



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 : C1			
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, (850 INTERMITTENT)
(FOR BRANCH CONNECTIONS SEE ATTACHMENT "A")

Gaskets : SPIRAL WOUND GRAPHITE / S.S.304	Rating/Facing : CL300 RF	Corrosion : 0.063" (1.5MM) See Note 8	Facing Finish : ASME B16.5	Block Valve Trim : API TRIM No. 8	Weld Quality Insp : PER JOB SPEC -52A1	Stress Relief : NO (See Note 9)
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Materials : CARBON STEEL PIPING & VALVES (See General Notes 1 Thru 28)	Temp/Press Limits : 525 PSIG AT 100F ; 525 PSIG AT 493F ; (See Note 10 & 11)
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Item Name	Range		Det	Rev
Unique/Client* Code	from	to		
GATE VALVE 512GQ0004	1/2"	2"	GAT	
Body Mat'l : ASTM A105 Codes : API 602 Body constr. : WELDED BONNET Rating : 800# Ends : S.W. 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 VALVE 511GB0002	3"	24"	GAT	
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 : HANDWHEEL				

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Spec. No. : 10087902-SP-50-03			
Class : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	2
Compared with:	2	28 Feb 02	

GATE VALVE N 8" 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

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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : C1			
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" 2" **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

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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	4
Compared with:	2	28 Feb 02	

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

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" GLO
512DQ0005

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" GLO
511DB0001

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



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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	5
Compared with:	2	28 Feb 02	

Y GLOBE V. 1/2" 2" GLY
512DQ0009

Body Mat'l : ASTM A105
Codes : API 602 / ASME B16.34
Body constr. : WELDED BONNET
Rating : 800#
Ends : S.W.
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 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

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

* Client codes only, not including sizes



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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	6
Compared with:	2	28 Feb 02	

BALL VALVE 512BD0001	1/2"	2"		BAL
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.				
PIPE A/G 541SG0001	1/2"	2"	SCH. XS	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.				
PIPE A/G 541SG0002	3"	20"	SCH. STD	PIP
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	24"	24"	CALC	PIP
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"	36"	CALC	PIP
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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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	8
Compared with:	2	28 Feb 02	

NIPPLES 551NC0001	1/2"	2"	SCH. 160	NIP
Material : C.S. ASTM A106 GR.B Codes : ASME B36.10 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2 Ends : T.O.E.				
FLANGE 561NB0005	1/2"	2"	SCH. XS	FLG
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 561WB0005	3"	20"	SCH. STD	FLG
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	24"	24"	CALC	FLG
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 W.N.	30"	36"	CALC	FWN7A
Type : W.N. Material : ASTM A105 Codes : ASME B16.47 "A" (EX MSS-SP44) Rating : 300# Ends : RF Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2				

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Spec. No. : 10087902-SP-50-03			
Class : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	9
Compared with:	2	28 Feb 02	

FLANGE W.N.	30"	36"	CALC	FWN7B
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Type : W.N.
 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

FLANGE	1/2"	2"	SCH. XS	FL1
561NB0009				

Type : S.W.
 Material : ASTM A105
 Codes : ASME B16.5
 Rating : **600#**
 Ends : **RF**
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE	3"	20"	SCH. STD	FL1
561WB0006				

Type : W.N.
 Material : ASTM A105
 Codes : ASME B16.5
 Rating : **600#**
 Ends : **RF**
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE	24"	24"	CALC	FL1
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Type : W.N.
 Material : ASTM A105
 Codes : ASME B16.5
 Rating : **600#**
 Ends : **RF**
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE F.F.	1/2"	2"	SCH. XS	FLGFF
561NB0010				

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

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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	10
Compared with:	2	28 Feb 02	

FLANGE F.F. 3" 20" **SCH. STD** **FLGFF**
561WB0007

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

FLANGE F.F. 24" 24" **CALC** **FLGFF**

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

BLIND FLANGE 1/2" 24" **FBL**
561BB0004

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

BLIND F.47/A 30" 36" **FBL7A**
561BB0006

Material : ASTM A105
Codes : ASME B16.47 "A" (EX MSS-SP44)
Rating : **300#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

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

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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	11
Compared with:		2	28 Feb 02

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** **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).

ORIFICE FLG 3" 16" **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).

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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	15
Compared with:	2	28 Feb 02	

CONC. RED. 24" 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

ECC.RED. 3" 20" SCH. STD ERE

551RF0003

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. 24" 24" CALC ERE

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. 30" 36" CALC ERE

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

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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	16
Compared with:	2	28 Feb 02	

TEE	1/2"	2"		TEE
551HB0006				

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

TEE	3"	20"	SCH. STD	TEE
551EF0007				

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

TEE	24"	24"	CALC	TEE
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Material : C.S. ASTM A234 WPB
Component : TEE
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

TEE	30"	36"	CALC	TEE
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Material : C.S. ASTM A234 WPB
Component : TEE
Codes : ASME B16.9
Manufact. : WELDED
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

RED.TEE	1/2"	2"		TER
551FB0004				

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

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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	17
Compared with:	2	28 Feb 02	

CONC.SWAGE 1/2" 2" **SCH. XS** **CSA**
551SC0005

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 : **P.E.**

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" 20" **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

* 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 : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	18
Compared with:	2	28 Feb 02	

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"** **20"** **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

WELDOLET **24"** **24"** **CALC** **WOL**

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



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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	19
Compared with:	2	28 Feb 02	

LATROLET BW 3" 20" **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

UNION 1/2" 2" **GRO**
551HB0009

Material : C.S. ASTM A105
Component : UNION, GROUND JOINT, INTEGRAL CS SEATS
Codes : MSS SP83
Rating : **3000#**
Ends : **S.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	20
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**
 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 3/4" 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 [*]

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

* Client codes only, not including sizes



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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	21
Compared with:	2	28 Feb 02	

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" **DR**
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

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

* 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: C1', and revision/issue dates.

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
Thrd 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

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

* Client codes only, not including sizes



Contract N.: 1310087902
Client: Valero Refining Company - Texas
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Table with Piping Material Specification header and a grid containing Client Ref., Rev. No., Issue Date, Page, and Compared with information.

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

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 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 In The Horizontal Position Shall Be Bonnet Cover Up & Those Install In The Vertical Position Shall Be Flow Up Only.

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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	24
Compared with:	2	28 Feb 02	

- 6.) Use Ball Valves For Heater Fuel Oil & Gas Service Only.
- 7.) Gear Operated Valves Shall Be Used When Indicated On The EFD'S.
- 8.) 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.
- 9.) 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.
- 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.) Det 'PIP1' To Be Used With SW x T Valves Only.
- 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.

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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : C1			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	25
Compared with:	2	28 Feb 02	

END OF DOCUMENT

* Client codes only, not including sizes



Foster Wheeler USA Corporation

Piping Material Specification

Spec. No.: 10087902-SP-50-03
Class: C1

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) : C1																				
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) : 740 PSIG AT -20F TO 100F; 410 PSIG AT 800F 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	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	CALC	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.