			
30/36	STD	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	CA	CA	CA	T		
42	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.**