

PETRONAS TECHNICAL STANDARDS

DESIGN AND ENGINEERING PRACTICE

MANUAL

PIPING CLASSES - EXPLORATION AND PRODUCTION

CLASS 150

PTS 31.38.01.15

January 2010



PREFACE

PETRONAS Technical Standards (PTS) publications reflect the views, at the time of publication, of PETRONAS OPUs/Divisions.

They are based on the experience acquired during the involvement with the design, construction, operation and maintenance of processing units and facilities. Where appropriate they are based on, or reference is made to, national and international standards and codes of practice.

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PIPING CLASSES - CLASS 150

The piping class files below are embedded MS-Word files.

To open a file, double-click on the desired piping class (if you are viewing the PDF version of this document, open the MS-Word version of this document and double-click on the desired piping class).

Amended per
Circular 43/07 (Class 13430 added)

CLASS 11412
CLASS 11422
CLASS 11432
CLASS 11440
CLASS 11441
CLASS 11450
CLASS 11460
CLASS 11472
CLASS 11482
CLASS 11492
CLASS 11502
CLASS 11503
CLASS 13411
CLASS 13421
CLASS 13430
CLASS 13451
CLASS 13461
CLASS 13620
CLASS 13625
CLASS 13831
CLASS 13832
CLASS 13833
CLASS 13834
CLASS 16410
CLASS 16620

CLASS 11412

Design limits

	Temperature (°C)					
	0	50	75	100	125	150
Pressure (Bar ga)						
DN 15- 600	19.6	19.2	18.4	17.7	16.7	15.8

Notes

- Design limits acc. to ASME B16.5 flange rating mat. grp 1.1
- API 5L-B welded pipe (erw and saw) is normally the most economic choice
- For bending of pipe see PTS 31.38.01.31.
- For basis of design see PTS 31.38.01.10.
- The use of red. bore ball valves is considered most economical. Use full bore ball valves only when necessary for process/operating requirements
- Piston type check valves (DN 15-40) for horizontal mounting only
- The use of triple eccentric butterfly valves and dual plate check valves is considered most economical. Use gate valves and swing check valves only where fouling and abrasion are negatively affecting their functionality

Table of schedules

DN	Schedule
15	80
20	80
25	80
40	80
50	40
80	40
100	40
150	40
200	20
250	20
300	20
350	20
400	20
450	20
500	20
600	20

Branch connections 90 degrees

Run size	Branch Size															
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
600	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A
500	C	C	C	C	D	D	D	D	D	D	D	D	D	D	A	
450	C	C	C	C	E	D	D	D	E	B	B	B	B	A		
400	C	C	C	C	D	D	D	D	D	D	D	D	D	A		
350	C	C	C	C	D	D	D	D	D	D	D	A				
300	C	C	C	C	D	D	D	D	D	D	A					
250	C	C	C	C	D	D	D	D	D	A						
200	C	C	C	C	D	D	D	D	A							
150	C	C	C	C	D	D	D	A								
100	C	C	C	C	D	D	A									
80	C	C	C	C	D	A										
50	C	C	B	B	A											
40	C	B	B	A												
25	B	B	A													
20	B	A														
15	A															

Code	Explanation of characters
A	Equal tee
B	Reducing tee
C	Branch fitting
D	Pipe to pipe
E	Branch outlet

Carbon steel		Plant
Class no.	11412	Consignee
ASME rating	CLASS 150	Engineered by
Corrosion allowance	1 mm	Principal
Revision letter	O	Contr. job no.
Revision date	01/2006	Project no.

COMPONENT MATERIAL DESCRIPTION
(For full material description see relevant MES C buying description.)

Pipe

PIPE	Pipe	DN 15-600	ASTM A106-B
PISM	Pipe (API 5L-B sml)	DN 15-100	API 5L-B (sml)
PIWE	Pipe (API 5L-B erw)	DN 150-500	API 5L-B (erw)
PIWS	Pipe (API 5L-B saw)	DN 600-600	API 5L-B (saw)

Flanges

BLFL	Blind flange	DN 15-600	ASTM A105
LJFL	Lap joint flange	---	ASTM A105
SBFL	Spectacle blind	DN 15-400	ASTM A516-60/65/70
SPFL	Spade	DN 15-600	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-600	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-600	ASTM A105

Fittings

CAPB	Cap bw	DN 15-600	ASTM A234-WPB
E45B	Elbow 45 deg bw	DN 15-600	ASTM A234-WPB
E90B	Elbow 90 deg bw	DN 15-600	ASTM A234-WPB
TEEB	Tee equal bw	DN 15-600	ASTM A234-WPB

Reducing fittings

BNIF	Branch fitting flgd	DN 15-40	ASTM A105
BNIP	Branch fitting plain	DN 15-40	ASTM A105
BROB	Branch outlet bw	DN 150-600	ASTM A105
RECB	Reducer concentric bw	DN 20-600	ASTM A234-WPB
REEB	Reducer eccentric bw	DN 20-600	ASTM A234-WPB
TERB	Tee reducing bw	DN 20-600	ASTM A234-WPB

Valves

BAFF	Ball valve 17292 FB flgd	DN 15-250	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, PTFE
BARF	Ball valve 17292 RB flgd	DN 15-250	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, PTFE
BTFF	Ball valve 14313 FB flgd	DN 300-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, PTFE
BTRF	Ball valve 14313 RB flgd	DN 300-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, PTFE
BUTF	Butterfly valve triple ex flgd	DN 200-600	Body: ASTM A216-WCB/WCC Trim: CS, Duplex, Stellite
CHDF	Check valve dual plate flgd	DN 300-600	Body: ASTM A216-WCB/WCC Trim: AISI 410
CHVF	Check valve flgd	DN 15-40	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
CHVF	Check valve flgd	DN 50-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 410
GAVF	Gate valve flgd	DN 15-40	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GAVF	Gate valve flgd	DN 50-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 410
GLVF	Globe valve flgd	DN 15-40	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GLVF	Globe valve flgd	DN 50-200	Body: ASTM A105/A216-WCB/WCC Trim: AISI 410
MSBF	Monofl single block ball	DN 15-50	Body: ASTM A350-LF2 Trim: AISI 316, PTFE
VDBT	Valve ass doub block ball thrd	---	Body: ASTM A350-LF2 Trim: AISI 316, PTFE

Instruments

TWND	Thermowell	DN 40-40	ASTM B564 UNS N04400
TWNL	Thermowell L=255 mm	---	ASTM B564 UNS N04400
TWNS	Thermowell L=230 mm	---	ASTM B564 UNS N04400

Miscellaneous

GKSW	Gasket spiral wound	DN 15-600	AISI 316, graphite filled CS centring-/SS inner ring
MTRR	Meterrun	DN 15-40	Alloy 400/ASTM A350-LF2 end flanges
ORFS	Orifice flange set	DN 50-600	ASTM A105
ST1B	Strainer Y-type (1 mm ca)	DN 50-400	Sieve: AISI 316
STBT	Studbolt with nuts	---	ASTM A193-B7/A194-2H



PIPING COMPONENTS

Item description	MESC	Nominal pipe size															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
Pipe																	
Pipe	743005	0181	0281	0381	0581	0691	1031	1491	2111	2391	2791	3191	3731	4211	4691	5211	5691
Pipe (API 5L-B erw)	741314								2111	2391	2791	3191	3731	4211	4691	5211	
Pipe (API 5L-B saw)	741317																5691
Pipe (API 5L-B sml)	741312	0181	0281	0381	0581	0691	1031	1491									
Flanges																	
Blind flange	766211	0581	0621	0661	0681	0701	0721	0741	0761	0781	0801	0821	0841	0861	0881	0901	0921
Spacer ring	768816	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261	0281	0301	0321
Spade	768813	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261	0281	0301	0321
Spectacle blind	768803	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261			
Welding neck flange	766278	3521	3541	3561	3581	3101	3121	3141	3161	2081	2101	2121	2141	2161	2181	2201	2241
Fittings																	
Cap bw	763019	0181	0241	0301	0381	0551	0751	0951	1151	1321	1521	1721	1921	2121	2321	2551	2751
Elbow 45 deg bw	763038	5681	5741	5801	5881	6051	6251	6451	6651	6821	7021	7221	7421	7621	7821	8051	8251
Elbow 90 deg bw	763040	5681	5741	5801	5881	6051	6251	6451	6651	6821	7021	7221	7421	7621	7821	8051	8251
Tee equal bw	763084	5681	5741	5801	5881	6051	6251	6451	6651	6821	7021	7221	7421	7621	7821	8051	8251
Valves																	
Ball valve 14313 FB flgd	770067											5171	5181	5191	5201	5211	5231
Ball valve 14313 RB flgd	770067											0171	0181	0191	0201	0211	0231
Ball valve 17292 FB flgd	770025	5031	5041	5051	5071	5081	5101	5121	5141	5151	5161						
Ball valve 17292 RB flgd	770025	0031	0041	0051	0071	0081	0101	0121	0141	0151	0161						
Butterfly valve triple ex flgd	774130									0151	0161	0171	0181	0191	0201	0211	0231
Check valve dual plate flgd	776711											0171	0181	0191	0201	0211	0231
Check valve flgd	771005	3031	3041	3051	3071												
Check valve flgd	771020					0081	0101	0121	0141	0151	0161	0171	0181	0191	0201	0211	0231
Gate valve flgd	772004	3031	3041	3051	3071												
Gate valve flgd	772020					0081	0101	0121	0141	0151	0161	0171	0181	0191	0201	0211	0231
Globe valve flgd	773005	3031	3041	3051	3071												
Globe valve flgd	773020					0081	0101	0121	0141	0151							
Monofl single block ball	770095	4031	4041	4051	4071	4081											
Miscellaneous																	
Gasket spiral wound	854136	3041	3061	3081	3121	3141	3181	3201	3241	3261	3281	3301	3321	3341	3361	3381	3421
Meterrun	766496	0521	0541	0561	0581												
Orifice flange set	766295					0811	0821	0231	0241	0031	0041	0051	0061	0071	0081	0091	0101
Steamer Y-type (1 mm ca)	768319					4021	4041	4061	4081	3971	3981	4221	4001	4241			

REDUCING/PIPING COMPONENTS

Run	x	Br	BROB	RECB	REEB	TERB	Run	x	Br	BROB	RECB	REEB	TERB	Branch	Run	pipe	BNIF	BNIP
20	x	15		7630721371	7630731371	7630890351	400	x	50	7679002781				15	40	- 40	7680370611	7680310361
25	x	15		7630721471	7630731471	7630890451	400	x	80	7679002901				15	50	- 50	7680370631	7680310371
25	x	20		7630721571	7630731571	7630890551	400	x	100	7679003021				15	80	- 200	7680370641	7680310381
40	x	15		7630721671	7630731671		400	x	150	7679003171				15	250	- 600	7680370651	7680310391
40	x	20		7630721771	7630731771	7630890751	400	x	200	7679001901	7630724541	7630734541		20	50	- 50	7680370661	7680310401
40	x	25		7630721871	7630731871	7630890851	400	x	250		7630724631	7630734631	7630895031	20	80	- 100	7680370671	7680310411
50	x	20		7629461921	7629611921		400	x	300		7630724701	7630734701	7630895291	20	150	- 300	7680370691	7680310431
50	x	25		7630721961	7630731961	7630891091	400	x	350		7630724821	7630734821	7630895541	20	350	- 600	7680370711	7680310441
50	x	40		7630722061	7630732061	7630891181	450	x	50	7679002791				25	80	- 80	7680370731	7680310451
80	x	40		7630722261	7630732261		450	x	80	7679002911				25	100	- 100	7680370751	7680310461
80	x	50		7630722351	7630732351	7630891321	450	x	100	7679003031				25	150	- 250	7680370761	7680310471
100	x	40		7630722501	7630732501		450	x	150	7679003131				25	300	- 600	7680370771	7680310491
100	x	50		7630722651	7630732651	7630891531	450	x	200	7679001911				40	80	- 80	7680370791	7680310511
100	x	80		7630722751	7630732751	7630891651	450	x	250		7630725201	7630735201	7630896021	40	100	- 100	7680370801	7680310521
150	x	50	7679008141				450	x	300		7630725501	7630735501	7630896261	40	150	- 150	7680370821	7680310531
150	x	80		7630722951	7630732951	7630891771	450	x	350		7630725811	7630735811	7630896501	40	200	- 300	7680370831	7680310551
150	x	100		7630723051	7630733051	7630891891	450	x	400		7630726111	7630736111	7630896741	40	350	- 600	7680370851	7680310571
200	x	50	7679002741				500	x	50	7679002801				Thermowell Length MESC number				
200	x	80	7679002861				500	x	80	7679002921								
200	x	100		7630723221	7630733221	7630892101	500	x	100	7679003041				230			7683375111	
200	x	150		7630723331	7630733331	7630892301	500	x	150	7679003141				255			7683375121	
250	x	50	7679002751				500	x	200	7679001921				305			7683375131	
250	x	80	7679002871				500	x	250	7679001991				355			7683375141	
250	x	100		7629463401	7629613401	7630892581	500	x	300		7630726401	7630736401	7630897461	405			7683375151	
250	x	150		7630723531	7630733531	7630892761	500	x	350		7630726711	7630736711	7630897701	455			7683375161	
250	x	200		7630723611	7630733611	7630892891	500	x	400		7630727011	7630737011	7630897941					
300	x	50	7679002761				500	x	450		7630727311	7630737311	7630898181					
300	x	80	7679002881				600	x	50	7679002821								
300	x	100	7679003001				600	x	80	7679002941								
300	x	150		7630723861	7630733861	7630893151	600	x	100	7679003061								
300	x	200		7630723921	7630733921	7630893261	600	x	150	7679003161								
300	x	250		7630724021	7630734021	7630893481	600	x	200	7679001941								
350	x	50	7679002771				600	x	250	7679002001								
350	x	80	7679002891				600	x	300				7630898661					
350	x	100	7679003011				600	x	350				7630898901					
350	x	150	7679003111	7629466001	7629616001		600	x	400		7630728811	7630738811	7630899141					
350	x	200		7630724231	7630734231	7630893881	600	x	450		7630729111	7630739111	7630899381					
350	x	250		7630724301	7630734301	7630894131	600	x	500		7630729411	7630739411	7630899621					
350	x	300		7630724421	7630734421	7630894391												

Comp.name Description

BNIF	Branch fitting flgd
BNIP	Branch fitting plain
BROB	Branch outlet bw
RECB	Reducer concentric bw
REEB	Reducer eccentric bw
TERB	Tee reducing bw

BOLTING

Boltset standard flange

DN	nr	inch	x mm	MESC number
15	4	1/2	x 60	8138611531
20	4	1/2	x 70	8138611551
25	4	1/2	x 70	8138611551
40	4	1/2	x 80	8138611571
50	4	5/8	x 90	8138612711
80	4	5/8	x 100	8138612731
100	8	5/8	x 100	8138612731
150	8	3/4	x 110	8138613301
200	8	3/4	x 110	8138613301
250	12	7/8	x 120	8138614011
300	12	7/8	x 120	8138614011
350	12	1	x 140	8138614691
400	16	1	x 140	8138614691
450	16	1 1/8	x 150	8138615291
500	20	1 1/8	x 160	8138615301
600	20	1 1/4	x 180	8138615901

Boltset meter run

DN	nr	inch	x mm	MESC number
15	4	1/2	x 120	8138611641
20	4	1/2	x 120	8138611641
25	4	1/2	x 130	8138611671
40	4	1/2	x 130	8138611671

Boltset orifice flange

DN	nr	inch	x mm	MESC number
50	8	5/8	x 130	8138612781
80	8	3/4	x 140	8138613351
100	8	3/4	x 150	8138613371
150	12	3/4	x 150	8138613371
200	12	7/8	x 170	8138614091
250	16	1	x 190	8138614771
300	16	1 1/8	x 210	8138615381
350	20	1 1/8	x 220	8138615401
400	20	1 1/4	x 230	8138615981
450	24	1 1/4	x 250	8138615861
500	24	1 1/4	x 260	8138616031
600	24	1 1/2	x 290	8138617121

Boltset blind/spacer

DN	nr	inch	x mm	MESC number
15	4	1/2	x 70	8138611551
20	4	1/2	x 80	8138611571
25	4	1/2	x 80	8138611571
40	4	1/2	x 80	8138611571
50	4	5/8	x 100	8138612731
80	4	5/8	x 110	8138612741
100	8	5/8	x 110	8138612741
150	8	3/4	x 120	8138613321
200	8	3/4	x 130	8138613341
250	12	7/8	x 140	8138614041
300	12	7/8	x 150	8138614061
350	12	1	x 160	8138614721
400	16	1	x 170	8138614741
450	16	1 1/8	x 180	8138615331
500	20	1 1/8	x 200	8138615251
600	20	1 1/4	x 220	8138615971

ASSEMBLIES

Drain/vent point DN 15 Fig.I DN15 - 15

Branch: according to branch table		
Blind flange	1	7662110581
Welding neck flange	1	7662783521
Gasket spiral wound	1	8541363041
Studbolt with nuts	4	8138611531

Drain/vent point DN 20 Fig.I DN20 - 40

Branch: according to branch table		
Blind flange	1	7662110621
Welding neck flange	1	7662783541
Gasket spiral wound	1	8541363061
Studbolt with nuts	4	8138611551

Drain/vent point DN 20 Fig.H DN50 - 50

Branch: branch nipple flanged		
Blind flange	1	7662110621
Gasket spiral wound	1	8541363061
Studbolt with nuts	4	8138611551

Drain/vent point DN 25 Fig.H DN80 - 300

Branch: branch nipple flanged		
Blind flange	1	7662110661
Gasket spiral wound	1	8541363081
Studbolt with nuts	4	8138611551

Drain/vent point DN 40 Fig.H DN350 - 600

Branch: branch nipple flanged		
Blind flange	1	7662110681
Gasket spiral wound	1	8541363121
Studbolt with nuts	4	8138611571

Meter run connection DN 15 Fig.AA DN15 - 40

Branch: not applicable		
Valve ass doub block ball thrd	2	7785470031
Gasket spiral wound	2	8541363041

Orifice connection DN 15 Fig.AB DN50 - 600

Branch: not applicable		
Valve ass doub block ball thrd	2	7785470031
Welding neck flange	2	7662783521
Gasket spiral wound	2	8541363041

PI on piping cl coup DN 15 Fig.CB DN15 - 40

Branch: according to branch table		
Valve ass doub block ball thrd	1	7785470031
Welding neck flange	1	7662783521
Gasket spiral wound	1	8541363041

PI on piping cl coup DN 15 Fig.CA DN50 - 600

Branch: branch nipple flanged		
Valve ass doub block ball thrd	1	7785470031
Gasket spiral wound	1	8541363041

PI on piping remote DN 15 Fig.AB DN15 - 40

Branch: according to branch table		
Valve ass doub block ball thrd	1	7785470031
Welding neck flange	1	7662783521
Gasket spiral wound	1	8541363041

PI on piping remote DN 15 Fig.AA DN50 - 600

Branch: branch nipple flanged		
Valve ass doub block ball thrd	1	7785470031
Gasket spiral wound	1	8541363041

Temperature instrum DN 40 Fig.NS DN80 - 100

Branch: branch nipple flanged		
Lap joint flange	1	7662202181
Gasket spiral wound	1	8541363121
Thermowell L=230 mm	1	7683375111
Studbolt with nuts	4	8138611591

Temperature instrum DN 40 Fig.NL DN150 - 600

Branch: branch nipple flanged		
Lap joint flange	1	7662202181
Gasket spiral wound	1	8541363121
Thermowell L=255 mm	1	7683375121
Studbolt with nuts	4	8138611591



CLASS 11422

Design limits

	Temperature (°C)					
	0	50	75	100	125	150
Pressure (Bar ga)						
DN 15- 600	19.6	19.2	18.4	17.7	16.7	15.8

Notes

- Design limits acc. to ASME B16.5 flange rating mat. grp 1.1
- For bending of pipe see PTS 31.38.01.31.
- For basis of design see PTS 31.38.01.10.
- The use of red. bore ball valves is considered most economical. Use full bore ball valves only when necessary for process/operating requirements
- Piston type check valves (DN 15-40) for horizontal mounting only
- The use of triple eccentric butterfly valves and dual plate check valves is considered most economical. Use gate valves and swing check valves only where fouling and abrasion are negatively affecting their functionality

Table of schedules

DN	Schedule
15	80
20	80
25	80
40	80
50	40
80	40
100	40
150	40
200	20
250	20
300	20
350	20
400	20
450	20
500	20
600	20

Branch connections 90 degrees

Run size	Branch Size															
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
600	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A
500	C	C	C	C	D	D	D	D	D	D	D	D	D	D	A	
450	C	C	C	C	E	D	D	D	E	B	B	B	B	A		
400	C	C	C	C	D	D	D	D	D	D	D	D	D	A		
350	C	C	C	C	D	D	D	D	D	D	D	A				
300	C	C	C	C	D	D	D	D	D	D	A					
250	C	C	C	C	D	D	D	D	D	A						
200	C	C	C	C	D	D	D	D	A							
150	C	C	C	C	D	D	D	A								
100	C	C	C	C	D	D	A									
80	C	C	C	C	D	A										
50	C	C	B	B	A											
40	C	B	B	A												
25	B	B	A													
20	B	A														
15	A															

Code	Explanation of characters
A	Equal tee
B	Reducing tee
C	Branch fitting
D	Pipe to pipe
E	Branch outlet

Carbon steel Sour		Plant
Class no.	11422	Consignee
ASME rating	CLASS 150	Engineered by
Corrosion allowance	1 mm	Principal
Revision letter	O	Contr. job no.
Revision date	01/2006	Project no.

COMPONENT MATERIAL DESCRIPTION
(For full material description see relevant MES C buying description.)

Pipe

PIPE	Pipe	DN 15-600	ASTM A106-B
------	------	-----------	-------------

Flanges

BLFL	Blind flange	DN 15-600	ASTM A105
LJFL	Lap joint flange	---	ASTM A105
SBFL	Spectacle blind	DN 15-400	ASTM A516-60/65/70
SPFL	Spade	DN 15-600	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-600	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-600	ASTM A105

Fittings

CAPB	Cap bw	DN 15-600	ASTM A234-WPB
E45B	Elbow 45 deg bw	DN 15-600	ASTM A234-WPB
E90B	Elbow 90 deg bw	DN 15-600	ASTM A234-WPB
TEEB	Tee equal bw	DN 15-600	ASTM A234-WPB

Reducing fittings

BNIF	Branch fitting flgd	DN 15-40	ASTM A105
BNIP	Branch fitting plain	DN 15-40	ASTM A105
BROB	Branch outlet bw	DN 150-600	ASTM A105
RECB	Reducer concentric bw	DN 20-600	ASTM A234-WPB
REEB	Reducer eccentric bw	DN 20-600	ASTM A234-WPB
TERB	Tee reducing bw	DN 20-600	ASTM A234-WPB

Valves

BAFF	Ball valve 17292 FB flgd	DN 15-250	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, PTFE
BARF	Ball valve 17292 RB flgd	DN 15-250	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, PTFE
BTFF	Ball valve 14313 FB flgd	DN 300-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, PTFE
BTRF	Ball valve 14313 RB flgd	DN 300-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, PTFE
BUTF	Butterfly valve triple ex flgd	DN 200-600	Body: ASTM A216-WCB/WCC Trim: CS, Duplex, Stellite
CHDF	Check valve dual plate flgd	DN 300-600	Body: ASTM A216-WCB/WCC Trim: AISI 316, Stellite 6
CHVF	Check valve flgd	DN 15-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GAVF	Gate valve flgd	DN 15-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GLVF	Globe valve flgd	DN 15-200	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
MSBF	Monofl single block ball	DN 15-50	Body: ASTM A350-LF2 Trim: AISI 316, PTFE
VDBT	Valve ass doub block ball thrd	---	Body: ASTM A350-LF2 Trim: AISI 316, PTFE

Instruments

TWND	Thermowell	DN 40-40	ASTM B564 UNS N04400
TWNL	Thermowell L=255 mm	---	ASTM B564 UNS N04400
TWNS	Thermowell L=230 mm	---	ASTM B564 UNS N04400

Miscellaneous

GKSW	Gasket spiral wound	DN 15-600	AISI 316, graphite filled CS centring-/SS inner ring
MTRR	Meterrun	DN 15-40	Alloy 400/ASTM A350-LF2 end flanges
ORFS	Orifice flange set	DN 50-600	ASTM A105
ST1B	Strainer Y-type (1 mm ca)	DN 50-400	Sieve: AISI 316
STBT	Studbolt with nuts	---	ASTM A193-B7M/A194-2HM

PIPING COMPONENTS

Item description	Nominal MESC	pipe size															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
Pipe																	
Pipe	743003	0181	0281	0381	0581	0691	1031	1491	2111	2391	2791	3191	3731	4211	4691	5211	5691
Flanges																	
Blind flange	766211	0581	0621	0661	0681	0701	0721	0741	0761	0781	0801	0821	0841	0861	0881	0901	0921
Spacer ring	768846	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261	0281	0301	0321
Spade	768842	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261	0281	0301	0321
Spectacle blind	768837	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261			
Welding neck flange	766278	3521	3541	3561	3581	3101	3121	3141	3161	2081	2101	2121	2141	2161	2181	2201	2241
Fittings																	
Cap bw	763017	5681	5741	5801	5881	6051	6251	6451	6651	6821	7021	7221	7421	7621	7821	8051	8251
Elbow 45 deg bw	763034	5681	5741	5801	5881	6051	6251	6451	6651	6821	7021	7221	7421	7621	7821	8051	8251
Elbow 90 deg bw	763042	5681	5741	5801	5881	6051	6251	6451	6651	6821	7021	7221	7421	7621	7821	8051	8251
Tee equal bw	763081	5681	5741	5801	5881	6051	6251	6451	6651	6821	7021	7221	7421	7621	7821	8051	8251
Valves																	
Ball valve 14313 FB flgd	770067											5171	5181	5191	5201	5211	5231
Ball valve 14313 RB flgd	770067											0171	0181	0191	0201	0211	0231
Ball valve 17292 FB flgd	770025	5031	5041	5051	5071	5081	5101	5121	5141	5151	5161						
Ball valve 17292 RB flgd	770025	0031	0041	0051	0071	0081	0101	0121	0141	0151	0161						
Butterfly valve triple ex flgd	774131									0151	0161	0171	0181	0191	0201	0211	0231
Check valve dual plate flgd	776716											0171	0181	0191	0201	0211	0231
Check valve flgd	771005	3031	3041	3051	3071	0081	0101	0121	0141	0151	0161	0171	0181	0191	0201	0211	0231
Gate valve flgd	772004	3031	3041	3051	3071	0081	0101	0121	0141	0151	0161	0171	0181	0191	0201	0211	0231
Globe valve flgd	773005	3031	3041	3051	3071	0081	0101	0121	0141	0151							
Monofl single block ball	770095	4031	4041	4051	4071	4081											
Miscellaneous																	
Gasket spiral wound	854136	3041	3061	3081	3121	3141	3181	3201	3241	3261	3281	3301	3321	3341	3361	3381	3421
Meterrun	766496	0521	0541	0561	0581												
Orifice flange set	766295					0811	0821	0231	0241	0031	0041	0051	0061	0071	0081	0091	0101
Strainer Y-type (1 mm ca)	768322					0021	0041	0061	0081	1051	1061	0221	1081	0241			

REDUCING/PIPING COMPONENTS

Run	x	Br	BROB	RECB	REEB	TERB	Run	x	Br	BROB	RECB	REEB	TERB	Branch	Run	pipe	BNIF	BNIP
20	x	15		7630661371	7630671371	7630880351	400	x	50	7679002781				15	40	- 40	7680370611	7680310361
25	x	15		7630661471	7630671471	7630880451	400	x	80	7679002901				15	50	- 50	7680370631	7680310371
25	x	20		7630661571	7630671571	7630880551	400	x	100	7679003021				15	80	- 200	7680370641	7680310381
40	x	15		7630661671	7630671671		400	x	150	7679003171				15	250	- 600	7680370651	7680310391
40	x	20		7630661771	7630671771	7630880751	400	x	200	7679001901	7630664541	7630674541		20	50	- 50	7680370661	7680310401
40	x	25		7630661871	7630671871	7630880851	400	x	250		7630664631	7630674631	7630885031	20	80	- 100	7680370671	7680310411
50	x	20		7630661931	7629621931		400	x	300		7630664701	7630674701	7630885291	20	150	- 300	7680370691	7680310431
50	x	25		7630661961	7630671961	7630881091	400	x	350		7630664821	7630674821	7630885541	20	350	- 600	7680370711	7680310441
50	x	40		7630662061	7630672061	7630881181	450	x	50	7679002791				25	80	- 80	7680370731	7680310451
80	x	40		7630662261	7630672261		450	x	80	7679002911				25	100	- 100	7680370751	7680310461
80	x	50		7630662351	7630672351	7630881321	450	x	100	7679003031				25	150	- 250	7680370761	7680310471
100	x	40		7630662501	7630672501		450	x	150	7679003131				25	300	- 600	7680370771	7680310491
100	x	50		7630662651	7630672651	7630881531	450	x	200	7679001911				40	80	- 80	7680370791	7680310511
100	x	80		7630662751	7630672751	7630881651	450	x	250		7630665201	7630675201	7630886021	40	100	- 100	7680370801	7680310521
150	x	50	7679008141				450	x	300		7630665501	7630675501	7630886261	40	150	- 150	7680370821	7680310531
150	x	80		7630662951	7630672951	7630881771	450	x	350		7630665811	7630675811	7630886501	40	200	- 300	7680370831	7680310551
150	x	100		7630663051	7630673051	7630881891	450	x	400		7630666111	7630676111	7630886741	40	350	- 600	7680370851	7680310571
200	x	50	7679002741				500	x	50	7679002801				Thermowell Length MESC number				
200	x	80	7679002861				500	x	80	7679002921								
200	x	100		7630663221	7630673221	7630882101	500	x	100	7679003041				230			7683375111	
200	x	150		7630663331	7630673331	7630882301	500	x	150	7679003141				255			7683375121	
250	x	50	7679002751				500	x	200	7679001921				305			7683375131	
250	x	80	7679002871				500	x	250	7679001991				355			7683375141	
250	x	100		7629473401	7629623401	7630882581	500	x	300		7630666401	7630676401	7630887461	405			7683375151	
250	x	150		7630663531	7630673531	7630882761	500	x	350		7630666711	7630676711	7630887701	455			7683375161	
250	x	200		7630663611	7630673611	7630882891	500	x	400		7630667011	7630677011	7630887941					
300	x	50	7679002761				500	x	450		7630667311	7630677311	7630888181					
300	x	80	7679002881				600	x	50	7679002821								
300	x	100	7679003001				600	x	80	7679002941								
300	x	150		7630663861	7630673861	7630883151	600	x	100	7679003061								
300	x	200		7630663921	7630673921	7630883261	600	x	150	7679003161								
300	x	250		7630664021	7630674021	7630883481	600	x	200	7679001941								
350	x	50	7679002771				600	x	250	7679002001								
350	x	80	7679002891				600	x	300				7630888661					
350	x	100	7679003011				600	x	350				7630888901					
350	x	150	7679003111	7629476001	7629626001		600	x	400		7630668811	7630678811	7630889141					
350	x	200		7630664231	7630674231	7630883881	600	x	450		7630669111	7630679111	7630889381					
350	x	250		7630664301	7630674301	7630884131	600	x	500		7630669411	7630679411	7630889621					
350	x	300		7630664421	7630674421	7630884391												

Comp.name Description

BNIF	Branch fitting flgd
BNIP	Branch fitting plain
BROB	Branch outlet bw
RECB	Reducer concentric bw
REEB	Reducer eccentric bw
TERB	Tee reducing bw

BOLTING

Boltset standard flange

DN	nr	inch	x mm	MESC number
15	4	1/2	x 60	8138661531
20	4	1/2	x 70	8138661551
25	4	1/2	x 70	8138661551
40	4	1/2	x 80	8138661571
50	4	5/8	x 90	8138662711
80	4	5/8	x 100	8138662731
100	8	5/8	x 100	8138662731
150	8	3/4	x 110	8138663301
200	8	3/4	x 110	8138663301
250	12	7/8	x 120	8138664011
300	12	7/8	x 120	8138664011
350	12	1	x 140	8138664691
400	16	1	x 140	8138664691
450	16	1 1/8	x 150	8138665291
500	20	1 1/8	x 160	8138665301
600	20	1 1/4	x 180	8138665901

Boltset meter run

DN	nr	inch	x mm	MESC number
15	4	1/2	x 120	8138661641
20	4	1/2	x 120	8138661641
25	4	1/2	x 130	8138661661
40	4	1/2	x 130	8138661661

Boltset orifice flange

DN	nr	inch	x mm	MESC number
50	8	5/8	x 130	8138662781
80	8	3/4	x 140	8138663351
100	8	3/4	x 150	8138663371
150	12	3/4	x 150	8138663371
200	12	7/8	x 170	8138664091
250	16	1	x 190	8138664771
300	16	1 1/8	x 210	8138665381
350	20	1 1/8	x 220	8138665401
400	20	1 1/4	x 230	8138665981
450	24	1 1/4	x 250	8138666091
500	24	1 1/4	x 260	8138666031
600	24	1 1/2	x 290	8138666801

Boltset blind/spacer

DN	nr	inch	x mm	MESC number
15	4	1/2	x 70	8138661551
20	4	1/2	x 80	8138661571
25	4	1/2	x 80	8138661571
40	4	1/2	x 80	8138661571
50	4	5/8	x 100	8138662731
80	4	5/8	x 110	8138662741
100	8	5/8	x 110	8138662741
150	8	3/4	x 120	8138663321
200	8	3/4	x 130	8138663341
250	12	7/8	x 140	8138664041
300	12	7/8	x 150	8138664061
350	12	1	x 160	8138664721
400	16	1	x 170	8138664741
450	16	1 1/8	x 180	8138665331
500	20	1 1/8	x 200	8138665251
600	20	1 1/4	x 220	8138665971

ASSEMBLIES

Drain/vent point DN 15 Fig.I DN15 - 15

Branch: according to branch table		
Blind flange	1	7662110581
Welding neck flange	1	7662783521
Gasket spiral wound	1	8541363041
Studbolt with nuts	4	8138661531

Drain/vent point DN 20 Fig.I DN20 - 40

Branch: according to branch table		
Blind flange	1	7662110621
Welding neck flange	1	7662783541
Gasket spiral wound	1	8541363061
Studbolt with nuts	4	8138661551

Drain/vent point DN 20 Fig.H DN50 - 50

Branch: branch nipple flanged		
Blind flange	1	7662110621
Gasket spiral wound	1	8541363061
Studbolt with nuts	4	8138661551

Drain/vent point DN 25 Fig.H DN80 - 300

Branch: branch nipple flanged		
Blind flange	1	7662110661
Gasket spiral wound	1	8541363081
Studbolt with nuts	4	8138661551

Drain/vent point DN 40 Fig.H DN350 - 600

Branch: branch nipple flanged		
Blind flange	1	7662110681
Gasket spiral wound	1	8541363121
Studbolt with nuts	4	8138661571

Meter run connection DN 15 Fig.AA DN15 - 40

Branch: not applicable		
Valve ass doub block ball thrd	2	7785470031
Gasket spiral wound	2	8541363041

Orifice connection DN 15 Fig.AB DN50 - 600

Branch: not applicable		
Valve ass doub block ball thrd	2	7785470031
Welding neck flange	2	7662783521
Gasket spiral wound	2	8541363041

PI on piping cl coup DN 15 Fig.CB DN15 - 40

Branch: according to branch table		
Valve ass doub block ball thrd	1	7785470031
Welding neck flange	1	7662783521
Gasket spiral wound	1	8541363041

PI on piping cl coup DN 15 Fig.CA DN50 - 600

Branch: branch nipple flanged		
Valve ass doub block ball thrd	1	7785470031
Gasket spiral wound	1	8541363041

PI on piping remote DN 15 Fig.AB DN15 - 40

Branch: according to branch table		
Valve ass doub block ball thrd	1	7785470031
Welding neck flange	1	7662783521
Gasket spiral wound	1	8541363041

PI on piping remote DN 15 Fig.AA DN50 - 600

Branch: branch nipple flanged		
Valve ass doub block ball thrd	1	7785470031
Gasket spiral wound	1	8541363041

Temperature instrum DN 40 Fig.NS DN80 - 100

Branch: branch nipple flanged		
Lap joint flange	1	7662202181
Gasket spiral wound	1	8541363121
Thermowell L=230 mm	1	7683375111
Studbolt with nuts	4	8138661591

Temperature instrum DN 40 Fig.NL DN150 - 600

Branch: branch nipple flanged		
Lap joint flange	1	7662202181
Gasket spiral wound	1	8541363121
Thermowell L=255 mm	1	7683375121
Studbolt with nuts	4	8138661591



CLASS 11432

Design limits

	Temperature (°C)					
	0	50	75	100	125	150
Pressure (Bar ga)						
DN 15- 600	19.6	19.2	18.4	17.7	16.7	15.8

Notes

- Design limits acc. to ASME B16.5 flange rating mat. grp 1.1
- For bending of pipe see PTS 31.38.01.31.
- For basis of design see PTS 31.38.01.10.
- The use of red. bore ball valves is considered most economical. Use full bore ball valves only when necessary for process/operating requirements
- Piston type check valves (DN 15-40) for horizontal mounting only
- The use of triple eccentric butterfly valves and dual plate check valves is considered most economical. Use gate valves and swing check valves only where fouling and abrasion are negatively affecting their functionality

Table of schedules

DN	Schedule
15	160
20	160
25	160
40	160
50	80
80	80
100	40
150	40
200	30
250	30
300	30
350	20
400	20
450	20
500	20
600	20

Branch connections 90 degrees

Run size	Branch Size															
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
600	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A
500	C	C	C	C	E	E	E	E	E	E	B	B	B	B	A	
450	C	C	C	C	E	E	E	E	E	E	B	B	B	A		
400	C	C	C	C	E	E	E	E	E	E	B	B	B	A		
350	C	C	C	C	E	E	E	E	B	B	B	A				
300	C	C	C	C	E	D	E	B	B	B	A					
250	C	C	C	C	D	D	D	D	D	A						
200	C	C	C	C	D	D	D	D	A							
150	C	C	C	C	D	D	D	A								
100	C	C	C	C	D	D	A									
80	C	C	C	C	D	A										
50	C	C	B	B	A											
40	C	B	B	A												
25	B	B	A													
20	B	A														
15	A															

Code	Explanation of characters
A	Equal tee
B	Reducing tee
C	Branch fitting
D	Pipe to pipe
E	Branch outlet

Carbon steel		Plant
Class no.	11432	Consignee
ASME rating	CLASS 150	Engineered by
Corrosion allowance	3 mm	Principal
Revision letter	O	Contr. job no.
Revision date	01/2006	Project no.

COMPONENT MATERIAL DESCRIPTION
(For full material description see relevant MES C buying description.)

Pipe

PIPE	Pipe	DN 15-600	ASTM A106-B
PISM	Pipe (API 5L-B sml)	DN 15-350	API 5L-B (sml)
PIWS	Pipe (API 5L-B saw)	DN 400-600	API 5L-B (saw)

Flanges

BLFL	Blind flange	DN 15-600	ASTM A105
LJFL	Lap joint flange	---	ASTM A105
SBFL	Spectacle blind	DN 15-400	ASTM A516-60/65/70
SPFL	Spade	DN 15-600	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-600	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-600	ASTM A105

Fittings

CAPB	Cap bw	DN 15-600	ASTM A234-WPB
E45B	Elbow 45 deg bw	DN 15-600	ASTM A234-WPB
E90B	Elbow 90 deg bw	DN 15-600	ASTM A234-WPB
TEEB	Tee equal bw	DN 15-600	ASTM A234-WPB

Reducing fittings

BNIF	Branch fitting flgd	DN 15-40	ASTM A105
BNIP	Branch fitting plain	DN 15-40	ASTM A105
BROB	Branch outlet bw	DN 150-600	ASTM A105
RECB	Reducer concentric bw	DN 20-600	ASTM A234-WPB
REEB	Reducer eccentric bw	DN 20-600	ASTM A234-WPB
TERB	Tee reducing bw	DN 20-600	ASTM A234-WPB

Valves

BAFF	Ball valve 17292 FB flgd	DN 15-250	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, PTFE
BARF	Ball valve 17292 RB flgd	DN 15-250	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, PTFE
BTFF	Ball valve 14313 FB flgd	DN 300-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, PTFE
BTRF	Ball valve 14313 RB flgd	DN 300-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, PTFE
BUTF	Butterfly valve triple ex flgd	DN 200-600	Body: ASTM A216-WCB/WCC Trim: CS, Duplex, Stellite
CHDF	Check valve dual plate flgd	DN 300-600	Body: ASTM A216-WCB/WCC Trim: AISI 410
CHVF	Check valve flgd	DN 15-40	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
CHVF	Check valve flgd	DN 50-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 410
GAVF	Gate valve flgd	DN 15-40	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GAVF	Gate valve flgd	DN 50-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 410
GLVF	Globe valve flgd	DN 15-40	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GLVF	Globe valve flgd	DN 50-200	Body: ASTM A105/A216-WCB/WCC Trim: AISI 410
MSBF	Monofl single block ball	DN 15-50	Body: ASTM A350-LF2 Trim: AISI 316, PTFE
VDBT	Valve ass doub block ball thrd	---	Body: ASTM A350-LF2 Trim: AISI 316, PTFE

Instruments

TWND	Thermowell	DN 40-40	ASTM B564 UNS N04400
TWNL	Thermowell L=255 mm	---	ASTM B564 UNS N04400
TWNS	Thermowell L=230 mm	---	ASTM B564 UNS N04400

Miscellaneous

GKSW	Gasket spiral wound	DN 15-600	AISI 316, graphite filled CS centring-/SS inner ring
MTRR	Meterrun	DN 15-40	Alloy 400/ASTM A350-LF2 end flanges
ORFS	Orifice flange set	DN 50-600	ASTM A105
ST3B	Strainer Y-type (3 mm ca)	DN 50-400	Sieve: AISI 316
STBT	Studbolt with nuts	---	ASTM A193-B7/A194-2H



PIPING COMPONENTS

Item description	Nominal pipe size															
	MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600
Pipe																
Pipe	743005	0201	0301	0401	0601	0711	1091	1491	2111	2411	2831	3251	3731		4211	5691
Pipe (API 5L-B saw)	741317														4191	5691
Pipe (API 5L-B sml)	741312	0201	0301	0401	0601	0711	1091	1491	2111	2411	2831	3251	3731			
Flanges																
Blind flange	766211	0581	0621	0661	0681	0701	0721	0741	0761	0781	0801	0821	0841	0861	0881	0921
Spacer ring	768816	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261	0281	0321
Spade	768813	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261	0281	0321
Spectacle blind	768803	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261		
Welding neck flange	766278	4021	4041	4061	4081	3601	3621	3141	3161	2581	2601	2621	2141	2161	2181	2241
Fittings																
Cap bw	763019	0221	0281	0321	0421	0581	0781	0951	1151	1331	1531	1731	1921	2121	2321	2751
Elbow 45 deg bw	763038	5721	5781	5821	5921	6081	6281	6451	6651	6831	7031	7231	7421	7621	7821	8251
Elbow 90 deg bw	763040	5721	5781	5821	5921	6081	6281	6451	6651	6831	7031	7231	7421	7621	7821	8251
Tee equal bw	763084	5721	5781	5821	5921	6081	6281	6451	6651	6831	7031	7231	7421	7621	7821	8251
Valves																
Ball valve 14313 FB flgd	770067											5171	5181	5191	5201	5231
Ball valve 14313 RB flgd	770067											0171	0181	0191	0201	0231
Ball valve 17292 FB flgd	770025	5031	5041	5051	5071	5081	5101	5121	5141	5151	5161					
Ball valve 17292 RB flgd	770025	0031	0041	0051	0071	0081	0101	0121	0141	0151	0161					
Butterfly valve triple ex flgd	774130									0151	0161	0171	0181	0191	0201	0231
Check valve dual plate flgd	776711											0171	0181	0191	0201	0231
Check valve flgd	771005	3031	3041	3051	3071											
Check valve flgd	771020					0081	0101	0121	0141	0151	0161	0171	0181	0191	0201	0231
Gate valve flgd	772004	3031	3041	3051	3071											
Gate valve flgd	772020					0081	0101	0121	0141	0151	0161	0171	0181	0191	0201	0231
Globe valve flgd	773005	3031	3041	3051	3071											
Globe valve flgd	773020					0081	0101	0121	0141	0151						
Monofl single block ball	770095	4031	4041	4051	4071	4081										
Miscellaneous																
Gasket spiral wound	854136	3041	3061	3081	3121	3141	3181	3201	3241	3261	3281	3301	3321	3341	3361	3421
Meter run	766496	0521	0541	0561	0581											
Orifice flange set	766295					1051	1061	0231	0241	0131	0141	0151	0061	0071	0081	0101
Strainer Y-type (3 mm ca)	768319					4261	4281	4061	4081	4451	4461	4471	4481	4491		

REDUCING/PIPING COMPONENTS

Run	x	Br	BROB	RECB	REEB	TERB	Run	x	Br	BROB	RECB	REEB	TERB	Branch	Run	pipe	BNIF	BNIP
20	x	15		7630721411	7630731411	7630890391	400	x	50	7679017481				15	40	- 600	7680370211	7680310161
25	x	15		7630721511	7630731511	7630890491	400	x	80	7679017601				20	50	- 50	7680370221	7680310171
25	x	20		7630721611	7630731611	7630890591	400	x	100	7679003021				20	80	- 150	7680370241	7680310191
40	x	15		7630721711	7630731711		400	x	150	7679003171				20	200	- 600	7680370271	7680310211
40	x	20		7630721811	7630731811	7630890791	400	x	200	7679001081	7629468251	7629617731		25	80	- 250	7680370281	7680310221
40	x	25		7630721911	7630731911	7630890891	400	x	250		7629468701	7630734601	7630895121	25	300	- 600	7680370291	7680310231
50	x	20		7629461931	7629611931		400	x	300		7630724781	7629618751	7630895381	40	80	- 80	7680370321	7680310251
50	x	25		7630721991	7630731991	7630891111	400	x	350		7630724821	7630734821	7630895541	40	100	- 200	7680370331	7680310271
50	x	40		7630722081	7630732081	7630891201	450	x	50	7679017491				40	250	- 500	7680370341	7680310291
80	x	40		7630722291	7630732291		450	x	80	7679017611				40	600	- 600	7680370351	7680310301
80	x	50		7630722371	7630732371	7630891331	450	x	100	7679003031				Thermowell Length MESC number				
100	x	40		7630722521	7630732491		450	x	150	7679003131								
100	x	50		7630722661	7630732661	7630891571	450	x	200	7679001091								
100	x	80		7630722761	7630732761	7630891691	450	x	250		7630725321	7630735321	7630896101					
150	x	50	7679010641				450	x	300		7630725621	7630735621	7630896341	230	7683375111			
150	x	80		7630722961	7630732961	7630891811	450	x	350		7630725811	7630735811	7630896501	255	7683375121			
150	x	100		7630723051	7630733051	7630891891	450	x	400		7630726111	7630736111	7630896741	305	7683375131			
200	x	50	7679012631				500	x	50	7679017501				355	7683375141			
200	x	80	7679012751				500	x	80	7679017621				405	7683375151			
200	x	100		7630723241	7630733241	7630892111	500	x	100	7679003041				455	7683375161			
200	x	150		7630723341	7630733341	7630892311	500	x	150	7679003141								
250	x	50	7679012641				500	x	200	7679001101								
250	x	80	7679012761				500	x	250	7679001171								
250	x	100		7629463421	7629613421	7630892591	500	x	300		7630726521	7630736521	7630897541					
250	x	150		7630723521	7630733521	7630892771	500	x	350		7630726711	7630736711	7630897701					
250	x	200		7630723631	7630733631	7630892901	500	x	400		7630727011	7630737011	7630897941					
300	x	50	7679012651				500	x	450		7630727311	7630737311	7630898181					
300	x	80	7679012771				600	x	50	7679017511								
300	x	100	7679003921				600	x	80	7679017631								
300	x	150		7630723811	7630733811	7630893161	600	x	100	7679003061								
300	x	200		7630723941	7630733941	7630893271	600	x	150	7679003161								
300	x	250		7630724031	7630734031	7630893491	600	x	200	7679001111								
350	x	50	7679017471				600	x	250	7679001181								
350	x	80	7679017591				600	x	300				7630898741					
350	x	100	7679003011				600	x	350				7630898901					
350	x	150	7679003111	7629466001	7629616001		600	x	400		7630728811	7630738811	7630899141					
350	x	200		7629466451	7629616371	7630893971	600	x	450		7630729111	7630739111	7630899381					
350	x	250		7630724321	7630734311	7630894221	600	x	500		7630729411	7630739411	7630899621					
350	x	300		7629467151	7629616871	7630894481												

Comp.name Description

BNIF	Branch fitting flgd
BNIP	Branch fitting plain
BROB	Branch outlet bw
RECB	Reducer concentric bw
REEB	Reducer eccentric bw
TERB	Tee reducing bw

BOLTING

Boltset standard flange

DN	nr	inch	x mm	MESC number
15	4	1/2	x 60	8138611531
20	4	1/2	x 70	8138611551
25	4	1/2	x 70	8138611551
40	4	1/2	x 80	8138611571
50	4	5/8	x 90	8138612711
80	4	5/8	x 100	8138612731
100	8	5/8	x 100	8138612731
150	8	3/4	x 110	8138613301
200	8	3/4	x 110	8138613301
250	12	7/8	x 120	8138614011
300	12	7/8	x 120	8138614011
350	12	1	x 140	8138614691
400	16	1	x 140	8138614691
450	16	1 1/8	x 150	8138615291
500	20	1 1/8	x 160	8138615301
600	20	1 1/4	x 180	8138615901

Boltset meter run

DN	nr	inch	x mm	MESC number
15	4	1/2	x 120	8138611641
20	4	1/2	x 120	8138611641
25	4	1/2	x 130	8138611671
40	4	1/2	x 130	8138611671

Boltset orifice flange

DN	nr	inch	x mm	MESC number
50	8	5/8	x 130	8138612781
80	8	3/4	x 140	8138613351
100	8	3/4	x 150	8138613371
150	12	3/4	x 150	8138613371
200	12	7/8	x 170	8138614091
250	16	1	x 190	8138614771
300	16	1 1/8	x 210	8138615381
350	20	1 1/8	x 220	8138615401
400	20	1 1/4	x 230	8138615981
450	24	1 1/4	x 250	8138615861
500	24	1 1/4	x 260	8138616031
600	24	1 1/2	x 290	8138617121

Boltset blind/spacer

DN	nr	inch	x mm	MESC number
15	4	1/2	x 70	8138611551
20	4	1/2	x 80	8138611571
25	4	1/2	x 80	8138611571
40	4	1/2	x 80	8138611571
50	4	5/8	x 100	8138612731
80	4	5/8	x 110	8138612741
100	8	5/8	x 110	8138612741
150	8	3/4	x 120	8138613321
200	8	3/4	x 130	8138613341
250	12	7/8	x 140	8138614041
300	12	7/8	x 150	8138614061
350	12	1	x 160	8138614721
400	16	1	x 170	8138614741
450	16	1 1/8	x 180	8138615331
500	20	1 1/8	x 200	8138615251
600	20	1 1/4	x 220	8138615971

ASSEMBLIES

Drain/vent point DN 15 Fig.I DN15 - 15

Branch: according to branch table		
Blind flange	1	7662110581
Welding neck flange	1	7662784021
Gasket spiral wound	1	8541363041
Studbolt with nuts	4	8138611531

Drain/vent point DN 20 Fig.I DN20 - 40

Branch: according to branch table		
Blind flange	1	7662110621
Welding neck flange	1	7662784041
Gasket spiral wound	1	8541363061
Studbolt with nuts	4	8138611551

Drain/vent point DN 20 Fig.H DN50 - 50

Branch: branch nipple flanged		
Blind flange	1	7662110621
Gasket spiral wound	1	8541363061
Studbolt with nuts	4	8138611551

Drain/vent point DN 25 Fig.H DN80 - 300

Branch: branch nipple flanged		
Blind flange	1	7662110661
Gasket spiral wound	1	8541363081
Studbolt with nuts	4	8138611551

Drain/vent point DN 40 Fig.H DN350 - 600

Branch: branch nipple flanged		
Blind flange	1	7662110681
Gasket spiral wound	1	8541363121
Studbolt with nuts	4	8138611571

Meter run connection DN 15 Fig.AA DN15 - 40

Branch: not applicable		
Valve ass doub block ball thrd	2	7785470031
Gasket spiral wound	2	8541363041

Orifice connection DN 15 Fig.AB DN50 - 600

Branch: not applicable		
Valve ass doub block ball thrd	2	7785470031
Welding neck flange	2	7662784021
Gasket spiral wound	2	8541363041

PI on piping cl coup DN 15 Fig.CB DN15 - 40

Branch: according to branch table		
Valve ass doub block ball thrd	1	7785470031
Welding neck flange	1	7662784021
Gasket spiral wound	1	8541363041

PI on piping cl coup DN 15 Fig.CA DN50 - 600

Branch: branch nipple flanged		
Valve ass doub block ball thrd	1	7785470031
Gasket spiral wound	1	8541363041

PI on piping remote DN 15 Fig.AB DN15 - 40

Branch: according to branch table		
Valve ass doub block ball thrd	1	7785470031
Welding neck flange	1	7662784021
Gasket spiral wound	1	8541363041

PI on piping remote DN 15 Fig.AA DN50 - 600

Branch: branch nipple flanged		
Valve ass doub block ball thrd	1	7785470031
Gasket spiral wound	1	8541363041

Temperature instrum DN 40 Fig.NS DN80 - 100

Branch: branch nipple flanged		
Lap joint flange	1	7662202181
Gasket spiral wound	1	8541363121
Thermowell L=230 mm	1	7683375111
Studbolt with nuts	4	8138611591

Temperature instrum DN 40 Fig.NL DN150 - 600

Branch: branch nipple flanged		
Lap joint flange	1	7662202181
Gasket spiral wound	1	8541363121
Thermowell L=255 mm	1	7683375121
Studbolt with nuts	4	8138611591



CLASS 11440

Design limits

	Temperature (°C)					
	0	50	75	100	125	150
Pressure (Bar ga)						
DN 15- 600	19.6	19.2	18.4	17.7	16.7	15.8

Notes

- Design limits acc. to ASME B16.5 flange rating mat. grp 1.1
- For bending of pipe see PTS 31.38.01.31.
- For basis of design see PTS 31.38.01.10.
- The use of red. bore ball valves is considered most economical. Use full bore ball valves only when necessary for process/operating requirements
- Piston type check valves (DN 15-40) for horizontal mounting only
- The use of triple eccentric butterfly valves and dual plate check valves is considered most economical. Use gate valves and swing check valves only where fouling and abrasion are negatively affecting their functionality

Table of schedules

DN	Schedule
15	160
20	160
25	160
40	160
50	80
80	80
100	40
150	40
200	30
250	30
300	30
350	20
400	20
450	20
500	20
600	20

Branch connections 90 degrees

Run size	Branch Size															
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
600	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A
500	C	C	C	C	E	E	E	E	E	E	B	B	B	B	A	
450	C	C	C	C	E	E	E	E	E	E	B	B	B	A		
400	C	C	C	C	E	E	E	E	E	E	B	B	B	A		
350	C	C	C	C	E	E	E	E	B	B	B	A				
300	C	C	C	C	E	D	E	B	B	B	A					
250	C	C	C	C	D	D	D	D	D	A						
200	C	C	C	C	D	D	D	D	A							
150	C	C	C	C	D	D	D	A								
100	C	C	C	C	D	D	A									
80	C	C	C	C	D	A										
50	C	C	B	B	A											
40	C	B	B	A												
25	B	B	A													
20	B	A														
15	A															

Code	Explanation of characters
A	Equal tee
B	Reducing tee
C	Branch fitting
D	Pipe to pipe
E	Branch outlet

Carbon steel Sour		Plant
Class no.	11440	Consignee
ASME rating	CLASS 150	Engineered by
Corrosion allowance	3 mm	Principal
Revision letter	D	Contr. job no.
Revision date	01/2006	Project no.

COMPONENT MATERIAL DESCRIPTION

(For full material description see relevant MESD buying description.)

Pipe

PIPE	Pipe	DN 15-600	ASTM A106-B
------	------	-----------	-------------

Flanges

BLFL	Blind flange	DN 15-600	ASTM A105
LJFL	Lap joint flange	---	ASTM A105
SBFL	Spectacle blind	DN 15-400	ASTM A516-60/65/70
SPFL	Spade	DN 15-600	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-600	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-600	ASTM A105

Fittings

CAPB	Cap bw	DN 15-600	ASTM A234-WPB
E45B	Elbow 45 deg bw	DN 15-600	ASTM A234-WPB
E90B	Elbow 90 deg bw	DN 15-600	ASTM A234-WPB
TEEB	Tee equal bw	DN 15-600	ASTM A234-WPB

Reducing fittings

BNIF	Branch fitting flgd	DN 15-40	ASTM A105
BNIP	Branch fitting plain	DN 15-40	ASTM A105
BROB	Branch outlet bw	DN 150-600	ASTM A105
RECB	Reducer concentric bw	DN 20-600	ASTM A234-WPB
REEB	Reducer eccentric bw	DN 20-600	ASTM A234-WPB
TERB	Tee reducing bw	DN 20-600	ASTM A234-WPB

Valves

BAFF	Ball valve 17292 FB flgd	DN 15-250	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, PTFE
BARF	Ball valve 17292 RB flgd	DN 15-250	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, PTFE
BTFF	Ball valve 14313 FB flgd	DN 300-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, PTFE
BTRF	Ball valve 14313 RB flgd	DN 300-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, PTFE
BUTF	Butterfly valve triple ex flgd	DN 200-600	Body: ASTM A216-WCB/WCC Trim: CS, Duplex, Stellite
CHDF	Check valve dual plate flgd	DN 300-600	Body: ASTM A216-WCB/WCC Trim: AISI 316, Stellite 6
CHVF	Check valve flgd	DN 15-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GAVF	Gate valve flgd	DN 15-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GLVF	Globe valve flgd	DN 15-200	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
MSBF	Monofl single block ball	DN 15-50	Body: ASTM A350-LF2 Trim: AISI 316, PTFE
VDBT	Valve ass doub block ball thrd	---	Body: ASTM A350-LF2 Trim: AISI 316, PTFE

Instruments

TWND	Thermowell	DN 40-40	ASTM B564 UNS N04400
TWNL	Thermowell L=255 mm	---	ASTM B564 UNS N04400
TWNS	Thermowell L=230 mm	---	ASTM B564 UNS N04400

Miscellaneous

GKSW	Gasket spiral wound	DN 15-600	AISI 316, graphite filled CS centring-/SS inner ring
MTRR	Meterrun	DN 15-40	Alloy 400/ASTM A350-LF2 end flanges
ORFS	Orifice flange set	DN 50-600	ASTM A105
ST3B	Strainer Y-type (3 mm ca)	DN 50-400	Sieve: AISI 316
STBT	Studbolt with nuts	---	ASTM A193-B7M/A194-2HM

PIPING COMPONENTS

Item description	Nominal pipe size																
	MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
Pipe																	
Pipe	743003	0201	0301	0401	0601	0711	1091	1491	2111	2411	2831	3251	3731	4211	4691	5211	5691
Flanges																	
Blind flange	766211	0581	0621	0661	0681	0701	0721	0741	0761	0781	0801	0821	0841	0861	0881	0901	0921
Spacer ring	768846	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261	0281	0301	0321
Spade	768842	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261	0281	0301	0321
Spectacle blind	768837	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261			
Welding neck flange	766278	4021	4041	4061	4081	3601	3621	3141	3161	2581	2601	2621	2141	2161	2181	2201	2241
Fittings																	
Cap bw	763017	5721	5781	5821	5921	6081	6281	6451	6651	6831	7031	7231	7421	7621	7821	8051	8251
Elbow 45 deg bw	763034	5721	5781	5821	5921	6081	6281	6451	6651	6831	7031	7231	7421	7621	7821	8051	8251
Elbow 90 deg bw	763042	5721	5781	5821	5921	6081	6281	6451	6651	6831	7031	7231	7421	7621	7821	8051	8251
Tee equal bw	763081	5721	5781	5821	5921	6081	6281	6451	6651	6831	7031	7231	7421	7621	7821	8051	8251
Valves																	
Ball valve 14313 FB flgd	770067											5171	5181	5191	5201	5211	5231
Ball valve 14313 RB flgd	770067											0171	0181	0191	0201	0211	0231
Ball valve 17292 FB flgd	770025	5031	5041	5051	5071	5081	5101	5121	5141	5151	5161						
Ball valve 17292 RB flgd	770025	0031	0041	0051	0071	0081	0101	0121	0141	0151	0161						
Butterfly valve triple ex flgd	774131									0151	0161	0171	0181	0191	0201	0211	0231
Check valve dual plate flgd	776716											0171	0181	0191	0201	0211	0231
Check valve flgd	771005	3031	3041	3051	3071	0081	0101	0121	0141	0151	0161	0171	0181	0191	0201	0211	0231
Gate valve flgd	772004	3031	3041	3051	3071	0081	0101	0121	0141	0151	0161	0171	0181	0191	0201	0211	0231
Globe valve flgd	773005	3031	3041	3051	3071	0081	0101	0121	0141	0151							
Monofl single block ball	770095	4031	4041	4051	4071	4081											
Miscellaneous																	
Gasket spiral wound	854136	3041	3061	3081	3121	3141	3181	3201	3241	3261	3281	3301	3321	3341	3361	3381	3421
Meterrun	766496	0521	0541	0561	0581												
Orifice flange set	766295					1051	1061	0231	0241	0131	0141	0151	0061	0071	0081	0091	0101
Strainer Y-type (3 mm ca)	768322					0261	0281	0061	0081	0451	0461	0471	0481	0491			

REDUCING/PIPING COMPONENTS

Run	x	Br	BROB	RECB	REEB	TERB	Run	x	Br	BROB	RECB	REEB	TERB	Branch	Run	pipe	BNIF	BNIP
20	x	15		7630661411	7630671411	7630880391	400	x	50	7679017481				15	40	- 600	7680370211	7680310161
25	x	15		7630661511	7630671511	7630880491	400	x	80	7679017601				20	50	- 50	7680370221	7680310171
25	x	20		7630661611	7630671611	7630880591	400	x	100	7679003021				20	80	- 150	7680370241	7680310191
40	x	15		7630661711	7630671711		400	x	150	7679003171				20	200	- 600	7680370271	7680310211
40	x	20		7630661811	7630671811	7630880791	400	x	200	7679001081	7629478201	7629628131		25	80	- 250	7680370281	7680310221
40	x	25		7630661911	7630671911	7630880891	400	x	250		7629478691	7629628641	7630885111	25	300	- 600	7680370291	7680310231
50	x	20		7629471971	7630671931		400	x	300		7630664711	7630674711	7630885371	40	80	- 80	7680370321	7680310251
50	x	25		7630661991	7630671991	7630881111	400	x	350		7630664821	7630674821	7630885541	40	100	- 200	7680370331	7680310271
50	x	40		7630662081	7630672081	7630881201	450	x	50	7679017491				40	250	- 500	7680370341	7680310291
80	x	40		7630662291	7630672291		450	x	80	7679017611				40	600	- 600	7680370351	7680310301
80	x	50		7630662371	7630672371	7630881331	450	x	100	7679003031				Thermowell Length MESC number				
100	x	40		7630662521	7630672491		450	x	150	7679003131								
100	x	50		7630662661	7630672661	7630881571	450	x	200	7679001091				230			7683375111	
100	x	80		7629472751	7629622701	7630881691	450	x	250		7630665321	7630675321	7630886101					
150	x	50	7679010641				450	x	300		7630665621	7630675621	7630886341	255			7683375121	
150	x	80		7630662961	7630672961	7630881811	450	x	350		7630665811	7630675811	7630886501	305			7683375131	
150	x	100		7630663051	7630673051	7630881891	450	x	400		7630666111	7630676111	7630886741	355			7683375141	
200	x	50	7679012631				500	x	50	7679017501				405			7683375151	
200	x	80	7679012751				500	x	80	7679017621				455			7683375161	
200	x	100		7630663241	7630673241	7630882111	500	x	100	7679003041								
200	x	150		7630663341	7630673341	7630882311	500	x	150	7679003141								
250	x	50	7679012641				500	x	200	7679001101								
250	x	80	7679012761				500	x	250	7679001171								
250	x	100		7629473421	7629623421	7630882591	500	x	300		7630666521	7630676521	7630887541					
250	x	150		7630663521	7630673521	7630882771	500	x	350		7630666711	7630676711	7630887701					
250	x	200		7630663631	7630673631	7630882901	500	x	400		7630667011	7630677011	7630887941					
300	x	50	7679012651				500	x	450		7630667311	7630677311	7630888181					
300	x	80	7679012771				600	x	50	7679017511								
300	x	100	7679003921				600	x	80	7679017631								
300	x	150		7630663811	7630673811	7630883161	600	x	100	7679003061								
300	x	200		7630663941	7630673941	7630883271	600	x	150	7679003161								
300	x	250		7630664031	7630674031	7630883491	600	x	200	7679001111								
350	x	50	7679017471				600	x	250	7679001181								
350	x	80	7679017591				600	x	300				7630888741					
350	x	100	7679003011				600	x	350				7630888901					
350	x	150	7679003111	7629476001	7629626001		600	x	400		7630668811	7630678811	7630889141					
350	x	200		7629476391	7629626401	7630883961	600	x	450		7630669111	7630679111	7630889381					
350	x	250		7629476731	7629626731	7630884211	600	x	500		7630669411	7630679411	7630889621					
350	x	300		7630664451	7630674451	7630884471												

Comp.name Description

BNIF	Branch fitting flgd
BNIP	Branch fitting plain
BROB	Branch outlet bw
RECB	Reducer concentric bw
REEB	Reducer eccentric bw
TERB	Tee reducing bw

BOLTING

Boltset standard flange

DN	nr	inch	x mm	MESC number
15	4	1/2	x 60	8138661531
20	4	1/2	x 70	8138661551
25	4	1/2	x 70	8138661551
40	4	1/2	x 80	8138661571
50	4	5/8	x 90	8138662711
80	4	5/8	x 100	8138662731
100	8	5/8	x 100	8138662731
150	8	3/4	x 110	8138663301
200	8	3/4	x 110	8138663301
250	12	7/8	x 120	8138664011
300	12	7/8	x 120	8138664011
350	12	1	x 140	8138664691
400	16	1	x 140	8138664691
450	16	1 1/8	x 150	8138665291
500	20	1 1/8	x 160	8138665301
600	20	1 1/4	x 180	8138665901

Boltset meter run

DN	nr	inch	x mm	MESC number
15	4	1/2	x 120	8138661641
20	4	1/2	x 120	8138661641
25	4	1/2	x 130	8138661661
40	4	1/2	x 130	8138661661

Boltset orifice flange

DN	nr	inch	x mm	MESC number
50	8	5/8	x 130	8138662781
80	8	3/4	x 140	8138663351
100	8	3/4	x 150	8138663371
150	12	3/4	x 150	8138663371
200	12	7/8	x 170	8138664091
250	16	1	x 190	8138664771
300	16	1 1/8	x 210	8138665381
350	20	1 1/8	x 220	8138665401
400	20	1 1/4	x 230	8138665981
450	24	1 1/4	x 250	8138666091
500	24	1 1/4	x 260	8138666031
600	24	1 1/2	x 290	8138666801

Boltset blind/spacer

DN	nr	inch	x mm	MESC number
15	4	1/2	x 70	8138661551
20	4	1/2	x 80	8138661571
25	4	1/2	x 80	8138661571
40	4	1/2	x 80	8138661571
50	4	5/8	x 100	8138662731
80	4	5/8	x 110	8138662741
100	8	5/8	x 110	8138662741
150	8	3/4	x 120	8138663321
200	8	3/4	x 130	8138663341
250	12	7/8	x 140	8138664041
300	12	7/8	x 150	8138664061
350	12	1	x 160	8138664721
400	16	1	x 170	8138664741
450	16	1 1/8	x 180	8138665331
500	20	1 1/8	x 200	8138665251
600	20	1 1/4	x 220	8138665971

ASSEMBLIES

Drain/vent point DN 15 Fig.I DN15 - 15

Branch: according to branch table		
Blind flange	1	7662110581
Welding neck flange	1	7662784021
Gasket spiral wound	1	8541363041
Studbolt with nuts	4	8138661531

Drain/vent point DN 20 Fig.I DN20 - 40

Branch: according to branch table		
Blind flange	1	7662110621
Welding neck flange	1	7662784041
Gasket spiral wound	1	8541363061
Studbolt with nuts	4	8138661551

Drain/vent point DN 20 Fig.H DN50 - 50

Branch: branch nipple flanged		
Blind flange	1	7662110621
Gasket spiral wound	1	8541363061
Studbolt with nuts	4	8138661551

Drain/vent point DN 25 Fig.H DN80 - 300

Branch: branch nipple flanged		
Blind flange	1	7662110661
Gasket spiral wound	1	8541363081
Studbolt with nuts	4	8138661551

Drain/vent point DN 40 Fig.H DN350 - 600

Branch: branch nipple flanged		
Blind flange	1	7662110681
Gasket spiral wound	1	8541363121
Studbolt with nuts	4	8138661571

Meter run connection DN 15 Fig.AA DN15 - 40

Branch: not applicable		
Valve ass doub block ball thrd	2	7785470031
Gasket spiral wound	2	8541363041

Orifice connection DN 15 Fig.AB DN50 - 600

Branch: not applicable		
Valve ass doub block ball thrd	2	7785470031
Welding neck flange	2	7662784021
Gasket spiral wound	2	8541363041

PI on piping cl coup DN 15 Fig.CB DN15 - 40

Branch: according to branch table		
Valve ass doub block ball thrd	1	7785470031
Welding neck flange	1	7662784021
Gasket spiral wound	1	8541363041

PI on piping cl coup DN 15 Fig.CA DN50 - 600

Branch: branch nipple flanged		
Valve ass doub block ball thrd	1	7785470031
Gasket spiral wound	1	8541363041

PI on piping remote DN 15 Fig.AB DN15 - 40

Branch: according to branch table		
Valve ass doub block ball thrd	1	7785470031
Welding neck flange	1	7662784021
Gasket spiral wound	1	8541363041

PI on piping remote DN 15 Fig.AA DN50 - 600

Branch: branch nipple flanged		
Valve ass doub block ball thrd	1	7785470031
Gasket spiral wound	1	8541363041

Temperature instrum DN 40 Fig.NS DN80 - 100

Branch: branch nipple flanged		
Lap joint flange	1	7662202181
Gasket spiral wound	1	8541363121
Thermowell L=230 mm	1	7683375111
Studbolt with nuts	4	8138661591

Temperature instrum DN 40 Fig.NL DN150 - 600

Branch: branch nipple flanged		
Lap joint flange	1	7662202181
Gasket spiral wound	1	8541363121
Thermowell L=255 mm	1	7683375121
Studbolt with nuts	4	8138661591



CLASS 11441

Design limits

	Temperature (°C)					
	0	50	75	100	125	150
Pressure (Bar ga)						
DN 15- 600	19.6	19.2	18.4	17.7	16.7	15.8

Notes

- Design limits acc. to ASME B16.5 flange rating mat. grp 1.1
- For bending of pipe see PTS 31.38.01.31.
- For basis of design see PTS 31.38.01.10.
- The use of red. bore ball valves is considered most economical. Use full bore ball valves only when necessary for process/operating requirements
- Piston type check valves (DN 15-40) for horizontal mounting only
- The use of triple eccentric butterfly valves and dual plate check valves is considered most economical. Use gate valves and swing check valves only where fouling and abrasion are negatively affecting their functionality

Table of schedules

DN	Schedule
15	160
20	160
25	160
40	160
50	80
80	80
100	40
150	40
200	30
250	30
300	30
350	20
400	20
450	20
500	20
600	20

Branch connections 90 degrees

Run size	Branch Size															
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
600	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A
500	C	C	C	C	E	E	E	E	E	E	B	B	B	B	A	
450	C	C	C	C	E	E	E	E	E	E	B	B	B	A		
400	C	C	C	C	E	E	E	E	E	E	B	B	B	A		
350	C	C	C	C	E	E	E	E	B	B	B	A				
300	C	C	C	C	E	D	E	B	B	B	A					
250	C	C	C	C	D	D	D	D	D	A						
200	C	C	C	C	D	D	D	D	A							
150	C	C	C	C	D	D	D	A								
100	C	C	C	C	D	D	A									
80	C	C	C	C	D	A										
50	C	C	B	B	A											
40	C	B	B	A												
25	B	B	A													
20	B	A														
15	A															

Code	Explanation of characters
A	Equal tee
B	Reducing tee
C	Branch fitting
D	Pipe to pipe
E	Branch outlet

Carbon steel Sour		Plant
Class no.	11441	Consignee
ASME rating	CLASS 150	Engineered by
Corrosion allowance	3 mm	Principal
Revision letter	C	Contr. job no.
Revision date	01/2006	Project no.

COMPONENT MATERIAL DESCRIPTION
(For full material description see relevant MES C buying description.)

Pipe

PIPE	Pipe	DN 15-600	ASTM A106-B
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Flanges

BLFL	Blind flange	DN 15-600	ASTM A105
LJFL	Lap joint flange	---	ASTM A105
SBFL	Spectacle blind	DN 15-400	ASTM A516-60/65/70
SPFL	Spade	DN 15-600	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-600	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-600	ASTM A105

Fittings

CAPB	Cap bw	DN 15-600	ASTM A234-WPB
E45B	Elbow 45 deg bw	DN 15-600	ASTM A234-WPB
E90B	Elbow 90 deg bw	DN 15-600	ASTM A234-WPB
TEEB	Tee equal bw	DN 15-600	ASTM A234-WPB

Reducing fittings

BNIF	Branch fitting flgd	DN 15-40	ASTM A105
BNIP	Branch fitting plain	DN 15-40	ASTM A105
BROB	Branch outlet bw	DN 150-600	ASTM A105
RECB	Reducer concentric bw	DN 20-600	ASTM A234-WPB
REEB	Reducer eccentric bw	DN 20-600	ASTM A234-WPB
TERB	Tee reducing bw	DN 20-600	ASTM A234-WPB

Valves

BAFF	Ball valve 17292 FB flgd	DN 15-250	Body: ASTM A105/A216-WCB/WCC Trim: Alloy 825, PTFE
BARF	Ball valve 17292 RB flgd	DN 15-250	Body: ASTM A105/A216-WCB/WCC Trim: Alloy 825, PTFE
BTFF	Ball valve 14313 FB flgd	DN 200-600	Body: ASTM A105/A216-WCB/WCC Trim: Alloy 825, PTFE
BTRF	Ball valve 14313 RB flgd	DN 300-600	Body: ASTM A105/A216-WCB/WCC Trim: Alloy 825, PTFE
BUTF	Butterfly valve triple ex flgd	DN 200-600	Body: ASTM A216-WCB/WCC Trim: CS, Alloy 625, Stellite
CHDF	Check valve dual plate flgd	DN 300-600	Body: ASTM A216-WCB/WCC Trim: Alloy 825
CHVF	Check valve flgd	DN 15-600	Body: ASTM A105/A216-WCB/WCC Trim: Alloy 825, Stellite 6
GAVF	Gate valve flgd	DN 15-600	Body: ASTM A105/A216-WCB/WCC Trim: Alloy 825, Stellite 6
GLVF	Globe valve flgd	DN 15-200	Body: ASTM A105/A216-WCB/WCC Trim: Alloy 825, Stellite 6
MSBF	Monofl single block ball	DN 15-50	Body: ASTM A350-LF2 Trim: Alloy 825, PTFE
VDBT	Valve ass doub block ball thrd	---	Body: ASTM A350-LF2 Trim: Alloy 825, PTFE

Instruments

TWND	Thermowell	DN 40-40	ASTM B564 UNS N04400
TWNL	Thermowell L=255 mm	---	ASTM B564 UNS N04400
TWNS	Thermowell L=230 mm	---	ASTM B564 UNS N04400

Miscellaneous

GKSW	Gasket spiral wound	DN 15-600	AISI 316, graphite filled CS centring-/SS inner ring
MTRR	Meterrun	DN 15-40	Alloy 400/ASTM A350-LF2 end flanges
ORFS	Orifice flange set	DN 50-600	ASTM A105
ST3B	Strainer Y-type (3 mm ca)	DN 50-400	Sieve: AISI 316
STBT	Studbolt with nuts	---	ASTM A193-B7M/A194-2HM



PIPING COMPONENTS

Item description	Nominal pipe size															
	MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600
Pipe																
Pipe	743003	0201	0301	0401	0601	0711	1091	1491	2111	2411	2831	3251	3731	4211	4691	5211 5691
Flanges																
Blind flange	766211	0581	0621	0661	0681	0701	0721	0741	0761	0781	0801	0821	0841	0861	0881	0901 0921
Spacer ring	768846	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261	0281	0301 0321
Spade	768842	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261	0281	0301 0321
Spectacle blind	768837	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261		
Welding neck flange	766278	4021	4041	4061	4081	3601	3621	3141	3161	2581	2601	2621	2141	2161	2181	2201 2241
Fittings																
Cap bw	763017	5721	5781	5821	5921	6081	6281	6451	6651	6831	7031	7231	7421	7621	7821	8051 8251
Elbow 45 deg bw	763034	5721	5781	5821	5921	6081	6281	6451	6651	6831	7031	7231	7421	7621	7821	8051 8251
Elbow 90 deg bw	763042	5721	5781	5821	5921	6081	6281	6451	6651	6831	7031	7231	7421	7621	7821	8051 8251
Tee equal bw	763081	5721	5781	5821	5921	6081	6281	6451	6651	6831	7031	7231	7421	7621	7821	8051 8251
Valves																
Ball valve 14313 FB flgd	770091									5151	5161	5171	5181	5191	5201	5211 5231
Ball valve 14313 RB flgd	770091											0171	0181	0191	0201	0211 0231
Ball valve 17292 FB flgd	770054	5031	5041	5051	5071	5081	5101	5121	5141	5151	5161					
Ball valve 17292 RB flgd	770054	0031	0041	0051	0071	0081	0101	0121	0141	0151	0161					
Butterfly valve triple ex flgd	774142									0151	0161	0171	0181	0191	0201	0211 0231
Check valve dual plate flgd	776714											0171	0181	0191	0201	0211 0231
Check valve flgd	771043	3031	3041	3051	3071	0081	0101	0121	0141	0151	0161	0171	0181	0191	0201	0211 0231
Gate valve flgd	772053	3031	3041	3051	3071	0081	0101	0121	0141	0151	0161	0171	0181	0191	0201	0211 0231
Globe valve flgd	773053	3031	3041	3051	3071	0081	0101	0121	0141	0151						
Monofl single block ball	770097	4031	4041	4051	4071	4081										
Miscellaneous																
Gasket spiral wound	854136	3041	3061	3081	3121	3141	3181	3201	3241	3261	3281	3301	3321	3341	3361	3381 3421
Meterrun	766496	0521	0541	0561	0581											
Orifice flange set	766295					1051	1061	0231	0241	0131	0141	0151	0061	0071	0081	0091 0101
Strainer Y-type (3 mm ca)	768322					0261	0281	0061	0081	0451	0461	0471	0481	0491		

REDUCING/PIPING COMPONENTS

Run	x	Br	BROB	RECB	REEB	TERB	Run	x	Br	BROB	RECB	REEB	TERB	Branch	Run	pipe	BNIF	BNIP
20	x	15		7630661411	7630671411	7630880391	400	x	50	7679017481				15	40	- 600	7680370211	7680310161
25	x	15		7630661511	7630671511	7630880491	400	x	80	7679017601				20	50	- 50	7680370221	7680310171
25	x	20		7630661611	7630671611	7630880591	400	x	100	7679003021				20	80	- 150	7680370241	7680310191
40	x	15		7630661711	7630671711		400	x	150	7679003171				20	200	- 600	7680370271	7680310211
40	x	20		7630661811	7630671811	7630880791	400	x	200	7679001081	7629478201	7629628131		25	80	- 250	7680370281	7680310221
40	x	25		7630661911	7630671911	7630880891	400	x	250		7629478691	7629628641	7630885111	25	300	- 600	7680370291	7680310231
50	x	20		7629471971	7630671931		400	x	300		7630664711	7630674711	7630885371	40	80	- 80	7680370321	7680310251
50	x	25		7630661991	7630671991	7630881111	400	x	350		7630664821	7630674821	7630885541	40	100	- 200	7680370331	7680310271
50	x	40		7630662081	7630672081	7630881201	450	x	50	7679017491				40	250	- 500	7680370341	7680310291
80	x	40		7630662291	7630672291		450	x	80	7679017611				40	600	- 600	7680370351	7680310301
80	x	50		7630662371	7630672371	7630881331	450	x	100	7679003031				Thermowell Length MESC number				
100	x	40		7630662521	7630672491		450	x	150	7679003131								
100	x	50		7630662661	7630672661	7630881571	450	x	200	7679001091				230			7683375111	
100	x	80		7629472751	7629622701	7630881691	450	x	250		7630665321	7630675321	7630886101	255			7683375121	
150	x	50	7679010641				450	x	300		7630665621	7630675621	7630886341	305			7683375131	
150	x	80		7630662961	7630672961	7630881811	450	x	350		7630665811	7630675811	7630886501	355			7683375141	
150	x	100		7630663051	7630673051	7630881891	450	x	400		7630666111	7630676111	7630886741	405			7683375151	
200	x	50	7679012631				500	x	50	7679017501				455			7683375161	
200	x	80	7679012751				500	x	80	7679017621								
200	x	100		7630663241	7630673241	7630882111	500	x	100	7679003041								
200	x	150		7630663341	7630673341	7630882311	500	x	150	7679003141								
250	x	50	7679012641				500	x	200	7679001101								
250	x	80	7679012761				500	x	250	7679001171								
250	x	100		7629473421	7629623421	7630882591	500	x	300		7630666521	7630676521	7630887541					
250	x	150		7630663521	7630673521	7630882771	500	x	350		7630666711	7630676711	7630887701					
250	x	200		7630663631	7630673631	7630882901	500	x	400		7630667011	7630677011	7630887941					
300	x	50	7679012651				500	x	450		7630667311	7630677311	7630888181					
300	x	80	7679012771				600	x	50	7679017511								
300	x	100	7679003921				600	x	80	7679017631								
300	x	150		7630663811	7630673811	7630883161	600	x	100	7679003061								
300	x	200		7630663941	7630673941	7630883271	600	x	150	7679003161								
300	x	250		7630664031	7630674031	7630883491	600	x	200	7679001111								
350	x	50	7679017471				600	x	250	7679001181								
350	x	80	7679017591				600	x	300				7630888741					
350	x	100	7679003011				600	x	350				7630888901					
350	x	150	7679003111	7629476001	7629626001		600	x	400		7630668811	7630678811	7630889141					
350	x	200		7629476391	7629626401	7630883961	600	x	450		7630669111	7630679111	7630889381					
350	x	250		7629476731	7629626731	7630884211	600	x	500		7630669411	7630679411	7630889621					
350	x	300		7630664451	7630674451	7630884471												

Comp.name Description

BNIF	Branch fitting flgd
BNIP	Branch fitting plain
BROB	Branch outlet bw
RECB	Reducer concentric bw
REEB	Reducer eccentric bw
TERB	Tee reducing bw

BOLTING

Boltset standard flange

DN	nr	inch	x mm	MESC number
15	4	1/2	x 60	8138661531
20	4	1/2	x 70	8138661551
25	4	1/2	x 70	8138661551
40	4	1/2	x 80	8138661571
50	4	5/8	x 90	8138662711
80	4	5/8	x 100	8138662731
100	8	5/8	x 100	8138662731
150	8	3/4	x 110	8138663301
200	8	3/4	x 110	8138663301
250	12	7/8	x 120	8138664011
300	12	7/8	x 120	8138664011
350	12	1	x 140	8138664691
400	16	1	x 140	8138664691
450	16	1 1/8	x 150	8138665291
500	20	1 1/8	x 160	8138665301
600	20	1 1/4	x 180	8138665901

Boltset meter run

DN	nr	inch	x mm	MESC number
15	4	1/2	x 120	8138661641
20	4	1/2	x 120	8138661641
25	4	1/2	x 130	8138661661
40	4	1/2	x 130	8138661661

Boltset orifice flange

DN	nr	inch	x mm	MESC number
50	8	5/8	x 130	8138662781
80	8	3/4	x 140	8138663351
100	8	3/4	x 150	8138663371
150	12	3/4	x 150	8138663371
200	12	7/8	x 170	8138664091
250	16	1	x 190	8138664771
300	16	1 1/8	x 210	8138665381
350	20	1 1/8	x 220	8138665401
400	20	1 1/4	x 230	8138665981
450	24	1 1/4	x 250	8138666091
500	24	1 1/4	x 260	8138666031
600	24	1 1/2	x 290	8138666801

Boltset blind/spacer

DN	nr	inch	x mm	MESC number
15	4	1/2	x 70	8138661551
20	4	1/2	x 80	8138661571
25	4	1/2	x 80	8138661571
40	4	1/2	x 80	8138661571
50	4	5/8	x 100	8138662731
80	4	5/8	x 110	8138662741
100	8	5/8	x 110	8138662741
150	8	3/4	x 120	8138663321
200	8	3/4	x 130	8138663341
250	12	7/8	x 140	8138664041
300	12	7/8	x 150	8138664061
350	12	1	x 160	8138664721
400	16	1	x 170	8138664741
450	16	1 1/8	x 180	8138665331
500	20	1 1/8	x 200	8138665251
600	20	1 1/4	x 220	8138665971

ASSEMBLIES

Drain/vent point DN 15 Fig.I DN15 - 15

Branch: according to branch table		
Blind flange	1	7662110581
Welding neck flange	1	7662784021
Gasket spiral wound	1	8541363041
Studbolt with nuts	4	8138661531

Drain/vent point DN 20 Fig.I DN20 - 40

Branch: according to branch table		
Blind flange	1	7662110621
Welding neck flange	1	7662784041
Gasket spiral wound	1	8541363061
Studbolt with nuts	4	8138661551

Drain/vent point DN 20 Fig.H DN50 - 50

Branch: branch nipple flanged		
Blind flange	1	7662110621
Gasket spiral wound	1	8541363061
Studbolt with nuts	4	8138661551

Drain/vent point DN 25 Fig.H DN80 - 300

Branch: branch nipple flanged		
Blind flange	1	7662110661
Gasket spiral wound	1	8541363081
Studbolt with nuts	4	8138661551

Drain/vent point DN 40 Fig.H DN350 - 600

Branch: branch nipple flanged		
Blind flange	1	7662110681
Gasket spiral wound	1	8541363121
Studbolt with nuts	4	8138661571

Meter run connection DN 15 Fig.AA DN15 - 40

Branch: not applicable		
Valve ass doub block ball thrd	2	7785473031
Gasket spiral wound	2	8541363041

Orifice connection DN 15 Fig.AB DN50 - 600

Branch: not applicable		
Valve ass doub block ball thrd	2	7785473031
Welding neck flange	2	7662784021
Gasket spiral wound	2	8541363041

PI on piping cl coup DN 15 Fig.CB DN15 - 40

Branch: according to branch table		
Valve ass doub block ball thrd	1	7785473031
Welding neck flange	1	7662784021
Gasket spiral wound	1	8541363041

PI on piping cl coup DN 15 Fig.CA DN50 - 600

Branch: branch nipple flanged		
Valve ass doub block ball thrd	1	7785473031
Gasket spiral wound	1	8541363041

PI on piping remote DN 15 Fig.AB DN15 - 40

Branch: according to branch table		
Valve ass doub block ball thrd	1	7785473031
Welding neck flange	1	7662784021
Gasket spiral wound	1	8541363041

PI on piping remote DN 15 Fig.AA DN50 - 600

Branch: branch nipple flanged		
Valve ass doub block ball thrd	1	7785473031
Gasket spiral wound	1	8541363041

Temperature instrum DN 40 Fig.NS DN80 - 100

Branch: branch nipple flanged		
Lap joint flange	1	7662202181
Gasket spiral wound	1	8541363121
Thermowell L=230 mm	1	7683375111
Studbolt with nuts	4	8138661591

Temperature instrum DN 40 Fig.NL DN150 - 600

Branch: branch nipple flanged		
Lap joint flange	1	7662202181
Gasket spiral wound	1	8541363121
Thermowell L=255 mm	1	7683375121
Studbolt with nuts	4	8138661591



CLASS 11450

Design limits

	Temperature (°C)							
	0	50	75	100	125	150	175	200
Pressure (Bar ga)								
DN 15- 600	19.6	19.2	18.4	17.7	16.7	15.8	14.8	13.8

Notes

- Design limits acc. to ASME B16.5 flange rating mat. grp 1.1
- API 5L-B welded pipe (erw and saw) is normally the most economic choice
- For bending of pipe see PTS 31.38.01.31.
- For basis of design see PTS 31.38.01.10.
- Piston type check valves (DN 15-40) for horizontal mounting only
- The use of triple eccentric butterfly valves and dual plate check valves is considered most economical. Use gate valves and swing check valves only where fouling and abrasion are negatively affecting their functionality

Table of schedules

DN	Schedule
15	80
20	80
25	80
40	80
50	40
80	40
100	40
150	40
200	20
250	20
300	20
350	20
400	20
450	20
500	20
600	20

Branch connections 90 degrees

Run size	Branch Size															
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
600	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A
500	C	C	C	C	D	D	D	D	D	D	D	D	D	D	A	
450	C	C	C	C	E	D	D	D	E	B	B	B	B	A		
400	C	C	C	C	D	D	D	D	D	D	D	D	D	A		
350	C	C	C	C	D	D	D	D	D	D	D	A				
300	C	C	C	C	D	D	D	D	D	D	A					
250	C	C	C	C	D	D	D	D	D	A						
200	C	C	C	C	D	D	D	D	A							
150	C	C	C	C	D	D	D	A								
100	C	C	C	C	D	D	A									
80	C	C	C	C	D	A										
50	C	C	B	B	A											
40	C	B	B	A												
25	B	B	A													
20	B	A														
15	A															

Code	Explanation of characters
A	Equal tee
B	Reducing tee
C	Branch fitting
D	Pipe to pipe
E	Branch outlet

Carbon steel		Plant
Class no.	11450	Consignee
ASME rating	CLASS 150	Engineered by
Corrosion allowance	1 mm	Principal
Revision letter	C	Contr. job no.
Revision date	01/2006	Project no.

COMPONENT MATERIAL DESCRIPTION

(For full material description see relevant MESG buying description.)

Pipe

PIPE	Pipe	DN 15-600	ASTM A106-B
PISM	Pipe (API 5L-B sml)	DN 15-100	API 5L-B (sml)
PIWE	Pipe (API 5L-B erw)	DN 150-500	API 5L-B (erw)
PIWS	Pipe (API 5L-B saw)	DN 600-600	API 5L-B (saw)

Flanges

BLFL	Blind flange	DN 15-600	ASTM A105
LJFL	Lap joint flange	---	ASTM A105
SBFL	Spectacle blind	DN 15-400	ASTM A516-60/65/70
SPFL	Spade	DN 15-600	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-600	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-600	ASTM A105

Fittings

CAPB	Cap bw	DN 15-600	ASTM A234-WPB
E45B	Elbow 45 deg bw	DN 15-600	ASTM A234-WPB
E90B	Elbow 90 deg bw	DN 15-600	ASTM A234-WPB
TEEB	Tee equal bw	DN 15-600	ASTM A234-WPB

Reducing fittings

BNIF	Branch fitting flgd	DN 15-40	ASTM A105
BNIP	Branch fitting plain	DN 15-40	ASTM A105
BROB	Branch outlet bw	DN 150-600	ASTM A105
RECB	Reducer concentric bw	DN 20-600	ASTM A234-WPB
REEB	Reducer eccentric bw	DN 20-600	ASTM A234-WPB
TERB	Tee reducing bw	DN 20-600	ASTM A234-WPB

Valves

BUTF	Butterfly valve triple ex flgd	DN 200-600	Body: ASTM A216-WCB/WCC Trim: CS, Duplex, Stellite
CHDF	Check valve dual plate flgd	DN 300-600	Body: ASTM A216-WCB/WCC Trim: AISI 410
CHVF	Check valve flgd	DN 15-40	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
CHVF	Check valve flgd	DN 50-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 410
GAVF	Gate valve flgd	DN 15-40	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GAVF	Gate valve flgd	DN 50-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 410
GLVF	Globe valve flgd	DN 15-40	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GLVF	Globe valve flgd	DN 50-200	Body: ASTM A105/A216-WCB/WCC Trim: AISI 410

Instruments

TWND	Thermowell	DN 40-40	ASTM B564 UNS N04400
TWNL	Thermowell L=255 mm	---	ASTM B564 UNS N04400
TWNS	Thermowell L=230 mm	---	ASTM B564 UNS N04400

Miscellaneous

GKSW	Gasket spiral wound	DN 15-600	AISI 316, graphite filled CS centring-/SS inner ring
MTRR	Meterrun	DN 15-40	Alloy 400/ASTM A350-LF2 end flanges
ORFS	Orifice flange set	DN 50-600	ASTM A105
ST1B	Strainer Y-type (1 mm ca)	DN 50-400	Sieve: AISI 316
STBT	Studbolt with nuts	---	ASTM A193-B7/A194-2H



PIPING COMPONENTS

Item description	Nominal MESC	pipe size															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
Pipe																	
Pipe	743005	0181	0281	0381	0581	0691	1031	1491	2111	2391	2791	3191	3731	4211	4691	5211	5691
Pipe (API 5L-B erw)	741314								2111	2391	2791	3191	3731	4211	4691	5211	
Pipe (API 5L-B saw)	741317																5691
Pipe (API 5L-B sml)	741312	0181	0281	0381	0581	0691	1031	1491									
Flanges																	
Blind flange	766211	0581	0621	0661	0681	0701	0721	0741	0761	0781	0801	0821	0841	0861	0881	0901	0921
Spacer ring	768816	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261	0281	0301	0321
Spade	768813	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261	0281	0301	0321
Spectacle blind	768803	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261			
Welding neck flange	766278	3521	3541	3561	3581	3101	3121	3141	3161	2081	2101	2121	2141	2161	2181	2201	2241
Fittings																	
Cap bw	763019	0181	0241	0301	0381	0551	0751	0951	1151	1321	1521	1721	1921	2121	2321	2551	2751
Elbow 45 deg bw	763038	5681	5741	5801	5881	6051	6251	6451	6651	6821	7021	7221	7421	7621	7821	8051	8251
Elbow 90 deg bw	763040	5681	5741	5801	5881	6051	6251	6451	6651	6821	7021	7221	7421	7621	7821	8051	8251
Tee equal bw	763084	5681	5741	5801	5881	6051	6251	6451	6651	6821	7021	7221	7421	7621	7821	8051	8251
Valves																	
Butterfly valve triple ex flgd	774130									0151	0161	0171	0181	0191	0201	0211	0231
Check valve dual plate flgd	776711											0171	0181	0191	0201	0211	0231
Check valve flgd	771005	3031	3041	3051	3071												
Check valve flgd	771020					0081	0101	0121	0141	0151	0161	0171	0181	0191	0201	0211	0231
Gate valve flgd	772004	3031	3041	3051	3071												
Gate valve flgd	772020					0081	0101	0121	0141	0151	0161	0171	0181	0191	0201	0211	0231
Globe valve flgd	773005	3031	3041	3051	3071												
Globe valve flgd	773020					0081	0101	0121	0141	0151							
Miscellaneous																	
Gasket spiral wound	854136	3041	3061	3081	3121	3141	3181	3201	3241	3261	3281	3301	3321	3341	3361	3381	3421
Meterrun	766496	0521	0541	0561	0581												
Orifice flange set	766295					0811	0821	0231	0241	0031	0041	0051	0061	0071	0081	0091	0101
Strainer Y-type (1 mm ca)	768319					4021	4041	4061	4081	3971	3981	4221	4001	4241			

REDUCING/PIPING COMPONENTS

Run	x	Br	BROB	RECB	REEB	TERB
20	x	15		7630721371	7630731371	7630890351
25	x	15		7630721471	7630731471	7630890451
25	x	20		7630721571	7630731571	7630890551
40	x	15		7630721671	7630731671	
40	x	20		7630721771	7630731771	7630890751
40	x	25		7630721871	7630731871	7630890851
50	x	20		7629461921	7629611921	
50	x	25		7630721961	7630731961	7630891091
50	x	40		7630722061	7630732061	7630891181
80	x	40		7630722261	7630732261	
80	x	50		7630722351	7630732351	7630891321
100	x	40		7630722501	7630732501	
100	x	50		7630722651	7630732651	7630891531
100	x	80		7630722751	7630732751	7630891651
150	x	50	7679008141			
150	x	80		7630722951	7630732951	7630891771
150	x	100		7630723051	7630733051	7630891891
200	x	50	7679002741			
200	x	80	7679002861			
200	x	100		7630723221	7630733221	7630892101
200	x	150		7630723331	7630733331	7630892301
250	x	50	7679002751			
250	x	80	7679002871			
250	x	100		7629463401	7629613401	7630892581
250	x	150		7630723531	7630733531	7630892761
250	x	200		7630723611	7630733611	7630892891
300	x	50	7679002761			
300	x	80	7679002881			
300	x	100	7679003001			
300	x	150		7630723861	7630733861	7630893151
300	x	200		7630723921	7630733921	7630893261
300	x	250		7630724021	7630734021	7630893481
350	x	50	7679002771			
350	x	80	7679002891			
350	x	100	7679003011			
350	x	150	7679003111	7629466001	7629616001	
350	x	200		7630724231	7630734231	7630893881
350	x	250		7630724301	7630734301	7630894131
350	x	300		7630724421	7630734421	7630894391

Comp.name Description

BNIF	Branch fitting flgd
BNIP	Branch fitting plain
BROB	Branch outlet bw
RECB	Reducer concentric bw
REEB	Reducer eccentric bw
TERB	Tee reducing bw

Run	x	Br	BROB	RECB	REEB	TERB
400	x	50	7679002781			
400	x	80	7679002901			
400	x	100	7679003021			
400	x	150	7679003171			
400	x	200	7679001901	7630724541	7630734541	
400	x	250		7630724631	7630734631	7630895031
400	x	300		7630724701	7630734701	7630895291
400	x	350		7630724821	7630734821	7630895541
450	x	50	7679002791			
450	x	80	7679002911			
450	x	100	7679003031			
450	x	150	7679003131			
450	x	200	7679001911			
450	x	250		7630725201	7630735201	7630896021
450	x	300		7630725501	7630735501	7630896261
450	x	350		7630725811	7630735811	7630896501
450	x	400		7630726111	7630736111	7630896741
500	x	50	7679002801			
500	x	80	7679002921			
500	x	100	7679003041			
500	x	150	7679003141			
500	x	200	7679001921			
500	x	250	7679001991			
500	x	300		7630726401	7630736401	7630897461
500	x	350		7630726711	7630736711	7630897701
500	x	400		7630727011	7630737011	7630897941
500	x	450		7630727311	7630737311	7630898181
600	x	50	7679002821			
600	x	80	7679002941			
600	x	100	7679003061			
600	x	150	7679003161			
600	x	200	7679001941			
600	x	250	7679002001			
600	x	300				7630898661
600	x	350				7630898901
600	x	400		7630728811	7630738811	7630899141
600	x	450		7630729111	7630739111	7630899381
600	x	500		7630729411	7630739411	7630899621

Branch	Run	pipe	BNIF	BNIP
15	40	- 40	7680370611	7680310361
15	50	- 50	7680370631	7680310371
15	80	- 200	7680370641	7680310381
15	250	- 600	7680370651	7680310391
20	50	- 50	7680370661	7680310401
20	80	- 100	7680370671	7680310411
20	150	- 300	7680370691	7680310431
20	350	- 600	7680370711	7680310441
25	80	- 80	7680370731	7680310451
25	100	- 100	7680370751	7680310461
25	150	- 250	7680370761	7680310471
25	300	- 600	7680370771	7680310491
40	80	- 80	7680370791	7680310511
40	100	- 100	7680370801	7680310521
40	150	- 150	7680370821	7680310531
40	200	- 300	7680370831	7680310551
40	350	- 600	7680370851	7680310571

Thermowell

Length	MESC number
230	7683375111
255	7683375121
305	7683375131
355	7683375141
405	7683375151
455	7683375161

BOLTING

Boltset standard flange

DN	nr	inch	x mm	MESC number
15	4	1/2	x 60	8138611531
20	4	1/2	x 70	8138611551
25	4	1/2	x 70	8138611551
40	4	1/2	x 80	8138611571
50	4	5/8	x 90	8138612711
80	4	5/8	x 100	8138612731
100	8	5/8	x 100	8138612731
150	8	3/4	x 110	8138613301
200	8	3/4	x 110	8138613301
250	12	7/8	x 120	8138614011
300	12	7/8	x 120	8138614011
350	12	1	x 140	8138614691
400	16	1	x 140	8138614691
450	16	1 1/8	x 150	8138615291
500	20	1 1/8	x 160	8138615301
600	20	1 1/4	x 180	8138615901

Boltset meter run

DN	nr	inch	x mm	MESC number
15	4	1/2	x 120	8138611641
20	4	1/2	x 120	8138611641
25	4	1/2	x 130	8138611671
40	4	1/2	x 130	8138611671

Boltset orifice flange

DN	nr	inch	x mm	MESC number
50	8	5/8	x 130	8138612781
80	8	3/4	x 140	8138613351
100	8	3/4	x 150	8138613371
150	12	3/4	x 150	8138613371
200	12	7/8	x 170	8138614091
250	16	1	x 190	8138614771
300	16	1 1/8	x 210	8138615381
350	20	1 1/8	x 220	8138615401
400	20	1 1/4	x 230	8138615981
450	24	1 1/4	x 250	8138615861
500	24	1 1/4	x 260	8138616031
600	24	1 1/2	x 290	8138617121

Boltset blind/spacer

DN	nr	inch	x mm	MESC number
15	4	1/2	x 70	8138611551
20	4	1/2	x 80	8138611571
25	4	1/2	x 80	8138611571
40	4	1/2	x 80	8138611571
50	4	5/8	x 100	8138612731
80	4	5/8	x 110	8138612741
100	8	5/8	x 110	8138612741
150	8	3/4	x 120	8138613321
200	8	3/4	x 130	8138613341
250	12	7/8	x 140	8138614041
300	12	7/8	x 150	8138614061
350	12	1	x 160	8138614721
400	16	1	x 170	8138614741
450	16	1 1/8	x 180	8138615331
500	20	1 1/8	x 200	8138615251
600	20	1 1/4	x 220	8138615971

ASSEMBLIES

Drain/vent point DN 15 Fig.I DN15 - 15

Branch: according to branch table	
Blind flange	1 7662110581
Welding neck flange	1 7662783521
Gasket spiral wound	1 8541363041
Studbolt with nuts	4 8138611531

Drain/vent point DN 20 Fig.I DN20 - 40

Branch: according to branch table	
Blind flange	1 7662110621
Welding neck flange	1 7662783541
Gasket spiral wound	1 8541363061
Studbolt with nuts	4 8138611551

Drain/vent point DN 20 Fig.H DN50 - 50

Branch: branch nipple flanged	
Blind flange	1 7662110621
Gasket spiral wound	1 8541363061
Studbolt with nuts	4 8138611551

Drain/vent point DN 25 Fig.H DN80 - 300

Branch: branch nipple flanged	
Blind flange	1 7662110661
Gasket spiral wound	1 8541363081
Studbolt with nuts	4 8138611551

Drain/vent point DN 40 Fig.H DN350 - 600

Branch: branch nipple flanged	
Blind flange	1 7662110681
Gasket spiral wound	1 8541363121
Studbolt with nuts	4 8138611571

Meter run connection DN 15 Fig.OH DN15 - 40

Branch: not applicable	
Gate valve flgd	2 7720043031
Lap joint flange	2 7662202081
Gasket spiral wound	4 8541363041
Studbolt with nuts	8 8138611551
Studbolt with nuts	8 8138611531

Orifice connection DN 15 Fig.OI DN50 - 600

Branch: not applicable	
Gate valve flgd	2 7720043031
Lap joint flange	2 7662202081
Welding neck flange	2 7662783521
Gasket spiral wound	4 8541363041
Studbolt with nuts	8 8138611551
Studbolt with nuts	8 8138611531

Pressure instrument DN 15 Fig.OJ DN15 - 25

Branch: according to branch table	
Gate valve flgd	1 7720043031
Lap joint flange	1 7662202081
Pipe	1 7430050181
Welding neck flange	1 7662783521
Gasket spiral wound	2 8541363041
Studbolt with nuts	4 8138611551
Studbolt with nuts	4 8138611531

Pressure instrument DN 15 Fig.OH DN40 - 600

Branch: branch nipple flanged	
Gate valve flgd	1 7720043031
Lap joint flange	1 7662202081
Gasket spiral wound	2 8541363041
Studbolt with nuts	4 8138611551
Studbolt with nuts	4 8138611531

Temperature instrum DN 40 Fig.NS DN80 - 100

Branch: branch nipple flanged	
Lap joint flange	1 7662202181
Gasket spiral wound	1 8541363121
Thermowell L=230 mm	1 7683375111
Studbolt with nuts	4 8138611591

Temperature instrum DN 40 Fig.NL DN150 - 600

Branch: branch nipple flanged	
Lap joint flange	1 7662202181
Gasket spiral wound	1 8541363121
Thermowell L=255 mm	1 7683375121
Studbolt with nuts	4 8138611591



CLASS 11460

Design limits

	Temperature (°C)							
	0	50	75	100	125	150	175	200
Pressure (Bar ga)								
DN 15- 600	19.6	19.2	18.4	17.7	16.7	15.8	14.8	13.8

Notes

- Design limits acc. to ASME B16.5 flange rating mat. grp 1.1
- For bending of pipe see PTS 31.38.01.31.
- For basis of design see PTS 31.38.01.10.
- Piston type check valves (DN 15-40) for horizontal mounting only
- The use of triple eccentric butterfly valves and dual plate check valves is considered most economical. Use gate valves and swing check valves only where fouling and abrasion are negatively affecting their functionality

Table of schedules

DN	Schedule
15	80
20	80
25	80
40	80
50	40
80	40
100	40
150	40
200	20
250	20
300	20
350	20
400	20
450	20
500	20
600	20

Branch connections 90 degrees

Run size	Branch Size															
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
600	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A
500	C	C	C	C	D	D	D	D	D	D	D	D	D	D	A	
450	C	C	C	C	E	D	D	D	E	B	B	B	B	A		
400	C	C	C	C	D	D	D	D	D	D	D	D	D	A		
350	C	C	C	C	D	D	D	D	D	D	D	A				
300	C	C	C	C	D	D	D	D	D	D	A					
250	C	C	C	C	D	D	D	D	D	D	A					
200	C	C	C	C	D	D	D	D	A							
150	C	C	C	C	D	D	D	A								
100	C	C	C	C	D	D	A									
80	C	C	C	C	D	A										
50	C	C	B	B	A											
40	C	B	B	A												
25	B	B	A													
20	B	A														
15	A															

Code	Explanation of characters
A	Equal tee
B	Reducing tee
C	Branch fitting
D	Pipe to pipe
E	Branch outlet

Carbon steel Sour		Plant
Class no.	11460	Consignee
ASME rating	CLASS 150	Engineered by
Corrosion allowance	1 mm	Principal
Revision letter	C	Contr. job no.
Revision date	01/2006	Project no.

COMPONENT MATERIAL DESCRIPTION
(For full material description see relevant MES C buying description.)

Pipe

PIPE	Pipe	DN 15-600	ASTM A106-B
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Flanges

BLFL	Blind flange	DN 15-600	ASTM A105
LJFL	Lap joint flange	---	ASTM A105
SBFL	Spectacle blind	DN 15-400	ASTM A516-60/65/70
SPFL	Spade	DN 15-600	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-600	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-600	ASTM A105

Fittings

CAPB	Cap bw	DN 15-600	ASTM A234-WPB
E45B	Elbow 45 deg bw	DN 15-600	ASTM A234-WPB
E90B	Elbow 90 deg bw	DN 15-600	ASTM A234-WPB
TEEB	Tee equal bw	DN 15-600	ASTM A234-WPB

Reducing fittings

BNIF	Branch fitting flgd	DN 15-40	ASTM A105
BNIP	Branch fitting plain	DN 15-40	ASTM A105
BROB	Branch outlet bw	DN 150-600	ASTM A105
RECB	Reducer concentric bw	DN 20-600	ASTM A234-WPB
REEB	Reducer eccentric bw	DN 20-600	ASTM A234-WPB
TERB	Tee reducing bw	DN 20-600	ASTM A234-WPB

Valves

BUTF	Butterfly valve triple ex flgd	DN 200-600	Body: ASTM A216-WCB/WCC Trim: CS, Duplex, Stellite
CHDF	Check valve dual plate flgd	DN 300-600	Body: ASTM A216-WCB/WCC Trim: AISI 316, Stellite 6
CHVF	Check valve flgd	DN 15-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GAVF	Gate valve flgd	DN 15-600	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GLVF	Globe valve flgd	DN 15-200	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6

Instruments

TWND	Thermowell	DN 40-40	ASTM B564 UNS N04400
TWNL	Thermowell L=255 mm	---	ASTM B564 UNS N04400
TWNS	Thermowell L=230 mm	---	ASTM B564 UNS N04400

Miscellaneous

GKSW	Gasket spiral wound	DN 15-600	AISI 316, graphite filled CS centring-/SS inner ring
MTRR	Meterrun	DN 15-40	Alloy 400/ASTM A350-LF2 end flanges
ORFS	Orifice flange set	DN 50-600	ASTM A105
ST1B	Strainer Y-type (1 mm ca)	DN 50-400	Sieve: AISI 316
STBT	Studbolt with nuts	---	ASTM A193-B7M/A194-2HM



PIPING COMPONENTS

Item description	MESC	Nominal pipe size															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
Pipe	743003	0181	0281	0381	0581	0691	1031	1491	2111	2391	2791	3191	3731	4211	4691	5211	5691
Flanges																	
Blind flange	766211	0581	0621	0661	0681	0701	0721	0741	0761	0781	0801	0821	0841	0861	0881	0901	0921
Spacer ring	768846	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261	0281	0301	0321
Spade	768842	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261	0281	0301	0321
Spectacle blind	768837	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221	0241	0261			
Welding neck flange	766278	3521	3541	3561	3581	3101	3121	3141	3161	2081	2101	2121	2141	2161	2181	2201	2241
Fittings																	
Cap bw	763017	5681	5741	5801	5881	6051	6251	6451	6651	6821	7021	7221	7421	7621	7821	8051	8251
Elbow 45 deg bw	763034	5681	5741	5801	5881	6051	6251	6451	6651	6821	7021	7221	7421	7621	7821	8051	8251
Elbow 90 deg bw	763042	5681	5741	5801	5881	6051	6251	6451	6651	6821	7021	7221	7421	7621	7821	8051	8251
Tee equal bw	763081	5681	5741	5801	5881	6051	6251	6451	6651	6821	7021	7221	7421	7621	7821	8051	8251
Valves																	
Butterfly valve triple ex flgd	774131									0151	0161	0171	0181	0191	0201	0211	0231
Check valve dual plate flgd	776716											0171	0181	0191	0201	0211	0231
Check valve flgd	771005	3031	3041	3051	3071	0081	0101	0121	0141	0151	0161	0171	0181	0191	0201	0211	0231
Gate valve flgd	772004	3031	3041	3051	3071	0081	0101	0121	0141	0151	0161	0171	0181	0191	0201	0211	0231
Globe valve flgd	773005	3031	3041	3051	3071	0081	0101	0121	0141	0151							
Miscellaneous																	
Gasket spiral wound	854136	3041	3061	3081	3121	3141	3181	3201	3241	3261	3281	3301	3321	3341	3361	3381	3421
Meterrun	766496	0521	0541	0561	0581												
Orifice flange set	766295					0811	0821	0231	0241	0031	0041	0051	0061	0071	0081	0091	0101
Strainer Y-type (1 mm ca)	768322					0021	0041	0061	0081	1051	1061	0221	1081	0241			

REDUCING/PIPING COMPONENTS

Run	x	Br	BROB	RECB	REEB	TERB
20	x	15		7630661371	7630671371	7630880351
25	x	15		7630661471	7630671471	7630880451
25	x	20		7630661571	7630671571	7630880551
40	x	15		7630661671	7630671671	
40	x	20		7630661771	7630671771	7630880751
40	x	25		7630661871	7630671871	7630880851
50	x	20		7630661931	7629621931	
50	x	25		7630661961	7630671961	7630881091
50	x	40		7630662061	7630672061	7630881181
80	x	40		7630662261	7630672261	
80	x	50		7630662351	7630672351	7630881321
100	x	40		7630662501	7630672501	
100	x	50		7630662651	7630672651	7630881531
100	x	80		7630662751	7630672751	7630881651
150	x	50	7679008141			
150	x	80		7630662951	7630672951	7630881771
150	x	100		7630663051	7630673051	7630881891
200	x	50	7679002741			
200	x	80	7679002861			
200	x	100		7630663221	7630673221	7630882101
200	x	150		7630663331	7630673331	7630882301
250	x	50	7679002751			
250	x	80	7679002871			
250	x	100		7629473401	7629623401	7630882581
250	x	150		7630663531	7630673531	7630882761
250	x	200		7630663611	7630673611	7630882891
300	x	50	7679002761			
300	x	80	7679002881			
300	x	100	7679003001			
300	x	150		7630663861	7630673861	7630883151
300	x	200		7630663921	7630673921	7630883261
300	x	250		7630664021	7630674021	7630883481
350	x	50	7679002771			
350	x	80	7679002891			
350	x	100	7679003011			
350	x	150	7679003111	7629476001	7629626001	
350	x	200		7630664231	7630674231	7630883881
350	x	250		7630664301	7630674301	7630884131
350	x	300		7630664421	7630674421	7630884391

Comp.name Description

BNIF	Branch fitting flgd
BNIP	Branch fitting plain
BROB	Branch outlet bw
RECB	Reducer concentric bw
REEB	Reducer eccentric bw
TERB	Tee reducing bw

Run	x	Br	BROB	RECB	REEB	TERB
400	x	50	7679002781			
400	x	80	7679002901			
400	x	100	7679003021			
400	x	150	7679003171			
400	x	200	7679001901	7630664541	7630674541	
400	x	250		7630664631	7630674631	7630885031
400	x	300		7630664701	7630674701	7630885291
400	x	350		7630664821	7630674821	7630885541
450	x	50	7679002791			
450	x	80	7679002911			
450	x	100	7679003031			
450	x	150	7679003131			
450	x	200	7679001911			
450	x	250		7630665201	7630675201	7630886021
450	x	300		7630665501	7630675501	7630886261
450	x	350		7630665811	7630675811	7630886501
450	x	400		7630666111	7630676111	7630886741
500	x	50	7679002801			
500	x	80	7679002921			
500	x	100	7679003041			
500	x	150	7679003141			
500	x	200	7679001921			
500	x	250	7679001991			
500	x	300		7630666401	7630676401	7630887461
500	x	350		7630666711	7630676711	7630887701
500	x	400		7630667011	7630677011	7630887941
500	x	450		7630667311	7630677311	7630888181
600	x	50	7679002821			
600	x	80	7679002941			
600	x	100	7679003061			
600	x	150	7679003161			
600	x	200	7679001941			
600	x	250	7679002001			
600	x	300				7630888661
600	x	350				7630888901
600	x	400		7630668811	7630678811	7630889141
600	x	450		7630669111	7630679111	7630889381
600	x	500		7630669411	7630679411	7630889621

Branch	Run	pipe	BNIF	BNIP
15	40	- 40	7680370611	7680310361
15	50	- 50	7680370631	7680310371
15	80	- 200	7680370641	7680310381
15	250	- 600	7680370651	7680310391
20	50	- 50	7680370661	7680310401
20	80	- 100	7680370671	7680310411
20	150	- 300	7680370691	7680310431
20	350	- 600	7680370711	7680310441
25	80	- 80	7680370731	7680310451
25	100	- 100	7680370751	7680310461
25	150	- 250	7680370761	7680310471
25	300	- 600	7680370771	7680310491
40	80	- 80	7680370791	7680310511
40	100	- 100	7680370801	7680310521
40	150	- 150	7680370821	7680310531
40	200	- 300	7680370831	7680310551
40	350	- 600	7680370851	7680310571

Thermowell

Length	MESC number
230	7683375111
255	7683375121
305	7683375131
355	7683375141
405	7683375151
455	7683375161

BOLTING

Boltset standard flange

DN	nr	inch	x mm	MESC number
15	4	1/2	x 60	8138661531
20	4	1/2	x 70	8138661551
25	4	1/2	x 70	8138661551
40	4	1/2	x 80	8138661571
50	4	5/8	x 90	8138662711
80	4	5/8	x 100	8138662731
100	8	5/8	x 100	8138662731
150	8	3/4	x 110	8138663301
200	8	3/4	x 110	8138663301
250	12	7/8	x 120	8138664011
300	12	7/8	x 120	8138664011
350	12	1	x 140	8138664691
400	16	1	x 140	8138664691
450	16	1 1/8	x 150	8138665291
500	20	1 1/8	x 160	8138665301
600	20	1 1/4	x 180	8138665901

Boltset meter run

DN	nr	inch	x mm	MESC number
15	4	1/2	x 120	8138661641
20	4	1/2	x 120	8138661641
25	4	1/2	x 130	8138661661
40	4	1/2	x 130	8138661661

Boltset orifice flange

DN	nr	inch	x mm	MESC number
50	8	5/8	x 130	8138662781
80	8	3/4	x 140	8138663351
100	8	3/4	x 150	8138663371
150	12	3/4	x 150	8138663371
200	12	7/8	x 170	8138664091
250	16	1	x 190	8138664771
300	16	1 1/8	x 210	8138665381
350	20	1 1/8	x 220	8138665401
400	20	1 1/4	x 230	8138665981
450	24	1 1/4	x 250	8138666091
500	24	1 1/4	x 260	8138666031
600	24	1 1/2	x 290	8138666801

Boltset blind/spacer

DN	nr	inch	x mm	MESC number
15	4	1/2	x 70	8138661551
20	4	1/2	x 80	8138661571
25	4	1/2	x 80	8138661571
40	4	1/2	x 80	8138661571
50	4	5/8	x 100	8138662731
80	4	5/8	x 110	8138662741
100	8	5/8	x 110	8138662741
150	8	3/4	x 120	8138663321
200	8	3/4	x 130	8138663341
250	12	7/8	x 140	8138664041
300	12	7/8	x 150	8138664061
350	12	1	x 160	8138664721
400	16	1	x 170	8138664741
450	16	1 1/8	x 180	8138665331
500	20	1 1/8	x 200	8138665251
600	20	1 1/4	x 220	8138665971

ASSEMBLIES

Drain/vent point DN 15 Fig.I DN15 - 15

Branch: according to branch table		
Blind flange	1	7662110581
Welding neck flange	1	7662783521
Gasket spiral wound	1	8541363041
Studbolt with nuts	4	8138661531

Drain/vent point DN 20 Fig.I DN20 - 40

Branch: according to branch table		
Blind flange	1	7662110621
Welding neck flange	1	7662783541
Gasket spiral wound	1	8541363061
Studbolt with nuts	4	8138661551

Drain/vent point DN 20 Fig.H DN50 - 50

Branch: branch nipple flanged		
Blind flange	1	7662110621
Gasket spiral wound	1	8541363061
Studbolt with nuts	4	8138661551

Drain/vent point DN 25 Fig.H DN80 - 300

Branch: branch nipple flanged		
Blind flange	1	7662110661
Gasket spiral wound	1	8541363081
Studbolt with nuts	4	8138661551

Drain/vent point DN 40 Fig.H DN350 - 600

Branch: branch nipple flanged		
Blind flange	1	7662110681
Gasket spiral wound	1	8541363121
Studbolt with nuts	4	8138661551

Meter run connection DN 15 Fig.0H DN15 - 40

Branch: not applicable		
Gate valve flgd	2	7720043031
Lap joint flange	2	7662202081
Gasket spiral wound	4	8541363041
Studbolt with nuts	8	8138661551
Studbolt with nuts	8	8138661531

Orifice connection DN 15 Fig.0I DN50 - 600

Branch: not applicable		
Gate valve flgd	2	7720043031
Lap joint flange	2	7662202081
Welding neck flange	2	7662783521
Gasket spiral wound	4	8541363041
Studbolt with nuts	8	8138661551
Studbolt with nuts	8	8138661531

Pressure instrument DN 15 Fig.0J DN15 - 25

Branch: according to branch table		
Gate valve flgd	1	7720043031
Lap joint flange	1	7662202081
Pipe	1	7430030181
Welding neck flange	1	7662783521
Gasket spiral wound	2	8541363041
Studbolt with nuts	4	8138661551
Studbolt with nuts	4	8138661531

Pressure instrument DN 15 Fig.0H DN40 - 600

Branch: branch nipple flanged		
Gate valve flgd	1	7720043031
Lap joint flange	1	7662202081
Gasket spiral wound	2	8541363041
Studbolt with nuts	4	8138661551
Studbolt with nuts	4	8138661531

Temperature instrum DN 40 Fig.NS DN80 - 100

Branch: branch nipple flanged		
Lap joint flange	1	7662202181
Gasket spiral wound	1	8541363121
Thermowell L=230 mm	1	7683375111
Studbolt with nuts	4	8138661591

Temperature instrum DN 40 Fig.NL DN150 - 600

Branch: branch nipple flanged		
Lap joint flange	1	7662202181
Gasket spiral wound	1	8541363121
Thermowell L=255 mm	1	7683375121
Studbolt with nuts	4	8138661591

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