

PETRONAS TECHNICAL STANDARDS

DESIGN AND ENGINEERING PRACTICE (CORE)

MANUAL

PIPING CLASSES – REFINING AND CHEMICALS – CLASS 2500

PTS 31.38.01.12

JANUARY 2010



PREFACE

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

The objective is to set the recommended standard for good technical practice to be applied by PETRONAS' OPU in oil and gas production facilities, refineries, gas processing plants, chemical plants, marketing facilities or any other such facility, and thereby to achieve maximum technical and economic benefit from standardisation.

The information set forth in these publications is provided to users for their consideration and decision to implement. This is of particular importance where PTS may not cover every requirement or diversity of condition at each locality. The system of PTS is expected to be sufficiently flexible to allow individual operating units to adapt the information set forth in PTS to their own environment and requirements.

When Contractors or Manufacturers/Suppliers use PTS they shall be solely responsible for the quality of work and the attainment of the required design and engineering standards. In particular, for those requirements not specifically covered, it is expected of them to follow those design and engineering practices which will achieve the same level of integrity as reflected in the PTS. If in doubt, the Contractor or Manufacturer/Supplier shall, without detracting from his own responsibility, consult the owner.

The right to use PTS rests with three categories of users:

- 1) PETRONAS and its affiliates.
- 2) Other parties who are authorised to use PTS subject to appropriate contractual arrangements.
- 3) Contractors/subcontractors and Manufacturers/Suppliers under a contract with users referred to under 1) and 2) which requires that tenders for projects, materials supplied or - generally - work performed on behalf of the said users comply with the relevant standards.

Subject to any particular terms and conditions as may be set forth in specific agreements with users, PETRONAS disclaims any liability of whatsoever nature for any damage (including injury or death) suffered by any company or person whomsoever as a result of or in connection with the use, application or implementation of any PTS, combination of PTS or any part thereof. The benefit of this disclaimer shall inure in all respects to PETRONAS and/or any company affiliated to PETRONAS that may issue PTS or require the use of PTS.

Without prejudice to any specific terms in respect of confidentiality under relevant contractual arrangements, PTS shall not, without the prior written consent of PETRONAS, be disclosed by users to any company or person whomsoever and the PTS shall be used exclusively for the purpose they have been provided to the user. They shall be returned after use, including any copies which shall only be made by users with the express prior written consent of PETRONAS.

The copyright of PTS vests in PETRONAS. Users shall arrange for PTS to be held in safe custody and PETRONAS may at any time require information satisfactory to PETRONAS in order to ascertain how users implement this requirement.

PIPING CLASSES - CLASS 2500

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).

CLASS 251076
CLASS 251011-20
CLASS 251031
CLASS 251031-KS
CLASS 251011
CLASS 251076-KS
CLASS 252050
CLASS 252120
CLASS 253021
CLASS 253055

CLASS 251011-20

Design limits

		Temperature (°C)									
		-20	0	50	100	150	200	250	300	350	400
		Pressure (Bar ga)									
DN	15- 300	257.7	257.7	257.7	257.7	257.7	257.7	246.0	228.6	217.5	166.3

Notes

- Design limits acc. to ASME B31.3 allowable internal pressure
- 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

Table of schedules

DN	Schedule
15	160
20	160
25	160
40	160
50	160
80	160
100	160
150	160
200	160
250	160
300	160

Branch connections 90 degrees

		Branch Size											
		Run size	15	20	25	40	50	80	100	150	200	250	300
300	C	C	C	C	C	E	E	E	E	B	B	B	A
250	C	C	C	C	C	E	E	E	B	B	B	A	
200	C	C	C	C	C	E	E	E	B	B	A		
150	C	C	C	C	C	E	E	B	B	A			
100	C	C	C	C	C	B	B	A					
80	C	C	C	C	C	B	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
E	Branch outlet

Carbon steel		Plant
Class no.	251011-20	Consignee
ASME rating	CLASS 2500	Engineered by
Corrosion allowance	1 mm	Principal
Revision letter	O	Contr. job no.
Revision date	08/2005	Project no.

COMPONENT MATERIAL DESCRIPTION

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

Pipe

PIPE	Pipe	DN 15-100	ASTM A106-B
PIPE	Pipe	DN 150-300	ASTM A333-6

Flanges

BLFL	Blind flange	DN 15-100	ASTM A105
BLFL	Blind flange	DN 150-300	ASTM A350-LF2
LJFL	Lap joint flange	---	ASTM A105
SBFL	Spectacle blind	DN 15-250	ASTM A516-60/65/70
SPFL	Spade	DN 15-300	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-300	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-100	ASTM A105
WNFL	Welding neck flange	DN 150-300	ASTM A350-LF2

Fittings

CAPB	Cap bw	DN 15-100	ASTM A234-WPB
CAPB	Cap bw	DN 150-300	ASTM A420-WPL6
E45B	Elbow 45 deg bw	DN 15-100	ASTM A234-WPB
E45B	Elbow 45 deg bw	DN 150-300	ASTM A420-WPL6
E90B	Elbow 90 deg bw	DN 15-100	ASTM A234-WPB
E90B	Elbow 90 deg bw	DN 150-300	ASTM A420-WPL6
TEEB	Tee equal bw	DN 15-100	ASTM A234-WPB
TEEB	Tee equal bw	DN 150-300	ASTM A420-WPL6

Reducing fittings

BNIF	Branch fitting flgd	DN 15-50	ASTM A105
BNIP	Branch fitting plain	DN 15-40	ASTM A105
BROB	Branch outlet bw	DN 150-300	ASTM A350-LF2
RECB	Reducer concentric bw	DN 150-300	ASTM A420-WPL6
RECB	Reducer concentric bw	DN 20-100	ASTM A234-WPB
REEB	Reducer eccentric bw	DN 150-300	ASTM A420-WPL6
REEB	Reducer eccentric bw	DN 20-100	ASTM A234-WPB
TERB	Tee reducing bw	DN 150-300	ASTM A420-WPL6
TERB	Tee reducing bw	DN 20-100	ASTM A234-WPB

Valves

CHVF	Check valve flgd	DN 15-40	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
CHVF	Check valve flgd	DN 50-300	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 50-300	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 50-100	Body: ASTM A105/A216-WCB/WCC Trim: AISI 410

Instruments

TWHD	Thermowell	DN 50-50	AISI 316
TWHL	Thermowell L=255 mm	---	AISI 316
TWHS	Thermowell L=230 mm	---	AISI 316

Miscellaneous

GKSW	Gasket spiral wound	DN 15-300	AISI 316, graphite filled CS centring-/SS inner ring
ORFS	Orifice flange set	DN 50-300	ASTM A105
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
Pipe												
Pipe	743005	0201	0301	0401	0601	0731	1131	1611				
Pipe	743017								0881	1011	1131	1251
Flanges												
Blind flange	766210	4721	4741	4761	4781	4801	4841	4861				
Blind flange	766212								7261	7281	7301	7321
Spacer ring	768816	2021	2041	2061	2081	2101	2121	2141	2161	2181		
Spacer ring	768817										8301	8321
Spade	768813	2021	2041	2061	2081	2101	2121	2141	2161	2181		
Spade	768860										1091	1101
Spectacle blind	768803	2021	2041	2061	2081	2101	2121	2141	2161	2181		
Spectacle blind	768834										7341	
Welding neck flange	766280	0021	0041	0061	0081	0101	0121	0141				
Welding neck flange	766286								7561	7581	7601	7621
Fittings												
Cap bw	763019	0221	0281	0321	0421	0621	0821	1021				
Cap bw	763118								2721	2921	3151	3371
Elbow 45 deg bw	763038	5721	5781	5821	5921	6121	6321	6521				
Elbow 45 deg bw	763138								2721	2921	3151	3371
Elbow 90 deg bw	763040	5721	5781	5821	5921	6121	6321	6521				
Elbow 90 deg bw	763139								2721	2921	3151	3371
Tee equal bw	763084	5721	5781	5821	5921	6121	6321	6521				
Tee equal bw	763184								2721	2921	3151	3371
Valves												
Check valve flgd	771020					2581	2601	2621	2641	2651	2661	2671
Check valve flgd	771056	2531	2541	2551	2571							
Gate valve flgd	772020					2581	2601	2621	2641	2651	2661	2671
Gate valve flgd	772078	2531	2541	2551	2571							
Globe valve flgd	773020					2581	2601	2621				
Globe valve flgd	773056	2531	2541	2551	2571							
Miscellaneous												
Gasket spiral wound	854136	2541	2561	2581	2621	2641	2681	2701	2741	2761	2781	2801
Orifice flange set	766295					4691	4711	4731	4751	4771	4791	4811



REDUCING/PIPING COMPONENTS

Run	x	Br	BROB	RECB	REEB	TERB
20	x	15		7630721411	7630731411	7630890391
25	x	15		7630721511	7630731511	7630890491
25	x	20		7630721611	7630731611	7630890591
40	x	15		7630721711	7630731711	
40	x	20		7630721811	7630731811	7630890791
40	x	25		7630721911	7630731911	7630890891
50	x	20		7630721951	7630731951	
50	x	25		7630722011	7630732011	7630891071
50	x	40		7630722111	7630732111	7630891161
80	x	40		7630722311	7630732311	
80	x	50		7630722411	7630732411	7630891341
100	x	40		7630722591	7630732591	
100	x	50		7630722711	7630732711	7630891551
100	x	80		7630722811	7630732811	7630891671
150	x	50	7679071841			
150	x	80		7631703011	7631713011	7631851791
150	x	100		7631703111	7631713111	7631851921
200	x	50	7679071861			
200	x	80	7679072101			
200	x	100		7631703311	7631713311	7631852081
200	x	150		7631703411	7631713411	7631852281
250	x	50	7679071881			
250	x	80	7679072121			
250	x	100		7631703491	7631713491	7631852561
250	x	150		7631703601	7631713601	7631852741
250	x	200		7631703701	7631713701	7631852961
300	x	50	7679071901			
300	x	80	7679072141			
300	x	100	7679072361			
300	x	150		7631703891	7631713891	7631853131
300	x	200		7631704001	7631714001	7631853331
300	x	250		7631704101	7631714101	7631853551

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

Branch	Run	pipe	BNIF	BNIP
15	40	- 300	7680374211	7680310161
20	50	- 50	7680374221	7680310171
20	80	- 150	7680374241	7680310191
20	200	- 300	7680374271	7680310211
25	80	- 250	7680374281	7680310221
25	300	- 300	7680374291	7680310231
40	80	- 80	7680374321	7680310251
40	100	- 200	7680374331	7680310271
40	250	- 300	7680374341	7680310291
50	80	- 80	7680374631	
50	100	- 200	7680374641	
50	250	- 300	7680374651	

Thermowell	
Length	MESC number
230	7683380611
255	7683380621



BOLTING

Boltset standard flange					
DN	nr	inch	x mm	MESC number	
15	4	3/4	x 130	8138613341	
20	4	3/4	x 130	8138613341	
25	4	7/8	x 140	8138614041	
40	4	1 1/8	x 180	8138615331	
50	8	1	x 180	8138614751	
80	8	1 1/4	x 230	8138615981	
100	8	1 1/2	x 300	8138616961	
150	8	2	x 400	8138618241	
200	12	2	x 440	8138618291	
250	12	2 1/2	x 550	8138837061	
300	12	2 3/4	x 610	8138837821	

Boltset orifice flange					
DN	nr	inch	x mm	MESC number	
50	8	1	x 190	8138614771	
80	8	1 1/4	x 240	8138616001	
100	8	1 1/2	x 310	8138616981	
150	8	2	x 410	8138618251	
200	12	2	x 460	8138618341	
250	12	2 1/2	x 570	8138837081	
300	12	2 3/4	x 640	8138837851	

Boltset blind/spacer					
DN	nr	inch	x mm	MESC number	
15	4	3/4	x 140	8138613351	
20	4	3/4	x 140	8138613351	
25	4	7/8	x 160	8138614071	
40	4	1 1/8	x 190	8138615351	
50	8	1	x 200	8138614641	
80	8	1 1/4	x 260	8138616031	
100	8	1 1/2	x 330	8138617171	
150	8	2	x 450	8138618311	
200	12	2	x 500	8138835611	
300	12	2 3/4	x 700	8138837911	

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

Branch: according to branch table					
Blind flange	1	7662104721			
Welding neck flange	1	7662800021			
Gasket spiral wound	1	8541362541			
Studbolt with nuts	4	8138613341			

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

Branch: according to branch table					
Blind flange	1	7662104741			
Welding neck flange	1	7662800041			
Gasket spiral wound	1	8541362561			
Studbolt with nuts	4	8138613341			

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

Branch: branch nipple flanged					
Blind flange	1	7662104741			
Gasket spiral wound	1	8541362561			
Studbolt with nuts	4	8138613341			

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

Branch: branch nipple flanged					
Blind flange	1	7662104761			
Gasket spiral wound	1	8541362581			
Studbolt with nuts	4	8138614041			

Orifice connection DN 15 Fig.OI DN50 - 300

Branch: not applicable					
Gate valve flgd	2	7720782531			
Lap joint flange	2	7662205581			
Welding neck flange	2	7662800021			
Gasket spiral wound	4	8541362541			
Studbolt with nuts	8	8138613341			
Studbolt with nuts	8	8138613341			

Pressure instrument DN 15 Fig.OJ DN15 - 25

Branch: according to branch table					
Gate valve flgd	1	7720782531			
Lap joint flange	1	7662205581			
Pipe	1	7430050201			
Welding neck flange	1	7662800021			
Gasket spiral wound	2	8541362541			
Studbolt with nuts	4	8138613341			
Studbolt with nuts	4	8138613341			

Pressure instrument DN 15 Fig.OH DN40 - 300

Branch: branch nipple flanged					
Gate valve flgd	1	7720782531			
Lap joint flange	1	7662205581			
Gasket spiral wound	2	8541362541			
Studbolt with nuts	4	8138613341			
Studbolt with nuts	4	8138613341			

Temperature instrum DN 50 Fig.HS DN80 - 100

Branch: branch nipple flanged					
Lap joint flange	1	7662205701			
Gasket spiral wound	1	8541362641			
Thermowell L=230 mm	1	7683380611			
Studbolt with nuts	4	8138614641			

Temperature instrum DN 50 Fig.HL DN150 - 300

Branch: branch nipple flanged					
Lap joint flange	1	7662205701			
Gasket spiral wound	1	8541362641			
Thermowell L=255 mm	1	7683380621			
Studbolt with nuts	4	8138614641			

CLASS 251011

Design limits

	Temperature (°C)									
	0	50	100	150	200	250	300	350	400	
Pressure (Bar ga)										
DN 15- 300	257.7	257.7	257.7	257.7	257.7	246.0	228.6	217.5	166.3	

Notes

- Design limits acc. to ASME B31.3 allowable internal pressure
- 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

Table of schedules

DN	Schedule
15	160
20	160
25	160
40	160
50	160
80	160
100	160
150	160
200	160
250	160
300	160

Branch connections 90 degrees

Run size	Branch Size												
	15	20	25	40	50	80	100	150	200	250	300		
300	C	C	C	C	E	E	E	B	B	B	A		
250	C	C	C	C	E	E	B	B	B	A			
200	C	C	C	C	E	E	B	B	A				
150	C	C	C	C	E	B	B	A					
100	C	C	C	C	B	B	A						
80	C	C	C	C	B	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
E	Branch outlet

Carbon steel		Plant
Class no.	251011	Consignee
ASME rating	CLASS 2500	Engineered by
Corrosion allowance	1 mm	Principal
Revision letter	E	Contr. job no.
Revision date	08/2005	Project no.

COMPONENT MATERIAL DESCRIPTION

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

Pipe

PIPE	Pipe	DN 15-200	ASTM A106-B
PIPE	Pipe	DN 250-300	ASTM A333-6

Flanges

BLFL	Blind flange	DN 15-300	ASTM A105
LJFL	Lap joint flange	---	ASTM A105
SBFL	Spectacle blind	DN 15-250	ASTM A516-60/65/70
SPFL	Spade	DN 15-300	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-300	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-300	ASTM A105

Fittings

CAPB	Cap bw	DN 15-200	ASTM A234-WPB
CAPB	Cap bw	DN 250-300	ASTM A420-WPL6
E45B	Elbow 45 deg bw	DN 15-200	ASTM A234-WPB
E45B	Elbow 45 deg bw	DN 250-300	ASTM A420-WPL6
E90B	Elbow 90 deg bw	DN 15-200	ASTM A234-WPB
E90B	Elbow 90 deg bw	DN 250-300	ASTM A420-WPL6
TEEB	Tee equal bw	DN 15-200	ASTM A234-WPB
TEEB	Tee equal bw	DN 250-300	ASTM A420-WPL6

Reducing fittings

BNIF	Branch fitting flgd	DN 15-50	ASTM A105
BNIP	Branch fitting plain	DN 15-40	ASTM A105
BROB	Branch outlet bw	DN 150-300	ASTM A105
RECB	Reducer concentric bw	DN 20-200	ASTM A234-WPB
RECB	Reducer concentric bw	DN 250-300	ASTM A420-WPL6
REEB	Reducer eccentric bw	DN 20-200	ASTM A234-WPB
REEB	Reducer eccentric bw	DN 250-300	ASTM A420-WPL6
TERB	Tee reducing bw	DN 20-200	ASTM A234-WPB
TERB	Tee reducing bw	DN 250-300	ASTM A420-WPL6

Valves

CHVF	Check valve flgd	DN 15-40	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
CHVF	Check valve flgd	DN 50-300	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 50-300	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 50-100	Body: ASTM A105/A216-WCB/WCC Trim: AISI 410

Instruments

TWHD	Thermowell	DN 50-50	AISI 316
TWHL	Thermowell L=255 mm	---	AISI 316
TWHS	Thermowell L=230 mm	---	AISI 316

Miscellaneous

GKSW	Gasket spiral wound	DN 15-300	AISI 316, graphite filled CS centring-/SS inner ring
ORFS	Orifice flange set	DN 50-300	ASTM A105
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
Pipe												
Pipe	743005	0201	0301	0401	0601	0731	1131	1611	2271	2671		
Pipe	743017										1131	1251
Flanges												
Blind flange	766210	4721	4741	4761	4781	4801	4841	4861	4881	4901	4921	4941
Spacer ring	768816	2021	2041	2061	2081	2101	2121	2141	2161	2181	2201	2221
Spade	768813	2021	2041	2061	2081	2101	2121	2141	2161	2181	2201	2221
Spectacle blind	768803	2021	2041	2061	2081	2101	2121	2141	2161	2181	2201	
Welding neck flange	766280	0021	0041	0061	0081	0101	0121	0141	0161	0181	0201	0221
Fittings												
Cap bw	763019	0221	0281	0321	0421	0621	0821	1021	1221	1451		
Cap bw	763118										3151	3371
Elbow 45 deg bw	763038	5721	5781	5821	5921	6121	6321	6521	6721	6951		
Elbow 45 deg bw	763138										3151	3371
Elbow 90 deg bw	763040	5721	5781	5821	5921	6121	6321	6521	6721	6951		
Elbow 90 deg bw	763139										3151	3371
Tee equal bw	763084	5721	5781	5821	5921	6121	6321	6521	6721	6951		
Tee equal bw	763184										3151	3371
Valves												
Check valve flgd	771020					2581	2601	2621	2641	2651	2661	2671
Check valve flgd	771056	2531	2541	2551	2571							
Gate valve flgd	772020					2581	2601	2621	2641	2651	2661	2671
Gate valve flgd	772078	2531	2541	2551	2571							
Globe valve flgd	773020					2581	2601	2621				
Globe valve flgd	773056	2531	2541	2551	2571							
Miscellaneous												
Gasket spiral wound	854136	2541	2561	2581	2621	2641	2681	2701	2741	2761	2781	2801
Orifice flange set	766295					4691	4711	4731	4751	4771	4791	4811

REDUCING/PIPING COMPONENTS

Run	x	Br	BROB	RECB	REEB	TERB
20	x	15		7630721411	7630731411	7630890391
25	x	15		7630721511	7630731511	7630890491
25	x	20		7630721611	7630731611	7630890591
40	x	15		7630721711	7630731711	
40	x	20		7630721811	7630731811	7630890791
40	x	25		7630721911	7630731911	7630890891
50	x	20		7630721951	7630731951	
50	x	25		7630722011	7630732011	7630891071
50	x	40		7630722111	7630732111	7630891161
80	x	40		7630722311	7630732311	
80	x	50		7630722411	7630732411	7630891341
100	x	40		7630722591	7630732591	
100	x	50		7630722711	7630732711	7630891551
100	x	80		7630722811	7630732811	7630891671
150	x	50	7679031841			
150	x	80		7630723011	7630733011	7630891791
150	x	100		7630723111	7630733111	7630891921
200	x	50	7679031861			
200	x	80	7679032101			
200	x	100		7630723311	7630733311	7630892081
200	x	150		7630723411	7630733411	7630892281
250	x	50	7679031881			
250	x	80	7679032121			
250	x	100		7631703491	7631713491	7631852561
250	x	150		7631703601	7631713601	7631852741
250	x	200		7631703701	7631713701	7631852961
300	x	50	7679031901			
300	x	80	7679032141			
300	x	100	7679032361			
300	x	150		7631703891	7631713891	7631853131
300	x	200		7631704001	7631714001	7631853331
300	x	250		7631704101	7631714101	7631853551

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

Branch	Run	pipe	BNIF	BNIP
15	40	- 300	7680374211	7680310161
20	50	- 50	7680374221	7680310171
20	80	- 150	7680374241	7680310191
20	200	- 300	7680374271	7680310211
25	80	- 250	7680374281	7680310221
25	300	- 300	7680374291	7680310231
40	80	- 80	7680374321	7680310251
40	100	- 200	7680374331	7680310271
40	250	- 300	7680374341	7680310291
50	80	- 80	7680374631	
50	100	- 200	7680374641	
50	250	- 300	7680374651	

Thermowell	
Length	MESC number
230	7683380611
255	7683380621

BOLTING

Boltset standard flange					
DN	nr	inch	x mm	MESC number	
15	4	3/4	x 130	8138613341	
20	4	3/4	x 130	8138613341	
25	4	7/8	x 140	8138614041	
40	4	1 1/8	x 180	8138615331	
50	8	1	x 180	8138614751	
80	8	1 1/4	x 230	8138615981	
100	8	1 1/2	x 300	8138616961	
150	8	2	x 400	8138618241	
200	12	2	x 440	8138618291	
250	12	2 1/2	x 550	8138837061	
300	12	2 3/4	x 610	8138837821	

Boltset orifice flange					
DN	nr	inch	x mm	MESC number	
50	8	1	x 190	8138614771	
80	8	1 1/4	x 240	8138616001	
100	8	1 1/2	x 310	8138616981	
150	8	2	x 410	8138618251	
200	12	2	x 460	8138618341	
250	12	2 1/2	x 570	8138837081	
300	12	2 3/4	x 640	8138837851	

Boltset blind/spacer					
DN	nr	inch	x mm	MESC number	
15	4	3/4	x 140	8138613351	
20	4	3/4	x 140	8138613351	
25	4	7/8	x 160	8138614071	
40	4	1 1/8	x 190	8138615351	
50	8	1	x 200	8138614641	
80	8	1 1/4	x 260	8138616031	
100	8	1 1/2	x 330	8138617171	
150	8	2	x 450	8138618311	
200	12	2	x 500	8138835611	
300	12	2 3/4	x 700	8138837911	

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

Branch: according to branch table					
Blind flange	1	7662104721			
Welding neck flange	1	7662800021			
Gasket spiral wound	1	8541362541			
Studbolt with nuts	4	8138613341			

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

Branch: according to branch table					
Blind flange	1	7662104741			
Welding neck flange	1	7662800041			
Gasket spiral wound	1	8541362561			
Studbolt with nuts	4	8138613341			

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

Branch: branch nipple flanged					
Blind flange	1	7662104741			
Gasket spiral wound	1	8541362561			
Studbolt with nuts	4	8138613341			

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

Branch: branch nipple flanged					
Blind flange	1	7662104761			
Gasket spiral wound	1	8541362581			
Studbolt with nuts	4	8138614041			

Orifice connection DN 15 Fig.OI DN50 - 300

Branch: not applicable					
Gate valve flgd	2	7720782531			
Lap joint flange	2	7662205581			
Welding neck flange	2	7662800021			
Gasket spiral wound	4	8541362541			
Studbolt with nuts	8	8138613341			
Studbolt with nuts	8	8138613341			

Pressure instrument DN 15 Fig.OJ DN15 - 25

Branch: according to branch table					
Gate valve flgd	1	7720782531			
Lap joint flange	1	7662205581			
Pipe	1	7430050201			
Welding neck flange	1	7662800021			
Gasket spiral wound	2	8541362541			
Studbolt with nuts	4	8138613341			
Studbolt with nuts	4	8138613341			

Pressure instrument DN 15 Fig.OH DN40 - 300

Branch: branch nipple flanged					
Gate valve flgd	1	7720782531			
Lap joint flange	1	7662205581			
Gasket spiral wound	2	8541362541			
Studbolt with nuts	4	8138613341			
Studbolt with nuts	4	8138613341			

Temperature instrum DN 50 Fig.HS DN80 - 100

Branch: branch nipple flanged					
Lap joint flange	1	7662205701			
Gasket spiral wound	1	8541362641			
Thermowell L=230 mm	1	7683380611			
Studbolt with nuts	4	8138614641			

Temperature instrum DN 50 Fig.HL DN150 - 300

Branch: branch nipple flanged					
Lap joint flange	1	7662205701			
Gasket spiral wound	1	8541362641			
Thermowell L=255 mm	1	7683380621			
Studbolt with nuts	4	8138614641			

CLASS 251031

Design limits

		Temperature (°C)								
		0	50	100	150	200	250	300	350	400
		Pressure (Bar ga)								
DN	15- 300	313.6	313.6	313.6	313.6	313.6	299.3	278.1	264.6	202.4

Notes

- Design limits acc. to ASME B31.3 allowable internal pressure
- For bending of pipe see PTS 31.38.01.31.
- For basis of design see PTS 31.38.01.10.
- Nominal pipe size DN15 shall be avoided where possible, (inside diameter = 6.4 mm)
- Piston type check valves (DN 15-40) for horizontal mounting only

Table of schedules

DN	Schedule
15	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
100	XXS
150	24.0
200	30.0
250	36.0
300	42.0

Branch connections 90 degrees

Run size	Branch Size											
	15	20	25	40	50	80	100	150	200	250	300	
300	C	C	C	C	E	E	E	B	B	B	A	
250	C	C	C	C	E	E	B	B	B	A		
200	C	C	C	C	E	E	B	B	A			
150	C	C	C	C	E	B	B	A				
100	C	C	C	C	B	B	A					
80	C	C	C	C	B	A						
50	C	C	C	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
E	Branch outlet

Carbon steel		Plant
Class no.	251031	Consignee
ASME rating	CLASS 2500	Engineered by
Corrosion allowance	3 mm	Principal
Revision letter	D	Contr. job no.
Revision date	08/2005	Project no.

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

Pipe

PIPE	Pipe	DN 15-150	ASTM A106-B
PIPE	Pipe	DN 200-300	ASTM A333-6

Flanges

BLFL	Blind flange	DN 15-300	ASTM A105
LJFL	Lap joint flange	---	ASTM A105
SBFL	Spectacle blind	DN 15-250	ASTM A516-60/65/70
SPFL	Spade	DN 15-300	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-300	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-300	ASTM A105

Fittings

CAPB	Cap bw	DN 15-150	ASTM A234-WPB
CAPB	Cap bw	DN 200-300	ASTM A420-WPL6
E45B	Elbow 45 deg bw	DN 15-150	ASTM A234-WPB
E45B	Elbow 45 deg bw	DN 200-300	ASTM A420-WPL6
E90B	Elbow 90 deg bw	DN 15-150	ASTM A234-WPB
E90B	Elbow 90 deg bw	DN 200-300	ASTM A420-WPL6
TEEB	Tee equal bw	DN 15-150	ASTM A234-WPB
TEEB	Tee equal bw	DN 200-300	ASTM A420-WPL6

Reducing fittings

BNIB	Branch fitting bw	DN 15-40	ASTM A105
BNIF	Branch fitting flgd	DN 15-50	ASTM A105
BROB	Branch outlet bw	DN 150-300	ASTM A105
RECB	Reducer concentric bw	DN 20-150	ASTM A234-WPB
RECB	Reducer concentric bw	DN 200-300	ASTM A420-WPL6
REEB	Reducer eccentric bw	DN 20-150	ASTM A234-WPB
REEB	Reducer eccentric bw	DN 200-300	ASTM A420-WPL6
TERB	Tee reducing bw	DN 20-150	ASTM A234-WPB
TERB	Tee reducing bw	DN 200-300	ASTM A420-WPL6

Valves

CHVF	Check valve flgd	DN 15-40	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
CHVF	Check valve flgd	DN 50-300	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 50-300	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 50-100	Body: ASTM A105/A216-WCB/WCC Trim: AISI 410

Instruments

TWHD	Thermowell	DN 50-50	AISI 316
TWHL	Thermowell L=255 mm	---	AISI 316
TWHS	Thermowell L=230 mm	---	AISI 316

Miscellaneous

GKSW	Gasket spiral wound	DN 15-300	AISI 316, graphite filled CS centring-/SS inner ring
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
Pipe	743000								1101			
Pipe	743005	0221	0321	0421	0621	0751	1151	1631				
Pipe	743014									1461	1861	2381
Flanges												
Blind flange	766210	4721	4741	4761	4781	4801	4841	4861	4881	4901	4921	4941
Spacer ring	768816	2021	2041	2061	2081	2101	2121	2141	2161	2181	2201	2221
Spade	768813	2021	2041	2061	2081	2101	2121	2141	2161	2181	2201	2221
Spectacle blind	768803	2021	2041	2061	2081	2101	2121	2141	2161	2181	2201	
Welding neck flange	766280	0521	0541	0561	0581	0601	0641	0661				
Welding neck flange	766285								1101	1461	1861	2381
Fittings												
Cap bw	763019	0231	0291	0331	0431	0631	0831	1031				
Cap bw	763022								1101			
Cap bw	763115									1461	1861	2381
Elbow 45 deg bw	763038	5731	5791	5831	5931	6131	6331	6531				
Elbow 45 deg bw	763044								1101			
Elbow 45 deg bw	763144									1431	1831	2341
Elbow 90 deg bw	763040	5731	5791	5831	5931	6131	6331	6531				
Elbow 90 deg bw	763046								1101			
Elbow 90 deg bw	763146									1461	1861	2381
Tee equal bw	763084	5731	5791	5831	5931	6131	6331	6531				
Tee equal bw	763090								1101			
Tee equal bw	763190									1461	1861	2381
Valves												
Check valve flgd	771020					2581	2601	2621	2641	2651	2661	2671
Check valve flgd	771056	2531	2541	2551	2571							
Gate valve flgd	772020					2581	2601	2621	2641	2651	2661	2671
Gate valve flgd	772078	2531	2541	2551	2571							
Globe valve flgd	773020					2581	2601	2621				
Globe valve flgd	773056	2531	2541	2551	2571							
Miscellaneous												
Gasket spiral wound	854136	2541	2561	2581	2621	2641	2681	2701	2741	2761	2781	2801

