

0. INTRODUCTION

This Standards is prepared in three parts, which are separately bindered as follow:

- Part I General (guidance on the application of piping classes).
- Part II Piping class rating: PN 20 (150) and PN 50 (300).
- Part III Piping class rating: PN 100 (600), PN 150 (900), PN 250 (1500) and PN 420 (2500).

Class No.: FN01	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 100 (Class 600)	Date:	
Corrosion Allowance: 1 mm	Sign:	

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-600	102.0	100.1	92.8	90.6	87.8	83.6	77.5	74.0	69.1

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES																
			BRANCH SIZE																
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600	
15	80	600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	
20	80	500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		
25	80	450	C	C	C	C	E	E	E	E	E	E	E	E	E	A			
40	80	400	C	C	C	C	E	E	E	E	E	E	E	E	A				
50	80	350	C	C	C	C	E	E	E	E	E	E	E	A					
80	80	300	C	C	C	C	E	E	E	E	E	E	A						
100	80	250	C	C	C	C	E	E	E	E	E	A							
150	80	200	C	C	C	C	E	E	E	E	A								
200	80	150	C	C	C	C	E	E	E	A									
250	80	100	C	C	C	C	E	E	A										
300	80	80	C	C	C	C	E	A											
350	80	50	C	C	C	B	A												
400	80	40	C	B	B	A													
450	80	25	B	B	A														
500	80	20	B	A															
600	80	15	A																

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

- | | |
|---|---------------------------------------|
| A | Equal tee |
| B | Reducing tee |
| C | Branch fitting outlet socket weld-end |
| E | Branch outlet reducing butt-weld |

Class No.: FN01	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-600	API	5L-B (Seamless)
PNPP	pipe Nipple 50 mm	DN	15-40	ASTM	A-106-B

* FLANGES

BLFL	Blind Flange	DN	15-600	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-600	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-600	ASTM	A516-60
WNFL	Welding Neck Flange	DN	15-600	ASTM	A105

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-600	ASTM	A234-WPB
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-600	ASTM	A234-WPB
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-600	ASTM	A234-WPB
TEEB	Equal Tee	Butt-Weld. End	DN	15-600	ASTM	A234-WPB
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A105
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A105
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A105

* REDUCING FITTINGS

BROS	Branch Outlet Socket-Weld. End	DN	15-40	ASTM	A105
BROB	Branch Outlet Red. Butt-Weld.	DN	80-600	ASTM	A105
RECB	Reducer Conc. Butt-Weld. End	DN	20-600	ASTM	A234-WPB
REEB	Reducer Ecc. Butt-Weld. End	DN	20-600	ASTM	A234-WPB
TERB	Tee Reducing Butt-Weld. End	DN	20-600	ASTM	A234-WPB
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A105

Note:

- For full material description see relevant buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVF	Check Valve Flanged	DN	15-600	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
CHVS	Check Valve Socket	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GAVF	Gate Valve Flanged	DN	15-600	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GAVS	Gate Valve Socket-Weld	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GLVF	Globe Valve Flanged	DN	15-150	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GLVS	Globe Valve Socket	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
NEVS	Globe Valve Needle Type Socket	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-600	AISI 316, Asbestos Filled, CS Centring Ring
ORFS	Orifice Flange Set	DN	50-600	ASTM A-105
STBT	Stud Bolt with Nuts	—		Studs: ASTM A193-B7 Nuts: ASTM A194-2H

Class No.: FN01	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
* PIPE																	
Pipe	74.13.21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pipe Nipple 50 mm	76.30.57	*	*	*	*												
* FLANGES																	
Blind Flange	76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.62.79	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS																	
Cap	Butt-Weld. End 76.30.18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End 76.30.38	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End 76.30.40	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End 76.30.84	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End 76.34.38	*	*	*	*												
Elbow 90 Deg.	Socket-Weld. End 76.34.39	*	*	*	*												
Equal Tee	Socket-Weld. End 76.34.84	*	*	*	*												
Coupling	Socket-Weld. End 76.34.28	*	*	*	*												
Cap	Socket-Weld. End 76.34.18	*	*	*	*												
* VALVES																	
Check Valve Flanged	75.37.15	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Check Valve Socket	75.56.13	*	*	*	*												
Gate Valve Flanged	75.37.35	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Sw	75.56.35	*	*	*	*												
Globe Valve Flanged	75.37.45	*	*	*	*	*	*	*									
Globe Valve Socket	75.56.45	*	*	*	*												
Globe Valve Needle Type Socket	75.56.63	*	*	*	*												
* MISCELLANEOUS																	
Gasket, Spiral Wound	85.41.35	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52							*	*	*	*	*	*	*	*	*	*

Class No.: FN01	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	TERS 76.34.85	Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	COMP. NAME	DESCRIPTION
20 × 15			*	*	*	*	400 × 50		*				BROS	Branch Fitting Socket-Weld. Outlet
25 × 15			*	*	*	*	400 × 80		*				BROB	Branch Outlet Red. Butt-Weld
25 × 20			*	*	*	*	400 × 100		*				RECB	Reducer Conc. Butt-Weld. End
40 × 15				*	*	*	400 × 150		*			*	REEB	Reducer Ecc. Butt-Weld. End
40 × 20			*	*	*	*	400 × 200		*	*	*	*	TERB	Tee Reducing Butt-Weld. End
40 × 25			*	*	*	*	400 × 250		*	*	*	*	TERS	Tee Reducing Socket-Weld. End
50 × 20				*	*	*	400 × 300		*	*	*	*		
50 × 25			*	*	*	*	400 × 350		*	*	*	*		
50 × 40			*	*	*	*	450 × 50		*				RUN	Br.
80 × 40			*	*	*	*	450 × 80		*					BROS
80 × 50	*		*	*	*	*	450 × 100		*					76.80.26
100 × 50	*		*	*	*	*	450 × 150		*				40-150	15
100 × 80	*		*	*	*	*	450 × 200		*	*	*	*	200-600	*
150 × 50	*		*	*	*	*	450 × 250		*	*	*	*		
150 × 80	*		*	*	*	*	450 × 300		*	*	*	*	50-80	20
150 × 100	*		*	*	*	*	450 × 350		*	*	*	*	100-600	*
200 × 50	*		*	*	*	*	450 × 400		*	*	*	*		
200 × 80	*		*	*	*	*	500 × 50		*				50	25
200 × 100	*		*	*	*	*	500 × 80		*				80-100	*
200 × 150	*		*	*	*	*	500 × 100		*				150-600	*
250 × 50	*		*	*	*	*	500 × 150		*					
250 × 80	*		*	*	*	*	500 × 200		*	*	*	*	80-100	40
250 × 100	*		*	*	*	*	500 × 250		*	*	*	*	150-300	*
250 × 150	*	*	*	*	*	*	500 × 300		*	*	*	*	350-600	*
250 × 200	*	*	*	*	*	*	500 × 350		*	*	*	*		
300 × 50	*		*	*	*	*	500 × 400		*	*	*	*		
300 × 80	*		*	*	*	*	500 × 450		*	*	*	*		
300 × 100	*		*	*	*	*	600 × 50		*					
300 × 150	*	*	*	*	*	*	600 × 80		*					
300 × 200	*	*	*	*	*	*	600 × 100		*					
300 × 250	*	*	*	*	*	*	600 × 150		*					
350 × 50	*		*	*	*	*	600 × 200		*	*	*	*		
350 × 80	*		*	*	*	*	600 × 250		*	*	*	*		
350 × 100	*		*	*	*	*	600 × 300		*	*	*	*		
350 × 150	*		*	*	*	*	600 × 350		*	*	*	*		
350 × 200	*	*	*	*	*	*	600 × 400		*	*	*	*		
350 × 250	*	*	*	*	*	*	600 × 450		*	*	*	*		
350 × 300	*	*	*	*	*	*	600 × 500		*	*	*	*		

Class No.: FN01	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	1/2	× 80	*
20	4	5/8	× 90	*
25	4	5/8	× 90	*
40	4	3/4	× 110	*
50	8	5/8	× 110	*
80	8	5/8	× 130	*
100	8	7/8	× 150	*
150	12	1	× 170	*
200	12	1 1/8	× 190	*
250	16	1 1/4	× 220	*
300	20	1 1/4	× 220	*
350	20	1 3/8	× 240	*
400	20	1 1/2	× 250	*
450	20	1-5/8	× 280	*
500	24	1-5/8	× 290	*
600	24	1-7/8	× 330	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.63
15	4	5/8	× 135	*
20	4	5/8	× 135	*
25	4	5/8	× 135	*
40	4	3/4	× 140	*
50	8	5/8	× 150	*
80	8	3/4	× 150	*
100	8	7/8	× 160	*
150	12	1	× 180	*
200	12	1-1/8	× 210	*
250	16	1-1/4	× 230	*
300	20	1-1/4	× 240	*
350	20	1-3/8	× 260	*
400	20	1-1/2	× 275	*
450	20	1-5/8	× 300	*
500	24	1-5/8	× 320	*
600	24	1-7/8	× 355	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	× 90	*
20	4	5/8	× 100	*
25	4	5/8	× 100	*
40	4	3/4	× 120	*
50	8	5/8	× 120	*
80	8	3/4	× 150	*
100	8	7/8	× 170	*
150	12	1	× 210	*
200	12	1 1/8	× 230	*
250	16	1 1/4	× 260	*
300	20	1 1/4	× 270	*
350	20	1 3/8	× 290	*
400	20	1 1/2	× 310	*
450	20	1-5/8	× 340	*
500	24	1-5/8	× 360	*
600	24	1-7/8	× 415	*

*** DRAIN POINT Fig. 0E**

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Gate Valve SW				1
Pipe Nipple 50 mm				2
Stud Bolt with Nuts				4
Welding Neck Flange				1

*** DRAIN POINT Fig. 0E**

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Gate Valve SW				1
Pipe Nipple 50 mm				2
Stud Bolt with Nuts				4
Welding Neck Flange				1

*** VENT POINT Fig. 1E**

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Globe Valve Socket				1
Pipe Nipple 50 mm				2
Stud Bolt with Nuts				4
Welding Neck Flange				1

*** VENT POINT Fig. 1E**

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Globe Valve Socket				1
Pipe Nipple 50 mm				2
Stud Bolt with Nuts				4
Welding Neck Flange				1

Class No.: FN04	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 100 (Class 600)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-600	102.0	100.0	92.7	90.6	87.8	83.6	77.5	73.9	69.1

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES																
			BRANCH SIZE																
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600	
15	80	600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	
20	80	500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		
25	80	450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		
40	80	400	C	C	C	C	E	E	E	E	E	E	E	E	A				
50	80	350	C	C	C	C	E	E	E	E	E	E	E	A					
80	80	300	C	C	C	C	E	E	E	E	E	E	A						
100	80	250	C	C	C	C	E	E	E	E	E	A							
150	80	200	C	C	C	C	E	E	E	E	A								
200	80	150	C	C	C	C	E	E	E	A									
250	80	100	C	C	C	C	E	E	A										
300	80	80	C	C	C	C	E	A											
350	80	50	C	C	C	B	A												
400	80	40	C	B	B	A													
450	80	25	B	B	A														
500	80	20	B	A															
600	80	15	A																

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch connections shall be subject to prior approval of company.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: FN04	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-600	ASTM	A106-B
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A106-B

* FLANGES

BLFL	Blind Flange	DN	15-600	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-600	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-600	ASTM	A516-60
WNFL	Welding Neck Flange	DN	15-600	ASTM	A105

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-600	ASTM	A234-WPB
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-600	ASTM	A234-WPB
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-600	ASTM	A234-WPB
TEEB	Equal Tee	Butt-Weld. End	DN	15-600	ASTM	A234-WPB
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A105
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A105
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A105

* REDUCING FITTINGS

BROS	Branch Outlet Socket-Weld. End	DN	15-50	ASTM	A105
BROB	Branch Outlet Red. Butt-Weld.	DN	80-600	ASTM	A105
RECB	Reducer Conc. Butt-Weld. End	DN	20-600	ASTM	A234-WPB
REEB	Reducer Ecc. Butt-Weld. End	DN	20-600	ASTM	A234-WPB
TERB	Tee Reducing Butt-Weld. End	DN	20-600	ASTM	A234-WPB
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A105

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVF	Check Valve Flanged	DN	15-600	Body: ASTM A216-WCB/WCC, A105	Trim: AISI 316L + Stellite 6
GAVF	Gate Valve Flanged	DN	15-600	Body: ASTM A216-WCB/WCC, A105	Trim: AISI 316L + Stellite 6
GLVF	Globe Valve Flanged	DN	15-150	Body: ASTM A216-WCB/WCC, A105	Trim: AISI 316L + Stellite 6

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-600	AISI 316, 316L, Graphite Filled CS Centring Ring
ORFS	Orifice Flange Set	DN	50-600	ASTM A105
STBT	Stud Bolt with Nuts	—		Studs: ASTM A193-B7 Nuts: ASTM A194-2H

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ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
* PIPE																	
Pipe	74.30.21/31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pipe Nipple 50 mm	76.30.57	*	*	*	*												
* FLANGES																	
Blind Flange	76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.62.79	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS																	
Cap	Butt-Weld. End 76.30.18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End 76.30.38	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End 76.30.39/40	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End 76.30.84	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End 76.34.38	*	*	*	*												
Elbow 90 Deg.	Socket-Weld. End 76.34.39	*	*	*	*												
Equal Tee	Socket-Weld. End 76.34.84	*	*	*	*												
Coupling	Socket-Weld. End 76.34.28	*	*	*	*												
Cap	Socket-Weld. End 76.34.18	*	*	*	*												
* VALVES																	
Check Valve Flanged	75.37.15	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged	75.37.35	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged	75.37.45	*	*	*	*	*	*	*	*								
* MISCELLANEOUS																	
Gasket, Spiral Wound	85.41.36	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*	*	*	*	*	*	*	*

Class No.: FN04	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	TERS 76.34.85	Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	COMP. NAME	DESCRIPTION	
20 × 15			*	*	*	*	400 × 50		*				BROS	Branch Fitting Socket-Weld. Outlet	
25 × 15			*	*	*	*	400 × 80		*				BROB	Branch Outlet Red. Butt-Weld	
25 × 20			*	*	*	*	400 × 100		*				RECB	Reducer Conc. Butt-Weld. End	
40 × 15			*	*	*	*	400 × 150		*	*	*	*	REEB	Reducer Ecc. Butt-Weld. End	
40 × 20			*	*	*	*	400 × 200		*	*	*	*	TERB	Tee Reducing Butt-Weld. End	
40 × 25			*	*	*	*	400 × 250		*	*	*	*	TERS	Tee Reducing Socket-Weld. End	
50 × 20			*	*	*	*	400 × 300		*	*	*	*			
50 × 25			*	*	*	*	400 × 350		*	*	*	*			
50 × 40			*	*	*	*	450 × 50		*						
80 × 40			*	*	*	*	450 × 80		*						
80 × 50	*		*	*	*	*	450 × 100		*				RUN	Br.	
100 × 40			*	*	*	*	450 × 150		*					BROS	
100 × 50	*		*	*	*	*	450 × 200		*	*	*	*		76.80.26	
100 × 80	*		*	*	*	*	450 × 250		*	*	*	*	40-150	15	*
150 × 50	*		*	*	*	*	450 × 300		*	*	*	*	200-600		*
150 × 80	*		*	*	*	*	450 × 350		*	*	*	*	50-80	20	*
150 × 100	*		*	*	*	*	450 × 400		*	*	*	*	100-600		*
200 × 50	*						500 × 50		*				50	25	*
200 × 80	*						500 × 80		*				80-100		*
200 × 100	*	*		*	*	*	500 × 100		*				150-600		*
200 × 150	*	*		*	*	*	500 × 150		*				80-100	40	*
250 × 50	*						500 × 200		*	*	*	*	150-300		*
250 × 80	*						500 × 250		*	*	*	*	350-600		*
250 × 100	*	*		*	*	*	500 × 300		*	*	*	*			
250 × 150	*	*		*	*	*	500 × 350		*	*	*	*			
250 × 200	*	*		*	*	*	500 × 400		*	*	*	*			
300 × 50	*						500 × 450		*	*	*	*			
300 × 80	*						600 × 50		*						
300 × 100	*						600 × 80		*						
300 × 150	*	*		*	*	*	600 × 100		*						
300 × 200	*	*		*	*	*	600 × 150		*						
300 × 250	*	*		*	*	*	600 × 200		*						
350 × 50	*						600 × 250		*	*	*	*			
350 × 80	*						600 × 300		*	*	*	*			
350 × 100	*						600 × 350		*	*	*	*			
350 × 150	*	*		*	*	*	600 × 400		*	*	*	*			
350 × 200	*	*		*	*	*	600 × 450		*	*	*	*			
350 × 250	*	*		*	*	*	600 × 500		*	*	*	*			
350 × 300	*	*		*	*	*									

Class No.: FN04	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	1/2	× 80	*
20	4	5/8	× 90	*
25	4	5/8	× 90	*
40	4	3/4	× 110	*
50	8	5/8	× 110	*
80	8	3/4	× 130	*
100	8	7/8	× 150	*
150	12	1	× 170	*
200	12	1 1/8	× 190	*
250	16	1 1/4	× 220	*
300	20	1 1/4	× 220	*
350	20	1 3/8	× 240	*
400	20	1 1/2	× 250	*
450	20	1 5/8	× 280	*
500	24	1 5/8	× 290	*
600	24	1 7/8	× 330	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	5/8	× 135	*
20	4	5/8	× 135	*
25	4	5/8	× 135	*
40	4	3/4	× 140	*
50	8	5/8	× 150	*
80	8	3/4	× 150	*
100	8	7/8	× 160	*
150	12	1	× 180	*
200	12	1 1/8	× 210	*
250	16	1 1/4	× 230	*
300	20	1 1/4	× 240	*
350	20	1 3/8	× 260	*
400	20	1 1/2	× 275	*
450	20	1 5/8	× 300	*
500	24	1 5/8	× 320	*
600	24	1 7/8	× 355	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	× 90	*
20	4	5/8	× 100	*
25	4	5/8	× 100	*
40	4	3/4	× 120	*
50	8	5/8	× 120	*
80	8	3/4	× 150	*
100	8	7/8	× 170	*
150	12	1	× 210	*
200	12	1 1/8	× 230	*
250	16	1 1/4	× 260	*
300	20	1 1/4	× 270	*
350	20	1 3/8	× 290	*
400	20	1 1/2	× 310	*
450	20	1 5/8	× 340	*
500	24	1 5/8	× 360	*
600	24	1 7/8	× 415	*

* DRAIN POINT Fig. 0I

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* DRAIN POINT Fig. 0J

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT Fig. 1I

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT Fig. 1J

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

Class No.: FN07	Page: 1	Content: General
Base Material: Carbon Steel, Fine Gr. LT, PWHT	First Issue:	Revision:
Rating: PN 100 (Class 600)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		-50	0	50	100	150	200	250	300	340
Pressure Barg.	DN 15-400	95.8	95.8	94.7	90.3	87.8	85.3	81.1	75.3	72.2

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES												
			BRANCH SIZE												
			15	20	25	40	50	80	100	150	200	250	300	350	400
15	80	400	C	C	C	C	E	E	E	E	E	E	E	E	A
20	80	350	C	C	C	C	E	E	E	E	E	E	E	A	
25	80	300	C	C	C	C	E	E	E	E	E	E	A		
40	80	250	C	C	C	C	E	E	E	E	E	A			
50	40	200	C	C	C	C	E	E	E	E	A				
80	40	150	C	C	C	C	E	E	E	A					
100	80	100	C	C	C	C	E	E	A						
150	80	80	C	C	C	C	E	A							
200	80	50	C	C	C	B	A								
250	80	40	C	B	B	A									
300	80	25	B	B	A										
350	80	20	B	A											
400	80	15	A												

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.3.
- Welds, attachment welds and cord formed piping parts shall be post-weld heat treated.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting socket weld end outlet
E	Branch outlet reducing butt-weld

Class No.: FN07	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A333-6 (Seamless)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A333-6 (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-400	ASTM	A350-LF2
SBFL	Spectacle Blind Flange	DN	15-400	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-400	ASTM	A516-60
WNFL	Welding Neck Flange	DN	15-400	ASTM	A350-LF2

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-400	ASTM	A420-WPL6
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-400	ASTM	A420-WPL6
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-400	ASTM	A420-WPL6
TEEB	Equal Tee	Butt-Weld. End	DN	15-400	ASTM	A420-WPL6
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A350-LF2
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A350-LF2
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A350-LF2
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A350-LF2
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A350-LF2

* REDUCING FITTINGS

BROS	Branch Fitting Outlet	Socket-Weld. End	DN	15-40	ASTM	A350-LF2
BROB	Branch Outlet Red.	Butt-Weld.	DN	80-400	ASTM	A350-LF2
RECB	Reducer Conc.	Butt-Weld. End	DN	20-400	ASTM	A420-WPL6
REEB	Reducer Ecc.	Butt-Weld. End	DN	20-400	ASTM	A420-WPL6
TERB	Tee Reducing	Butt-Weld. End	DN	20-400	ASTM	A420-WPL6
TERS	Tee Reducing	Socket-Weld. End	DN	20-40	ASTM	A350-LF2

Note:

- For full material description see relevant buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVF	Check Valve Flanged	DN	15-400	Body:	ASTM	A352-LCB/LCC
				Trim:	AISI	316, 316L
GAVF	Gate Valve Flanged	DN	15-400	Body:	ASTM	A352-LCB/LCC
				Trim:	AISI	316, 316L
GLVF	Globe Valve Flanged	DN	15-150	Body:	ASTM	A352-LCB/LCC
				Trim:	AISI	316, 316L

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-40	AISI	316, 316L, Graphite Filled CS Centring Ring
ORFS	Orifice Flange Set	DN	50-400	ASTM	A350-LF2
STBT	Stud Bolt with Nuts		—	Studs:	ASTM A320-L7
				Nuts:	ASTM A194-4

Class No.: FN07	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE												
		15	20	25	40	50	80	100	150	200	250	300	350	400
* PIPE														
Pipe	74.14.21	*	*	*	*	*	*	*	*	*	*	*	*	*
* FLANGES														
Blind Flange	76.62.12	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.00	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.62.82	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS														
Cap	Butt-Weld. End	76.31.18	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.31.38	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.31.39	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.31.84	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.35.38	*	*	*	*								
Elbow 90 Deg.	Socket-Weld. End	76.35.39	*	*	*	*								
Equal Tee	Socket-Weld. End	76.35.80	*	*	*	*								
Coupling	Socket-Weld. End	76.35.28	*	*	*	*								
Cap	Socket-Weld. End	76.35.18	*	*	*	*								
* VALVES														
Check Valve Flanged	75.42.15	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged	75.42.35	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged	75.42.40	*	*	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS														
Gasket, Spiral Wound	85.41.36	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52	*	*	*	*	*	*	*	*	*	*	*	*	*

Class No.: FN07	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.00	RECB 76.31.70	REEB 76.37.71	TERB 76.31.85	TERS 76.35.85	Run	Br.	BROB 76.80.00	RECB 76.31.70	REEB 76.37.71	TERB 76.35.85	COMP. NAME	DESCRIPTION	
20	× 15		*	*	*	*	350	× 50					BROB	Branch Outlet Red. Butt-Weld	
25	× 15		*	*	*	*	350	× 80					RECB	Reducer Conc. Butt-Weld. End	
25	× 20		*	*	*	*	350	× 100					REEB	Reducer Ecc. Butt-Weld. End	
40	× 15				*	*	350	× 150	*	*	*	*	TERB	Tee Reducing Butt-Weld. End	
40	× 20		*	*	*	*	350	× 200	*	*	*	*	TERS	Tee Reducing Socket-Weld. End	
40	× 25		*	*	*	*	350	× 250	*	*	*	*	BROS	Branch Fitting Socket-Weld. End Outlet	
50	× 25				*	*	350	× 300	*	*	*	*			
50	× 40		*	*	*	*	400	× 50	*						
80	× 40		*	*	*	*	400	× 80	*						
80	× 50	*	*	*	*	*	400	× 100	*						
100	× 50	*	*	*	*	*	400	× 150	*	*	*	*	RUN	Br.	
100	× 80	*	*	*	*	*	400	× 200	*	*	*	*		BROS	
150	× 50	*	*	*	*	*	400	× 250	*	*	*	*		76.80.26	
150	× 80	*	*	*	*	*	400	× 300	*	*	*	*	40-150	15	*
150	× 100	*	*	*	*	*	400	× 350	*	*	*	*	200-400		*
200	× 50	*											50-80	20	*
200	× 80	*											100-400		*
200	× 100	*	*	*	*	*							50	25	*
200	× 150	*	*	*	*	*							80-100		*
250	× 50	*											150-400		*
250	× 80	*											80-100	40	*
250	× 100	*			*	*							150-300		*
250	× 150	*	*	*	*	*							350-400		*
250	× 200	*	*	*	*	*									
300	× 50	*													
300	× 80	*													
300	× 100	*													
300	× 150	*	*	*	*	*									
300	× 200	*	*	*	*	*									
300	× 250	*	*	*	*	*									

Class No.: FN07	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.63
15	4	1/2	× 80	*
20	4	5/8	× 90	*
25	4	5/8	× 90	*
40	4	3/4	× 110	*
50	8	5/8	× 110	*
80	8	3/4	× 130	*
100	8	7/8	× 150	*
150	12	1	× 170	*
200	12	1 1/8	× 190	*
250	16	1 1/4	× 220	*
300	20	1 1/4	× 220	*
350	20	1 3/8	× 240	*
400	20	1 1/2	× 250	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.63
15	4	1/2	× 90	*
20	4	5/8	× 100	*
25	4	5/8	× 100	*
40	4	3/4	× 120	*
50	8	5/8	× 120	*
80	8	3/4	× 150	*
100	8	7/8	× 170	*
150	12	1	× 216	*
200	12	1 1/8	× 230	*
250	16	1 1/4	× 260	*
300	20	1 1/4	× 270	*
350	20	1 3/8	× 290	*
400	20	1 1/2	× 310	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.63
15	4	5/8	× 135	*
20	4	5/8	× 135	*
25	4	5/8	× 135	*
40	4	3/4	× 140	*
50	8	5/8	× 150	*
80	8	3/4	× 150	*
100	8	7/8	× 160	*
150	12	1	× 180	*
200	12	1-1/8	× 210	*
250	16	1-1/4	× 230	*
300	20	1-1/4	× 240	*
350	20	1-3/8	× 260	*
400	20	1-1/2	× 275	*

*** DRAIN POINT Fig. 0J**

Run DN 15-25 Br DN 15

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	2
Gate Valve Flanged	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	8
Welding Neck Flange	1

*** DRAIN POINT Fig. 0J**

Run DN 40-40 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	2
Gate Valve Flanged	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	8
Welding Neck Flange	1

*** DRAIN POINT Fig. 0J**

Run DN 50-400 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	2
Gate Valve Flanged	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	8
Welding Neck Flange	1

*** VENT POINT Fig. 1J**

Run DN 15-25 Br DN 15

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	2
Globe Valve Flanged	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	8
Welding Neck Flange	1

*** VENT POINT Fig. 1J**

Run DN 40-40 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	2
Globe Valve Flanged	1
Stud Bolt with Nuts	8
Pipe Nipple 50 mm	1
Welding Neck Flange	1

*** VENT POINT Fig. 1J**

Run DN 50-400 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	2
Globe Valve Flanged	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	8
Welding Neck Flange	1

Class No.: FN10	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 100 (Class 600)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-400	102.0	100.0	92.7	90.6	87.8	83.6	77.5	73.9	69.1

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES												
			BRANCH SIZE												
			15	20	25	40	50	80	100	150	200	250	300	350	400
15	80	400	C	C	C	C	E	E	E	E	E	E	E	E	A
20	80	350	C	C	C	C	E	E	E	E	E	E	E	A	
25	80	300	C	C	C	C	E	E	E	E	E	E	A		
40	80	250	C	C	C	C	E	E	E	E	E	A			
50	80	200	C	C	C	C	E	E	E	E	A				
80	80	150	C	C	C	C	E	E	E	A					
100	80	100	C	C	C	C	E	E	A						
150	80	80	C	C	C	C	E	A							
200	80	50	C	C	C	B	A								
250	80	40	C	B	B	A									
300	80	25	B	B	A										
350	80	20	B	A											
400	80	15	A												

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1.
- Piston type check valves for horizontal mounting only.
- Steam traps to be selected by utility engineer.
- API 5L-B welded pipe is normally the most economic choice.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting socket weld end outlet
E	Branch outlet reducing butt-weld

Class No.: FN10	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A106-B
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A106-B

* FLANGES

BLFL	Blind Flange	DN	15-400	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-400	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-400	ASTM	A516-60
WNFL	Welding Neck Flange	DN	15-400	ASTM	A105

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
TEEB	Equal Tee	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A105
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A105
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A105

* REDUCING FITTINGS

BROS	Branch Fitting Outlet	Socket-Weld. End	DN	15-40	ASTM	A105
BROB	Branch Outlet Red.	Butt-Weld.	DN	80-400	ASTM	A105
RECB	Reducer Conc.	Butt-Weld. End	DN	20-400	ASTM	A234-WPB
REEB	Reducer Ecc.	Butt-Weld. End	DN	20-400	ASTM	A234-WPB
TERB	Tee Reducing	Butt-Weld. End	DN	20-400	ASTM	A234-WPB
TERS	Tee Reducing	Socket-Weld. End	DN	20-40	ASTM	A105

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVB	Check Valve	Butt-Weld. End	DN	50-400	Body:	ASTM A216-WCB/WCC, A105
					Trim:	AISI 316 (L) + Stellite 6
CHVS	Check Valve	Socket	DN	15-40	Body:	ASTM A216-WCB/WCC, A105
					Trim:	AISI 316 (L) + Stellite 6
GABS	Gate Valve	SW Bellow Sealed	DN	15-40	Body:	ASTM A216-WCB/WCC, A105
					Trim:	AISI 316 (L) + Stellite 6
GAVB	Gate Valve	Butt-Weld. End	DN	50-400	Body:	ASTM A216-WCB/WCC, A105
					Trim:	AISI 316 (L) + Stellite 6
GAVF	Gate Valve	Flanged	DN	15-50	Body:	ASTM A216-WCB/WCC, A105
					Trim:	AISI 316 (L) + Stellite 6
GAVS	Gate Valve	Sw	DN	15-40	Body:	ASTM A216-WCB/WCC, A105
					Trim:	AISI 316 (L) + Stellite 6
GLBS	Globe Valve	SW Bellow Sealed	DN	15-40	Body:	ASTM A216-WCB/WCC, A105
					Trim:	AISI 316 (L) + Stellite 6
GLVS	Globe Valve	Socket	DN	15-40	Body:	ASTM A216-WCB/WCC, A105
					Trim:	AISI 316 (L) + Stellite 6

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-400	AISI	316, 316L, Graphite Filled CS Centring Ring
ORFS	Orifice Flange Set	DN	50-400	ASTM	A105
STBT	Stud Bolt with Nuts			Studs:	ASTM A193-B7
				Nuts:	ASTM A194-2H

Class No.: FN10	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
* PIPE															
Pipe	74.30.21	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pipe Nipple 50 mm	76.30.57	*	*	*	*										
* FLANGES															
Blind Flange	76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.16	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.62.79	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS															
Cap	Butt-Weld. End	76.30.18	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.30.38	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.30.40	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.30.84	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.34.38	*	*	*	*									
Elbow 90 Deg.	Socket-Weld. End	76.34.39	*	*	*	*									
Equal Tee	Socket-Weld. End	76.34.84	*	*	*	*									
Coupling	Socket-Weld. End	76.34.28	*	*	*	*									
Cap	Socket-Weld. End	76.34.18	*	*	*	*									
* VALVES															
Check Valve Butt-Weld. End	75.56.19					*	*	*	*	*	*	*	*	*	*
Check Valve Socket	75.56.13	*	*	*	*										
Gate Valve SW Bellows Sealed	75.56.35	*	*	*	*										
Gate Valve Butt-Weld. End	75.56.38					*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged	75.37.35	*	*	*	*	*									
Gate Valve Socket	75.56.35	*	*	*	*										
Globe Valve SW Bellows Sealed	75.56.45	*	*	*	*										
Globe Valve Socket	75.56.45	*	*	*	*										
* MISCELLANEOUS															
Gasket, Spiral Wound	85.41.36	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*	*	*	*	*	*

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Run	Br.	BROB 76.80.05	RECB 76.30.71	REEB 76.30.73	TERB 76.30.85	TERS 76.34.85	Run	Br.	BROB 76.80.05	RECB 76.30.71	REEB 76.30.73	TERB 76.30.85	COMP. NAME	DESCRIPTION
20 × 15			*	*	*	*	400 × 50		*				BROS	Branch Fitting Socket-Weld. Outlet
25 × 15			*	*	*	*	400 × 80		*				BROB	Branch Outlet Red. Butt-Weld
25 × 20			*	*	*	*	400 × 100		*				RECB	Reducer Conc. Butt-Weld. End
40 × 15			*	*	*	*	400 × 150		*	*	*	*	REEB	Reducer Ecc. Butt-Weld. End
40 × 20			*	*	*	*	400 × 200		*	*	*	*	TERB	Tee Reducing Butt-Weld. End
40 × 25			*	*	*	*	400 × 250		*	*	*	*	TERS	Tee Reducing Socket-Weld. End
50 × 20			*	*	*	*	400 × 300		*	*	*	*		
50 × 25			*	*	*	*	400 × 350		*	*	*	*		
50 × 40			*	*	*	*								
80 × 40			*	*	*	*								
80 × 50		*	*	*	*	*							RUN	Br. BROS
100 × 40			*	*	*	*								76.80.26
100 × 50		*	*	*	*	*							40-150	15 *
100 × 80		*	*	*	*	*							200-400	*
150 × 50		*	*	*	*	*							50-80	20 *
150 × 80		*	*	*	*	*							100-400	*
150 × 100		*	*	*	*	*							50	25 *
200 × 50		*	*	*	*	*							80-100	*
200 × 80		*	*	*	*	*							150-400	*
200 × 100		*	*	*	*	*							80-100	40 *
200 × 150		*	*	*	*	*							150-300	*
250 × 50		*	*	*	*	*							350-400	*
250 × 80		*	*	*	*	*								
250 × 100		*	*	*	*	*								
250 × 150		*	*	*	*	*								
250 × 200		*	*	*	*	*								
300 × 50		*	*	*	*	*								
300 × 80		*	*	*	*	*								
300 × 100		*	*	*	*	*								
300 × 150		*	*	*	*	*								
300 × 200		*	*	*	*	*								
300 × 250		*	*	*	*	*								
350 × 50		*	*	*	*	*								
350 × 80		*	*	*	*	*								
350 × 100		*	*	*	*	*								
350 × 150		*	*	*	*	*								
350 × 200		*	*	*	*	*								
350 × 250		*	*	*	*	*								
350 × 300		*	*	*	*	*								

Class No.: FN10	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	1/2	× 80	*
20	4	5/8	× 90	*
25	4	5/8	× 90	*
40	4	3/4	× 110	*
50	8	5/8	× 110	*
80	8	3/4	× 130	*
100	8	7/8	× 150	*
150	12	1	× 170	*
200	12	1 1/8	× 190	*
250	16	1 1/4	× 220	*
300	20	1 1/4	× 220	*
350	20	1 3/8	× 240	*
400	20	1 1/2	× 250	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	× 90	*
20	4	5/8	× 100	*
25	4	5/8	× 100	*
40	4	3/4	× 120	*
50	8	5/8	× 120	*
80	8	3/4	× 150	*
100	8	7/8	× 170	*
150	12	1	× 210	*
200	12	1 1/8	× 230	*
250	16	1 1/4	× 260	*
300	20	1 1/4	× 270	*
350	20	1 3/8	× 290	*
400	20	1 1/2	× 310	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.63
15	4	5/8	× 135	*
20	4	5/8	× 135	*
25	4	5/8	× 135	*
40	4	3/4	× 140	*
50	8	5/8	× 150	*
80	8	3/4	× 150	*
100	8	7/8	× 160	*
150	12	1	× 180	*
200	12	1 1/8	× 210	*
250	16	1 1/4	× 230	*
300	20	1 1/4	× 240	*
350	20	1 3/8	× 260	*
400	20	1 1/2	× 275	*

*** DRAIN POINT Fig. 0E**

Run DN 15-25 Br DN 15

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Gate Valve Socket	1
Pipe Nipple 50 mm	2
Stud Bolt with Nuts	4
Welding Neck Flange	1

*** DRAIN POINT Fig. 0E**

Run DN 40-40 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Gate Valve Socket	1
Pipe Nipple 50 mm	2
Stud Bolt with Nuts	4
Welding Neck Flange	1

*** DRAIN POINT Fig. 0E**

Run DN 50-400 Br DN 20	No.
Branch: Table Page 1	1
Blind Flange	1
Gasket Spiral Wound	1
Gate Valve Socket	1
Pipe Nipple 50 mm	2
Stud Bolt with Nuts	4
Welding Neck Flange	1

*** VENT POINT Fig. 1E**

Run DN 15-25 Br DN 15	No.
Branch: Table Page 1	1
Blind Flange	1
Gasket Spiral Wound	1
Globe Valve Socket	1
Pipe Nipple 50 mm	2
Stud Bolt with Nuts	4
Welding Neck Flange	1

*** VENT POINT Fig. 1E**

Run DN 40-40 Br DN 20	No.
Branch: Table Page 1	1
Blind Flange	1
Gasket Spiral Wound	1
Globe Valve Socket	1
Pipe Nipple 50 mm	2
Stud Bolt with Nuts	4
Welding Neck Flange	1

*** VENT POINT Fig. 1E**

Run DN 50-400 Br DN 20	No.
Branch: Table Page 1	1
Blind Flange	1
Gasket Spiral Wound	1
Globe Valve Socket	1
Pipe Nipple 50 mm	2
Stud Bolt with Nuts	4
Welding Neck Flange	1

Class No.: FN14	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 100 (Class 600)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-600	102.0	100.1	92.8	90.6	87.8	83.6	77.5	73.9	69.1

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES																
			BRANCH SIZE																
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600	
15	80	600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	
20	80	500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		
25	80	450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		
40	80	400	C	C	C	C	E	E	E	E	E	E	E	E	A				
50	80	350	C	C	C	C	E	E	E	E	E	E	E	A					
80	80	300	C	C	C	C	E	E	E	E	E	E	A						
100	80	250	C	C	C	C	E	E	E	E	E	A							
150	80	200	C	C	C	C	E	E	E	E	A								
200	80	150	C	C	C	C	E	E	E	A									
250	80	100	C	C	C	C	E	E	A										
300	80	80	C	C	C	C	E	A											
350	80	50	C	C	C	B	A												
400	80	40	C	B	B	A													
450	80	25	B	B	A														
500	80	20	B	A															
600	80	15	A																

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting socket weld end outlet
E	Branch outlet reducing butt-weld

Class No.: FN14	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-600	ASTM	A106-B
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A106-B

* FLANGES

BLFL	Blind Flange	DN	15-600	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-600	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-600	ASTM	A516-60
WNFL	Welding Neck Flange	DN	15-600	ASTM	A105

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-600	ASTM	A234-WPB
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-600	ASTM	A234-WPB
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-600	ASTM	A234-WPB
TEEB	Equal Tee	Butt-Weld. End	DN	15-600	ASTM	A234-WPB
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A105
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A105
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A105

* REDUCING FITTINGS

BROS	Branch Fitting Outlet	Socket-Weld. End	DN	15-40	ASTM	A105
BROB	Branch Outlet Red.	Butt-Weld.	DN	80-600	ASTM	A105
RECB	Reducer Conc.	Butt-Weld. End	DN	20-600	ASTM	A234-WPB
REEB	Reducer Ecc.	Butt-Weld. End	DN	20-600	ASTM	A234-WPB
TERB	Tee Reducing	Butt-Weld. End	DN	20-600	ASTM	A234-WPB
TERS	Tee Reducing	Socket-Weld. End	DN	20-40	ASTM	A105

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVB	Check Valve	Butt-Weld. End	DN	15-600	Body: ASTM A216-WCB/WCC, A105 Trim: AISI 410
GAVB	Gate Valve	Butt-Weld. End	DN	15-600	Body: ASTM A216-WCB/WCC, A105 Trim: AISI 410
GLVB	Globe Valve	Butt-Weld. End	DN	15-150	Body: ASTM A216-WCB/WCC, A105 Trim: AISI 410
GAVF	Gate Valve	Flange End	DN	15-50	Body: ASTM A216-WCB/WCC, A105 Trim: AISI 410

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-600	AISI 316, 316L, Graphited Filled CS Centring, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-600	ASTM A-105
STBT	Stud Bolt with Nuts	—		Studs: ASTM A193-B7 Nuts: ASTM A194-2H

Class No.: FN14	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
* PIPE																	
Pipe	74.30.21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pipe Nipple 50 mm	76.30.57	*	*	*	*												
* FLANGES																	
Blind Flange	76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.62.79	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS																	
Cap	Butt-Weld. End 76.30.18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End 76.30.38	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End 76.30.40	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End 76.30.84	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End 76.34.38	*	*	*	*												
Elbow 90 Deg.	Socket-Weld. End 76.34.39	*	*	*	*												
Equal Tee	Socket-Weld. End 76.34.84	*	*	*	*												
Coupling	Socket-Weld. End 76.34.28	*	*	*	*												
Cap	Socket-Weld. End 76.34.18	*	*	*	*												
* VALVES																	
Check Valve Butt-Weld. End	75.56.19	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Butt-Weld. End	75.56.38	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Butt-Weld. End	75.56.50	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS																	
Gasket, Spiral Wound	85.41.36	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*	*	*	*	*	*	*	*

Class No.: FN14	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	TERS 76.34.85	Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	COMP. NAME	DESCRIPTION	
20 × 15			*	*	*	*	400 × 50		*				BROB	Branch Outlet Red. Butt-Weld	
25 × 15			*	*	*	*	400 × 80		*				RECB	Reducer Conc. Butt-Weld. End	
25 × 20			*	*	*	*	400 × 100		*				REEB	Reducer Ecc. Butt-Weld. End	
40 × 15				*	*	*	400 × 150		*			*	TERB	Tee Reducing Butt-Weld. End	
40 × 20			*	*	*	*	400 × 200		*	*	*	*	TERS	Tee Reducing Socket-Weld. End	
40 × 25			*	*	*	*	400 × 250		*	*	*	*	BROS	Branch Fitting Socket-Weld. End Outlet	
50 × 20				*	*	*	400 × 300		*	*	*	*			
50 × 25			*	*	*	*	400 × 350		*	*	*	*			
50 × 40			*	*	*	*	450 × 50		*						
80 × 40			*	*	*	*	450 × 80		*						
80 × 50	*		*	*	*	*	450 × 100		*				RUN	Br.	
100 × 50	*		*	*	*	*	450 × 150		*					BROS	
100 × 80	*		*	*	*	*	450 × 200		*	*	*	*	40-150	15	*
150 × 50	*		*	*	*	*	450 × 250		*	*	*	*	200-600		*
150 × 80	*		*	*	*	*	450 × 300		*	*	*	*	50-80	20	*
150 × 100	*		*	*	*	*	450 × 350		*	*	*	*	100-600		*
200 × 50	*						450 × 400		*	*	*	*	50	25	*
200 × 80	*						500 × 50		*				80-100		*
200 × 100	*		*	*	*	*	500 × 80		*				150-600		*
200 × 150	*		*	*	*	*	500 × 100		*				80-100	40	*
250 × 50	*						500 × 150		*				150-300		*
250 × 80	*						500 × 200		*	*	*	*	350-600		*
250 × 100	*				*	*	500 × 250		*	*	*	*			
250 × 150	*	*		*	*	*	500 × 300		*	*	*	*			
250 × 200	*	*	*	*	*	*	500 × 350		*	*	*	*			
300 × 50	*						500 × 400		*	*	*	*			
300 × 80	*						500 × 450		*	*	*	*			
300 × 100	*						600 × 50		*						
300 × 150	*	*		*	*	*	600 × 80		*						
300 × 200	*	*	*	*	*	*	600 × 100		*						
300 × 250	*	*	*	*	*	*	600 × 150		*						
350 × 50	*						600 × 200		*	*	*	*			
350 × 80	*						600 × 250		*	*	*	*			
350 × 100	*						600 × 300		*	*	*	*			
350 × 150	*				*	*	600 × 350		*	*	*	*			
350 × 200	*	*	*	*	*	*	600 × 400		*	*	*	*			
350 × 250	*	*	*	*	*	*	600 × 450		*	*	*	*			
350 × 300	*	*	*	*	*	*	600 × 500		*	*	*	*			

Class No.: FN14	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	1/2	× 80	*
20	4	5/8	× 90	*
25	4	5/8	× 90	*
40	4	3/4	× 110	*
50	8	5/8	× 110	*
80	8	5/8	× 130	*
100	8	7/8	× 150	*
150	12	1	× 170	*
200	12	1 1/8	× 190	*
250	16	1 1/4	× 220	*
300	20	1 1/4	× 220	*
350	20	1 3/8	× 240	*
400	20	1 1/2	× 250	*
450	20	1-5/8	× 280	*
500	24	1-5/8	× 290	*
600	24	1-7/8	× 330	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	× 90	*
20	4	5/8	× 100	*
25	4	5/8	× 100	*
40	4	3/4	× 120	*
50	8	5/8	× 120	*
80	8	3/4	× 150	*
100	8	7/8	× 170	*
150	12	1	× 210	*
200	12	1 1/8	× 230	*
250	16	1 1/4	× 260	*
300	20	1 1/4	× 270	*
350	20	1 3/8	× 290	*
400	20	1 1/2	× 310	*
450	20	1-5/8	× 340	*
500	24	1-5/8	× 360	*
600	24	1-7/8	× 415	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.63
15	4	5/8	× 135	*
20	4	5/8	× 135	*
25	4	5/8	× 135	*
40	4	3/4	× 140	*
50	8	5/8	× 150	*
80	8	3/4	× 150	*
100	8	7/8	× 160	*
150	12	1	× 180	*
200	12	1-1/8	× 210	*
250	16	1-1/4	× 230	*
300	20	1-1/4	× 240	*
350	20	1-3/8	× 260	*
400	20	1-1/2	× 275	*
450	20	1-5/8	× 300	*
500	24	1-5/8	× 320	*
600	24	1-7/8	× 355	*

*** DRAIN POINT Fig. 0M**

Run DN 15-25	Br DN 15	No.
Run DN 40	Br DN 20	
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve Butt-Weld. End		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

*** DRAIN POINT Fig. 0N**

Run DN 50-600	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve Butt-Weld. End		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

*** VENT POINT Fig. 1M**

Run DN 15-25	Br DN 15	No.
Run DN 40	Br DN 20	
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld. End		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

*** VENT POINT Fig. 1N**

Run DN 50-600	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld. End		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

Class No.: FP02	Page: 1	Content: General
Base Material: Alloy Steel (1.25 Cr - 0.5 Mo)	First Issue:	Revision:
Rating: PN 100 (Class 600)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400	450
Pressure Barg.	DN 15-600	103.4	102.2	97.5	92.6	90.8	88.9	84.8	80.3	73.2	67.6

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES															
			BRANCH SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
15	80	600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A
20	80	500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A	
25	80	450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A	
40	80	400	C	C	C	C	E	E	E	E	E	E	E	E	A			
50	80	350	C	C	C	C	E	E	E	E	E	E	E	A				
80	80	300	C	C	C	C	E	E	E	E	E	E	A					
100	80	250	C	C	C	C	E	E	E	E	E	A						
150	80	200	C	C	C	C	E	E	E	E	A							
200	80	150	C	C	C	C	E	E	E	A								
250	80	100	C	C	C	C	E	E	A									
300	80	80	C	C	C	C	E	A										
350	80	50	C	C	C	B	A											
400	80	40	C	B	B	A												
450	80	25	B	B	A													
500	80	20	B	A														
600	80	15	A															

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.9.
- For design temperatures of 400°C and below, application of ASTM A193-B7 bolting material and asbestos filled gaskets is possible.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting socket-weld end outlet
E	Branch outlet reducing butt-weld

Class No.: FP02	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A335-P11 (Seamless)
		DN	450-600	ASTM	A691-1.25CR (Welded)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A335-P11 (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-600	ASTM	A182-F11
SBFL	Spectacle Blind Flange	DN	15-600	ASTM	A387-11 CL.2
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-600	ASTM	A387-11 CL.2
WNFL	Welding Neck Flange	DN	15-600	ASTM	A182-F11

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-600	ASTM	A234-WP11
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-600	ASTM	A234-WP11
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-600	ASTM	A234-WP11
TEEB	Equal Tee	Butt-Weld. End	DN	15-600	ASTM	A234-WP11
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F11
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F5
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A182-F5
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A182-F11
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A182-F11

* REDUCING FITTINGS

BROS	Branch Fitting Outlet	Socket-Weld. End	DN	15-40	ASTM	A182-F11
BROB	Branch Outlet Red.	Butt-Weld.	DN	80-600	ASTM	A182-F11
RECB	Reducer Conc.	Butt-Weld. End	DN	20-600	ASTM	A234-WP11
REEB	Reducer Ecc.	Butt-Weld. End	DN	20-600	ASTM	A234-WP11
TERB	Tee Reducing	Butt-Weld. End	DN	20-25	ASTM	A234-WP11
TERS	Tee Reducing	Socket-Weld. End	DN	20-40	ASTM	A182-F11

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVB	Check Valve Butt-Weld. End	DN	15-400	Body:	ASTM A217-WC6, A182-F11
				Trim:	AISI 316, 316L
GAVB	Gate Valve Butt-Weld. End	DN	15-600	Body:	ASTM A217-WC6, A182-F11
				Trim:	AISI 316, 316L
GLVB	Globe Valve Butt-Weld. End	DN	15-150	Body:	AASTMA217-WC6, A182-F11
				Trim:	AISI 316, 316L

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-600	AISI	304, Graphite Filled, CS Centring-Ring, AISI 304 Inner R.
ORFS	Orifice Flange Set	DN	50-600		ASTM A182-F11
STBT	Stud Bolt with Nuts		—	Studs:	ASTM A193-B16
				Nuts:	ASTM A194-4

Class No.: FP02	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
* PIPE																	
Pipe	74.33.11	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FLANGES																	
Blind Flange	76.64.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.64.80	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS																	
Cap	Butt-Weld. End	76.32.18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.32.38	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.32.39	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.32.84	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.36.38	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Socket-Weld. End	76.36.39	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Socket-Weld. End	76.36.84	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Coupling	Socket-Weld. End	76.36.28	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cap	Socket-Weld. End	76.36.18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* VALVES																	
Check Valve	Butt-Weld. End	75.59.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve	Butt-Weld. End	75.59.30	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve	Butt-Weld. End	75.59.40	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS																	
Gasket, Spiral Wound		85.41.31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.88.52					*	*	*	*	*	*	*	*	*	*	*

Class No.: FP02	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.32.72	REEB 76.32.73	TERB 76.32.85	TERS 76.36.85	Run	Br.	BROB 76.80.05	RECB 76.32.72	REEB 76.32.73	COMP. NAME	DESCRIPTION	
20	× 15		*	*	*	*	400	× 50	*			BROB	Branch Outlet Red. Butt-Weld	
25	× 15		*	*	*	*	400	× 80	*			RECB	Reducer Conc. Butt-Weld. End	
25	× 20		*	*	*	*	400	× 100	*			REEB	Reducer Ecc. Butt-Weld. End	
40	× 20		*	*	*	*	400	× 150	*			TERB	Tee Reducing Butt-Weld. End	
40	× 25		*	*	*	*	400	× 200	*	*	*	BROS	Branch Fitting Socket-Weld. End Outlet	
50	× 25		*	*	*	*	400	× 250	*	*	*	TERS	Tee Reducing Socket-Weld. End	
50	× 40		*	*	*	*	400	× 300	*	*	*			
80	× 40		*	*	*	*	400	× 350	*	*	*			
80	× 50	*	*	*	*	*	450	× 50	*					
100	× 50	*	*	*	*	*	450	× 80	*			RUN	Br.	
100	× 80	*	*	*	*	*	450	× 100	*				BROS	
150	× 50	*	*	*	*	*	450	× 150	*				76.80.26	
150	× 80	*	*	*	*	*	450	× 200	*			40-150	15	*
150	× 100	*	*	*	*	*	450	× 250	*			200-600		*
200	× 50	*	*	*	*	*	450	× 300	*					
200	× 80	*	*	*	*	*	450	× 350	*	*	*	50-80	20	*
200	× 100	*	*	*	*	*	450	× 400	*	*	*	100-600		*
200	× 150	*	*	*	*	*	500	× 50	*					
250	× 50	*	*	*	*	*	500	× 80	*			50	25	*
250	× 80	*	*	*	*	*	500	× 100	*			80-100		*
250	× 100	*	*	*	*	*	500	× 150	*			150-600		*
250	× 150	*	*	*	*	*	500	× 200	*					
250	× 200	*	*	*	*	*	500	× 250	*			80-100	40	*
300	× 50	*	*	*	*	*	500	× 300	*	*	*	150-300		*
300	× 80	*	*	*	*	*	500	× 350	*	*	*	350-600		*
300	× 100	*	*	*	*	*	500	× 400	*	*	*			
300	× 150	*	*	*	*	*	500	× 450	*	*	*			
300	× 200	*	*	*	*	*	600	× 50	*					
300	× 250	*	*	*	*	*	600	× 80	*					
350	× 50	*	*	*	*	*	600	× 100	*					
350	× 80	*	*	*	*	*	600	× 150	*					
350	× 100	*	*	*	*	*	600	× 200	*					
350	× 150	*	*	*	*	*	600	× 250	*					
350	× 200	*	*	*	*	*	600	× 300	*					
350	× 250	*	*	*	*	*	600	× 350	*					
350	× 300	*	*	*	*	*	600	× 400	*					
							600	× 450	*	*	*			
							600	× 500	*	*	*			

Class No.: FP02	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.96
15	4	1/2	× 80	*
20	4	5/8	× 90	*
25	4	5/8	× 90	*
40	4	3/4	× 110	*
50	8	5/8	× 110	*
80	8	3/4	× 130	*
100	8	7/8	× 150	*
150	12	1	× 170	*
200	12	1 1/8	× 190	*
250	16	1 1/4	× 220	*
300	20	1 1/4	× 220	*
350	20	1 3/8	× 240	*
400	20	1 1/2	× 250	*
450	20	1 5/8	× 280	*
500	24	1 5/8	× 290	*
600	24	1 7/8	× 330	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.96
15	4	1/2	× 90	*
20	4	5/8	× 100	*
25	4	5/8	× 100	*
40	4	3/4	× 120	*
50	8	5/8	× 120	*
80	8	3/4	× 150	*
100	8	7/8	× 170	*
150	12	1	× 210	*
200	12	1 1/8	× 230	*
250	16	1 1/4	× 260	*
300	20	1 1/4	× 270	*
350	20	1 3/8	× 290	*
400	20	1 1/2	× 310	*
450	20	1 5/8	× 340	*
500	24	1 5/8	× 360	*
600	24	1 7/8	× 415	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.63
15	4	5/8	× 135	*
20	4	5/8	× 135	*
25	4	5/8	× 135	*
40	4	3/4	× 140	*
50	8	5/8	× 150	*
80	8	3/4	× 150	*
100	8	7/8	× 160	*
150	12	1	× 180	*
200	12	1-1/8	× 210	*
250	16	1-1/4	× 230	*
300	20	1-1/4	× 240	*
350	20	1-3/8	× 260	*
400	20	1-1/2	× 275	*
450	20	1-5/8	× 300	*
500	24	1-5/8	× 320	*
600	24	1-7/8	× 355	*

* DRAIN POINT Fig. 0N

Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Gate Valve Butt Weld End				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

* DRAIN POINT Fig. 0N

Run	DN 40-40	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Gate Valve Butt Weld End				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

* DRAIN POINT Fig. 0N

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Gate Valve Butt Weld End				1
Stud Bolt with Nuts				4
Pipe Nipple 50 mm				1
Welding Neck Flange				1

* VENT POINT Fig. 1N

Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Globe Valve Butt Weld End				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

* VENT POINT Fig. 1N

Run	DN 40-40	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Globe Valve Butt Weld End				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

* VENT POINT Fig. 1N

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Globe Valve Butt Weld End				1
Stud Bolt with Nuts				4
Pipe Nipple 50 mm				1
Welding Neck Flange				1

Class No.: FP04	Page: 1	Content: General
Base Material: Alloy Steel (5 Cr - 0.5 Mo)	First Issue:	Revision:
Rating: PN 100 (Class 600)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400	450
Pressure Barg.	DN 15-600	103.4	103.4	103.1	100.3	97.3	92.7	85.7	80.4	73.2	61.9

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES															
			BRANCH SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
15	80	600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A
20	80	500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A	
25	80	450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A	
40	80	400	C	C	C	C	E	E	E	E	E	E	E	E	A			
50	80	350	C	C	C	C	E	E	E	E	E	E	E	A				
80	80	300	C	C	C	C	E	E	E	E	E	E	A					
100	80	250	C	C	C	C	E	E	E	E	E	A						
150	80	200	C	C	C	C	E	E	E	E	A							
200	80	150	C	C	C	C	E	E	E	A								
250	80	100	C	C	C	C	E	E	A									
300	80	80	C	C	C	C	E	A										
350	80	50	C	C	C	B	A											
400	80	40	C	B	B	A												
450	80	25	B	B	A													
500	80	20	B	A														
600	80	15	A															

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.13.
- For design temperatures of 400°C and below, application of ASTM A193-B7 bolting material and asbestos filled gaskets is possible.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting socket-weld end outlet
E	Branch outlet reducing butt-weld

Class No.: FP04	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A335-P5 (Seamless)
		DN	450-600	ASTM	A691-5CR (Welded)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A335-P5 (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-600	ASTM	A182-F5
SBFL	Spectacle Blind Flange	DN	15-600	ASTM	A387-5 CL.2
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-600	ASTM	A387-5 CL.2
WNFL	Welding Neck Flange	DN	15-600	ASTM	A182-F5

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-600	ASTM	A234-WP5
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-600	ASTM	A234-WP5
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-600	ASTM	A234-WP5
TEEB	Equal Tee	Butt-Weld. End	DN	15-600	ASTM	A234-WP5
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F5
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F5
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A182-F5
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A182-F5
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A182-F5

* REDUCING FITTINGS

BROS	Branch Fitting Outlet	Socket-Weld. End	DN	15-40	ASTM	A182-F5
BROB	Branch Outlet Red.	Butt-Weld.	DN	80-600	ASTM	A182-F5
RECB	Reducer Conc.	Butt-Weld. End	DN	20-600	ASTM	A234-WP5
REEB	Reducer Ecc.	Butt-Weld. End	DN	20-600	ASTM	A234-WP5
TERB	Tee Reducing	Butt-Weld. End	DN	20-25	ASTM	A234-WP5
TERS	Tee Reducing	Socket-Weld. End	DN	20-40	ASTM	A182-F5

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVF	Check Valve Flanged	DN	15-400	Body: ASTM	A217-C5, A182-F5	Trim: AISI	316, 316L
GAVF	Gate Valve Flanged	DN	15-600	Body: ASTM	A217-C5, A182-F5	Trim: AISI	316, 316L
GLVF	Globe Valve Flanged	DN	15-150	Body: ASTM	A217-C5, A182-F5	Trim: AISI	316, 316L

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-600	AISI	304, Graphite Filled, CS Centring-, AISI 304 Inner-Ring		
ORFS	Orifice Flange Set	DN	50-600	ASTM	A182-F5		
STBT	Stud Bolt with Nuts	—		Studs: ASTM	A193-B16	Nuts: ASTM	A194-4

Class No.: FP04	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
* PIPE																	
Pipe	74.33.31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FLANGES																	
Blind Flange	76.64.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.64.80	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS																	
Cap	Butt-Weld. End	76.32.18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.32.38	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.32.39	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.32.84	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.36.38	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Socket-Weld. End	76.36.39	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Socket-Weld. End	76.36.84	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Coupling	Socket-Weld. End	76.36.28	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cap	Socket-Weld. End	76.36.18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* VALVES																	
Check Valve Flanged	75.41.13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged	75.41.33	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged	75.41.42	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS																	
Gasket, Spiral Wound	85.41.31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*	*	*	*	*	*	*	*

Class No.: FP04	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.32.72	REEB 76.32.73	TERB 76.32.85	TERS 76.36.85	Run	Br.	BROB 76.80.05	RECB 76.32.72	REEB 76.32.73	COMP. NAME	DESCRIPTION
20	× 15		*	*	*	*	400	× 50	*			BROB	Branch Outlet Red. Butt-Weld
25	× 15		*	*	*	*	400	× 80	*			RECB	Reducer Conc. Butt-Weld. End
25	× 20		*	*	*	*	400	× 100	*			REEB	Reducer Ecc. Butt-Weld. End
40	× 20		*	*	*	*	400	× 150	*			TERB	Tee Reducing Butt-Weld. End
40	× 25		*	*	*	*	400	× 200	*	*	*	TERS	Tee Reducing Socket-Weld. End
50	× 25		*	*	*	*	400	× 250	*	*	*	BROS	Branch Fitting Socket-Weld. End Outlet
50	× 40		*	*	*	*	400	× 300	*	*	*		
80	× 40		*	*	*	*	400	× 350	*	*	*		
80	× 50	*	*	*	*	*	450	× 50	*				
100	× 50	*	*	*	*	*	450	× 80	*			RUN	Br.
100	× 80	*	*	*	*	*	450	× 100	*				BROS
150	× 50	*	*	*	*	*	450	× 150	*				76.80.26
150	× 80	*	*	*	*	*	450	× 200	*			40-150	15
150	× 100	*	*	*	*	*	450	× 250	*	*	*	200-600	
200	× 50	*	*	*	*	*	450	× 300	*	*	*		
200	× 80	*	*	*	*	*	450	× 350	*	*	*	50-80	20
200	× 100	*	*	*	*	*	450	× 400	*	*	*	100-600	
200	× 150	*	*	*	*	*	500	× 50	*				
250	× 50	*	*	*	*	*	500	× 80	*			50	25
250	× 80	*	*	*	*	*	500	× 100	*			80-100	
250	× 100	*	*	*	*	*	500	× 150	*			150-600	
250	× 150	*	*	*	*	*	500	× 200	*				
250	× 200	*	*	*	*	*	500	× 250	*			80-100	40
300	× 50	*	*	*	*	*	500	× 300	*	*	*	150-300	
300	× 80	*	*	*	*	*	500	× 350	*	*	*	350-600	
300	× 100	*	*	*	*	*	500	× 400	*	*	*		
300	× 150	*	*	*	*	*	500	× 450	*	*	*		
300	× 200	*	*	*	*	*	600	× 50	*				
300	× 250	*	*	*	*	*	600	× 80	*				
350	× 50	*	*	*	*	*	600	× 100	*				
350	× 80	*	*	*	*	*	600	× 150	*				
350	× 100	*	*	*	*	*	600	× 200	*				
350	× 150	*	*	*	*	*	600	× 250	*				
350	× 200	*	*	*	*	*	600	× 300	*				
350	× 250	*	*	*	*	*	600	× 350	*				
350	× 300	*	*	*	*	*	600	× 400	*	*	*		
							600	× 450	*	*	*		
							600	× 500	*	*	*		

Class No.: FP04	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.96
15	4	1/2	× 75	*
20	4	5/8	× 85	*
25	4	5/8	× 90	*
40	4	3/4	× 110	*
50	8	5/8	× 110	*
80	8	3/4	× 125	*
100	8	7/8	× 145	*
150	12	1	× 170	*
200	12	1 1/8	× 190	*
250	16	1 1/4	× 215	*
300	20	1 1/4	× 220	*
350	20	1 3/8	× 235	*
400	20	1 1/2	× 250	*
450	20	1 5/8	× 275	*
500	24	1 5/8	× 290	*
600	24	1 7/8	× 330	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.96
15	4	1/2	× 90	*
20	4	5/8	× 100	*
25	4	5/8	× 100	*
40	4	3/4	× 120	*
50	8	5/8	× 120	*
80	8	3/4	× 145	*
100	8	7/8	× 170	*
150	12	1	× 205	*
200	12	1 1/8	× 230	*
250	16	1 1/4	× 255	*
300	20	1 1/4	× 270	*
350	20	1 3/8	× 285	*
400	20	1 1/2	× 310	*
450	20	1 5/8	× 340	*
500	24	1 5/8	× 360	*
600	24	1 7/8	× 415	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.63
15	4	5/8	× 135	*
20	4	5/8	× 135	*
25	4	5/8	× 135	*
40	4	3/4	× 140	*
50	8	5/8	× 150	*
80	8	3/4	× 150	*
100	8	7/8	× 160	*
150	12	1	× 180	*
200	12	1-1/8	× 210	*
250	16	1-1/4	× 230	*
300	20	1-1/4	× 240	*
350	20	1-3/8	× 260	*
400	20	1-1/2	× 275	*
450	20	1-5/8	× 300	*
500	24	1-5/8	× 320	*
600	24	1-7/8	× 355	*

*** DRAIN POINT Fig. 0J**

Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

*** DRAIN POINT Fig. 0J**

Run	DN 40-40	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

*** DRAIN POINT Fig. 0J**

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

*** VENT POINT Fig. 1J**

Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

*** VENT POINT Fig. 1J**

Run	DN 40-40	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

*** VENT POINT Fig. 1J**

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

Class No.: FP06	Page: 1	Content: General
Base Material: Alloy Steel (1.25 Cr. - 0.5 Mo)	First Issue:	Revision:
Rating: PN 100 (Class 600)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400	450	500
Pressure Barg.	DN 15-600	103.4	102.2	97.5	92.6	90.8	88.9	84.8	80.3	73.2	67.6	55.6

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES															
			BRANCH SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
15	80	600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A
20	80	500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A
25	80	450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A
40	80	400	C	C	C	C	E	E	E	E	E	E	E	E	E	A		
50	80	350	C	C	C	C	E	E	E	E	E	E	E	A				
80	80	300	C	C	C	C	E	E	E	E	E	E	A					
100	80	250	C	C	C	C	E	E	E	E	E	A						
150	80	200	C	C	C	C	E	E	E	E	A							
200	80	150	C	C	C	C	E	E	E	A								
250	80	100	C	C	C	C	E	E	A									
300	80	80	C	C	C	C	E	A										
350	80	50	C	C	C	B	A											
400	80	40	C	B	B	A												
450	80	25	B	B	A													
500	80	20	B	A														
600	80	15	A															

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.9.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

- A Equal tee
- B Reducing tee
- C Branch fitting socket weld end outlet
- E Branch outlet reducing butt-weld

Class No.: FP06	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A335-P11 (Seamless)
		DN	450-600	ASTM	A691-1.25CR (welded)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A335-P11 (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-600	ASTM	A182-F11
SBFL	Spectacle Blind Flange	DN	15-600	ASTM	A387-11 CL.2
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-600	ASTM	A387-11 CL.2
WNFL	Welding Neck Flange	DN	15-600	ASTM	A182-F11

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-600	ASTM	A234-WP11
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-600	ASTM	A234-WP11
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-600	ASTM	A234-WP11
TEEB	Equal Tee	Butt-Weld. End	DN	15-600	ASTM	A234-WP11
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F11
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F11
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A182-F11
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A182-F11
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A182-F11

* REDUCING FITTINGS

BROS	Branch Fitting Outlet	Socket-Weld. End	DN	15-40	ASTM	A182-F11
BROB	Branch Outlet Red.	Butt-Weld.	DN	80-600	ASTM	A182-F11
RECB	Reducer Conc.	Butt-Weld. End	DN	20-600	ASTM	A234-WP11
REEB	Reducer Ecc.	Butt-Weld. End	DN	20-600	ASTM	A234-WP11
TERB	Tee Reducing	Butt-Weld. End	DN	20-25	ASTM	A234-WP11
TERS	Tee Reducing	Socket-Weld. End	DN	20-40	ASTM	A182-F11

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVB	Check Valve Butt-Weld. End	DN	15-600	Body: ASTM A217-WC6, A182-F11
				Trim: AISI 316 or Body Mat. all with Stellite-6 Facings
GAVB	Gate Valve Butt-Weld. End	DN	50-600	Body: ASTM A217-WC6, A182-F11
				Trim: AISI 316 or Body Mat. all with Stellite-6 Facings
GLVB	Globe Valve Butt-Weld. End	DN	15-150	Body: ASTM A217-WC6, A182-F11
				Trim: AISI 316 or Body Mat. all with Stellite-6 Facings

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-600	AISI 316, 316L Graphited Filled CS Centring, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-600	ASTM A182-F11
STBT	Stud Bolt with Nuts			Studs: ASTM A193-B16 Nuts: ASTM A194-8C

Class No.: FP06	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
* PIPE																	
Pipe	74.33.11	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FLANGES																	
Blind Flange	76.64.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.64.80	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS																	
Cap	Butt-Weld. End	76.32.18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.32.38	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.32.39	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.32.84	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.36.38	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Socket-Weld. End	76.36.39	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Socket-Weld. End	76.36.84	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Coupling	Socket-Weld. End	76.36.28	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cap	Socket-Weld. End	76.36.18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* VALVES																	
Check Valve	Butt-Weld. End	75.59.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve	Butt-Weld. End	75.59.30	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve	Butt-Weld. End	75.59.40	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS																	
Gasket, Spiral Wound		85.41.36	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.88.52					*	*	*	*	*	*	*	*	*	*	*

Class No.: FP06	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.32.72	REEB 76.32.73	TERB 76.32.85	TERS 76.36.85	Run	Br.	BROB 76.80.05	RECB 76.32.72	REEB 76.32.73	COMP. NAME	DESCRIPTION	
20	× 15		*	*	*	*	400	× 50	*			BROB	Branch Outlet Red. Butt-Weld	
25	× 15		*	*	*	*	400	× 80	*			RECB	Reducer Conc. Butt-Weld. End	
25	× 20		*	*	*	*	400	× 100	*			REEB	Reducer Ecc. Butt-Weld. End	
40	× 20		*	*	*	*	400	× 150	*			TERB	Tee Reducing Butt-Weld. End	
40	× 25		*	*	*	*	400	× 200	*	*	*	TERS	Tee Reducing Socket-Weld. End	
50	× 25		*	*	*	*	400	× 250	*	*	*	BROS	Branch Fitting Socket-Weld. End Outlet	
50	× 40		*	*	*	*	400	× 300	*	*	*			
80	× 40		*	*	*	*	400	× 350	*	*	*			
80	× 50	*	*	*	*	*	450	× 100						
100	× 50	*	*	*	*	*	450	× 150				RUN	Br.	
100	× 80	*	*	*	*	*	450	× 200	*	*	*		BROS	
150	× 50	*	*	*	*	*	450	× 250	*	*	*		76.80.26	
150	× 80	*	*	*	*	*	450	× 300	*	*	*	40-150	15	*
150	× 100	*	*	*	*	*	450	× 350	*	*	*	200-600		*
200	× 50	*	*	*	*	*	450	× 400	*	*	*			
200	× 80	*	*	*	*	*	500	× 50				50-80	20	*
200	× 100	*	*	*	*	*	500	× 80				100-600		*
200	× 150	*	*	*	*	*	500	× 100						
250	× 50	*	*	*	*	*	500	× 150				50	25	*
250	× 80	*	*	*	*	*	500	× 200	*	*	*	80-100		*
250	× 100	*	*	*	*	*	500	× 250	*	*	*	150-600		*
250	× 150	*	*	*	*	*	500	× 300	*	*	*			
250	× 200	*	*	*	*	*	500	× 350	*	*	*	80-100	40	*
300	× 50	*	*	*	*	*	500	× 400	*	*	*	150-300		*
300	× 80	*	*	*	*	*	500	× 450	*	*	*	350-600		*
300	× 100	*	*	*	*	*	600	× 50						
300	× 150	*	*	*	*	*	600	× 80						
300	× 200	*	*	*	*	*	600	× 100						
300	× 250	*	*	*	*	*	600	× 150						
350	× 50	*	*	*	*	*	600	× 200						
350	× 80	*	*	*	*	*	600	× 250	*	*	*			
350	× 100	*	*	*	*	*	600	× 300	*	*	*			
350	× 150	*	*	*	*	*	600	× 350	*	*	*			
350	× 200	*	*	*	*	*	600	× 400	*	*	*			
350	× 250	*	*	*	*	*	600	× 450	*	*	*			
350	× 300	*	*	*	*	*	600	× 500	*	*	*			

Class No.: FP06	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.96
15	4	1/2	× 80	*
20	4	5/8	× 90	*
25	4	5/8	× 90	*
40	4	3/4	× 110	*
50	8	5/8	× 110	*
80	8	3/4	× 130	*
100	8	7/8	× 150	*
150	12	1	× 170	*
200	12	1 1/8	× 190	*
250	16	1 1/4	× 220	*
300	20	1 1/4	× 220	*
350	20	1 3/8	× 240	*
400	20	1 1/2	× 250	*
450	20	1 5/8	× 280	*
500	24	1 5/8	× 290	*
600	24	1 7/8	× 330	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.96
15	4	1/2	× 90	*
20	4	5/8	× 100	*
25	4	5/8	× 100	*
40	4	3/4	× 120	*
50	8	5/8	× 120	*
80	8	3/4	× 150	*
100	8	7/8	× 170	*
150	12	1	× 210	*
200	12	1 1/8	× 230	*
250	16	1 1/4	× 260	*
300	20	1 1/4	× 270	*
350	20	1 3/8	× 290	*
400	20	1 1/2	× 310	*
450	20	1 5/8	× 340	*
500	24	1 5/8	× 360	*
600	24	1 7/8	× 415	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.63
15	4	5/8	× 135	*
20	4	5/8	× 135	*
25	4	5/8	× 135	*
40	4	3/4	× 140	*
50	8	5/8	× 150	*
80	8	3/4	× 150	*
100	8	7/8	× 160	*
150	12	1	× 180	*
200	12	1-1/8	× 210	*
250	16	1-1/4	× 230	*
300	20	1-1/4	× 240	*
350	20	1-3/8	× 260	*
400	20	1-1/2	× 275	*
450	20	1-5/8	× 300	*
500	24	1-5/8	× 320	*
600	24	1-7/8	× 355	*

*** DRAIN POINT Fig. 0N**

Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Gate Valve Butt-Weld. End				1
Pipe Nipple 50 mm				4
Stud Bolt with Nuts				4
Welding Neck Flange				1

*** DRAIN POINT Fig. 0N**

Run	DN 40-40	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Gate Valve Butt-Weld. End				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

*** DRAIN POINT Fig. 0N**

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Gate Valve Butt-Weld. End				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

*** VENT POINT Fig. 1N**

Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Globe Valve Butt-Weld. End				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

*** VENT POINT Fig. 1N**

Run	DN 40-40	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Globe Valve Butt-Weld. End				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

*** VENT POINT Fig. 1N**

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Globe Valve Butt-Weld. End				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

Class No.: FS02	Page: 1	Content: General
Base Material: Stainless Steel (AISI 316)	First Issue:	Revision:
Rating: PN 100 (Class 600)		Date:
Corrosion Allowance: 0 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-200	99.2	96.2	84.5	77.0	71.5	66.7	63.3	60.9	58.2

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE								
			15	20	25	40	50	80	100	150	200
15	40S	200	C	C	C	C	E	E	E	E	A
20	40S	150	C	C	C	C	E	E	E	A	
25	40S	100	C	C	C	C	E	E	A		
40	40S	80	C	C	C	C	E	A			
50	40S	50	C	C	C	B	A				
80	40S	40	C	B	B	A					
100	40S	25	B	B	A						
150	80S	20	B	A							
200	80S	15	A								

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 2.2.
- Blind flanges to be provided with liner.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting socket weld end outlet
E	Branch outlet reducing butt-weld

Class No.: FS02	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-200	ASTM	A312-TP316L (Seamless or Welded)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A312-TP316L (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-200	ASTM	A182-F316
FLIN	Blind Flange Liner	DN	15-200	ASTM	A240-TP316
SBFL	Spectacle Blind Flange	DN	15-200	ASTM	A240-TP316
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-200	ASTM	A240-TP316
WNFL	Welding Neck Flange	DN	15-200	ASTM	A182-F316

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-200	ASTM	A403-WP316L
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-200	ASTM	A403-WP316L
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-200	ASTM	A403-WP316L
TEEB	Equal Tee	Butt-Weld. End	DN	15-200	ASTM	A403-WP316L
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F316
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F316
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A182-F316
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A182-F316
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A182-F316

* REDUCING FITTINGS

BROS	Branch Fitting Outlet	Socket-Weld. End	DN	15-40	ASTM	A182-F316
BROB	Branch Outlet Red.	Butt-Weld.	DN	80-200	ASTM	A182-F316
RECB	Reducer Conc.	Butt-Weld. End	DN	20-200	ASTM	A403-WP316L
REEB	Reducer Ecc.	Butt-Weld. End	DN	20-200	ASTM	A403-WP316L
TERB	Tee Reducing	Butt-Weld. End	DN	20-200	ASTM	A403-WP316L
TERS	Tee Reducing	Socket-Weld. End	DN	20-40	ASTM	A182-F316

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVF	Check Valve Flanged	DN	15-200	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316, 316L
GAVF	Gate Valve Flanged	DN	15-200	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316, 316L
GLVF	Globe Valve Flanged	DN	15-150	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316, 316L

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-200	AISI 316, 316L, Graphite Filled CS Centring-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-200	ASTM A182-F316
STBT	Stud Bolt with Nuts		—	Studs: ASTM A193-B7 Nuts: ASTM A194-2H

Class No.: FS02	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE									
		15	20	25	40	50	80	100	150	200	
* PIPE											
Pipe	74.36.40	*	*	*	*	*	*	*	*	*	*
* FLANGES											
Blind Flange	76.65.11	*	*	*	*	*	*	*	*	*	*
Blind Flange Liner	76.80.00	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.00	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.65.80	*	*	*	*	*	*	*	*	*	*
* FITTINGS											
Cap	Butt-Weld. End	76.33.18	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.33.38	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.33.40	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.33.84	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.37.38	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Socket-Weld. End	76.37.39	*	*	*	*	*	*	*	*	*
Equal Tee	Socket-Weld. End	76.37.84	*	*	*	*	*	*	*	*	*
Coupling	Socket-Weld. End	76.37.28	*	*	*	*	*	*	*	*	*
Cap	Socket-Weld. End	76.37.18	*	*	*	*	*	*	*	*	*
* VALVES											
Check Valve Flanged	75.40.13	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged	75.40.30	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged	75.40.41	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS											
Gasket, Spiral Wound	85.41.35	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*	*

Class No.: FS02	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.33.72	REEB 76.33.73	TERB 76.33.85	TERS 76.37.85
20 × 15			*	*	*	*
25 × 15			*	*	*	*
25 × 20			*	*	*	*
40 × 15				*	*	*
40 × 20			*	*	*	*
40 × 25			*	*	*	*
50 × 25			*	*		
50 × 40			*	*	*	
80 × 40			*	*		
80 × 50	*		*	*	*	
100 × 40				*	*	
100 × 50	*		*	*	*	
100 × 80	*		*	*	*	
150 × 50	*		*	*	*	
150 × 80	*		*	*	*	
150 × 100	*		*	*	*	
200 × 50	*					
200 × 80	*					
200 × 100	*		*	*	*	
200 × 150	*		*	*	*	

COMP. NAME		DESCRIPTION	
BROB		Branch Outlet Red. Butt-Weld	
RECB		Reducer Conc. Butt-Weld. End	
REEB		Reducer Ecc. Butt-Weld. End	
TERB		Tee Reducing Butt-Weld. End	
TERS		Tee Reducing Socket-Weld. End	
BROS		Branch Fitting Socket-Weld. End Outlet	
RUN	Br.	BROS	
		76.80.26	
40-150 200	15	*	*
50-80 100-200	20	*	*
50 80-100 150-200	25	*	*
80-100 150-200	40	*	*

Class No.: FS02	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	1/2	× 80	*
20	4	5/8	× 90	*
25	4	5/8	× 90	*
40	4	3/4	× 110	*
50	8	5/8	× 110	*
80	8	3/4	× 130	*
100	8	7/8	× 150	*
150	12	1	× 170	*
200	12	1 1/8	× 190	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	× 90	*
20	4	5/8	× 100	*
25	4	5/8	× 100	*
40	4	3/4	× 120	*
50	8	5/8	× 120	*
80	8	3/4	× 150	*
100	8	7/8	× 170	*
150	12	1	× 210	*
200	12	1 1/8	× 230	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.63
15	4	5/8	× 135	*
20	4	5/8	× 135	*
25	4	5/8	× 135	*
40	4	3/4	× 140	*
50	8	5/8	× 150	*
80	8	3/4	× 150	*
100	8	7/8	× 160	*
150	12	1	× 180	*
200	12	1 1/8	× 210	*

* DRAIN POINT Fig. 0I

Run DN 15-25	Br DN 15	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		2
Gate Valve Flanged		1
Stud Bolt with Nuts		8
Welding Neck Flange		1

* DRAIN POINT Fig. 0I

Run DN 40-40	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		2
Gate Valve Flanged		1
Stud Bolt with Nuts		8
Welding Neck Flange		1

* DRAIN POINT Fig. 0J

Run DN 50-200	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		2
Gate Valve Flanged		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		8
Welding Neck Flange		1

* VENT POINT Fig. 1I

Run DN 15-25	Br DN 15	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		2
Globe Valve Flanged		1
Stud Bolt with Nuts		8
Welding Neck Flange		1

* VENT POINT Fig. 1I

Run DN 40-40	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		2
Globe Valve Flanged		1
Stud Bolt with Nuts		8
Welding Neck Flange		1

* VENT POINT Fig. 1J

Run DN 50-200	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		2
Globe Valve Flanged		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		8
Welding Neck Flange		1

Class No.: FS04	Page: 1	Content: General
Base Material: Stainless Steel (AISI 304, LT)	First Issue:	Revision:
Rating: PN 100 (Class 600)		Date:
Corrosion Allowance: 0 mm		Sign:

Temperature °C		-200	0	50	100	125	150
Pressure Barg.	DN 15-600	93.1	93.1	89.6	76.3	72.7	69.2

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES																
			BRANCH SIZE																
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600	
15	40S	600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	
20	40S	500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		
25	40S	450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		
40	40S	400	C	C	C	C	E	E	E	E	E	E	E	E	A				
50	40S	350	C	C	C	C	E	E	E	E	E	E	E	A					
80	40S	300	C	C	C	C	E	E	E	E	E	E	A						
100	40S	250	C	C	C	C	E	E	E	E	E	A							
150	40S	200	C	C	C	C	E	E	E	E	A								
200	80S	150	C	C	C	C	E	E	E	A									
250	80S	100	C	C	C	C	E	E	A										
300	60	80	C	C	C	C	E	A											
350	60	50	C	C	C	B	A												
400	60	40	C	B	B	A													
450	60	25	B	B	A														
500	60	20	B	A															
600	60	15	A																

Notes:

- Design limits are based on bolting material.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting socket weld end outlet
E	Branch outlet reducing butt-weld

Class No.: FS04	Page: 2	Content: Material Descriptions
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* PIPE						* VALVES								
PIPE	Pipe		DN	15-600	ASTM A312-TP304 (Seamless or Welded)	CHVF	Check Valve Flanged	DN	15-600	Body: ASTM A351-CF8M, A182-F316				
										Trim: AISI 316, 316L				
PNPP	Pipe Nipple 50 mm		DN	15-40	ASTM A312-TP304 (Seamless)	GAVF	Gate Valve Flanged	DN	15-600	Body: ASTM A351-CF8M, A182-F316				
										Trim: AISI 316, 316L				
						GLVF	Globe Valve Flanged	DN	15-150	Body: ASTM A351-CF8M, A182-F316				
										Trim: AISI 316, 316L				
* FLANGES						* MISCELLANEOUS								
SBFL	Spectacle Blind Flange		DN	15-600	ASTM A240-TP304	GKSW	Gasket, Spiral Wound	DN	15-600	AISI 316, 316L, Asbestos Filled				
SPRT	Spacer Ring Type (ANS Flanges)		DN	15-600	ASTM A240-TP304					CS Centring Ring				
WNFL	Welding Neck Flange		DN	15-600	ASTM A182-F304	ORFS	Orifice Flange Set	DN	50-600	ASTM A182-F304				
						STBT	Stud Bolt with Nuts			Bolts (Dia. > 1/2") ASTM A193B8M2,				
										Nuts: ASTM A194 Gr. 8M				
										Studs: ASTM A193-B8				
										Nuts: ASTM A194-8				
* FITTINGS														
CAPB	Cap	Butt-Weld. End	DN	15-600	ASTM A403-WP304									
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-600	ASTM A403-WP304									
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-600	ASTM A403-WP304									
TEEB	Equal Tee	Butt-Weld. End	DN	15-600	ASTM A403-WP304									
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM A182-F304									
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM A182-F304									
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM A182-F304									
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM A182-F304									
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM A182-F304									
* REDUCING FITTINGS														
BROS	Branch Fitting Outlet	Socket-Weld. End	DN	15-40	ASTM A182-F304									
BROB	Branch Outlet Red.	Butt-Weld.	DN	80-600	ASTM A182-F304									
RECB	Reducer Conc.	Butt-Weld. End	DN	20-600	ASTM A403-WP304									
REEB	Reducer Ecc.	Butt-Weld. End	DN	20-600	ASTM A403-WP304									
TERS	Tee Reducing	Socket-Weld. End	DN	20-40	ASTM A182-F304									

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

Class No.: FS04	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
* PIPE																	
Pipe	74.36.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FLANGES																	
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.09	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.65.80	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS																	
Cap	Butt-Weld. End	76.33.18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.33.38	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.33.40	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.33.84	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.37.38	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Socket-Weld. End	76.37.39	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Socket-Weld. End	76.37.84	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Coupling	Socket-Weld. End	76.37.28	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cap	Socket-Weld. End	76.37.18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* VALVES																	
Check Valve Flanged	75.40.13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged	75.40.30	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged	75.40.41	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS																	
Gasket, Spiral Wound	85.41.35	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*	*	*	*	*	*	*	*

Class No.: FS04	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.33.71	REEB 76.33.73	TERB 76.33.85	TERS 76.37.85	Run	Br.	BROB 76.80.05	RECB 76.36.71	REEB 76.36.73	TERB 76.33.85	COMP. NAME	DESCRIPTION
20	× 15		*	*	*	*	400	× 50	*				BROB	Branch Outlet Red. Butt-Weld
25	× 15		*	*	*	*	400	× 80	*				RECB	Reducer Conc. Butt-Weld. End
25	× 20		*	*	*	*	400	× 100	*				REEB	Reducer Ecc. Butt-Weld. End
40	× 15		*	*	*	*	400	× 150	*			*	TERB	Tee Reducing Butt-Weld. End
40	× 20		*	*	*	*	400	× 200	*				TERS	Tee Reducing Socket-Weld. End
40	× 25		*	*	*	*	400	× 250	*				BROS	Branch Fitting Socket-Weld. End Outlet
50	× 25		*	*	*	*	400	× 300	*	*	*	*		
50	× 40		*	*	*	*	400	× 350	*	*	*	*		
80	× 40		*	*	*	*	450	× 50	*					
80	× 50	*	*	*	*	*	450	× 80	*					
100	× 50	*	*	*	*	*	450	× 100	*					
100	× 80	*	*	*	*	*	450	× 150	*					
150	× 50	*	*	*	*	*	450	× 200	*					
150	× 80	*	*	*	*	*	450	× 250	*					
150	× 100	*	*	*	*	*	450	× 300	*	*	*	*		
200	× 50	*	*	*	*	*	450	× 350	*	*	*	*		
200	× 80	*	*	*	*	*	450	× 400	*	*	*	*		
200	× 100	*	*	*	*	*	500	× 50	*					
200	× 150	*	*	*	*	*	500	× 80	*					
250	× 50	*	*	*	*	*	500	× 100	*					
250	× 80	*	*	*	*	*	500	× 150	*					
250	× 100	*	*	*	*	*	500	× 200	*					
250	× 150	*	*	*	*	*	500	× 250	*					
250	× 200	*	*	*	*	*	500	× 300	*	*	*	*		
300	× 50	*	*	*	*	*	500	× 350	*	*	*	*		
300	× 80	*	*	*	*	*	500	× 400	*	*	*	*		
300	× 100	*	*	*	*	*	500	× 450	*	*	*	*		
300	× 150	*	*	*	*	*	600	× 50	*					
300	× 200	*	*	*	*	*	600	× 80	*					
300	× 250	*	*	*	*	*	600	× 100	*					
350	× 50	*	*	*	*	*	600	× 150	*					
350	× 80	*	*	*	*	*	600	× 200	*					
350	× 100	*	*	*	*	*	600	× 250	*					
350	× 150	*	*	*	*	*	600	× 300	*			*		
350	× 200	*	*	*	*	*	600	× 350	*			*		
350	× 250	*	*	*	*	*	600	× 400	*	*	*	*		
350	× 300	*	*	*	*	*	600	× 450	*	*	*	*		
							600	× 500	*	*	*	*		

RUN	Br.	BROS 76.80.26
40-150	15	*
200-600		*
50-80	20	*
100-600		*
50	25	*
80-100		*
150-600		*
80-100	40	*
150-300		*
350-600		*

Class No.: FS04	Page: 5	Content: Bolting and Assemblies
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BOLT SET ORIFICE FLANGES

BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.43
15	4	1/2	× 80	*
20	4	5/8	× 90	*
25	4	5/8	× 90	*
40	4	3/4	× 110	*
50	8	5/8	× 110	*
80	8	3/4	× 130	*
100	8	7/8	× 150	*
150	12	1	× 170	*
200	12	1 1/8	× 190	*
250	16	1 1/4	× 220	*
300	20	1 1/4	× 220	*
350	20	1 3/8	× 240	*
400	20	1 1/2	× 250	*
450	20	1 5/8	× 280	*
500	24	1 5/8	× 290	*
600	24	1 7/8	× 330	*

DN	No.	Inch	mm	81.38.63
15	4	5/8	× 135	*
20	4	5/8	× 135	*
25	4	5/8	× 135	*
40	4	3/4	× 140	*
50	8	5/8	× 150	*
80	8	3/4	× 150	*
100	8	7/8	× 160	*
150	12	1	× 180	*
200	12	1-1/8	× 210	*
250	16	1-1/4	× 230	*
300	20	1-1/4	× 240	*
350	20	1-3/8	× 260	*
400	20	1-1/2	× 275	*
450	20	1-5/8	× 300	*
500	24	1-5/8	× 320	*
600	24	1-7/8	× 355	*

* DRAIN POINT		Fig. 0J		No.
Run	DN 50-600	Br	DN 20	
Branch: Table Page 1				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT		Fig. 1J		No.
Run	DN 15-25	Br	DN 15	
Branch: Table Page 1				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.43
15	4	1/2	× 90	*
20	4	5/8	× 100	*
25	4	5/8	× 100	*
40	4	3/4	× 120	*
50	8	5/8	× 120	*
80	8	3/4	× 150	*
100	8	7/8	× 170	*
150	12	1	× 210	*
200	12	1 1/8	× 230	*
250	16	1 1/4	× 260	*
300	20	1 1/4	× 270	*
350	20	1 3/8	× 290	*
400	20	1 1/2	× 310	*
450	20	1 5/8	× 340	*
500	24	1 5/8	× 360	*
600	24	1 7/8	× 415	*

* DRAIN POINT		Fig. 0J		No.
Run	DN 15-25	Br	DN 15	
Branch: Table Page 1				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* DRAIN POINT		Fig. 0J		No.
Run	DN 40-40	Br	DN 20	
Branch: Table Page 1				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT		Fig. 1J		No.
Run	DN 40-40	Br	DN 20	
Branch: Table Page 1				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT		Fig. 1J		No.
Run	DN 50-600	Br	DN 20	
Branch: Table Page 1				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

Class No.: FS06	Page: 1	Content: General
Base Material: Stainless Steel (AISI 321/347)	First Issue:	Revision:
Rating: PN 100 (Class 600)		Date:
Corrosion Allowance: 0 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400	450
Pressure Barg.	DN 15-150	99.2	95.9	83.0	75.0	68.8	64.0	61.1	58.7	57.2	56.3
	DN 200-	92.5	92.5	83.0	75.0	68.8	64.0	61.1	58.7	57.2	56.3
	DN 250-	83.9	83.9	83.0	75.0	68.8	64.0	61.1	58.7	57.2	56.3
	DN 300-	72.5	72.5	72.5	72.4	67.8	63.5	60.3	58.0	56.8	55.5

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES										
			BRANCH SIZE										
			15	20	25	40	50	80	100	150	200	250	300
15	40S	300	C	C	C	C	E	E	E	E	E	E	A
20	40S	250	C	C	C	C	E	E	E	E	E	A	
25	40S	200	C	C	C	C	E	E	E	E	A		
40	40S	150	C	C	C	C	E	E	E	A			
50	40S	100	C	C	C	C	E	E	A				
80	40S	80	C	C	C	C	E	A					
100	40S	50	C	C	C	B	A						
150	40S	40	C	B	B	A							
200	40S	25	B	B	A								
250	40S	20	B	A									
300	40S	15	A										

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 2.4 and to allowable internal pressure acc. ANSI B31.3.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

- A Equal tee
- B Reducing tee
- C Branch fitting socket weld end outlet
- E Branch outlet reducing butt-weld

Class No.: FS06	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-300	ASTM	A312-TP321/347 (Seamless or Welded)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A312-TP321/347 (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-300	ASTM	A182-F321/347
SBFL	Spectacle Blind Flange	DN	15-300	ASTM	A240-TP321/347
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-300	ASTM	A240-TP321/347
WNFL	Welding Neck Flange	DN	15-300	ASTM	A182-F321/347

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-300	ASTM	A403-WP321/347
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-300	ASTM	A403-WP321/347
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-300	ASTM	A403-WP321/347
TEEB	Equal Tee	Butt-Weld. End	DN	15-300	ASTM	A403-WP321/347
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F321/347
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F321/347
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A182-F321/347
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A182-F321/347
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A182-F321/3476

* REDUCING FITTINGS

BROS	Branch Fitting Outlet	Socket-Weld. End	DN	15-40	ASTM	A182-F321/347
BROB	Branch Outlet Red.	Butt-Weld.	DN	80-300	ASTM	A182-F321/347
RECB	Reducer Conc.	Butt-Weld. End	DN	20-300	ASTM	A403-WP321/347
REEB	Reducer Ecc.	Butt-Weld. End	DN	20-300	ASTM	A403-WP321/347
TERB	Tee Reducing	Butt-Weld. End	DN	20-50	ASTM	A403-WP321/347
TERS	Tee Reducing	Socket-Weld. End	DN	20-40	ASTM	A182-F321/347

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVF	Check Valve Flanged	DN	15-300	Body: ASTM A351-CF8C, A182-F321 Trim: AISI 321
GAVF	Gate Valve Flanged	DN	15-300	Body: ASTM A351-CF8C, A182-F321 Trim: AISI 321
GLVF	Globe Valve Flanged	DN	15-150	Body: ASTM A351-CF8C, A182-F321 Trim: AISI 321

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-300	AISI 304, Graphite Filled, CS Centring-, AISI 304 Inner-Ring
ORFS	Orifice Flange Set	DN	50-300	ASTM A182-F321
STBT	Stud Bolt with Nuts	—	—	ASTM A453-Gr. 660, CL.A.

Class No.: FS06	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE										
		15	20	25	40	50	80	100	150	200	250	300
* PIPE												
Pipe	74.36.60 76.36.40	*	*	*	*	*	*	*	*	*	*	*
* FLANGES												
Blind Flange	76.65.10	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.00	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.65.80	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS												
Cap	Butt-Weld. End 76.33.18	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End 76.33.38	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End 76.33.39	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End 76.33.84	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End 76.37.38	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Socket-Weld. End 76.37.39	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Socket-Weld. End 76.37.84	*	*	*	*	*	*	*	*	*	*	*
Coupling	Socket-Weld. End 76.37.28	*	*	*	*	*	*	*	*	*	*	*
Cap	Socket-Weld. End 76.37.18	*	*	*	*	*	*	*	*	*	*	*
* VALVES												
Check Valve Flanged	75.40.13	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged	75.40.30	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged	75.40.40	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS												
Gasket, Spiral Wound	85.41.31	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*	*	*

Class No.: FS06	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.33.71	REEB 76.33.73	TERB 76.33.85	TERS 76.37.85
20 × 15			*	*	*	*
25 × 15			*	*	*	*
25 × 20			*	*	*	*
40 × 15				*	*	*
40 × 20			*	*	*	*
40 × 25			*	*	*	*
50 × 25			*	*	*	*
50 × 40			*	*	*	*
80 × 40			*	*	*	*
80 × 50		*	*	*	*	*
100 × 50		*	*	*	*	*
100 × 80		*	*	*	*	*
150 × 50		*	*	*	*	*
150 × 80		*	*	*	*	*
150 × 100		*	*	*	*	*
200 × 50		*	*	*	*	*
200 × 80		*	*	*	*	*
200 × 100		*	*	*	*	*
200 × 150		*	*	*	*	*
250 × 50		*	*	*	*	*
250 × 80		*	*	*	*	*
250 × 100		*	*	*	*	*
250 × 150		*	*	*	*	*
250 × 200		*	*	*	*	*
300 × 50		*	*	*	*	*
300 × 80		*	*	*	*	*
300 × 100		*	*	*	*	*
300 × 150		*	*	*	*	*
300 × 200		*	*	*	*	*
300 × 250		*	*	*	*	*

COMP. NAME	DESCRIPTION
BROB	Branch Outlet Red. Butt-Weld
RECB	Reducer Conc. Butt-Weld. End
REEB	Reducer Ecc. Butt-Weld. End
TERB	Tee Reducing Butt-Weld. End
TERS	Tee Reducing Socket-Weld. End
BROS	Branch Fitting Socket-Weld. End Outlet

RUN	Br.	BROS 76.80.26
40-150	15	*
200-300		*
50-80	20	*
100-300		*
50	25	*
80-100		*
150-300		*
80-100	40	*
150-300		*

Class No.: FS06	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.40
15	4	1/2	× 80	*
20	4	5/8	× 90	*
25	4	5/8	× 90	*
40	4	3/4	× 110	*
50	8	5/8	× 110	*
80	8	3/4	× 130	*
100	8	7/8	× 150	*
150	12	1	× 170	*
200	12	1 1/8	× 190	*
250	16	1 1/4	× 220	*
300	20	1 1/4	× 220	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.40
15	4	1/2	× 90	*
20	4	5/8	× 100	*
25	4	5/8	× 100	*
40	4	3/4	× 120	*
50	8	5/8	× 120	*
80	8	3/4	× 150	*
100	8	7/8	× 170	*
150	12	1	× 210	*
200	12	1 1/8	× 230	*
250	16	1 1/4	× 260	*
300	20	1 1/4	× 270	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.63
15	4	5/8	× 135	*
20	4	5/8	× 135	*
25	4	5/8	× 135	*
40	4	3/4	× 140	*
50	8	5/8	× 150	*
80	8	3/4	× 150	*
100	8	7/8	× 160	*
150	12	1	× 180	*
200	12	1-1/8	× 210	*
250	16	1-1/4	× 230	*
300	20	1-1/4	× 240	*

* DRAIN POINT Fig. 0I

Run DN 15-25	Br DN 15	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		2
Gate Valve Flanged		1
Stud Bolt with Nuts		8
Welding Neck Flange		1

* DRAIN POINT Fig. 0I

Run DN 40-40	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		2
Gate Valve Flanged		1
Stud Bolt with Nuts		8
Welding Neck Flange		1

* DRAIN POINT Fig. 0J

Run DN 50-300	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		2
Gate Valve Flanged		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		8
Welding Neck Flange		1

* VENT POINT Fig. 1I

Run DN 15-25	Br DN 15	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		2
Globe Valve Flanged		1
Stud Bolt with Nuts		8
Welding Neck Flange		1

* VENT POINT Fig. 1I

Run DN 40-40	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		2
Globe Valve Flanged		1
Stud Bolt with Nuts		8
Welding Neck Flange		1

* VENT POINT Fig. 1J

Run DN 50-300	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		2
Globe Valve Flanged		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		8
Welding Neck Flange		1

Class No.: FS07	Page: 1	Content: General
Base Material: Stainless Steel (AISI 321, Stab. HT)	First Issue:	Revision:
Rating: PN 100 (Class 600)		Date:
Corrosion Allowance: 0 mm		Sign:

Temperature °C		0	50	150	200	250	300	350	400	450	500	538
Pressure Barg.	DN 15-250	99.2	95.9	75.0	68.8	64.0	61.1	58.7	57.2	56.3	54.3	49.2
	DN 300-	97.3	95.9	75.0	68.8	64.0	61.1	58.7	57.2	56.3	54.3	49.2
	DN 350-450	77.0	77.0	75.0	68.8	64.0	61.1	58.7	57.2	56.3	54.3	49.2
	DN 500-600	70.6	70.6	70.6	66.0	61.8	58.7	56.5	55.3	54.1	53.4	48.5

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
15	40S	600	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A
20	40S	500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A
25	40S	450	C	C	C	C	E	E	E	E	E	B	B	B	B	A		
40	40S	400	C	C	C	C	E	E	E	E	B	B	B	B	A			
50	40S	350	C	C	C	C	E	E	E	E	B	B	B	A				
80	40S	300	C	C	C	C	E	E	E	B	B	B	A					
100	40S	250	C	C	C	C	E	E	E	B	B	A						
150	40S	200	C	C	C	C	E	E	B	B	A							
200	80S	150	C	C	C	C	E	B	B	A								
250	80S	100	C	C	C	C	B	B	A									
300	80S	80	C	C	C	B	B	A										
350	40	50	C	C	C	B	A											
400	40	40	C	B	B	A												
450	40	25	B	B	A													
500	40	20	B	A														
600	40	15	A															

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 2.4 and to allowable internal prisor acc. ANSI B31.3.
- Cold bending of pipe is not allowed and hot bending is not recommended.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting socket weld end outlet
E	Branch outlet reducing butt-weld

Class No.: FS07	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-300	ASTM	A312/TP321 Stab. HT. (Seamless or welded)
		DN	350-600	ASTM	A358/TP321 Stab. HT. (Welded)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A312/TP321 Stab. HT. (Welded)

* FLANGES

BLFL	Blind Flange	DN	15-300	ASTM	A182/F321 Stab. HT.
SBFL	Spectacle Blind Flange	DN	15-600	ASTM	A240-TP321 Stab. HT.
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-600	ASTM	A240-TP321 Stab. HT.
WNFL	Welding Neck Flange	DN	15-600	ASTM	A182/F321 Stab. HT.

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-600	ASTM	A403-WP-S-321 Stab. HT.
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-400	ASTM	A403-WP-S-321 Stab. HT.
			DN	450-600	ASTM	A403-WP-S/W-321 Stab. HT.
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-400	ASTM	A403-WP-S-321 Stab. HT.
			DN	450-600	ASTM	A403-WP-S/W-321 Stab. HT.
TEEB	Equal Tee	Butt-Weld. End	DN	15-400	ASTM	A403-WP-S-321 Stab. HT.
			DN	450-600	ASTM	A403-WP-S/W-321 Stab. HT.
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182/F321 Stab. HT.
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182/F321 Stab. HT.
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A182/F321 Stab. HT.
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A182/F321 Stab. HT.
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A182/F321 Stab. HT.

* REDUCING FITTINGS

BROS	Branch Fitting Outlet	Socket-Weld. End	DN	15-40	ASTM	A182/F321 Stab. HT.
BROB	Branch Outlet Red.	Butt-Weld.	DN	80-600	ASTM	A182/F321 Stab. HT.
RECB	Reducer Conc.	Butt-Weld. End	DN	20-400	ASTM	A403-WP-S-321 Stab. HT.
			DN	450-600	ASTM	A403-WP-S/W-321 Stab. HT.
REEB	Reducer Ecc.	Butt-Weld. End	DN	20-400	ASTM	A403-WP-S-321 Stab. HT.
			DN	450-600	ASTM	A403-WP-S/W-321 Stab. HT.
TERB	Tee Reducing	Butt-Weld. End	DN	20-400	ASTM	A403-WP-S-321 Stab. HT.
			DN	450-600	ASTM	A403-WP-S/W-321 Stab. HT.
TERS	Tee Reducing	Socket-Weld. End	DN	20-40	ASTM	A182/F321 Stab. HT.

* VALVES

CHVB	Check Valve	Butt-Weld. End	DN	15-400	Body: ASTM A351/CF8C, A182/F321 Trim: AISI 321 + Stilletes 6
GAVB	Gate Valve	Butt-Weld. End	DN	15-400	Body: ASTM A351/CF8C, A182/F321 Trim: AISI 321 + Stilletes 6
GLVB	Globe Valve	Butt-Weld. End	DN	15-150	Body: ASTM A351/CF8C, A182/F321
GAVF	Gate Valve	Flanged End	DN	15-50	Body: ASTM A351-CF8C, A182-F321 Trim: AISI 321 + Stilletes 6

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-600	AISI	316, 316L, Graphite Filled CS Centeig-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-600	ASTM	A182-F321 Stab. HT.
STBT	Stud Bolt with Nuts		—	ASTM	A453-Gr. 660, CL. A.

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

Class No.: FS07	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
* PIPE																	
Pipe	74.36.40	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FLANGES																	
Blind Flange	76.65.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.65.80	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS																	
Cap	Butt-Weld. End	76.33.18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.33.38	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.33.41	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.33.84	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.34.38	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Socket-Weld. End	76.34.39	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Socket-Weld. End	76.34.80	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Coupling	Socket-Weld. End	76.34.28	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cap	Socket-Weld. End	76.34.18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* VALVES																	
Check Valve	Butt-Weld. End	75.58.15	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve	Butt-Weld. End	75.58.35	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve	Butt-Weld. End	75.58.45	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS																	
Gasket, Spiral Wound		85.41.37	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.88.52					*	*	*	*	*	*	*	*	*	*	*

Class No.: FS07	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.33.71	REEB 76.33.73	TERB 76.33.85	TERS 76.34.85	Run	Br.	BROB 76.80.05	RECB 76.33.71	REEB 76.33.73	TERB 76.33.85	COMP. NAME	DESCRIPTION	
20 × 15			*	*	*	*	400 × 50		*				BROB	Branch Outlet Red. Butt-Weld	
25 × 15			*	*	*	*	400 × 80		*				RECB	Reducer Conc. Butt-Weld. End	
25 × 20			*	*	*	*	400 × 100		*				REEB	Reducer Ecc. Butt-Weld. End	
40 × 15				*	*	*	400 × 150		*			*	TERB	Tee Reducing Butt-Weld. End	
40 × 20			*	*	*	*	400 × 200		*	*	*	*	TERS	Tee Reducing Socket-Weld. End	
40 × 25			*	*	*	*	400 × 250		*	*	*	*	BROS	Branch Fitting Socket-Weld. End Outlet	
50 × 25			*	*	*	*	400 × 300		*	*	*	*			
50 × 40			*	*	*	*	400 × 350		*	*	*	*			
80 × 40			*	*	*	*	450 × 50		*						
80 × 50			*	*	*	*	450 × 80		*						
100 × 50			*	*	*	*	450 × 100		*						
100 × 80			*	*	*	*	450 × 150		*						
150 × 50		*					450 × 200		*			*			
150 × 80		*	*	*	*	*	450 × 250		*	*	*	*	40-150	15	*
150 × 100		*	*	*	*	*	450 × 300		*	*	*	*	200-600		*
200 × 50		*					450 × 350		*	*	*	*	50-80	20	*
200 × 80		*					450 × 400		*	*	*	*	100-600		*
200 × 100		*	*	*	*	*	500 × 50		*						
200 × 150		*	*	*	*	*	500 × 80		*				50	25	*
250 × 50		*					500 × 100		*				80-100		*
250 × 80		*					500 × 150		*				150-600		*
250 × 100		*			*	*	500 × 200		*			*			
250 × 150		*	*	*	*	*	500 × 250		*			*	80-100	40	*
250 × 200		*	*	*	*	*	500 × 300		*	*	*	*	150-300		*
300 × 50		*					500 × 350		*	*	*	*	350-600		*
300 × 80		*					500 × 400		*	*	*	*			
300 × 100		*					500 × 450		*	*	*	*			
300 × 150		*	*	*	*	*	600 × 50		*						
300 × 200		*	*	*	*	*	600 × 80		*						
300 × 250		*	*	*	*	*	600 × 100		*						
350 × 50		*					600 × 150		*						
350 × 80		*					600 × 200		*						
350 × 100		*					600 × 250		*			*			
350 × 150		*			*	*	600 × 300		*			*			
350 × 200		*	*	*	*	*	600 × 350		*			*			
350 × 250		*	*	*	*	*	600 × 400		*	*	*	*			
350 × 300		*	*	*	*	*	600 × 450		*	*	*	*			
							600 × 500		*	*	*	*			

Class No.: FS07	Page: 5	Content: Bolting and Assemblies
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BOLT SET ORIFICE FLANGES

BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.40
15	4	1/2	× 80	*
20	4	5/8	× 90	*
25	4	5/8	× 90	*
40	4	3/4	× 110	*
50	8	5/8	× 110	*
80	8	3/4	× 130	*
100	8	7/8	× 150	*
150	12	1	× 170	*
200	12	1 1/8	× 190	*
250	16	1 1/4	× 220	*
300	20	1 1/4	× 220	*
350	20	1 3/8	× 240	*
400	20	1 1/2	× 250	*
450	20	1 5/8	× 280	*
500	24	1 5/8	× 290	*
600	24	1 7/8	× 330	*

DN	No.	Inch	mm	81.38.63
15	4	5/8	× 135	*
20	4	5/8	× 135	*
25	4	5/8	× 135	*
40	4	3/4	× 140	*
50	8	5/8	× 150	*
80	8	3/4	× 150	*
100	8	7/8	× 160	*
150	12	1	× 180	*
200	12	1 1/8	× 210	*
250	16	1 1/4	× 230	*
300	20	1 1/4	× 240	*
350	20	1 3/8	× 260	*
400	20	1 1/2	× 275	*
450	20	1 5/8	× 300	*
500	24	1 5/8	× 320	*
600	24	1 7/8	× 355	*

* DRAIN POINT Fig. 0N

Run DN 50-600	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve Butt-Weld End		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

* VENT POINT Fig. 1N

Run DN 15-25	Br DN 15	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld End		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.40
15	4	1/2	× 90	*
20	4	5/8	× 100	*
25	4	5/8	× 100	*
40	4	3/4	× 120	*
50	8	5/8	× 120	*
80	8	3/4	× 150	*
100	8	7/8	× 170	*
150	12	1	× 210	*
200	12	1 1/8	× 230	*
250	16	1 1/4	× 260	*
300	20	1 1/4	× 270	*
350	20	1 3/8	× 290	*
400	20	1 1/2	× 310	*
450	20	1 5/8	× 340	*
500	24	1 5/8	× 360	*
600	24	1 7/8	× 415	*

* DRAIN POINT Fig. 0N

Run DN 15-25	Br DN 15	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve Butt-Weld End		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

* DRAIN POINT Fig. 0N

Run DN 40-40	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve Butt-Weld End		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

* VENT POINT Fig. 1N

Run DN 40-40	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld End		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

* VENT POINT Fig. 1N

Run DN 50-600	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld End		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

Class No.: GN01	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 150 (Class 900)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-400	153.0	150.1	139.1	135.7	131.3	125.0	116.0	110.8	103.3

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES												
			BRANCH SIZE												
			15	20	25	40	50	80	100	150	200	250	300	350	400
15	80	400	C	C	C	C	E	E	E	E	E	E	E	E	A
20	80	350	C	C	C	C	E	E	E	E	E	E	E	A	
25	80	300	C	C	C	C	E	E	E	E	E	E	A		
40	80	250	C	C	C	C	E	E	E	E	E	A			
50	80	200	C	C	C	C	E	E	E	E	A				
80	80	150	C	C	C	C	E	E	E	A					
100	80	100	C	C	C	C	E	E	A						
150	120	80	C	C	C	C	E	A							
200	120	50	C	C	C	B	A								
250	120	40	C	B	B	A									
300	120	25	B	B	A										
350	120	20	B	A											
400	120	15	A												

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1.
- API 5L-B welded pipe is normally the most economic choice.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: GN01	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A106-B
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A106-B

* FLANGES

BLFL	Blind Flange	DN	15-400	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-400	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-400	ASTM	A516-60
WNFL	Welding Neck Flange	DN	15-400	ASTM	A105

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
TEEB	Equal Tee	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A105
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A105
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A105

* REDUCING FITTINGS

BROS	Branch Fitting	Socket-Weld. Outlet	DN	15-50	ASTM	A105
BROB	Branch Outlet Red.	Butt-Weld.	DN	80-400	ASTM	A105
RECB	Reducer Conc.	Butt-Weld. End	DN	20-400	ASTM	A234-WPB
REEB	Reducer Ecc.	Butt-Weld. End	DN	20-400	ASTM	A234-WPB
TERB	Tee Reducing	Butt-Weld. End	DN	20-400	ASTM	A234-WPB
TERS	Tee Reducing	Socket-Weld. End	DN	20-40	ASTM	A105

Note:

For full material description see relevant MESC buying description.

* VALVES

CHVB	Check Valve	Butt-Weld. Ends	DN	15-400	Body: ASTM A216-WCB/WCC, A105 Trim: AISI 316 (L) + Stellite 6
GAVB	Gate Valve	Butt-Weld. Ends	DN	15-400	Body: ASTM A216-WCB/WCC, A105 Trim: AISI 316 (L) + Stellite 6
GAVF	Gate Valve	Flanged	DN	15-50	Body: ASTM A216-WCB/WCC, A105 Trim: AISI 316 (L) + Stellite 6
GLVF	Globe Valve	Flanged	DN	15-50	Body: ASTM A216-WCB/WCC, A105 Trim: AISI 316 (L) + Stellite 6
GLVB	Globe Valve	Butt-Weld. Ends	DN	15-150	Body: ASTM A216-WCB/WCC, A105 Trim: AISI 316 (L) + Stellite 6

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-400	AISI 316, 316L, Graphite Filled CS Centring-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-400	ASTM A105
STBT	Stud Bolt with Nuts	—	Studs: ASTM A193-B7 Nuts: ASTM A194-2H	

Class No.: GN01	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE												
		15	20	25	40	50	80	100	150	200	250	300	350	400
* PIPE														
Pipe	74.30.21/31	*	*	*	*	*	*	*	*	*	*	*	*	*
Pipe Nipple 50 mm	76.30.57	*	*	*	*									
* FLANGES														
Blind Flange	76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.16	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.62.79	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS														
Cap	Butt-Weld. End 76.30.18	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End 76.30.38	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End 76.30.39/40	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End 76.30.84	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End 76.34.38	*	*	*	*									
Elbow 90 Deg.	Socket-Weld. End 76.34.39	*	*	*	*									
Equal Tee	Socket-Weld. End 76.34.84	*	*	*	*									
Coupling	Socket-Weld. End 76.34.28	*	*	*	*									
Cap	Socket-Weld. End 76.34.18	*	*	*	*									
* VALVES														
Check Valve Butt-Weld. End	75.56.16	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Butt-Weld. End	75.56.40	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged	75.37.36	*	*	*	*	*								
Globe Valve Butt-Weld. End	75.56.54	*	*	*	*	*	*	*	*					
Globe Valve Flanged	75.37.46	*	*	*	*	*								
* MISCELLANEOUS														
Gasket, Spiral Wound	85.41.37	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*	*	*	*	*

Class No.: GN01	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.85.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	TERS 76.34.85	Run	Br.	BROB 76.85.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	COMP. NAME	DESCRIPTION
20 × 15			*	*	*	*	400 × 50		*				BROS	Branch Fitting Outlet Socket-Weld.
25 × 15			*	*	*	*	400 × 80		*				BROB	Branch Outlet Red. Butt-Weld
25 × 20			*	*	*	*	400 × 100		*				RECB	Reducer Conc. Butt-Weld. End
40 × 15			*	*	*	*	400 × 150		*	*	*	*	REEB	Reducer Ecc. Butt-Weld. End
40 × 20			*	*	*	*	400 × 200		*	*	*	*	TERB	Tee Reducing Butt-Weld. End
40 × 25			*	*	*	*	400 × 250		*	*	*	*	TERS	Tee Reducing Socket-Weld. End
50 × 20			*	*	*	*	400 × 300		*	*	*	*		
50 × 25			*	*	*	*	400 × 350		*	*	*	*		
50 × 40			*	*	*	*								
80 × 40			*	*	*	*								
80 × 50		*	*	*	*	*							RUN	Br.
100 × 40			*	*	*	*								BROS
100 × 50		*	*	*	*	*								76.80.26
100 × 80		*	*	*	*	*							40-150	15
150 × 50		*	*	*	*	*							200-400	*
150 × 80		*	*	*	*	*								
150 × 100		*	*	*	*	*							50-80	20
200 × 50		*	*	*	*	*							100-400	*
200 × 80		*	*	*	*	*								
200 × 100		*	*	*	*	*							50	25
200 × 150		*	*	*	*	*							80-100	*
250 × 50		*	*	*	*	*							150-400	*
250 × 80		*	*	*	*	*								
250 × 100		*	*	*	*	*							80-100	40
250 × 150		*	*	*	*	*							150-300	*
250 × 200		*	*	*	*	*							350-400	*
300 × 50		*	*	*	*	*								
300 × 80		*	*	*	*	*								
300 × 100		*	*	*	*	*								
300 × 150		*	*	*	*	*								
300 × 200		*	*	*	*	*								
300 × 250		*	*	*	*	*								
350 × 50		*	*	*	*	*								
350 × 80		*	*	*	*	*								
350 × 100		*	*	*	*	*								
350 × 150		*	*	*	*	*								
350 × 200		*	*	*	*	*								
350 × 250		*	*	*	*	*								
350 × 300		*	*	*	*	*								

Class No.: GN01	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 110	*
20	4	3/4	× 110	*
25	4	7/8	× 130	*
40	4	1	× 140	*
50	8	7/8	× 150	*
80	8	7/8	× 150	*
100	8	1 1/8	× 170	*
150	12	1 1/8	× 190	*
200	12	1 3/8	× 220	*
250	16	1 3/8	× 240	*
300	20	1 3/8	× 250	*
350	20	1 1/2	× 275	*
400	20	1 5/8	× 290	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 120	*
20	4	3/4	× 130	*
25	4	7/8	× 140	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 170	*
100	8	1 1/8	× 195	*
150	12	1 1/8	× 230	*
200	12	1 3/8	× 265	*
250	16	1 3/8	× 290	*
300	20	1 3/8	× 310	*
350	20	1 1/2	× 345	*
400	20	1 5/8	× 360	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	7/8	× 150	*
20	4	7/8	× 150	*
25	4	7/8	× 150	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 160	*
100	8	1-1/8	× 180	*
150	12	1-1/8	× 210	*
200	12	1-3/8	× 240	*
250	16	1-3/8	× 250	*
300	20	1-3/8	× 275	*
350	20	1-1/2	× 300	*
400	20	1-5/8	× 305	*

*** DRAIN POINT Fig. 0N**

Run DN 15-25	Br DN 15	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve Butt-Weld. Ends		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1
* DRAIN POINT Fig. 0N		
Run DN 40-40	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve Butt-Weld. Ends		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

*** DRAIN POINT Fig. 0N**

Run DN 50-400	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve Butt-Weld. Ends		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

*** VENT POINT Fig. 1N**

Run DN 15-25	Br DN 15	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld. Ends		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

*** VENT POINT Fig. 1N**

Run DN 40-40	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld. Ends		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

*** VENT POINT Fig. 1N**

Run DN 50-400	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld. Ends		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

Class No.: GN04	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 150 (Class 900)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-400	153.0	150.1	139.1	135.7	131.3	125.0	116.0	110.8	103.3

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES												
			BRANCH SIZE												
			15	20	25	40	50	80	100	150	200	250	300	350	400
15	80	400	C	C	C	C	E	E	E	E	E	E	E	E	A
20	80	350	C	C	C	C	E	E	E	E	E	E	E	A	
25	80	300	C	C	C	C	E	E	E	E	E	E	A		
40	80	250	C	C	C	C	E	E	E	E	E	A			
50	80	200	C	C	C	C	E	E	E	E	A				
80	80	150	C	C	C	C	E	E	E	A					
100	80	100	C	C	C	C	E	E	A						
150	120	80	C	C	C	C	E	A							
200	120	50	C	C	C	B	A								
250	120	40	C	B	B	A									
300	120	25	B	B	A										
350	120	20	B	A											
400	120	15	A												

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: GN04	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A106-B
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A106-B

* FLANGES

BLFL	Blind Flange	DN	15-400	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-400	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-400	ASTM	A516-60
WNFL	Welding Neck Flange	DN	15-400	ASTM	A105

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
TEEB	Equal Tee	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A105
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A105
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A105

* REDUCING FITTINGS

BROS	Branch Outlet Socket-Weld. End	DN	15-50	ASTM	A105
BROB	Branch Outlet Red. Butt-Weld.	DN	80-400	ASTM	A105
RECB	Reducer Conc. Butt-Weld. End	DN	20-400	ASTM	A234-WPB
REEB	Reducer Ecc. Butt-Weld. End	DN	20-400	ASTM	A234-WPB
TERB	Tee Reducing Butt-Weld. End	DN	20-400	ASTM	A234-WPB
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A105

Note:

- For full material description see relevant buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVF	Check Valve Flanged	DN	15-400	Body: ASTM A216-WCB/WCC, A105	Trim: AISI 316L + Stellite 6
GAVF	Gate Valve Flanged	DN	15-400	Body: ASTM A216-WCB/WCC, A105	Trim: AISI 316L + Stellite 6
GLVF	Globe Valve Flanged	DN	15-150	Body: ASTM A216-WCB/WCC, A105	Trim: AISI 316L + Stellite 6

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-400	AISI 316, 316L, Graphite Filled CS Centring-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-400	ASTM A105
STBT	Stud Bolt with Nuts	—	Studs: ASTM A193-B7	Nuts: ASTM A194-2H

Class No.: GN04	Page: 3	Content: Piping Components
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ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
* PIPE															
Pipe	74.30.21/31	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pipe Nipple 50 mm	76.30.57	*	*	*	*										
* FLANGES															
Blind Flange	76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.16	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.62.79	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS															
Cap	Butt-Weld. End	76.30.19	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.30.38	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.30.39/40	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.30.84	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.34.38	*	*	*	*									
Elbow 90 Deg.	Socket-Weld. End	76.34.39	*	*	*	*									
Equal Tee	Socket-Weld. End	76.34.84	*	*	*	*									
Coupling	Socket-Weld. End	76.34.28	*	*	*	*									
Cap	Socket-Weld. End	76.34.18	*	*	*	*									
* VALVES															
Check Valve Flanged	75.10.05	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged	75.20.04	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged	75.30.05	*	*	*	*	*	*	*	*						
* MISCELLANEOUS															
Gasket, Spiral Wound	85.41.37	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*	*	*	*	*	*

Class No.: GN04	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	TERS 76.34.85	Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	COMP. NAME	DESCRIPTION
20 × 15			*	*	*	*	400 × 50		*				BROS	Branch Fitting Socket-Weld. Outlet
25 × 15			*	*	*	*	400 × 80		*				BROB	Branch Outlet Red. Butt-Weld
25 × 20			*	*	*	*	400 × 100		*				RECB	Reducer Conc. Butt-Weld. End
40 × 15			*	*	*	*	400 × 150		*	*	*	*	REEB	Reducer Ecc. Butt-Weld. End
40 × 20			*	*	*	*	400 × 200		*	*	*	*	TERB	Tee Reducing Butt-Weld. End
40 × 25			*	*	*	*	400 × 250		*	*	*	*	TERS	Tee Reducing Socket-Weld. End
50 × 20			*	*	*	*	400 × 300		*	*	*	*		
50 × 25			*	*	*	*	400 × 350		*	*	*	*		
50 × 40			*	*	*	*								
80 × 40			*	*	*	*								
80 × 50		*	*	*	*	*							RUN	Br.
100 × 40			*	*	*	*								BROS
100 × 50		*	*	*	*	*								76.80.26
100 × 80		*	*	*	*	*							40-150	15
150 × 50		*	*	*	*	*							200-400	*
150 × 80		*	*	*	*	*							50-80	20
150 × 100		*	*	*	*	*							100-400	*
200 × 50		*	*	*	*	*							50	25
200 × 80		*	*	*	*	*							80-100	*
200 × 100		*	*	*	*	*							150-400	*
200 × 150		*	*	*	*	*							80-100	40
250 × 50		*	*	*	*	*							150-300	*
250 × 80		*	*	*	*	*							350-400	*
250 × 100		*	*	*	*	*								
250 × 150		*	*	*	*	*								
250 × 200		*	*	*	*	*								
300 × 50		*	*	*	*	*								
300 × 80		*	*	*	*	*								
300 × 100		*	*	*	*	*								
300 × 150		*	*	*	*	*								
300 × 200		*	*	*	*	*								
300 × 250		*	*	*	*	*								
350 × 50		*	*	*	*	*								
350 × 80		*	*	*	*	*								
350 × 100		*	*	*	*	*								
350 × 150		*	*	*	*	*								
350 × 200		*	*	*	*	*								
350 × 250		*	*	*	*	*								
350 × 300		*	*	*	*	*								

Class No.: GN04	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 110	*
20	4	3/4	× 110	*
25	4	7/8	× 130	*
40	4	1	× 140	*
50	8	7/8	× 150	*
80	8	7/8	× 150	*
100	8	1 1/8	× 170	*
150	12	1 1/8	× 190	*
200	12	1 3/8	× 220	*
250	16	1 3/8	× 240	*
300	20	1 3/8	× 250	*
350	20	1 1/2	× 275	*
400	20	1 5/8	× 290	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 120	*
20	4	3/4	× 130	*
25	4	7/8	× 140	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 170	*
100	8	1 1/8	× 195	*
150	12	1 1/8	× 230	*
200	12	1 3/8	× 265	*
250	16	1 3/8	× 290	*
300	20	1 3/8	× 310	*
350	20	1 1/2	× 345	*
400	20	1 5/8	× 360	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	7/8	× 150	*
20	4	7/8	× 150	*
25	4	7/8	× 150	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 160	*
100	8	1 1/8	× 180	*
150	12	1 1/8	× 210	*
200	12	1 3/8	× 240	*
250	16	1 3/8	× 250	*
300	20	1 3/8	× 275	*
350	20	1 1/2	× 300	*
400	20	1 5/8	× 305	*

*** DRAIN POINT Fig. 0I**

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

*** DRAIN POINT Fig. 0J**

Run	DN 50-400	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

*** VENT POINT Fig. 1I**

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

*** VENT POINT Fig. 1J**

Run	DN 50-400	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

Class No.: GN07	Page: 1	Content: General
Base Material: Carbon Steel, Fine Gr. Low Temp.	First Issue:	Revision:
Rating: PN 150 (Class 900)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		-50	0	50	100	150	200	250	300	340
Pressure Barg.	DN 15-300	143.7	143.7	142.0	135.3	131.9	127.9	121.6	113.1	108.4

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES											
			BRANCH SIZE											
			15	20	25	40	50	80	100	150	200	250	300	
15	80	300	C	C	C	C	E	E	E	E	E	E	A	
20	80	250	C	C	C	C	E	E	E	E	E	A		
25	80	200	C	C	C	C	E	E	E	E	A			
40	80	150	C	C	C	C	E	E	E	A				
50	80	100	C	C	C	C	E	E	A					
80	80	80	C	C	C	C	E	A						
100	80	50	C	C	C	C	A							
150	80	40	C	C	C	A								
200	80	25	B	B	A									
250	80	20	B	A										
300	100	15	A											
350	100													
400	100													

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.3.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: GN07	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-300	ASTM	A333-6 (Seamless)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A333-6 (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-300	ASTM	A350-LF2
SBFL	Spectacle Blind Flange	DN	15-300	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-300	ASTM	A516-60
WNFL	Welding Neck Flange	DN	15-300	ASTM	A350-LF2

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-300	ASTM	A420-WPL6
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-300	ASTM	A420-WPL6
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-300	ASTM	A420-WPL6
TEEB	Equal Tee	Butt-Weld. End	DN	15-300	ASTM	A420-WPL6
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A105
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A105
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A105

* REDUCING FITTINGS

BROS	Branch Fitting	Socket-Weld. Outlet	DN	15-50	ASTM	A350-LF2
BROB	Branch Outlet	Red. Butt-Weld.	DN	80-300	ASTM	A350-LF2
RECB	Reducer	Conc. Butt-Weld. End	DN	20-300	ASTM	A420-WPL6
REEB	Reducer	Ecc. Butt-Weld. End	DN	20-300	ASTM	A420-WPL6
TERB	Tee	Reducing Butt-Weld. End	DN	20-300	ASTM	A420-WPL6
TERS	Tee	Reducing Socket-Weld. End	DN	20-40	ASTM	A105

Note:

For full material description see relevant MESC buying description.

* VALVES

CHVF	Check Valve	Flanged	DN	15-300	Body: ASTM A352, A350	Trim: AISI 316, 316L
GAVF	Gate Valve	Flanged	DN	15-300	Body: ASTM A352, A350	Trim: AISI 316, 316L
GLVF	Globe Valve	Flanged	DN	15-150	Body: ASTM A352, A350	Trim: AISI 316, 316L

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-300	AISI	316, 316L, Graphite Filled CS Centring-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-300	ASTM	A350-LF2
STBT	Stud Bolt with Nuts	—		Studs: ASTM A320-L7	Nuts: ASTM A194-4

Class No.: GN07	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE										
		15	20	25	40	50	80	100	150	200	250	300
* PIPE												
Pipe	74.30.10	*	*	*	*	*	*	*	*	*	*	*
* FLANGES												
Blind Flange	76.62.12	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.00	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.62.82	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS												
Cap	Butt-Weld. End	76.31.18	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.31.38	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.31.39	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.31.84	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.34.38	*	*	*	*						
Elbow 90 Deg.	Socket-Weld. End	76.34.39	*	*	*	*						
Equal Tee	Socket-Weld. End	76.34.84	*	*	*	*						
Coupling	Socket-Weld. End	76.34.28	*	*	*	*						
Cap	Socket-Weld. End	76.34.18	*	*	*	*						
* VALVES												
Check Valve Flanged	75.42.16	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged	75.42.36	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged	75.42.46	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS												
Gasket, Spiral Wound	85.41.37	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*	*	*

Class No.: GN07	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB	RECB 76.31.70	REEB 76.31.71	TERB 76.31.85	TERS 76.34.85
20 × 15			*	*	*	*
25 × 15			*	*	*	*
25 × 20			*	*	*	*
40 × 15				*	*	*
40 × 20			*	*	*	*
40 × 25			*	*	*	*
50 × 20		*			*	*
50 × 25			*	*	*	*
50 × 40			*	*	*	*
80 × 40			*	*	*	*
80 × 50		*	*	*	*	*
100 × 40					*	*
100 × 50		*	*	*	*	*
100 × 80		*	*	*	*	*
150 × 50		*			*	*
150 × 80		*	*	*	*	*
150 × 100		*	*	*	*	*
200 × 50		*			*	*
200 × 80		*			*	*
200 × 100		*	*	*	*	*
200 × 150		*	*	*	*	*
250 × 50		*			*	*
250 × 80		*			*	*
250 × 100		*			*	*
250 × 150		*	*	*	*	*
250 × 200		*	*	*	*	*
300 × 50		*			*	*
300 × 80		*			*	*
300 × 100		*			*	*
300 × 150		*			*	*
300 × 200		*	*	*	*	*
300 × 250		*	*	*	*	*

COMP. NAME	DESCRIPTION
BROS	Branch Fitting Outlet Socket-Weld
BROB	Branch Outlet Red. Butt-Weld
RECB	Reducer Conc. Butt-Weld. End
REEB	Reducer Ecc. Butt-Weld. End
TERB	Tee Reducing Butt-Weld. End
TERS	Tee Reducing Socket-Weld. End

RUN	Br.	BROS 76.80.26
40-150	15	*
200-300		*
50-80	20	*
100-300		*
50	25	*
80-100		*
150-300		*
80-100	40	*
150-300		*

Class No.: GN07	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.63
15	4	3/4	× 110	*
20	4	3/4	× 110	*
25	4	7/8	× 125	*
40	4	1	× 140	*
50	8	7/8	× 145	*
80	8	7/8	× 145	*
100	8	1 1/8	× 170	*
150	12	1 1/8	× 190	*
200	12	1 3/8	× 220	*
250	16	1 3/8	× 235	*
300	20	1 3/8	× 250	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.63
15	4	3/4	× 115	*
20	4	3/4	× 125	*
25	4	7/8	× 140	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 165	*
100	8	1 1/8	× 195	*
150	12	1 1/8	× 230	*
200	12	1 3/8	× 265	*
250	16	1 3/8	× 285	*
300	20	1 3/8	× 310	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.63
15	4	7/8	× 150	*
20	4	7/8	× 150	*
25	4	7/8	× 150	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 160	*
100	8	1-1/8	× 180	*
150	12	1-1/8	× 210	*
200	12	1-3/8	× 240	*
250	16	1-3/8	× 250	*
300	20	1-3/8	× 275	*

* DRAIN POINT Fig. 0J

Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* DRAIN POINT Fig. 0J

Run	DN 40-40	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* DRAIN POINT Fig. 0J

Run	DN 50-300	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT Fig. 1J

Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT Fig. 1J

Run	DN 40-40	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT Fig. 1J

Run	DN 50-300	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

Class No.: GN10	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 150 (Class 900)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-400	153.0	150.1	139.1	135.7	131.3	125.0	116.0	110.8	103.3

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES												
			BRANCH SIZE												
			15	20	25	40	50	80	100	150	200	250	300	350	400
15	80	400	C	C	C	C	E	E	E	E	E	E	E	E	A
20	80	350	C	C	C	C	E	E	E	E	E	E	E	A	
25	80	300	C	C	C	C	E	E	E	E	E	E	A		
40	80	250	C	C	C	C	E	E	E	E	E	A			
50	80	200	C	C	C	C	E	E	E	E	A				
80	80	150	C	C	C	C	E	E	E	A					
100	80	100	C	C	C	C	E	E	A						
150	120	80	C	C	C	C	E	A							
200	120	50	C	C	C	B	A								
250	120	40	C	B	B	A									
300	120	25	B	B	A										
350	120	20	B	A											
400	120	15	A												

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1.
- API 5L-B welded pipe is normally the most economic choice.
- Application of other types of branch connections is subject to company approval.
- Piston type check valves for horizontal mounting only.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: GN10	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A106-B
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A106-B

* FLANGES

BLFL	Blind Flange	DN	15-400	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-400	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-400	ASTM	A516-60
WNFL	Welding Neck Flange	DN	15-400	ASTM	A105

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
TEEB	Equal Tee	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A105
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A105
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A105

* REDUCING FITTINGS

BROS	Branch Fitting	Socket-Weld. Outlet	DN	15-50	ASTM	A105
BROB	Branch Outlet Red.	Butt-Weld.	DN	15-400	ASTM	A105
RECB	Reducer Conc.	Butt-Weld. End	DN	20-400	ASTM	A234-WPB
REEB	Reducer Ecc.	Butt-Weld. End	DN	20-400	ASTM	A234-WPB
TERB	Tee Reducing	Butt-Weld. End	DN	20-400	ASTM	A234-WPB
TERS	Tee Reducing	Socket-Weld. End	DN	20-40	ASTM	A105

Note:

For full material description see relevant MESC buying description.

* VALVES

CHVF	Check Valve Flanged	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6
		DN	50-400	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GAVF	Gate Valve Flanged	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6
		DN	50-400	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GLVF	Globe Valve Flanged	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6
		DN	50-150	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-400	AISI	316, 316L, Graphite Filled
					CS Centring-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-400	ASTM	A105
STBT	Stud Bolt with Nuts	—		Studs:	ASTM A193-B7
				Nuts:	ASTM A194-2H

Class No.: GN10	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE												
		15	20	25	40	50	80	100	150	200	250	300	350	400
* PIPE														
Pipe	74.30.21/31	*	*	*	*	*	*	*	*	*	*	*	*	*
Pipe Nipple 50 mm	76.30.57	*	*	*	*									
* FLANGES														
Blind Flange	76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.16	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.62.79	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS														
Cap	Butt-Weld. End 76.30.18	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End 76.30.38	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End 76.30.39/40	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End 76.30.84	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End 76.34.38	*	*	*	*									
Elbow 90 Deg.	Socket-Weld. End 76.34.39	*	*	*	*									
Equal Tee	Socket-Weld. End 76.34.84	*	*	*	*									
Coupling	Socket-Weld. End 76.34.28	*	*	*	*									
Cap	Socket-Weld. End 76.34.18	*	*	*	*									
* VALVES														
Check Valve Flanged	75.37.16	*	*	*	*		*	*	*					
Gate Valve Flanged	75.37.36	*	*	*	*		*	*	*					
Globe Valve Flanged	75.37.46	*	*	*	*		*	*	*	*	*	*	*	*
* MISCELLANEOUS														
Gasket, Spiral Wound	85.41.37	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*	*	*	*	*

Class No.: GN10	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	TERS 76.34.85	Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	COMP. NAME	DESCRIPTION	
20 × 15			*	*	*	*	400 × 50		*				BROS	Branch Fitting Socket-Weld. Outlet	
25 × 15			*	*	*	*	400 × 80		*				BROB	Branch Outlet Red. Butt-Weld	
25 × 20			*	*	*	*	400 × 100		*				RECB	Reducer Conc. Butt-Weld. End	
40 × 15			*	*	*	*	400 × 150		*	*	*	*	REEB	Reducer Ecc. Butt-Weld. End	
40 × 20			*	*	*	*	400 × 200		*	*	*	*	TERB	Tee Reducing Butt-Weld. End	
40 × 25			*	*	*	*	400 × 250		*	*	*	*	TERS	Tee Reducing Socket-Weld. End	
50 × 20			*	*	*	*	400 × 300		*	*	*	*			
50 × 25			*	*	*	*	400 × 350		*	*	*	*			
50 × 40			*	*	*	*									
80 × 40			*	*	*	*									
80 × 50		*	*	*	*	*							RUN	Br.	BROS 76.80.26
100 × 40			*	*	*	*									
100 × 50		*	*	*	*	*							40-150	15	*
100 × 80		*	*	*	*	*							200-400		*
150 × 50		*	*	*	*	*									
150 × 80		*	*	*	*	*							50-80	20	*
150 × 100		*	*	*	*	*							100-400		*
200 × 50		*	*	*	*	*									
200 × 80		*	*	*	*	*							50	25	*
200 × 100		*	*	*	*	*							80-100		*
200 × 150		*	*	*	*	*							150-400		*
250 × 50		*	*	*	*	*									
250 × 80		*	*	*	*	*							80-100	40	*
250 × 100		*	*	*	*	*							150-300		*
250 × 150		*	*	*	*	*							350-400		*
250 × 200		*	*	*	*	*									
300 × 50		*	*	*	*	*									
300 × 80		*	*	*	*	*									
300 × 100		*	*	*	*	*									
300 × 150		*	*	*	*	*									
300 × 200		*	*	*	*	*									
300 × 250		*	*	*	*	*									
350 × 50		*	*	*	*	*									
350 × 80		*	*	*	*	*									
350 × 100		*	*	*	*	*									
350 × 150		*	*	*	*	*									
350 × 200		*	*	*	*	*									
350 × 250		*	*	*	*	*									
350 × 300		*	*	*	*	*									

Class No.: GN10	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 110	*
20	4	3/4	× 110	*
25	4	7/8	× 130	*
40	4	1	× 140	*
50	8	7/8	× 150	*
80	8	7/8	× 150	*
100	8	1 1/8	× 170	*
150	12	1 1/8	× 190	*
200	12	1 3/8	× 220	*
250	16	1 3/8	× 240	*
300	20	1 3/8	× 250	*
350	20	1 1/2	× 275	*
400	20	1 5/8	× 290	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 120	*
20	4	3/4	× 130	*
25	4	7/8	× 140	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 170	*
100	8	1 1/8	× 195	*
150	12	1 1/8	× 230	*
200	12	1 3/8	× 265	*
250	16	1 3/8	× 290	*
300	20	1 3/8	× 310	*
350	20	1 1/2	× 345	*
400	20	1 5/8	× 360	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	7/8	× 150	*
20	4	7/8	× 150	*
25	4	7/8	× 150	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 160	*
100	8	1 1/8	× 180	*
150	12	1 1/8	× 210	*
200	12	1 3/8	× 240	*
250	16	1 3/8	× 250	*
300	20	1 3/8	× 275	*
350	20	1 1/2	× 300	*
400	20	1 5/8	× 305	*

* DRAIN POINT Fig. 0I

Run DN 15-25 Br DN 15

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	2
Gate Valve Flanged	1
Stud Bolt with Nuts	8
Welding Neck Flange	1

* DRAIN POINT Fig. 0I

Run DN 40-40 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	2
Gate Valve Flanged	1
Stud Bolt with Nuts	8
Welding Neck Flange	1

* DRAIN POINT Fig. 0J

Run DN 50-400 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	2
Gate Valve Flanged	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	8
Welding Neck Flange	1

* VENT POINT Fig. 1I

Run DN 15-25 Br DN 15

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	2
Globe Valve Flanged	1
Stud Bolt with Nuts	8
Welding Neck Flange	1

* VENT POINT Fig. 1I

Run DN 40-40 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	2
Globe Valve Flanged	1
Stud Bolt with Nuts	8
Welding Neck Flange	1

* VENT POINT Fig. 1J

Run DN 50-400 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	2
Globe Valve Flanged	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	8
Welding Neck Flange	1

Class No.: GN14	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 150 (Class 900)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-400	153.0	150.1	139.1	135.7	131.3	125.0	116.0	110.8	103.3

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES												
			BRANCH SIZE												
			15	20	25	40	50	80	100	150	200	250	300	350	400
15	80	400	C	C	C	C	E	E	E	E	E	E	E	E	A
20	80	350	C	C	C	C	E	E	E	E	E	E	E	A	
25	80	300	C	C	C	C	E	E	E	E	E	E	A		
40	80	250	C	C	C	C	E	E	E	E	E	A			
50	80	200	C	C	C	C	E	E	E	E	A				
80	80	150	C	C	C	C	E	E	E	A					
100	80	100	C	C	C	C	E	E	A						
150	120	80	C	C	C	C	E	A							
200	120	50	C	C	C	B	A								
250	120	40	C	B	B	A									
300	120	25	B	B	A										
350	120	20	B	A											
400	120	15	A												

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: GN14	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A106-B
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A106-B

* FLANGES

BLFL	Blind Flange	DN	15-400	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-400	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-400	ASTM	A516-60
WNFL	Welding Neck Flange	DN	15-400	ASTM	A105

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
TEEB	Equal Tee	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A105
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A105
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A105

* REDUCING FITTINGS

BROS	Branch Fitting	Socket-Weld. Outlet	DN	15-50	ASTM	A105
BROB	Branch Outlet Red.	Butt-Weld.	DN	80-400	ASTM	A105
RECB	Reducer Conc.	Butt-Weld. End	DN	20-400	ASTM	A234-WPB
REEB	Reducer Ecc.	Butt-Weld. End	DN	20-400	ASTM	A234-WPB
TERB	Tee Reducing	Butt-Weld. End	DN	20-400	ASTM	A234-WPB
TERS	Tee Reducing	Socket-Weld. End	DN	20-40	ASTM	A105

Note:

For full material description see relevant MESG buying description.

* VALVES

CHVB	Check Valve	Butt-Weld. End	DN	15-400	Body: ASTM A216-WCB/WCC, A105 Trim: AISI 316 (L) + Stellite 6
GAVB	Gate Valve	Butt-Weld. End	DN	15-400	Body: ASTM A216-WCB/WCC, A105 Trim: AISI 316 (L) + Stellite 6
GAVF	Gate Valve	Flanged	DN	15-50	Body: ASTM A216-WCB/WCC, A105 Trim: AISI 316 (L) + Stellite 6
GLVB	Globe Valve	Butt-Weld. End	DN	15-150	Body: ASTM A216-WCB/WCC, A105 Trim: AISI 316 (L) + Stellite 6

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-400	AISI	316, 316L, Graphite Filled CS Centring-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-400	ASTM	A105
STBT	Stud Bolt with Nuts	—	—	Studs: ASTM A193-B7 Nuts: ASTM A194-2H	

Class No.: GN14	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE												
		15	20	25	40	50	80	100	150	200	250	300	350	400
* PIPE														
Pipe	74.30.21/31	*	*	*	*	*	*	*	*	*	*	*	*	*
Pipe Nipple 50 mm	76.30.57	*	*	*	*									
* FLANGES														
Blind Flange	76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.16	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.62.79	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS														
Cap	Butt-Weld. End	76.30.18	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.30.38	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.30.39/40	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.30.84	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.34.38	*	*	*	*								
Elbow 90 Deg.	Socket-Weld. End	76.34.39	*	*	*	*								
Equal Tee	Socket-Weld. End	76.34.84	*	*	*	*								
Coupling	Socket-Weld. End	76.34.28	*	*	*	*								
Cap	Socket-Weld. End	76.34.18	*	*	*	*								
* VALVES														
Check Valve	Butt-Weld. End	75.56.16	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve	Butt-Weld. End	75.56.36	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve	Butt-Weld. End	75.56.46	*	*	*	*	*	*	*					
Gate Valve	Flanged	75.20.04	*	*	*	*	*							
* MISCELLANEOUS														
Gasket, Spiral Wound		85.41.37	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.88.52				*	*	*	*	*	*	*	*	*

Class No.: GN14	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	TERS 76.34.85	Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	COMP. NAME	DESCRIPTION	
20 × 15			*	*	*	*	400 × 50		*				BROS	Branch Fitting Socket-Weld. Outlet	
25 × 15			*	*	*	*	400 × 80		*				BROB	Branch Outlet Red. Butt-Weld	
25 × 20			*	*	*	*	400 × 100		*				RECB	Reducer Conc. Butt-Weld. End	
40 × 15				*	*	*	400 × 150		*	*	*	*	REEB	Reducer Ecc. Butt-Weld. End	
40 × 20			*	*	*	*	400 × 200		*	*	*	*	TERB	Tee Reducing Butt-Weld. End	
40 × 25			*	*	*	*	400 × 250		*	*	*	*	TERS	Tee Reducing Socket-Weld. End	
50 × 20				*	*	*	400 × 300		*	*	*	*			
50 × 25			*	*	*	*	400 × 350		*	*	*	*			
50 × 40			*	*	*	*									
80 × 40			*	*	*	*									
80 × 50		*	*	*	*	*							RUN	Br.	BROS 76.80.26
100 × 40		*	*	*	*	*									
100 × 50		*	*	*	*	*							40-150	15	*
100 × 80		*	*	*	*	*							200-400		*
150 × 50		*													
150 × 80		*	*	*									50-80	20	*
150 × 100		*	*	*	*								100-400		*
200 × 50		*													
200 × 80		*											50	25	*
200 × 100		*	*	*									80-100		*
200 × 150		*	*	*	*								150-400		*
250 × 50		*													
250 × 80		*											80-100	40	*
250 × 100		*	*	*									150-300		*
250 × 150		*	*	*	*								350-400		*
250 × 200		*	*	*	*										
300 × 50		*													
300 × 80		*													
300 × 100		*													
300 × 150		*	*	*	*										
300 × 200		*	*	*	*										
300 × 250		*	*	*	*										
350 × 50		*													
350 × 80		*													
350 × 100		*													
350 × 150		*	*	*	*										
350 × 200		*	*	*	*										
350 × 250		*	*	*	*										
350 × 300		*	*	*	*										

Class No.: GN14	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 110	*
20	4	3/4	× 110	*
25	4	7/8	× 130	*
40	4	1	× 140	*
50	8	7/8	× 150	*
80	8	7/8	× 150	*
100	8	1 1/8	× 170	*
150	12	1 1/8	× 190	*
200	12	1 3/8	× 220	*
250	16	1 3/8	× 240	*
300	20	1 3/8	× 250	*
350	20	1 1/2	× 275	*
400	20	1 5/8	× 290	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 120	*
20	4	3/4	× 130	*
25	4	7/8	× 140	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 170	*
100	8	1 1/8	× 195	*
150	12	1 1/8	× 230	*
200	12	1 3/8	× 265	*
250	16	1 3/8	× 290	*
300	20	1 3/8	× 310	*
350	20	1 1/2	× 345	*
400	20	1 5/8	× 360	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	7/8	× 150	*
20	4	7/8	× 150	*
25	4	7/8	× 150	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 160	*
100	8	1 1/8	× 180	*
150	12	1 1/8	× 210	*
200	12	1 3/8	× 240	*
250	16	1 3/8	× 250	*
300	20	1 3/8	× 275	*
350	20	1 1/2	× 300	*
400	20	1 5/8	× 305	*

*** VENT POINT Fig. 1M**

Run	DN 15-25	Br	DN 15
Run	DN 40	Br	DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Globe Valve Butt-Weld End	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

*** VENT POINT Fig. 1N**

Run	DN 50-400	Br	DN 20
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Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Globe Valve Butt-Weld End	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

*** DRAIN POINT Fig. 0M**

Run	DN 15-25	Br	DN 15
Run	DN 40	Br	DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Gate Valve Butt-Weld End	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

*** DRAIN POINT Fig. 0N**

Run	DN 50-400	Br	DN 20
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Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Gate Valve Butt-Weld End	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

Class No.: GP02	Page: 1	Content: General
Base Material: Alloy Steel (1.25 Cr. - 0.5 Mo)	First Issue:	Revision:
Rating: PN 150 (Class 900)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400	450
Pressure Barg.	DN 15-400	155.1	153.3	146.2	139.2	136.4	133.3	127.2	120.7	109.7	101.3

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE													
			15	20	25	40	50	80	100	150	200	250	300	350	400	
15	80	400	C	C	C	C	E	E	E	E	E	E	E	E	E	A
20	80	350	C	C	C	C	E	E	E	E	E	E	E	E	A	
25	80	300	C	C	C	C	E	E	E	E	E	E	E	A		
40	80	250	C	C	C	C	E	E	E	E	E	E	A			
50	80	200	C	C	C	C	E	E	E	E	E	A				
80	80	150	C	C	C	C	E	E	E	A						
100	80	100	C	C	C	C	E	E	A							
150	120	80	C	C	C	C	E	A								
200	120	50	C	C	C	C	E	A								
250	120	40	C	C	C	A										
300	120	25	B	B	A											
350	120	20	B	A												
400	120	15	A													

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.9.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: GP02	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A335-P11 (Seamless)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A335-P11 (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-400	ASTM	A182-F11
SBFL	Spectacle Blind Flange	DN	15-400	ASTM	A387-11 CL.2
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-400	ASTM	A387-11 CL.2
WNFL	Welding Neck Flange	DN	15-400	ASTM	A182-F11

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-400	ASTM	A234-WP11
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WP11
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WP11
TEEB	Equal Tee	Butt-Weld. End	DN	15-400	ASTM	A234-WP11
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F11
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F11
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A182-F11
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A182-F11
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A182-F11

* REDUCING FITTINGS

BROS	Branch Fitting	Socket-Weld. Outlet	DN	15-50	ASTM	A182-F11
BROB	Branch Outlet Red.	Butt-Weld.	DN	80-400	ASTM	A182-F11
RECB	Reducer Conc.	Butt-Weld. End	DN	20-400	ASTM	A234-WP11
REEB	Reducer Ecc.	Butt-Weld. End	DN	20-400	ASTM	A234-WP11
TERB	Tee Reducing	Butt-Weld. End	DN	20-25	ASTM	A234-WP11
TERS	Tee Reducing	Socket-Weld. End	DN	20-40	ASTM	A182-F11

Note:

For full material description see relevant MESC buying description.

* VALVES

CHVF	Check Valve	Butt-Weld. End	DN	15-300	Body: ASTM A217-WC6, A182-F11 Trim: AISI 316 (L) + Stellite 6
GAVB	Gate Valve	Butt-Weld. End	DN	15-400	Body: ASTM A217-WC6, A182-F11 Trim: AISI 316 (L) + Stellite 6
GLVF	Globe Valve	Butt-Weld. End	DN	15-150	Body: ASTM A217-WC6, A182-F11 Trim: AISI 316 (L) + Stellite 6
GAVF	Gate Valve	Flanged	DN	15-50	Body: ASTM A217-WC6, A182-F11 Trim: AISI 316 (L) + Stellite 6

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-400	AISI 304, Graphited Filled, CS Centring-, AISI 304 Inner-Ring
ORFS	Orifice Flange Set	DN	50-400	ASTM A182-F11
STBT	Stud Bolt with Nuts	—		Studs: ASTM A193-B16 Nuts: ASTM A194-4

Class No.: GP02	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
* PIPE															
Pipe	74.33.11	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FLANGES															
Blind Flange	76.64.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)		*	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.64.80	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS															
Cap	Butt-Weld. End	76.32.18	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.32.38	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.32.39	*	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.32.84	*	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.36.38	*	*	*	*									
Elbow 90 Deg.	Socket-Weld. End	76.36.39	*	*	*	*									
Equal Tee	Socket-Weld. End	76.36.80	*	*	*	*									
Coupling	Socket-Weld. End	76.36.28	*	*	*	*									
Cap	Socket-Weld. End	76.36.18	*	*	*	*									
* VALVES															
Check Valve	Butt-Weld. End	75.59.10	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve	Butt-Weld. End	75.59.30	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve	Butt-Weld. End	75.59.40	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve	Flanged	75.41.33	*	*	*	*	*								
* MISCELLANEOUS															
Gasket, Spiral Wound		85.41.31	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.88.52					*	*	*	*	*	*	*	*	*

Class No.: GP02	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB	RECB 76.32.70	REEB 76.32.71	TERB 76.32.85	TERS 76.36.85	Run	Br.	BROB	RECB 76.32.70	REEB 76.32.71	COMP. NAME	DESCRIPTION
20	× 15		*	*	*	*	400	× 50	*			BROS	Branch Fitting Socket-Weld. Outlet
25	× 15		*	*	*	*	400	× 80	*			BROB	Branch Outlet Red. Butt-Weld
25	× 20		*	*	*	*	400	× 150	*			RECB	Reducer Conc. Butt-Weld. End
40	× 20		*	*		*	400	× 200	*	*	*	REEB	Reducer Ecc. Butt-Weld. End
40	× 25		*	*		*	400	× 250	*	*	*	TERB	Tee Reducing Butt-Weld. End
50	× 25		*	*			400	× 300	*	*	*	TERS	Tee Reducing Socket-Weld. End
50	× 40		*				400	× 350	*	*	*		
80	× 40			*	*								
80	× 50	*	*	*									
100	× 50	*	*	*									
100	× 80	*	*	*									
150	× 50	*											
150	× 80	*	*	*									
150	× 100	*	*	*									
200	× 50		*										
200	× 80	*											
200	× 100	*	*	*									
200	× 150	*	*	*									
250	× 50	*											
250	× 80	*											
250	× 100	*											
250	× 150	*	*	*									
250	× 200	*	*	*									
300	× 50	*											
300	× 80	*											
300	× 150	*	*	*									
300	× 200	*	*	*									
300	× 250	*	*	*									
350	× 50	*											
350	× 80	*											
350	× 150	*											
350	× 200	*	*	*									
350	× 250	*	*	*									
350	× 300	*	*	*									

Run	Br.	BROS 76.80.26	COMP. NAME	DESCRIPTION
40-150	15	*		
200-400		*		
50-80	20	*		
100-400		*		
50	25	*		
80-100		*		
150-400		*		
80-100	40	*		
150-300		*		
350-400		*		

Class No.: GP02	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.96
15	4	3/4	× 110	*
20	4	3/4	× 110	*
25	4	7/8	× 125	*
40	4	1	× 140	*
50	8	7/8	× 145	*
80	8	7/8	× 145	*
100	8	1 1/8	× 170	*
150	12	1 1/8	× 190	*
200	12	1 3/8	× 220	*
250	16	1 3/8	× 235	*
300	20	1 3/8	× 250	*
350	20	1 1/2	× 275	*
400	20	1 5/8	× 285	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.96
15	4	3/4	× 115	*
20	4	3/4	× 125	*
25	4	7/8	× 140	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 165	*
100	8	1 1/8	× 195	*
150	12	1 1/8	× 230	*
200	12	1 3/8	× 265	*
250	16	1 3/8	× 285	*
300	20	1 3/8	× 310	*
350	20	1 1/2	× 345	*
400	20	1 5/8	× 355	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.96
15	4	7/8	× 150	*
20	4	7/8	× 150	*
25	4	7/8	× 150	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 160	*
100	8	1 1/8	× 180	*
150	12	1 1/8	× 210	*
200	12	1 3/8	× 240	*
250	16	1 3/8	× 250	*
300	20	1 3/8	× 275	*
350	20	1 1/2	× 300	*
400	20	1 5/8	× 305	*

* DRAIN POINT Fig. 0N

Run DN 15-25 Br DN 15

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Gate Valve Butt-Weld. End	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

* DRAIN POINT Fig. 0N

Run DN 40-40 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Gate Valve Butt-Weld. End	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

* DRAIN POINT Fig. 0N

Run DN 50-400 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Gate Valve Butt-Weld. End	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

* VENT POINT Fig. 1N

Run DN 15-25 Br DN 15

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Globe Valve Butt-Weld. End	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

* VENT POINT Fig. 1N

Run DN 40-40 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Globe Valve Butt-Weld. End	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

* VENT POINT Fig. 1N

Run DN 50-400 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Globe Valve Butt-Weld. End	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

Class No.: GP06	Page: 1	Content: General
Base Material: Alloy Steel (1.25 Cr. - 0.5 Mo)	First Issue:	Revision:
Rating: PN 150 (Class 900)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400	450	500
Pressure Barg.	DN 15-400	155.1	153.3	146.2	139.2	136.4	133.3	127.2	120.7	109.7	101.3	83.3

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES												
			BRANCH SIZE												
			15	20	25	40	50	80	100	150	200	250	300	350	400
15	80	400	C	C	C	C	E	E	E	E	E	E	E	E	A
20	80	350	C	C	C	C	E	E	E	E	E	E	E	E	A
25	80	300	C	C	C	C	E	E	E	E	E	E	E	A	
40	80	250	C	C	C	C	E	E	E	E	E	A			
50	80	200	C	C	C	C	E	E	E	E	A				
80	80	150	C	C	C	C	E	E	E	A					
100	80	100	C	C	C	C	E	E	A						
150	120	80	C	C	C	C	E	A							
200	120	50	C	C	C	B	A								
250	120	40	C	B	B	A									
300	120	25	B	B	A										
350	120	20	B	A											
400	120	15	A												

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.9.
- Application of other types of branch connections is subject to company approval.
- Piston type check valves for horizontal mounting only.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: GP06	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A335-P11 (Seamless)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A335-P11 (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-400	ASTM	A182-F11
SBFL	Spectacle Blind Flange	DN	15-400	ASTM	A387-11 CL.2
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-400	ASTM	A387-11 CL.2
WNFL	Welding Neck Flange	DN	15-400	ASTM	A182-F11

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-400	ASTM	A234-WP11
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WP11
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WP11
TEEB	Equal Tee	Butt-Weld. End	DN	15-400	ASTM	A234-WP11
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F11
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F11
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A182-F11
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A182-F11
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A182-F11

* REDUCING FITTINGS

BROS	Branch Fitting	Socket-Weld. Outlet	DN	15-50	ASTM	A182-F11
BROB	Branch Outlet Red.	Butt-Weld.	DN	80-400	ASTM	A182-F11
RECB	Reducer Conc.	Butt-Weld. End	DN	20-400	ASTM	A234-WP11
REEB	Reducer Ecc.	Butt-Weld. End	DN	20-400	ASTM	A234-WP11
TERB	Tee Reducing	Butt-Weld. End	DN	20-25	ASTM	A234-WP11
TERS	Tee Reducing	Socket-Weld. End	DN	20-40	ASTM	A182-F11

Note:

For full material description see relevant MESC buying description.

* VALVES

CHVB	Check Valve	Butt-Weld. End	DN	15-300	Body: ASTM A217-WC6, A182-F11 Trim: AISI 316, 316L or Body Mat. + Stellite-6 (Hydrogen)
GAVB	Gate Valve	Butt-Weld. End	DN	15-400	Body: ASTM A217-WC6, A182-F11 Trim: AISI 316, 316L or Body Mat. + Stellite-6 (Hydrogen)
GLVB	Globe Valve	Butt-Weld. End	DN	15-150	Body: ASTM A217-WC6, A182-F11 Trim: AISI 316, 316L or Body Mat. + Stellite-6 (Hydrogen)

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-400	AISI 316, 316L Graphited Filled, CS Centring-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-400	ASTM A182-F11
STBT	Stud Bolt with Nuts	—		Studs: ASTM A193-B16 Nuts: ASTM A194-8C

Class No.: GP06	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE												
		15	20	25	40	50	80	100	150	200	250	300	350	400
* PIPE														
Pipe	74.33.11	*	*	*	*	*	*	*	*	*	*	*	*	*
* FLANGES														
Blind Flange	76.64.10	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)		*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.64.80	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS														
Cap	Butt-Weld. End	76.32.18	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.32.38	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.32.39	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.32.84	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.36.38	*	*	*	*								
Elbow 90 Deg.	Socket-Weld. End	76.36.39	*	*	*	*								
Equal Tee	Socket-Weld. End	76.36.80	*	*	*	*								
Coupling	Socket-Weld. End	76.36.28	*	*	*	*								
Cap	Socket-Weld. End	76.36.18	*	*	*	*								
* VALVES														
Check Valve	Butt-Weld. End	75.59.10	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve	Butt-Weld. End	75.59.30	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve	Butt-Weld. End	75.59.40	*	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS														
Gasket, Spiral Wound		85.41.37	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.88.52					*	*	*	*	*	*	*	*

Class No.: GP06	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB	RECB 76.32.70	REEB 76.32.71	TERB 76.32.85	TERS 76.36.85	Run	Br.	BROB	RECB 76.32.70	REEB 76.32.71	COMP. NAME	DESCRIPTION
20	× 15		*	*	*	*	400	× 50	*			BROS	Branch Fitting Socket-Weld. Outlet
25	× 15		*	*	*	*	400	× 80	*			BROB	Branch Outlet Red. Butt-Weld
25	× 20		*	*	*	*	400	× 150	*			RECB	Reducer Conc. Butt-Weld. End
40	× 20		*	*	*	*	400	× 200	*	*	*	REEB	Reducer Ecc. Butt-Weld. End
40	× 25		*	*	*	*	400	× 250	*	*	*	TERB	Tee Reducing Butt-Weld. End
50	× 25		*	*	*	*	400	× 300	*	*	*	TERS	Tee Reducing Socket-Weld. End
50	× 40		*	*	*	*	400	× 350	*	*	*		
80	× 40		*	*	*	*							
80	× 50	*	*	*	*	*							
100	× 50	*	*	*	*	*							
100	× 80	*	*	*	*	*							
150	× 50	*	*	*	*	*							
150	× 80	*	*	*	*	*							
150	× 100	*	*	*	*	*							
200	× 50	*	*	*	*	*							
200	× 80	*	*	*	*	*							
200	× 100	*	*	*	*	*							
200	× 150	*	*	*	*	*							
250	× 50	*	*	*	*	*							
250	× 80	*	*	*	*	*							
250	× 100	*	*	*	*	*							
250	× 150	*	*	*	*	*							
250	× 200	*	*	*	*	*							
300	× 50	*	*	*	*	*							
300	× 80	*	*	*	*	*							
300	× 150	*	*	*	*	*							
300	× 200	*	*	*	*	*							
300	× 250	*	*	*	*	*							
350	× 50	*	*	*	*	*							
350	× 80	*	*	*	*	*							
350	× 150	*	*	*	*	*							
350	× 200	*	*	*	*	*							
350	× 250	*	*	*	*	*							
350	× 300	*	*	*	*	*							

Run	Br.	BROS 76.80.26
40-150	15	*
200-400		*
50-80	20	*
100-400		*
50	25	*
80-100		*
150-400		*
80-100	40	*
150-300		*
350-400		*

Class No.: GP06	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.96
15	4	3/4	× 110	*
20	4	3/4	× 110	*
25	4	7/8	× 125	*
40	4	1	× 140	*
50	8	7/8	× 145	*
80	8	7/8	× 145	*
100	8	1 1/8	× 170	*
150	12	1 1/8	× 190	*
200	12	1 3/8	× 220	*
250	16	1 3/8	× 235	*
300	20	1 3/8	× 250	*
350	20	1 1/2	× 275	*
400	20	1 5/8	× 285	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.96
15	4	3/4	× 115	*
20	4	3/4	× 125	*
25	4	7/8	× 140	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 165	*
100	8	1 1/8	× 195	*
150	12	1 1/8	× 230	*
200	12	1 3/8	× 265	*
250	16	1 3/8	× 285	*
300	20	1 3/8	× 310	*
350	20	1 1/2	× 345	*
400	20	1 5/8	× 355	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.96
15	4	7/8	× 150	*
20	4	7/8	× 150	*
25	4	7/8	× 150	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 160	*
100	8	1 1/8	× 180	*
150	12	1 1/8	× 210	*
200	12	1 3/8	× 240	*
250	16	1 3/8	× 250	*
300	20	1 3/8	× 275	*
350	20	1 1/2	× 300	*
400	20	1 5/8	× 305	*

* DRAIN POINT Fig. 0N

Run DN 15-25 Br DN 15

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Gate Valve Butt-Weld Ends	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

* DRAIN POINT Fig. 0N

Run DN 40-40 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Gate Valve Butt-Weld Ends	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

* DRAIN POINT Fig. 0N

Run DN 50-400	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve Butt-Weld Ends		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

* VENT POINT Fig. 1N

Run DN 15-25	Br DN 15	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld Ends		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

* VENT POINT Fig. 1N

Run DN 40-40	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld Ends		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

* VENT POINT Fig. 1N

Run DN 50-400	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld Ends		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

Class No.: GS02	Page: 1	Content: General
Base Material: Stainless Steel AISI 316	First Issue:	Revision:
Rating: PN 150 (Class 900)		Date:
Corrosion Allowance: 0 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-150	137.6	137.6	126.7	115.6	106.9	100.2	94.9	91.1	87.4

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES							
			BRANCH SIZE							
			15	20	25	40	50	80	100	150
15	40S	150	C	C	C	C	E	E	E	A
20	40S	100	C	C	C	C	E	E	A	
25	40S	80	C	C	C	C	E	A		
40	40S	50	C	C	C	C	A			
50	80S	40	C	B	C	A				
80	80S	25	B	B	A					
100	80S	20	B	A						
150	80S	15	A							

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 2.2 and to allowable internal pressure acc. ANSI B31.3.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: GS02	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-150	ASTM	A312-TP316L (Seamless/wld.)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A312-TP316L (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-150	ASTM	A182-F316
SBFL	Spectacle Blind Flange	DN	15-150	ASTM	A240-TP316
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-150	ASTM	A240-TP316
WNFL	Welding Neck Flange	DN	15-150	ASTM	A182-F316

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-150	ASTM	A403-WP316L
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-150	ASTM	A403-WP316L
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-150	ASTM	A403-WP316L
TEEB	Equal Tee	Butt-Weld. End	DN	15-150	ASTM	A403-WP316L
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F11
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F11
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A182-F11
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A182-F11
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A182-F11

* REDUCING FITTINGS

BROS	Branch Fitting Socket-Weld. Outlet	DN	15-50	ASTM	A182-F316
BROB	Branch Outlet Red. Butt-Weld.	DN	15-150	ASTM	A182-F316
RECB	Reducer Conc. Butt-Weld. End	DN	20-150	ASTM	A403-WP316L
REEB	Reducer Ecc. Butt-Weld. End	DN	20-150	ASTM	A403-WP316L
TERB	Tee Reducing Butt-Weld. End	DN	20-150	ASTM	A403-WP316L
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A182-F316

Note:

For full material description see relevant MESC buying description.

* VALVES

CHVF	Check Valve Flanged	DN	15-150	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316, 316L
GAVF	Gate Valve Flanged	DN	15-150	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316, 316L
GLVF	Globe Valve Flanged	DN	15-150	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316, 316L

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-150	AISI 316, Graphited Filled, CS Centring-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-150	ASTM A182-F316
STBT	Stud Bolt with Nuts	—		Studs: ASTM A193-B7 Nuts: ASTM A194-2H

Class No.: GS02	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE								
		15	20	25	40	50	80	100	150	
* PIPE										
Pipe	74.36.40	*	*	*	*	*	*	*	*	*
* FLANGES										
Blind Flange	76.65.11	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)		*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.65.80	*	*	*	*	*	*	*	*	*
* FITTINGS										
Cap	Butt-Weld. End	76.32.18	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.33.38	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.33.40	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.33.84	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.37.38	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Socket-Weld. End	76.37.39	*	*	*	*	*	*	*	*
Equal Tee	Socket-Weld. End	76.37.80	*	*	*	*	*	*	*	*
Coupling	Socket-Weld. End	76.37.28	*	*	*	*	*	*	*	*
Cap	Socket-Weld. End	76.37.18	*	*	*	*	*	*	*	*
* VALVES										
Check Valve Flanged		75.40.11	*	*	*	*	*	*	*	*
Gate Valve Flanged		75.40.31	*	*	*	*	*	*	*	*
Globe Valve Flanged		75.40.41	*	*	*	*	*	*	*	*
* MISCELLANEOUS										
Gasket, Spiral Wound		85.41.37	*	*	*	*	*	*	*	*
Orifice Flange Set		60.88.52				*	*	*	*	*

Class No.: GS02	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.00	RECB 76.33.70	REEB 76.33.73	TERB 76.33.85	TERS 76.37.85
20 × 15			*	*	*	*
25 × 15			*	*	*	*
25 × 20			*	*	*	*
40 × 15				*	*	*
40 × 20			*	*	*	*
40 × 25			*	*	*	*
80 × 50		*	*	*	*	*
100 × 50		*	*	*	*	*
100 × 80		*	*	*	*	*
150 × 50		*				
150 × 80		*	*	*	*	*
150 × 100		*	*	*	*	*

COMP. NAME	DESCRIPTION
BROS	Branch Fitting Socket-Weld. Outlet
BROB	Branch Outlet Red. Butt-Weld
RECB	Reducer Conc. Butt-Weld. End
REEB	Reducer Ecc. Butt-Weld. End
TERB	Tee Reducing Butt-Weld. End
TERS	Tee Reducing Socket-Weld. End

Run	Br.	BROS 76.80.26
40-150	15	*
50-80	20	*
100-150		*
50	25	*
80-100		*
150		*
80-100	40	*
150		*

Class No.: GS02	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 110	*
20	4	3/4	× 110	*
25	4	7/8	× 125	*
40	4	1	× 140	*
50	8	7/8	× 145	*
80	8	7/8	× 145	*
100	8	1 1/8	× 170	*
150	12	1 1/8	× 190	*

* DRAIN POINT Fig. 0I

Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT Fig. 1I

Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 115	*
20	4	3/4	× 125	*
25	4	7/8	× 140	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 165	*
100	8	1 1/8	× 195	*
150	12	1 1/8	× 230	*

* DRAIN POINT Fig. 0I

Run	DN 40-40	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT Fig. 1I

Run	DN 40-40	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.96
15	4	7/8	× 150	*
20	4	7/8	× 150	*
25	4	7/8	× 150	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 160	*
100	8	1 1/8	× 180	*
150	12	1 1/8	× 210	*

* DRAIN POINT Fig. 0J

Run	DN 50-150	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT Fig. 1J

Run	DN 50-150	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

Class No.: GS06	Page: 1	Content: General
Base Material: Stainless Steel AISI 321/347	First Issue:	Revision:
Rating: PN 150 (Class 900)		Date:
Corrosion Allowance: 0 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400	450
Pressure Barg.	DN 15-150	146.4	142.0	124.5	112.5	103.2	96.1	91.5	87.9	85.8	84.6

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES							
			BRANCH SIZE							
			15	20	25	40	50	80	100	150
15	40S	150	C	C	C	C	E	E	E	A
20	40S	100	C	C	C	C	E	E	A	
25	40S	80	C	C	C	C	E	A		
40	40S	50	C	C	C	C	A			
50	40S	40	C	C	C	A				
80	40S	25	B	B	A					
100	80S	20	B	A						
150	80S	15	A							

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 2.4 and to allowable internal pressure according to ANSI B31.3 and to bolting material.
- Piston type check valve for horizontal mounting only.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: GS06	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-150	ASTM	A312-TP321/347 (Seamless or Welded)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A312-TP321/347 (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-150	ASTM	A182-F321/347
SBFL	Spectacle Blind Flange	DN	15-150	ASTM	A240-TP321/347
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-150	ASTM	A240-TP321/347
WNFL	Welding Neck Flange	DN	15-150	ASTM	A182-F321/347

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-150	ASTM	A403-WP321/347
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-150	ASTM	A403-WP321/347
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-150	ASTM	A403-WP321/347
TEEB	Equal Tee	Butt-Weld. End	DN	15-150	ASTM	A403-WP321/347
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F11
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F11
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A182-F11
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A182-F11
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A182-F11

* REDUCING FITTINGS

BROS	Branch Fitting Socket-Weld. Outlet	DN	15-50	ASTM	A182-F321/347
BROB	Branch Outlet Red. Butt-Weld.	DN	15-150	ASTM	A182-F321/347
RECB	Reducer Conc. Butt-Weld. End	DN	20-150	ASTM	A403-WP321/347
REEB	Reducer Ecc. Butt-Weld. End	DN	20-150	ASTM	A403-WP321/347
TERB	Tee Reducing Butt-Weld. End	DN	20-50	ASTM	A403-WP321/347
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A182-F321/347

Note:

For full material description see relevant MESC buying description.

* VALVES

CHVF	Check Valve Flanged	DN	15-150	Body: ASTM A351-CF8C, A182-F321 Trim: AISI 321
GAVF	Gate Valve Flanged	DN	15-150	Body: ASTM A351-CF8C, A182-F321 Trim: AISI 321
GLVF	Globe Valve Flanged	DN	15-150	Body: A351-CF8C, A182-F321 Trim: AISI 321

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-150	AISI 304, Graphited Filled, CS Centring-, AISI 304 Inner-Ring
ORFS	Orifice Flange Set	DN	50-150	ASTM A182-F321/347
STBT	Stud Bolt with Nuts	—	—	Studs: ASTM A453-GR.660, CL.A.

Class No.: GS06	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE								
		15	20	25	40	50	80	100	150	
* PIPE										
Pipe	74.36.40	*	*	*	*	*	*	*	*	*
* FLANGES										
Blind Flange	76.65.10	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)		*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.65.80	*	*	*	*	*	*	*	*	*
* FITTINGS										
Cap	Butt-Weld. End	76.33.18	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.33.38	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.33.40/41	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.33.84	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.36.38	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Socket-Weld. End	76.36.39	*	*	*	*	*	*	*	*
Equal Tee	Socket-Weld. End	76.36.80	*	*	*	*	*	*	*	*
Coupling	Socket-Weld. End	76.36.28	*	*	*	*	*	*	*	*
Cap	Socket-Weld. End	76.36.18	*	*	*	*	*	*	*	*
* VALVES										
Check Valve Flanged	75.40.11	*	*	*	*	*	*	*	*	*
Gate Valve Flanged	75.40.31	*	*	*	*	*	*	*	*	*
Globe Valve Flanged	75.40.41	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS										
Gasket, Spiral Wound	85.41.31	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*

Class No.: GS06	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.33.70	RECB 76.33.73	REEB 76.33.85	TERB 76.37.85	TERS
20	× 15		*	*	*	*
25	× 15		*	*	*	*
25	× 20	*	*	*	*	*
40	× 15				*	*
40	× 20		*	*	*	*
40	× 25		*	*	*	*
50	× 25	*	*	*		
50	× 40		*	*	*	
80	× 40		*	*	*	
80	× 50	*	*	*		
100	× 50	*	*	*		
100	× 80	*	*	*		
150	× 50	*	*	*		
150	× 80	*	*	*		
150	× 100	*	*	*		

COMP. NAME	DESCRIPTION
BROS	Branch Fitting Socket-Weld. Outlet
BROB	Branch Outlet Red. Butt-Weld
RECB	Reducer Conc. Butt-Weld. End
REEB	Reducer Ecc. Butt-Weld. End
TERB	Tee Reducing Butt-Weld. End
TERS	Tee Reducing Socket-Weld. End

Run	Br.	BROS 76.80.26
40-150	15	*
50-80	20	*
100-150		*
50	25	*
80-100		*
150		*
80-100	40	*
150		*

Class No.: GS06	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.40
15	4	3/4	× 110	*
20	4	3/4	× 110	*
25	4	7/8	× 125	*
40	4	1	× 140	*
50	8	7/8	× 145	*
80	8	7/8	× 145	*
100	8	1 1/8	× 170	*
150	12	1 1/8	× 190	*

* DRAIN POINT Fig. 0I

Run	DN 15-25	Br	DN 15	No.
				1
Branch:	Table Page 1			1
Blind Flange				2
Gasket Spiral Wound				1
Gate Valve Flanged				8
Stud Bolt with Nuts				1
Welding Neck Flange				

* VENT POINT Fig. 1I

Run	DN 15-25	Br	DN 15	No.
				1
Branch:	Table Page 1			1
Blind Flange				2
Gasket Spiral Wound				1
Globe Valve Flanged				8
Stud Bolt with Nuts				1
Welding Neck Flange				

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.40
15	4	3/4	× 115	*
20	4	3/4	× 125	*
25	4	7/8	× 140	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 165	*
100	8	1 1/8	× 195	*
150	12	1 1/8	× 230	*

* DRAIN POINT Fig. 0I

Run	DN 40-40	Br	DN 20	No.
				1
Branch:	Table Page 1			1
Blind Flange				2
Gasket Spiral Wound				1
Gate Valve Flanged				8
Stud Bolt with Nuts				1
Welding Neck Flange				

* VENT POINT Fig. 1I

Run	DN 40-40	Br	DN 20	No.
				1
Branch:	Table Page 1			1
Blind Flange				2
Gasket Spiral Wound				1
Globe Valve Flanged				8
Stud Bolt with Nuts				1
Welding Neck Flange				

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.40
15	4	7/8	× 150	*
20	4	7/8	× 150	*
25	4	7/8	× 150	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 160	*
100	8	1 1/8	× 180	*
150	12	1 1/8	× 210	*

* DRAIN POINT Fig. 0J

Run	DN 50-150	Br	DN 20	No.
				1
Branch:	Table Page 1			1
Blind Flange				2
Gasket Spiral Wound				1
Gate Valve Flanged				1
Pipe Nipple 50 mm				8
Stud Bolt with Nuts				1
Welding Neck Flange				

* VENT POINT Fig. 1J

Run	DN 50-150	Br	DN 20	No.
				1
Branch:	Table Page 1			1
Blind Flange				2
Gasket Spiral Wound				1
Globe Valve Flanged				1
Pipe Nipple 50 mm				8
Stud Bolt with Nuts				1
Welding Neck Flange				

Class No.: GS07	Page: 1	Content: General
Base Material: Stainless Steel AISI 321, Stab. HT	First Issue:	Revision:
Rating: PN 150 (Class 900)		Date:
Corrosion Allowance: 0 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400	500	538
Pressure Barg.	DN 15-300	146.4	142.0	124.5	112.5	103.2	96.1	91.5	87.9	85.8	81.3	73.7

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES										
			BRANCH SIZE										
			15	20	25	40	50	80	100	150	200	250	300
15	40S	300	C	C	C	C	E	E	E	B	B	B	A
20	40S	250	C	C	C	C	E	E	B	B	B	A	
25	40S	200	C	C	C	C	E	E	B	B	A		
40	40S	150	C	C	C	C	E	B	B	A			
50	40S	100	C	C	C	C	B	B	A				
80	40S	80	C	C	C	C	B	A					
100	80S	50	C	C	C	C	A						
150	80S	40	C	B	B	A							
200	100	25	B	B	A								
250	100	20	B	A									
300	100	15	A										

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 2.4 and to allowable internal pressure according to ANSI B31.3 and to bolting material.
- Piston type check valve for horizontal mounting only.
- Cold bending of pipe is not allowed and hot bending is not recommended.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: GS07	Page: 2	Content: Material Descriptions
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* PIPE					* VALVES						
PIPE	Pipe		DN	15-300	ASTM	A312-TP321 Stab. HT (Seamless or Welded)	CHVB	Check Valve Butt-Weld. End	DN	15-300	Body: ASTM A351-CF8C, A182-F321 Trim: AISI 321 + Stellite 6
PNPP	Pipe Nipple 50 mm		DN	15-40	ASTM	A312-TP321 Stab. HT (Seamless)	GAVB	Gate Valve Butt-Weld. End	DN	15-300	Body: ASTM A351-CF8C, A182-F321 Trim: AISI 321 + Stellite 6
* FLANGES					* MISCELLANEOUS						
BLFL	Blind Flange		DN	15-300	ASTM	A182-F321 Stab. HT	GAVF	Gate Valve Flanged	DN	15-50	Body: ASTM A351-CF8C, A182-F321 Trim: AISI 321 + Stellite 6
SBFL	Spectacle Blind Flange		DN	15-300	ASTM	A240-TP321 Stab. HT					
SPRT	Spacer Ring Type (ANS Flanges)		DN	15-300	ASTM	A240-TP321 Stab. HT					
WNFL	Welding Neck Flange		DN	15-300	ASTM	A182-F321 Stab. HT	GKSW	Gasket, Spiral Wound	DN	15-300	AISI 316, Graphited Filled, CS Centring-, SS Inner-Ring
* FITTINGS											
CAPB	Cap	Butt-Weld. End	DN	15-300	ASTM	A403-WP-S-321 Stab. HT	ORFS	Orifice Flange Set	DN	50-300	ASTM A182-F321 Stab. HT
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-300	ASTM	A403-WP-S-321 Stab. HT	STBT	Stud Bolt with Nuts	—		Studs: ASTM A453-Gr. 660, CL.A.
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-300	ASTM	A403-WP-S-321 Stab. HT					
TEEB	Equal Tee	Butt-Weld. End	DN	15-300	ASTM	A403-WP-S-321 Stab. HT					
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F11					
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F11					
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A182-F11					
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A182-F11					
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A182-F11					
* REDUCING FITTINGS											
BROS	Branch Fitting Socket-Weld. Outlet		DN	15-50	ASTM	A182-F321 Stab. HT					
BROB	Branch Outlet Red. Butt-Weld.		DN	80-300	ASTM	A182-F321 Stab. HT					
RECB	Reducer Conc. Butt-Weld. End		DN	20-300	ASTM	A403-WP-S-321 Stab. HT					
REEB	Reducer Ecc. Butt-Weld. End		DN	20-300	ASTM	A403-WP-S-321 Stab. HT					
TERB	Tee Reducing Butt-Weld. End		DN	20-300	ASTM	A403-WP-S-321 Stab. HT					
TERS	Tee Reducing Socket-Weld. End		DN	20-40	ASTM	A182-F321 Stab. HT					

Note:

For full material description see relevant MESC buying description.

Class No.: GS07	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE										
		15	20	25	40	50	80	100	150	200	250	300
* PIPE												
Pipe	74.36.40	*	*	*	*	*	*	*	*	*	*	*
* FLANGES												
Blind Flange	76.65.10	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)		*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.65.80	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS												
Cap	Butt-Weld. End	76.33.18	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.33.38	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.33.44	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.33.84	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.36.38	*	*	*	*						
Elbow 90 Deg.	Socket-Weld. End	76.36.39	*	*	*	*						
Equal Tee	Socket-Weld. End	76.36.80	*	*	*	*						
Coupling	Socket-Weld. End	76.36.28	*	*	*	*						
Cap	Socket-Weld. End	76.36.18	*	*	*	*						
* VALVES												
Check Valve	Butt-Weld. End	75.58.11	*	*	*	*	*	*	*	*	*	*
Gate Valve	Butt-Weld. End	75.58.31	*	*	*	*	*	*	*	*	*	*
Globe Valve	Butt-Weld. End	75.58.41	*	*	*	*	*	*	*			
Gate Valve	Flanged	75.40.41	*	*	*	*	*					
* MISCELLANEOUS												
Gasket, Spiral Wound		85.41.37	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.88.52					*	*	*	*	*	*

Class No.: GS07	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB	RECB 76.33.70	REEB 76.33.73	TERB 76.33.85	TERS 76.36.85
20	× 15		*	*	*	*
25	× 15		*	*	*	*
25	× 20		*	*	*	*
40	× 15			*	*	*
40	× 20		*	*	*	*
40	× 25		*	*	*	*
50	× 25		*	*		
50	× 40		*	*	*	
80	× 40		*	*		
80	× 50	*	*	*	*	
100	× 50	*	*	*	*	
100	× 80	*	*	*	*	
150	× 50	*				
150	× 80	*	*	*	*	
150	× 100	*	*	*	*	
200	× 50	*				
200	× 80	*				
200	× 100	*	*	*	*	
200	× 150	*	*	*	*	
250	× 50	*				
250	× 80	*				
250	× 100	*				
250	× 150	*	*	*	*	
250	× 200	*	*	*	*	
300	× 50	*				
300	× 80	*				
300	× 100	*				
300	× 150	*	*	*	*	
300	× 200	*	*	*	*	
300	× 250	*	*	*	*	

COMP. NAME	DESCRIPTION
BROS	Branch Fitting Socket-Weld. Outlet
BROB	Branch Outlet Red. Butt-Weld
RECB	Reducer Conc. Butt-Weld. End
REEB	Reducer Ecc. Butt-Weld. End
TERB	Tee Reducing Butt-Weld. End
TERS	Tee Reducing Socket-Weld. End

Run	Br.	BROS 76.80.26
40-150	15	*
50-80	20	*
100-300		*
50	25	*
80-100		*
150-300		*
80-100	40	*
150-300		*

Class No.: GS07	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.40
15	4	3/4	× 110	*
20	4	3/4	× 110	*
25	4	7/8	× 125	*
40	4	1	× 140	*
50	8	7/8	× 145	*
80	8	7/8	× 145	*
100	8	1 1/8	× 170	*
150	12	1 1/8	× 190	*
200	12	1 3/8	× 220	*
250	16	1 3/8	× 235	*
300	20	1 3/8	× 250	*

* DRAIN POINT Fig. 0N

Run	DN 15-25	Br	DN 15	No.
Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Gate Valve Butt-Weld Ends				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

* VENT POINT Fig. 1N

Run	DN 15-25	Br	DN 15	No.
Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Globe Valve Butt-Weld Ends				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.40
15	4	3/4	× 115	*
20	4	3/4	× 125	*
25	4	7/8	× 140	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 165	*
100	8	1 1/8	× 195	*
150	12	1 1/8	× 230	*
200	12	1 3/8	× 265	*
250	16	1 3/8	× 285	*
300	20	1 3/8	× 310	*

* DRAIN POINT Fig. 0N

Run	DN 40-40	Br	DN 20	No.
Run	DN 40-40	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Gate Valve Butt-Weld Ends				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

* VENT POINT Fig. 1N

Run	DN 40-40	Br	DN 20	No.
Run	DN 40-40	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Globe Valve Butt-Weld Ends				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

* DRAIN POINT Fig. 0N

Run	DN 50-300	Br	DN 20	No.
Run	DN 50-300	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Gate Valve Butt-Weld Ends				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

* VENT POINT Fig. 1N

Run	DN 50-300	Br	DN 20	No.
Run	DN 50-300	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Globe Valve Butt-Weld Ends				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.40
15	4	7/8	× 150	*
20	4	7/8	× 150	*
25	4	7/8	× 150	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	7/8	× 160	*
100	8	1 1/8	× 180	*
150	12	1 1/8	× 210	*
200	12	1 3/8	× 240	*
250	16	1 3/8	× 250	*
300	20	1 3/8	× 275	*

Class No.: HN01	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 250 (Class 1500)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-400	250.6	250.4	231.9	226.0	219.2	208.6	193.5	184.7	161.7

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES												
			BRANCH SIZE												
			15	20	25	40	50	80	100	150	200	250	300	350	400
15	160	400	C	C	C	C	E	E	E	E	E	E	E	E	A
20	160	350	C	C	C	C	E	E	E	E	E	E	E	A	
25	160	300	C	C	C	C	E	E	E	E	E	E	A		
40	160	250	C	C	C	C	E	E	E	E	E	A			
50	160	200	C	C	C	C	E	E	E	E	A				
80	160	150	C	C	C	C	E	E	E	A					
100	160	100	C	C	C	C	E	E	A						
150	160	80	C	C	C	C	E	A							
200	160	50	C	C	C	B	A								
250	160	40	C	B	B	A									
300	160	25	B	B	A										
350	160	20	B	A											
400	160	15	A												

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1 and to allowable internal pressure acc. ANSI B31.3.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: HN01	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A106-B
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A106-B

* FLANGES

BLFL	Blind Flange	DN	15-400	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-400	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-400	ASTM	A516-60
WNFL	Welding Neck Flange	DN	15-400	ASTM	A105

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
TEEB	Equal Tee	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A105
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A105
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A105

* REDUCING FITTINGS

BROS	Branch Fitting	Socket-Weld. Outlet	DN	15-50	ASTM	A182-F11
BROB	Branch Outlet Red.	Butt-Weld.	DN	80-400	ASTM	A105
RECB	Reducer Conc.	Butt-Weld. End	DN	20-400	ASTM	A234-WPB
REEB	Reducer Ecc.	Butt-Weld. End	DN	20-400	ASTM	A234-WPB
TERB	Tee Reducing	Butt-Weld. End	DN	20-400	ASTM	A234-WPB
TERS	Tee Reducing	Socket-Weld. End	DN	20-40	ASTM	A105

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVF	Check Valve Flanged	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6
		DN	50-400	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GAVF	Gate Valve Flanged	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6
		DN	50-400	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GLVF	Globe Valve Flanged	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6
		DN	50-100	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-400	AISI	316, 316L, Graphite Filled CS Centring-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-400	ASTM	A105
STBT	Stud Bolt with Nuts	—		Studs:	ASTM A193-B7
				Nuts:	ASTM A194-2H

Class No.: HN01	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE												
		15	20	25	40	50	80	100	150	200	250	300	350	400
* PIPE														
Pipe	74.30.21/31	*	*	*	*	*	*	*	*	*	*	*	*	*
* FLANGES														
Blind Flange	76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.16	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.62.79	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS														
Cap	Butt-Weld. End	76.30.18	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.30.38	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.30.39/40	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.30.84	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.34.38	*	*	*	*								
Elbow 90 Deg.	Socket-Weld. End	76.34.39	*	*	*	*								
Equal Tee	Socket-Weld. End	76.34.84	*	*	*	*								
Coupling	Socket-Weld. End	76.34.28	*	*	*	*								
Cap	Socket-Weld. End	76.34.18	*	*	*	*								
* VALVES														
Check Valve Flanged	75.37.17	*	*	*	*		*	*	*	*	*	*	*	*
Gate Valve Flanged	75.37.37	*	*	*	*		*	*	*	*	*	*	*	*
Globe Valve Flanged	75.37.47	*	*	*	*		*	*	*					
* MISCELLANEOUS														
Gasket, Spiral Wound	85.41.37	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*	*	*	*	*

Class No.: HN01	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	TERS 76.34.85	Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	COMP. NAME	DESCRIPTION
20 × 15			*	*	*	*	400 × 50		*				BROS	Branch Fitting Socket-Weld. Outlet
25 × 15			*	*	*	*	400 × 80		*				BROB	Branch Outlet Red. Butt-Weld
25 × 20			*	*	*	*	400 × 100		*				RECB	Reducer Conc. Butt-Weld. End
40 × 15			*	*	*	*	400 × 150		*	*	*	*	REEB	Reducer Ecc. Butt-Weld. End
40 × 20			*	*	*	*	400 × 200		*	*	*	*	TERB	Tee Reducing Butt-Weld. End
40 × 25			*	*	*	*	400 × 250		*	*	*	*	TERS	Tee Reducing Socket-Weld. End
50 × 20			*	*			400 × 300		*	*	*	*		
50 × 25			*	*			400 × 350		*	*	*	*		
50 × 40			*	*	*									
80 × 40			*	*	*									
80 × 50		*	*	*	*								RUN	Br. BROS
100 × 40			*	*	*									76.80.26
100 × 50		*	*	*	*								40-150	15 *
100 × 80		*	*	*	*								200-400	*
150 × 50		*												
150 × 80		*	*	*	*								50-80	20 *
150 × 100		*	*	*	*								100-400	*
200 × 50		*												
200 × 80		*											50	25 *
200 × 100		*	*	*	*								80-100	*
200 × 150		*	*	*	*								150-400	*
250 × 50		*												
250 × 80		*											80-100	40 *
250 × 100		*	*	*	*								150-300	*
250 × 150		*	*	*	*								350-400	*
250 × 200		*	*	*	*									
300 × 50		*												
300 × 80		*												
300 × 100		*												
300 × 150		*	*	*	*									
300 × 200		*	*	*	*									
300 × 250		*	*	*	*									
350 × 50		*												
350 × 80		*												
350 × 100		*												
350 × 150		*	*	*	*									
350 × 200		*	*	*	*									
350 × 250		*	*	*	*									
350 × 300		*	*	*	*									

Class No.: HN01	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 110	*
20	4	3/4	× 120	*
25	4	7/8	× 130	*
40	4	1	× 140	*
50	8	7/8	× 150	*
80	8	1 1/8	× 180	*
100	8	1 1/4	× 195	*
150	12	1 3/8	× 260	*
200	12	1 5/8	× 350	*
250	12	1 7/8	× 400	*
300	16	2	× 440	*
350	16	2 1/4	× 480	*
400	16	2 1/2	× 530	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 120	*
20	4	3/4	× 130	*
25	4	7/8	× 140	*
40	4	1	× 160	*
50	8	7/8	× 170	*
80	8	1 1/8	× 210	*
100	8	1 1/4	× 230	*
150	12	1 3/8	× 300	*
200	12	1 5/8	× 400	*
250	12	1 7/8	× 460	*
300	16	2	× 510	*
350	16	2 1/4	× 560	*
400	16	2 1/2	× 620	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	7/8	× 150	*
20	4	7/8	× 150	*
25	4	7/8	× 150	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	1 1/8	× 190	*
100	8	1 1/4	× 210	*
150	12	1 3/8	× 275	*
200	12	1 5/8	× 360	*
250	12	1 7/8	× 415	*
300	16	2	× 455	*
350	16	2 1/4	× 500	*
400	16	2 1/2	× 550	*

*** DRAIN POINT Fig. 0I**

Run	DN 15-25 DN 40	Br	DN 15 DN 20	No.
Branch:	Table Page 1			1
	Blind Flange			1
	Gasket Spiral Wound			2
	Gate Valve Flanged			1
	Stud Bolt with Nuts			8
	Welding Neck Flange			1

*** DRAIN POINT Fig. 0J**

Run	DN 50-400	Br	DN 20	No.
Branch:	Table Page 1			1
	Blind Flange			1
	Gasket Spiral Wound			2
	Gate Valve Flanged			1
	Pipe Nipple 50 mm			1
	Stud Bolt with Nuts			8
	Welding Neck Flange			1

*** VENT POINT Fig. 1I**

Run	DN 15-25 DN 40	Br	DN 15 DN 20	No.
Branch:	Table Page 1			1
	Blind Flange			1
	Gasket Spiral Wound			2
	Globe Valve Flanged			1
	Stud Bolt with Nuts			8
	Welding Neck Flange			1

*** VENT POINT Fig. 1J**

Run	DN 50-400	Br	DN 20	No.
Branch:	Table Page 1			1
	Blind Flange			1
	Gasket Spiral Wound			2
	Globe Valve Flanged			1
	Pipe Nipple 50 mm			1
	Stud Bolt with Nuts			8
	Welding Neck Flange			1

Class No.: HN04	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 250 (Class 1500)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-400	250.6	250.4	231.9	226.0	219.2	208.6	193.5	184.7	161.7

TABLE OF SCHEDULES

BRANCH CONNECTIONS 90 DEGREES

DN	Schedule	Run Size	BRANCH SIZE													
			15	20	25	40	50	80	100	150	200	250	300	350	400	
15	160	400	C	C	C	C	E	E	E	E	E	E	E	E	E	A
20	160	350	C	C	C	C	E	E	E	E	E	E	E	E	A	
25	160	300	C	C	C	C	E	E	E	E	E	E	E	A		
40	160	250	C	C	C	C	E	E	E	E	E	E	A			
50	160	200	C	C	C	C	E	E	E	E	A					
80	160	150	C	C	C	C	E	E	E	A						
100	160	100	C	C	C	C	E	E	A							
150	160	80	C	C	C	C	E	A								
200	160	50	C	C	C	B	A									
250	160	40	C	B	B	A										
300	160	25	B	B	A											
350	160	20	B	A												
400	160	15	A													

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1 and to allowable internal pressure acc. ANSI B31.3.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch connections is subject to company approval.

Class No.: HN04	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A106-B
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A106-B

* FLANGES

BLFL	Blind Flange	DN	15-400	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-400	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-400	ASTM	A516-60
WNFL	Welding Neck Flange	DN	15-400	ASTM	A105

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
TEEB	Equal Tee	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A105
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A105
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A105

* REDUCING FITTINGS

BROS	Branch Outlet Socket-Weld. End	DN	15-50	ASTM	A105
BROB	Branch Outlet Red. Butt-Weld.	DN	80-400	ASTM	A105
RECB	Reducer Conc. Butt-Weld. End	DN	20-400	ASTM	A234-WPB
REEB	Reducer Ecc. Butt-Weld. End	DN	20-400	ASTM	A234-WPB
TERB	Tee Reducing Butt-Weld. End	DN	20-400	ASTM	A234-WPB
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A105

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVF	Check Valve Flanged	DN	15-400	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6
GAVF	Gate Valve Flanged	DN	15-400	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6
GLVF	Globe Valve Flanged	DN	15-100	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-400	AISI	316, 316 L, Graphite Filled CS Centring-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-400		ASTM A105
STBT	Stud Bolt with Nuts		—	Studs:	ASTM A193-B7
				Nuts:	ASTM A194-2H

Class No.: HN04	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE												
		15	20	25	40	50	80	100	150	200	250	300	350	400
* PIPE														
Pipe	74.30.21/31	*	*	*	*	*	*	*	*	*	*	*	*	*
* FLANGES														
Blind Flange	76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.16	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.62.79	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS														
Cap	Butt-Weld. End	76.30.18	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.30.38	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.30.39/40	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.30.84	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.34.38	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Socket-Weld. End	76.34.39	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Socket-Weld. End	76.34.84	*	*	*	*	*	*	*	*	*	*	*	*
Coupling	Socket-Weld. End	76.34.28	*	*	*	*	*	*	*	*	*	*	*	*
Cap	Socket-Weld. End	76.34.18	*	*	*	*	*	*	*	*	*	*	*	*
* VALVES														
Check Valve Flanged	75.37.17	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged	75.37.37	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged	75.37.47	*	*	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS														
Gasket, Spiral Wound	85.41.37	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*	*	*	*	*

Class No.: HN04	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	TERS 76.34.85	Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	COMP. NAME	DESCRIPTION
20 × 15			*	*	*	*	400 × 50		*				BROS	Branch Fitting Socket-Weld. Outlet
25 × 15			*	*	*	*	400 × 80		*				BROB	Branch Outlet Red. Butt-Weld
25 × 20			*	*	*	*	400 × 100		*				RECB	Reducer Conc. Butt-Weld. End
40 × 15			*	*	*	*	400 × 150		*	*	*	*	REEB	Reducer Ecc. Butt-Weld. End
40 × 20			*	*	*	*	400 × 200		*	*	*	*	TERB	Tee Reducing Butt-Weld. End
40 × 25			*	*	*	*	400 × 250		*	*	*	*	TERS	Tee Reducing Socket-Weld. End
50 × 20			*	*			400 × 300		*	*	*	*		
50 × 25			*	*			400 × 350		*	*	*	*		
50 × 40			*	*	*									
80 × 40			*	*	*									
80 × 50		*	*	*	*								RUN	Br. BROS
100 × 40			*	*	*									76.80.26
100 × 50		*	*	*	*								40-150	15 *
100 × 80		*	*	*	*								200-400	*
150 × 50		*	*	*	*									
150 × 80		*	*	*	*								50-80	20 *
150 × 100		*	*	*	*								100-400	*
200 × 50		*	*	*	*									
200 × 80		*	*	*	*								50	25 *
200 × 100		*	*	*	*								80-100	*
200 × 150		*	*	*	*								150-400	*
250 × 50		*	*	*	*									
250 × 80		*	*	*	*								80-100	40 *
250 × 100		*	*	*	*								150-300	*
250 × 150		*	*	*	*								350-400	*
250 × 200		*	*	*	*									
300 × 50		*	*	*	*									
300 × 80		*	*	*	*									
300 × 100		*	*	*	*									
300 × 150		*	*	*	*									
300 × 200		*	*	*	*									
300 × 250		*	*	*	*									
350 × 50		*	*	*	*									
350 × 80		*	*	*	*									
350 × 100		*	*	*	*									
350 × 150		*	*	*	*									
350 × 200		*	*	*	*									
350 × 250		*	*	*	*									
350 × 300		*	*	*	*									

Class No.: HN04	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 110	*
20	4	3/4	× 120	*
25	4	7/8	× 130	*
40	4	1	× 140	*
50	8	7/8	× 150	*
80	8	1 1/8	× 180	*
100	8	1 1/4	× 195	*
150	12	1 3/8	× 260	*
200	12	1 5/8	× 350	*
250	12	1 7/8	× 400	*
300	16	2	× 440	*
350	16	2 1/4	× 480	*
400	16	2 1/2	× 530	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 120	*
20	4	3/4	× 130	*
25	4	7/8	× 140	*
40	4	1	× 160	*
50	8	7/8	× 170	*
80	8	1 1/8	× 210	*
100	8	1 1/4	× 230	*
150	12	1 3/8	× 300	*
200	12	1 5/8	× 400	*
250	12	1 7/8	× 460	*
300	16	2	× 510	*
350	16	2 1/4	× 560	*
400	16	2 1/2	× 620	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	7/8	× 150	*
20	4	7/8	× 150	*
25	4	7/8	× 150	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	1 1/8	× 190	*
100	8	1 1/4	× 210	*
150	12	1 3/8	× 275	*
200	12	1 5/8	× 360	*
250	12	1 7/8	× 415	*
300	16	2	× 455	*
350	16	2 1/4	× 500	*
400	16	2 1/2	× 550	*

* DRAIN POINT Fig. 0I

Run	DN 15-25	Br	DN 15	No.
	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* DRAIN POINT Fig. 0J

Run	DN 50-400	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Gate Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT Fig. 1I

Run	DN 15-25	Br	DN 15	No.
	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT Fig. 1J

Run	DN 50-400	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

Class No.: HN10	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 250 (Class 1500)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-400	250.6	250.4	231.9	226.0	219.1	208.6	193.5	184.7	161.7

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES												
			BRANCH SIZE												
			15	20	25	40	50	80	100	150	200	250	300	350	400
15	160	400	C	C	C	C	E	E	E	E	E	E	E	E	A
20	160	350	C	C	C	C	E	E	E	E	E	E	E	A	
25	160	300	C	C	C	C	E	E	E	E	E	E	A		
40	160	250	C	C	C	C	E	E	E	E	E	A			
50	160	200	C	C	C	C	E	E	E	E	A				
80	160	150	C	C	C	C	E	E	E	A					
100	160	100	C	C	C	C	E	E	A						
150	160	80	C	C	C	C	E	A							
200	160	50	C	C	C	B	A								
250	160	40	C	B	B	A									
300	160	25	B	B	A										
350	160	20	B	A											
400	160	15	A												

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1 and to allowable internal pressure acc. ANSI B31.3.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: HN10	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A106-B
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A106-B

* FLANGES

BLFL	Blind Flange	DN	15-400	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-400	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-400	ASTM	A516-60
WNFL	Welding Neck Flange	DN	15-400	ASTM	A105

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
TEEB	Equal Tee	Butt-Weld. End	DN	15-400	ASTM	A234-WPB
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A105
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A105
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A234-WPB

* REDUCING FITTINGS

BROS	Branch Outlet Socket-Weld. End	DN	15-50	ASTM	A105
BROB	Branch Outlet Red. Butt-Weld.	DN	80-400	ASTM	A105
RECB	Reducer Conc. Butt-Weld. End	DN	20-400	ASTM	A234-WPB
REEB	Reducer Ecc. Butt-Weld. End	DN	20-400	ASTM	A234-WPB
TERB	Tee Reducing Butt-Weld. End	DN	20-400	ASTM	A234-WPB
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A105

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVB	Check Valve Butt-Weld. End	DN	15-400	Body:	ASTM	A216-WCB/WCC, A105	Trim:	AISI	316 (L) + Stellite 6
GABB	Gate Valve BW Bellows Sealed	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105	Trim:	AISI	316 (L) + Stellite 6
GAVB	Gate Valve Butt-Weld. End	DN	15-400	Body:	ASTM	A216-WCB/WCC, A105	Trim:	AISI	316 (L) + Stellite 6
GAVF	Gate Valve Flanged	DN	15-50	Body:	ASTM	A216-WCB/WCC, A105	Trim:	AISI	316 (L) + Stellite 6
GLBB	Globe Valve BW Bellows Sealed	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105	Trim:	AISI	316 (L) + Stellite 6
GLVB	Globe Valve Butt-Weld. End	DN	15-100	Body:	ASTM	A216-WCB/WCC, A105	Trim:	AISI	316 (L) + Stellite 6

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-400	AISI	316, 316L, Graphite Filled CS Centring-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-400	ASTM	A105
STBT	Stud Bolt with Nuts	—		Studs:	ASTM A193-B7
				Nuts:	ASTM A194-2H

Class No.: HN10	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE												
		15	20	25	40	50	80	100	150	200	250	300	350	400
* PIPE														
Pipe	74.30.21/31	*	*	*	*	*	*	*	*	*	*	*	*	*
* FLANGES														
Blind Flange	76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.16	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.62.79	*	*	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS														
Cap	Butt-Weld. End	76.30.18	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.30.38	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.30.39/40	*	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.30.84	*	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.34.38	*	*	*	*								
Elbow 90 Deg.	Socket-Weld. End	76.34.39	*	*	*	*								
Equal Tee	Socket-Weld. End	76.34.84	*	*	*	*								
Coupling	Socket-Weld. End	76.34.28	*	*	*	*								
Cap	Socket-Weld. End	76.34.18	*	*	*	*								
* VALVES														
Check Valve	Butt-Weld. End	75.56.16	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve	BW Bellows Sealed	75.56.40	*	*	*	*								
Gate Valve	Butt-Weld. End	75.56.40	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve	Flanged	75.37.37	*	*	*	*	*							
Globe Valve	BW Bellows Sealed	75.56.54	*	*	*	*								
Globe Valve	Butt-Weld. End	75.56.54	*	*	*	*	*	*	*					
* MISCELLANEOUS														
Gasket, Spiral Wound		85.41.37	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.88.52					*	*	*	*	*	*	*	*

Class No.: HN10	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	TERS 76.34.85	Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	COMP. NAME	DESCRIPTION	
20 × 15			*	*	*	*	400 × 50		*				BROS	Branch Fitting Socket-Weld. Outlet	
25 × 15			*	*	*	*	400 × 80		*				BROB	Branch Outlet Red. Butt-Weld	
25 × 20			*	*	*	*	400 × 100		*				RECB	Reducer Conc. Butt-Weld. End	
40 × 15			*	*	*	*	400 × 150		*	*	*	*	REEB	Reducer Ecc. Butt-Weld. End	
40 × 20			*	*	*	*	400 × 200		*	*	*	*	TERB	Tee Reducing Butt-Weld. End	
40 × 25			*	*	*	*	400 × 250		*	*	*	*	TERS	Tee Reducing Socket-Weld. End	
50 × 20			*	*			400 × 300		*	*	*	*			
50 × 25			*	*			400 × 350		*	*	*	*			
50 × 40			*	*	*										
80 × 40			*	*	*										
80 × 50		*	*	*	*								RUN	Br.	BROS 76.80.26
100 × 40			*	*	*										
100 × 50		*	*	*	*								40-150	15	*
100 × 80		*	*	*	*								200-400		*
150 × 50		*	*	*	*										
150 × 80		*	*	*	*								50-80	20	*
150 × 100		*	*	*	*								100-400		*
200 × 50		*	*	*	*										
200 × 80		*	*	*	*								50	25	*
200 × 100		*	*	*	*								80-100		*
200 × 150		*	*	*	*								150-400		*
250 × 50		*	*	*	*										
250 × 80		*	*	*	*								80-100	40	*
250 × 100		*	*	*	*								150-300		*
250 × 150		*	*	*	*								350-400		*
250 × 200		*	*	*	*										
300 × 50		*	*	*	*										
300 × 80		*	*	*	*										
300 × 100		*	*	*	*										
300 × 150		*	*	*	*										
300 × 200		*	*	*	*										
300 × 250		*	*	*	*										
350 × 50		*	*	*	*										
350 × 80		*	*	*	*										
350 × 100		*	*	*	*										
350 × 150		*	*	*	*										
350 × 200		*	*	*	*										
350 × 250		*	*	*	*										
350 × 300		*	*	*	*										

Class No.: HN10	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 110	*
20	4	3/4	× 120	*
25	4	7/8	× 130	*
40	4	1	× 140	*
50	8	7/8	× 150	*
80	8	1 1/8	× 180	*
100	8	1 1/4	× 195	*
150	12	1 3/8	× 260	*
200	12	1 5/8	× 350	*
250	12	1 7/8	× 400	*
300	16	2	× 440	*
350	16	2 1/4	× 480	*
400	16	2 1/2	× 530	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 120	*
20	4	3/4	× 130	*
25	4	7/8	× 140	*
40	4	1	× 160	*
50	8	7/8	× 170	*
80	8	1 1/8	× 210	*
100	8	1 1/4	× 230	*
150	12	1 3/8	× 300	*
200	12	1 5/8	× 400	*
250	12	1 7/8	× 460	*
300	16	2	× 510	*
350	16	2 1/4	× 560	*
400	16	2 1/2	× 620	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	7/8	× 150	*
20	4	7/8	× 150	*
25	4	7/8	× 150	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	1 1/8	× 190	*
100	8	1 1/4	× 210	*
150	12	1 3/8	× 275	*
200	12	1 5/8	× 360	*
250	12	1 7/8	× 415	*
300	16	2	× 455	*
350	16	2 1/4	× 500	*
400	16	2 1/2	× 550	*

* DRAIN POINT Fig. 0N

Run DN 15-25 Br DN 15

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Gate Valve Butt-Weld Ends	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

* DRAIN POINT Fig. 0N

Run DN 40 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Gate Valve Butt-Weld Ends	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

* DRAIN POINT Fig. 0N

Run DN 50-400 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Gate Valve Butt-Weld Ends	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

* VENT POINT Fig. 1N

Run DN 15-25 Br DN 15
Run DN 40 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Globe Valve Butt-Weld Ends	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

* VENT POINT Fig. 1N

Run DN 50-400 Br DN 20

Branch: Table Page 1	No.
Blind Flange	1
Gasket Spiral Wound	1
Globe Valve Butt-Weld Ends	1
Pipe Nipple 50 mm	1
Stud Bolt with Nuts	4
Welding Neck Flange	1

Class No.: HN14	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 250 (Class 1500)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-200	255.4	250.4	231.9	226.0	219.1	208.6	193.5	184.7	167.1

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES								
			BRANCH SIZE								
			15	20	25	40	50	80	100	150	200
15	160	200	C	C	C	C	E	E	E	E	A
20	160	150	C	C	C	C	E	E	E	A	
25	160	100	C	C	C	C	E	E	A		
40	160	80	C	C	C	C	E	A			
50	160	50	C	C	C	B	A				
80	160	40	C	B	B	A					
100	160	25	B	B	A						
150	160	20	B	A							
200	160	15	A								

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1 and to allowable internal pressure acc. ANSI B31.3.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: HN14	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-200	ASTM	A106-B
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A106-B

* FLANGES

BLFL	Blind Flange	DN	15-200	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-200	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-200	ASTM	A516-60
WNFL	Welding Neck Flange	DN	15-200	ASTM	A105

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-200	ASTM	A234-WPB
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-200	ASTM	A234-WPB
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-200	ASTM	A234-WPB
TEEB	Equal Tee	Butt-Weld. End	DN	15-200	ASTM	A234-WPB
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A105
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A105
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A234-WPB

* REDUCING FITTINGS

BROS	Branch Outlet Socket-Weld. End	DN	15-50	ASTM	A105
BROB	Branch Outlet Red. Butt-Weld.	DN	80-200	ASTM	A105
RECB	Reducer Conc. Butt-Weld. End	DN	20-200	ASTM	A234-WPB
REEB	Reducer Ecc. Butt-Weld. End	DN	20-200	ASTM	A234-WPB
TERB	Tee Reducing Butt-Weld. End	DN	20-200	ASTM	A234-WPB
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A105

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVB	Check Valve Butt-Weld. End	DN	15-200	Body: ASTM A216-WCB/WCC, A105	Trim: AISI 316 (L) + Stellite 6
GAVB	Gate Valve Butt-Weld. End	DN	15-200	Body: ASTM A216-WCB/WCC, A105	Trim: AISI 316 (L) + Stellite 6
GAVF	Gate Valve Flanged	DN	15-50	Body: ASTM A216-WCB/WCC, A105	Trim: AISI 316 (L) + Stellite 6
GLVB	Globe Valve Butt-Weld. End	DN	15-100	Body: ASTM A216-WCB/WCC, A105	Trim: AISI 316 (L) + Stellite 6

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-200	AISI	316, 316L, Graphite Filled CS Centring-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-200	ASTM	A105
STBT	Stud Bolt with Nuts	—	—	Studs: ASTM A193-B7	Nuts: ASTM A194-2H

Class No.: HN14	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE									
		15	20	25	40	50	80	100	150	200	
* PIPE											
Pipe	74.30.21/31	*	*	*	*	*	*	*	*	*	
Pipe Nipple 50 mm		*	*	*	*						
* FLANGES											
Blind Flange	76.62.10	*	*	*	*	*	*	*	*	*	
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	
Spacer Ring Type (ANS Flanges)	76.88.16	*	*	*	*	*	*	*	*	*	
Welding Neck Flange	76.62.79	*	*	*	*	*	*	*	*	*	
* FITTINGS											
Cap	Butt-Weld. End 76.30.18	*	*	*	*	*	*	*	*	*	
Elbow 45 Deg.	Butt-Weld. End 76.30.38	*	*	*	*	*	*	*	*	*	
Elbow 90 Deg.	Butt-Weld. End 76.30.39/40	*	*	*	*	*	*	*	*	*	
Equal Tee	Butt-Weld. End 76.30.84	*	*	*	*	*	*	*	*	*	
Elbow 45 Deg.	Socket-Weld. End 76.34.38	*	*	*	*						
Elbow 90 Deg.	Socket-Weld. End 76.34.39	*	*	*	*						
Equal Tee	Socket-Weld. End 76.34.84	*	*	*	*						
Coupling	Socket-Weld. End 76.34.28	*	*	*	*						
Cap	Socket-Weld. End 76.34.18	*	*	*	*						
* VALVES											
Check Valve Butt-Weld. End	75.56.16	*	*	*	*	*	*	*	*	*	
Gate Valve Butt-Weld. End	75.56.40	*	*	*	*	*	*	*	*	*	
Gate Valve Flanged	75.37.37	*	*	*	*	*					
Globe Valve Butt-Weld. End	75.56.54	*	*	*	*	*	*	*			
* MISCELLANEOUS											
Gasket, Spiral Wound	85.41.37	*	*	*	*	*	*	*	*	*	
Orifice Flange Set	60.88.52					*	*	*	*	*	

Class No.: HN14	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	TERS 76.34.85
20 × 15			*	*	*	*
25 × 15			*	*	*	*
25 × 20			*	*	*	*
40 × 15			*	*	*	*
40 × 20			*	*	*	*
40 × 25			*	*	*	*
50 × 20			*	*		*
50 × 25			*	*		
50 × 40			*	*	*	
80 × 40			*	*		
80 × 50		*	*	*	*	
100 × 40			*	*		*
100 × 50		*	*	*	*	
100 × 80		*	*	*	*	
150 × 50		*				
150 × 80		*	*	*	*	
150 × 100		*	*	*	*	
200 × 50		*				
200 × 80		*				
200 × 100		*	*	*	*	
200 × 150		*	*	*	*	

COMP. NAME	DESCRIPTION		
BROS	Branch Fitting Socket-Weld. Outlet		
BROB	Branch Outlet Red. Butt-Weld		
RECB	Reducer Conc. Butt-Weld. End		
REEB	Reducer Ecc. Butt-Weld. End		
TERB	Tee Reducing Butt-Weld. End		
TERS	Tee Reducing Socket-Weld. End		
RUN	Br.	BROS 76.80.26	
40-150 200	15	*	
50-80 100-200	20	*	
50 80-100 150-200	25	*	
80-100 150-200	40	*	

Class No.: HN14	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 110	*
20	4	3/4	× 120	*
25	4	7/8	× 130	*
40	4	1	× 140	*
50	8	7/8	× 150	*
80	8	1 1/8	× 180	*
100	8	1 1/4	× 195	*
150	12	1 3/8	× 260	*
200	12	1 5/8	× 350	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	7/8	× 150	*
20	4	7/8	× 150	*
25	4	7/8	× 150	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	1 1/8	× 190	*
100	8	1 1/4	× 210	*
150	12	1 3/8	× 275	*
200	12	1 5/8	× 360	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	3/4	× 120	*
20	4	3/4	× 130	*
25	4	7/8	× 140	*
40	4	1	× 160	*
50	8	7/8	× 170	*
80	8	1 1/8	× 210	*
100	8	1 1/4	× 230	*
150	12	1 3/8	× 300	*
200	12	1 5/8	× 400	*

*** DRAIN POINT Fig. 0M**

Run DN 15-25	Br DN 15	No.
Run DN 40	Br DN 20	
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve Butt-Weld Ends		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

*** DRAIN POINT Fig. 0N**

Run DN 50-200	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve Butt-Weld Ends		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

*** VENT POINT Fig. 1M**

Run DN 15-25	Br DN 15	No.
Run DN 40	Br DN 20	
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld Ends		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

*** VENT POINT Fig. 1N**

Run DN 50-200	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld Ends		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

Class No.: HP02	Page: 1	Content: General
Base Material: Alloy Steel (1.25 Cr - 0.5 Mo)	First Issue:	Revision:
Rating: PN 250 (Class 1500)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400	450
Pressure Barg.	DN 15-300	257.6	253.9	239.7	231.9	226.0	222.2	212.1	201.0	183.0	169.0

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES											
			BRANCH SIZE											
			15	20	25	40	50	80	100	150	200	250	300	
15	160	300	C	C	C	C	E	E	E	E	E	E	A	
20	160	250	C	C	C	C	E	E	E	E	E	A		
25	160	200	C	C	C	C	E	E	E	E	A			
40	160	150	C	C	C	C	E	E	E	A				
50	160	100	C	C	C	C	E	E	A					
80	160	80	C	C	C	C	E	A						
100	160	50	C	C	C	B	A							
150	160	40	C	B	B	A								
200	160	25	B	B	A									
250	160	20	B	A										
300	160	15	A											

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.9 and to allowable internal pressure acc ANSI B31.3.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: HP02	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-300	ASTM	A335-P11 (Seamless)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A335-P11 (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-300	ASTM	A182-F11
SBFL	Spectacle Blind Flange	DN	15-300	ASTM	A387-11 CL. 2
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-300	ASTM	A387-11 CL. 2
WNFL	Welding Neck Flange	DN	15-300	ASTM	A182-F11

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-300	ASTM	A234-WP11
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-300	ASTM	A234-WP11
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-300	ASTM	A234-WP11
TEEB	Equal Tee	Butt-Weld. End	DN	15-300	ASTM	A234-WP11
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F11
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F11
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A182-F11
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A182-F11
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A182-F11

* REDUCING FITTINGS

BROS	Branch Outlet Socket-Weld. End	DN	-	ASTM	A182-F11
BROB	Branch Outlet Red. Butt-Weld.	DN	80-300	ASTM	A182-F11
RECB	Reducer Conc. Butt-Weld. End	DN	20-300	ASTM	A234-WP11
REEB	Reducer Ecc. Butt-Weld. End	DN	20-300	ASTM	A234-WP11
TERB	Tee Reducing Butt-Weld. End	DN	20-25	ASTM	A234-WP11
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A182-F11

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVB	Check Valve Butt-Weld. End	DN	15-300	Body:	ASTM	A217-WC6, A182-F11	Trim:	AISI	316 (L) + Stellite 6
GABB	Gate Valve BW Bellows Sealed	DN	15-40	Body:	ASTM	A217-WC6, A182-F11	Trim:	AISI	316 (L) + Stellite 6
GAVB	Gate Valve Butt-Weld. End	DN	15-300	Body:	ASTM	A217-WC6, A182-F11	Trim:	AISI	316 (L) + Stellite 6
GAVF	Gate Valve Flanged	DN	15-50	Body:	ASTM	A217-WC6, A182-F11	Trim:	AISI	316 (L) + Stellite 6
GLBB	Globe Valve BW Bellows Sealed	DN	15-40	Body:	ASTM	A217-WC6, A182-F11	Trim:	AISI	316 (L) + Stellite 6
GLVB	Globe Valve Butt-Weld. End	DN	15-100	Body:	ASTM	A217-WC6, A182-F11	Trim:	AISI	316 (L) + Stellite 6

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-300	AISI	316, 316L, Graphite Filled CS Centring-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-300	ASTM	A182-F11
STBT	Stud Bolt with Nuts	—		Studs:	ASTM A193-B16
				Nuts:	ASTM A194-4

Class No.: HP02	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE										
		15	20	25	40	50	80	100	150	200	250	300
* PIPE												
Pipe	74.33.11	*	*	*	*	*	*	*	*	*	*	*
Pipe Nipple 50 mm		*	*	*	*							
* FLANGES												
Blind Flange	76.64.10	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)		*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.64.80	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS												
Cap	Butt-Weld. End 76.32.18	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End 76.32.38	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End 76.32.39	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End 76.32.84	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End 76.36.38	*	*	*	*							
Elbow 90 Deg.	Socket-Weld. End 76.36.39	*	*	*	*							
Equal Tee	Socket-Weld. End 76.36.80	*	*	*	*							
Coupling	Socket-Weld. End 76.36.28	*	*	*	*							
Cap	Socket-Weld. End 76.36.18	*	*	*	*							
* VALVES												
Check Valve Butt-Weld. End	75.59.10	*	*	*	*	*	*	*	*	*	*	*
Gate Valve BW Bellows Sealed	75.59.30	*	*	*	*							
Gate Valve Butt-Weld. End	75.59.30	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged	75.44.33	*	*	*	*	*						
Globe Valve BW Bellows Sealed	75.59.40	*	*	*	*							
Globe Valve Butt-Weld. End	75.59.40	*	*	*	*	*	*	*				
* MISCELLANEOUS												
Gasket, Spiral Wound	85.41.37	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange set	60.88.52					*	*	*	*	*	*	*

Class No.: HP02	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.79.27	RECB 76.32.70	REEB 76.32.71	TERB 76.32.85	TERS 76.34.85
20 × 15			*	*	*	*
25 × 15			*	*	*	*
25 × 20			*	*	*	*
40 × 15			*	*		*
40 × 20			*	*		*
40 × 25			*	*		*
50 × 20			*	*		*
50 × 25			*	*		*
50 × 40			*	*		*
80 × 40			*	*		*
80 × 50		*	*	*		*
100 × 40			*	*		*
100 × 50		*	*	*		*
100 × 80		*	*	*		*
150 × 50		*				*
150 × 80		*	*	*		*
150 × 100		*	*	*		*
200 × 50		*				*
200 × 80		*				*
200 × 100		*	*	*		*
200 × 150		*	*	*		*
250 × 50		*				*
250 × 80		*				*
250 × 100		*	*	*		*
250 × 150		*	*	*		*
250 × 200		*	*	*		*
300 × 50		*				*
300 × 80		*				*
300 × 100		*				*
300 × 150		*	*	*		*
300 × 200		*	*	*		*
300 × 250		*	*	*		*

COMP. NAME	DESCRIPTION
BROS	Branch Fitting Socket-Weld. Outlet
BROB	Branch Outlet Red. Butt-Weld
RECB	Reducer Conc. Butt-Weld. End
REEB	Reducer Ecc. Butt-Weld. End
TERB	Tee Reducing Butt-Weld. End
TERS	Tee Reducing Socket-Weld. End

RUN	Br.	BROB 76.80.26
40-150	15	*
200-300		*
50-80	20	*
100-300		*
50	25	*
80-100		*
150-300		*
80-100	40	*
150-300		*

Class No.: HP02	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.96
15	4	3/4	× 110	*
20	4	3/4	× 120	*
25	4	7/8	× 130	*
40	4	1	× 140	*
50	8	7/8	× 150	*
80	8	1 1/8	× 180	*
100	8	1 1/4	× 195	*
150	12	1 3/8	× 260	*
200	12	1 5/8	× 350	*
250	12	1 7/8	× 400	*
300	16	2	× 440	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.96
15	4	7/8	× 150	*
20	4	7/8	× 150	*
25	4	7/8	× 150	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	1 1/8	× 190	*
100	8	1 1/4	× 210	*
150	12	1 3/8	× 275	*
200	12	1 5/8	× 360	*
250	12	1 7/8	× 415	*
300	16	2	× 455	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.96
15	4	3/4	× 120	*
20	4	3/4	× 130	*
25	4	7/8	× 140	*
40	4	1	× 160	*
50	8	7/8	× 170	*
80	8	1 1/8	× 210	*
100	8	1 1/4	× 230	*
150	12	1 3/8	× 300	*
200	12	1 5/8	× 400	*
250	12	1 7/8	× 460	*
300	16	2	× 510	*

* DRAIN POINT Fig. 0N

Run DN 15-25	Br DN 15	No.
Run DN 40	Br DN 20	
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve Butt-Weld Ends		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

* DRAIN POINT Fig. 0N

Run DN 50-300	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve Butt-Weld Ends		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

* VENT POINT Fig. 1N

Run DN 15-25	Br DN 15	No.
Run DN 40	Br DN 20	
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld Ends		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

* VENT POINT Fig. 1N

Run DN 50-300	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld Ends		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

Class No.: HS06	Page: 1	Content: General
Base Material: Stainless Steel AISI 321/347	First Issue:	Revision:
Rating: PN 250 (Class 1500)		Date:
Corrosion Allowance: 0 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400	450
Pressure Barg.	DN 15-50	236.8	231.0	207.6	187.5	171.7	160.1	152.6	146.6	143.0	140.9
	DN 80-100	190.7	190.7	190.7	187.5	171.7	160.1	152.6	146.6	143.0	140.9

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES							100
			BRANCH SIZE							
			15	20	25	40	50	80		
15	80S	100	C	C	C	C	E	E	A	
20	80S	80	C	C	C	C	E	A		
25	80S	50	C	C	C	B	A			
40	80S	40	C	B	B	A				
50	80S	25	B	B	A					
80	80S	20	B	A						
100	80S	15	A							

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 2.4 and to allowable internal pressure acc. ANSI B31.3 and to bolting material.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: HS06	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-100	ASTM	A312-TP321/347 (Seamless or Welded)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A312-TP321/347 (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-100	ASTM	A182-F321/347
SBFL	Spectacle Blind Flange	DN	15-100	ASTM	A240-TP321/347
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-100	ASTM	A240-TP321/347
WNFL	Welding Neck Flange	DN	15-100	ASTM	A182-F321/347

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-100	ASTM	A403-WP321/347
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-100	ASTM	A403-WP321/347
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-100	ASTM	A403-WP321/347
TEEB	Equal Tee	Butt-Weld. End	DN	15-100	ASTM	A403-WP321/347
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F321/347
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F321/347
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A182-F321/347
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A182-F321/347
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A182-F321/347

* REDUCING FITTINGS

BROS	Branch Outlet Socket-Weld. End	DN	15-50	ASTM	A182-F321/347
BROB	Branch Outlet Red. Butt-Weld.	DN	80-100	ASTM	A182-F321/347
RECB	Reducer Conc. Butt-Weld. End	DN	20-100	ASTM	A403-WP321/347
REEB	Reducer Ecc. Butt-Weld. End	DN	20-100	ASTM	A403-WP321/347
TERB	Tee Reducing Butt-Weld. End	DN	20-50	ASTM	A403-WP321/347
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A182-F321/347

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVF	Check Valve Flanged	DN	15-100	Body: ASTM A351-CF8C, A182-F321 Trim: AISI 321
GAVF	Gate Valve Flanged	DN	15-100	Body: ASTM A351-CF8C, A182-F321 Trim: AISI 321
GLVF	Globe Valve Flanged	DN	15-100	Body: ASTM A351-CF8C, A182-F321 Trim: AISI 321

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-100	AISI 316, 316L, Graphite Filled CS Centring-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-100	ASTM A182-F321/347
STBT	Stud Bolt with Nuts	—	—	ASTM A453-Gr. 660, CL.

Class No.: HS06	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE							
		15	20	25	40	50	80	100	
* PIPE									
Pipe	74.36.40	*	*	*	*	*	*	*	*
* FLANGES									
Blind Flange	76.65.10	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)		*	*	*	*	*	*	*	*
Welding Neck Flange	76.65.80	*	*	*	*	*	*	*	*
* FITTINGS									
Cap	Butt-Weld. End	76.33.18	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.33.38	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.33.39	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.33.84	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End	76.37.38	*	*	*	*	*	*	*
Elbow 90 Deg.	Socket-Weld. End	76.37.39	*	*	*	*	*	*	*
Equal Tee	Socket-Weld. End	76.37.80	*	*	*	*	*	*	*
Coupling	Socket-Weld. End	76.37.28	*	*	*	*	*	*	*
Cap	Socket-Weld. End	76.37.18	*	*	*	*	*	*	*
* VALVES									
Check Valve Flanged		75.40.11	*	*	*	*	*	*	*
Gate Valve Flanged		75.40.31	*	*	*	*	*	*	*
Globe Valve Flanged		75.40.41	*	*	*	*	*	*	*
* MISCELLANEOUS									
Gasket, Spiral Wound		85.41.37	*	*	*	*	*	*	*
Orifice Flange Set		60.88.52				*	*	*	*

Class No.: HS06	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB	RECB 76.33.70	REEB 76.33.73	TERB 76.33.85	TERS 76.37.85
20	× 15		*	*	*	*
25	× 15		*	*	*	*
25	× 20		*	*	*	*
40	× 15		*	*	*	*
40	× 20		*	*	*	*
40	× 25		*	*	*	*
50	× 20		*	*		
50	× 25		*	*		
50	× 40		*	*	*	
80	× 40		*	*		
80	× 50	*	*	*		
100	× 40		*	*		
100	× 50	*	*	*		
100	× 80	*	*	*		

COMP. NAME	DESCRIPTION
BROS	Branch Fitting Socket-Weld. Outlet
BROB	Branch Outlet Red. Butt-Weld
RECB	Reducer Conc. Butt-Weld. End
REEB	Reducer Ecc. Butt-Weld. End
TERB	Tee Reducing Butt-Weld. End
TERS	Tee Reducing Socket-Weld. End

RUN	Br.	BROS 76.80.61
40-100	15	*
50-80	20	*
100		*
50	25	*
80-100		*
80-100	40	*

Class No.: HS06	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.40
15	4	3/4	× 110	*
20	4	3/4	× 120	*
25	4	7/8	× 130	*
40	4	1	× 140	*
50	8	7/8	× 150	*
80	8	1 1/8	× 180	*
100	8	1 1/4	× 195	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.40
15	4	7/8	× 150	*
20	4	7/8	× 150	*
25	4	7/8	× 150	*
40	4	1	× 160	*
50	8	7/8	× 160	*
80	8	1 1/8	× 190	*
100	8	1 1/4	× 210	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.40
15	4	3/4	× 120	*
20	4	3/4	× 130	*
25	4	7/8	× 140	*
40	4	1	× 160	*
50	8	7/8	× 170	*
80	8	1 1/8	× 210	*
100	8	1 1/4	× 230	*

*** DRAIN POINT Fig. 0I**

Run DN 15-25	Br DN 15	No.
Run DN 40	Br DN 20	1
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		2
Gate Valve Flanged		1
Stud Bolt with Nuts		8
Welding Neck Flange		1

*** DRAIN POINT Fig. 0J**

Run DN 50-100	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		2
Gate Valve Flanged		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		8
Welding Neck Flange		1

*** VENT POINT Fig. 1I**

Run DN 15-25	Br DN 15	No.
Run DN 40	Br DN 20	1
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		2
Globe Valve Flanged		1
Stud Bolt with Nuts		8
Welding Neck Flange		1

*** VENT POINT Fig. 1J**

Run DN 50-100	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		2
Globe Valve Flanged		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		8
Welding Neck Flange		1

Class No.: JN01	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 420 (Class 2500)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	200	250	300	350	400
Pressure Barg.	DN 15-300	257.6	257.6	245.9	228.5	217.4	166.3

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES										
			BRANCH SIZE										
			15	20	25	40	50	80	100	150	200	250	300
15	160	300	C	C	C	C	E	E	E	B	B	B	A
20	160	250	C	C	C	C	E	E	E	B	B	A	
25	160	200	C	C	C	C	E	E	B	B	A		
40	160	150	C	C	C	C	E	B	B	A			
50	160	100	C	C	C	C	B	B	A				
80	160	80	C	C	C	B	B	A					
100	160	50	C	C	C	B	B	A					
150	160	40	C	B	B	A							
200	160	25	B	B	A								
250	160	20	B	A									
300	160	15	A										

Notes:

- Design limits are based on allowable internal pressure, according to ANSI B31.3.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: JN01	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-300	ASTM	A106-B
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A106-B

* FLANGES

BLFL	Blind Flange	DN	15-300	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-300	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-300	ASTM	A516-60
WNFL	Welding Neck Flange	DN	15-300	ASTM	A105

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-300	ASTM	A234-WPB
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-300	ASTM	A234-WPB
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-300	ASTM	A234-WPB
TEEB	Equal Tee	Butt-Weld. End	DN	15-300	ASTM	A234-WPB
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A105
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A105
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A105
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A105

* REDUCING FITTINGS

BROS	Branch Outlet Socket-Weld. End	DN	15-50	ASTM	A105
BROB	Branch Outlet Red. Butt-Weld.	DN	80-300	ASTM	A105
RECB	Reducer Conc. Butt-Weld. End	DN	20-300	ASTM	A234-WPB
REEB	Reducer Ecc. Butt-Weld. End	DN	20-300	ASTM	A234-WPB
TERB	Tee Reducing Butt-Weld. End	DN	20-300	ASTM	A234-WPB
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A105

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVF	Check Valve Flanged	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6
		DN	50-300	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GAVF	Gate Valve Flanged	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6
		DN	50-300	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GLVF	Globe Valve Flanged	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6
		DN	50-100	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-300	AISI 316, 316L, Graphite Filled, CS Centring-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-300	ASTM A105
STBT	Stud Bolt with Nuts	—		Studs: ASTM A193-B7 Nuts: ASTM A194-2H

Class No.: JN01	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE										
		15	20	25	40	50	80	100	150	200	250	300
* PIPE												
Pipe	74.30.21/31	*	*	*	*	*	*	*	*	*	*	*
Pipe Nipple 50 mm		*	*	*	*							
* FLANGES												
Blind Flange	76.62.10	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)	76.88.16	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.62.79	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS												
Cap	Butt-Weld. End 76.30.18	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End 76.30.38	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End 76.30.39/40	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End 76.30.84	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End 76.34.38	*	*	*	*							
Elbow 90 Deg.	Socket-Weld. End 76.34.39	*	*	*	*							
Equal Tee	Socket-Weld. End 76.34.84	*	*	*	*							
Coupling	Socket-Weld. End 76.34.28	*	*	*	*							
Cap	Socket-Weld. End 76.34.18	*	*	*	*							
* VALVES												
Check Valve Flanged	75.37.18					*	*	*	*	*	*	*
Gate Valve Flanged	75.37.38	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged	75.37.48	*	*	*	*	*	*	*				
* MISCELLANEOUS												
Gasket, Spiral Wound	85.41.37	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*	*	*

Class No.: JN01	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.05	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	TERS 76.34.85
20 × 15			*	*	*	*
25 × 15			*	*	*	*
25 × 20			*	*	*	*
40 × 15			*	*	*	*
40 × 20			*	*	*	*
40 × 25			*	*	*	*
50 × 20			*	*		
50 × 25			*	*		
50 × 40			*	*	*	
80 × 40			*	*	*	
80 × 50		*	*	*	*	
100 × 40			*	*		
100 × 50		*	*	*	*	
100 × 80		*	*	*	*	
150 × 50		*				
150 × 80		*	*	*	*	
150 × 100		*	*	*	*	
200 × 50		*				
200 × 80		*				
200 × 100		*	*	*	*	
200 × 150		*	*	*	*	
250 × 50		*				
250 × 80		*				
250 × 100		*	*	*	*	
250 × 150		*	*	*	*	
250 × 200		*	*	*	*	
300 × 50		*				
300 × 80		*				
300 × 100		*				
300 × 150		*	*	*	*	
300 × 200		*	*	*	*	
300 × 250		*	*	*	*	

COMP. NAME	DESCRIPTION
BROS	Branch Fitting Socket-Weld. Outlet
BROB	Branch Outlet Red. Butt-Weld
RECB	Reducer Conc. Butt-Weld. End
REEB	Reducer Ecc. Butt-Weld. End
TERB	Tee Reducing Butt-Weld. End
TERS	Tee Reducing Socket-Weld. End

RUN	Br.	BROB 76.80.26
40-150	15	*
200-300		*
50-80	20	*
100-300		*
50	25	*
80-100		*
150-300		*
80-100	40	*
150-300		*

Class No.: JN01	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	3/4	×	130 *
20	4	3/4	×	130 *
25	4	7/8	×	140 *
40	4	1 1/8	×	170 *
50	8	1	×	180 *
80	8	1 1/4	×	220 *
100	8	1 1/2	×	300 *
150	8	2	×	410 *
200	12	2	×	445 *
250	12	2 1/2	×	570 *
300	12	2 3/4	×	630 *

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	3/4	×	140 *
20	4	3/4	×	140 *
25	4	7/8	×	160 *
40	4	1 1/8	×	190 *
50	8	1	×	210 *
80	8	1 1/4	×	260 *
100	8	1 1/2	×	345 *
150	8	2	×	455 *
200	12	2	×	510 *
250	12	2 1/2	×	640 *
300	12	2 3/4	×	720 *

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
50	8	1	×	190 *
80	8	1 1/4	×	230 *
100	8	1 1/2	×	320 *
150	8	2	×	415 *
200	12	2	×	455 *
250	12	2 1/2	×	570 *
300	12	2 3/4	×	640 *

* DRAIN POINT Fig. 0M

Run DN 15-25	Br DN 15	No.
Run DN 40	Br DN 20	1
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve Butt-Weld. End		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

* DRAIN POINT Fig. 0N

Run DN 50-300	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve Butt-Weld. End		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

* VENT POINT Fig. 1M

Run DN 15-25	Br DN 15	No.
Run DN 40	Br DN 20	1
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld. End		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

* VENT POINT Fig. 1N

Run DN 50-300	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve Butt-Weld. End		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

Class No.: JP05	Page: 1	Content: General
Base Material: Alloy Steel (2.25 Cr, 1.0 Mo)	First Issue:	Revision:
Rating: PN 420 (Class 2500)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	100	150	200	400	450	500	538
Pressure Barg.	DN 15-300	257.6	237.5	231.8	230.6	230.5	193.5	148.4	100.1

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES										
			BRANCH SIZE										
			15	20	25	40	50	80	100	150	200	250	300
15	160	300	C	C	C	C	E	E	E	B	B	B	A
20	160	250	C	C	C	C	E	E	E	B	B	A	
25	160	200	C	C	C	C	E	E	B	B	A		
40	160	150	C	C	C	C	E	B	B	A			
50	160	100	C	C	C	C	B	B	A				
80	160	80	C	C	C	B	B	A					
100	160	50	C	C	C	B	B	A					
150	160	40	C	B	B	A							
200	160	25	B	B	A								
250	160	20	B	A									
300	160	15	A										

Notes:

- Design limits are based on allowable internal pressure, according to ANSI B31.3.
- For temperature points a branch outlet (DN 50) shall be used for nominal pipe sizes DN 80 and above.
- Bolt diameter limited to 2 inch.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: JP05	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-300	ASTM	A335-P22 Seamless
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A335-P22 Seamless

* FLANGES

BLFL	Blind Flange	DN	15-300	ASTM	A182-F22-CL3
SBFL	Spectacle Blind Flange	DN	15-300	ASTM	A387-22-CL2
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-300	ASTM	A387-22-CL2
WNFL	Welding Neck Flange	DN	15-300	ASTM	A182-F22-CL3

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-300	ASTM	A234-WP22-CL3
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-300	ASTM	A234-WP22-CL3
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-300	ASTM	A234-WP22-CL3
TEEB	Equal Tee	Butt-Weld. End	DN	15-300	ASTM	A234-WP22-CL3
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F22-CL3
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F22-CL3
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A182-F22-CL3
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A182-F22-CL3
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A182-F22-CL3

* REDUCING FITTINGS

BROS	Branch Outlet Socket-Weld. End	DN	15-50	ASTM	A182-F22-CL3
BROB	Branch Outlet Red. Butt-Weld.	DN	80-300	ASTM	A182-F22-CL3
RECB	Reducer Conc. Butt-Weld. End	DN	20-300	ASTM	A234-WP22-CL3
REEB	Reducer Ecc. Butt-Weld. End	DN	20-300	ASTM	A234-WP22-CL3
TERB	Tee Reducing Butt-Weld. End	DN	20-300	ASTM	A234-WP22-CL3
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A182-F22-CL3

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHSB	Check Valve B.W. Special Class	DN	15-300	Body:	ASTM	A182-F22-CL3
				Trim:	AISI	316 (L) + Stellite 6
GASB	Gate Valve B.W. Special Class	DN	15-300	Body:	ASTM	A182-F22-CL3
				Trim:	AISI	316 (L) + Stellite 6
GLSB	Globe Valve B.W. Special Class	DN	15-100	Body:	ASTM	A182-F22-CL3
				Trim:	AISI	316 (L) + Stellite 6

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-300	AISI	316, 316L, Graphite Filled, CS Centring-, SS Inner-Ring
ORFS	Orifice Flange Set	DN	50-200	ASTM	A182-F22-CL3
STBT	Stud Bolt with Nuts			Studs:	ASTM A193-B16
				Nuts:	ASTM A194-8C

Class No.: JP05	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE										
		15	20	25	40	50	80	100	150	200	250	300
* PIPE												
Pipe	74.33.21	*	*	*	*	*	*	*	*	*	*	*
Pipe Nipple 50 mm		*	*	*	*							
* FLANGES												
Blind Flange	76.64.12	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)		*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.64.82	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS												
Cap	Butt-Weld. End 76.32.18	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End 76.32.38	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End 76.32.39/40	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End 76.32.84	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End 76.36.38	*	*	*	*							
Elbow 90 Deg.	Socket-Weld. End 76.36.39	*	*	*	*							
Equal Tee	Socket-Weld. End 76.36.80	*	*	*	*							
Coupling	Socket-Weld. End 76.36.28	*	*	*	*							
Cap	Socket-Weld. End 76.36.18	*	*	*	*							
* VALVES												
Check Valve BW. Special Class	75.59.10	*	*	*	*	*	*	*	*	*	*	*
Gate Valve BW. Special Class	75.59.30	*	*	*	*	*	*	*	*	*	*	*
Globe Valve BW. Special Class	75.59.40	*	*	*	*	*	*	*				
* MISCELLANEOUS												
Gasket, Spiral Wound	85.41.37	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*		

Class No.: JP05	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.80.10	RECB 76.32.70	REEB 76.32.71	TERB 76.32.85	TERS 76.36.85
20 × 15			*	*	*	*
25 × 15			*	*	*	*
25 × 20			*	*	*	*
40 × 15			*	*	*	*
40 × 20			*	*	*	*
40 × 25			*	*	*	*
50 × 20			*	*	*	*
50 × 25			*	*	*	*
50 × 40			*	*	*	*
80 × 40			*	*	*	*
80 × 50		*	*	*	*	*
100 × 40			*	*	*	*
100 × 50		*	*	*	*	*
100 × 80		*	*	*	*	*
150 × 50		*	*	*	*	*
150 × 80		*	*	*	*	*
150 × 100		*	*	*	*	*
200 × 50		*	*	*	*	*
200 × 80		*	*	*	*	*
200 × 100		*	*	*	*	*
200 × 150		*	*	*	*	*
250 × 50		*	*	*	*	*
250 × 80		*	*	*	*	*
250 × 100		*	*	*	*	*
250 × 150		*	*	*	*	*
250 × 200		*	*	*	*	*
300 × 50		*	*	*	*	*
300 × 80		*	*	*	*	*
300 × 100		*	*	*	*	*
300 × 150		*	*	*	*	*
300 × 200		*	*	*	*	*
300 × 250		*	*	*	*	*

COMP. NAME	DESCRIPTION
BROS	Branch Fitting Socket-Weld. Outlet
BROB	Branch Outlet Red. Butt-Weld
RECB	Reducer Conc. Butt-Weld. End
REEB	Reducer Ecc. Butt-Weld. End
TERB	Tee Reducing Butt-Weld. End
TERS	Tee Reducing Socket-Weld. End

RUN	Br.	BROS 76.83.43
40-150	15	*
200-300		*
50-80	20	*
100-300		*
50	25	*
80-100		*
150-300		*
80-100	40	*
150-300		*

Class No.: JP05	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.96
15	4	3/4	× 130	*
20	4	3/4	× 130	*
25	4	7/8	× 140	*
40	4	1 1/8	× 170	*
50	8	1	× 180	*
80	8	1 1/4	× 220	*
100	8	1 1/2	× 300	*
150	8	2	× 410	*
200	12	2	× 445	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.96
50	8	1	× 190	*
80	8	1 1/4	× 230	*
100	8	1 1/2	× 320	*
150	8	2	× 415	*
200	12	2	× 455	*

*** DRAIN POINT Fig. 0N**

Run DN 15-25	Br DN 15	No.
Run DN 40	Br DN 20	
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve BW Special Class		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.96
15	4	3/4	× 140	*
20	4	3/4	× 140	*
25	4	7/8	× 160	*
40	4	1 1/8	× 190	*
50	8	1	× 210	*
80	8	1 1/4	× 260	*
100	8	1 1/2	× 345	*
150	8	2	× 455	*
200	12	2	× 510	*

*** DRAIN POINT Fig. 0N**

Run DN 50-300	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Gate Valve BW Special Class		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

*** VENT POINT Fig. 1N**

Run DN 15-25	Br DN 15	No.
Run DN 40	Br DN 20	
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Globe Valve BW Special Class		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

*** VENT POINT Fig. 1N**

Run DN 50-300	Br DN 20	No.
Branch: Table Page 1		1
Blind Flange		1
Gasket Spiral Wound		1
Pipe Nipple 50 mm		1
Stud Bolt with Nuts		4
Welding Neck Flange		1

Class No.: JS02	Page: 1	Content: General
Base Material: Stainless Steel AISI 316	First Issue:	Revision:
Rating: PN 420 (Class 2500)		Date:
Corrosion Allowance: 0 mm		Sign:

Temperature °C		0	50	150	200	250	300	350	400
Pressure Barg.	DN 15-300	223.4	223.4	223.4	208.5	195.3	183.9	175.5	168.4

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES										
			BRANCH SIZE										
			15	20	25	40	50	80	100	150	200	250	300
15	160	300	C	C	C	C	E	E	E	B	B	B	A
20	160	250	C	C	C	C	E	E	E	B	B	A	
25	160	200	C	C	C	C	E	E	B	B	A		
40	160	150	C	C	C	C	E	B	B	A			
50	160	100	C	C	C	C	B	B	A				
80	160	80	C	C	C	B	B	A					
100	160	50	C	C	C	B	B	A					
150	160	40	C	B	B	A							
200	160	25	B	B	A								
250	160	20	B	A									
300	160	15	A										

Notes:

- Design limits are based on allowable internal pressure according to ANSI B31.3.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: JS02	Page: 2	Content: Material Descriptions
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* PIPE					* VALVES					
PIPE	Pipe		DN	15-300	ASTM	A312-TP316L (Seamless or Welded)	CHVF	Check Valve Flanged	DN 15-300	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316 (L) + Stellite 6
PNPP	Pipe Nipple 50 mm		DN	15-40	ASTM	A312-TP316L (Seamless)	GAVB	Gate Valve Butt-Weld Ends	DN 15-40	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316 (L) + Stellite 6
* FLANGES					* MISCELLANEOUS					
BLFL	Blind Flange		DN	15-150	ASTM	A182-F316	GLVB	Globe Valve Butt-Weld Ends	DN 15-40	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316 (L) + Stellite 6
SBFL	Spectacle Blind Flange		DN	15-300	ASTM	A240-TP316	GLVF	Globe Valve Flanged	DN 15-100	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316 (L) + Stellite 6
SPRT	Spacer Ring Type (ANS Flanges)		DN	15-300	ASTM	A240-TP316				
WNFL	Welding Neck Flange		DN	15-300	ASTM	A182-F316				
* FITTINGS					* MISCELLANEOUS					
CAPB	Cap	Butt-Weld. End	DN	15-300	ASTM	A403-WP316L	GKSW	Gasket, Spiral Wound	DN 15-300	AISI 316, 316L, Graphite Filled, CS Centring-, SS Inner-Ring
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-300	ASTM	A403-WP316L	ORFS	Orifice Flange Set	DN 50-300	ASTM A182-F316
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-300	ASTM	A403-WP316L	STBT	Stud Bolt with Nuts	—	Studs: ASTM A193-B7 Nuts: ASTM A194-2H
TEEB	Equal Tee	Butt-Weld. End	DN	15-300	ASTM	A403-WP316L				
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F316				
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	15-40	ASTM	A182-F316				
TEES	Equal Tee	Socket-Weld. End	DN	15-40	ASTM	A182-F316				
COUS	Coupling	Socket-Weld. End	DN	15-40	ASTM	A182-F316				
CAPS	Cap	Socket-Weld. End	DN	15-40	ASTM	A182-F316				
* REDUCING FITTINGS										
BROS	Branch Outlet Socket-Weld. End		DN	15-50	ASTM	A182-F316				
BROB	Branch Outlet Red. Butt-Weld.		DN	80-300	ASTM	A182-F316				
RECB	Reducer Conc. Butt-Weld. End		DN	20-300	ASTM	A403-WP316L				
REEB	Reducer Ecc. Butt-Weld. End		DN	20-300	ASTM	A403-WP316L				
TERB	Tee Reducing Butt-Weld. End		DN	20-300	ASTM	A403-WP316L				
TERS	Tee Reducing Socket-Weld. End		DN	20-40	ASTM	A182-F316				

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

Class No.: JS02	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE										
		15	20	25	40	50	80	100	150	200	250	300
* PIPE												
Pipe	74.36.40	*	*	*	*	*	*	*	*	*	*	*
Pipe Nipple 50 mm		*	*	*	*							
* FLANGES												
Blind Flange	76.65.11	*	*	*	*	*	*	*	*			
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)		*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange	76.65.80	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS												
Cap	Butt-Weld. End 76.33.18	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End 76.33.38	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End 76.33.40	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End 76.33.84	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Socket-Weld. End 76.37.38	*	*	*	*							
Elbow 90 Deg.	Socket-Weld. End 76.37.39	*	*	*	*							
Equal Tee	Socket-Weld. End 76.37.80	*	*	*	*							
Coupling	Socket-Weld. End 76.37.28	*	*	*	*							
Cap	Socket-Weld. End 76.37.18	*	*	*	*							
* VALVES												
Check Valve Flanged	75.40.11					*	*	*	*	*	*	*
Gate Valve Butt-Weld Ends	75.58.31	*	*	*	*							
Gate Valve Flanged	75.40.31	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Butt-Weld Ends	75.58.41	*	*	*	*							
Globe Valve Flanged	75.40.41	*	*	*	*	*	*	*				
* MISCELLANEOUS												
Gasket, Spiral Wound	85.41.37	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.52					*	*	*	*	*	*	*

Class No.: JS02	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.79.71	RECB 76.33.70	REEB 76.33.73	TERB 76.33.85	TERS 76.37.85
20 × 15			*	*	*	*
25 × 15			*	*	*	*
25 × 20			*	*	*	*
40 × 15			*	*	*	*
40 × 20			*	*	*	*
40 × 25			*	*	*	*
50 × 20			*	*	*	*
50 × 25			*	*	*	*
50 × 40			*	*	*	*
80 × 40			*	*	*	*
80 × 50	*		*	*	*	*
100 × 40			*	*	*	*
100 × 50	*		*	*	*	*
100 × 80	*		*	*	*	*
150 × 50	*		*	*	*	*
150 × 80	*		*	*	*	*
150 × 100	*		*	*	*	*
200 × 50	*		*	*	*	*
200 × 80	*		*	*	*	*
200 × 100	*	*	*	*	*	*
200 × 150	*	*	*	*	*	*
250 × 50	*		*	*	*	*
250 × 80	*		*	*	*	*
250 × 100	*	*	*	*	*	*
250 × 150	*	*	*	*	*	*
250 × 200	*	*	*	*	*	*
300 × 50	*		*	*	*	*
300 × 80	*		*	*	*	*
300 × 100	*		*	*	*	*
300 × 150	*	*	*	*	*	*
300 × 200	*	*	*	*	*	*
300 × 250	*	*	*	*	*	*

COMP. NAME	DESCRIPTION
BROS	Branch Fitting Socket-Weld. Outlet
BROB	Branch Outlet Red. Butt-Weld
RECB	Reducer Conc. Butt-Weld. End
REEB	Reducer Ecc. Butt-Weld. End
TERB	Tee Reducing Butt-Weld. End
TERS	Tee Reducing Socket-Weld. End

RUN	Br.	BROS 76.83.38
40-150	15	*
200-300		*
50-80	20	*
100-300		*
50	25	*
80-100		*
150-300		*
80-100	40	*
150-300		*

Class No.: JS02	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	3/4	×	130 *
20	4	3/4	×	130 *
25	4	7/8	×	140 *
40	4	1 1/8	×	170 *
50	8	1	×	180 *
80	8	1 1/4	×	220 *
100	8	1 1/2	×	300 *
150	8	2	×	410 *
200	12	2	×	445 *
250	12	2 1/2	×	570 *
300	12	2 3/4	×	630 *

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
50	8	1	×	190 *
80	8	1 1/4	×	230 *
100	8	1 1/2	×	320 *
150	8	2	×	415 *
200	12	2	×	455 *
250	12	2 1/2	×	570 *
300	12	2 3/4	×	640 *

*** DRAIN POINT Fig. 0N**

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Gate Valve Butt-Weld Ends				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

*** DRAIN POINT Fig. 0N**

Run	DN 50-300	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Gate Valve Butt-Weld Ends				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	3/4	×	140 *
20	4	3/4	×	140 *
25	4	7/8	×	160 *
40	4	1 1/8	×	190 *
50	8	1	×	210 *
80	8	1 1/4	×	260 *
100	8	1 1/2	×	345 *
150	8	2	×	455 *
200	12	2	×	510 *
250	12	2 1/2	×	640 *
300	12	2 3/4	×	720 *

*** VENT POINT Fig. 1N**

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Globe Valve Butt-Weld Ends				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

*** VENT POINT Fig. 1N**

Run	DN 50-300	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Globe Valve Butt-Weld Ends				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

Class No.: JS07	Page: 1	Content: General
Base Material: Stainless Steel AISI 321, Stab. HT.	First Issue:	Revision:
Rating: PN 420 (Class 2500)		Date:
Corrosion Allowance: 0 mm		Sign:

Temperature °C		0	150	200	250	300	350	400	450	500	538
Pressure Barg.	DN 15-50	328.9	312.4	286.3	267.1	254.4	244.4	238.5	234.8	225.9	204.7
	DN 80-600	236.6	236.6	236.6	229.5	218.9	209.9	202.4	198.5	193.6	190.7

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
15	160	600	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A
20	160	500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A
25	160	450	C	C	C	C	E	E	E	E	E	B	B	B	B	A		
40	160	400	C	C	C	C	E	E	E	E	B	B	B	B	A			
50	160	350	C	C	C	C	E	E	E	E	B	B	B	A				
80	160	300	C	C	C	C	E	E	E	B	B	B	A					
100	160	250	C	C	C	C	E	E	E	B	B	A						
150	160	200	C	C	C	C	E	E	B	B	A							
200	24.0	150	C	C	C	C	E	B	B	A								
250	30.0	100	C	C	C	C	B	B	A									
300	36.0	80	C	C	C	B	B	A										
350	40.0	50	C	C	C	B	A											
400	44.0	40	C	B	B	A												
450	50.0	25	B	B	A													
500	56.0	20	B	A														
600	66.0	15	A															

Notes:

- Design limits are acc flange rating ANSI B16.5 material group 2.4 and to allowable internal pressure acc. ANSI B31.3.
- Piston type check valves for horizontal mounting only.
- Cold bending of pipe is not allowed and hot bending is not recommended.
- For temperature points a brach outlet (DN 50) shall be used for nominal pipe sizes DN 80 and above.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld
E	Branch outlet reducing butt-weld

Class No.: JS07	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN 15-150	ASTM A312-TP321	Stab.HT.
		DN 200-300	ASTM A312-TP321	Stab.HT.
		DN 350-600	ASTM A358-TP321	Stab.HT.
PNPP	Pipe Nipple 50 mm	DN 15-40	ASTM A312-TP321	Stab.HT.

* FLANGES

BLFL	Blind Flange	DN 15-300	ASTM A182-F321	Stab.HT.
SBFL	Spectacle Blind Flange	DN 15-300	ASTM A240-TP321	Stab.HT.
SPRT	Spacer Ring Type (ANS Flanges)	DN 15-300	ASTM A240-TP321	Stab.HT.
WNFL	Welding Neck Flange	DN 15-300	ASTM A182-F321	Stab.HT.

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN 15-600	ASTM A403-WP-S-321	Stab.HT.
E45B	Elbow 45 Deg.	Butt-Weld. End	DN 15-600	ASTM A403-WP-S-321	Stab.HT.
E90B	Elbow 90 Deg.	Butt-Weld. End	DN 15-400	ASTM A403-WP-S-321	Stab.HT.
			DN 450-600	ASTM A403-WP-S/W-321	Stab.HT.
TEEB	Equal Tee	Butt-Weld. End	DN 15-400	ASTM A403-WP-S-321	Stab.HT.
			DN 450-600	ASTM A403-WP-S/W-321	Stab.HT.
E45S	Elbow 45 Deg.	Socket-Weld. End	DN 15-40	ASTM A182-F321	Stab.HT.
E90S	Elbow 90 Deg.	Socket-Weld. End	DN 15-40	ASTM A182-F321	Stab.HT.
TEES	Equal Tee	Socket-Weld. End	DN 15-40	ASTM A182-F321	Stab.HT.
COUS	Coupling	Socket-Weld. End	DN 15-40	ASTM A182-F321	Stab.HT.
CAPS	Cap	Socket-Weld. End	DN 15-40	ASTM A182-F321	Stab.HT.

* REDUCING FITTINGS

BROS	Branch Outlet Socket-Weld. End	DN 15-50	ASTM A182-F321	Stab.HT.
BROB	Branch Outlet Red. Butt-Weld.	DN 80-600	ASTM A182-F321	Stab.HT.
RECB	Reducer Conc. Butt-Weld. End	DN 20-400	ASTM A403-WP-S-321	Stab.HT.
		DN 450-600	ASTM A403-WP-S/W-321	Stab.HT.
REEB	Reducer Ecc. Butt-Weld. End	DN 20-400	ASTM A403-WP-S-321	Stab.HT.
		DN 450-600	ASTM A403-WP-S/W-321	Stab.HT.
TERB	Tee Reducing Butt-Weld. End	DN 20-400	ASTM A403-WP-S-321	Stab.HT.
		DN 450-600	ASTM A403-WP-S/W-321	Stab.HT.
TERS	Tee Reducing Socket-Weld. End	DN 20-40	ASTM A182-F321	Stab.HT.

Note:

- For full material description see relevant MESC buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

CHVB	Check Valve Butt-Weld Ends	DN 15-300	Body: ASTM A351-CF8C, A182-F321
			Trim: AISI 321 + Stellite 6
GAVB	Gate Valve Butt-Weld Ends	DN 15-300	Body: ASTM A351-CF8C, A182-F321
			Trim: AISI 321 + Stellite 6
GLVB	Globe Valve Butt-Weld Ends	DN 15-100	Body: ASTM A351-CF8C, A182-F321
			Trim: AISI 321 + Stellite 6

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN 15-300	AISI 316, 316L, Graphite Filled, CS Centring-, SS Inner-Ring
STBT	Stud Bolt with Nuts	—	ASTM A453-GR.660, CL.A.

Class No.: JS07	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
* PIPE																	
Pipe	74.36.40	*	*	*	*	*	*	*	*		*	*	*	*	*	*	*
Pipe Nipple 50 mm		*	*	*	*						*	*	*	*	*	*	*
* FLANGES																	
Blind Flange	76.65.10	*	*	*	*	*	*	*	*	*	*	*					
Spectacle Blind Flange	76.88.07	*	*	*	*	*	*	*	*	*	*	*					
Spacer Ring Type (ANS Flanges)		*	*	*	*	*	*	*	*	*	*	*					
Welding Neck Flange	76.65.80	*	*	*	*	*	*	*	*	*	*	*					
* FITTINGS																	
Cap	Butt-Weld. End	76.33.18	*	*	*	*	*	*	*	*							
Elbow 45 Deg.	Butt-Weld. End	76.33.38									*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.33.41	*	*	*	*	*	*	*	*							
Equal Tee	Butt-Weld. End	76.33.84	*	*	*	*	*	*	*	*							
Elbow 45 Deg.	Socket-Weld. End	76.37.38	*	*	*	*					*	*	*	*	*	*	*
Elbow 90 Deg.	Socket-Weld. End	76.37.39	*	*	*	*											
Equal Tee	Socket-Weld. End	76.37.80	*	*	*	*											
Coupling	Socket-Weld. End	76.37.28	*	*	*	*											
Cap	Socket-Weld. End	76.37.18	*	*	*	*											
* VALVES																	
Check Valve Butt-Weld End		75.58.11	*	*	*	*	*	*	*	*	*	*					
Gate Valve Butt-Weld End		75.58.31	*	*	*	*	*	*	*	*	*	*					
Globe Valve Butt-Weld End		75.58.41	*	*	*	*	*	*	*	*	*	*					
* MISCELLANEOUS																	
Gasket, Spiral Wound		85.41.37	*	*	*	*	*	*	*	*	*	*					

Class No.: JS07	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB	RECB 76.33.70	REEB 76.33.73	TERB 76.33.85	TERS 76.37.85	Run	Br.	BROB	RECB 76.33.70	REEB 76.33.73	TERB 76.33.85	COMP. NAME	DESCRIPTION	
20 × 15			*	*	*	*	400 × 50		*				BROS	Branch Fitting Socket-Weld. Outlet	
25 × 15			*	*	*	*	400 × 80		*				BROB	Branch Outlet Red. Butt-Weld	
25 × 20			*	*	*	*	400 × 100		*				RECB	Reducer Conc. Butt-Weld. End	
40 × 15			*	*	*	*	400 × 150		*	*	*		REEB	Reducer Ecc. Butt-Weld. End	
40 × 20			*	*	*	*	400 × 200			*	*	*	TERB	Tee Reducing Butt-Weld. End	
40 × 25			*	*	*	*	400 × 250			*	*	*	TERS	Tee Reducing Socket-Weld. End	
50 × 20			*	*			400 × 300			*	*	*			
50 × 25			*	*			400 × 350			*	*	*			
50 × 40			*	*	*		450 × 50		*						
80 × 40			*	*	*		450 × 80		*						
80 × 50		*	*	*	*		450 × 100		*				RUN	Br.	
100 × 40			*	*	*		450 × 150		*					BROS	
100 × 50		*	*	*	*		450 × 200		*	*	*			76.83.43	
100 × 80		*	*	*	*		450 × 250			*	*	*	40-150	15	*
150 × 50		*					450 × 300			*	*	*	200-600		*
150 × 80		*	*	*	*		450 × 350			*	*	*	50-80	20	*
150 × 100		*	*	*	*		450 × 400			*	*	*	100-600		*
200 × 50		*					500 × 50		*				50	25	*
200 × 80		*					500 × 80		*				80-100		*
200 × 100			*	*	*		500 × 100		*				150-600		*
200 × 150			*	*	*		500 × 150		*						*
250 × 50		*					500 × 200		*	*	*		80-100	40	*
250 × 80		*					500 × 250			*	*	*	150-300		*
250 × 100		*	*	*	*		500 × 300			*	*	*	350-600		*
250 × 150		*	*	*	*		500 × 350			*	*	*			*
250 × 200		*	*	*	*		500 × 400			*	*	*			*
300 × 50		*					500 × 450			*	*	*			*
300 × 80		*					600 × 50		*						*
300 × 100		*					600 × 80		*						*
300 × 150			*	*	*		600 × 100		*						*
300 × 200			*	*	*		600 × 150		*						*
300 × 250			*	*	*		600 × 200		*						*
350 × 50		*					600 × 250		*	*	*				*
350 × 80		*					600 × 300			*	*	*			*
350 × 100		*					600 × 350			*	*	*			*
350 × 150		*	*	*			600 × 400			*	*	*			*
350 × 200			*	*	*		600 × 450			*	*	*			*
350 × 250			*	*	*		600 × 500			*	*	*			*
350 × 300			*	*	*										*

Class No.: JS07	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.40
15	4	3/4	×	130 *
20	4	3/4	×	130 *
25	4	7/8	×	140 *
40	4	1 1/8	×	170 *
50	8	1	×	180 *
80	8	1 1/4	×	220 *
100	8	1 1/2	×	300 *
150	8	2	×	410 *
200	12	2	×	445 *
250	12	2 1/2	×	570 *
300	12	2 3/4	×	630 *

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.40
15	4	3/4	×	140 *
20	4	3/4	×	140 *
25	4	7/8	×	160 *
40	4	1 1/8	×	190 *
50	8	1	×	210 *
80	8	1 1/4	×	260 *
100	8	1 1/2	×	345 *
150	8	2	×	455 *
200	12	2	×	510 *
250	12	2 1/2	×	640 *
300	12	2 3/4	×	720 *

* DRAIN POINT Fig. 0N

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Gate Valve Butt-Weld Ends				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

* DRAIN POINT Fig. 0N

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Gate Valve Butt-Weld Ends				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

* VENT POINT Fig. 1N

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Globe Valve Butt-Weld Ends				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

* VENT POINT Fig. 1N

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Blind Flange				1
Gasket Spiral Wound				1
Globe Valve Butt-Weld Ends				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1