

PETRONAS TECHNICAL STANDARDS

DESIGN AND ENGINEERING PRACTICE (CORE)

MANUAL

PIPING CLASSES – REFINING AND CHEMICALS – CLASS 1500

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 1500

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 151042-20
CLASS 151011-20
CLASS 151015
CLASS 151015-KS
CLASS 151031
CLASS 151031-KS
CLASS 151041
CLASS 151041-20
CLASS 151042
CLASS 151011
CLASS 151055
CLASS 151055-20
CLASS 151071
CLASS 151071-KS
CLASS 151076
CLASS 151076-KS
CLASS 151261
CLASS 151374
CLASS 151374-KS
CLASS 152010
CLASS 152020
CLASS 152021
CLASS 152090
CLASS 152120
CLASS 153021
CLASS 153052
CLASS 153055

CLASS 151011-20

Design limits

	Temperature (°C)									
	-20	0	50	100	150	200	250	300	350	400
Pressure (Bar ga)										
DN 15- 400	250.6	250.6	250.6	233.0	225.4	219.0	209.7	199.1	187.8	161.7

Notes

- Design limits acc. to ASME B16.5 flange rating mat. grp 1.1 and 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
350	160
400	160

Branch connections 90 degrees

Run size	Branch Size														
	15	20	25	40	50	80	100	150	200	250	300	350	400		
400	C	C	C	C	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	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.	151011-20	Consignee
ASME rating	CLASS 1500	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 150-400	ASTM A333-6

Flanges

BLFL	Blind flange	DN 15-100	ASTM A105
BLFL	Blind flange	DN 150-400	ASTM A350-LF2
LJFL	Lap joint flange	---	ASTM A105
SBFL	Spectacle blind	DN 15-250	ASTM A516-60/65/70
SPFL	Spade	DN 15-400	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-400	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-100	ASTM A105
WNFL	Welding neck flange	DN 150-400	ASTM A350-LF2

Fittings

CAPB	Cap bw	DN 15-100	ASTM A234-WPB
CAPB	Cap bw	DN 150-400	ASTM A420-WPL6
E45B	Elbow 45 deg bw	DN 15-100	ASTM A234-WPB
E45B	Elbow 45 deg bw	DN 150-400	ASTM A420-WPL6
E90B	Elbow 90 deg bw	DN 15-100	ASTM A234-WPB
E90B	Elbow 90 deg bw	DN 150-400	ASTM A420-WPL6
TEEB	Tee equal bw	DN 15-100	ASTM A234-WPB
TEEB	Tee equal bw	DN 150-400	ASTM A420-WPL6

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 150-400	ASTM A350-LF2
RECB	Reducer concentric bw	DN 150-400	ASTM A420-WPL6
RECB	Reducer concentric bw	DN 20-100	ASTM A234-WPB
REEB	Reducer eccentric bw	DN 150-400	ASTM A420-WPL6
REEB	Reducer eccentric bw	DN 20-100	ASTM A234-WPB
TERB	Tee reducing bw	DN 150-400	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 50-400	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 50-400	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

TWND	Thermowell	DN 40-40	AISI 316
TWNL	Thermowell L=255mm	---	AISI 316
TWNS	Thermowell L=230mm	---	AISI 316

Miscellaneous

GKSW	Gasket spiral wound	DN 15-400	AISI 316, graphite filled CS centring-/SS inner ring
MTRR	Meterrun	DN 15-40	AISI 316 LJ end flanges: ASTM A105
ORFS	Orifice flange set	DN 150-400	ASTM A350-LF2
ORFS	Orifice flange set	DN 50-100	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	350	400	
Pipe															
Pipe	743005	0201	0301	0401	0601	0731	1131	1611							
Pipe	743017								0881	1011	1131	1251	1381	1471	
Flanges															
Blind flange	766210	4081	4121	4161	4181	4201	4221	4241							
Blind flange	766212								6761	6781	6801	6821	6841	6861	
Spacer ring	768816	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801				
Spacer ring	768817											7321	7341	7361	
Spade	768813	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801				
Spade	768860											0901	0911	0921	
Spectacle blind	768803	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801				
Welding neck flange	766279	9621	9641	9661	9681	9701	9721	9741							
Welding neck flange	766286								6761	6781	6801	6821	6841	6861	
Fittings															
Cap bw	763019	0221	0281	0321	0421	0621	0821	1021							
Cap bw	763118								2721	2921	3151	3371	3571	3771	
Elbow 45 deg bw	763038	5721	5781	5821	5921	6121	6321	6521							
Elbow 45 deg bw	763138								2721	2921	3151	3371	3571	3771	
Elbow 90 deg bw	763040	5721	5781	5821	5921	6121	6321	6521							
Elbow 90 deg bw	763139								2721	2921	3151	3371	3571	3771	
Tee equal bw	763084	5721	5781	5821	5921	6121	6321	6521							
Tee equal bw	763184								2721	2921	3151	3371	3571	3771	
Valves															
Check valve flgd	771005	5031	5041	5051	5071										
Check valve flgd	771020					2081	2101	2121	2141	2151	2161	2171	2181	2191	
Gate valve flgd	772004	2031	2041	2051	2071										
Gate valve flgd	772020					2081	2101	2121	2141	2151	2161	2171	2181	2191	
Globe valve flgd	773005	2031	2041	2051	2071										
Globe valve flgd	773020					2081	2101	2121							
Miscellaneous															
Gasket spiral wound	854136	2041	2061	2081	2121	2141	2181	2201	2241	2261	2281	2301	2321	2341	
Meterrun	766596	2821	2841	2861	2881										
Orifice flange set	766295					3261	3271	3281							
Orifice flange set	766297								3301	3311	3321	3331	3341	3351	



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	7679071941				15	40	- 400	7680373211	7680310161
25	x	15		7630721511	7630731511	7630890491	400	x	80	7679072181				20	50	- 50	7680373221	7680310171
25	x	20		7630721611	7630731611	7630890591	400	x	100	7679072401				20	80	- 150	7680373241	7680310191
40	x	15		7630721711	7630731711		400	x	150	7679072601				20	200	- 400	7680373271	7680310211
40	x	20		7630721811	7630731811	7630890791	400	x	200	7679072781	7631704591	7631714591		25	80	- 250	7680373281	7680310221
40	x	25		7630721911	7630731911	7630890891	400	x	250		7631704681	7631714681	7631855101	25	300	- 400	7680373291	7680310231
50	x	20		7630721951	7630731951		400	x	300		7631704801	7631714801	7631855361	40	80	- 80	7680373321	7680310251
50	x	25		7630722011	7630732011	7630891071	400	x	350		7631704911	7631714911	7631855611	40	100	- 200	7680373331	7680310271
50	x	40		7630722111	7630732111	7630891161								40	250	- 400	7680373341	7680310291
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												
350	x	50	7679071921															
350	x	80	7679072161															
350	x	100	7679072381															
350	x	150	7679072581	7631704191	7631714191													
350	x	200		7631704281	7631714281	7631853951												
350	x	250		7631704411	7631714411	7631854201												
350	x	300		7631704511	7631714511	7631854461												

Thermowell	
Length	MESC number
230	7683370311
255	7683370321
305	7683370331
355	7683370341
405	7683370351
455	7683370361

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	3/4	x	110	8138613301
20	4	3/4	x	120	8138613321
25	4	7/8	x	130	8138614031
40	4	1	x	140	8138614691
50	8	7/8	x	150	8138614061
80	8	1 1/8	x	180	8138615331
100	8	1 1/4	x	200	8138615881
150	12	1 3/8	x	260	8138616491
200	12	1 5/8	x	340	8138617321
250	12	1 7/8	x	390	8138617951
300	16	2	x	430	8138618131
350	16	2 1/4	x	470	8138618591
400	16	2 1/2	x	510	8138837021

Boltset meter run

DN	nr	inch	x	mm	MESC number
15	4	3/4	x	150	8138613371
20	4	3/4	x	150	8138613371
25	4	7/8	x	150	8138614061
40	4	1	x	160	8138614721

Boltset orifice flange

DN	nr	inch	x	mm	MESC number
50	8	7/8	x	160	8138614071
80	8	1 1/8	x	190	8138615351
100	8	1 1/4	x	210	8138615951
150	12	1 3/8	x	280	8138616521
200	12	1 5/8	x	360	8138617361
250	12	1 7/8	x	410	8138617961
300	16	2	x	460	8138618341
350	16	2 1/4	x	500	8138836311
400	16	2 1/2	x	550	8138837061

Boltset blind/spacer

DN	nr	inch	x	mm	MESC number
15	4	3/4	x	120	8138613321
20	4	3/4	x	130	8138613341
25	4	7/8	x	140	8138614041
40	4	1	x	160	8138614721
50	8	7/8	x	170	8138614091
80	8	1 1/8	x	210	8138615381
100	8	1 1/4	x	230	8138615981
150	12	1 3/8	x	300	8138616551
200	12	1 5/8	x	390	8138617401
250	12	1 7/8	x	450	8138618031
300	16	2	x	500	8138835611
350	16	2 1/4	x	550	8138836361
400	16	2 1/2	x	600	8138837111

ASSEMBLIES

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

Branch: according to branch table		
Blind flange	1	7662104081
Welding neck flange	1	7662799621
Gasket spiral wound	1	8541362041
Studbolt with nuts	4	8138613301

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

Branch: according to branch table		
Blind flange	1	7662104121
Welding neck flange	1	7662799641
Gasket spiral wound	1	8541362061
Studbolt with nuts	4	8138613321

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

Branch: branch nipple flanged		
Blind flange	1	7662104121
Gasket spiral wound	1	8541362061
Studbolt with nuts	4	8138613321

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

Branch: branch nipple flanged		
Blind flange	1	7662104161
Gasket spiral wound	1	8541362081
Studbolt with nuts	4	8138614031

Drain/vent point DN 40 Fig.H DN350 - 400

Branch: branch nipple flanged		
Blind flange	1	7662104181
Gasket spiral wound	1	8541362121
Studbolt with nuts	4	8138614691

Meter run connection DN 15 Fig.OH DN15 - 40

Branch: not applicable		
Gate valve flgd	2	7720042031
Lap joint flange	2	7662205081
Gasket spiral wound	4	8541362041
Studbolt with nuts	8	8138613301
Studbolt with nuts	8	8138613301

Orifice connection DN 15 Fig.OI DN50 - 400

Branch: not applicable		
Gate valve flgd	2	7720042031
Lap joint flange	2	7662205081
Welding neck flange	2	7662799621
Gasket spiral wound	4	8541362041
Studbolt with nuts	8	8138613301
Studbolt with nuts	8	8138613301

Pressure instrument DN 15 Fig.OJ DN15 - 25

Branch: according to branch table		
Gate valve flgd	1	7720042031
Lap joint flange	1	7662205081
Pipe	1	7430050201
Welding neck flange	1	7662799621
Gasket spiral wound	2	8541362041
Studbolt with nuts	4	8138613301
Studbolt with nuts	4	8138613301

Pressure instrument DN 15 Fig.OH DN40 - 400

Branch: according to branch table		
Gate valve flgd	1	7720042031
Lap joint flange	1	7662205081
Gasket spiral wound	2	8541362041
Studbolt with nuts	4	8138613301
Studbolt with nuts	4	8138613301

Temperature instrum DN 50 Fig.HS DN80 - 100

Branch: branch nipple flanged		
Lap joint flange	1	7662205201
Gasket spiral wound	1	8541362141
Studbolt with nuts	4	8138614071

Temperature instrum DN 50 Fig.HL DN150 - 400

Branch: branch nipple flanged		
Lap joint flange	1	7662205201
Gasket spiral wound	1	8541362141
Studbolt with nuts	4	8138614071

CLASS 151011

Design limits

	Temperature (°C)									
	0	50	100	150	200	250	300	350	400	
Pressure (Bar ga)										
DN 15- 400	250.6	250.6	233.0	225.4	219.0	209.7	199.1	187.8	161.7	

Notes

- Design limits acc. to ASME B16.5 flange rating mat. grp 1.1 and 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
350	160
400	160

Branch connections 90 degrees

Run size	Branch Size															
	15	20	25	40	50	80	100	150	200	250	300	350	400			
400	C	C	C	C	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	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.	151011	Consignee
ASME rating	CLASS 1500	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 MES C buying description.)

Pipe

PIPE	Pipe	DN 15-200	ASTM A106-B
PIPE	Pipe	DN 250-400	ASTM A333-6

Flanges

BLFL	Blind flange	DN 15-400	ASTM A105
LJFL	Lap joint flange	---	ASTM A105
SBFL	Spectacle blind	DN 15-250	ASTM A516-60/65/70
SPFL	Spade	DN 15-400	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-400	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-400	ASTM A105

Fittings

CAPB	Cap bw	DN 15-200	ASTM A234-WPB
CAPB	Cap bw	DN 250-400	ASTM A420-WPL6
E45B	Elbow 45 deg bw	DN 15-200	ASTM A234-WPB
E45B	Elbow 45 deg bw	DN 250-400	ASTM A420-WPL6
E90B	Elbow 90 deg bw	DN 15-200	ASTM A234-WPB
E90B	Elbow 90 deg bw	DN 250-400	ASTM A420-WPL6
TEEB	Tee equal bw	DN 15-200	ASTM A234-WPB
TEEB	Tee equal bw	DN 250-400	ASTM A420-WPL6

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 150-400	ASTM A105
RECB	Reducer concentric bw	DN 20-200	ASTM A234-WPB
RECB	Reducer concentric bw	DN 250-400	ASTM A420-WPL6
REEB	Reducer eccentric bw	DN 20-200	ASTM A234-WPB
REEB	Reducer eccentric bw	DN 250-400	ASTM A420-WPL6
TERB	Tee reducing bw	DN 20-200	ASTM A234-WPB
TERB	Tee reducing bw	DN 250-400	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 50-400	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 50-400	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

TWND	Thermowell	DN 40-40	AISI 316
TWNL	Thermowell L=255mm	---	AISI 316
TWNS	Thermowell L=230mm	---	AISI 316

Miscellaneous

GKSW	Gasket spiral wound	DN 15-400	AISI 316, graphite filled CS centring-/SS inner ring
MTRR	Meterrun	DN 15-40	AISI 316 LJ end flanges: ASTM A105
ORFS	Orifice flange set	DN 50-400	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	350	400	
Pipe															
Pipe	743005	0201	0301	0401	0601	0731	1131	1611	2271	2671					
Pipe	743017										1131	1251	1381	1471	
Flanges															
Blind flange	766210	4081	4121	4161	4181	4201	4221	4241	4261	4281	4301	4321	4341	4361	
Spacer ring	768816	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801	1821	1841	1861	
Spade	768813	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801	1821	1841	1861	
Spectacle blind	768803	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801				
Welding neck flange	766279	9621	9641	9661	9681	9701	9721	9741	9761	9781	9801	9821	9841	9861	
Fittings															
Cap bw	763019	0221	0281	0321	0421	0621	0821	1021	1221	1451					
Cap bw	763118										3151	3371	3571	3771	
Elbow 45 deg bw	763038	5721	5781	5821	5921	6121	6321	6521	6721	6951					
Elbow 45 deg bw	763138										3151	3371	3571	3771	
Elbow 90 deg bw	763040	5721	5781	5821	5921	6121	6321	6521	6721	6951					
Elbow 90 deg bw	763139										3151	3371	3571	3771	
Tee equal bw	763084	5721	5781	5821	5921	6121	6321	6521	6721	6951					
Tee equal bw	763184										3151	3371	3571	3771	
Valves															
Check valve flgd	771005	5031	5041	5051	5071										
Check valve flgd	771020					2081	2101	2121	2141	2151	2161	2171	2181	2191	
Gate valve flgd	772004	2031	2041	2051	2071										
Gate valve flgd	772020					2081	2101	2121	2141	2151	2161	2171	2181	2191	
Globe valve flgd	773005	2031	2041	2051	2071										
Globe valve flgd	773020					2081	2101	2121							
Miscellaneous															
Gasket spiral wound	854136	2041	2061	2081	2121	2141	2181	2201	2241	2261	2281	2301	2321	2341	
Meterrun	766596	2821	2841	2861	2881										
Orifice flange set	766295					3261	3271	3281	3291	3301	3311	3321	3331	3341	

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	7679031941				15	40	- 400	7680373211	7680310161
25	x	15		7630721511	7630731511	7630890491	400	x	80	7679032181				20	50	- 50	7680373221	7680310171
25	x	20		7630721611	7630731611	7630890591	400	x	100	7679032401				20	80	- 150	7680373241	7680310191
40	x	15		7630721711	7630731711		400	x	150	7679032601				20	200	- 400	7680373271	7680310211
40	x	20		7630721811	7630731811	7630890791	400	x	200	7679032781	7631704591	7631714591		25	80	- 250	7680373281	7680310221
40	x	25		7630721911	7630731911	7630890891	400	x	250		7631704681	7631714681	7631855101	25	300	- 400	7680373291	7680310231
50	x	20		7630721951	7630731951		400	x	300		7631704801	7631714801	7631855361	40	80	- 80	7680373321	7680310251
50	x	25		7630722011	7630732011	7630891071	400	x	350		7631704911	7631714911	7631855611	40	100	- 200	7680373331	7680310271
50	x	40		7630722111	7630732111	7630891161								40	250	- 400	7680373341	7680310291
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												
350	x	50	7679031921															
350	x	80	7679032161															
350	x	100	7679032381															
350	x	150	7679032581	7631704191	7631714191													
350	x	200		7631704281	7631714281	7631853951												
350	x	250		7631704411	7631714411	7631854201												
350	x	300		7631704511	7631714511	7631854461												

Thermowell	
Length	MESC number
230	7683370311
255	7683370321
305	7683370331
355	7683370341
405	7683370351
455	7683370361

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	3/4	x	110	8138613301
20	4	3/4	x	120	8138613321
25	4	7/8	x	130	8138614031
40	4	1	x	140	8138614691
50	8	7/8	x	150	8138614061
80	8	1 1/8	x	180	8138615331
100	8	1 1/4	x	200	8138615881
150	12	1 3/8	x	260	8138616491
200	12	1 5/8	x	340	8138617321
250	12	1 7/8	x	390	8138617951
300	16	2	x	430	8138618131
350	16	2 1/4	x	470	8138618591
400	16	2 1/2	x	510	8138837021

Boltset meter run

DN	nr	inch	x	mm	MESC number
15	4	3/4	x	150	8138613371
20	4	3/4	x	150	8138613371
25	4	7/8	x	150	8138614061
40	4	1	x	160	8138614721

Boltset orifice flange

DN	nr	inch	x	mm	MESC number
50	8	7/8	x	160	8138614071
80	8	1 1/8	x	190	8138615351
100	8	1 1/4	x	210	8138615951
150	12	1 3/8	x	280	8138616521
200	12	1 5/8	x	360	8138617361
250	12	1 7/8	x	410	8138617961
300	16	2	x	460	8138618341
350	16	2 1/4	x	500	8138836311
400	16	2 1/2	x	550	8138837061

Boltset blind/spacer

DN	nr	inch	x	mm	MESC number
15	4	3/4	x	120	8138613321
20	4	3/4	x	130	8138613341
25	4	7/8	x	140	8138614041
40	4	1	x	160	8138614721
50	8	7/8	x	170	8138614091
80	8	1 1/8	x	210	8138615381
100	8	1 1/4	x	230	8138615981
150	12	1 3/8	x	300	8138616551
200	12	1 5/8	x	390	8138617401
250	12	1 7/8	x	450	8138618031
300	16	2	x	500	8138835611
350	16	2 1/4	x	550	8138836361
400	16	2 1/2	x	600	8138837111

ASSEMBLIES

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

Branch: according to branch table		
Blind flange	1	7662104081
Welding neck flange	1	7662799621
Gasket spiral wound	1	8541362041
Studbolt with nuts	4	8138613301

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

Branch: according to branch table		
Blind flange	1	7662104121
Welding neck flange	1	7662799641
Gasket spiral wound	1	8541362061
Studbolt with nuts	4	8138613321

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

Branch: branch nipple flanged		
Blind flange	1	7662104121
Gasket spiral wound	1	8541362061
Studbolt with nuts	4	8138613321

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

Branch: branch nipple flanged		
Blind flange	1	7662104161
Gasket spiral wound	1	8541362081
Studbolt with nuts	4	8138614031

Drain/vent point DN 40 Fig.H DN350 - 400

Branch: branch nipple flanged		
Blind flange	1	7662104181
Gasket spiral wound	1	8541362121
Studbolt with nuts	4	8138614691

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

Branch: not applicable		
Gate valve flgd	2	7720042031
Lap joint flange	2	7662205081
Gasket spiral wound	4	8541362041
Studbolt with nuts	8	8138613301
Studbolt with nuts	8	8138613301

Orifice connection DN 15 Fig.0I DN50 - 400

Branch: not applicable		
Gate valve flgd	2	7720042031
Lap joint flange	2	7662205081
Welding neck flange	2	7662799621
Gasket spiral wound	4	8541362041
Studbolt with nuts	8	8138613301
Studbolt with nuts	8	8138613301

Pressure instrument DN 15 Fig.0J DN15 - 25

Branch: according to branch table		
Gate valve flgd	1	7720042031
Lap joint flange	1	7662205081
Pipe	1	7430050201
Welding neck flange	1	7662799621
Gasket spiral wound	2	8541362041
Studbolt with nuts	4	8138613301
Studbolt with nuts	4	8138613301

Pressure instrument DN 15 Fig.0H DN40 - 400

Branch: according to branch table		
Gate valve flgd	1	7720042031
Lap joint flange	1	7662205081
Gasket spiral wound	2	8541362041
Studbolt with nuts	4	8138613301
Studbolt with nuts	4	8138613301

Temperature instrum DN 50 Fig.HS DN80 - 100

Branch: branch nipple flanged		
Lap joint flange	1	7662205201
Gasket spiral wound	1	8541362141
Studbolt with nuts	4	8138614071

Temperature instrum DN 50 Fig.HL DN150 - 400

Branch: branch nipple flanged		
Lap joint flange	1	7662205201
Gasket spiral wound	1	8541362141
Studbolt with nuts	4	8138614071

CLASS 151015

Design limits

	Temperature (°C)									
	0	50	100	150	200	250	300	350	400	
Pressure (Bar ga)										
DN 15- 400	219.5	219.5	219.5	219.5	219.0	209.7	199.1	187.8	161.7	

Notes

- Design limits acc. to ASME B16.5 flange rating mat. grp 1.1 and ASME B31.3 allowable internal pressure, and limited by allowable stress of bolting material
- 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
350	160
400	160

Branch connections 90 degrees

Run size	Branch Size														
	15	20	25	40	50	80	100	150	200	250	300	350	400		
400	C	C	C	C	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	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 H-Sour		Plant
Class no.	151015	Consignee
ASME rating	CLASS 1500	Engineered by
Corrosion allowance	1 mm	Principal
Revision letter	D	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 250-400	ASTM A333-6

Flanges

BLFL	Blind flange	DN 15-400	ASTM A105
LJFL	Lap joint flange	---	ASTM A105
SBFL	Spectacle blind	DN 15-250	ASTM A516-60/65/70
SPFL	Spade	DN 15-400	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-400	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-400	ASTM A105

Fittings

CAPB	Cap bw	DN 15-200	ASTM A234-WPB
CAPB	Cap bw	DN 250-400	ASTM A420-WPL6
E45B	Elbow 45 deg bw	DN 15-200	ASTM A234-WPB
E45B	Elbow 45 deg bw	DN 250-400	ASTM A420-WPL6
E90B	Elbow 90 deg bw	DN 15-200	ASTM A234-WPB
E90B	Elbow 90 deg bw	DN 250-400	ASTM A420-WPL6
TEEB	Tee equal bw	DN 15-200	ASTM A234-WPB
TEEB	Tee equal bw	DN 250-400	ASTM A420-WPL6

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 150-400	ASTM A105
RECB	Reducer concentric bw	DN 20-200	ASTM A234-WPB
RECB	Reducer concentric bw	DN 250-400	ASTM A420-WPL6
REEB	Reducer eccentric bw	DN 20-200	ASTM A234-WPB
REEB	Reducer eccentric bw	DN 250-400	ASTM A420-WPL6
TERB	Tee reducing bw	DN 20-200	ASTM A234-WPB
TERB	Tee reducing bw	DN 250-400	ASTM A420-WPL6

Valves

CHVF	Check valve flgd	DN 15-400	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GAVF	Gate valve flgd	DN 15-400	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GLVF	Globe valve flgd	DN 15-100	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6

Instruments

TWND	Thermowell	DN 40-40	AISI 316
TWNL	Thermowell L=255mm	---	AISI 316
TWNS	Thermowell L=230mm	---	AISI 316

Miscellaneous

GKSW	Gasket spiral wound	DN 15-400	AISI 316, graphite filled CS centring-/SS inner ring
MTRR	Meterrun	DN 15-40	AISI 316 LJ end flanges: ASTM A105
ORFS	Orifice flange set	DN 50-400	ASTM A105
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	
Pipe															
Pipe	743003	0201	0301	0401	0601	0731	1131	1611	2271	2671					
Pipe	743016										1131	1251	1381	1471	
Flanges															
Blind flange	766210	4081	4121	4161	4181	4201	4221	4241	4261	4281	4301	4321	4341	4361	
Spacer ring	768846	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801	1821	1841	1861	
Spade	768842	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801	1821	1841	1861	
Spectacle blind	768837	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801				
Welding neck flange	766279	9621	9641	9661	9681	9701	9721	9741	9761	9781	9801	9821	9841	9861	
Fittings															
Cap bw	763017	5721	5781	5821	5921	6121	6321	6521	6721	6951					
Cap bw	763117										3151	3371	3571	3771	
Elbow 45 deg bw	763034	5721	5781	5821	5921	6121	6321	6521	6721	6951					
Elbow 45 deg bw	763134										3151	3371	3571	3771	
Elbow 90 deg bw	763042	5721	5781	5821	5921	6121	6321	6521	6721	6951					
Elbow 90 deg bw	763143										3151	3371	3571	3771	
Tee equal bw	763081	5721	5781	5821	5921	6121	6321	6521	6721	6951					
Tee equal bw	763180										3151	3371	3571	3771	
Valves															
Check valve flgd	771005	5031	5041	5051	5071	2081	2101	2121	2141	2151	2161	2171	2181	2191	
Gate valve flgd	772004	2031	2041	2051	2071	2081	2101	2121	2141	2151	2161	2171	2181	2191	
Globe valve flgd	773005	2031	2041	2051	2071	2081	2101	2121							
Miscellaneous															
Gasket spiral wound	854136	2041	2061	2081	2121	2141	2181	2201	2241	2261	2281	2301	2321	2341	
Meterrun	766596	2821	2841	2861	2881										
Orifice flange set	766295					3261	3271	3281	3291	3301	3311	3321	3331	3341	

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	7679031941				15	40	- 400	7680373211	7680310161
25	x	15		7630661511	7630671511	7630880491	400	x	80	7679032181				20	50	- 50	7680373221	7680310171
25	x	20		7630661611	7630671611	7630880591	400	x	100	7679032401				20	80	- 150	7680373241	7680310191
40	x	15		7630661711	7630671711		400	x	150	7679032601				20	200	- 400	7680373271	7680310211
40	x	20		7630661811	7630671811	7630880791	400	x	200	7679032781	7631664591	7631754591		25	80	- 250	7680373281	7680310221
40	x	25		7630661911	7630671911	7630880891	400	x	250		7631664681	7631754681	7631885101	25	300	- 400	7680373291	7680310231
50	x	20		7630661951	7630671951		400	x	300		7631664801	7631754801	7631885361	40	80	- 80	7680373321	7680310251
50	x	25		7630662011	7630672011	7630881071	400	x	350		7631664911	7631754911	7631885611	40	100	- 200	7680373331	7680310271
50	x	40		7630662111	7630672111	7630881161								40	250	- 400	7680373341	7680310291
80	x	40		7630662311	7630672311													
80	x	50		7630662411	7630672411	7630881341												
100	x	40		7630662591	7630672591													
100	x	50		7630662711	7630672711	7630881551												
100	x	80		7630662811	7630672811	7630881671												
150	x	50	7679031841															
150	x	80		7630663011	7630673011	7630881791												
150	x	100		7630663111	7630673111	7630881921												
200	x	50	7679031861															
200	x	80	7679032101															
200	x	100		7630663311	7630673311	7630882081												
200	x	150		7630663411	7630673411	7630882281												
250	x	50	7679031881															
250	x	80	7679032121															
250	x	100		7631663491	7631753491	7631882561												
250	x	150		7631663601	7631753601	7631882741												
250	x	200		7631663701	7631753701	7631882961												
300	x	50	7679031901															
300	x	80	7679032141															
300	x	100	7679032361															
300	x	150		7631663891	7631753891	7631883131												
300	x	200		7631664001	7631754001	7631883331												
300	x	250		7631664101	7631754101	7631883551												
350	x	50	7679031921															
350	x	80	7679032161															
350	x	100	7679032381															
350	x	150	7679032581	7631664191	7631754191													
350	x	200		7631664281	7631754281	7631883951												
350	x	250		7631664411	7631754411	7631884201												
350	x	300		7631664511	7631754511	7631884461												

Thermowell	
Length	MESC number
230	7683370311
255	7683370321
305	7683370331
355	7683370341
405	7683370351
455	7683370361

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	3/4	x	110	8138663301
20	4	3/4	x	120	8138663321
25	4	7/8	x	130	8138664031
40	4	1	x	140	8138664691
50	8	7/8	x	150	8138664061
80	8	1 1/8	x	180	8138665331
100	8	1 1/4	x	200	8138665881
150	12	1 3/8	x	260	8138666491
200	12	1 5/8	x	340	8138667321
250	12	1 7/8	x	390	8138667951
300	16	2	x	430	8138668351
350	16	2 1/4	x	470	8138668591
400	16	2 1/2	x	510	8138867021

Boltset meter run

DN	nr	inch	x	mm	MESC number
15	4	3/4	x	150	8138663371
20	4	3/4	x	150	8138663371
25	4	7/8	x	150	8138664061
40	4	1	x	160	8138664721

Boltset orifice flange

DN	nr	inch	x	mm	MESC number
50	8	7/8	x	160	8138664071
80	8	1 1/8	x	190	8138665351
100	8	1 1/4	x	210	8138665951
150	12	1 3/8	x	280	8138666521
200	12	1 5/8	x	360	8138667361
250	12	1 7/8	x	410	8138667991
300	16	2	x	460	8138668341
350	16	2 1/4	x	500	8138866311
400	16	2 1/2	x	550	8138867061

Boltset blind/spacer

DN	nr	inch	x	mm	MESC number
15	4	3/4	x	120	8138663321
20	4	3/4	x	130	8138663341
25	4	7/8	x	140	8138664041
40	4	1	x	160	8138664721
50	8	7/8	x	170	8138664091
80	8	1 1/8	x	210	8138665381
100	8	1 1/4	x	230	8138665981
150	12	1 3/8	x	300	8138666551
200	12	1 5/8	x	390	8138667401
250	12	1 7/8	x	450	8138668031
300	16	2	x	500	8138865611
350	16	2 1/4	x	550	8138866361
400	16	2 1/2	x	600	8138867111

ASSEMBLIES

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

Branch: according to branch table		
Blind flange	1	7662104081
Welding neck flange	1	7662799621
Gasket spiral wound	1	8541362041
Studbolt with nuts	4	8138663301

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

Branch: according to branch table		
Blind flange	1	7662104121
Welding neck flange	1	7662799641
Gasket spiral wound	1	8541362061
Studbolt with nuts	4	8138663321

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

Branch: branch nipple flanged		
Blind flange	1	7662104121
Gasket spiral wound	1	8541362061
Studbolt with nuts	4	8138663321

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

Branch: branch nipple flanged		
Blind flange	1	7662104161
Gasket spiral wound	1	8541362081
Studbolt with nuts	4	8138664031

Drain/vent point DN 40 Fig.H DN350 - 400

Branch: branch nipple flanged		
Blind flange	1	7662104181
Gasket spiral wound	1	8541362121
Studbolt with nuts	4	8138664691

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

Branch: not applicable		
Gate valve flgd	2	7720042031
Lap joint flange	2	7662205081
Gasket spiral wound	4	8541362041
Studbolt with nuts	8	8138663301
Studbolt with nuts	8	8138663301

Orifice connection DN 15 Fig.0I DN50 - 400

Branch: not applicable		
Gate valve flgd	2	7720042031
Lap joint flange	2	7662205081
Welding neck flange	2	7662799621
Gasket spiral wound	4	8541362041
Studbolt with nuts	8	8138663301
Studbolt with nuts	8	8138663301

Pressure instrument DN 15 Fig.0J DN15 - 25

Branch: according to branch table		
Gate valve flgd	1	7720042031
Lap joint flange	1	7662205081
Pipe	1	7430030201
Welding neck flange	1	7662799621
Gasket spiral wound	2	8541362041
Studbolt with nuts	4	8138663301
Studbolt with nuts	4	8138663301

Pressure instrument DN 15 Fig.0H DN40 - 400

Branch: according to branch table		
Gate valve flgd	1	7720042031
Lap joint flange	1	7662205081
Gasket spiral wound	2	8541362041
Studbolt with nuts	4	8138663301
Studbolt with nuts	4	8138663301

Temperature instrum DN 50 Fig.HS DN80 - 100

Branch: branch nipple flanged		
Lap joint flange	1	7662205201
Gasket spiral wound	1	8541362141
Studbolt with nuts	4	8138664071

Temperature instrum DN 50 Fig.HL DN150 - 400

Branch: branch nipple flanged		
Lap joint flange	1	7662205201
Gasket spiral wound	1	8541362141
Studbolt with nuts	4	8138664071

CLASS 151015-KS

Design limits

Temperature (°C)										
	-20	0	50	100	150	200	250	300	340	
Pressure (Bar ga)										
DN 15- 400	219.5	219.5	219.5	219.5	219.5	219.0	209.7	199.1	190.1	

Notes

- Design limits acc. to ASME B16.5 flange rating mat. grp 1.1 and ASME B31.3 allowable internal pressure, and limited by allowable stress of bolting material
- 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
350	160
400	160

Branch connections 90 degrees

Run size	Branch Size												
	15	20	25	40	50	80	100	150	200	250	300	350	400
400	C	C	C	C	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	E	E	B	B	B	A		
250	C	C	C	C	E	E	E	B	B	B	A		
200	C	C	C	C	E	E	B	B	B				
150	C	C	C	C	E	B	B	B	A				
100	C	C	C	C	C	B	B	A					
80	C	C	C	C	B	B	A						
50	C	C	B	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 F-Gr H-Sour		Plant
Class no.	151015-KS	Consignee
ASME rating	CLASS 1500	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 MES C buying description.)

Pipe

PIPE	Pipe	DN 15-400	ASTM A333-6
------	------	-----------	-------------

Flanges

BLFL	Blind flange	DN 15-400	ASTM A350-LF2
LJFL	Lap joint flange	---	ASTM A350-LF2
SBFL	Spectacle blind	DN 15-250	ASTM A516-60/65/70
SPFL	Spade	DN 15-400	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-400	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-400	ASTM A350-LF2

Fittings

CAPB	Cap bw	DN 15-400	ASTM A420-WPL6
E45B	Elbow 45 deg bw	DN 15-400	ASTM A420-WPL6
E90B	Elbow 90 deg bw	DN 15-400	ASTM A420-WPL6
TEEB	Tee equal bw	DN 15-400	ASTM A420-WPL6

Reducing fittings

BNIF	Branch fitting flgd	DN 15-40	ASTM A350-LF2
BNIP	Branch fitting plain	DN 15-40	ASTM A350-LF2
BROB	Branch outlet bw	DN 150-400	ASTM A350-LF2
RECB	Reducer concentric bw	DN 20-400	ASTM A420-WPL6
REEB	Reducer eccentric bw	DN 20-400	ASTM A420-WPL6
TERB	Tee reducing bw	DN 20-400	ASTM A420-WPL6

Valves

CHVF	Check valve flgd	DN 15-400	Body: ASTM A350-LF2/A352-LCC Trim: AISI 316, Stellite 6
GAVF	Gate valve flgd	DN 15-400	Body: ASTM A350-LF2/A352-LCC Trim: AISI 316, Stellite 6
GLVF	Globe valve flgd	DN 15-100	Body: ASTM A350-LF2/A352-LCC Trim: AISI 316, Stellite 6

Instruments

TWND	Thermowell	DN 40-40	AISI 316
TWNL	Thermowell L=255mm	---	AISI 316
TWNS	Thermowell L=230mm	---	AISI 316

Miscellaneous

GKSW	Gasket spiral wound	DN 15-400	AISI 316, graphite filled CS centring-/SS inner ring
MTRR	Meterrun	DN 15-40	AISI 316 LJ end flanges: ASTM A350-LF2
ORFS	Orifice flange set	DN 50-400	ASTM A350-LF2
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
Pipe														
Pipe	743016	0231	0301	0381	0541	0631	0711	0791	0881	1011	1131	1251	1381	1471
Flanges														
Blind flange	766212	6581	6621	6661	6681	6701	6721	6741	6761	6781	6801	6821	6841	6861
Spacer ring	768847	7081	7121	7161	7181	7201	7221	7241	7261	7281	7301	7321	7341	7361
Spade	768861	0801	0811	0821	0831	0841	0851	0861	0871	0881	0891	0901	0911	0921
Spectacle blind	768835	6081	6121	6161	6181	6201	6221	6241	6261	6281	6301			
Welding neck flange	766286	6621	6641	6661	6681	6701	6721	6741	6761	6781	6801	6821	6841	6861
Fittings														
Cap bw	763117	1721	1781	1821	1921	2121	2321	2521	2721	2921	3151	3371	3571	3771
Elbow 45 deg bw	763134	1721	1781	1821	1921	2121	2321	2521	2721	2921	3151	3371	3571	3771
Elbow 90 deg bw	763143	1721	1781	1821	1921	2121	2321	2521	2721	2921	3151	3371	3571	3771
Tee equal bw	763180	1721	1781	1821	1921	2121	2321	2521	2721	2921	3151	3371	3571	3771
Valves														
Check valve flgd	771033	2031	2041	2051	2071	2081	2101	2121	2141	2151	2161	2171	2181	2191
Gate valve flgd	772037	2031	2041	2051	2071	2081	2101	2121	2141	2151	2161	2171	2181	2191
Globe valve flgd	773037	2031	2041	2051	2071	2081	2101	2121						
Miscellaneous														
Gasket spiral wound	854136	2041	2061	2081	2121	2141	2181	2201	2241	2261	2281	2301	2321	2341
Meterrun	766596	3321	3341	3361	3381									
Orifice flange set	766297					3271	3281	3291	3301	3311	3321	3331	3341	3351

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		7631661411	7631751411	7631880391	400	x	50	7679071941				15	40	- 400	7680378211	7680311161
25	x	15		7631661511	7631751511	7631880491	400	x	80	7679072181				20	50	- 50	7680378221	7680311121
25	x	20		7631661611	7631751611	7631880591	400	x	100	7679072401				20	80	- 150	7680378241	7680311001
40	x	15		7631661711	7631751711		400	x	150	7679072601				20	200	- 400	7680378271	7680310991
40	x	20		7631661811	7631751811	7631880791	400	x	200	7679072781	7631664591	7631754591		25	80	- 250	7680378281	7680310971
40	x	25		7631661911	7631751911	7631880891	400	x	250		7631664681	7631754681	7631885101	25	300	- 400	7680378291	7680310951
50	x	20		7631661951	7631751951		400	x	300		7631664801	7631754801	7631885361	40	80	- 80	7680378321	7680310931
50	x	25		7631662011	7631752011	7631881071	400	x	350		7631664911	7631754911	7631885611	40	100	- 200	7680378331	7680310911
50	x	40		7631662111	7631752111	7631881161								40	250	- 400	7680378341	7680310891
80	x	40		7631662311	7631752311													
80	x	50		7631662411	7631752411	7631881341												
100	x	40		7631662591	7631752591													
100	x	50		7631662711	7631752711	7631881551												
100	x	80		7631662811	7631752811	7631881671												
150	x	50	7679071841															
150	x	80		7631663011	7631753011	7631881791												
150	x	100		7631663111	7631753111	7631881921												
200	x	50	7679071861															
200	x	80	7679072101															
200	x	100		7631663311	7631753311	7631882081												
200	x	150		7631663411	7631753411	7631882281												
250	x	50	7679071881															
250	x	80	7679072121															
250	x	100		7631663491	7631753491	7631882561												
250	x	150		7631663601	7631753601	7631882741												
250	x	200		7631663701	7631753701	7631882961												
300	x	50	7679071901															
300	x	80	7679072141															
300	x	100	7679072361															
300	x	150		7631663891	7631753891	7631883131												
300	x	200		7631664001	7631754001	7631883331												
300	x	250		7631664101	7631754101	7631883551												
350	x	50	7679071921															
350	x	80	7679072161															
350	x	100	7679072381															
350	x	150	7679072581	7631664191	7631754191													
350	x	200		7631664281	7631754281	7631883951												
350	x	250		7631664411	7631754411	7631884201												
350	x	300		7631664511	7631754511	7631884461												

Thermowell	
Length	MESC number
230	7683370311
255	7683370321
305	7683370331
355	7683370341
405	7683370351
455	7683370361

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	3/4	x	110	8138663301
20	4	3/4	x	120	8138663321
25	4	7/8	x	130	8138664031
40	4	1	x	140	8138664691
50	8	7/8	x	150	8138664061
80	8	1 1/8	x	180	8138665331
100	8	1 1/4	x	200	8138665881
150	12	1 3/8	x	260	8138666491
200	12	1 5/8	x	340	8138667321
250	12	1 7/8	x	390	8138667951
300	16	2	x	430	8138668351
350	16	2 1/4	x	470	8138668591
400	16	2 1/2	x	510	8138867021

Boltset meter run

DN	nr	inch	x	mm	MESC number
15	4	3/4	x	150	8138663371
20	4	3/4	x	150	8138663371
25	4	7/8	x	150	8138664061
40	4	1	x	160	8138664721

Boltset orifice flange

DN	nr	inch	x	mm	MESC number
50	8	7/8	x	160	8138664071
80	8	1 1/8	x	190	8138665351
100	8	1 1/4	x	210	8138665951
150	12	1 3/8	x	280	8138666521
200	12	1 5/8	x	360	8138667361
250	12	1 7/8	x	410	8138667991
300	16	2	x	460	8138668341
350	16	2 1/4	x	500	8138866311
400	16	2 1/2	x	550	8138867061

Boltset blind/spacer

DN	nr	inch	x	mm	MESC number
15	4	3/4	x	120	8138663321
20	4	3/4	x	130	8138663341
25	4	7/8	x	140	8138664041
40	4	1	x	160	8138664721
50	8	7/8	x	170	8138664091
80	8	1 1/8	x	210	8138665381
100	8	1 1/4	x	230	8138665981
150	12	1 3/8	x	300	8138666551
200	12	1 5/8	x	390	8138667401
250	12	1 7/8	x	450	8138668031
300	16	2	x	500	8138865611
350	16	2 1/4	x	550	8138866361
400	16	2 1/2	x	600	8138867111

ASSEMBLIES

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

Branch: according to branch table		
Blind flange	1	7662126581
Welding neck flange	1	7662866621
Gasket spiral wound	1	8541362041
Studbolt with nuts	4	8138663301

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

Branch: according to branch table		
Blind flange	1	7662126621
Welding neck flange	1	7662866641
Gasket spiral wound	1	8541362061
Studbolt with nuts	4	8138663321

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

Branch: branch nipple flanged		
Blind flange	1	7662126621
Gasket spiral wound	1	8541362061
Studbolt with nuts	4	8138663321

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

Branch: branch nipple flanged		
Blind flange	1	7662126661
Gasket spiral wound	1	8541362081
Studbolt with nuts	4	8138664031

Drain/vent point DN 40 Fig.H DN350 - 400

Branch: branch nipple flanged		
Blind flange	1	7662126681
Gasket spiral wound	1	8541362121
Studbolt with nuts	4	8138664691

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

Branch: not applicable		
Lap joint flange	2	7662208281
Gasket spiral wound	4	8541362041
Gate valve flgd	2	7720372031
Studbolt with nuts	8	8138663301
Studbolt with nuts	8	8138663301

Orifice connection DN 15 Fig.0I DN50 - 400

Branch: not applicable		
Lap joint flange	2	7662208281
Welding neck flange	2	7662866621
Gasket spiral wound	4	8541362041
Gate valve flgd	2	7720372031
Studbolt with nuts	8	8138663301
Studbolt with nuts	8	8138663301

Pressure instrument DN 15 Fig.0J DN15 - 25

Branch: according to branch table		
Lap joint flange	1	7662208281
Pipe	1	7430160231
Welding neck flange	1	7662866621
Gasket spiral wound	2	8541362041
Gate valve flgd	1	7720372031
Studbolt with nuts	4	8138663301
Studbolt with nuts	4	8138663301

Pressure instrument DN 15 Fig.0H DN40 - 400

Branch: according to branch table		
Lap joint flange	1	7662208281
Gasket spiral wound	2	8541362041
Gate valve flgd	1	7720372031
Studbolt with nuts	4	8138663301
Studbolt with nuts	4	8138663301

Temperature instrum DN 50 Fig.HS DN80 - 100

Branch: branch nipple flanged		
Gasket spiral wound	1	8541362141
Studbolt with nuts	4	8138664071

Temperature instrum DN 50 Fig.HL DN150 - 400

Branch: branch nipple flanged		
Gasket spiral wound	1	8541362141
Studbolt with nuts	4	8138664071

CLASS 151031

Design limits

	Temperature (°C)								
	0	50	100	150	200	250	300	350	400
Pressure (Bar ga)									
DN 15- 400	230.0	230.0	230.0	225.4	219.0	209.7	199.1	187.8	148.5

Notes

- Design limits acc. to ASME B16.5 flange rating mat. grp 1.1 and 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	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
100	XXS
150	XXS
200	160
250	160
300	160
350	160
400	160

Branch connections 90 degrees

Run size	Branch Size														
	15	20	25	40	50	80	100	150	200	250	300	350	400		
400	C	C	C	C	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	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.	151031	Consignee
ASME rating	CLASS 1500	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 15-200	ASTM A106-B
PIPE	Pipe	DN 250-400	ASTM A333-6

Flanges

BLFL	Blind flange	DN 15-400	ASTM A105
LJFL	Lap joint flange	---	ASTM A105
SBFL	Spectacle blind	DN 15-250	ASTM A516-60/65/70
SPFL	Spade	DN 15-400	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-400	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-400	ASTM A105

Fittings

CAPB	Cap bw	DN 15-200	ASTM A234-WPB
CAPB	Cap bw	DN 250-400	ASTM A420-WPL6
E45B	Elbow 45 deg bw	DN 15-200	ASTM A234-WPB
E45B	Elbow 45 deg bw	DN 250-400	ASTM A420-WPL6
E90B	Elbow 90 deg bw	DN 15-200	ASTM A234-WPB
E90B	Elbow 90 deg bw	DN 250-400	ASTM A420-WPL6
TEEB	Tee equal bw	DN 15-200	ASTM A234-WPB
TEEB	Tee equal bw	DN 250-400	ASTM A420-WPL6

Reducing fittings

BNIB	Branch fitting bw	DN 15-40	ASTM A105
BNIF	Branch fitting flgd	DN 15-40	ASTM A105
BROB	Branch outlet bw	DN 150-400	ASTM A105
RECB	Reducer concentric bw	DN 20-200	ASTM A234-WPB
RECB	Reducer concentric bw	DN 250-400	ASTM A420-WPL6
REEB	Reducer eccentric bw	DN 20-200	ASTM A234-WPB
REEB	Reducer eccentric bw	DN 250-400	ASTM A420-WPL6
TERB	Tee reducing bw	DN 20-200	ASTM A234-WPB
TERB	Tee reducing bw	DN 250-400	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 50-400	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 50-400	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 15-400	AISI 316, graphite filled CS centring-/SS inner ring
MTRR	Meterrun	DN 15-40	AISI 316 LJ end flanges: ASTM A105
ORFS	Orifice flange set	DN 50-400	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	350	400
Pipe														
Pipe	743005	0221	0321	0421	0621	0751	1151	1631	2291	2671				
Pipe	743017										1131	1251	1381	1471
Flanges														
Blind flange	766210	4081	4121	4161	4181	4201	4221	4241	4261	4281	4301	4321	4341	4361
Spacer ring	768816	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801	1821	1841	1861
Spade	768813	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801	1821	1841	1861
Spectacle blind	768803	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801			
Welding neck flange	766279									9781	9801	9821	9841	9861
Welding neck flange	766280	0321	0341	0361	0381	0401	0441	0461	0481					
Fittings														
Cap bw	763019	0231	0291	0331	0431	0631	0831	1031	1231	1451				
Cap bw	763118										3151	3371	3571	3771
Elbow 45 deg bw	763038	5731	5791	5831	5931	6131	6331	6531	6731	6951				
Elbow 45 deg bw	763138										3151	3371	3571	3771
Elbow 90 deg bw	763040	5731	5791	5831	5931	6131	6331	6531	6731	6951				
Elbow 90 deg bw	763139										3151	3371	3571	3771
Tee equal bw	763084	5731	5791	5831	5931	6131	6331	6531	6731	6951				
Tee equal bw	763184										3151	3371	3571	3771
Valves														
Check valve flgd	771005	5031	5041	5051	5071									
Check valve flgd	771020					2081	2101	2121	2141	2151	2161	2171	2181	2191
Gate valve flgd	772004	2031	2041	2051	2071									
Gate valve flgd	772020					2081	2101	2121	2141	2151	2161	2171	2181	2191
Globe valve flgd	773005	2031	2041	2051	2071									
Globe valve flgd	773020					2081	2101	2121						
Miscellaneous														
Gasket spiral wound	854136	2041	2061	2081	2121	2141	2181	2201	2241	2261	2281	2301	2321	2341
Meterrun	766596	2821	2841	2861	2881									
Orifice flange set	766295					3381	3391	3401	3411	3301	3311	3321	3331	3341

REDUCING/PIPING COMPONENTS

Run	x	Br	BROB	RECB	REEB	TERB	Run	x	Br	BROB	RECB	REEB	TERB	Branch	Run	pipe	BNIB	BNIF
20	x	15		7630721421	7630731421	7630890401	400	x	50	7679031071				15	40	- 400	7680310721	7680373411
25	x	15		7630721521	7630731521	7630890501	400	x	80	7679031201				20	50	- 50	7680310731	7680373421
25	x	20		7630721621	7630731621	7630890601	400	x	100	7679031311				20	80	- 150	7680310741	7680373441
40	x	15		7630721721	7630731721		400	x	150	7679031421				20	200	- 400	7680310751	7680373471
40	x	20		7630721821	7630731821	7630890801	400	x	200	7679032781	7631704591	7631714591		25	80	- 250	7680310761	7680373481
40	x	25		7630721921	7630731901	7630890901	400	x	250		7631704681	7631714681	7631855101	25	300	- 400	7680310771	7680373491
50	x	20		7629461961	7629611961		400	x	300		7631704801	7631714801	7631855361	40	80	- 80	7680310791	7680373521
50	x	25		7630722021	7630732021	7630891081	400	x	350		7631704911	7631714911	7631855611	40	100	- 200	7680310811	7680373531
50	x	40		7630722121	7630732121	7630891171								40	250	- 400	7680310821	7680373541
80	x	40		7630722321	7630732321													
80	x	50		7630722421	7630732421	7630891351												
100	x	40		7630722601	7630732601													
100	x	50		7630722721	7630732721	7630891561												
100	x	80		7630722821	7630732821	7630891681												
150	x	50	7679036841															
150	x	80		7630723021	7630733021	7630891801												
150	x	100		7630723121	7630733121	7630891931												
200	x	50	7679031021															
200	x	80	7679031161															
200	x	100		7630723321	7630733321	7630892221												
200	x	150		7630723421	7630733421	7630892431												
250	x	50	7679031041															
250	x	80	7679031171															
250	x	100		7629443541	7629593541	7631852681												
250	x	150		7629443701	7629593701	7631852861												
250	x	200		7631703701	7631713701	7631852961												
300	x	50	7679031051															
300	x	80	7679031181															
300	x	100	7679031291															
300	x	150		7629444681	7629594681	7631853251												
300	x	200		7631704001	7631714001	7631853331												
300	x	250		7631704101	7631714101	7631853551												
350	x	50	7679031061															
350	x	80	7679031191															
350	x	100	7679031301															
350	x	150	7679031411	7629446091	7629596091													
350	x	200		7631704281	7631714281	7631853951												
350	x	250		7631704411	7631714411	7631854201												
350	x	300		7631704511	7631714511	7631854461												

Comp.name	Description
BNIB	Branch fitting bw
BNIF	Branch fitting flgd
BROB	Branch outlet bw
RECB	Reducer concentric bw
REEB	Reducer eccentric bw
TERB	Tee reducing bw

Thermowell	
Length	MESC number
230	7683380611
255	7683380621

BOLTING

Boltset standard flange

DN	nr	inch	x mm	MESC number
15	4	3/4	x 110	8138613301
20	4	3/4	x 120	8138613321
25	4	7/8	x 130	8138614031
40	4	1	x 140	8138614691
50	8	7/8	x 150	8138614061
80	8	1 1/8	x 180	8138615331
100	8	1 1/4	x 200	8138615881
150	12	1 3/8	x 260	8138616491
200	12	1 5/8	x 340	8138617321
250	12	1 7/8	x 390	8138617951
300	16	2	x 430	8138618131
350	16	2 1/4	x 470	8138618591
400	16	2 1/2	x 510	8138837021

Boltset meter run

DN	nr	inch	x mm	MESC number
15	4	3/4	x 150	8138613371
20	4	3/4	x 150	8138613371
25	4	7/8	x 150	8138614061
40	4	1	x 160	8138614721

Boltset orifice flange

DN	nr	inch	x mm	MESC number
50	8	7/8	x 160	8138614071
80	8	1 1/8	x 190	8138615351
100	8	1 1/4	x 210	8138615951
150	12	1 3/8	x 280	8138616521
200	12	1 5/8	x 360	8138617361
250	12	1 7/8	x 410	8138617961
300	16	2	x 460	8138618341
350	16	2 1/4	x 500	8138836311
400	16	2 1/2	x 550	8138837061

Boltset blind/spacer

DN	nr	inch	x mm	MESC number
15	4	3/4	x 120	8138613321
20	4	3/4	x 130	8138613341
25	4	7/8	x 140	8138614041
40	4	1	x 160	8138614721
50	8	7/8	x 170	8138614091
80	8	1 1/8	x 210	8138615381
100	8	1 1/4	x 230	8138615981
150	12	1 3/8	x 300	8138616551
200	12	1 5/8	x 390	8138617401
250	12	1 7/8	x 450	8138618031
300	16	2	x 500	8138835611
350	16	2 1/4	x 550	8138836361
400	16	2 1/2	x 600	8138837111

ASSEMBLIES

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

Branch: according to branch table		
Blind flange	1	7662104081
Welding neck flange	1	7662800321
Gasket spiral wound	1	8541362041
Studbolt with nuts	4	8138613301

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

Branch: according to branch table		
Blind flange	1	7662104121
Welding neck flange	1	7662800341
Gasket spiral wound	1	8541362061
Studbolt with nuts	4	8138613321

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

Branch: branch nipple flanged		
Blind flange	1	7662104121
Gasket spiral wound	1	8541362061
Studbolt with nuts	4	8138613321

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

Branch: branch nipple flanged		
Blind flange	1	7662104161
Gasket spiral wound	1	8541362081
Studbolt with nuts	4	8138614031

Drain/vent point DN 40 Fig.H DN350 - 400

Branch: branch nipple flanged		
Blind flange	1	7662104181
Gasket spiral wound	1	8541362121
Studbolt with nuts	4	8138614691

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

Branch: not applicable		
Gate valve flgd	2	7720042031
Lap joint flange	2	7662205081
Gasket spiral wound	4	8541362041
Studbolt with nuts	8	8138613301
Studbolt with nuts	8	8138613301

Orifice connection DN 15 Fig.0I DN50 - 400

Branch: not applicable		
Gate valve flgd	2	7720042031
Lap joint flange	2	7662205081
Welding neck flange	2	7662800321
Gasket spiral wound	4	8541362041
Studbolt with nuts	8	8138613301
Studbolt with nuts	8	8138613301

Pressure instrument DN 15 Fig.0J DN15 - 25

Branch: according to branch table		
Gate valve flgd	1	7720042031
Lap joint flange	1	7662205081
Pipe	1	7430050221
Welding neck flange	1	7662800321
Gasket spiral wound	2	8541362041
Studbolt with nuts	4	8138613301
Studbolt with nuts	4	8138613301

Pressure instrument DN 15 Fig.0H DN40 - 400

Branch: according to branch table		
Gate valve flgd	1	7720042031
Lap joint flange	1	7662205081
Gasket spiral wound	2	8541362041
Studbolt with nuts	4	8138613301
Studbolt with nuts	4	8138613301

Temperature instrum DN 50 Fig.HS DN80 - 100

Branch: branch nipple flanged		
Lap joint flange	1	7662205201
Gasket spiral wound	1	8541362141
Thermowell L=230 mm	1	7683380611
Studbolt with nuts	4	8138614071

Temperature instrum DN 50 Fig.HL DN150 - 400

Branch: branch nipple flanged		
Lap joint flange	1	7662205201
Gasket spiral wound	1	8541362141
Thermowell L=255 mm	1	7683380621
Studbolt with nuts	4	8138614071

CLASS 151031-KS

Design limits

	Temperature (°C)									
	-20	0	50	100	150	200	250	300	340	
Pressure (Bar ga)										
DN 15- 400	230.0	230.0	230.0	230.0	225.4	219.0	209.7	199.1	190.1	

Notes

- Design limits acc. to ASME B16.5 flange rating mat. grp 1.1 and 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	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
100	XXS
150	XXS
200	160
250	160
300	160
350	160
400	160

Branch connections 90 degrees

Run size	Branch Size															
	15	20	25	40	50	80	100	150	200	250	300	350	400			
400	C	C	C	C	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	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 F-Gr		Plant
Class no.	151031-KS	Consignee
ASME rating	CLASS 1500	Engineered by
Corrosion allowance	3 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 15-400	ASTM A333-6
------	------	-----------	-------------

Flanges

BLFL	Blind flange	DN 15-400	ASTM A350-LF2
LJFL	Lap joint flange	---	ASTM A350-LF2
SBFL	Spectacle blind	DN 15-250	ASTM A516-60/65/70
SPFL	Spade	DN 15-400	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-400	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-400	ASTM A350-LF2

Fittings

CAPB	Cap bw	DN 15-400	ASTM A420-WPL6
E45B	Elbow 45 deg bw	DN 15-400	ASTM A420-WPL6
E90B	Elbow 90 deg bw	DN 15-400	ASTM A420-WPL6
TEEB	Tee equal bw	DN 15-400	ASTM A420-WPL6

Reducing fittings

BNIB	Branch fitting bw	DN 15-40	ASTM A350-LF2
BNIF	Branch fitting flgd	DN 15-40	ASTM A350-LF2
BROB	Branch outlet bw	DN 150-400	ASTM A350-LF2
RECB	Reducer concentric bw	DN 20-400	ASTM A420-WPL6
REEB	Reducer eccentric bw	DN 20-400	ASTM A420-WPL6
TERB	Tee reducing bw	DN 20-400	ASTM A420-WPL6

Valves

CHVF	Check valve flgd	DN 15-400	Body: ASTM A350-LF2/A352-LCC Trim: AISI 316, Stellite 6
GAVF	Gate valve flgd	DN 15-400	Body: ASTM A350-LF2/A352-LCC Trim: AISI 316, Stellite 6
GLVF	Globe valve flgd	DN 15-100	Body: ASTM A350-LF2/A352-LCC Trim: AISI 316, Stellite 6

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 15-400	AISI 316, graphite filled CS centring-/SS inner ring
MTRR	Meterrun	DN 15-40	AISI 316 LJ end flanges: ASTM A350-LF2
ORFS	Orifice flange set	DN 50-400	ASTM A350-LF2
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
Pipe														
Pipe	743017	0251	0321	0401	0561	0651	0731	0801	0891	1011	1131	1251	1381	1471
Flanges														
Blind flange	766212	6581	6621	6661	6681	6701	6721	6741	6761	6781	6801	6821	6841	6861
Spacer ring	768817	7081	7121	7161	7181	7201	7221	7241	7261	7281	7301	7321	7341	7361
Spade	768860	0801	0811	0821	0831	0841	0851	0861	0871	0881	0891	0901	0911	0921
Spectacle blind	768834	6081	6121	6161	6181	6201	6221	6241	6261	6281	6301			
Welding neck flange	766286	7021	7041	7061	7081	7101	7121	7141	7161	6781	6801	6821	6841	6861
Fittings														
Cap bw	763118	1731	1791	1831	1931	2131	2331	2531	2731	2921	3151	3371	3571	3771
Elbow 45 deg bw	763138	1731	1791	1831	1931	2131	2331	2531	2731	2921	3151	3371	3571	3771
Elbow 90 deg bw	763139	1731	1791	1831	1931	2131	2331	2531	2731	2921	3151	3371	3571	3771
Tee equal bw	763184	1731	1791	1831	1931	2131	2331	2531	2731	2921	3151	3371	3571	3771
Valves														
Check valve flgd	771033	2031	2041	2051	2071	2081	2101	2121	2141	2151	2161	2171	2181	2191
Gate valve flgd	772037	2031	2041	2051	2071	2081	2101	2121	2141	2151	2161	2171	2181	2191
Globe valve flgd	773037	2031	2041	2051	2071	2081	2101	2121						
Miscellaneous														
Gasket spiral wound	854136	2041	2061	2081	2121	2141	2181	2201	2241	2261	2281	2301	2321	2341
Meterrun	766596	3321	3341	3361	3381									
Orifice flange set	766297					3391	3401	3411	3421	3311	3321	3331	3341	3351

REDUCING/PIPING COMPONENTS

Run	x	Br	BROB	RECB	REEB	TERB
20	x	15		7631701421	7631711421	7631850401
25	x	15		7631701521	7631711521	7631850501
25	x	20		7631701621	7631711621	7631850601
40	x	15		7631701721	7631711721	
40	x	20		7631701821	7631711821	7631850801
40	x	25		7631701921	7631711921	7631850901
50	x	20		7631701961	7631711961	
50	x	25		7631702021	7631712021	7631851081
50	x	40		7631702121	7631712121	7631851171
80	x	40		7631702321	7631712321	
80	x	50		7631702421	7631712421	7631851351
100	x	40		7631702601	7631712601	
100	x	50		7631702721	7631712721	7631851561
100	x	80		7631702821	7631712821	7631851681
150	x	50	7679076841			
150	x	80		7631703021	7631713021	7631851801
150	x	100		7631703121	7631713121	7631851931
200	x	50	7679073671			
200	x	80	7679073971			
200	x	100		7629443321	7629593321	7631852221
200	x	150		7629443351	7629593351	7631852421
250	x	50	7679073681			
250	x	80	7679073981			
250	x	100		7629443541	7629593541	7631852681
250	x	150		7629443701	7629593701	7631852861
250	x	200		7631703701	7631713701	7631852961
300	x	50	7679073701			
300	x	80	7679074001			
300	x	100	7679074111			
300	x	150		7629444681	7629594681	7631853251
300	x	200		7631704001	7631714001	7631853331
300	x	250		7631704101	7631714101	7631853551
350	x	50	7679073721			
350	x	80	7679074021			
350	x	100	7679074121			
350	x	150	7679074201	7629446091	7629596091	
350	x	200		7631704281	7631714281	7631853951
350	x	250		7631704411	7631714411	7631854201
350	x	300		7631704511	7631714511	7631854461

Comp.name	Description
BNIB	Branch fitting bw
BNIF	Branch fitting flgd
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	7679073741			
400	x	80	7679074041			
400	x	100	7679074131			
400	x	150	7679074211			
400	x	200	7679072781	7631704591	7631714591	
400	x	250		7631704681	7631714681	7631855101
400	x	300		7631704801	7631714801	7631855361
400	x	350		7631704911	7631714911	7631855611

Branch	Run	pipe	BNIB	BNIF
15	40	- 400	7680311291	7680378411
20	50	- 50	7680311321	7680378421
20	80	- 150	7680311271	7680378441
20	200	- 400	7680311251	7680378471
25	80	- 250	7680311231	7680378481
25	300	- 400	7680311221	7680378491
40	80	- 80	7680311211	7680378521
40	100	- 200	7680311191	7680378531
40	250	- 400	7680311171	7680378541

Thermowell	
Length	MESC number
230	7683380611
255	7683380621

BOLTING

Boltset standard flange

DN	nr	inch	x	mm	MESC number
15	4	3/4	x	110	8138613301
20	4	3/4	x	120	8138613321
25	4	7/8	x	130	8138614031
40	4	1	x	140	8138614691
50	8	7/8	x	150	8138614061
80	8	1 1/8	x	180	8138615331
100	8	1 1/4	x	200	8138615881
150	12	1 3/8	x	260	8138616491
200	12	1 5/8	x	340	8138617321
250	12	1 7/8	x	390	8138617951
300	16	2	x	430	8138618131
350	16	2 1/4	x	470	8138618591
400	16	2 1/2	x	510	8138837021

Boltset meter run

DN	nr	inch	x	mm	MESC number
15	4	3/4	x	150	8138613371
20	4	3/4	x	150	8138613371
25	4	7/8	x	150	8138614061
40	4	1	x	160	8138614721

Boltset orifice flange

DN	nr	inch	x	mm	MESC number
50	8	7/8	x	160	8138614071
80	8	1 1/8	x	190	8138615351
100	8	1 1/4	x	210	8138615951
150	12	1 3/8	x	280	8138616521
200	12	1 5/8	x	360	8138617361
250	12	1 7/8	x	410	8138617961
300	16	2	x	460	8138618341
350	16	2 1/4	x	500	8138836311
400	16	2 1/2	x	550	8138837061

Boltset blind/spacer

DN	nr	inch	x	mm	MESC number
15	4	3/4	x	120	8138613321
20	4	3/4	x	130	8138613341
25	4	7/8	x	140	8138614041
40	4	1	x	160	8138614721
50	8	7/8	x	170	8138614091
80	8	1 1/8	x	210	8138615381
100	8	1 1/4	x	230	8138615981
150	12	1 3/8	x	300	8138616551
200	12	1 5/8	x	390	8138617401
250	12	1 7/8	x	450	8138618031
300	16	2	x	500	8138835611
350	16	2 1/4	x	550	8138836361
400	16	2 1/2	x	600	8138837111

ASSEMBLIES

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

Branch: according to branch table		
Blind flange	1	7662126581
Welding neck flange	1	7662867021
Gasket spiral wound	1	8541362041
Studbolt with nuts	4	8138613301

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

Branch: according to branch table		
Blind flange	1	7662126621
Welding neck flange	1	7662867041
Gasket spiral wound	1	8541362061
Studbolt with nuts	4	8138613321

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

Branch: branch nipple flanged		
Blind flange	1	7662126621
Gasket spiral wound	1	8541362061
Studbolt with nuts	4	8138613321

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

Branch: branch nipple flanged		
Blind flange	1	7662126661
Gasket spiral wound	1	8541362081
Studbolt with nuts	4	8138614031

Drain/vent point DN 40 Fig.H DN350 - 400

Branch: branch nipple flanged		
Blind flange	1	7662126681
Gasket spiral wound	1	8541362121
Studbolt with nuts	4	8138614691

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

Branch: not applicable		
Lap joint flange	2	7662208281
Gasket spiral wound	4	8541362041
Gate valve flgd	2	7720372031
Studbolt with nuts	8	8138613301
Studbolt with nuts	8	8138613301

Orifice connection DN 15 Fig.0I DN50 - 400

Branch: not applicable		
Lap joint flange	2	7662208281
Welding neck flange	2	7662867021
Gasket spiral wound	4	8541362041
Gate valve flgd	2	7720372031
Studbolt with nuts	8	8138613301
Studbolt with nuts	8	8138613301

Pressure instrument DN 15 Fig.0J DN15 - 25

Branch: according to branch table		
Lap joint flange	1	7662208281
Pipe	1	7430170251
Welding neck flange	1	7662867021
Gasket spiral wound	2	8541362041
Gate valve flgd	1	7720372031
Studbolt with nuts	4	8138613301
Studbolt with nuts	4	8138613301

Pressure instrument DN 15 Fig.0H DN40 - 400

Branch: according to branch table		
Lap joint flange	1	7662208281
Gasket spiral wound	2	8541362041
Gate valve flgd	1	7720372031
Studbolt with nuts	4	8138613301
Studbolt with nuts	4	8138613301

Temperature instrum DN 50 Fig.HS DN80 - 100

Branch: branch nipple flanged		
Gasket spiral wound	1	8541362141
Thermowell L=230 mm	1	7683380611
Studbolt with nuts	4	8138614071

Temperature instrum DN 50 Fig.HL DN150 - 400

Branch: branch nipple flanged		
Gasket spiral wound	1	8541362141
Thermowell L=255 mm	1	7683380621
Studbolt with nuts	4	8138614071

CLASS 151041-20

Design limits

		Temperature (°C)									
		-20	0	50	100	150	200	250	300	350	400
		Pressure (Bar ga)									
DN	15- 400	250.6	250.6	250.6	233.0	225.4	219.0	209.7	199.1	187.8	161.7

Notes

- Design limits acc. to ASME B16.5 flange rating mat. grp 1.1 and 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
350	160
400	160

Branch connections 90 degrees

Branch Size		15	20	25	40	50	80	100	150	200	250	300	350	400
Run size														
400	C	C	C	C	C	E	E	E	E	E	B	B	B	A
350	C	C	C	C	C	E	E	E	B	B	B	B	A	
300	C	C	C	C	C	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	B			
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	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 M-Sour		Plant
Class no.	151041-20	Consignee
ASME rating	CLASS 1500	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 MESD buying description.)

Pipe

PIPE	Pipe	DN 15-100	ASTM A106-B
PIPE	Pipe	DN 150-400	ASTM A333-6

Flanges

BLFL	Blind flange	DN 15-100	ASTM A105
BLFL	Blind flange	DN 150-400	ASTM A350-LF2
LJFL	Lap joint flange	---	ASTM A105
SBFL	Spectacle blind	DN 15-250	ASTM A516-60/65/70
SPFL	Spade	DN 15-400	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-400	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-100	ASTM A105
WNFL	Welding neck flange	DN 150-400	ASTM A350-LF2

Fittings

CAPB	Cap bw	DN 15-100	ASTM A234-WPB
CAPB	Cap bw	DN 150-400	ASTM A420-WPL6
E45B	Elbow 45 deg bw	DN 15-100	ASTM A234-WPB
E45B	Elbow 45 deg bw	DN 150-400	ASTM A420-WPL6
E90B	Elbow 90 deg bw	DN 15-100	ASTM A234-WPB
E90B	Elbow 90 deg bw	DN 150-400	ASTM A420-WPL6
TEEB	Tee equal bw	DN 15-100	ASTM A234-WPB
TEEB	Tee equal bw	DN 150-400	ASTM A420-WPL6

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 150-400	ASTM A350-LF2
RECB	Reducer concentric bw	DN 150-400	ASTM A420-WPL6
RECB	Reducer concentric bw	DN 20-100	ASTM A234-WPB
REEB	Reducer eccentric bw	DN 150-400	ASTM A420-WPL6
REEB	Reducer eccentric bw	DN 20-100	ASTM A234-WPB
TERB	Tee reducing bw	DN 150-400	ASTM A420-WPL6
TERB	Tee reducing bw	DN 20-100	ASTM A234-WPB

Valves

CHVF	Check valve flgd	DN 15-400	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GAVF	Gate valve flgd	DN 15-400	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GLVF	Globe valve flgd	DN 15-100	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6

Instruments

TWND	Thermowell	DN 40-40	AISI 316
TWNL	Thermowell L=255mm	---	AISI 316
TWNS	Thermowell L=230mm	---	AISI 316

Miscellaneous

GKSW	Gasket spiral wound	DN 15-400	AISI 316, graphite filled CS centring-/SS inner ring
MTRR	Meterrun	DN 15-40	AISI 316 LJ end flanges: ASTM A105
ORFS	Orifice flange set	DN 50-400	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	350	400	
Pipe															
Pipe	743005	0201	0301	0401	0601	0731	1131	1611							
Pipe	743017								0881	1011	1131	1251	1381	1471	
Flanges															
Blind flange	766210	4081	4121	4161	4181	4201	4221	4241							
Blind flange	766212								6761	6781	6801	6821	6841	6861	
Spacer ring	768816	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801				
Spacer ring	768817											7321	7341	7361	
Spade	768813	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801				
Spade	768860											0901	0911	0921	
Spectacle blind	768803	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801				
Welding neck flange	766279	9621	9641	9661	9681	9701	9721	9741							
Welding neck flange	766286								6761	6781	6801	6821	6841	6861	
Fittings															
Cap bw	763019	0221	0281	0321	0421	0621	0821	1021							
Cap bw	763118								2721	2921	3151	3371	3571	3771	
Elbow 45 deg bw	763038	5721	5781	5821	5921	6121	6321	6521							
Elbow 45 deg bw	763138								2721	2921	3151	3371	3571	3771	
Elbow 90 deg bw	763040	5721	5781	5821	5921	6121	6321	6521							
Elbow 90 deg bw	763139								2721	2921	3151	3371	3571	3771	
Tee equal bw	763084	5721	5781	5821	5921	6121	6321	6521							
Tee equal bw	763184								2721	2921	3151	3371	3571	3771	
Valves															
Check valve flgd	771005	5031	5041	5051	5071	2081	2101	2121	2141	2151	2161	2171	2181	2191	
Gate valve flgd	772004	2031	2041	2051	2071	2081	2101	2121	2141	2151	2161	2171	2181	2191	
Globe valve flgd	773005	2031	2041	2051	2071	2081	2101	2121							
Miscellaneous															
Gasket spiral wound	854136	2041	2061	2081	2121	2141	2181	2201	2241	2261	2281	2301	2321	2341	
Meterrun	766596	2821	2841	2861	2881										
Orifice flange set	766295					3261	3271	3281	3291	3301	3311	3321	3331	3341	

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	7679071941				15	40	- 400	7680373211	7680310161
25	x	15		7630721511	7630731511	7630890491	400	x	80	7679072181				20	50	- 50	7680373221	7680310171
25	x	20		7630721611	7630731611	7630890591	400	x	100	7679072401				20	80	- 150	7680373241	7680310191
40	x	15		7630721711	7630731711		400	x	150	7679072601				20	200	- 400	7680373271	7680310211
40	x	20		7630721811	7630731811	7630890791	400	x	200	7679072781	7631704591	7631714591		25	80	- 250	7680373281	7680310221
40	x	25		7630721911	7630731911	7630890891	400	x	250		7631704681	7631714681	7631855101	25	300	- 400	7680373291	7680310231
50	x	20		7630721951	7630731951		400	x	300		7631704801	7631714801	7631855361	40	80	- 80	7680373321	7680310251
50	x	25		7630722011	7630732011	7630891071	400	x	350		7631704911	7631714911	7631855611	40	100	- 200	7680373331	7680310271
50	x	40		7630722111	7630732111	7630891161								40	250	- 400	7680373341	7680310291
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												
350	x	50	7679071921															
350	x	80	7679072161															
350	x	100	7679072381															
350	x	150	7679072581	7631704191	7631714191													
350	x	200		7631704281	7631714281	7631853951												
350	x	250		7631704411	7631714411	7631854201												
350	x	300		7631704511	7631714511	7631854461												

Thermowell	
Length	MESC number
230	7683370311
255	7683370321
305	7683370331
355	7683370341
405	7683370351
455	7683370361

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	3/4	x	110	8138613301
20	4	3/4	x	120	8138613321
25	4	7/8	x	130	8138614031
40	4	1	x	140	8138614691
50	8	7/8	x	150	8138614061
80	8	1 1/8	x	180	8138615331
100	8	1 1/4	x	200	8138615881
150	12	1 3/8	x	260	8138616491
200	12	1 5/8	x	340	8138617321
250	12	1 7/8	x	390	8138617951
300	16	2	x	430	8138618131
350	16	2 1/4	x	470	8138618591
400	16	2 1/2	x	510	8138837021

Boltset meter run					
DN	nr	inch	x	mm	MESC number
15	4	3/4	x	150	8138613371
20	4	3/4	x	150	8138613371
25	4	7/8	x	150	8138614061
40	4	1	x	160	8138614721

Boltset orifice flange					
DN	nr	inch	x	mm	MESC number
50	8	7/8	x	160	8138614071
80	8	1 1/8	x	190	8138615351
100	8	1 1/4	x	210	8138615951
150	12	1 3/8	x	280	8138616521
200	12	1 5/8	x	360	8138617361
250	12	1 7/8	x	410	8138617961
300	16	2	x	460	8138618341
350	16	2 1/4	x	500	8138836311
400	16	2 1/2	x	550	8138837061

Boltset blind/spacer					
DN	nr	inch	x	mm	MESC number
15	4	3/4	x	120	8138613321
20	4	3/4	x	130	8138613341
25	4	7/8	x	140	8138614041
40	4	1	x	160	8138614721
50	8	7/8	x	170	8138614091
80	8	1 1/8	x	210	8138615381
100	8	1 1/4	x	230	8138615981
150	12	1 3/8	x	300	8138616551
200	12	1 5/8	x	390	8138617401
250	12	1 7/8	x	450	8138618031
300	16	2	x	500	8138835611
350	16	2 1/4	x	550	8138836361
400	16	2 1/2	x	600	8138837111

ASSEMBLIES

Drain/vent point DN 15 Fig.I DN15 - 15		
Branch: according to branch table		
Blind flange	1	7662104081
Welding neck flange	1	7662799621
Gasket spiral wound	1	8541362041
Studbolt with nuts	4	8138613301

Drain/vent point DN 20 Fig.I DN20 - 40		
Branch: according to branch table		
Blind flange	1	7662104121
Welding neck flange	1	7662799641
Gasket spiral wound	1	8541362061
Studbolt with nuts	4	8138613321

Drain/vent point DN 20 Fig.H DN50 - 50		
Branch: branch nipple flanged		
Blind flange	1	7662104121
Gasket spiral wound	1	8541362061
Studbolt with nuts	4	8138613321

Drain/vent point DN 25 Fig.H DN80 - 300		
Branch: branch nipple flanged		
Blind flange	1	7662104161
Gasket spiral wound	1	8541362081
Studbolt with nuts	4	8138614031

Drain/vent point DN 40 Fig.H DN350 - 400		
Branch: branch nipple flanged		
Blind flange	1	7662104181
Gasket spiral wound	1	8541362121
Studbolt with nuts	4	8138614691

Meter run connection DN 15 Fig.OH DN15 - 40		
Branch: not applicable		
Gate valve flgd	2	7720042031
Lap joint flange	2	7662205081
Gasket spiral wound	4	8541362041
Studbolt with nuts	8	8138613301
Studbolt with nuts	8	8138613301

Orifice connection DN 15 Fig.OI DN50 - 400		
Branch: not applicable		
Gate valve flgd	2	7720042031
Lap joint flange	2	7662205081
Welding neck flange	2	7662799621
Gasket spiral wound	4	8541362041
Studbolt with nuts	8	8138613301
Studbolt with nuts	8	8138613301

Pressure instrument DN 15 Fig.OJ DN15 - 25		
Branch: according to branch table		
Gate valve flgd	1	7720042031
Lap joint flange	1	7662205081
Pipe	1	7430050201
Welding neck flange	1	7662799621
Gasket spiral wound	2	8541362041
Studbolt with nuts	4	8138613301
Studbolt with nuts	4	8138613301

Pressure instrument DN 15 Fig.OH DN40 - 400		
Branch: according to branch table		
Gate valve flgd	1	7720042031
Lap joint flange	1	7662205081
Gasket spiral wound	2	8541362041
Studbolt with nuts	4	8138613301
Studbolt with nuts	4	8138613301

Temperature instrum DN 50 Fig.HS DN80 - 100		
Branch: branch nipple flanged		
Lap joint flange	1	7662205201
Gasket spiral wound	1	8541362141
Studbolt with nuts	4	8138614071

Temperature instrum DN 50 Fig.HL DN150 - 400		
Branch: branch nipple flanged		
Lap joint flange	1	7662205201
Gasket spiral wound	1	8541362141
Studbolt with nuts	4	8138614071

CLASS 151041

Design limits

	Temperature (°C)									
	0	50	100	150	200	250	300	350	400	
Pressure (Bar ga)										
DN 15- 400	250.6	250.6	233.0	225.4	219.0	209.7	199.1	187.8	161.7	

Notes

- Design limits acc. to ASME B16.5 flange rating mat. grp 1.1 and 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
350	160
400	160

Branch connections 90 degrees

Run size	Branch Size														
	15	20	25	40	50	80	100	150	200	250	300	350	400		
400	C	C	C	C	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	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 M-Sour		Plant
Class no.	151041	Consignee
ASME rating	CLASS 1500	Engineered by
Corrosion allowance	1 mm	Principal
Revision letter	C	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 15-200	ASTM A106-B
PIPE	Pipe	DN 250-400	ASTM A333-6

Flanges

BLFL	Blind flange	DN 15-400	ASTM A105
LJFL	Lap joint flange	---	ASTM A105
SBFL	Spectacle blind	DN 15-250	ASTM A516-60/65/70
SPFL	Spade	DN 15-400	ASTM A516-60/65/70
SPRT	Spacer ring	DN 15-400	ASTM A516-60/65/70
WNFL	Welding neck flange	DN 15-400	ASTM A105

Fittings

CAPB	Cap bw	DN 15-200	ASTM A234-WPB
CAPB	Cap bw	DN 250-400	ASTM A420-WPL6
E45B	Elbow 45 deg bw	DN 15-200	ASTM A234-WPB
E45B	Elbow 45 deg bw	DN 250-400	ASTM A420-WPL6
E90B	Elbow 90 deg bw	DN 15-200	ASTM A234-WPB
E90B	Elbow 90 deg bw	DN 250-400	ASTM A420-WPL6
TEEB	Tee equal bw	DN 15-200	ASTM A234-WPB
TEEB	Tee equal bw	DN 250-400	ASTM A420-WPL6

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 150-400	ASTM A105
RECB	Reducer concentric bw	DN 20-200	ASTM A234-WPB
RECB	Reducer concentric bw	DN 250-400	ASTM A420-WPL6
REEB	Reducer eccentric bw	DN 20-200	ASTM A234-WPB
REEB	Reducer eccentric bw	DN 250-400	ASTM A420-WPL6
TERB	Tee reducing bw	DN 20-200	ASTM A234-WPB
TERB	Tee reducing bw	DN 250-400	ASTM A420-WPL6

Valves

CHVF	Check valve flgd	DN 15-400	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GAVF	Gate valve flgd	DN 15-400	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6
GLVF	Globe valve flgd	DN 15-100	Body: ASTM A105/A216-WCB/WCC Trim: AISI 316, Stellite 6

Instruments

TWND	Thermowell	DN 40-40	AISI 316
TWNL	Thermowell L=255mm	---	AISI 316
TWNS	Thermowell L=230mm	---	AISI 316

Miscellaneous

GKSW	Gasket spiral wound	DN 15-400	AISI 316, graphite filled CS centring-/SS inner ring
MTRR	Meterrun	DN 15-40	AISI 316 LJ end flanges: ASTM A105
ORFS	Orifice flange set	DN 50-400	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	350	400	
Pipe															
Pipe	743005	0201	0301	0401	0601	0731	1131	1611	2271	2671					
Pipe	743017										1131	1251	1381	1471	
Flanges															
Blind flange	766210	4081	4121	4161	4181	4201	4221	4241	4261	4281	4301	4321	4341	4361	
Spacer ring	768816	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801	1821	1841	1861	
Spade	768813	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801	1821	1841	1861	
Spectacle blind	768803	1621	1641	1661	1681	1701	1721	1741	1761	1781	1801				
Welding neck flange	766279	9621	9641	9661	9681	9701	9721	9741	9761	9781	9801	9821	9841	9861	
Fittings															
Cap bw	763019	0221	0281	0321	0421	0621	0821	1021	1221	1451					
Cap bw	763118										3151	3371	3571	3771	
Elbow 45 deg bw	763038	5721	5781	5821	5921	6121	6321	6521	6721	6951					
Elbow 45 deg bw	763138										3151	3371	3571	3771	
Elbow 90 deg bw	763040	5721	5781	5821	5921	6121	6321	6521	6721	6951					
Elbow 90 deg bw	763139										3151	3371	3571	3771	
Tee equal bw	763084	5721	5781	5821	5921	6121	6321	6521	6721	6951					
Tee equal bw	763184										3151	3371	3571	3771	
Valves															
Check valve flgd	771005	5031	5041	5051	5071	2081	2101	2121	2141	2151	2161	2171	2181	2191	
Gate valve flgd	772004	2031	2041	2051	2071	2081	2101	2121	2141	2151	2161	2171	2181	2191	
Globe valve flgd	773005	2031	2041	2051	2071	2081	2101	2121							
Miscellaneous															
Gasket spiral wound	854136	2041	2061	2081	2121	2141	2181	2201	2241	2261	2281	2301	2321	2341	
Meterrun	766596	2821	2841	2861	2881										
Orifice flange set	766295					3261	3271	3281	3291	3301	3311	3321	3331	3341	

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	7679031941				15	40	- 400	7680373211	7680310161
25	x	15		7630721511	7630731511	7630890491	400	x	80	7679032181				20	50	- 50	7680373221	7680310171
25	x	20		7630721611	7630731611	7630890591	400	x	100	7679032401				20	80	- 150	7680373241	7680310191
40	x	15		7630721711	7630731711		400	x	150	7679032601				20	200	- 400	7680373271	7680310211
40	x	20		7630721811	7630731811	7630890791	400	x	200	7679032781	7631704591	7631714591		25	80	- 250	7680373281	7680310221
40	x	25		7630721911	7630731911	7630890891	400	x	250		7631704681	7631714681	7631855101	25	300	- 400	7680373291	7680310231
50	x	20		7630721951	7630731951		400	x	300		7631704801	7631714801	7631855361	40	80	- 80	7680373321	7680310251
50	x	25		7630722011	7630732011	7630891071	400	x	350		7631704911	7631714911	7631855611	40	100	- 200	7680373331	7680310271
50	x	40		7630722111	7630732111	7630891161								40	250	- 400	7680373341	7680310291
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												
350	x	50	7679031921															
350	x	80	7679032161															
350	x	100	7679032381															
350	x	150	7679032581	7631704191	7631714191													
350	x	200		7631704281	7631714281	7631853951												
350	x	250		7631704411	7631714411	7631854201												
350	x	300		7631704511	7631714511	7631854461												

Thermowell	
Length	MESC number
230	7683370311
255	7683370321
305	7683370331
355	7683370341
405	7683370351
455	7683370361

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