



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 : DG5A			
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,
 (PWHT REQUIRED FOR ALL WELD SEE JOB SPEC -88A1.)
 (FOR BRANCH CONNECTIONS SEE ATTACHMENT "A")

Gaskets : SPIRAL WOUND GRAPHITE / S.S.304	Rating/Facing : CL600 RF	Corrosion : 0.125" (3.0MM) See Note 6	Facing Finish : ASME B16.5	Block Valve Trim : API TRIM No. 8	Weld Quality Insp : PER JOB SPEC -52A1	Stress Relief : YES (See Note 7)
Materials : 9 CR.-1 MO. PIPING & VALVES (SEE GENERAL NOTES 1 THRU 25)			Temp/Press Limits : 772 PSIG AT 940F (1/2"-2") ; 772 PSIG AT 940F (3"-8" XS) ; 772 PSIG AT 587F (10"-14" XS) ; 772 PSIG AT 587F (16"-24" S/160; 772 PSIG AT 940F 10"- 24" S/80; 772 PSIG AT -20F TO 100F; (See Note 8 & 9)			

Item Name	Range		Det	Rev
Unique/Client* Code	from	to		
GATE VALVE 514GQ0009	1/2"	2"	GAT	
Body Mat'l :ASTM A182 GR.F9 Codes : API 602 Body constr. :BOLTED 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. Gasket Mat'l :PER API STANDARD 602. Packing : GRAPHITE PACKING . Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9 Operator :HANDWHEEL				
GATE VALVE 513GD0005	3"	24"	GAT	
Body Mat'l :ASTM A217 GR.C12 Codes : API 600 Body constr. :BOLTED BONNET Rating : 600# 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 : DG5A			
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**
 513GD0006

Body Mat'l : ASTM A217 GR.C12
 Codes : API 600
 Body constr. : BOLTED BONNET
Rating : 600#
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**
 514GD0006

Body Mat'l : ASTM A182 GR.F9
 Codes : API 602
 Body constr. : BOLTED BONNET, FULL PORT.
Rating : 600#
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**
 514GQ0010

Body Mat'l : ASTM A182 GR.F9
 Codes : API 602
 Body constr. : BOLTED 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.
 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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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : DG5A			
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**
 514EQ0008

Body Mat'l : ASTM A182 GR.F9
 Codes : API 602
 Body constr. : EXTENDED BODY, BOLTED 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.
 Gasket 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**
 514EQ0007

Body Mat'l : ASTM A182 GR.F9
 Codes : API 602
 Body constr. : EXTENDED BODY, BOLTED 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.
 Gasket Mat'l : PER API STANDARD 602.
 Packing : GRAPHITE PACKING .
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9
 Operator : HANDWHEEL

GATE V. FLG. 1/2" 2" **GAF**
 514GD0005

Body Mat'l : ASTM A182 GR.F9
 Codes : API 602
 Body constr. : BOLTED BONNET
Rating : 600#
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

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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	4
Compared with:	2	28 Feb 02	

GLOBE VALVE 1/2" 2" **GLO**
 514DQ0004

Body Mat'l : ASTM A182 GR.F9
 Codes : API 602 / ASME B16.34
 Body constr. : BOLTED 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.
 Gasket 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**
 513DD0003

Body Mat'l : ASTM A217 GR.C12
 Codes : API 600 / ASME B16.34
 Body constr. : BOLTED BONNET
Rating : 600#
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

Y GLOBE V. 1/2" 2" **GLY**
 514DQ0009

Body Mat'l : ASTM A182 GR.F9
 Codes : ASME B16.34
 Body constr. : WELDED BONNET
Rating : 800#
Ends : S.W.
 Trim constr. : BODY-GUIDED NON-SPINNING DISC, Y-PATTERN, OS&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

* Client codes only, not including sizes



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Table with Piping Material Specification details including Spec. No., Class, Client Ref., Rev. No., Issue Date, and Page.

CHECK VALVE 1/2" 2"
514CQ0004

CHE

Body Mat'l : ASTM A182 GR.F9
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"
513CD0003

CHE

Body Mat'l : ASTM A217 GR.C12
Codes : API 600 / ASME B16.34
Body constr. : BOLTED CAP
Rating : 600#
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"
514CD0001

CHEFL

Body Mat'l : ASTM A182 GR.F9
Codes : API 602 / ASME B16.34
Body constr. : BOLTED CAP
Rating : 600#
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. 160
542SG0001

PIP

Material : ASTM A335 GR.P9
Manufact. : SMLS
Codes : ASME B36.10
Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2
Ends : P.E.

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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	6
Compared with:		2	28 Feb 02

PIPE A/G	3"	8"	SCH. XS	PIP
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542SG0005

Material : ASTM A335 GR.P9
 Manufact. : SMLS
 Codes : ASME B36.10
 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2
 Ends : B.E.

PIPE A/G	10"	24"	CALC	PIP
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Material : ASTM A335 GR.P9
 Manufact. : SMLS
 Codes : ASME B36.10
 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2
 Ends : B.E.

PIPE A/G	30"	36"	CALC	PIP
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Material : ASTM A691 GR.9 Cr. CL.22
 Manufact. : E.F.W.
 Codes : ASME B36.10
 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2
 Ends : B.E.

<u>PIPE A/G</u>	<u>3"</u>	<u>8"</u>	<u>SCH. XS</u>	<u>PIP2</u> [*]
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542SGAAAD

Material : ASTM A335 GR.P9
 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.

[*]
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PIPE A/G	16"	24"	SCH. 60	PIPI
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542SG0004

Material : ASTM A335 GR.P9
 Manufact. : SMLS
 Codes : ASME B36.10
 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2
 Ends : B.E.

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Spec. No. : 10087902-SP-50-03			
Class : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	7
Compared with:	2	28 Feb 02	

PIPE A/G 542SG0005	10"	14"	SCH. XS	PIPJ
Material : ASTM A335 GR.P9 Manufact. : SMLS Codes : ASME B36.10 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2 Ends : B.E.				

<u>PIPE A/G</u> <u>542SGAAAD</u>	<u>10"</u>	<u>14"</u>	<u>SCH. XS</u>	<u>PIPJ2</u> [*]
Material : ASTM A335 GR.P9 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 542SG0006	10"	24"	SCH. 80	PIPK
Material : ASTM A335 GR.P9 Manufact. : SMLS Codes : ASME B36.10 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2 Ends : B.E.				

<u>PIPE A/G</u> <u>542SGAAAE</u>	<u>10"</u>	<u>24"</u>	<u>SCH. 80</u>	<u>PIPK2</u> [*]
Material : ASTM A335 GR.P9 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.				

NIPPLES 552NU0001	1/2"	2"	SCH. XXS	NIP
Material : ASTM A335 GR.P9 Codes : ASME B36.10 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2 Ends : T.O.E.				

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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : DG5A			
Client Ref. VALERO	Rev. No. 3	Issue Date 03 Jun 02	Page 8
Compared with:	2	28 Feb 02	

FLANGE 1/2" 2" SCH. 160 562NI0006 FLG

Type : S.W.
Material : ASTM A182 GR.F9
Codes : ASME B16.5
Rating : **600#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE 3" 8" SCH. XS 562WI0010 FLG

Type : W.N.
Material : ASTM A182 GR.F9
Codes : ASME B16.5
Rating : **600#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE 10" 24" CALC 562WI0009 FLG

Type : W.N.
Material : ASTM A182 GR.F9
Codes : ASME B16.5
Rating : **600#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE 16" 24" SCH. 60 562WI0009 FLGJ

Type : W.N.
Material : ASTM A182 GR.F9
Codes : ASME B16.5
Rating : **600#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE 10" 14" SCH. XS 562WI0010 FLGJ

Type : W.N.
Material : ASTM A182 GR.F9
Codes : ASME B16.5
Rating : **600#**
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 : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	9
Compared with:	2	28 Feb 02	

FLANGE 10" 24" SCH. 80 FLGK
562WI0011

Type : W.N.
Material : ASTM A182 GR.F9
Codes : ASME B16.5
Rating : **600#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE W.N. 30" 36" CALC FWN7A

Type : W.N.
Material : ASTM A182 GR.F9
Codes : ASME B16.47 "A" (EX MSS-SP44)
Rating : **600#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE W.N. 30" 36" CALC FWN7B

Type : W.N.
Material : ASTM A182 GR.F9
Codes : ASME B16.47 "B" (EX API-605)
Rating : **600#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE 1/2" 2" SCH. 160 FL1
562NI0007

Type : S.W.
Material : ASTM A182 GR.F9
Codes : ASME B16.5
Rating : **1500#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE 3" 8" SCH. XS FL1
562WI0007

Type : W.N.
Material : ASTM A182 GR.F9
Codes : ASME B16.5
Rating : **900#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

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Spec. No. : 10087902-SP-50-03			
Class : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	10
Compared with:	2	28 Feb 02	

FLANGE 10" 24" CALC FL1

Type : W.N.
 Material : ASTM A182 GR.F9
 Codes : ASME B16.5
 Rating : 900#
 Ends : RF
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE 16" 24" SCH. 60 FL11
562WI0006

Type : W.N.
 Material : ASTM A182 GR.F9
 Codes : ASME B16.5
 Rating : 900#
 Ends : RF
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE 10" 14" SCH. XS FL1J
562WI0007

Type : W.N.
 Material : ASTM A182 GR.F9
 Codes : ASME B16.5
 Rating : 900#
 Ends : RF
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE 10" 24" SCH. 80 FL1K
562WI0008

Type : W.N.
 Material : ASTM A182 GR.F9
 Codes : ASME B16.5
 Rating : 900#
 Ends : RF
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE W.N. 1/2" 2" SCH. 160 FWN [*]
562WX0002

Type : W.N.
 Material : ASTM A182 GR.F91
 Codes : ASME B16.5
 Rating : 600#
 Ends : RF
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

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Continue....



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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	11
Compared with:	2	28 Feb 02	

BLIND FLANGE 1/2" 24" **FBL**
 562BI0003

Material : ASTM A182 GR.F9
 Codes : ASME B16.5
Rating : 600#
Ends : RF
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

BLIND F.47/A 30" 36" **FBL7A**
 562BI0008

Material : ASTM A182 GR.F9
 Codes : ASME B16.47 "A" (EX MSS-SP44)
Rating : 600#
Ends : RF
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

BLIND F.47/B 30" 36" **FBL7B**
 562BI0009

Material : ASTM A182 GR.F9
 Codes : ASME B16.47 "B" (EX API-605)
Rating : 600#
Ends : RF
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

ORIFICE FLG 2" 2" **SCH. 160** **FTR**
 562CI0005

Body Mat'l : ASTM A182 GR.F9
 Component : ORIFICE FLANGE SET, WELD NECK TYPE
 Codes : ASME B16.36
Rating : 600#
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" 8" **SCH. XS** **FTR**
 562CI0008

Body Mat'l : ASTM A182 GR.F9
 Component : ORIFICE FLANGE SET, WELD NECK TYPE
 Codes : ASME B16.36
Rating : 600#
Ends : RF
 Hole Tape : N.4 HOLES 90 DEGREES 1/2" S.W.
 Note : 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 : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	12
Compared with:	2	28 Feb 02	

ORIFICE FLG 10" 16" **CALC** **FTR**

Body Mat'l : ASTM A182 GR.F9
 Component : ORIFICE FLANGE SET, WELD NECK TYPE
 Codes : ASME B16.36
Rating : 600#
Ends : RF
 Hole Tape : N.4 HOLES 90 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" 14" **SCH. XS** **FTRJ**

562CI0010

Body Mat'l : ASTM A182 GR.F9
 Component : ORIFICE FLANGE SET, WELD NECK TYPE
 Codes : ASME B16.36
Rating : 600#
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 10" 16" **SCH. 80** **FTRK**

562CI0011

Body Mat'l : ASTM A182 GR.F9
 Component : ORIFICE FLANGE SET, WELD NECK TYPE
 Codes : ASME B16.36
Rating : 600#
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. 160** **FTRI**

562CI0006

Body Mat'l : ASTM A182 GR.F9
 Component : ORIFICE FLANGE SET, WELD NECK TYPE
 Codes : ASME B16.36
Rating : 600#
Ends : RF
 Hole Tape : N.4 HOLES 90 DEGREES 1/2" S.W.
 Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

* Client codes only, not including sizes



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

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	13
Compared with:		2	28 Feb 02

ORIFICE FLG **16"** **16"** **SCH. 60** **FTRI**
 562CI0007

Body Mat'l : ASTM A182 GR.F9
 Component : ORIFICE FLANGE SET, WELD NECK TYPE
 Codes : ASME B16.36
Rating : 600#
Ends : RF
 Hole Tape : N.4 HOLES 90 DEGREES 1/2" S.W.
 Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

ORIFICE FLG **16"** **16"** **SCH. 60** **FTRII**
 562CI0007

Body Mat'l : ASTM A182 GR.F9
 Component : ORIFICE FLANGE SET, WELD NECK TYPE
 Codes : ASME B16.36
Rating : 600#
Ends : RF
 Hole Tape : N.4 HOLES 90 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"** **14"** **SCH. XS** **FTRIJ**
 562CI0008

Body Mat'l : ASTM A182 GR.F9
 Component : ORIFICE FLANGE SET, WELD NECK TYPE
 Codes : ASME B16.36
Rating : 600#
Ends : RF
 Hole Tape : N.4 HOLES 90 DEGREES 1/2" S.W.
 Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

ORIFICE FLG **10"** **16"** **SCH. 80** **FTRIK**
 562CI0009

Body Mat'l : ASTM A182 GR.F9
 Component : ORIFICE FLANGE SET, WELD NECK TYPE
 Codes : ASME B16.36
Rating : 600#
Ends : RF
 Hole Tape : N.4 HOLES 90 DEGREES 1/2" S.W.
 Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

* Client codes only, not including sizes



Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	14
Compared with:	2	28 Feb 02	

90 ELBOW **1/2" 2"** **90E**
552HI0001

Material : ASTM A182 GR.F9
Component : 90 DEGREES ELBOWS
Codes : ASME B16.11
Rating : **6000#**
Ends : **S.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

90 ELBOW **3" 8" SCH. XS** **90E**
552EP0013

Material : ASTM A234 GR.WP9
Component : 90 DEGREES LONG RADIUS
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

90 ELBOW **10" 24" CALC** **90E**

Material : ASTM A234 GR.WP9
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" CALC** **90E**

Material : ASTM A234 GR.WP9
Component : 90 DEGREES LONG RADIUS
Codes : ASME B16.9
Manufact. : WELDED
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

90 ELBOW **16" 24" SCH. 60** **90E**
552EP0012

Material : ASTM A234 GR.WP9
Component : 90 DEGREES LONG RADIUS
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

* Client codes only, not including sizes



Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	15
Compared with:	2	28 Feb 02	

90 ELBOW **10" 14" SCH. XS** **90EJ**
552EP0013

Material : ASTM A234 GR.WP9
Component : 90 DEGREES LONG RADIUS
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

90 ELBOW **10" 24" SCH. 80** **90EK**
552EP0014

Material : ASTM A234 GR.WP9
Component : 90 DEGREES LONG RADIUS
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

45 ELBOW **1/2" 2"** **45E**
552HI0002

Material : ASTM A182 GR.F9
Component : 45 DEGREES ELBOWS
Codes : ASME B16.11
Rating : **6000#**
Ends : **S.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

45 ELBOW **3" 8" SCH. XS** **45E**
552EP0010

Material : ASTM A234 GR.WP9
Component : 45 DEGREES LONG RADIUS
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

45 ELBOW **10" 24" CALC** **45E**

Material : ASTM A234 GR.WP9
Component : 45 DEGREES LONG RADIUS
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

* Client codes only, not including sizes



Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	16
Compared with:	2	28 Feb 02	

45 ELBOW 30" 36" **CALC** 45E

Material : ASTM A234 GR.WP9
 Component : 45 DEGREES LONG RADIUS
 Codes : ASME B16.9
 Manufact. : WELDED
Ends : B.W.
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

45 ELBOW 16" 24" **SCH. 60** 45E
 552EP0009

Material : ASTM A234 GR.WP9
 Component : 45 DEGREES LONG RADIUS
 Codes : ASME B16.9
 Manufact. : SMLS
Ends : B.W.
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

45 ELBOW 10" 14" **SCH. XS** 45E
 552EP0010

Material : ASTM A234 GR.WP9
 Component : 45 DEGREES LONG RADIUS
 Codes : ASME B16.9
 Manufact. : SMLS
Ends : B.W.
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

45 ELBOW 10" 24" **SCH. 80** 45E
 552EP0011

Material : ASTM A234 GR.WP9
 Component : 45 DEGREES LONG RADIUS
 Codes : ASME B16.9
 Manufact. : SMLS
Ends : B.W.
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

CAP 1/2" 2" **CAP**
 552HI0003

Material : ASTM A182 GR.F9
 Component : CAP
 Codes : ASME B16.11
Rating : 6000#
Ends : S.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)

Table with Piping Material Specification header and a comparison table with columns: Client Ref., Rev. No., Issue Date, Page.

CAP 3" 8" SCH. XS CAP
552EP0016

Material : ASTM A234 GR.WP9
Component : CAP
Codes : ASME B16.9
Manufact. : SMLS
Ends : B.W.
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

CAP 10" 24" CALC CAP

Material : ASTM A234 GR.WP9
Component : CAP
Codes : ASME B16.9
Manufact. : SMLS
Ends : B.W.
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

CAP 30" 36" CALC CAP

Material : ASTM A234 GR.WP9
Component : CAP
Codes : ASME B16.9
Manufact. : WELDED
Ends : B.W.
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

CAP 16" 24" SCH. 60 CAPI
552EP0015

Material : ASTM A234 GR.WP9
Component : CAP
Codes : ASME B16.9
Manufact. : SMLS
Ends : B.W.
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

CAP 10" 14" SCH. XS CAPJ
552EP0016

Material : ASTM A234 GR.WP9
Component : CAP
Codes : ASME B16.9
Manufact. : SMLS
Ends : B.W.
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

* Client codes only, not including sizes



Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	19
Compared with:	2	28 Feb 02	

CONC. RED. 30" 36" CALC CRE

Material : ASTM A234 GR.WP9
Component : CONCENTRIC REDUCER
Codes : ASME B16.9
Manufact. : WELDED
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

CONC. RED. 16" 24" SCH. 60 CRE
552RP0005

Material : ASTM A234 GR.WP9
Component : CONCENTRIC REDUCER
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

CONC. RED. 10" 14" SCH. XS CREJ
552RP0006

Material : ASTM A234 GR.WP9
Component : CONCENTRIC REDUCER
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

CONC. RED. 10" 24" SCH. 80 CREK
552RP0007

Material : ASTM A234 GR.WP9
Component : CONCENTRIC REDUCER
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

CONC. RED. 8" 14" SCH. 80
552RP0012 SCH. XS CREKJ

Material : ASTM A234 GR.WP9
Component : CONCENTRIC REDUCER
Codes : ASME B16.9
Manufact. : SMLS
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)

Table with Piping Material Specification header and Client Ref., Rev. No., Issue Date, Page, and Compared with details.

ECC.RED. 3" 8" SCH. XS ERE
552RP0009

Material : ASTM A234 GR.WP9
Component : ECCENTRIC REDUCER
Codes : ASME B16.9
Manufact. : SMLS
Ends : B.W.
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

ECC.RED. 10" 24" CALC ERE

Material : ASTM A234 GR.WP9
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 : ASTM A234 GR.WP9
Component : ECCENTRIC REDUCER
Codes : ASME B16.9
Manufact. : WELDED
Ends : B.W.
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

ECC.RED. 16" 24" SCH. 60 ERE
552RP0008

Material : ASTM A234 GR.WP9
Component : ECCENTRIC REDUCER
Codes : ASME B16.9
Manufact. : SMLS
Ends : B.W.
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

ECC.RED. 8" 14" SCH. XS EREJ [*]
552RP0009 [*]

Material : ASTM A234 GR.WP9
Component : ECCENTRIC REDUCER
Codes : ASME B16.9
Manufact. : SMLS
Ends : B.W.
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

* Client codes only, not including sizes



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 : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	21
Compared with:	2	28 Feb 02	

ECC.RED.	10"	24"	SCH. 80		EREK
552RP0010					

Material : ASTM A234 GR.WP9
Component : ECCENTRIC REDUCER
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

ECC.RED.	8"	14"	SCH. 80		EREKJ
552RP0011			SCH. XS		

Material : ASTM A234 GR.WP9
Component : ECCENTRIC REDUCER
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

TEE	1/2"	2"			TEE
552HI0006					

Material : ASTM A182 GR.F9
Component : TEE
Codes : ASME B16.11
Rating : **6000#**
Ends : **S.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

TEE	3"	8"	SCH. XS		TEE
552EP0019					

Material : ASTM A234 GR.WP9
Component : TEE
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

TEE	10"	24"	CALC		TEE
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Material : ASTM A234 GR.WP9
Component : TEE
Codes : ASME B16.9
Manufact. : SMLS
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 : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	22
Compared with:	2	28 Feb 02	

TEE	30"	36"	CALC	TEE
Material : ASTM A234 GR.WP9 Component : TEE Codes : ASME B16.9 Manufact. : WELDED Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				

TEE	16"	24"	SCH. 60	TEEJ
552EP0018 Material : ASTM A234 GR.WP9 Component : TEE Codes : ASME B16.9 Manufact. : SMLS Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				

TEE	10"	14"	SCH. XS	TEEJ
552EP0019 Material : ASTM A234 GR.WP9 Component : TEE Codes : ASME B16.9 Manufact. : SMLS Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				

TEE	10"	24"	SCH. 80	TEEK
552EP0020 Material : ASTM A234 GR.WP9 Component : TEE Codes : ASME B16.9 Manufact. : SMLS Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				

RED.TEE	1/2"	2"		TER
552FI0001 Material : ASTM A182 GR.F9 Component : REDUCER TEE Codes : ASME B16.11 Ends : S.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2 Rating : 6000#				

* 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 : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	23
Compared with:	2	28 Feb 02	

CONC.SWAGE 1/2" 2" **SCH. 160** **CSA**
552SU0001

Material : ASTM A335 GR.P9
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. 160** **CSC**
552SU0002

Material : ASTM A335 GR.P9
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. 160** **ESA**
552SU0003

Material : ASTM A335 GR.P9
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. 160** **ESC**
552SU0004

Material : ASTM A335 GR.P9
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. XS** **ELBBW**
552WI0004

Material : ASTM A182 GR.F9
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 : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	24
Compared with:	2	28 Feb 02	

ELBOLET BW 10" 24" CALC ELBBW

Material : ASTM A182 GR.F9
 Component : ELBOLET
 Codes : MSS SP97
 Ends : **B.W.**
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

ELBOLET 10" 14" SCH. XS ELBJ
 552WI0004

Material : ASTM A182 GR.F9
 Component : ELBOLET
 Codes : MSS SP97
 Ends : **B.W.**
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

ELBOLET 10" 24" SCH. 80 ELBK
 552WI0008

Material : ASTM A182 GR.F9
 Component : ELBOLET
 Codes : MSS SP97
 Ends : **B.W.**
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

ELBOLET SW 1/2" 36" ELBS
 552LI0004

Material : ASTM A182 GR.F9
 Component : ELBOLET
 Codes : MSS SP97
 Ends : **S.W.**
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2
 Rating : **6000#**

SOCKOLET 1/2" 36" SOL
 552LI0002

Material : ASTM A182 GR.F9
 Component : SOCKOLET
 Codes : MSS SP97
 Ends : **S.W.**
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2
 Rating : **6000#**

* 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 : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	25
Compared with:	2	28 Feb 02	

WELDOLET 3" 8" **SCH. XS** **WOL**
 552WI0006

Material : ASTM A182 GR.F9
 Component : WELDOLET
 Codes : MSS SP97
 Ends : **B.W.**
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

WELDOLET 10" 24" **CALC** **WOL**

Material : ASTM A182 GR.F9
 Component : WELDOLET
 Codes : MSS SP97
 Ends : **B.W.**
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

WELDOLET 10" 14" **SCH. XS** **WOLJ**
 552WI0006

Material : ASTM A182 GR.F9
 Component : WELDOLET
 Codes : MSS SP97
 Ends : **B.W.**
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

WELDOLET 10" 24" **SCH. 80** **WOLK**
 552WI0007

Material : ASTM A182 GR.F9
 Component : WELDOLET
 Codes : MSS SP97
 Ends : **B.W.**
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

WELDOLET 8" 14" **SCH. 80**
 552WI0009 **SCH. XS** **WOLKJ**

Material : ASTM A182 GR.F9
 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 : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	26
Compared with:	2	28 Feb 02	

LATROLET BW 3" 8" **SCH. XS** **LATBW**
552WI0005

Material : ASTM A182 GR.F9
Component : LATROLET
Codes : MSS SP97
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

LATROLET BW 10" 14" **CALC** **LATBW**

Material : ASTM A182 GR.F9
Component : LATROLET
Codes : MSS SP97
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

LATROLET 10" 14" **SCH. XS** **LATJ**
552WI0005

Material : ASTM A182 GR.F9
Component : LATROLET
Codes : MSS SP97
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

LATROLET SW 1/2" 36" **LATS**
552LI0005

Material : ASTM A182 GR.F9
Component : LATROLET
Codes : MSS SP97
Ends : **S.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2
Rating : **6000#**

FULL CPLG. 1/2" 2" **CPL**
552HI0007

Material : ASTM A182 GR.F9
Component : FULL COUPLING
Codes : ASME B16.11
Rating : **6000#**
Ends : **S.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 : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	27
Compared with:		2	28 Feb 02

Y STRAINER 592Yt0002	1/2"	2"	YST
<p>Body Mat'l : ASTM A217 GR.C12 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.</p>			

TEMP. CONIC. 592TC0003	2"	24"	TCS
<p>Rating : 600# Codes : ASME B16.5 Ends : RF Material : 316 SS. CONICAL SCREEN. Mesh size : 14 GA PERFORATED PLATE WITH 1/8" DIA. HOLES ON 3/16" CENTERS, 200% OPEN AREA.</p>			

FIGURE 8 562FS0003	6"	12"	F8F
<p>Material : ASTM A387 GR.9 CL.1 Codes : ASME B16.48 Rating : 600# Ends : RF Face finish : ASME B16.5 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2</p>			

PADDLE BLIND 562PS0003	1"	4"	PBL
<p>Material : ASTM A387 GR.9 CL.1 Codes : ASME B16.48 Rating : 600# Ends : RF Face finish : ASME B16.5 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2</p>			

* Client codes only, not including sizes



Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	28
Compared with:	2	28 Feb 02	

PADDLE BLIND 14" 24" **PBL**
562PS0003

Material : ASTM A387 GR.9 CL.1
Codes : ASME B16.48
Rating : 600#
Ends : RF
Face finish : ASME B16.5
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

PAD.B16.47/B 30" 36" **PAD7B**
562PS0006

Material : ASTM A387 GR.9 CL.1
Codes : ASME B16.47 "B" (EX API-605)
Rating : 600#
Ends : RF
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

DRIP RING 1" 12" **DR**
562DS0003

Material : ASTM A387 GR.9 CL.1
Codes : ASME B16.48
Rating : 600#
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**
562RS0003

Material : ASTM A387 GR.9 CL.1
Codes : ASME B16.48
Rating : 600#
Ends : RF
Face finish : ASME B16.5
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

SPACER RING 14" 24" **SPA**
562RS0003

Material : ASTM A387 GR.9 CL.1
Codes : ASME B16.48
Rating : 600#
Ends : RF
Face finish : ASME B16.5
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

* 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 : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	29
Compared with:	2	28 Feb 02	

SPA.R.47/B 562RS0006	30"	36"	SPA7B
Material : ASTM A387 GR.9 CL.1 Codes : ASME B16.47 "B" (EX API-605) Rating : 600# Ends : RF Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2			
STUD BOLTS 572SC0002	1/2"	4"	STU
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 574SC0012	30"	36"	GA1
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 : 600# 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 574SC0011	30"	36"	GA2
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 : 600# 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
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Table with Piping Material Specification header and a 2x3 grid of Client Ref., Rev. No., Issue Date, and Page information.

GASKET 1/2" 24" GAS
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 1/2" 2" GAS1
574SA0005

Material : SPIRAL WOUND SS.304/GRAPHITE
Codes : DIMENSIONS PER ASME B16.20
Thickness : 3.2 MM (1/8")
Rating : 1500#
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 3" 24" GAS1
574SA0004

Material : SPIRAL WOUND SS.304/GRAPHITE
Codes : DIMENSIONS PER ASME B16.20
Thickness : 3.2 MM (1/8")
Rating : 900#
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

GASK. SPIR.W 1/2" 24" GASK
574SC0015

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 / 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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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	31
Compared with:	2	28 Feb 02	

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.) Dets 'GAF' And 'GAF1' Are To Be Used At Flanged Equipment Or When Required At Instrument.
- 3.) 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.
- 4.) Check Valves When Installed In The Horizontal Position Shall Be Bonnet Cover Up & Those Install In The Vertical Position Shall Be Flow Up Only.
- 5.) Gear Operated Valves Shall Be Used When Indicated On The EFD'S.
- 6.) A Minimum Of 0.10" 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.
- 7.) Heat Treatment Noted Is For General Fabrication. Weld Size For Fillet And/Or Branch Connections Shall Be 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.
- 8.) Where Pipe Schedule Is Shown, It Is Adequate For The Design Conditions Listed In Temp/Press Limits . Where "CALC" Is Shown, The Pressure Limit May Be Lower Than Flange Rating. See The Project Line List And Applicable Piping Drawing For Details.
- 9.) 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.
- 10.) Pipe And Components > 1/2" Thickness May Require Impact Tested Materials When The Minimum Design Metal Temperature Is Below 100F ASME B31.3 Para. 323.2.2.
- 11.) All Fabrication Shall Comply With 52A1.
- 12.) Pipe Supports And Spring Hangers Shall Comply With 59A2 And 59A3 Respectively.
- 13.) 'BEP' Nipples Shall Be Cut From Pipe.
- 14.) 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.
- 15.) Use Union Or Coupling To Join Pipe. Flanged Joint To Be Used Only Where Indicated On EFD'S.
- 16.) Couplings Shall Not Be Used For Branch Connections Use Inline Only.
- 17.) Use Flat Face Valve, Flange & Full Face Gasket To Mate With Flat Face Nozzles Only.
- 18.) Flanges Shall Not Be Insulated.
- 19.) Temperature Instrument Connection Shall Be NPS 1-1/2" Flanged.
- 20.) Pressure Instrument Connection Shall Be NPS 3/4" Socket-weld.
- 21.) 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.

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Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : DG5A			
Client Ref.	Rev. No.	Issue Date	Page
VALERO	3	03 Jun 02	32
Compared with:	2	28 Feb 02	

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

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

24.) Det 'GASK' To Be Used For Coke Drum Inlet & Overhead Lines.

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

26.) Remove Temporary Strainers After Flushing.

END OF DOCUMENT

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Foster Wheeler USA Corporation

Piping Material Specification

Spec. No.: 10087902-SP-50-03
Class: DG5A

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) : DG5A																				
MATERIAL (S) : 9CR-1MO, SMLS, ASTM A335 GR P9											P/SE :		C.A. : 0.125"							
9CR-1MO, EFW, ASTM A691 GR. 9CR. CL.22																				
DESIGN LIMIT (S) : 1500 PSIG AT -20F TO 100F; 505 PSIG AT 1000F 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	160	T																		
3/4	160	RT	T																	
1	160	RT	RT	T																
1 1/2	160	RT	RT	RT	T															
2	160	RT	RT	RT	RT	T														
3	SPEC	SK	SK	SK	SK	SK	T													
4	SPEC	SK	SK	SK	SK	SK	W	T												
6	SPEC	SK	SK	SK	SK	SK	W	W	T											
8	SPEC	SK	SK	SK	SK	SK	W	W	W	T										
10	SPEC	SK	SK	SK	SK	SK	W	W	W	W	T									
12	SPEC	SK	SK	SK	SK	SK	W	W	W	W	W	T								
14	SPEC	SK	SK	SK	SK	SK	W	W	W	W	W	W	T							
16	SPEC	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	T						
18	SPEC	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	T					
20	SPEC	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	CA	T				
24	SPEC	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.