

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.: AN01	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 20 (Class 150)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-600	19.6	19.2	17.6	15.8	13.9	12.0	10.2	8.3	6.5

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

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1.
- Piston type check valves for horizontal mounting only.
- For level gages, recommended max. temperature differential (ambient to fluid) 256°C.
- Application of other types of branch connections is subject to company approval.
- For connections class 300, use equivalent class 300 for flange, bolting and gasket selection.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch outlet socket-weld end
D	Pipe to pipe
E	Branch outlet butt-weld end

Class No.:	AN01	Page:	2	Content:	Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-100	API 5L-B	SML
		DN	150-500	API 5L-B	ERW
		DN	600	API 5L-B	SAW
		DN	15-600	ASTM	A 106 B
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
CAPT	Cap	Threaded Inside	DN	15-40	ASTM	A105

* REDUCING FITTINGS

BROS	Branch Outlet Socket-Weld. End	DN	15-40	ASTM	A105
BROB	Branch Outlet Butt-Weld. End	DN	50-600	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

Notes:

- For full material description see relevant MESC buying description.
- Where both API 5L and ASTM A106 pipes are specified, preference is subject to company approval.
- Where both butt-weld end and socket weld end 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, 410
		DN	50-600	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
CHVS	Check Valve Socket	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6, 410
GAVF	Gate Valve Flanged	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6, 410
		DN	50-600	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GAVS	Gate Valve Sw	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6, 410
GLVF	Globe Valve Flanged	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6, 410
		DN	50-200	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GLVS	Globe Valve Socket	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6, 410

* MISCELLANEOUS

GKTI	Gasket, C.A.F	DN	15-600	C.A.F	
ORFS	Orifice Flange Set	DN	50-600		ASTM A105
STBT	Stud Bolt with Nuts		—	Studs:	ASTM A193-B7
				Nuts:	ASTM A194-2H

Class No.: AN01	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	API-5L GR.B SML	74.13.21	*	*	*	*	*	*	*									
	API-5L GR.B ERW	74.13.23								*	*	*	*	*	*	*	*	
	API-5L GR.B SAW	74.13.23																*
	ASTM A 106 B	74.30.21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pipe nipple (50 mm)	ASTM A 106 B	76.05.56	*	*	*	*												
* 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	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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	Threaded	76.05.18	*	*	*	*												
* VALVES																		
Check Valve Flanged		75.37.12	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Check Valve Socket		75.56.13	*	*	*	*												
Gate Valve Flanged		75.37.32	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Sw		75.56.35	*	*	*	*												
Globe Valve Flanged		75.37.42	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Socket		75.56.45	*	*	*	*												
* MISCELLANEOUS																		
Gasket, RF. C.A.F		85.31.15/17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange set		76.83.00					*	*	*	*	*	*	*	*	*	*	*	*

Class No.: AN01	Page: 4	Content: Reducing Piping Components
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TERS Run	Br.	76.80.05	BROB 76.30.72	RECB 76.30.73	REEB 76.30.85	TERB 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 Outlet Socket-Weld. End
25	× 15		*	*	*	*	400	× 80	*				BROB	Branch Outlet Butt-Weld. End
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	*					
100	× 40		*	*			450	× 150	*					
100	× 50	*	*	*	*		450	× 200	*	*	*	*		
100	× 80	*	*	*	*		450	× 250		*	*	*		
150	× 50	*	*	*	*		450	× 300		*	*	*		
150	× 80	*	*	*	*		450	× 350		*	*	*		
150	× 100	*	*	*	*		450	× 400		*	*	*		
200	× 50	*					500	× 50	*					
200	× 80	*					500	× 80	*					
200	× 100		*	*	*		500	× 100	*					
200	× 150		*	*	*		500	× 150	*					
250	× 50	*					500	× 200	*	*	*	*		
250	× 80	*					500	× 250		*	*	*		
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		*	*	*									

RUN	Br.	BROS 76.80.28
40-150	15	*
200-600		*
40-80	20	*
100-600		*
50	25	*
80-100		*
150-600		*
80-100	40	*
150-300		*
35-600		*

Class No.: AN01	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	×	60 *
20	4	1/2	×	70 *
25	4	1/2	×	70 *
40	4	1/2	×	80 *
50	4	5/8	×	80 *
80	4	5/8	×	100 *
100	8	5/8	×	100 *
150	8	3/4	×	100 *
200	8	3/4	×	110 *
250	12	7/8	×	120 *
300	12	7/8	×	120 *
350	12	1	×	130 *
400	16	1	×	140 *
450	16	1-1/8	×	150 *
500	20	1-1/8	×	160 *
600	20	1-1/4	×	180 *

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	×	70 *
20	4	1/2	×	70 *
25	4	1/2	×	80 *
40	4	1/2	×	80 *
50	4	5/8	×	90 *
80	4	5/8	×	110 *
100	8	5/8	×	110 *
150	8	3/4	×	120 *
200	8	3/4	×	130 *
250	12	7/8	×	140 *
300	12	7/8	×	150 *
350	12	1	×	160 *
400	16	1	×	170 *
450	16	1-1/8	×	180 *
500	20	1-1/8	×	195 *
600	20	1-1/4	×	220 *

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	5/8	×	120 *
20	4	5/8	×	120 *
25	4	5/8	×	120 *
40	4	3/4	×	130 *
50	8	5/8	×	150 *
80	8	3/4	×	150 *
100	12	3/4	×	140 *
150	12	3/4	×	140 *
200	12	7/8	×	150 *
250	16	1	×	170 *
300	16	1-1/8	×	190 *
350	20	1-1/8	×	195 *
400	20	1-1/4	×	210 *
450	24	1-1/4	×	220 *
500	24	1-1/4	×	230 *
600	24	1-1/2	×	260 *

* DRAIN POINT Fig. 0B

Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Cap Threaded				1
Gate Valve SW				1
Pipe Nipple 50 mm				1
Pipe Nipple Plain/Threaded				1

* DRAIN POINT Fig. 0B

Run	DN 40-600	Br	DN 20	No.
Branch: Table Page 1				1
Cap Threaded				1
Gate Valve SW				1
Pipe Nipple 50 mm				1
Pipe Nipple Plain/Threaded				1

* VENT POINT Fig. 1B

Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Cap Threaded				1
Globe Valve Socket				1
Pipe Nipple 50 mm				1
Pipe Nipple Plain/Threaded				1

* VENT POINT Fig. 1B

Run	DN 40-600	Br	DN 20	No.
Branch: Table Page 1				1
Cap Threaded				1
Globe Valve Socket				1
Pipe Nipple 50 mm				1
Pipe Nipple Plain/Threaded				1

Class No.: AN02	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 20 (Class 150)	Date:	
Corrosion Allowance: 1 mm	Sign:	

Temperature °C		0	50	75	100	125	150	175	200
Pressure Barg.	DN 15-80	19.6	19.2	18.4	17.6	16.7	15.8	14.8	11.0
	DN 100-150	19.6	19.2	18.4	17.6	16.7	15.8	14.8	9.0
	DN 200-600	19.6	19.2	18.4	17.6	16.7	15.8	12.0	7.0

TABLE OF SCHEDULES

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

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1 and ball valve rating acc. BS 5351.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch connections is subject to company approval.
- For connections class 300, use equivalent class 300 for flange, bolting and gasket selection.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch outlet socket-weld. end
D	Pipe to pipe
E	Branch outlet butt-weld. end

Class No.:	AN02	Page:	2	Content:	Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-100	API 5L-B	SML
		DN	150-500	API 5L-B	ERW
		DN	600	API 5L-B	SAW
		DN	15-600	ASTM	A 106 B
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 Butt-Weld. End	DN	50-600	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

Notes:

- For full material description see relevant MESC buying description.
- Where both API 5L and ASTM A106 pipes are specified, preference is subject to company approval.
- Where both butt-weld end and socket weld end Fittings are specified, preference is subject to company approval.

* VALVES

BARF	Ball Valve Red. Bore Flanged	DN	15-250	Body:	ASTM	A216-WCB/WCC, A105
				Int.:	AISI	316 (L) / PTFE
CHVF	Check Valve Flanged	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6, 410
		DN	50-600	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
CHVS	Check Valve Socket	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6, 410
GAVF	Gate Valve Flanged	DN	150-600	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, 410
		DN	50-200	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GLVS	Globe Valve Socket	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6, 410

* MISCELLANEOUS

GKTI	Gasket, RF.	DN	15-600	C.A.F	
ORFS	Orifice Flange Set	DN	50-600		ASTM A105
STBT	Stud Bolt with Nuts		—	Studs:	ASTM A193-B7
				Nuts:	ASTM A194-2H

Class No.: AN02	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	API-5L GR.B SML	74.13.21/23	*	*	*	*	*	*	*									
	API-5L GR.B EW	74.13.23								*	*	*	*	*	*	*	*	
	API-5L GR.B SAW	74.13.23																*
	A-106 GR.B	74.30.21/31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pipe nipple (50 mm)	ASTM A 106 B	76.05.56	*	*	*	*												
* 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																		
Ball Valve Red. Bore Flanged		75.37.02	*	*	*	*	*	*	*	*	*	*						
Check Valve Flanged		75.37.12	*	*	*	*												
Check Valve Socket		75.56.13	*	*	*	*												
Gate Valve Flanged		75.37.32							*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged		75.37.42	*	*	*	*												
Globe Valve Socket		75.56.45	*	*	*	*												
* MISCELLANEOUS																		
Gasket, RF. C.A.F		85.31.15/17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		76.83.00					*	*	*	*	*	*	*	*	*	*	*	*

Class No.: AN02	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 Outlet Socket-Weld. End
25 × 15			*	*	*	*	400 × 80		*				BROB	Branch Outlet Butt-Weld. End
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	76.80.28
100 × 50	*		*	*	*		450 × 200			*	*	*		
100 × 80	*		*	*	*		450 × 250			*	*	*	40-150	15
150 × 50	*						450 × 300			*	*	*	200-600	*
150 × 80	*		*	*	*		450 × 350			*	*	*		
150 × 100	*		*	*	*		450 × 400			*	*	*	50-80	20
200 × 50	*						500 × 50		*				100-600	*
200 × 80	*						500 × 80		*					
200 × 100		*	*	*	*		500 × 100		*				50	25
200 × 150		*	*	*	*		500 × 150		*				80-100	*
250 × 50	*						500 × 200		*		*	*	150-600	*
250 × 80	*						500 × 250			*	*	*		
250 × 100	*	*	*	*	*		500 × 300			*	*	*	80-100	40
250 × 150		*	*	*	*		500 × 350			*	*	*	150-300	*
250 × 200		*	*	*	*		500 × 400			*	*	*	35-600	*
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.: AN02	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	×	60 *
20	4	1/2	×	70 *
25	4	1/2	×	70 *
40	4	1/2	×	80 *
50	4	5/8	×	80 *
80	4	5/8	×	100 *
100	8	5/8	×	100 *
150	8	3/4	×	100 *
200	8	3/4	×	110 *
250	12	7/8	×	120 *
300	12	7/8	×	120 *
350	12	1	×	130 *
400	16	1	×	140 *
450	16	1-1/8	×	150 *
500	20	1-1/8	×	160 *
600	20	1-1/4	×	180 *

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	×	70 *
20	4	1/2	×	70 *
25	4	1/2	×	80 *
40	4	1/2	×	80 *
50	4	5/8	×	90 *
80	4	5/8	×	110 *
100	8	5/8	×	110 *
150	8	3/4	×	120 *
200	8	3/4	×	130 *
250	12	7/8	×	140 *
300	12	7/8	×	150 *
350	12	1	×	160 *
400	16	1	×	170 *
450	16	1-1/8	×	180 *
500	20	1-1/8	×	195 *
600	20	1-1/4	×	220 *

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	5/8	×	120 *
20	4	5/8	×	120 *
25	4	5/8	×	120 *
40	4	3/4	×	130 *
50	8	5/8	×	150 *
80	8	3/4	×	150 *
100	12	3/4	×	140 *
150	12	3/4	×	140 *
200	12	7/8	×	150 *
250	16	1	×	170 *
300	16	1-1/8	×	190 *
350	20	1-1/8	×	195 *
400	20	1-1/4	×	210 *
450	24	1-1/4	×	220 *
500	24	1-1/4	×	230 *
600	24	1-1/2	×	260 *

* DRAIN POINT Fig. 2I

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF. Tanged Insert				2
Stud Bolt with Nuts				8
Welding Neck Flange				1

* DRAIN POINT Fig. 2J

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF. Tanged Insert				2
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 RF. Tanged Insert				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 RF. Tanged Insert				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

Class No.: AN04	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 20 (Class 150)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-600	19.6	19.2	17.6	15.8	13.9	12.0	10.2	8.3	6.5

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

Notes:

- Design limits are acc. flange rating ANSI B16.5.
- For connection class 300, use equivalent class 300 for flange, bolting and gasket selection.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch is subject to prior approval of company.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch outlet socket-weld end
D	Pipe to pipe
E	Branch outlet butt-weld end

Class No.: AN04	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-600	ASTM	A 106 B
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 Butt-Weld. End	DN	50-600	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 butt-weld end and socket weld end 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	316 (L) + Stellite 6
GAVF	Gate Valve Flanged	DN	15-600	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6
GLVF	Globe Valve Flanged	DN	15-200	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6

* MISCELLANEOUS

GKTI	Gasket, C.A.F	DN	15-600	C.A.F	
ORFS	Orifice Flange Set	DN	50-600	ASTM	A105
STBT	Stud Bolt with Nuts	—		Studs:	ASTM A193-B7
				Nuts:	ASTM A194-2H

Class No.: AN04	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		74.30.21/31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pipe nipple (50 mm)		76.05.00	*	*	*	*												
* 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		75.42.13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged		75.42.32	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged		75.42.40	*	*	*	*	*	*	*	*								
* MISCELLANEOUS																		
Gasket, RF. C.A.F		85.31.15/17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		76.83.00					*	*	*	*	*	*	*	*	*	*	*	*

Class No.: AN04	Page: 4	Content: Reducing Piping Components
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TERS Run	Br.	76.80.05	BROB 76.30.72	RECB 76.30.73	REEB 76.30.85	TERB 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 Outlet Socket-Weld. End
25	× 15		*	*	*	*	400	× 80	*				BROB	Branch Outlet Butt-Weld. End
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	*					
100	× 40		*	*			450	× 150	*					
100	× 50	*	*	*	*		450	× 200	*	*	*	*		
100	× 80	*	*	*	*		450	× 250		*	*	*		
150	× 50	*	*	*	*		450	× 300		*	*	*		
150	× 80	*	*	*	*		450	× 350		*	*	*		
150	× 100	*	*	*	*		450	× 400		*	*	*		
200	× 50	*					500	× 50	*					
200	× 80	*					500	× 80	*					
200	× 100		*	*	*		500	× 100	*					
200	× 150		*	*	*		500	× 150	*					
250	× 50	*					500	× 200	*	*	*	*		
250	× 80	*					500	× 250		*	*	*		
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		*	*	*									

RUN	Br.	BROS 76.80.28
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.: AN04	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	×	60 *
20	4	1/2	×	70 *
25	4	1/2	×	70 *
40	4	1/2	×	80 *
50	4	5/8	×	80 *
80	4	5/8	×	100 *
100	8	5/8	×	100 *
150	8	3/4	×	100 *
200	8	3/4	×	110 *
250	12	7/8	×	120 *
300	12	7/8	×	120 *
350	12	1	×	130 *
400	16	1	×	140 *
450	16	1-1/8	×	150 *
500	20	1-1/8	×	160 *
600	20	1-1/4	×	180 *

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	×	70 *
20	4	1/2	×	70 *
25	4	1/2	×	80 *
40	4	1/2	×	80 *
50	4	5/8	×	90 *
80	4	5/8	×	110 *
100	8	5/8	×	110 *
150	8	3/4	×	120 *
200	8	3/4	×	130 *
250	12	7/8	×	140 *
300	12	7/8	×	150 *
350	12	1	×	160 *
400	16	1	×	170 *
450	16	1-1/8	×	180 *
500	20	1-1/8	×	195 *
600	20	1-1/4	×	220 *

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	5/8	×	120 *
20	4	5/8	×	120 *
25	4	5/8	×	120 *
40	4	3/4	×	130 *
50	8	5/8	×	150 *
80	8	3/4	×	150 *
100	12	3/4	×	140 *
150	12	3/4	×	140 *
200	12	7/8	×	150 *
250	16	1	×	170 *
300	16	1-1/8	×	190 *
350	20	1-1/8	×	195 *
400	20	1-1/4	×	210 *
450	24	1-1/4	×	220 *
500	24	1-1/4	×	230 *
600	24	1-1/2	×	260 *

* 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 CAF. Oil Resistance				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 CAF. Oil Resistance				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 CAF. Oil Resistance				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 CAF. Oil Resistance				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

Class No.: AN05	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 20 (Class 150)		Date:
Corrosion Allowance: 3 mm		Sign:

Temperature °C		0	50	65
Pressure Barg.	DN 25-300	19.6	19.2	18.8

TABLE OF SCHEDULES

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

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1.
- This piping class is originally designed for acid service.
- Standard long radius elbows DN80 and larger shall be used for sweep-in connections.
- DN 15-20 piping components only to be used for short branches e.g. pressure points.
- Application of other types of branch connections shall be subject to prior approval of owner.
- For connections class 300, use equivalent class 300 for flange, bolting and gasket selection.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting socket-weld. end
X	Pipe to pipe connection to be made by sweep-in or lateral branch

Class No.: AN05	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	25-300	ASTM	A106-B
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* FLANGES

BLFL	Blind Flange	DN	25-300	ASTM	A105
WNFL	Welding Neck Flange	DN	25-300	ASTM	A105

* FITTINGS

E45B	Elbow 45 Deg.	Butt-Weld. End	DN	25-300	ASTM	A234-WPB
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	25-300	ASTM	A234-WPB
TEEB	Equal Tee	Butt-Weld. End	DN	25-300	ASTM	A234-WPB
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	25-40	ASTM	A105
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	25-40	ASTM	A105
TEES	Equal Tee	Socket-Weld. End	DN	25-40	ASTM	A105
COUS	Coupling	Socket-Weld. End	DN	25-40	ASTM	A105
CAPS	Cap	Socket-Weld. End	DN	25-40	ASTM	A105

* REDUCING FITTINGS

BROS	Branch Fitting Socket-Weld Outlet	DN	25-40	ASTM	A105
BNIP	Branch Fitting Plain-End Outlet	DN	15-50	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
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

BAFF	Ball Valve Full Bore Flanged	DN	25-300	Body:	ASTM A216-WCB/WCC, A105
				Int.:	Alloy 20/PTFE
CHVF	Check Valve Flanged	DN	25-300	Body:	ASTM A216-WCB/WCC, A105
				Trim:	Alloy 20
GLVF	Globe Valve Flanged	DN	25-200	Body:	ASTM A216-WCB/WCC, A105
				Trim:	Alloy 20

* MISCELLANEOUS

GKRF	Gasket, Raised Face	DN	25-300	PTFE Reinf. with Mineral Filler
STBT	Stud Bolt with Nuts	—		Studs: ASTM A193-B7
				Nuts: ASTM A194-2H

Class No.: AN05	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	ASTM A106 B	74.30.21/31	*	*	*	*	*	*	*	*	*	*	*
* FLANGES													
Blind Flange		76.62.10	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange		76.62.79	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS													
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													
Ball Valve Full Bore Flanged		77.37.02	*	*	*	*	*	*	*	*	*	*	*
Check Valve Flanged		75.37.12	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged		75.37.42	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS													
Gasket, Raised Face		85.31.15/17	*	*	*	*	*	*	*	*	*	*	*

Class No.: AN05	Page: 4	Content: Reducing Piping Components
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Run	Br.	RECB 76.30.72	REEB 76.30.73	TERS 76.34.85	TERB 76.30.85
20 × 15		*	*	*	*
25 × 20		*	*	*	*
40 × 25		*	*	*	*
50 × 40		*	*		*
80 × 50		*	*		
100 × 80		*	*		
150 × 100		*	*		
200 × 150		*	*		
250 × 200		*	*		
300 × 250		*	*		

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

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

Class No.: AN05	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	×	60	*
20	4	1/2	×	70	*
25	4	1/2	×	70	*
40	4	1/2	×	80	*
50	4	5/8	×	80	*
80	4	5/8	×	100	*
100	8	5/8	×	100	*
150	8	3/4	×	100	*
200	8	3/4	×	110	*
250	12	7/8	×	120	*
300	12	7/8	×	120	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch		mm	81.38.61
15	4	1/2	×	70	*
20	4	1/2	×	70	*
25	4	1/2	×	80	*
40	4	1/2	×	80	*
50	4	5/8	×	90	*
80	4	5/8	×	110	*
100	8	5/8	×	110	*
150	8	3/4	×	120	*
200	8	3/4	×	130	*
250	12	7/8	×	140	*
300	12	7/8	×	150	*

Class No.: AN06	Page: 1	Content:
Base Material: Carbon Steel (Sour)	First Issue:	Revision:
Rating: PN 20 (Class 150)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	75	100	125	150	175	200
Pressure Barg.	DN 15-80	19.6	19.2	18.4	17.6	16.7	15.8	14.8	11.0
	DN 100-150	19.6	19.2	18.4	17.6	16.7	15.8	14.8	9.0
	DN 200-600	19.6	19.2	18.4	17.6	16.7	15.8	12.0	7.0

TABLE OF SCHEDULES

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

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1 and ball valve rating acc. BS 5351.
- Piston type check valves for horizontal mounting only.
- Cold bending is not allowed.
- Application of other types of branch connections shall be subject to prior approval of company.
- For connections class 300, use equivalent class 300 for flange, bolting and gasket selection.

CODE EXPLANATION OF CHARACTERS

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

Class No.: AN06	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	50-600	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

BARF	Ball Valve Red. Bore Flanged	DN	15-250	Body:	ASTM	A216-WCB/WCC, A105
				Int.:	AISI	316 (L) / PTFE
CHVB	Check Valve Butt-Weld. End	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L)
CHVF	Check Valve Flanged	DN	15-600	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6
GAVF	Gate Valve Flanged	DN	150-600	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6
GLVB	Globe Valve Butt-Weld. End	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6
GLVF	Globe Valve Flanged	DN	15-200	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6

* MISCELLANEOUS

GKTI	Gasket, RF.	DN	15-600	C.A.F	
ORFS	Orifice Flange Set	DN	50-600	ASTM	A105
STBT	Stud Bolt with Nuts		—	Studs:	ASTM A193-B7M
				Nuts:	ASTM A194-2HM

Class No.: AN06			Page: 3								Content: Piping Components									
ITEM DESCRIPTION			NOMINAL PIPE SIZE																	
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
* PIPE																				
Pipe	ASTM A106 B	74.30.21/31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
Pipe nipple (50 mm)		76.05.56	*	*	*	*														
* FLANGES																				
Blind Flange		76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
Spectacle Blind Flange		76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
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																				
Ball Valve Red. Bore Flanged		75.37.02	*	*	*	*	*	*	*	*	*	*								
Check Valve Butt-Weld. End		75.56.19	*	*	*	*														
Check Valve Flanged		75.37.12	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
Gate Valve Flanged		75.37.32					*	*	*	*	*	*	*	*	*	*	*	*		
Globe Valve Butt-Weld. End		75.56.50	*	*	*	*														
Globe Valve Flanged		75.37.42	*	*	*	*	*	*	*	*	*									
* MISCELLANEOUS																				
Gasket, RF. C.A.F		85.31.15/17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
Orifice Flange Set		60.88.52					*	*	*	*	*	*	*	*	*	*	*	*		

Class No.:	AN06	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 Outlet Socket Weld. End
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	*				
100	×	40	*	*			450	×	150	*				
100	×	50	*	*	*		450	×	200	*	*	*		
100	×	80	*	*	*		450	×	250	*	*	*		
150	×	50	*	*	*		450	×	300	*	*	*		
150	×	80	*	*	*		450	×	350	*	*	*		
150	×	100	*	*	*		450	×	400	*	*	*		
200	×	50	*				500	×	50	*				
200	×	80	*				500	×	80	*				
200	×	100	*	*	*		500	×	100	*				
200	×	150	*	*	*		500	×	150	*				
250	×	50	*				500	×	200	*	*	*		
250	×	80	*				500	×	250	*	*	*		
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	*	*	*									

RUN	Br.	BROS 76.80.28
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.: AN06	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.60
15	4	1/2	×	60 *
20	4	1/2	×	70 *
25	4	1/2	×	70 *
40	4	1/2	×	80 *
50	4	5/8	×	80 *
80	4	5/8	×	100 *
100	8	5/8	×	100 *
150	8	3/4	×	100 *
200	8	3/4	×	110 *
250	12	7/8	×	120 *
300	12	7/8	×	120 *
350	12	1	×	130 *
400	16	1	×	140 *
450	16	1-1/8	×	150 *
500	20	1-1/8	×	160 *
600	20	1-1/4	×	180 *

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.60
15	4	1/2	×	70 *
20	4	1/2	×	70 *
25	4	1/2	×	80 *
40	4	1/2	×	80 *
50	4	5/8	×	90 *
80	4	5/8	×	110 *
100	8	5/8	×	110 *
150	8	3/4	×	120 *
200	8	3/4	×	130 *
250	12	7/8	×	140 *
300	12	7/8	×	150 *
350	12	1	×	160 *
400	16	1	×	170 *
450	16	1-1/8	×	180 *
500	20	1-1/8	×	195 *
600	20	1-1/4	×	220 *

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.60
15	4	5/8	×	120 *
20	4	5/8	×	120 *
25	4	5/8	×	120 *
40	4	3/4	×	130 *
50	8	5/8	×	150 *
80	8	3/4	×	150 *
100	12	3/4	×	140 *
150	12	3/4	×	140 *
200	12	7/8	×	150 *
250	16	1	×	170 *
300	16	1-1/8	×	190 *
350	20	1-1/8	×	195 *
400	20	1-1/4	×	210 *
450	24	1-1/4	×	220 *
500	24	1-1/4	×	230 *
600	24	1-1/2	×	260 *

* DRAIN POINT Fig. 2I

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF. C.A.F.				2
Stud Bolt with Nuts				8
Welding Neck Flange				1

* DRAIN POINT Fig. 2J

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF. C.A.F.				2
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
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 RF. C.A.F.				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 RF. C.A.F.				1
Globe Valve Butt. Weld End				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

Class No.: AN07	Page: 1	Content: General
Base Material: Carbon Steel, Fine Grained, LT	First Issue:	Revision:
Rating: PN 20 (Class 150)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		-50	0	50	75	100	125	150	175	200
Pressure Barg.	DN 15-80	18.2	18.2	18.0	17.5	17.0	16.4	15.8	14.8	11.0
	DN 100-150	18.2	18.2	18.0	17.5	17.0	16.4	15.8	14.8	9.0
	DN 200-600	18.2	18.2	18.0	17.5	17.0	16.4	15.8	12.0	7.0

TABLE OF SCHEDULES

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

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.3 and ball valve rating acc. BS 5351.
- Application of other types of branch connections shall be subject to prior approval of company.
- Welds, attachment welds and cold formed piping parts shall be post weld heat treated.
- For connections class 300, use equivalent class 300 for flange, bolting and gasket selection.

CODE EXPLANATION OF CHARACTERS

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

Class No.: AN07	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A333-6 (Seamless)
		DN	450-600	ASTM	A671-CC65 (Welded)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A333-6 (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-600	ASTM	A350-LF2
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	A350-LF2

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-600	ASTM	A420-WPL6
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-600	ASTM	A420-WPL6
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-600	ASTM	A420-WPL6
TEEB	Equal Tee	Butt-Weld. End	DN	15-600	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
CAPT	Cap	Socket-Weld. End	DN	15-40	ASTM	A350-LF2

* REDUCING FITTINGS

BROS	Branch Outlet Socket-Weld. End	DN	15-50	ASTM	A350-LF2
BROB	Branch Outlet Red. Butt-Weld.	DN	50-500	ASTM	A350-LF2
RECB	Reducer Conc. Butt-Weld. End	DN	20-600	ASTM	A420-WPL6
REEB	Reducer Ecc. Butt-Weld. End	DN	20-600	ASTM	A420-WPL6
TERB	Tee Reducing Butt-Weld. End	DN	20-600	ASTM	A420-WPL6
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A350-LF2

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

BARF	Ball Valve Red. Bore Flanged	DN	15-250	Body:	ASTM	A352-LCB/C, A350-LF2
				Int.:	AISI	316 (L) / PTFE
CHVF	Check Valve Flanged	DN	15-600	Body:	ASTM	A352-LCB/C, A350-LF2
				Trim:	AISI	316 (L) + Stellite 6
GAVF	Gate Valve Flanged	DN	150-600	Body:	ASTM	A352-LCB/C, A350-LF2
				Trim:	AISI	316 (L) + Stellite 6
GLVF	Globe Valve Flanged	DN	15-200	Body:	ASTM	A352-LCB/C, A350-LF2
				Trim:	AISI	316 (L) + Stellite 6

* MISCELLANEOUS

GKTI	Gasket,	DN	15-600	C.A.F	
ORFS	Orifice Flange Set	DN	50-600	ASTM	A350-LF2
STBT	Stud Bolt with Nuts		—	Studs:	ASTM A320-L7
				Nuts:	ASTM A194-4

Class No.: AN07	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	74.30.10															*	*	*
	74.14.23/31		*	*	*	*	*	*	*	*	*	*	*	*	*			
* FLANGES																		
Blind Flange	76.62.12		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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	Threaded	76.07.18	*	*	*	*												
* VALVES																		
Ball Valve Red. Bore Flanged	75.72.00		*	*	*	*	*	*	*	*	*	*						
Check Valve Flanged	75.42.13		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged	75.42.32									*	*	*	*	*	*	*	*	*
Globe Valve Flanged	75.42.40		*	*	*	*	*	*	*	*	*							
* MISCELLANEOUS																		
Gasket, C.A.F	85.31.16/17		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.88.00						*	*	*	*	*	*	*	*	*	*	*	*

Class No.:	AN07	Page:	4	Content:	Reducing Piping Components
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Run	Br.	BROB 76.80.04	RECB 76.31.72	REEB 76.31.73	TERB 76.31.85	TERS 76.00.85	Run	Br.	BROB 76.80.05	RECB 76.31.72	REEB 76.31.73	TERB 76.31.85	COMP. NAME	DESCRIPTION
20 × 15			*	*	*	*	400 × 50		*				BROS	Branch Outlet, Socket-Weld. End
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		*					
100 × 40			*	*	*	*	450 × 150		*					
100 × 50	*		*	*	*	*	450 × 200			*	*	*		
100 × 80	*		*	*	*	*	450 × 250			*	*	*		
150 × 50	*		*	*	*	*	450 × 300			*	*	*		
150 × 80	*		*	*	*	*	450 × 350			*	*	*		
150 × 100	*		*	*	*	*	450 × 400			*	*	*		
200 × 50	*						500 × 50		*					
200 × 80	*						500 × 80		*					
200 × 100		*	*	*	*	*	500 × 100		*					
200 × 150		*	*	*	*	*	500 × 150		*					
250 × 50	*						500 × 200		*	*	*	*		
250 × 80	*						500 × 250			*	*	*		
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		*	*	*	*	*								

RUN	Br.	BROS 76.80.28
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.: AN07	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	×	60 *
20	4	1/2	×	70 *
25	4	1/2	×	70 *
40	4	1/2	×	80 *
50	4	5/8	×	80 *
80	4	5/8	×	100 *
100	8	5/8	×	100 *
150	8	3/4	×	100 *
200	8	3/4	×	110 *
250	12	7/8	×	120 *
300	12	7/8	×	120 *
350	12	1	×	130 *
400	16	1	×	140 *
450	16	1-1/8	×	150 *
500	20	1-1/8	×	160 *
600	20	1-1/4	×	180 *

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.63
15	4	1/2	×	70 *
20	4	1/2	×	70 *
25	4	1/2	×	80 *
40	4	1/2	×	80 *
50	4	5/8	×	90 *
80	4	5/8	×	110 *
100	8	5/8	×	110 *
150	8	3/4	×	120 *
200	8	3/4	×	130 *
250	12	7/8	×	140 *
300	12	7/8	×	150 *
350	12	1	×	160 *
400	16	1	×	170 *
450	16	1-1/8	×	180 *
500	20	1-1/8	×	195 *
600	20	1-1/4	×	220 *

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.63
15	4	5/8	×	120 *
20	4	5/8	×	120 *
25	4	5/8	×	120 *
40	4	3/4	×	130 *
50	8	5/8	×	150 *
80	8	3/4	×	150 *
100	12	3/4	×	140 *
150	12	3/4	×	140 *
200	12	7/8	×	150 *
250	16	1	×	170 *
300	16	1-1/8	×	190 *
350	20	1-1/8	×	195 *
400	20	1-1/4	×	210 *
450	24	1-1/4	×	220 *
500	24	1-1/4	×	230 *
600	24	1-1/2	×	260 *

* DRAIN POINT Fig. 2J

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF. C.A.F.				2
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* DRAIN POINT Fig. 2J

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF. C.A.F.				2
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.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Gasket RF. C.A.F.				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 RF. C.A.F.				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

Class No.: AN09	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 20 (Class 150)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C	0	50	60
Pressure Barg.	DN 15-600	16.0	16.0

TABLE OF SCHEDULES

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

Notes:

- Design limits are acc. butterfly valve rating BS5155.
- API 5L-B welded pipe is normally the most economic choice.
- Application of other types of branch connections shall be subject to prior approval of company.
- For connections class 300, use equivalent class 300 for flange, bolting and gasket selection.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket-weld end
D	Pipe to pipe

Class No.: AN09	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-100	API 5L-B (Seamless)	
		DN	150-500	API 5L-B (Welded)	
		DN	600-600	API 5L-B (Welded)	
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	
SOFL	Slip-On Flange	DN	15-600	ASTM A105	
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	
BROT	Branch Fitting Outlet Threaded End	DN	15-40	ASTM A105	
BROB	Branch Outlet Red. Butt-Weld.	DN	50-600	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

BARF	Ball Valve Red. Bore Flanged	DN	15-250	Body: ASTM A216-WCB/WCC, A105 Ball/Stem: AISI 316, 316L Seats: PTFE
BART	Ball Valve Red. Bore	DN	15-40	Body: ASTM A216-WCB/WCC, A105 Ball/Stem: AISI 316, 316L Seats: PTFE
BUVW	Butterfly Valve Wafer Type	DN	50-600	Body: ASTM A216-WCB/WCC, A105 Rubber Lined, Cr Disc: ASTM A351-CD8M
CHVF	Check Valve Flanged	DN	15-600	Body: ASTM A216-WCB/WCC, A105 Trim: AISI 410
CHVW	Check Valve Wafer Type	DN	15-600	Body: ASTM A216-WCB/WCC, A105 Plate: AISI 410 Seat: PTFE or FKM
GAVF	Gate Valve Flanged	DN	15-600	Body: ASTM A216-WCB/WCC, A105 Trim: AISI 410

* MISCELLANEOUS

GKRF	Gasket, Raised Face	DN	15-600	CAF, Oil Resistant 1.5 mm
ORFS	Orifice Flange Set	DN	50-600	ASTM A350-LF2
STBT	Stud Bolt with Nuts	—		Studs: ASTM A193-B7 Nuts: ASTM A194-2H

Class No.:	AN09	Page:	3	Content:	Piping Components
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			NOMINAL PIPE SIZE															
ITEM DESCRIPTION			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
* PIPE																		
Pipe	API-5L GR.B SML	74.13.21/23	*	*	*	*	*	*	*									
	API-5L GR.B ERW	74.13.23								*	*	*	*	*	*	*	*	
	API-5L GR.B SAW	74.30.21/23																*
Pipe nipple (50 mm)	ASTM A 106 B	76.05.56	*	*	*	*												
* FLANGES																		
Blind Flange		76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange		76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Slip-On Flange		76.62.30	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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	Threaded	76.05.56	*	*	*	*												
* VALVES																		
Ball Valve Red. Bore Flanged		75.37.02	*	*	*	*	*	*	*	*	*	*						
Ball Valve Red. Bore Threaded		75.72.00	*	*	*	*												
Butterfly Valve Wafer Type		75.72.00					*	*	*	*	*	*	*	*	*	*	*	*
Check Valve Flanged		75.37.12	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Check Valve Wafer Type		75.37.12					*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged		75.37.32	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS																		
Gasket, Raised Face		85.31.15/17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.88.52					*	*	*	*	*	*	*	*	*	*	*	*

Class No.: AN09	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 Outlet Socket-Weld. End
25	× 15		*	*	*	*	400	× 80	*				BROT	Branch Fitting Outlet Threaded End
25	× 20		*	*	*	*	400	× 100	*				BROB	Branch Outlet Red. Butt-Weld
40	× 15				*	*	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	*					
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 76.80.28	BROT 76.80.05
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.: AN09	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	×	60
20	4	1/2	×	65
25	4	1/2	×	70
40	4	1/2	×	75
50	4	5/8	×	80
80	4	5/8	×	95
100	8	5/8	×	95
150	8	3/4	×	100
200	8	3/4	×	110
250	12	7/8	×	120
300	12	7/8	×	120
350	12	1	×	130
400	16	1	×	140
450	16	1-1/8	×	150
500	20	1-1/8	×	160
600	20	1-1/4	×	180

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	×	70
20	4	1/2	×	70
25	4	1/2	×	80
40	4	1/2	×	80
50	4	5/8	×	90
80	4	5/8	×	110
100	8	5/8	×	110
150	8	3/4	×	120
200	8	3/4	×	125
250	12	7/8	×	140
300	12	7/8	×	145
350	12	1	×	160
400	16	1	×	170
450	16	1-1/8	×	180
500	20	1-1/8	×	195
600	20	1-1/4	×	215

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	5/8	×	120
20	4	5/8	×	120
25	4	5/8	×	120
40	4	3/4	×	130
50	8	5/8	×	150
80	8	3/4	×	150
100	12	3/4	×	140
150	12	3/4	×	140
200	12	7/8	×	150
250	16	1	×	170
300	16	1-1/8	×	190
350	20	1-1/8	×	195
400	20	1-1/4	×	210
450	24	1-1/4	×	220
500	24	1-1/4	×	230
600	24	1-1/2	×	260

* DRAIN POINT Fig. 2B

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Ball Valve Red. Bore Threaded				1
Cap Threaded				1
Pipe Nipple Plain/Threaded				1
Pipe Nipple Thrd. Ends L = 50 mm				1

* DRAIN POINT Fig. 2B

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Ball Valve Red. Bore Threaded				1
Cap Threaded				1
Pipe Nipple Thrd. Ends L = 50 mm				1

* VENT POINT Fig. 2B

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Ball Valve Red. Bore Threaded				1
Cap Threaded				1
Pipe Nipple Plain/Threaded				1
Pipe Nipple Thrd. Ends L = 50 mm				1

* VENT POINT Fig. 2B

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Ball Valve Red. Bore Threaded				1
Cap Threaded				1
Pipe Nipple Thrd. Ends L = 50 mm				1

Class No.: AN10	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 20 (Class 150)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-600	19.6	19.2	17.6	15.8	13.9	12.0	10.2	8.3	6.5

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	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	D	D	D	D	D	D	D	D	D	D	A	
25	80	450	C	C	C	C	E	D	D	D	E	E	E	E	E	A		
40	80	400	C	C	C	C	D	D	D	D	D	D	D	D	A			
50	40	350	C	C	C	C	D	D	D	D	D	D	D	A				
80	40	300	C	C	C	C	D	D	D	D	D	D	A					
100	40	250	C	C	C	C	D	D	D	D	D	A						
150	40	200	C	C	C	C	D	D	D	D	A							
200	20	150	C	C	C	C	D	D	D	A								
250	20	100	C	C	C	C	D	D	A									
300	20	80	C	C	C	C	D	A										
350	20	50	C	C	C	B	A											
400	20	40	C	B	B	A												
450	20	25	B	B	A													
500	20	20	B	A														
600	20	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.
- For connections class 300, use equivalent class 300 for flange, bolting and gasket selection.

CODE EXPLANATION OF CHARACTERS

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

Class No.:	AN10	Page:	2	Content:	Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-100	API	5L-B (Seamless)
		DN	150-500	API	5L-B ERW
		DN	600-600	API	5L-B SAW

PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A106 B
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* FLANGES

BLFL	Blind Flange	DN	15-600	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-600	ASTM	A516-60
SOFL	Slip-On Flange	DN	15-600	ASTM	A105
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	50-500	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	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 Sw	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GLVF	Globe Valve Flanged	DN	15-200	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

* MISCELLANEOUS

GKRF	Gasket,	DN	15-600	CAF, Oil, Resistant 1.5 mm
ORFS	Orifice Flange Set	DN	50-600	ASTM A105
STBT	Stud Bolt with Nuts		—	Studs: ASTM A193-B7
				Nuts: ASTM A194-2H

Class No.:	AN10	Page:	3	Content:	Piping Components
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			NOMINAL PIPE SIZE															
ITEM DESCRIPTION			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
* PIPE																		
Pipe	API-5L GR.B SML	74.13.21/23	*	*	*	*	*	*	*									
	API-5L GR.B ERW	74.13.23								*	*	*	*	*	*	*	*	
	API-5L GR.B SAW	74.13.23																*
Pipe nipple (50 mm)	ASTM A 106 B	76.05.56	*	*	*	*												
* FLANGES																		
Blind Flange		76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange		76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Slip-On Flange		76.62.30	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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	Threaded	76.05.56	*	*	*	*												
* VALVES																		
Check Valve Flanged		75.37.12	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Check Valve Socket		75.56.13	*	*	*	*												
Gate Valve Flanged		75.37.32	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Sw		75.56.35	*	*	*	*												
Globe Valve Flanged		75.37.42	*	*	*	*	*	*	*	*								
Globe Valve Socket		75.56.45	*	*	*	*												
* MISCELLANEOUS																		
Gasket, Raised Face		85.31.15/17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.88.52					*	*	*	*	*	*	*	*	*	*	*	*

Class No.: AN10	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 Outlet Socket-Weld. End
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 × 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 76.80.28
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.: AN10	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	×	60
20	4	1/2	×	65
25	4	1/2	×	70
40	4	1/2	×	75
50	4	5/8	×	80
80	4	5/8	×	95
100	8	5/8	×	95
150	8	3/4	×	100
200	8	3/4	×	110
250	12	7/8	×	120
300	12	7/8	×	120
350	12	1	×	130
400	16	1	×	140
450	16	1-1/8	×	150
500	20	1-1/8	×	160
600	20	1-1/4	×	180

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	×	70
20	4	1/2	×	70
25	4	1/2	×	80
40	4	1/2	×	80
50	4	5/8	×	90
80	4	5/8	×	110
100	8	5/8	×	110
150	8	3/4	×	120
200	8	3/4	×	125
250	12	7/8	×	140
300	12	7/8	×	145
350	12	1	×	160
400	16	1	×	170
450	16	1-1/8	×	180
500	20	1-1/8	×	195
600	20	1-1/4	×	215

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	5/8	×	120
20	4	5/8	×	120
25	4	5/8	×	120
40	4	3/4	×	130
50	8	5/8	×	150
80	8	3/4	×	150
100	12	3/4	×	140
150	12	3/4	×	140
200	12	7/8	×	150
250	16	1	×	170
300	16	1-1/8	×	190
350	20	1-1/8	×	195
400	20	1-1/4	×	210
450	24	1-1/4	×	220
500	24	1-1/4	×	230
600	24	1-1/2	×	260

*DRAIN POINT Fig. 0B

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Cap Threaded				1
Gate Valve Sw				1
Pipe Nipple 50 mm				1
Pipe Nipple Plain/Threaded				1

*DRAIN POINT Fig. 0B

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Cap Threaded				1
Gate Valve Sw				1
Pipe Nipple Plain/Threaded				1
Pipe Nipple 50 mm				1

*VENT POINT Fig. 1B

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Cap Threaded				1
Globe Valve Socket				1
Pipe Nipple 50 mm				1
Pipe Nipple Plain/Threaded				1

*VENT POINT Fig. 1B

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Cap Threaded				1
Globe Valve Socket				1
Pipe Nipple Plain/Threaded				1
Pipe Nipple 50 mm				1

Class No.: AP04	Page: 1	Content: General
Base Material: Alloy Steel (5 Cr. - 0.5 Mo)	First Issue:	Revision:
Rating: PN 20 (Class 150)		Date:
Corrosion Allowance: 1 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400	450
Pressure Barg.	DN 15-600	19.9	19.5	17.6	15.8	13.9	12.0	10.2	8.3	6.5	4.6

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	D	D	D	D	D	D	D	D	D	D	A	
25	80	450	C	C	C	C	E	D	D	D	E	E	E	E	E	A		
40	80	400	C	C	C	C	D	D	D	D	D	D	D	D	A			
50	40	350	C	C	C	C	D	D	D	D	D	D	D	A				
80	40	300	C	C	C	C	D	D	D	D	D	D	A					
100	40	250	C	C	C	C	D	D	D	D	D	D						
150	40	200	C	C	C	C	D	D	D	D	A							
200	20	150	C	C	C	C	D	D	D	A								
250	20	100	C	C	C	C	D	D	A									
300	20	80	C	C	C	C	D	A										
350	20	50	C	C	C	B	A											
400	20	40	C	B	B	A												
450	20	25	B	B	A													
500	20	20	B	A														
600	20	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.
- For connections class 300, use equivalent class 300 for flange, bolting and gasket selection.
- 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
D	Pipe to pipe
E	Branch outlet reducing butt-weld

Class No.: AP04	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A 335-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 Socket-Weld Outlet	DN	15-40	ASTM	A182-F5
BROB	Branch Outlet Red. Butt-Weld.	DN	50-600	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	15-200	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.: AP04	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	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*
		74.33.32														*	*	*
* FLANGES																		
Blind Flange		76.64.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange		76.88.07	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)		76.88.00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange		76.64.84	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* 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	76.36.84	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Coupling	Socket-Weld. End	76.36.28	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cap	Socket-Weld. End	76.36.18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* VALVES																		
Check Valve Flanged		75.39.13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged		75.39.33	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged		75.39.43	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS																		
Gasket, Spiral Wound		85.41.33	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.00.00					*	*	*	*	*	*	*	*	*	*	*	*

Class No.:	AP04	Page:	4	Content:	Reducing Piping Components
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Run	Br.	BROB 76.80.00	RECB 76.32.70	REEB 76.32.71	TERB 76.32.85	TERS 76.36.85	Run	Br.	BROB 76.80.00	RECB 76.32.70	REEB 76.32.71	TERB 76.32.85	COMP. NAME	DESCRIPTION
20	× 15		*	*	*	*	400	× 50	*				BROS	Branch Fitting Outlet Socket-Weld. End
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	× 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	*	*	*	*	*	500	× 500	*	*	*	*		
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	*	*	*	*		

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.: AP04	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	×	60
20	4	1/2	×	65
25	4	1/2	×	70
40	4	1/2	×	75
50	4	5/8	×	80
80	4	5/8	×	95
100	8	5/8	×	95
150	8	3/4	×	100
200	8	3/4	×	110
250	12	7/8	×	120
300	12	7/8	×	120
350	12	1	×	130
400	16	1	×	140
450	16	1-1/8	×	150
500	20	1-1/8	×	160
600	20	1-1/4	×	180

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.96
15	4	1/2	×	70
20	4	1/2	×	70
25	4	1/2	×	80
40	4	1/2	×	80
50	4	5/8	×	90
80	4	5/8	×	110
100	8	5/8	×	110
150	8	3/4	×	120
200	8	3/4	×	125
250	12	7/8	×	140
300	12	7/8	×	145
350	12	1	×	160
400	16	1	×	170
450	16	1-1/8	×	180
500	20	1-1/8	×	195
600	20	1-1/4	×	215

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.96
15	4	5/8	×	120
20	4	5/8	×	120
25	4	5/8	×	120
40	4	3/4	×	130
50	8	5/8	×	150
80	8	3/4	×	150
100	12	3/4	×	140
150	12	3/4	×	140
200	12	7/8	×	150
250	16	1	×	170
300	16	1-1/8	×	190
350	20	1-1/8	×	195
400	20	1-1/4	×	210
450	24	1-1/4	×	220
500	24	1-1/4	×	230
600	24	1-1/2	×	260

* 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.: AS02	Page: 1	Content: General
Base Material: Stainless Steel AISI 316	First Issue:	Revision:
Rating: PN 20 (Class 150)		Date:
Corrosion Allowance: 0 mm		Sign:

Temperature °C		0	50	100	150	200	250	300	350	400
Pressure Barg.	DN 15-600	18.9	18.4	16.3	14.7	13.5	12.0	10.2	8.3	6.5

TABLE OF SCHEDULES

DN	Schedule	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE															
		Run Size	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500
15	40S	500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A
20	40S	450	C	C	C	C	E	E	E	E	E	E	E	E	E	A	
25	10S	400	C	C	C	C	E	E	E	E	E	E	E	E	A		
40	10S	350	C	C	C	C	E	E	E	E	E	E	E	A			
50	10S	300	C	C	C	C	E	E	E	E	E	E	A				
80	10S	250	C	C	C	C	E	E	E	E	E	A					
100	10S	200	C	C	C	C	D	D	E	E	A						
150	10S	150	C	C	C	C	D	D	D	A							
200	10S	100	C	C	C	C	D	D	A								
250	10S	80	C	C	C	C	D	A									
300	10S	50	C	C	C	B	A										
350	10S	40	C	B	B	A											
400	10S	25	B	B	A												
450	10S	20	B	A													
500	10S	15	A														

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 2.2.
- Blind flanges to be provided with liner.
- For economic reasons use lap-joint flanges from DN 15 up to DN 200.
- Spectacle blinds to be installed between welding neck flanges.
- Application of other types of branch connections is subject to company approval.
- For connections class 300, use equivalent class 300 for flange, bolting and gasket selection.

CODE EXPLANATION OF CHARACTERS

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

Class No.:	AS02	Page:	2	Content:	Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-300	ASTM	A312-TP316L (Seamless or Welded)
		DN	350-500	ASTM	A358-Gr. 316L (Welded)

* FLANGES

BLFL	Blind Flange	DN	15-500	ASTM	A182-F316
LJFL	Lap-Joint Flange	DN	15-200	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-500	ASTM	A240-TP316
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-500	ASTM	A240-TP316
WNFL	Welding Neck Flange	DN	15-500	ASTM	A182-F316

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-500	ASTM	A403-WP316L
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-500	ASTM	A403-WP316L
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-500	ASTM	A403-WP316L
STBE	Stub-End		DN	15-200	ASTM	A403-316L
TEEB	Equal Tee	Butt-Weld. End	DN	15-500	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-F316S
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 Socket-Weld. Outlet	DN	15-40	ASTM	A182-316
BROB	Branch Outlet Red. Butt-Weld.	DN	50-450	ASTM	A182-316
RECB	Reducer Conc. Butt-Weld. End	DN	20-500	ASTM	A403-316L
REEB	Reducer Ecc. Butt-Weld. End	DN	20-500	ASTM	A403-316L
TERB	Tee Reducing Butt-Weld. End	DN	20-500	ASTM	A403-316L
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	15-400	Body:	ASTM	A351-CF8M, A182-F316
				Trim:	AISI	316, 316L
GAVF	Gate Valve Flanged	DN	15-500	Body:	ASTM	A351-CF8M, A182-F316
				Trim:	AISI	316, 316L
GLVF	Globe Valve Flanged	DN	15-200	Body:	ASTM	A351-CF8M, A182-F316
				Trim:	AISI	316, 316L

* MISCELLANEOUS

GKTI	Gasket, C.A.F	DN	15-500	C.A.F	
ORFS	Orifice Flange Set	DN	50-500		ASTM A182-F316
STBT	Stud Bolt with Nuts	—		Studs:	ASTM A193-B7
				Nuts:	ASTM A194-2H

Class No.: AS02	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
* PIPE																	
Pipe		74.36.40	*	*	*	*	*	*	*	*	*	*	*				
		74.36.00												*	*	*	*
* FLANGES																	
Blind Flange		76.65.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lap-Joint Flanged		76.62.20	*	*	*	*	*	*	*	*	*	*	*				
Spectacle Blind Flange		76.88.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Stub-End		76.33.53	*	*	*	*	*	*	*	*	*						
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		75.40.33	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged		75.40.40	*	*	*	*	*	*	*	*							
* MISCELLANEOUS																	
Gasket, RF C.A.F.		85.31.16/17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.00.00					*	*	*	*	*	*	*	*	*	*	*

Class No.:	AS02	Page:	4	Content:	Reducing Piping Components
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Run	Br.	BROB 76.00.00	RECB 76.33.70	REEB 76.33.73	TERB 76.33.85	TERS 76.37.85	Run	Br.	BROB 76.00.00	RECB 76.33.70	REEB 76.33.73	TERB 76.33.85	COMP. NAME	DESCRIPTION
20 × 15			*	*	*	*	400 × 50		*				BROS	Branch Fitting Outlet Socket-Weld. End
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		*					
100 × 40				*	*	*	450 × 150		*					
100 × 50	*		*	*	*	*	450 × 200		*					
100 × 80	*		*	*	*	*	450 × 250		*	*	*			
150 × 50	*						450 × 300		*	*	*			
150 × 80	*		*	*	*	*	450 × 350		*	*	*			
150 × 100	*		*	*	*	*	450 × 400		*	*	*			
200 × 50	*						500 × 50							
200 × 80	*						500 × 80							
200 × 100	*	*	*	*	*	*	500 × 100							
200 × 150	*	*	*	*	*	*	500 × 150							
250 × 50	*						500 × 200				*			
250 × 80	*						500 × 250				*			
250 × 100	*				*	*	500 × 300	*	*	*	*			
250 × 150	*	*	*	*	*	*	500 × 350	*	*	*	*			
250 × 200	*	*	*	*	*	*	500 × 400	*	*	*	*			
300 × 50	*						500 × 450	*	*	*	*			
300 × 80	*													
300 × 100	*													
300 × 150	*	*	*	*	*	*								
300 × 200	*	*	*	*	*	*								
300 × 250	*	*	*	*	*	*								
350 × 50	*													
350 × 80	*													
350 × 100	*													
350 × 150	*				*	*								
350 × 200	*	*	*	*	*	*								
350 × 250	*	*	*	*	*	*								
350 × 300	*	*	*	*	*	*								

RUN	Br.	BROS 76.80.26
40-150	15	*
200-500		*
50-80	20	*
100-500		*
50	25	*
80-100		*
150-500		*
80-100	40	*
150-300		*
350-500		*

Class No.: AS02	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 ×	60	*
20	4	1/2 ×	65	*
25	4	1/2 ×	70	*
40	4	1/2 ×	75	*
50	4	5/8 ×	80	*
80	4	5/8 ×	95	*
100	8	5/8 ×	95	*
150	8	3/4 ×	100	*
200	8	3/4 ×	110	*
250	12	7/8 ×	120	*
300	12	7/8 ×	120	*
350	12	1 ×	130	*
400	16	1 ×	140	*
450	16	1-1/8 ×	150	*
500	20	1-1/8 ×	160	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2 ×	70	*
20	4	1/2 ×	70	*
25	4	1/2 ×	80	*
40	4	1/2 ×	80	*
50	4	5/8 ×	90	*
80	4	5/8 ×	110	*
100	8	5/8 ×	110	*
150	8	3/4 ×	120	*
200	8	3/4 ×	125	*
250	12	7/8 ×	140	*
300	12	7/8 ×	145	*
350	12	1 ×	160	*
400	16	1 ×	170	*
450	16	1-1/8 ×	180	*
500	20	1-1/8 ×	195	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	5/8 ×	120	*
20	4	5/8 ×	120	*
25	4	5/8 ×	120	*
40	4	3/4 ×	130	*
50	8	5/8 ×	150	*
80	8	3/4 ×	150	*
100	12	3/4 ×	140	*
150	12	3/4 ×	140	*
200	12	7/8 ×	150	*
250	16	1 ×	170	*
300	16	1-1/8 ×	190	*
350	20	1-1/8 ×	195	*
400	20	1-1/4 ×	210	*
450	24	1-1/4 ×	220	*
500	24	1-1/4 ×	230	*

* DRAIN POINT Fig. 0V

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Blind Flange Liner				1
Gasket RF. C.A.F.				2
Gate Valve Flanged				1
Lap-Joint Flange				1
Stub-End				1
Stud Bolt with Nuts				4

* DRAIN POINT Fig. 0R

Run	DN 50-500	Br	DN 20	No.
Branch: BROB				1
Blind Flange				1
Blind Flange Liner				1
Gasket RF. C.A.F.				2
Gate Valve Flanged				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT Fig. 1V

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Blind Flange Liner				1
Gasket RF. C.A.F.				2
Globe Valve Flanged				1
Lap-Joint Flange				1
Stub-End				1
Stud Bolt with Nuts				4

* VENT POINT Fig. 1R

Run	DN 50-500	Br	DN 20	No.
Branch: BROB				1
Blind Flange				1
Blind Flange Liner				1
Gasket RF. C.A.F.				2
Globe Valve Flanged				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

Class No.: AS04	Page: 1	Content: General
Base Material: Stainless Steel AISI 304, LT	First Issue:	Revision:
Rating: PN 20 (Class 150)	Date:	
Corrosion Allowance: 0 mm	Sign:	

Temperature °C		-200	0	50	100	150
Pressure Barg.	DN 15-600	18.9	18.9	18.3	15.9	14.1

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	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	10S	450	C	C	C	C	E	E	E	E	E	E	E	E	E	A		
40	10S	400	C	C	C	C	E	E	E	E	E	E	E	E	A			
50	10S	350	C	C	C	C	E	E	E	E	E	E	E	A				
80	10S	300	C	C	C	C	D	E	E	E	E	E	A					
100	10S	250	C	C	C	C	D	D	D	D	D	A						
150	10S	200	C	C	C	C	D	D	D	D	A							
200	10S	150	C	C	C	C	D	D	D	D								
250	10S	100	C	C	C	C	D	D	A									
300	10S	80	C	C	C	C	D	A										
350	10S	50	C	C	C	B	A											
400	10S	40	C	B	B	A												
450	10S	25	B	B	A													
500	10S	20	B	A														
600	10S	15	A															

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 2.1.
- Application of other types of branch connections is subject to company approval.
- For connections class 300, use equivalent class 300 for flange, bolting and gasket selection.

CODE EXPLANATION OF CHARACTERS

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

Class No.: AS04	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-300	ASTM	A312-TP304 (Seamless or Welded)
		DN	350-600	ASTM	A358-Gr. 304 (Welded)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A312-TP304 (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-600	ASTM	A182-F304
SBFL	Spectacle Blind Flange	DN	15-600	ASTM	A240-TP304
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-600	ASTM	A240-TP304
WNFL	Welding Neck Flange	DN	15-600	ASTM	A182-F304

* 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 Socket-Weld Outlet	DN	15-40	ASTM	A182-F304
BROB	Branch Outlet Red. Butt-Weld.	DN	50-600	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
TERB	Tee Reducing Butt-Weld. End	DN	20-50	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.

* VALVES

BARF	Ball Valve Red. Bore Flanged	DN	15-250	Body: A351-CF8M, A182-F316 Ball/Stem: AISI 316, 316L Seats: PTFE
CHVF	Check Valve Flanged	DN	15-400	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316, 316L
GAVF	Gate Valve Flanged	DN	15-600	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316, 316L
GLVF	Globe Valve Flanged	DN	15-200	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316, 316L

* MISCELLANEOUS

GKTI	Gasket, C.A.F	DN	15-600	C.A.F
ORFS	Orifice Flange Set	DN	50-600	ASTM A182-F304
STBT	Stud Bolt with Nuts			Bolts (Dia. > 1 1/2") ASTM A193 B8M2, Nuts: A194 Gr. 8M Studs: ASTM A193-B8 Nuts: ASTM A194-8

Class No.: AS04	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		*	*	*	*	*	*	*	*	*	*	*		*	*	*	*
	74.36.00													*	*	*	*	*
* FLANGES																		
Blind Flange	76.65.10		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange	76.88.09		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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																		
Ball Valve Red. Bore Flanged	75.40.08		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Check Valve Flanged	75.40.13		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged	75.40.33		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged	75.40.40		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS																		
Gasket, RF C.A.F.	85.31.16/17		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set	60.00.00						*	*	*	*	*	*	*	*	*	*	*	*

Class No.: AS04	Page: 4	Content: Reducing Piping Components
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Run	Br.	BROB 76.00.00	RECB 76.33.70	REEB 76.33.73	TERB 76.33.85	TERS 76.37.85	Run	Br.	BROB 76.00.00	RECB 76.33.70	REEB 76.33.73	COMP. NAME	DESCRIPTION
20 × 15			*	*	*	*	400 × 50		*			BROS	Branch Fitting Outlet Socket-Weld. End
25 × 15			*	*	*	*	400 × 80		*			BROB	Branch Outlet Red. Butt-Weld
25 × 20			*	*		*	400 × 100		*			RECB	Reducer Conc. Butt-Weld. End
40 × 20			*	*	*	*	400 × 150		*			REEB	Reducer Ecc. Butt-Weld. End
40 × 25			*	*	*	*	400 × 200		*	*	*	TERB	Tee Reducing Butt-Weld. End
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		*				
100 × 80		*	*	*			450 × 100		*				
150 × 50		*					450 × 150		*				
150 × 80		*	*	*			450 × 200		*				
150 × 100		*	*	*			450 × 250		*	*	*		
200 × 50		*					450 × 300		*	*	*		
200 × 80		*					450 × 350		*	*	*		
200 × 100		*	*	*			450 × 400		*	*	*		
200 × 150		*	*	*			500 × 50		*				
250 × 50		*					500 × 80		*				
250 × 80		*					500 × 100		*				
250 × 100		*					500 × 150		*				
250 × 150		*	*	*			500 × 200		*				
250 × 200		*	*	*			500 × 250		*				
300 × 50		*					500 × 300		*	*	*		
300 × 80		*					500 × 350		*	*	*		
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		*	*	*		

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.: AS04	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.43/44
15	4	1/2	×	60
20	4	1/2	×	65
25	4	1/2	×	70
40	4	1/2	×	75
50	4	5/8	×	80
80	4	5/8	×	95
100	8	5/8	×	95
150	8	3/4	×	100
200	8	3/4	×	110
250	12	7/8	×	120
300	12	7/8	×	120
350	12	1	×	130
400	16	1	×	140
450	16	1-1/8	×	150
500	20	1-1/8	×	160
600	20	1-1/4	×	180

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.43/44
15	4	1/2	×	70
20	4	1/2	×	70
25	4	1/2	×	80
40	4	1/2	×	80
50	4	5/8	×	90
80	4	5/8	×	110
100	8	5/8	×	110
150	8	3/4	×	120
200	8	3/4	×	125
250	12	7/8	×	140
300	12	7/8	×	145
350	12	1	×	160
400	16	1	×	170
450	16	1-1/8	×	180
500	20	1-1/8	×	195
600	20	1-1/4	×	215

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.43/44
15	4	5/8	×	120
20	4	5/8	×	120
25	4	5/8	×	120
40	4	3/4	×	130
50	8	5/8	×	150
80	8	3/4	×	150
100	12	3/4	×	140
150	12	3/4	×	140
200	12	7/8	×	150
250	16	1	×	170
300	16	1-1/8	×	190
350	20	1-1/8	×	195
400	20	1-1/4	×	210
450	24	1-1/4	×	220
500	24	1-1/4	×	230
600	24	1-1/2	×	260

* DRAIN POINT Fig. 2J

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF. C.A.F.				2
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* DRAIN POINT Fig. 2J

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF. C.A.F.				2
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.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Gasket RF. C.A.F.				2
Globe Valve Socket				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 RF. C.A.F.				2
Globe Valve Socket				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

Class No.: AS05	Page: 1	Content: General
Base Material: Stainless Steel AISI 321/347	First Issue:	Revision:
Rating: PN 20 (Class 150)		Date:
Corrosion Allowance: 0 mm		Sign:

Temperature °C		0	50	75	100	125	150	175	200
Pressure Barg.	DN 15-80	18.9	18.4	17.3	16.3	15.5	14.7	14.1	11.0
	DN 100-150	18.9	18.4	17.3	16.3	15.5	14.7	14.1	9.0
	DN 200-600	18.9	18.4	17.3	16.3	15.5	14.7	12.0	7.0

TABLE OF SCHEDULES

DN	Schedule	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE																
		Run 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	10S	450	C	C	C	C	E	E	E	E	E	E	E	E	E	A		
40	10S	400	C	C	C	C	E	E	E	E	E	E	E	E	A			
50	10S	350	C	C	C	C	E	E	E	E	E	E	E	A				
80	10S	300	C	C	C	C	E	E	E	E	E	E	A					
100	10S	250	C	C	C	C	E	E	E	E	E	A						
150	10S	200	C	C	C	C	D	D	E	E	A							
200	10S	150	C	C	C	C	D	D	D	A								
250	10S	100	C	C	C	C	D	D	A									
300	10S	80	C	C	C	C	D	A										
350	10S	50	C	C	C	B	A											
400	10S	40	C	B	B	A												
450	10S	25	B	B	A													
500	10S	20	B	A														
600	10S	15	A															

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 2.4 and to ball valve rating acc. BS5351.
- Blind flanges to be provided with liner.
- For economic reasons use lap-joint flanges from DN 15 to DN 200.
- Spectacle blinds to be installed between welding neck flanges.
- Application of other types of branch connections is subject to company approval.
- For connections class 300, use equivalent class 300 for flange, bolting and gasket selection.

CODE EXPLANATION OF CHARACTERS

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

Class No.: AS05	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	PIPE	DN	15-300	ASTM	A312-TP316L (Seamless or Welded)
		DN	350-600	ASTM	A358-Gr. 316L (Welded)

* FLANGES

BLFL	Blind Flange	DN	15-600	ASTM	A105
FLIN	Blind Flange Liner	DN	15-600	ASTM	A240-TP316
LJFL	Lap-Joint Flange	DN	15-200	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-600	ASTM	A240-TP316
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-600	ASTM	A240-TP316
WNFL	Welding Neck Flange	DN	15-600	ASTM	A182-F316

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-600	ASTM	A403-WP316L
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-600	ASTM	A403-WP316L
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-600	ASTM	A403-WP316L
STBE	Stub-End		DN	15-200	ASTM	A403-WP316L
TEEB	Equal Tee	Butt-Weld. End	DN	15-600	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 Socket-Weld Outlet	DN	15-40	ASTM	A182-F316
BROB	Branch Outlet Red. Butt-Weld.	DN	50-500	ASTM	A182-F316
RECB	Reducer Conc. Butt-Weld. End	DN	20-600	ASTM	A403-WP316
REEB	Reducer Ecc. Butt-Weld. End	DN	20-600	ASTM	A403-WP316
TERB	Tee Reducing Butt-Weld. End	DN	20-50	ASTM	A403-WP316
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

BARF	Ball Valve Red. Bore Flanged	DN	15-250	Body:	A351-CF8M, A182-F316
				Int:	AISI 316L/PTFE
				Seats:	PTFE
CHVF	Check Valve Flanged	DN	15-40	Body:	ASTM A351-CF8M, A182-F316
				Trim:	AISI 316L + Stellite
				Gask:	SS/PTFE
CHWL	Check Valve Wafer lug	DN	50-400	Body:	ASTM A351-CF8M, A182-F316
				Plate:	AISI 316L
GAVF	Gate Valve Flanged	DN	50-400	Body:	ASTM A351-CF8M, A182-F316
				Trim:	AISI 316L + Stellite
				Gask:	SS/PTFE
GLBF	Globe Valve Flanged. Bellows	DN	15-200	Body:	ASTM A351-CF8m, A182-F316
				Trim:	AISI 321
				Gask:	SS/PTFE

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-600	AISI 316, 316L Graphite Filled CS Centring-, SS Inner-Ring.
ORFS	Orifice Flange Set	DN	50-600	ASTM A182-F316
STBT	Stud Bolt with Nuts			Studs: ASTM A193-B7 Nuts: ASTM A194-2H

Class No.: AS05			Page: 3								Content: Piping Components							
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	*	*	*	*	*	*	*	*	*	*	*					
		74.36.00												*	*	*	*	*
* FLANGES																		
Blind Flange		76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Blind Flange Liner		76.80.00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lap-Joint Flanged		76.62.20	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange		76.88.09	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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																		
Ball Valve Red. Bore Flanged		75.40.08	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Check Valve Flanged		75.40.13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged		75.40.33	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged		75.40.40	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS																		
Gasket, Spiral Wound		85.41.37	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.00.00					*	*	*	*	*	*	*	*	*	*	*	*

Class No.:	AS05	Page:	4	Content:	Reducing Piping Components
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Run	Br.	BROB 76.00.00	RECB 76.33.70	REEB 76.33.73	TERB 76.33.85	TERS 76.37.85	Run	Br.	BROB 76.00.00	RECB 76.33.70	REEB 76.33.73	COMP. NAME	DESCRIPTION
20 × 15			*	*	*	*	400 × 50		*			BROS	Branch Fitting Outlet Socket-Weld. End
25 × 15			*	*	*	*	400 × 80		*			BROB	Branch Outlet Red. Butt-Weld
25 × 20			*	*	*	*	400 × 100		*			RECB	Reducer Conc. Butt-Weld. End
40 × 20			*	*	*	*	400 × 150		*			REEB	Reducer Ecc. Butt-Weld. End
40 × 25			*	*	*	*	400 × 200		*	*	*	TERB	Tee Reducing Butt-Weld. End
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		*				
100 × 80		*	*	*	*	*	450 × 100		*				
150 × 50		*	*	*	*	*	450 × 150		*				
150 × 80		*	*	*	*	*	450 × 200		*				
150 × 100		*	*	*	*	*	450 × 250		*	*	*		
200 × 50		*	*	*	*	*	450 × 300		*	*	*		
200 × 80		*	*	*	*	*	450 × 350		*	*	*		
200 × 100		*	*	*	*	*	450 × 400		*	*	*		
200 × 150		*	*	*	*	*	500 × 50		*				
250 × 50		*	*	*	*	*	500 × 80		*				
250 × 80		*	*	*	*	*	500 × 100		*				
250 × 100		*	*	*	*	*	500 × 150		*				
250 × 150		*	*	*	*	*	500 × 200		*				
250 × 200		*	*	*	*	*	500 × 250		*				
300 × 50		*	*	*	*	*	500 × 300		*	*	*		
300 × 80		*	*	*	*	*	500 × 350		*	*	*		
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		*	*	*		

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.: AS05	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	×	60
20	4	1/2	×	65
25	4	1/2	×	70
40	4	1/2	×	75
50	4	5/8	×	80
80	4	5/8	×	95
100	8	5/8	×	95
150	8	3/4	×	100
200	8	3/4	×	110
250	12	7/8	×	120
300	12	7/8	×	120
350	12	1	×	130
400	16	1	×	140
450	16	1-1/8	×	150
500	20	1-1/8	×	160
600	20	1-1/4	×	180

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	×	70
20	4	1/2	×	70
25	4	1/2	×	80
40	4	1/2	×	80
50	4	5/8	×	90
80	4	5/8	×	110
100	8	5/8	×	110
150	8	3/4	×	120
200	8	3/4	×	125
250	12	7/8	×	140
300	12	7/8	×	145
350	12	1	×	160
400	16	1	×	170
450	16	1-1/8	×	180
500	20	1-1/8	×	195
600	20	1-1/4	×	215

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	5/8	×	120
20	4	5/8	×	120
25	4	5/8	×	120
40	4	3/4	×	130
50	8	5/8	×	150
80	8	3/4	×	150
100	12	3/4	×	140
150	12	3/4	×	140
200	12	7/8	×	150
250	16	1	×	170
300	16	1-1/8	×	190
350	20	1-1/8	×	195
400	20	1-1/4	×	210
450	24	1-1/4	×	220
500	24	1-1/4	×	230
600	24	1-1/2	×	260

* DRAIN POINT Fig. 2V

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Blind Flange Liner				1
Gasket Spiral Wound				2
Lap-Joint Flange				1
Stub-End				1
Stud Bolt with Nuts				8

* DRAIN POINT Fig. 2R

Run	DN 50-600	Br	DN 20	No.
Branch: BROB				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Blind Flange Liner				1
Gasket Spiral Wound				2
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT Fig. 1V

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

* VENT POINT Fig. 1R

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

Class No.: AX01	Page: 1	Content: General
Base Material: Glass-Fiber Reinforced Epoxy	First Issue:	Revision:
Rating: PN 20 (Class 150)	Date:	
Corrosion Allowance: 0 mm	Sign:	

Temperature °C	0	90
Pressure Barg.	DN 25-600	10.0 10.0

TABLE OF SCHEDULES
DN Schedule

25	*
40	*
50	*
80	*
100	*
150	*
200	*
250	*
300	*
350	*
400	*
450	*
500	*
600	*

Notes:

- Design limits are based on nominal pressure (PN 10) of class components.
- For "requirements for GRE pipe and fittings", see Appendix J.
- For GRE flanges, bolts to be provided with washers.
- Flat face GRE flanges connected to raised face flanges must have a steel backing ring behind the GRE flanges.
- Pipe, fittings and flanges - DN 25 - 400 (adhesive bonded joint system).
- Pipe, fittings and flanges - DN 450 - 600 (laminated joints, custom made pipe work).
- For dimensions of pipe and fittings see product list of selected manufacturer.
- Flanges to be drilled in accordance with ANSI B16.5, CL.150.
- Diaphragm valves not to be used as liquid static head shutt-off valves on equipment.

Class No.:	AX01	Page:	2	Content:	Material Descriptions
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* VALVES

BARF	Ball Valve Red. Bore Flanged	DN	25-200	Body:	ASTM A216-WCB/WCC, A105
				Ball:	Lined Body Mat. or Alum.
				Stem:	ASTM B574
				Lining:	PTFE or PFA
BUVW	Butterfly Valve Wafer Type	DN	50-600	Body:	ASTM A216-WCB/WCC, A105
				Disc:	ASTM A182-F316, 316L
				Shaft:	ASTM A182-F316, 316L
				Lining:	PTFE or PFA
CHVF	Check Valve Flanged	DN	25-150	Body:	ASTM A216-WCB/WCC, A105
				Ball:	Lined Body Mat. or Alum.
				Lining:	PTFE or PFA
DIVF	Diaphragm Valve Flanged	DN	25-150	Body:	ASTM A216-WCB/WCC
					Polypropylene Lined
				Diaph:	PTFE with IIR Backing

* MISCELLANEOUS

GKFF	Gasket, Flat Face	DN	25-600	Chloroprene Rubber
				MIN Hardness 65 Shore A
GKRF	Gasket, Raised Face	DN	25-600	Chloroprene Rubber
				MIN Hardness 65 Shore A
STBT	Stud Bolt with Nuts	—		Studs: ASTM A193-B7
				Nuts: ASTM A194-2H
WABL	Washer Black	—		ASTM A307-B

Class No.: AX01	Page: 3	Content: Piping Components
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ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE														
		25	40	50	80	100	150	200	250	300	350	400	450	500	600	
* VALVES																
Ball Valve Red. Bore Flanged	75.72.13/15	*	*	*	*	*	*	*								
Butterfly Valve Wafer Type	75.78.80			*	*	*	*	*	*	*	*	*	*	*	*	*
Check Valve Flanged	75.37.12	*	*	*	*	*	*	*								
Diaphragm Valve Flanged	75.74.00	*	*	*	*	*	*									
* MISCELLANEOUS																
Gasket, Flat Face	85.00.00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gasket, Raised Face	85.00.00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Class No.: AX01	Page: 4	Content: Reducing Piping Components
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Class No.: AX01	Page: 5	Content: Bolting and Assemblies
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BLACK WASHER SET

DN	No.	Inch	mm	81.78.54
25	8	1/2	×	01 *
40	8	1/2	×	01 *
50	8	5/8	×	01 *
80	8	5/8	×	01 *
100	12	5/8	×	01 *
150	12	3/4	×	01 *
200	12	3/4	×	01 *
250	24	7/8	×	01 *
300	24	7/8	×	01 *
350	24	1	×	01 *
400	32	1	×	01 *
450	32	1 1/8	×	01 *
500	40	1 1/8	×	01 *
600	40	1 1/4	×	01 *

BOLT SET FOR GRE FLANGES

DN	No.	Inch	mm	81.38.61
25	4	1/2	×	80 *
40	4	1/2	×	90 *
50	4	5/8	×	110 *
80	4	5/8	×	110 *
100	8	5/8	×	110 *
150	8	3/4	×	130 *
200	8	3/4	×	140 *
250	12	7/8	×	160 *
300	12	7/8	×	170 *
350	12	1	×	190 *
400	16	1	×	210 *
450	16	1 1/8	×	240 *
500	20	1 1/8	×	250 *
600	20	1 1/4	×	275 *

BOLT SET GRE PN 10/WAFER

DN	No.	Inch	mm	81.38.61
50	4	5/8	×	195 *
80	4	5/8	×	215 *
100	8	5/8	×	230 *
150	8	3/4	×	250 *
200	8	3/4	×	255 *
250	12	7/8	×	295 *
300	12	7/8	×	310 *
350	12	1	×	340 *
400	16	1	×	355 *
450	16	1 1/8	×	400 *
500	20	1 1/8	×	420 *
600	20	1 1/4	×	490 *

BOLT SET FOR GRE PN 10/STEEL FLANGES

DN	No.	Inch	mm	81.38.61
25	4	1/2	×	100 *
40	4	1/2	×	100 *
50	4	5/8	×	110 *
80	4	5/8	×	130 *
100	8	5/8	×	130 *
150	8	3/4	×	150 *
200	8	3/4	×	150 *
250	12	7/8	×	170 *
300	12	7/8	×	170 *
350	12	1	×	190 *
400	16	1	×	195 *
450	16	1 1/8	×	210 *
500	20	1 1/8	×	220 *
600	20	1 1/4	×	245 *

Class No.: AZ01	Page: 1	Content: General
Base Material: Carbon Steel Galvanized (Threaded)	First Issue:	Revision:
Rating: PN 20 (Class 150)		Date:
Corrosion Allowance: 0 mm		Sign:

Temperature °C	0	100
Pressure Barg.	DN 15-50	16.0 16.0

TABLE OF SCHEDULES

DN	Schedule	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE					
		Run Size	15	20	25	40	50
15	80	50	R	R	R	R	T
20	80	40	R	R	R	T	
25	80	25	R	R	T		
40	80	20	R	T			
50	80	15	T				

Notes:

- Design limits are acc. valve rating BS 5154.
- Galvanized pipe and pipe spools may be joined by field welds (for wet systems only).
- Piston type check valves for horizontal mounting only.
- Under ground carbon steel components (incl. bolting) shall be protected by coating as per IPS-E-TP-270.
- Flanged joints are preferred above threaded joints.
- For pipes, fittings and flanges, sizes DN 80 and above use class AZ05.
- After shop fabrication, pipe spools shall be galvanized in accordance to ASTM A53.
- Pre-fabricated pipe spools shall have flanged ends and be limited to L-or Z-shapes.
- Application of other types of branch connections is subject to company approval.

CODE EXPLANATION OF CHARACTERS

R	Reducing tee (threaded)
T	Equal tee (threaded)

Class No.:	AZ01	Page:	2	Content:	Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-50	API 5L-B Hot Dip Galvanized To: ASTM A53 or BS 729
PNTT	Pipe Nipple Thrd. Ends L = 50 mm	DN	15-25	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
PT80	Pipe Nipple Thrd. Ends L = 80 mm	DN	15-50	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
PT99	Pipe Nipple Thrd. Ends L = 100 mm	DN	15-100	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729

* FLANGES

BLFL	Blind Flange	DN	15-250	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
FLTR	Flange Threaded	DN	15-150	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
LJFL	Lap-Joint Flange	—		ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729

* FITTINGS

CAPB	Cap Threaded	DN	15-100	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
COUT	Coupling Threaded Ends	DN	15-100	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
E45T	Elbow 45 Deg. Thrd. End	DN	15-100	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
E90T	Elbow 90 Deg. Thrd. End	DN	15-100	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
PLUG	Plug NPT	DN	15-100	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
TEET	Tee Threaded Ends	DN	15-100	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
UNIT	Union Threaded Ends	DN	15-100	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729

* REDUCING FITTINGS

REBT	Reduced Bushing Thrd. Ends	DN	20-100	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
RECT	Reducer Conc. Thrd. Ends	DN	20-100	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
REFT	Reducer Flanged Thrd. Ends	DN	20-100	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
TERT	Tee Reducing Thrd. Ends	DN	20-100	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729

Note:

For full material description see relevant MESC buying description.

* VALVES

BUVW	Butterfly Valve Wafer Type	DN	50-250	Body: ASTM A216-WCB/WCC, A105 Rubber Lined Disc: ASTM B148
CHVT	Check Valve Threaded Ends	DN	15-50	Body/Trim: ASTM B148
GAVP	Gate Valve Flanged Flat Face	DN	15-80	Body/Trim: ASTM B148
GAVT	Gate Valve Threaded Ends	DN	15-50	Body/Trim: ASTM B148
GLVT	Globe Valve Threaded Ends	DN	15-40	Body/Trim: ASTM B148

* MISCELLANEOUS

GKGF	Gasket Full Face	DN	15-250 C.A.F
GKTI	Gasket, RF.	DN	15-250 C.A.F
STBT	Stud Bolt with Nuts		— Studs: ASTM A193-B7 Nuts: ASTM A194-2H

Class No.: AZ01	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		MESC	15	20	25	40	50	NOMINAL PIPE SIZE					200	250
								80	100	150				
* PIPE														
Pipe		74.13.11	*	*	*	*	*							
Pipe Nipple Thrd. Ends L = 50 mm		76.06.56	*	*	*									
Pipe Nipple Thrd. Ends L = 80 mm		76.06.56	*	*	*	*	*							
Pipe Nipple Thrd. Ends L = 100 mm		76.06.56	*	*	*	*	*							
* FLANGES														
Blind Flange		76.62.15	*	*	*	*	*	*	*	*		*	*	
Flange Treaded		76.62.61	*	*	*	*	*							
* FITTINGS														
Cap	Threaded	76.06.18	*	*	*	*	*	*						
Coupling	Threaded Ends	76.06.28	*	*	*	*	*	*						
Elbow 45 Deg.	Threaded Ends	76.06.38	*	*	*	*	*	*						
Elbow 90 Deg.	Threaded Ends	76.06.39	*	*	*	*	*	*						
Plug NPT		76.06.66	*	*	*	*	*	*						
Tee	Threaded Ends	76.06.84	*	*	*	*	*	*						
Union	Threaded Ends	76.06.91	*	*	*	*	*	*						
* VALVES														
Butterfly Valve Wafer Type		75.72.78					*	*	*	*		*	*	
Check Valve Threaded Ends		75.21.12	*	*	*	*	*							
Gate Valve Flanged Flat Face		75.21.00	*	*	*	*	*	*						
Gate Valve Threaded Ends		75.21.16	*	*	*	*	*							
Globe Valve Threaded Ends		75.21.18	*	*	*	*	*							
* MISCELLANEOUS														
Gasket, Full Face		85.31.07	*	*	*	*	*	*	*	*	*	*	*	*
Gasket, RF.		85.31.02	*	*	*	*	*	*	*	*	*	*	*	*

Class No.: AZ01	Page: 4	Content: Reducing Piping Components
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Run	Br.	REBT 76.06.14	RECT 76.06.70	REFT 76.62.61	TERT 76.06.85	COMP. NAME	DESCRIPTION
20	× 15	*	*	*	*	REBT	Reduced Bushing Thrd. Ends
25	× 15	*	*	*	*	RECT	Reduced Conc. Thrd. Ends
25	× 20	*	*	*	*	REFT	Reducing Flange Threaded End
40	× 15	*	*	*	*	TERT	Tee Reducing Threaded Ends
40	× 20	*	*	*	*		
40	× 25	*	*	*	*		
50	× 15	*	*	*	*		
50	× 20	*	*	*	*		
50	× 25	*	*	*	*		
50	× 40	*	*	*	*		
80	× 15			*			
80	× 20			*			
80	× 25	*	*	*	*		
80	× 40	*	*	*	*		
80	× 50	*	*	*	*		
100	× 15			*			
100	× 20			*			
100	× 25			*			
100	× 40	*	*	*	*		
100	× 50	*	*	*	*		
100	× 80	*	*	*	*		

Class No.: AZ01	Page: 5	Content: Bolting and Assemblies
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BOLTS.WA. LUG BUTTFY VALVE

DN	No.	Inch	mm	81.38.61
15	4	5/8	×	130
80	4	5/8	×	150
100	8	5/8	×	150
150	8	3/4	×	160
200	8	3/4	×	170
250	12	7/8	×	190

BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	1/2	×	60
20	4	1/2	×	70
25	4	1/2	×	70
40	4	1/2	×	80
50	4	5/8	×	80
80	4	5/8	×	100
100	8	5/8	×	100
150	8	3/4	×	100
200	8	3/4	×	110
250	12	7/8	×	120

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	×	70
20	4	1/2	×	70
25	4	1/2	×	80
40	4	1/2	×	80
50	4	5/8	×	90
80	4	5/8	×	110
100	8	5/8	×	110
150	8	3/4	×	120
200	8	3/4	×	130
250	12	7/8	×	140

* DRAIN POINT Fig. 0C

Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Cap Threaded				1
Gate Valve Threaded Ends				1
Pipe Nipple Thrd. Ends L = 50 mm				2

* DRAIN POINT Fig. 0C

Run	DN 40-50	Br	DN 20	No.
Branch: Table Page 1				1
Cap Threaded				1
Gate Valve Threaded Ends				1
Pipe Nipple Thrd. Ends L = 50 mm				2

* VENT POINT Fig. 1C

Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Cap Threaded				1
Globe Valve Threaded Ends				1
Pipe Nipple Thrd. Ends L = 50 mm				2

* VENT POINT Fig. 1C

Run	DN 40-50	Br	DN 20	No.
Branch: Table Page 1				1
Cap Threaded				1
Globe Valve Threaded Ends				1
Pipe Nipple Thrd. Ends L = 50 mm				2

Class No.: AZ02	Page: 1	Content: General
Base Material: Carbon Steel Rubber Lined	First Issue:	Revision:
Rating: PN 20 (Class 150)		Date:
Corrosion Allowance: 0 mm		Sign:

Temperature °C		0	30	80
Pressure Barg.	DN 25-150	10.0	10.0	10.0
	DN 200-300	6.0	6.0	6.0
Pressure MBar Abs.	DN 25-300	130.0	130.0	

TABLE OF SCHEDULES

DN	Schedule	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE									
		Run Size	25	40	50	80	100	150	200	250	300
25	40	300	D	D	D	D	D	B	B	B	A
40	40	250	D	D	D	D	B	B	B	A	
50	40	200	D	D	D	D	B	B	A		
80	40	150	D	D	D	B	B	A			
100	40	100	D	B	B	B	A				
150	40	80	D	B	B	A					
200	40	50	B	B	A						
250	40	40	B	A							
300	40	25	A								

Notes:

- Design limits are based on allowable pressure rating of valves.
- For requirements for rubber linings of process equipment and piping, see Appendix H.
- All prefabricated piping parts and blind flanges shall be lined with hard natural rubber, minimum hardness = 60 shore D.
- Diaphragm valves not to be used as liquid static head shut-off valves on equipment.
- For type and overall dimensions of (combined) flanged fittings see drawing 4 of Appendix H.
- For overall dimensions of flanged pipe see drawing 5 of Appendix H.
- Branch pieces are intended for instrument connections and (where applicable) for vent-, and drain points.
- Application of other types of branch connections shall be subject to the prior approval of company.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
D	Pipe to pipe

Class No.: AZ02	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	25-300	ASTM	A106-B
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* FLANGES

BLFM	Blind Flange Modified	DN	25-300	ASTM	A105
SOFM	Slip-On Flange Modified	DN	25-300	Special Face, ASTM	A105
WNFM	Welding Neck Flange Modified	DN	25-300	Special Face, ASTM	A105

* FITTINGS

E45B	Elbow 45 Deg.	Butt-Weld. Ends	DN	25-300	ASTM	A234-WPB
E90B	Elbow 90 Deg.	Butt-Weld. Ends	DN	25-300	ASTM	A234-WPB
SP12	Spacer Straight	L = 12	DN	25-300	ASTM	A285-C
SP18	Spacer Straight	L = 18	DN	25-300	ASTM	A285-C
SP25	Spacer Straight	L = 25	DN	25-300	ASTM	A285-C
TEEB	Equal Tee	Butt-Weld. Ends	DN	25-300	ASTM	A234-WPB

* REDUCING FITTINGS

RECB	Reducer Conc.	Butt-Weld. Ends	DN	40-300	ASTM	A234-WPB
REEB	Reducer Ecc.	Butt-Weld. Ends	DN	40-300	ASTM	A234-WPB
TERB	Tee Reducing	Butt-Weld. Ends	DN	40-300	ASTM	A234-WPB

Note:

For full material description see relevant MESC buying description.

* VALVES

BARF	Ball Valve Red. Bore Flanged	DN	25-200	Body:	ASTM A216-WCB/WCC, A105
				Ball:	Lined Body Mat., Alum.
				Stem:	ASTM B574
				lining:	PTFE, PFA
BUVW	Butterfly Valve Wafer Type	DN	50-300	Body:	ASTM A216-WCB/WCC, A105
					Rubber Lined
				Disc:	ASTM B148
CHVF	Check Valve Flanged	DN	25-150	Body:	ASTM A216-WCB/WCC, A105
				Ball:	Lined Body Mat., Alum.
				lining:	PTFE, PFA
DIVF	Diaphragm Valve Flanged	DN	25-300	Body:	ASTM A216 or A105
				lining:	NR (Natural Rubber)
				Diaph:	IRR (Butyl Rubber)

* MISCELLANEOUS

GKRF	Gasket, Raised Face	DN	25-300	Natural Rubber, Black
STBT	Stud Bolt with Nuts			Hardness 56 Shore A
		—		Studs: ASTM A193-B7
				Nuts: ASTM A194-2H

Class No.: AZ02	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE								
			25	40	50	80	100	150	200	250	300
* PIPE											
Pipe		74.30.05	*	*	*	*	*	*	*	*	*
* FLANGES											
Blind Flange Modified		76.62.10	*	*	*	*	*	*	*	*	*
Slip-On Flange Modified		76.62.30	*	*	*	*	*	*	*	*	*
Welding Neck Flange Modified		76.62.79	*	*	*	*	*	*	*	*	*
* FITTINGS											
Elbow 45 Deg.	Butt-Weld. End	76.30.38	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.30.40	*	*	*	*	*	*	*	*	*
Spacer Straight	L = 12	76.82.68	*	*	*	*	*	*	*	*	*
Spacer Straight	L = 18	76.82.68	*	*	*	*	*	*	*	*	*
Spacer Straight	L = 25	76.82.68	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. EndS	76.30.84	*	*	*	*	*	*	*	*	*
* VALVES											
Ball Valve Red. Bore Flanged		75.72.13/15	*	*	*	*	*	*	*		
Butterfly Valve Wafer Type		75.72.78/80			*	*	*	*	*	*	*
Check Valve Flanged		75.37.12	*	*	*	*	*	*			
Diaphragm Valve Flanged		75.74.00	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS											
Gasket, Raised Face		85.45.02	*	*	*	*	*	*	*	*	*

Class No.: AZ02	Page: 4	Content: Reducing Piping Components
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Run	Br.	BRPW 76.82.00	RECB 76.30.72	REEB 76.30.73	TERB 76.30.85	COMP. NAME	DESCRIPTION
40 × 25			*	*	*	BRPW	Branch Piece, Wafer Type
50 × 25			*	*	*	RECB	Reducer Conc. Butt-Weld. Ends
50 × 40			*	*	*	REEB	Reducer Ecc. Butt-Weld. Ends
80 × 25		*				TERB	Tee Reducing Butt-Weld. Ends
80 × 40		*	*	*	*		
80 × 50			*	*	*		
100 × 25		*					
100 × 40		*	*	*			
100 × 50			*	*	*		
100 × 80			*	*	*		
150 × 25		*					
150 × 40		*					
150 × 80			*	*	*		
150 × 100			*	*	*		
200 × 25		*					
200 × 40		*					
200 × 100			*	*	*		
200 × 150			*	*	*		
250 × 25		*					
250 × 40		*					
250 × 100			*	*	*		
250 × 150			*	*	*		
250 × 200			*	*	*		
300 × 25		*					
300 × 40		*					
300 × 150			*	*	*		
300 × 200			*	*	*		
300 × 250			*	*	*		

Class No.: AZ02	Page: 5	Content: Bolting and Assemblies
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BOLT SET BRANCH PIECE

DN	No.	Inch	mm	81.38.61
80	4	5/8	×	170
100	8	5/8	×	170
150	8	3/4	×	170
200	8	3/4	×	180
250	12	7/8	×	190
300	12	7/8	×	190

BOLT SET SPACER L = 12

DN	No.	Inch	mm	81.38.61
25	4	1/2	×	90
40	4	1/2	×	90
50	4	5/8	×	100
80	4	5/8	×	110
100	8	5/8	×	110
150	8	3/4	×	120
200	8	3/4	×	130
250	12	7/8	×	140
300	12	7/8	×	140

BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
25	4	1/2	×	70
40	4	1/2	×	80
50	4	5/8	×	80
80	4	5/8	×	100
100	8	5/8	×	100
150	8	3/4	×	100
200	8	3/4	×	110
250	12	7/8	×	120
300	12	7/8	×	120

BOLT SET SPACER L = 18

DN	No.	Inch	mm	81.38.61
25	4	1/2	×	90
40	4	1/2	×	100
50	4	5/8	×	100
80	4	5/8	×	120
100	8	5/8	×	120
150	8	3/4	×	120
200	8	3/4	×	130
250	12	7/8	×	140
300	12	7/8	×	140

BOLT SET SPACER L = 25

DN	No.	Inch	mm	81.38.61
25	4	1/2	×	100
40	4	1/2	×	100
50	4	5/8	×	110
80	4	5/8	×	120
100	8	5/8	×	120
150	8	3/4	×	130
200	8	3/4	×	140
250	12	7/8	×	150
300	12	7/8	×	150

Class No.: AZ03	Page: 1	Content: General
Base Material: Carbon Steel, Cement Lined	First Issue:	Revision:
Rating: PN 20 (Class 150)	Date:	
Corrosion Allowance: 0 mm	Sign:	

Temperature °C	0	45
Pressure Barg.	DN 100-600	16.0
	DN 650-900	10.0

TABLE OF SCHEDULES			BRANCH CONNECTIONS 90 DEGREES																
			Run	BRANCH SIZE															
DN	Schedule	Size	100	150	200	250	300	350	400	450	500	600	650	700	750	800	850	900	
100	40	900	D	D	D	D	D	D	M	M	M	M	B	B	B	B	B	A	
150	40	850	D	D	D	D	D	D	M	M	M	M	B	B	B	B	A		
200	30	800	D	D	D	D	D	M	M	M	M	M	B	B	B	A			
250	30	750	D	D	D	D	M	M	M	M	M	M	B	B	A				
300	30	700	D	D	D	D	M	M	M	M	M	M	B	A					
350	30	650	D	D	D	D	M	M	M	M	M	M	A						
400	30	600	N	N	N	N	N	N	N	N	N	Q							
450	20	500	N	N	N	N	N	N	N	N	Q								
500	20	450	N	N	N	N	N	N	N	Q									
600	20	400	N	N	N	N	N	N	Q										
650	STD	350	N	N	N	N	N	Q											
700	STD	300	N	N	N	N	Q												
750	STD	250	N	N	N	Q													
800	STD	200	N	N	Q														
850	STD	150	N	Q															
900	STD	100	Q																

Notes:

			CODE		EXPLANATION OF CHARACTERS
- For requirements of cement-lined pipe and fittings see Appendix I.		Fabricated, Dwg. No. I-4 DN650-600	ASTM A234-WPB/API 5L-B	A	Equal tee, Factory made
- Pipe			ASTM A105	B	Reducing tee, Factory made
Plain/spigot end DN100-400	API 5L-B (Seamless)	Factory-Made, Butt-Weld DN650-900	ASTM A234-WPB	D	Pipe to pipe
Plain/spigot end DN450-600	API 5L-B (Welded)			M	Reducing tee Dwg. No. I-4
Butt-weld ends DN650-900	API 5L-B (Welded)	For type and overall dimensions of fabricated fittings see Dwg. No. I-3 and Dwg. No. I-4.		N	Reducing tee Dwg. No. I-3
- Flanges		Factory-Made, butt-welding fittings to be in accordance with ASME/ANSI B16.9.		Q	Equal tee Dwg. No. I-3
Slip-On, Spigot End DN100-600	ASTM A105/API 5L-B				
Welding Neck Flange DN650-900	ASTM A105	Relevant Drawings:			
Blind Flange DN100-900	ASTM A105	For dimensions of sleeves and tolerances of pipe ends see Dwg. No. I-5.			
- Fittings		For flanged ends see Dwg. No. I-6.			
Fabricated, Dwg. No. I-3 DN100-600	ASTM A234-WPB/API 5L-B	For typical detail of set-on branch see Dwg. No. I-7.			
	ASTM A105				

Class No.: AZ03	Page: 2	Content: Material Descriptions
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* FLANGES

BLFL Blind Flange DN 100-900 ASTM A105

* FITTINGS

TEEB Equal Tee Butt-Weld. Ends DN 100-900 ASTM A234-WPB

* REDUCING FITTINGS

TERB Tee Reducing Butt-Weld. Ends DN 150-900 ASTM A234-WPB

Note:

For full material description see relevant MESC buying description.

Carbon steel blind flanges to be protected as follow:

* Blast cleaning to SA 2½

* 400 µM (MIN) Epoxy coal tar paint.

* VALVES

BUVW Butterfly Valve Wafer Type DN 100-900 Body: ASTM A216-WCB/WCC, A105
Rubber Lined

CHWL Dual PL. Check Valve Wafer Lug DN 100-900 Disc: ASTM B148
Body: ASTM B148
Int: ASTM B148/NBR

* MISCELLANEOUS

GKFC Gasket, Flat Face DN 100-600 Chloroprene Rubber
MIN Hardmess 70.5 Shore A

GKRC Gasket, Raised Face DN 100-900 Chloroprene Rubber
MIN Hardmess 70.5 Shore A

STBT Stud Bolt with Nuts — Studs: ASTM A193-B7
Nuts: ASTM A194-2H

Class No.: AZ03	Page: 3	Content: Piping Components
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ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE																
		100	150	200	250	300	350	400	450	500	600	650	700	750	800	850	900	
* FLANGES																		
Blind Flange	76.62.10 76.70.12	*	*	*	*	*	*	*	*	*	*		*	*	*	*	*	*
* FITTINGS																		
Equal Tee	Butt-Weld. Ends	76.30.84	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* VALVES																		
Butterfly Valve Wafer Type	75.72.78/80	*	*	*	*	*	*	*	*	*	*		*	*	*			*
Dual PL. Check Valve Wafer Lug		*	*	*	*	*	*	*	*	*	*	*		*				*
* MISCELLANEOUS																		
Gasket, Flat Face	85.45.02	*	*	*	*	*	*	*	*	*	*							
Gasket, Rised Face	85.45.02	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Class No.: AZ03	Page: 4	Content: Reducing Piping Components
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Run	Br.	TERB 76.30.85	COMP. NAME	DESCRIPTION
150 × 100		*	TERB	Tee Reducer Butt-Weld. Ends
200 × 100		*		
200 × 150		*		
250 × 100		*		
250 × 150		*		
250 × 200		*		
300 × 150		*		
300 × 200		*		
300 × 250		*		
350 × 150		*		
350 × 200		*		
350 × 250		*		
350 × 300		*		
400 × 200		*		
400 × 250		*		
400 × 300		*		
400 × 350		*		
500 × 450		*		
600 × 450		*		
600 × 500		*		
700 × 650		*		
750 × 650		*		
750 × 700		*		

Class No.: AZ03	Page: 5	Content: Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
100	8	5/8	×	100 *
150	8	3/4	×	100 *
200	8	3/4	×	110 *
250	12	7/8	×	120 *
300	12	7/8	×	120 *
350	12	1	×	130 *
400	16	1	×	140 *
450	16	1 1/8	×	150 *
500	20	1 1/8	×	160 *
600	20	1 1/4	×	180 *

BOLT SET FLANGED JOINTS-C

DN	No.	Inch	mm	81.38.61
650	24	1 1/4	×	220 *
700	28	1 1/4	×	220 *
750	28	1 1/4	×	230 *
800	28	1 1/4	×	240 *
850	32	1 1/2	×	260 *
900	32	1 1/2	×	275 *

BOLT SET WAFER BUTTERFLY C

DN	No.	Inch	mm	81.38.61
100	8	5/8	×	150 *
150	8	3/4	×	160 *
200	8	3/4	×	170 *
250	12	7/8	×	190 *
300	12	7/8	×	210 *
350	12	1	×	230 *
400	16	1	×	250 *
450	16	1 1/8	×	265 *
500	20	1 1/8	×	290 *
600	20	1 1/4	×	340 *
700	28	1 1/4	×	455 *
750	28	1 1/4	×	470 *
800	28	1 1/4	×	490 *
900	32	1 1/2	×	520 *

BOLT SET WAFER CHECK VALVE

DN	No.	Inch	mm	81.38.61
100	8	5/8	×	170 *
150	8	3/4	×	210 *
200	8	3/4	×	240 *
250	12	7/8	×	285 *
300	12	7/8	×	310 *
350	12	1	×	330 *
400	16	1	×	330 *
450	16	1 1/8	×	360 *
500	20	1 1/8	×	385 *
600	20	1 1/4	×	400 *
750	28	1 1/4	×	540 *
900	32	1 1/2	×	680 *

Temperature °C		0	150
* Pressure Barg.	DN 25-200	10.0	10.0

DN	Schedule
25	80
40	80
50	80
80	40
100	40
150	40
200	30

Temp. in Deg. C-	20	0	50	75	100	120	150
Press. Bar Ga.	10.0	10.0	10.0	10.0	7.5	6.5	5.0

40×25	80×40	150×100
50×25	80×50	200×150
50×40	100×80	

- Use boltset "Large side tap" for these flanges. Use boltset "large side fl." for all other size combinations.
- Gaskets to be used for re-installation purposes only, and for connecting lined piping components to parts of vulnerable piping systems or equipment.
- The use of spacers shall be kept to a minimum.
- Diaphragm valves not to be used as liquid head shutt-off valves on equipment.

Class No.: AZ04	Page: 2	Content: Material Descriptions
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* PIPE

P 10	Pipe Spool	L = 100	DN 25-40	ASTM A106-B,	PTFE-Lined
P 20	Pipe Spool	L = 200	DN 25-200	ASTM A106-B,	PTFE-Lined
P 30	Pipe Spool	L = 300	DN 25-200	ASTM A106-B,	PTFE-Lined
P 40	Pipe Spool	L = 400	DN 25-200	ASTM A106-B,	PTFE-Lined
P 60	Pipe Spool	L = 600	DN 25-200	ASTM A106-B,	PTFE-Lined
P 80	Pipe Spool	L = 800	DN 25-200	ASTM A106-B,	PTFE-Lined
P100	Pipe Spool	L = 1000	DN 25-200	ASTM A106-B,	PTFE-Lined
P150	Pipe Spool	L = 1500	DN 25-200	ASTM A106-B,	PTFE-Lined
P200	Pipe Spool	L = 2000	DN 25-200	ASTM A106-B,	PTFE-Lined
P300	Pipe Spool	L = 3000	DN 25-200	ASTM A106-B,	PTFE-Lined
P600	Pipe Spool	L = 6000	DN 25-150	ASTM A106-B,	PTFE-Lined

* FLANGES

BLFL	Blind Flange		DN 25-200	ASTM A105	
FLIN	Blind Flange Liner		DN 25-200	ASTM D1457 Type 3, CL.1 or 2	

* FITTINGS

CREL	Cross Equal		DN 25-200	ASTM A216-WCB/WCC, PTFE/PFA-LD	
E45L	Elbow 45 Deg.		DN 25-200	ASTM A216-WCB/WCC, PTFE/PFA-LD	
E90L	Elbow 90 Deg.		DN 25-200	ASTM A216-WCB/WCC, PTFE/PFA-LD	
SP15	Spacer Straight	L = 15	DN 25-200	ASTM A105,	PTFE/PFA-Lined
SP20	Spacer Straight	L = 20	DN 25-200	ASTM A105,	PTFE/PFA-Lined
SP25	Spacer Straight	L = 25	DN 25-200	ASTM A105,	PTFE/PFA-Lined
SP30	Spacer Straight	L = 30	DN 25-200	ASTM A105,	PTFE/PFA-Lined
SP35	Spacer Straight	L = 35	DN 25-200	ASTM A105,	PTFE/PFA-Lined
SP40	Spacer Straight	L = 40	DN 25-200	ASTM A105,	PTFE/PFA-Lined
SP50	Spacer Straight	L = 50	DN 25-200	ASTM A105,	PTFE/PFA-Lined
SP60	Spacer Straight	L = 60	DN 25-80	ASTM A106-B,	PTFE/PFA-Lined
			DN 100-200	ASTM A105,	PTFE/PFA-Lined
SP70	Spacer Straight	L = 70	DN 25-100	ASTM A106-B,	PTFE/PFA-Lined
			DN 150-200	ASTM A105,	PTFE/PFA-Lined
SP80	Spacer Straight	L = 80	DN 25-200	ASTM A106-B,	PTFE/PFA-Lined
SP90	Spacer Straight	L = 90	DN 25-200	ASTM A106-B,	PTFE/PFA-Lined
SP99	Spacer Straight	L = 100	DN 50-200	ASTM A106-B,	PTFE/PFA-Lined
SP10	Spacer Ring Type	L = 10	DN 25-200	PTFE To ASTM D1457	
TEEL	Equal Tee		DN 25-200	ASTM A216-WCB/WCC, PTFE/PFA-LD	

* REDUCING FITTINGS

BRPL	Branch Piece, Wafer Type, Lined	DN 40-200	ASTM A106-B	PTFE-Lined	
RECL	Reducer Conc. Lined	DN 40-200	ASTM A216-WCB/WCC, PTFE/PFA-LD		
REEL	Reducer Ecc. Lined	DN 40-200	ASTM A216-WCB/WCC, PTFE/PFA-LD		
REFL	Reducing Flange, Lined	DN 40-200	ASTM A105	PTFE/PFA-Lined	
TERL	Reducing Tee, Lined	DN 40-200	ASTM A216-WCB/WCC, PTFE/PFA-LD		

* VALVES

BARF	Ball Valve Red. Bore Flanged	DN 25-200	Body: ASTM A216-WCB/WCC, A105 Ball: Lined Body Mat. or Alum. Stem: ASTM B574 Lining: PTFE or PFA	
BUVW	Butterfly Valve Wafer Type	DN 50-200	Body: ASTM A216-WCB/WCC, A105 Int: AISI 316(L) Lining: PTFE or PFA	
CHVF	Check Valve Flanged	DN 25-150	Body: ASTM A216-WCB/WCC, A105 Ball: Lined Body Mat. or Alum. Lining: PTFE or PFA	
DIVF	Diaphragm Valve Flanged	DN 25-150	Body: ASTM A216-WCB/WCC, A105 PTFE or PFA Lined Diaph: PTFE with IIR Backing	

* MISCELLANEOUS

GKRF	Gasket, Raised Face	DN 25-200	PTFE Reinf. with Mineral Filler	
STBT	Stud Bolt with Nuts	—	Studs: ASTM A193-B7 Nuts: ASTM A194-2H	

Note:

For full material description see relevant MESC buying description.

Class No.:	AZ04	Page:	3	Content:	Piping Components
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ITEM DESCRIPTION		MESC	25	40	50	80	100	150	200
NOMINAL PIPE SIZE									
* PIPE									
Pipe Spool	L = 100	74.94.41	*	*					
Pipe Spool	L = 200	74.94.41	*	*	*	*	*	*	*
Pipe Spool	L = 300	74.94.41	*	*	*	*	*	*	*
Pipe Spool	L = 400	74.94.41	*	*	*	*	*	*	*
Pipe Spool	L = 600	74.94.41	*	*	*	*	*	*	*
Pipe Spool	L = 800	74.94.41	*	*	*	*	*	*	*
Pipe Spool	L = 1000	74.94.41	*	*	*	*	*	*	*
Pipe Spool	L = 1500	74.94.41	*	*	*	*	*	*	*
Pipe Spool	L = 2000	74.94.41	*	*	*	*	*	*	*
Pipe Spool	L = 3000	74.94.41	*	*	*	*	*	*	*
Pipe Spool	L = 6000	74.94.41	*	*	*	*	*	*	*
* FLANGES									
Blind Flange		76.62.11	*	*	*	*	*	*	*
Blind Flange Liner		76.80.81	*	*	*	*	*	*	*
* FITTINGS									
Cross Equal		76.93.30	*	*	*	*	*	*	*
Elbow 45 Deg.		76.93.38	*	*	*	*	*	*	*
Elbow 90 Deg.		76.93.39	*	*	*	*	*	*	*
Spacer Straight	L = 15	76.93.68	*	*	*	*	*	*	*
Spacer Straight	L = 20	76.93.68	*	*	*	*	*	*	*
Spacer Straight	L = 25	76.93.68	*	*	*	*	*	*	*
Spacer Straight	L = 30	76.93.68	*	*	*	*	*	*	*
Spacer Straight	L = 35	76.93.68	*	*	*	*	*	*	*
Spacer Straight	L = 40	76.93.68	*	*	*	*	*	*	*
Spacer Straight	L = 50	76.93.68	*	*	*	*	*	*	*
Spacer Straight	L = 60	76.93.68	*	*	*	*	*	*	*
Spacer Straight	L = 70	76.93.68	*	*	*	*	*	*	*
Spacer Straight	L = 80	76.93.68	*	*	*	*	*	*	*
Spacer Straight	L = 90	76.93.68	*	*	*	*	*	*	*
Spacer Straight	L = 100	76.93.68	*	*	*	*	*	*	*
Spacer Ring Type	L = 10	76.95.68	*	*	*	*	*	*	*
Equal Tee		76.93.84	*	*	*	*	*	*	*
* VALVES									
Ball Valve Red. Bore Flanged		77.55.00	*	*	*	*	*	*	*
Butterfly Valve Wafer Type		77.60.20			*	*	*	*	*
Check Valve Flanged		77.62.00	*	*	*	*	*	*	*
Diaphragm Valve Flanged		77.64.00	*	*	*	*	*	*	*
* MISCELLANEOUS									
Gasket, Raised Face		85.48.74	*	*	*	*	*	*	*

Class No.: AZ04	Page: 4	Content: Reducing Piping Components, Bolting
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Run	Br.	BRPL 76.93.11	RECL 76.93.70	REEL 76.93.71	REFL 76.93.95	TERL 76.93.85
40 × 25		*	*	*	*	*
50 × 25		*	*	*	*	*
50 × 40		*	*	*	*	*
80 × 25		*		*	*	*
80 × 40		*	*	*	*	*
80 × 50			*	*	*	*
100 × 25		*		*	*	*
100 × 40		*		*	*	*
100 × 50			*	*	*	*
100 × 80			*	*	*	*
150 × 25		*		*	*	*
150 × 40		*		*	*	*
150 × 50				*	*	*
150 × 80			*	*	*	*
150 × 100			*	*	*	*
200 × 25		*		*	*	*
200 × 40		*		*	*	*
200 × 50				*	*	*
200 × 80				*	*	*
200 × 100			*	*	*	*
200 × 150			*	*	*	*

BOLT SET FLANGED JOINTS - P					
DN	No.	Inch	mm	81.38.61	
25	4	1/2 ×	80	*	
40	4	1/2 ×	90	*	
50	4	5/8 ×	100	*	
80	4	5/8 ×	110	*	
100	8	5/8 ×	110	*	
150	8	3/4 ×	130	*	
200	8	3/4 ×	140	*	

BOLT SET RED. FLG. L.S.FLG. - P					
DN	No.	Inch	mm	81.38.61	
40	4	1/2 ×	100	*	
50	4	5/8 ×	110	*	
80	4	5/8 ×	120	*	
100	8	5/8 ×	130	*	
150	8	3/4 ×	140	*	
200	8	3/4 ×	150	*	

BOLT SET RED. FLG. S.SIDE - P					
DN	No.	Inch	mm	81.38.61	
25	4	1/2 ×	70	*	
40	4	1/2 ×	80	*	
50	4	5/8 ×	90	*	
80	4	5/8 ×	100	*	
100	8	5/8 ×	100	*	
150	8	3/4 ×	110	*	

BOLT SET RED. FLG. L.S.TAP - P					
DN	No.	Inch	mm	81.38.61	
40	4	1/2 ×	90	*	
50	4	5/8 ×	100	*	
80	4	5/8 ×	110	*	
100	8	5/8 ×	120	*	
150	8	3/4 ×	120	*	
200	8	3/4 ×	130	*	

BOLT SET BRANCH PIECES-P					
DN	No.	Inch	mm	81.38.61	
25	4	1/2 ×	150	*	
40	4	1/2 ×	160	*	
50	4	5/8 ×	170	*	
80	4	5/8 ×	190	*	
100	8	5/8 ×	190	*	
150	8	3/4 ×	210	*	
200	8	3/4 ×	220	*	

BOLT SET SPACER L = 10 - P					
DN	No.	Inch	mm	81.38.61	
25	4	1/2 ×	90	*	
40	4	1/2 ×	100	*	
50	4	5/8 ×	110	*	
80	4	5/8 ×	120	*	
100	8	5/8 ×	130	*	
150	8	3/4 ×	140	*	
200	8	3/4 ×	150	*	

BOLT SET SPACER L = 15 - P					
DN	No.	Inch	mm	81.38.61	
25	4	1/2 ×	90	*	
40	4	1/2 ×	100	*	
50	4	5/8 ×	120	*	
80	4	5/8 ×	130	*	
100	8	5/8 ×	130	*	
150	8	3/4 ×	140	*	
200	8	3/4 ×	150	*	

BOLT SET SPACER L = 20 - P					
DN	No.	Inch	mm	81.38.61	
25	4	1/2 ×	95	*	
40	4	1/2 ×	105	*	
50	4	5/8 ×	120	*	
80	4	5/8 ×	130	*	
100	8	5/8 ×	130	*	
150	8	3/4 ×	145	*	
200	8	3/4 ×	160	*	

COMP. NAME	DESCRIPTION
BRPL	Branch Piece, Wafer Type Lined
RECL	Reducer Concentric, Lined
REEL	Reducer Eccentric, Lined
REFL	Reducing Flange, Lined
TERL	Reducing Tee, Lined

Class No.: AZ04	Page: 5	Content: Bolting and Assemblies
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BOLT SET SPACER L = 25 - P

DN	No.	Inch	mm	81.38.61
25	4	1/2 ×	100	*
40	4	1/2 ×	110	*
50	4	5/8 ×	130	*
80	4	5/8 ×	135	*
100	8	5/8 ×	135	*
150	8	3/4 ×	150	*
200	8	3/4 ×	170	*

BOLT SET SPACER L = 50 - P

DN	No.	Inch	mm	81.38.61
25	4	1/2 ×	125	*
40	4	1/2 ×	135	*
50	4	5/8 ×	150	*
80	4	5/8 ×	170	*
100	8	5/8 ×	170	*
150	8	3/4 ×	180	*
200	8	3/4 ×	190	*

BOLT SET SPACER L = 90 - P

DN	No.	Inch	mm	81.38.61
25	4	1/2 ×	170	*
40	4	1/2 ×	170	*
50	4	5/8 ×	190	*
80	4	5/8 ×	210	*
100	8	5/8 ×	210	*
150	8	3/4 ×	220	*
200	8	3/4 ×	230	*

BOLT SET SPACER L = 30 - P

DN	No.	Inch	mm	81.38.61
25	4	1/2 ×	110	*
40	4	1/2 ×	120	*
50	4	5/8 ×	130	*
80	4	5/8 ×	150	*
100	8	5/8 ×	150	*
150	8	3/4 ×	160	*
200	8	3/4 ×	170	*

BOLT SET SPACER L = 60 - P

DN	No.	Inch	mm	81.38.61
25	4	1/2 ×	135	*
40	4	1/2 ×	150	*
50	4	5/8 ×	170	*
80	4	5/8 ×	170	*
100	8	5/8 ×	170	*
150	8	3/4 ×	190	*
200	8	3/4 ×	210	*

BOLTSET SPACER L = 100 - P

DN	No.	Inch	mm	81.38.61
50	4	5/8 ×	210	*
80	4	5/8 ×	210	*
100	8	5/8 ×	210	*
150	8	3/4 ×	230	*
200	8	3/4 ×	240	*

BOLT SET SPACER L = 35 - P

DN	No.	Inch	mm	81.38.61
25	4	1/2 ×	110	*
40	4	1/2 ×	120	*
50	4	5/8 ×	135	*
80	4	5/8 ×	150	*
100	8	5/8 ×	150	*
150	8	3/4 ×	160	*
200	8	3/4 ×	170	*

BOLT SET SPACER L = 70 - P

DN	No.	Inch	mm	81.38.61
25	4	1/2 ×	150	*
40	4	1/2 ×	160	*
50	4	5/8 ×	170	*
80	4	5/8 ×	180	*
100	8	5/8 ×	180	*
150	8	3/4 ×	195	*
200	8	3/4 ×	210	*

BOLT SET SPACER L = 40 - P

DN	No.	Inch	mm	81.38.61
25	4	1/2 ×	120	*
40	4	1/2 ×	125	*
50	4	5/8 ×	150	*
80	4	5/8 ×	150	*
100	8	5/8 ×	150	*
150	8	3/4 ×	170	*
200	8	3/4 ×	180	*

BOLT SET SPACER L = 80 - P

DN	No.	Inch	mm	81.38.61
25	4	1/2 ×	160	*
40	4	1/2 ×	170	*
50	4	5/8 ×	180	*
80	4	5/8 ×	190	*
100	8	5/8 ×	190	*
150	8	3/4 ×	210	*
200	8	3/4 ×	220	*

Class No.: AZ05	Page: 1	Content: General
Base Material: Carbon Steel Galvanized	First Issue:	Revision:
Rating: PN 20 (Class 150)	Date:	
Corrosion Allowance: 0 mm	Sign:	

Temperature °C	0	60
Pressure Barg.	DN 15-400	16.0 16.0

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE									
			15	20	80	100	150	200	250	300	350	400
15	80	400	-	-	D	D	D	D	D	D	D	A
20	80	350	-	-	D	D	D	D	D	D	A	
80	40	300	-	-	D	D	D	D	D	A		
100	40	250	-	-	D	D	D	D	A			
150	40	200	-	-	D	D	D	A				
200	30	150	-	-	D	D	A					
250	30	100	-	-	D	A						
300	30	80	-	-	A							
350	30											
400	30											

Notes:

- Design limits are acc. butterfly valve rating BS5155.
- After shop fabrication, pipe spools shall be galvanized in accordance with ASTM A53.
- Pre-fabricated pipe spools shall have flanged ends and be limited to L- or Z- shapes.
- Drain holes (6 mm.) to be drilled before galvanizing.
- For pipes, fittings and flanges, sizes DN 50 and smaller use class AZ01.
- Application of other types of branch connections shall be subject to prior approval of company.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
D	Pipe to pipe
—	Branch connection to be of the type branch fitting threaded-end outlet.

Class No.: AZ05	Page: 2	Content: Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM A106-B
PNTT	Pipe Nipple Thrd. Ends L = 50 mm	DN	15-50	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
PNPT	Pipe Nipple Plain/Thrd. Ends	DN	15-50	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729

* FLANGES

BLFL	Blind Flange	DN	15-400	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
WNFL	Welding Neck Flange	DN	15-400	ASTM A105

* FITTINGS

CAPB	Cap Butt-Weld. End	DN	15-400	ASTM A234-WPB
COUT	Coupling Threaded Ends	DN	15-50	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
E45B	Elbow 45 Deg. Butt-Weld. Ends	DN	15-400	ASTM A234-WPB
E90B	Elbow 90 Deg. Butt-Weld. Ends	DN	15-400	ASTM A234-WPB
E90T	Elbow 90 Deg. Threaded Ends	DN	15-50	ASTM A105, Hot Dip Galvanized To: ASTM A153-B or BS 729
TEEB	Equal Tee Butt-Weld. End	DN	15-400	ASTM A234-WPB

* REDUCING FITTINGS

BNIT	Branch Fitting Threaded Outlet	DN	15-50	ASTM A105
RECB	Reducer Conc. Butt-Weld. Ends	DN	20-400	ASTM A234-WPB
REEB	Reducer Ecc. Butt-Weld. Ends	DN	20-400	ASTM A234-WPB

Note:

For full material description see relevant MESG buying description.

* VALVES

BARP	Ball Valve Red. Bore Flat Face	DN	50-100	Body/INT.: ASTM B148
BUVW	Butterfly Valve Wafer Type	DN	80-400	Body: ASTM A216-WCB/WCC, A105 Rubber Lined Disc: ASTM B148

* MISCELLANEOUS

GKRF	Gasket, Raised Face	DN	15-300	C.A.F
STBT	Stud Bolt with Nuts		—	Studs: ASTM A193-B7 Nuts: ASTM A194-2H

Class No.: AZ05	Page: 3	Content: Piping Components
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ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE									
			15	20	80	100	150	200	250	300	350	400
* PIPE												
Pipe		74.13.11	*	*	*	*	*	*	*	*	*	*
* FLANGES												
Blind Flange		76.62.11	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange		76.62.80	*	*	*	*	*	*	*	*	*	*
* FITTINGS												
Cap	Butt-Weld. Ends	76.33.18			*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. Ends	76.33.38			*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. Ends	76.33.40			*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. Ends	76.33.84			*	*	*	*	*	*	*	*
* VALVES												
Ball Valve Red. Bore Flat Face		75.40.08	*	*	*	*						
Butterfly Valve Wafer Type		75.72.78			*	*	*	*	*	*	*	*
* MISCELLANEOUS												
Gasket, Raised Face		85.31.02			*	*	*	*	*	*		

Class No.: AZ05	Page: 4	Content: Reducing Piping Components
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Run	Br.	RECB 76.30.72	REFB 76.30.73
100 × 80		*	*
150 × 80		*	*
150 × 100		*	*
200 × 100		*	*
200 × 150		*	*
250 × 100		*	*
250 × 150		*	*
250 × 200		*	*
300 × 150		*	*
300 × 200		*	*
300 × 250		*	*
350 × 150		*	*
350 × 200		*	*
350 × 250		*	*
350 × 300		*	*

Run	Br.	RECB 76.29.46	REFB 76.29.61
400 × 150		*	*
400 × 200		*	*
400 × 250		*	*
400 × 300		*	*
400 × 350		*	*

Class No.: AZ05	Page: 5	Content: Bolting and Assemblies
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BOLTS, WA. LUG BUTTERFLY VALVE

DN	No.	Inch	mm	81.38.61
80	4	5/8	×	150 *
100	8	5/8	×	150 *
150	8	3/4	×	160 *
200	8	3/4	×	170 *
250	12	7/8	×	190 *
300	12	7/8	×	210 *
350	12	1	×	230 *
400	16	1	×	250 *

BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	1/2	×	60 *
20	4	1/2	×	70 *
80	4	5/8	×	100 *
100	8	5/8	×	100 *
150	8	3/4	×	100 *
200	8	3/4	×	110 *
250	12	7/8	×	120 *
300	12	7/8	×	120 *
350	12	1	×	130 *
400	16	1	×	140 *

* DRAIN POINT Fig. 2I

Run	DN 80-400	Br	DN 20	No.
Branch: Table Page 1				1
Ball Valve Red. Bore Flat Face				1
Welding Neck Flange				1
Blind Flange				1
Gasket, Raised Face				2
Stud Bolt with Nuts				8

Class No.: CN01	Page: 1	Content: General
Base Material: Carbon Steel	First Issue: Revision:	
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 1 mm	Sign:	

Temperature °C	0	50	100	150	200	250	300	350	400
Pressure Barg. DN 15-600	50.5	50.0	46.3	45.1	43.8	41.8	38.8	36.8	32.6

TABLE OF SCHEDULES

DN	Schedule	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE																
		Run 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	40	350	C	C	C	C	E	E	E	E	E	E	E	A				
80	40	300	C	C	C	C	E	E	E	E	E	E	A					
100	40	250	C	C	C	C	E	E	E	E	E	A						
150	40	200	C	C	C	C	E	E	E	E	A							
200	30	150	C	C	C	C	E	E	E	A								
250	30	100	C	C	C	C	D	D	A									
300	30	80	C	C	C	C	D	A										
350	30	50	C	C	C	B	A											
400	30	40	C	B	B	A												
450	30	25	B	B	A													
500	30	20	B	A														
600	30	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 socket weld-end
D	Pipe to pipe
E	Branch outlet reducing butt-weld

Class No.:	CN01	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	A285.GRB
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
CAPT	Cap	Threaded	DN	—	ASTM	A105

* REDUCING FITTINGS

BROS	Branch Outlet Socket weld. End	DN	15-40	ASTM	A105
BROB	Branch Outlet Red. Butt-Weld.	DN	50-500	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	410
CHVS	Check Valve Socket Weld. End	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. End	DN	15-40	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GLVF	Globe Valve Flanged	DN	15-200	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GLVS	Globe Valve Socket Weld. End	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 A105
STBT	Stud Bolt with Nuts	—		Studs: ASTM A193-B7 Nuts: ASTM A194-2H

Class No.:	CN01	Page:	3	Content:	Piping Components
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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600	
* PIPE																		
Pipe	74.30.31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Pipe Nipple 50 mm	76.05.56	*	*	*	*													
* FLANGES																		
Blind Flange	76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Spacer Ring Type (ANS Flanges)	76.88.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Welding Neck Flange	76.62.78	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
* 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 76.34.80	*	*	*	*													
Coupling	Socket-Weld. End 76.34.28	*	*	*	*													
Cap	Socket-Weld. End 76.05.18	*	*	*	*													
* VALVES																		
Check Valve Flanged	75.37.13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Check Valve Socket	75.56.13	*	*	*	*													
Gate Valve Flanged	75.37.33	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Gate Valve Sw	75.56.35	*	*	*	*													
Globe Valve Flanged	75.37.43	*	*	*	*	*	*	*	*	*								
Globe Valve Socket	75.56.45	*	*	*	*													
Globe Valve Needle Type Socket	75.56.63	*	*	*	*													
* MISCELLANEOUS																		
Gasket, Spiral Wound	85.41.43	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Orifice Flange Set	60.88.52					*	*	*	*	*	*	*	*	*	*	*	*	

Class No.:	CN01	Page:	4	Content:	Reducing Piping Components
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Run	Br.	BROB 76.80.00	RECB 76.30.70	REEB 76.30.71	TERB 76.30.85	TERS 76.34.85	Run	Br.	BROB 76.80.00	RECB 76.30.70	REEB 76.30.71	TERB 76.30.85	COMP. NAME	DESCRIPTION
20 × 15			*	*	*	*	400 × 50		*				BROS	Branch Fitting Outlet Socket Weld. End
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 × 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		*	*	*	*		

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

Class No.:	CN01	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	×	70
20	4	5/8	×	75
25	4	5/8	×	80
40	4	3/4	×	90
50	8	5/8	×	90
80	8	3/4	×	110
100	8	3/4	×	115
150	12	3/4	×	125
200	12	7/8	×	140
250	16	1	×	160
300	16	1-1/8	×	170
350	20	1-1/8	×	180
400	20	1-1/4	×	190
450	24	1-1/4	×	195
500	24	1-1/4	×	210
600	24	1-1/2	×	240

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	×	75
20	4	5/8	×	85
25	4	5/8	×	90
40	4	3/4	×	100
50	8	5/8	×	100
80	8	3/4	×	120
100	8	3/4	×	130
150	12	3/4	×	145
200	12	7/8	×	170
250	16	1	×	190
300	16	1-1/8	×	205
350	20	1-1/8	×	215
400	20	1-1/4	×	235
450	24	1-1/4	×	245
500	24	1-1/4	×	260
600	24	1-1/2	×	300

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	5/8	×	120
20	4	5/8	×	120
25	4	5/8	×	120
40	4	3/4	×	130
50	8	5/8	×	150
80	8	3/4	×	150
100	12	3/4	×	140
150	12	3/4	×	140
200	12	7/8	×	150
250	16	1	×	170
300	16	1-1/8	×	190
350	20	1-1/8	×	195
400	20	1-1/4	×	210
450	24	1-1/4	×	220
500	24	1-1/4	×	230
600	24	1-1/2	×	260

* DRAIN POINT Fig. 0B

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Cap Threaded				1
Gate Valve Sw				1
Pipe Nipple 50 mm				1
Pipe Nipple Plain/Threaded				1

* DRAIN POINT Fig. 0B

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Cap Threaded				1
Gate Valve Sw				1
Pipe Nipple Plain/Threaded				1
Pipe Nipple 50 mm				1

* VENT POINT Fig. 1B

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Cap Threaded				1
Globe Valve Socket				1
Pipe Nipple 50 mm				1
Pipe Nipple Plain/Threaded				1

* VENT POINT Fig. 1B

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Cap Threaded				1
Globe Valve Socket				1
Pipe Nipple Plain/Threaded				1
Pipe Nipple 50 mm				1

Class No.: CN02	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 1 mm	Sign:	

Temperature °C	0	50	75	100	125	150	175	200
Pressure Barg. DN 15-80	50.0	49.0	48.0	46.4	38.0	29.0	20.0	11.0
DN 100-150		42.0	42.0	42.0	39.0	32.0	24.0	17.0
DN 200-600		31.0	31.0	31.0	29.0	23.0	18.0	12.0
								9.0
								7.0

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE															
			15	20	25	40	50	80	100	150	200	250	300	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	40	350	C	C	C	C	E	E	E	E	E	E	E	A				
80	40	300	C	C	C	C	E	E	E	E	E	E	A					
100	40	250	C	C	C	C	E	E	E	E	E	A						
150	40	200	C	C	C	C	E	E	E	E	A							
200	30	150	C	C	C	C	E	E	E	A								
250	30	100	C	C	C	C	D	D	A									
300	30	80	C	C	C	C	D	A										
350	30	50	C	C	C	B	A											
400	30	40	C	B	B	A												
450	20	25	B	B	A													
500	20	20	B	A														
600	20	15	A															

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1 and ball valve rating acc. BS 5351.
- 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
D	Pipe to pipe
E	Branch outlet reducing butt-weld

Class No.:	CN02	Page:	2	Content:	Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	API	5L-B (Seamless)
		DN	450-600	API	5L-B (Welded)

PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	5L-B (Seamless)
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* FLANGES

BLFL	Blind Flange	DN	15-600	ASTM	A105
SBFL	Spectacle Blind Flange	DN	15-600	ASTM	A285 GRB
SOFL	Slip-On Flange	DN	15-600	ASTM	A105
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	50-600	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

BARF	Ball Valve Red. Bore Flanged	DN	15-250	Body: ASTM A216-WCB/WCC, A105 Ball/Stem: AISI 316, 316L Seats: PTFE
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
GLVF	Globe Valve Flanged	DN	15-200	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

GKRF	Gasket, Raised Face	DN	15-600	CAF, Oil Resistant
ORFS	Orifice Flange Set	DN	50-600	ASTM A105
STBT	Stud Bolt with Nuts	—		Studs: ASTM A193-B7 Nuts: ASTM A194-2H

Class No.:		CN02	Page: 3								Content: Piping Components								
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600	
* PIPE																			
Pipe		74.13.21	*	*	*	*	*	*	*	*	*	*	*	*	*				
		74.13.23														*	*	*	
Pipe Nipple 50 mm		76.05.58	*	*	*	*													
* FLANGES																			
Blind Flange		76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Spectacle Blind Flange		76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Slip-On Flange		76.62.30	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
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 Thrd.	Thrd-Ins.	76.05.18	*	*	*	*													
* VALVES																			
Ball Valve Red. Bore Flanged		75.72.00	*	*	*	*	*	*	*	*	*	*							
Check Valve Flanged		75.37.13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Check Valve Socket		75.56.13	*	*	*	*													
Gate Valve Flanged		75.37.33	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Gate Valve Socket		75.56.35	*	*	*	*													
Globe Valve Flanged		75.37.43	*	*	*	*	*	*	*	*	*								
Globe Valve Socket		75.56.45	*	*	*	*													
Globe Valve Needle Type Socket		75.56.63	*	*	*	*													
* MISCELLANEOUS																			
Gasket, CAF		85.31.17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Orifice Flange Set		60.88.52					*	*	*	*	*	*	*	*	*	*	*	*	

Class No.:	CN02	Page:	4	Content:	Reducing Piping Components
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Run	Br.	BROB 76.80.00	RECB 76.30.70	REEB 76.30.73	TERB 76.30.85	TERS 76.34.85	Run	Br.	BROB 76.80.00	RECB 76.30.70	REEB 76.30.73	TERB 76.30.85	COMP. NAME	DESCRIPTION
20 × 15			*	*	*	*	400 × 50		*				BROS	Branch Fitting Outlet Socket Weld. End
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 × 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		*	*	*	*		

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

Class No.:	CN02	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	×	70
20	4	5/8	×	75
25	4	5/8	×	80
40	4	3/4	×	90
50	8	5/8	×	90
80	8	3/4	×	110
100	8	3/4	×	115
150	12	3/4	×	125
200	12	7/8	×	140
250	16	1	×	160
300	16	1-1/8	×	170
350	20	1-1/8	×	180
400	20	1-1/4	×	190
450	24	1-1/4	×	195
500	24	1-1/4	×	210
600	24	1-1/2	×	235

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	×	75
20	4	5/8	×	85
25	4	5/8	×	90
40	4	3/4	×	100
50	8	5/8	×	100
80	8	3/4	×	120
100	8	3/4	×	130
150	12	3/4	×	145
200	12	7/8	×	170
250	16	1	×	190
300	16	1-1/8	×	205
350	20	1-1/8	×	215
400	20	1-1/4	×	235
450	24	1-1/4	×	245
500	24	1-1/4	×	260
600	24	1-1/2	×	295

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	5/8	×	120
20	4	5/8	×	120
25	4	5/8	×	120
40	4	3/4	×	130
50	8	5/8	×	150
80	8	3/4	×	150
100	12	3/4	×	140
150	12	3/4	×	140
200	12	7/8	×	150
250	16	1	×	170
300	16	1-1/8	×	190
350	20	1-1/8	×	195
400	20	1-1/4	×	210
450	24	1-1/4	×	220
500	24	1-1/4	×	230
600	24	1-1/2	×	260

* DRAIN POINT Fig. 2I

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket Raised Face				2
Stud Bolt with Nuts				8
Welding Neck Flange				1

* DRAIN POINT Fig. 2J

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

Class No.: CN04	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 1 mm	Sign:	

Temperature °C	0	50	100	150	200	250	300	350	400
Pressure Barg. DN 15-600	50.5	50.0	46.3	45.1	43.8	41.8	38.8	36.8	32.6

TABLE OF SCHEDULES			BRANCH CONNECTIONS 90 DEGREES															
		Run	BRANCH SIZE															
DN	Schedule	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		
40	80	400	C	C	C	C	E	E	E	E	E	E	E	E	A			
50	40	350	C	C	C	C	E	E	E	E	E	E	E	A				
80	40	300	C	C	C	C	E	E	E	E	E	E	A					
100	40	250	C	C	C	C	E	E	E	E	E	A						
150	40	200	C	C	C	C	E	E	E	E	A							
200	30	150	C	C	C	C	E	E	E	A								
250	30	100	C	C	C	C	D	D	A									
300	30	80	C	C	C	C	D	A										
350	30	50	C	C	C	B	A											
400	30	40	C	B	B	A												
450	30	25	B	B	A													
500	30	20	B	A														
600	30	15	A															

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1 and to allowable internal prisor 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
D	Pipe to pipe
E	Branch outlet reducing butt-weld

Class No.:	CN04	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	50-600	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	316 (L) + Stellite 6
GAVF	Gate Valve Flanged	DN	15-600	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6
GLVF	Globe Valve Flanged	DN	15-200	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	316 (L) + Stellite 6

* MISCELLANEOUS

GKTI	Gasket, C.A.F., Oil Resistance	DN	15-600	Graphited		
ORFS	Orifice Flange Set	DN	50-600	ASTM	A105	
STBT	Stud Bolt with Nuts		—	Studs:	ASTM	A193-B7
				Nuts:	ASTM	A194-2H

Class No.:	CN04	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	450	500	600
* PIPE																		
Pipe		74.30.21/31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pipe Nipple 50 mm		76.05.00	*	*	*	*												
* FLANGES																		
Blind Flange		76.62.11	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange		76.88.03	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)		76.88.16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange		76.62.78	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* 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		75.37.13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged		75.37.33	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged		75.37.43	*	*	*	*	*	*	*	*								
* MISCELLANEOUS																		
Gasket, C.A.F., Oil Resistance		85.31.16/17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.88.52					*	*	*	*	*	*	*	*	*	*	*	*

Class No.:	CN04	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 Outlet Socket-Weld. End
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		*				Br.	Run Pipe
100 × 40			*	*			450 × 150		*				BROS	76.80.26
100 × 50	*		*	*	*		450 × 200		*	*	*	*	15	40-150
100 × 80	*		*	*	*		450 × 250		*	*	*	*		200-600
150 × 50	*						450 × 300		*	*	*	*		*
150 × 80	*		*	*	*		450 × 350		*	*	*	*	20	50-80
150 × 100	*		*	*	*		450 × 400		*	*	*	*		100-600
200 × 50	*						500 × 50		*					*
200 × 80	*						500 × 80		*				25	50
200 × 100	*	*	*	*	*		500 × 100		*					80-100
200 × 150	*	*	*	*	*		500 × 150		*					150-600
250 × 50	*						500 × 200		*	*	*	*		*
250 × 80	*						500 × 250		*	*	*	*	40	80-100
250 × 100	*	*	*	*	*		500 × 300		*	*	*	*		150-300
250 × 150	*	*	*	*	*		500 × 350		*	*	*	*		350-600
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.:	CN04	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	70	*
20	4	5/8	80	*
25	4	5/8	80	*
40	4	3/4	90	*
50	8	5/8	90	*
80	8	3/4	110	*
100	8	3/4	120	*
150	12	3/4	130	*
200	12	7/8	140	*
250	16	1	160	*
300	16	1-1/8	170	*
350	20	1-1/8	180	*
400	20	1-1/4	190	*
450	24	1-1/4	195	*
500	24	1-1/4	210	*
600	24	1-1/2	240	*

BOLT SET SPECTACLE/SPACER

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	100	*
50	8	5/8	100	*
80	8	3/4	120	*
100	8	3/4	130	*
150	12	3/4	150	*
200	12	7/8	170	*
250	16	1	190	*
300	16	1-1/8	210	*
350	20	1-1/8	220	*
400	20	1-1/4	240	*
450	24	1-1/4	245	*
500	24	1-1/4	260	*
600	24	1-1/2	300	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	5/8 ×	120	*
20	4	5/8 ×	120	*
25	4	5/8 ×	120	*
40	4	3/4 ×	130	*
50	8	5/8 ×	150	*
80	8	3/4 ×	150	*
100	12	3/4 ×	140	*
150	12	3/4 ×	140	*
200	12	7/8 ×	150	*
250	16	1 ×	170	*
300	16	1-1/8 ×	190	*
350	20	1-1/8 ×	195	*
400	20	1-1/4 ×	210	*
450	24	1-1/4 ×	220	*
500	24	1-1/4 ×	230	*
600	24	1-1/2 ×	260	*

* DRAIN POINT Fig. 0I

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

Class No.: CN05	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 3 mm	Sign:	

Temperature °C	0	50	65
Pressure Barg. DN 25-50	50.0	49.0	48.4
DN 80-100		42.0	42.0
DN 150-150		31.0	31.0
DN 200-300		21.0	21.0

TABLE OF SCHEDULES

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

Notes:

- Design limits are acc. ball valve rating BS 5351.
- This piping class is originally designed for acid service.
- Standard long radius elbows DN80 and larger shall be used for sweep-in connections.
- Application of other types of branch connections is subject to company approval.
- DN 15-20 piping components only to be used for short branches e.g. pressure points.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket weld end
X	Pipe to pipe connection to be made by sweep-in or lateral branch

Class No.:	CN05	Page:	2	Content:	Material Descriptions
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* PIPE

PIPE	Pipe	DN	25-300	ASTM	A106-B
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* FLANGES

BLFL	Blind Flange	DN	25-300	ASTM	A105
SBFL	Spectacle Blind Flange	DN	25-300	ASTM	A516-60
WNFL	Welding Neck Flange	DN	25-300	ASTM	A105

* FITTINGS

E45B	Elbow 45 Deg.	Butt-Weld. End	DN	25-300	ASTM	A234-WPB
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	25-300	ASTM	A234-WPB
TEEB	Equal Tee	Butt-Weld. End	DN	25-300	ASTM	A234-WPB
E45S	Elbow 45 Deg.	Socket-Weld. End	DN	25-40	ASTM	A105
E90S	Elbow 90 Deg.	Socket-Weld. End	DN	25-40	ASTM	A105
TEES	Equal Tee	Socket-Weld. End	DN	25-40	ASTM	A105
COUS	Coupling	Socket-Weld. End	DN	25-40	ASTM	A105
CAPS	Cap	Socket-Weld. End	DN	25-40	ASTM	A105

* REDUCING FITTINGS

BROS	Branch Fitting Socket Weld Outlet	DN	25-40	ASTM	A105
RECB	Reducer Conc. Butt-Weld. End	DN	25-300	ASTM	A234-WPB
REEB	Reducer Ecc. Butt-Weld. End	DN	25-300	ASTM	A234-WPB
TERB	Tee Reducing Butt-Weld. End	DN	25-300	ASTM	A234-WPB
TERS	Tee Reducing Socket-Weld. End	DN	25-40	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

BARF	Ball Valve Full Bore Flanged	DN	25-300	Body: ASTM A216-WCB/WCC, A105
				Ball-Trim: Monel
				Seats: PTFE
CHVF	Check Valve Flanged	DN	25-300	Body: ASTM A216-WCB/WCC, A105
				Trim: Monel
GLVF	Globe Valve Flanged	DN	25-200	Body: ASTM A216-WCB/WCC, A105
				Trim: Monel
PLVF	Plug Valve Flanged	DN	25-200	Body: ASTM A216-WCB/WCC, A105
				Plug/Stem: ASTM B564
				Sleeve: PTFE

* MISCELLANEOUS

GKTI	Gasket, RF. C.A.F	DN	25-300	C.A.F
STBT	Stud Bolt with Nuts		—	Studs: ASTM A193-B7
				Nuts: ASTM A194-2H

Class No.:	CN05	Page:	3	Content:	Piping Components
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		NOMINAL PIPE SIZE											
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300	
* PIPE													
Pipe	74.30.31	*	*	*	*	*	*	*	*	*	*	*	
* FLANGES													
Blind Flange	76.62.10	*	*	*	*	*	*	*	*	*	*	*	
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*	
Welding Neck Flange	76.62.78	*	*	*	*	*	*	*	*	*	*	*	
* FITTINGS													
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	76.34.80	*	*	*	*							
Coupling	Socket-Weld. End	76.34.28	*	*	*	*							
Cap	Socket-Weld. End	76.34.18	*	*	*	*							
* VALVES													
Ball Valve Full Bore Flanged	75.72.00	*	*	*	*	*	*	*	*	*	*	*	
Check Valve Flanged	75.37.13	*	*	*	*	*	*	*	*	*	*	*	
Gate Valve Flanged	75.37.43	*	*	*	*	*	*	*	*	*			
Plug Valve Flanged	75.37.73	*	*	*	*	*	*	*	*	*			
* MISCELLANEOUS													
Gasket, RF. C.A.F	85.31.15/17	*	*	*	*	*	*	*	*	*	*	*	

Class No.:	CN05	Page:	4	Content:	Reducing Piping Components
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Run	Br.	RECB 76.30.70	REEB 76.30.71	TERS 76.34.85	TERB 76.30.85
20 × 15		*	*	*	*
25 × 15		*	*	*	*
25 × 20		*	*	*	*
40 × 20		*	*	*	*
40 × 25		*	*	*	*
50 × 25		*	*		*
50 × 40		*	*		*
80 × 40		*	*		
80 × 50		*	*		
100 × 50		*	*		
100 × 80		*	*		
150 × 50		*	*		
150 × 80		*	*		
150 × 100		*	*		
200 × 100		*	*		
200 × 150		*	*		
250 × 150		*	*		
250 × 200		*	*		
300 × 150		*	*		
300 × 200		*	*		
300 × 250		*	*		

COMP. NAME	DESCRIPTION
BROS	Branch Fitting Outlet Socket Weld. End
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

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

Class No.:	CN05	Page:	5	Content:	Bolting
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BOLT SET FLANGED JOINTS

DN	No.	Inch		mm	81.38.61
15	4	1/2	×	70	*
20	4	5/8	×	75	*
25	4	5/8	×	80	*
40	4	3/4	×	90	*
50	8	5/8	×	90	*
80	8	3/4	×	110	*
100	8	3/4	×	115	*
150	12	3/4	×	125	*
200	12	7/8	×	140	*
250	16	1	×	160	*
300	16	1-1/8	×	170	*

BOLT SET SPECTACLE/SPACER

DN	No.	Inch		mm	81.38.61
15	4	1/2	×	75	*
20	4	5/8	×	85	*
25	4	5/8	×	90	*
40	4	3/4	×	100	*
50	8	5/8	×	100	*
80	8	3/4	×	120	*
100	8	3/4	×	130	*
150	12	3/4	×	145	*
200	12	7/8	×	170	*
250	16	1	×	190	*
300	16	1-1/8	×	205	*

Class No.: CN06	Page: 1	Content: General
Base Material: Carbon Steel Sour	First Issue:	Revision:
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 1 mm	Sign:	

Temperature °C	0	50	75	100	125	150	175	200
Pressure Barg. DN 15-80	50.0	49.0	48.0	46.3	38.0	29.0	20.0	11.0
DN 100-150		42.0	42.0	42.0	39.0	32.0	24.0	17.0
DN 200-600		31.0	31.0	31.0	29.0	23.0	18.0	12.0
								9.0
								7.0

TABLE OF SCHEDULES

DN	Schedule	Run Size	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE															
			15	20	25	40	50	80	100	150	200	250	300	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	40	350	C	C	C	C	E	D	E	E	E	E	E	A				
80	40	300	C	C	C	C	E	E	E	E	E	E	A					
100	40	250	C	C	C	C	D	D	D	D	D	A						
150	40	200	C	C	C	C	D	D	D	D	A							
200	30	150	C	C	C	C	D	D	D	A								
250	30	100	C	C	C	C	D	D	A									
300	30	80	C	C	C	C	D	A										
350	30	50	C	C	C	B	A											
400	30	40	C	B	B	A												
450	20	25	B	B	A													
500	20	20	B	A														
600	20	15	A															

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1 and ball valve rating acc. BS 5351.
- Piston type check valves for horizontal mounting only.
- Application of other types of branch connections is subject to company approval.
- Cold bending is not allowed.

CODE EXPLANATION OF CHARACTERS

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

Class No.:	CN06	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	50-600	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

BARF	Ball Valve Red. Bore Flanged	DN	15-250	Body: ASTM A216-WCB/WCC, A105
				Ball/Stem: AISI 316, 316L
				Seats: PTFE
CHVB	Check Valve Butt-Weld. End	DN	15-40	Body: ASTM A216-WCB/WCC, A105
				Trim: AISI 316, 316L
CHVF	Check Valve Flanged	DN	50-600	Body: ASTM A216-WCB/WCC, A105
				Trim: AISI 410
CHVS	Check Valve Socket	DN	15-40	Body: ASTM A216-WCB/WCC, A105
				Trim: AISI 316, 316L
GAVB	Gate Valve Butt-Weld. End	DN	15-40	Body: ASTM A216-WCB/WCC, A105
				Trim: AISI 316, 316L
GAVF	Gate Valve Flanged	DN	50-600	Body: ASTM A216-WCB/WCC, A105
				Trim: AISI 410
GAVS	Gate Valve Socket	DN	15-40	Body: ASTM A216-WCB/WCC, A105
				Trim: AISI 316, 316L
GLVB	Globe Valve Butt-Weld. End	DN	15-40	Body: ASTM A216-WCB/WCC, A105
				Trim: AISI 316, 316L
GLVF	Globe Valve Flanged	DN	50-200	Body: ASTM A216-WCB/WCC, A105
				Trim: AISI 410
GLVS	Globe Valve Socket	DN	15-400	Body: ASTM A216-WCB/WCC, A105
				Trim: AISI 316, 316L

* MISCELLANEOUS

GKTI	Gasket, RF. C.A.F.	DN	15-600	C.A.F.
ORFS	Orifice Flange Set	DN	50-600	ASTM A105
STBT	Stud Bolt with Nuts	—		Studs: ASTM A193-B7M
				Nuts: ASTM A194-2HM

Class No.:	CN06	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	450	500	600
* PIPE																		
Pipe		74.30.31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pipe Nipple 50 mm		76.05.56	*	*	*	*												
* 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	76.34.80	*	*	*	*												
Coupling	Socket-Weld. End	76.34.28	*	*	*	*												
Cap	Socket-Weld. End	76.34.18	*	*	*	*												
* VALVES																		
Ball Valve Red. Bore Flanged		75.37.00	*	*	*	*	*	*	*	*	*	*						
Check Valve Butt-Weld. End		75.56.19	*	*	*	*												
Check Valve Flanged		75.37.13					*	*	*	*	*	*	*	*	*	*	*	*
Check Valve Socket		75.56.13	*	*	*	*												
Gate Valve Butt-Weld. End		75.56.38	*	*	*	*												
Gate Valve Flanged		75.37.33					*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Socket		75.56.35	*	*	*	*												
Globe Valve Butt-Weld. End		75.56.50	*	*	*	*												
Globe Valve Flanged		75.37.43					*	*	*	*	*							
Globe Valve Socket		75.56.45	*	*	*	*												
* MISCELLANEOUS																		
Gasket, RF. C.A.F.		85.31.15/17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.88.52					*	*	*	*	*	*	*	*	*	*	*	*

Class No.:	CN06	Page:	4	Content:	Reducing Piping Components
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Run	Br.	BROB 76.80.00	RECB 76.30.70	REEB 76.30.71	TERB 76.30.85	TERS 76.34.85	Run	Br.	BROB 76.80.00	RECB 76.30.70	REEB 76.30.71	TERB 76.30.85	COMP. NAME	DESCRIPTION
20 × 15			*	*	*	*	400 × 50		*				BROS	Branch Fitting Outlet Socket Weld. End
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 × 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		*	*	*	*		

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

Class No.:	CN06	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	×	70
20	4	5/8	×	75
25	4	5/8	×	80
40	4	3/4	×	90
50	8	5/8	×	90
80	8	3/4	×	110
100	8	3/4	×	115
150	12	3/4	×	125
200	12	7/8	×	140
250	16	1	×	160
300	16	1-1/8	×	170
350	20	1-1/8	×	180
400	20	1-1/4	×	190
450	24	1-1/4	×	195
500	24	1-1/4	×	210
600	24	1-1/2	×	235

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	×	75
20	4	5/8	×	85
25	4	5/8	×	90
40	4	3/4	×	100
50	8	5/8	×	100
80	8	3/4	×	120
100	8	3/4	×	130
150	12	3/4	×	145
200	12	7/8	×	170
250	16	1	×	190
300	16	1-1/8	×	205
350	20	1-1/8	×	215
400	20	1-1/4	×	235
450	24	1-1/4	×	245
500	24	1-1/4	×	260
600	24	1-1/2	×	295

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	5/8	×	120
20	4	5/8	×	120
25	4	5/8	×	120
40	4	3/4	×	130
50	8	5/8	×	150
80	8	3/4	×	150
100	12	3/4	×	140
150	12	3/4	×	140
200	12	7/8	×	150
250	16	1	×	170
300	16	1-1/8	×	190
350	20	1-1/8	×	195
400	20	1-1/4	×	210
450	24	1-1/4	×	220
500	24	1-1/4	×	230
600	24	1-1/2	×	260

* DRAIN POINT Fig. 2I

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF. C.A.F.				2
Stud Bolt with Nuts				8
Welding Neck Flange				1

* DRAIN POINT Fig. 2J

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF. C.A.F.				2
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
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 RF. C.A.F.				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 RF. C.A.F.				1
Globe Valve Butt-Weld End				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				4
Welding Neck Flange				1

Class No.: CN07	Page: 1	Content: General
Base Material: Carbon Steel, Fine Grained, LT	First Issue:	Revision:
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 1 mm	Sign:	

Temperature °C		-50	0	50	75	100	125	150	175	200	
Pressure Barg.	DN 15-80	47.9	47.9	47.3	46.0	45.0	38.0	29.0	20.0	11.0	
	DN 100-150		42.0	42.0	42.0	42.0	39.0	32.0	24.0	17.0	9.0
	DN 200-600		31.0	31.0	31.0	31.0	29.0	23.0	18.0	12.0	7.0

TABLE OF SCHEDULES

DN	Schedule	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE																
		Run 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	40	350	C	C	C	C	E	D	E	E	E	E	E	A				
80	40	300	C	C	C	C	E	E	E	E	E	E	A					
100	40	250	C	C	C	C	D	D	D	D	D	A						
150	40	200	C	C	C	C	D	D	D	D	A							
200	30	150	C	C	C	C	D	D	D	D	A							
250	30	100	C	C	C	C	D	D	A									
300	30	80	C	C	C	C	D	A										
350	30	50	C	C	C	B	A											
400	30	40	C	B	B	A												
450	20	25	B	B	A													
500	20	20	B	A														
600	20	15	A															

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.3 and ball valve rating acc. BS 5351.
- Application of other types of branch connections is subject to company approval.
- Welds, attachment welds and cold formed piping parts shall be post weld heat treated.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket weld
D	Pipe to pipe
E	Branch outlet reducing butt-weld

Class No.:	CN07	Page:	2	Content:	Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A333-6 (Seamless)
		DN	450-600	ASTM	A671-CC65 (Welded)
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	50-600	ASTM	A350-LF2
RECB	Reducer Conc. Butt-Weld. End	DN	20-600	ASTM	A420-WPL6
REEB	Reducer Ecc. Butt-Weld. End	DN	20-600	ASTM	A420-WPL6
TERB	Tee Reducing Butt-Weld. End	DN	20-600	ASTM	A420-WPL6
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A350-LF2

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

BARF	Ball Valve Red. Bore Flanged	DN	15-250	Body: ASTM A352, A350
				Ball/Stem: AISI 316, 316L
				Seats: PTFE
CHVF	Check Valve Flanged	DN	15-400	Body: ASTM A352, A350
				Trim: AISI 316, 316L
GAVF	Gate Valve Flanged	DN	15-400	Body: ASTM A352, A350
				Trim: AISI 316, 316L
GLVF	Globe Valve Flanged	DN	15-200	Body: ASTM A352, A350
				Trim: AISI 316, 316L
				Trim: AISI 410

* MISCELLANEOUS

GKTI	Gasket, RF. C.A.F.	DN	15-400	C.A.F.
ORFS	Orifice Flange Set	DN	50-600	ASTM A350-LF2
STBT	Stud Bolt with Nuts	—		Studs: ASTM A320-L7
				Nuts: ASTM A194-4

Class No.:	CN07	Page:	3	Content:	Piping Components
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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600	
* PIPE																		
Pipe	74.30.10														*	*	*	
	74.14.23/31	*	*	*	*	*	*	*	*	*	*	*	*	*				
Pipe Nipple 50 mm	76.05.56	*	*	*	*													
* 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	76.34.18	*	*	*	*												
* VALVES																		
Ball Valve Red. Bore Flanged	75.72.11	*	*	*	*	*	*	*	*	*	*							
Check Valve Flanged	75.42.13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Gate Valve Flanged	75.42.32	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Globe Valve Flanged	75.42.40	*	*	*	*	*	*	*	*	*								
* MISCELLANEOUS																		
Gasket, RF C.A.F.	85.31.15/17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Orifice Flange Set	60.88.00					*	*	*	*	*	*	*	*	*				

Class No.:	CN07	Page:	4	Content:	Reducing Piping Components
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Run	Br.	BROB 76.80.04	RECB 76.31.72	REEB 76.31.73	TERB 76.31.85	TERS 76.00.85	Run	Br.	BROB 76.80.05	RECB 76.31.72	REEB 76.31.73	TERB 76.31.85	COMP. NAME	DESCRIPTION
20	× 15		*	*	*	*	400	× 50	*				BROS	Branch Fitting Outlet Socket Weld. End
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	× 25		*	*			400	× 300	*	*	*	*		
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	× 100	*												
300	× 150	*	*	*	*									
300	× 200	*	*	*	*									
300	× 250	*	*	*	*									
350	× 50	*												
350	× 80	*												
350	× 100	*												
350	× 150	*	*	*	*									
350	× 200	*	*	*	*									
350	× 250	*	*	*	*									
350	× 300	*	*	*	*									

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

Class No.:	CN07	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	×	70
20	4	5/8	×	75
25	4	5/8	×	80
40	4	3/4	×	90
50	8	5/8	×	90
80	8	3/4	×	110
100	8	3/4	×	115
150	12	3/4	×	125
200	12	7/8	×	140
250	16	1	×	160
300	16	1-1/8	×	170
350	20	1-1/8	×	180
400	20	1-1/4	×	190

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.63
15	4	1/2	×	75
20	4	5/8	×	85
25	4	5/8	×	90
40	4	3/4	×	100
50	8	5/8	×	100
80	8	3/4	×	120
100	8	3/4	×	130
150	12	3/4	×	145
200	12	7/8	×	170
250	16	1	×	190
300	16	1-1/8	×	205
350	20	1-1/8	×	215
400	20	1-1/4	×	235

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.63
15	4	5/8	×	120
20	4	5/8	×	120
25	4	5/8	×	120
40	4	3/4	×	130
50	8	5/8	×	150
80	8	3/4	×	150
100	12	3/4	×	140
150	12	3/4	×	140
200	12	7/8	×	150
250	16	1	×	170
300	16	1-1/8	×	190
350	20	1-1/8	×	195
400	20	1-1/4	×	210
450	24	1-1/4	×	220
500	24	1-1/4	×	230
600	24	1-1/2	×	260

* DRAIN POINT Fig. 2J

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF. C.A.F.				2
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* DRAIN POINT Fig. 2J

Run	DN 50-600	Br	DN 20	No.
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF. C.A.F.				2
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT Fig. 1J

Run	DN 15-25	Br	DN 15	No.
Run	DN 40	Br	DN 20	
Branch: Table Page 1				1
Blind Flange				1
Gasket RF. C.A.F.				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 RF. C.A.F.				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

Class No.: CN10	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 1 mm	Sign:	

Temperature °C	0	50	100	150	200	250	300	350	400
Pressure Barg. DN 15-600	42.9	42.9	42.9	42.9	42.9	40.9	38.0	36.2	27.7

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	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	40	350	C	C	C	C	E	E	E	E	E	E	E	A				
80	40	300	C	C	C	C	E	E	E	E	E	E	A					
100	40	250	C	C	C	C	E	E	E	E	E	A						
150	40	200	C	C	C	C	E	E	E	E	A							
200	30	150	C	C	C	C	E	E	E	A								
250	30	100	C	C	C	C	D	D	A									
300	30	80	C	C	C	C	D	A										
350	30	50	C	C	C	B	A											
400	30	40	C	B	B	A												
450	30	25	B	B	A													
500	30	20	B	A														
600	30	15	A															

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1 and to allowable internal prisor acc. ANSI BS 31.1.
- Max. allowable pressure for steam traps: 28 bar ga.
- Piston type check valves for horizontal mounting only.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket weld
D	Pipe to pipe
E	Branch outlet reducing butt-weld

Class No.:	CN10	Page:	2	Content:	Material Descriptions
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* PIPE

PIPE	Pipe	API 5L-B	DN	15-400	API	5L-B (Seamless)
		API 5L-B	DN	450-600	API	5L-B (Welded)
	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	15-400	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)		DN	15-400	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	50-600	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	20-600	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.
- Where both API 5L and ASTM A 106 pipes are specified, preference is subject to company approval.

* VALVES

CHVF	Check Valve Flanged	DN	15-600	Body:	ASTM A216-WCB/WCC, A105
				Trim:	Body Mat., AISI 316, 316L, AISI 410, + Stellite-6
CHVS	Check Valve Socket	DN	15-40	Body:	ASTM A216-WCB/WCC, A105
				Trim:	Body Mat., AISI 316, 316L, AISI 410, + Stellite-6
GAVB	Gate Valve Butt-Weld. End	DN	50-600	Body:	ASTM A216-WCB/WCC, A105
				Trim:	Body Mat., AISI 316, 316L, AISI 410, + Stellite-6
GAVF	Gate Valve Flanged	DN	—	Body:	ASTM A216-WCB/WCC, A105
				Trim:	Body Mat., AISI 316, 316L, AISI 410, + Stellite-6
GAVS	Gate Valve Sw	DN	15-40	Body:	ASTM A216-WCB/WCC, A105
				Trim:	Body Mat., AISI 316, 316L, AISI 410, + Stellite-6
GLVB	Globe Valve Butt-Weld. End	DN	50-200	Body:	ASTM A216-WCB/WCC, A105
				Trim:	Body Mat., AISI 316, 316L, AISI 410, + Stellite-6
GLVS	Globe Valve Socket	DN	15-40	Body:	ASTM A216-WCB/WCC, A105
				Trim:	Body Mat., AISI 316, 316L, AISI 410, + Stellite-6

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-600	AISI	316, 316L, Asbestos 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

Class No.:	CN10	Page:	3	Content:	Piping Components
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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600	
* PIPE																		
Pipe	74.13.23/31	*	*	*	*	*	*	*	*	*	*	*	*	*				
	74.13.23/24														*	*	*	
	74.30.21/31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
* FLANGES																		
Blind Flange	76.62.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Spectacle Blind Flange	76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Spacer Ring Type (ANS Flanges)	76.88.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Welding Neck Flange	76.62.78	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
* 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	76.34.80	*	*	*	*												
Coupling	Socket-Weld. End	76.34.28	*	*	*	*												
Cap	Socket-Weld. End	76.34.18	*	*	*	*												
* VALVES																		
Check Valve Flanged	75.37.13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Check Valve Socket	75.56.13	*	*	*	*													
Gate Valve Butt-Weld. End	75.56.33					*	*	*	*	*	*	*	*	*				
Gate Valve SW	75.56.35	*	*	*	*													
Globe Valve Butt-Weld. End	75.56.54					*	*	*	*	*								
Globe Valve Socket	75.56.45	*	*	*	*													
* MISCELLANEOUS																		
Gasket, Spiral Wound	85.41.35	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Orifice Flange Set	60.88.52					*	*	*	*	*	*	*	*	*	*	*	*	

Class No.:	CN10	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 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	× 25		*	*			400	× 300	*	*	*	*		
50	× 40		*	*			400	× 350	*	*	*	*		
80	× 40		*	*			450	× 80	*					
80	× 50	*	*	*	*		450	× 100	*					
100	× 50	*	*	*	*		450	× 150	*					
100	× 80	*	*	*	*		450	× 200	*	*	*	*		
150	× 50	*					450	× 250	*	*	*	*		
150	× 80	*	*	*	*		450	× 300	*	*	*	*		
150	× 100	*	*	*	*		450	× 350	*	*	*	*		
200	× 50	*					450	× 400	*	*	*	*		
200	× 80	*					500	× 50	*				15	40-150 *
200	× 100	*	*	*	*		500	× 80	*					200-600 *
200	× 150	*	*	*	*		500	× 100	*				20	50-80 *
250	× 50	*					500	× 150	*					100-600 *
250	× 80	*					500	× 200	*					
250	× 100	*			*		500	× 250	*	*	*	*	25	50 *
250	× 150	*	*	*	*		500	× 300	*	*	*	*		80-100 *
250	× 200	*	*	*	*		500	× 350	*	*	*	*		150-600 *
300	× 50	*					500	× 400	*	*	*	*		
300	× 80	*					500	× 450	*	*	*	*	40	80-100 *
300	× 100	*					600	× 50	*					150-300 *
300	× 150	*	*	*	*		600	× 80	*					350-600 *
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.:	CN10	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	×	70
20	4	5/8	×	75
25	4	5/8	×	80
40	4	3/4	×	90
50	8	5/8	×	90
80	8	3/4	×	110
100	8	3/4	×	115
150	12	3/4	×	125
200	12	7/8	×	140
250	16	1	×	160
300	16	1-1/8	×	170
350	20	1-1/8	×	180
400	20	1-1/4	×	190

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	×	75
20	4	5/8	×	85
25	4	5/8	×	90
40	4	3/4	×	100
50	8	5/8	×	100
80	8	3/4	×	120
100	8	3/4	×	130
150	12	3/4	×	145
200	12	7/8	×	170
250	16	1	×	190
300	16	1-1/8	×	205
350	20	1-1/8	×	215
400	20	1-1/4	×	235

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	5/8	×	120
20	4	5/8	×	120
25	4	5/8	×	120
40	4	3/4	×	130
50	8	5/8	×	150
80	8	3/4	×	150
100	12	3/4	×	140
150	12	3/4	×	140
200	12	7/8	×	150
250	16	1	×	170
300	16	1-1/8	×	190
350	20	1-1/8	×	195
400	20	1-1/4	×	210
450	24	1-1/4	×	220
500	24	1-1/4	×	230
600	24	1-1/2	×	260

* 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.: CN12	Page: 1	Content: General
Base Material: Killed Carbon Steel	First Issue: Revision:	
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 3 mm	Sign:	

Temperature °C 0-200

Pressure Barg. DN 15-400 20

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	D	D	D	D	D	D	D	D	D
20	160	350	C	C	C	C	D	D	D	D	D	D	D	D	D
25	160	300	C	C	C	C	D	D	D	D	D	D	D	D	D
40	160	250	C	C	C	C	D	D	D	D	D	D	D	D	D
50	80	200	C	C	C	C	D	D	D	D	D	D	D	D	D
80	80	150	C	C	C	C	D	D	D	D	D	D	D	D	D
100	80	100	C	C	C	C	D	D	D	D	D	D	D	D	D
150	80	80	C	C	C	C	D	D	D	D	D	D	D	D	D
200	40	50	C	C	C	C	D	D	D	D	D	D	D	D	D
250	40	40	C	C	C	C	D	D	D	D	D	D	D	D	D
300	40	25	B	B	A	A	D	D	D	D	D	D	D	D	D
350	40	20	B	A	A	A	D	D	D	D	D	D	D	D	D
400	40	15	A	A	A	A	D	D	D	D	D	D	D	D	D

Notes:

- Pipe DN 40 and smaller to be bent, radius R-4D min., wherever possible.
- DN 15 and DN 20 piping components only to be used for short branches e.g. pressure points.
- Open vents and drains are not allowed in HF service.
- Standard tees to be applied if more economical or preferred for practical reasons, instead of equal size pipe-to-pipe connection.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket weld
D	Pipe to pipe

Class No.:	CN12	Page:	2	Content:	Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-400	ASTM	A333-6 (Seamless)
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* 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	50-400	ASTM	A420-WPL6
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	50-400	ASTM	A420-WPL6
TEEB	Equal Tee	Butt-Weld. End	DN	15-40	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	15-400	ASTM	A350-LF2
RECB	Reducer Conc. Butt-Weld. End	DN	15-400	ASTM	A420-WPL6
REEB	Reducer Ecc. Butt-Weld. End	DN	15-400	ASTM	A420-WPL6
TERB	Tee Reducing Butt-Weld. End	DN	15-25	ASTM	A420-WPL6
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A350-LF2

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 Swing Flanged	DN	15-400	Body:	ASTM	A352-LCC
				Trim:	ASTM	B564A
GLVF	Globe Valve Flanged	DN	15-250	Body:	ASTM	A352-LCC
				Trim:	ASTM	B564A
BARF	Ball Valve Red. Bore Flanged	DN	15-400	Body:	ASTM	A352-LCC
				Ball/Stem:	ASTM	B564A
				Seat:	PIFE	

* MISCELLANEOUS

GKTI	Gasket, Spiral Wound	DN	15-250	Monel, PTFE Filled, 4.5 mm
ORFS	Orifice Flange Set	DN	50-600	CS Centering Ring, Monnel Inner Ring
STBT	Stud Bolt with Nuts		—	ASTM A350-LF2
			Studs:	ASTM A320-L7
			Nuts:	ASTM A194-4

Class No.:	CN12	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		74.14.21/31	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* 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	76.35.84	*	*	*	*										
Coupling	Socket-Weld. End	76.35.28	*	*	*	*										
Cap	Socket-Weld. End	76.35.18	*	*	*	*										
* VALVES																
Ball Valve Red. Bore Flanged		75.42.00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Check Valve Flanged		75.42.13	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged		75.42.40	*	*	*	*	*	*	*	*	*	*				
* MISCELLANEOUS																
Gasket, Spiral Wound		85.41.00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.88.00					*	*	*	*	*	*	*	*	*	*

Class No.:	CN12	Page:	4	Content:	Reducing Piping Components
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Run	Br.	BROB 76.80.04	RECB 76.31.72	REEB 76.31.72	TERB 76.31.85	TERS 76.00.85
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 × 80			*	*		
150 × 100			*	*		
200 × 100			*	*		
200 × 150			*	*		
250 × 150			*	*		
250 × 200			*	*		
300 × 200			*	*		
300 × 250			*	*		
350 × 250			*	*		
350 × 300			*	*		
400 × 300			*	*		
400 × 350			*	*		

COMP. NAME	DESCRIPTION
BROS	Branch Fitting Outlet Socket Wekd. End
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

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

Class No.:	CN12	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	×	70
20	4	5/8	×	75
25	4	5/8	×	80
40	4	3/4	×	90
50	8	5/8	×	90
80	8	3/4	×	110
100	8	3/4	×	115
150	12	3/4	×	125
200	12	7/8	×	140
250	16	1	×	160
300	16	1 1/8	×	170
350	20	1 1/8	×	180
400	20	1 1/4	×	190

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.63
15	4	5/8	×	120
20	4	5/8	×	120
25	4	5/8	×	120
40	4	3/4	×	130
50	8	5/8	×	150
80	8	3/4	×	150
100	12	3/4	×	140
150	12	3/4	×	140
200	12	7/8	×	150
250	16	1	×	170
300	16	1 1/8	×	190
350	20	1 1/8	×	195
400	20	1 1/4	×	210

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.63
15	4	1/2	×	75
20	4	5/8	×	85
25	4	5/8	×	90
40	4	3/4	×	100
50	8	5/8	×	100
80	8	3/4	×	120
100	8	3/4	×	130
150	12	3/4	×	145
200	12	7/8	×	180
250	16	1	×	205
300	16	1 1/8	×	215
350	20	1 1/8	×	230
400	20	1 1/4	×	240

Class No.: CN14	Page: 1	Content: General
Base Material: Carbon Steel	First Issue:	Revision:
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 1 mm	Sign:	

Temperature °C	0	50	100	150	200	250	300	350	400
Pressure Barg. DN 15-600	50.5	50.0	46.3	45.1	43.8	41.8	38.9	36.8	32.6

TABLE OF SCHEDULES

DN	Schedule	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE																
		Run 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	E			
50	40	350	C	C	C	C	E	E	E	E	E	E	E	A				
80	40	300	C	C	C	C	E	E	E	E	E	E	A					
100	40	250	C	C	C	C	E	E	E	E	E	A						
150	40	200	C	C	C	C	E	E	E	E	A							
200	30	150	C	C	C	C	E	E	E	A								
250	30	100	C	C	C	C	D	D	A									
300	30	80	C	C	C	C	D	A										
350	30	50	C	C	C	B	A											
400	30	40	C	B	B	A												
450	30	25	B	B	A													
500	30	20	B	A														
600	30	15	A															

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 1.1 and ball valve ratings acc. B 31.3.
- Piston type check valves for horizontal mounting only.

CODE EXPLANATION OF CHARACTERS

A	Equal tee
B	Reducing tee
C	Branch fitting outlet socket weld
D	Pipe to pipe
E	Branch outlet reducing butt-weld

Class No.:	CN14	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	50-600	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	410
GAVF	Gate Valve Flanged	DN	15-600	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410
GLVF	Globe Valve Flanged	DN	15-200	Body:	ASTM	A216-WCB/WCC, A105
				Trim:	AISI	410

* MISCELLANEOUS

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

Class No.:	CN14	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	450	500	600
* PIPE																		
Pipe		74.30.05	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pipe Nipple 50 mm		76.05.56	*	*	*	*												
* 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		75.37.12	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged		75.37.32					*	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged		75.37.42	*	*	*	*	*	*	*	*	*							
* MISCELLANEOUS																		
Gasket, Spiral Wound		85.41.35	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.88.52						*	*	*	*	*	*	*	*	*	*	*

Class No.:	CN14	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 Outlet Socket Weld. End
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 × 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		*	*	*	*		

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

Class No.:	CN14	Page:	5	Content:	Bolting and Assemblies
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BOLTSET FLANGED JOINTS

DN	No.	Inch	mm	81.38.61
15	4	1/2	×	70
20	4	5/8	×	75
25	4	5/8	×	80
40	4	3/4	×	90
50	8	5/8	×	90
80	8	3/4	×	110
100	8	3/4	×	115
150	12	3/4	×	125
200	12	7/8	×	140
250	16	1	×	160
300	16	1-1/8	×	170
350	20	1-1/8	×	180
400	20	1-1/4	×	190
450	24	1-1/4	×	195
500	24	1-1/4	×	210
600	24	1-1/2	×	235

BOLTSET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.61
15	4	1/2	×	75
20	4	5/8	×	85
25	4	5/8	×	90
40	4	3/4	×	100
50	8	5/8	×	100
80	8	3/4	×	120
100	8	3/4	×	130
150	12	3/4	×	145
200	12	7/8	×	170
250	16	1	×	190
300	16	1-1/8	×	205
350	20	1-1/8	×	215
400	20	1-1/4	×	235
450	24	1-1/4	×	245
500	24	1-1/4	×	260
600	24	1-1/2	×	295

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.61
15	4	5/8	×	120
20	4	5/8	×	120
25	4	5/8	×	120
40	4	3/4	×	130
50	8	5/8	×	150
80	8	3/4	×	150
100	12	3/4	×	140
150	12	3/4	×	140
200	12	7/8	×	150
250	16	1	×	170
300	16	1-1/8	×	190
350	20	1-1/8	×	195
400	20	1-1/4	×	210
450	24	1-1/4	×	220
500	24	1-1/4	×	230
600	24	1-1/2	×	260

* DRAIN POINT Fig. 0I

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

Class No.: CN16	Page: 1	Content: General
Base Material: Carbon Steel, Fine Grained, LT	First Issue: Revision:	
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 1 mm	Sign:	

Temperature °C	-35	0	70
Pressure Barg.	DN 20-150	30.0	30.0

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

Notes:

- Design limits are based on service conditions.
- All welds to be 100% radiographed.
- No angled welds permitted.
- This piping class is originally designed for liquid and vapour chlorine service.
- 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.:	CN16	Page:	2	Content:	Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-150	ASTM	A333-6 (Seamless)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A333-6 (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-150	ASTM	A350-LF2
SBFL	Spectacle Blind Flange	DN	15-150	ASTM	A516-60
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-150	ASTM	A516-60
WNFL	Welding Neck Flange	DN	15-150	ASTM	A350-LF2

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-150	ASTM	A420-WPL6
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-150	ASTM	A420-WPL6
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-150	ASTM	A420-WPL6
TEEB	Equal Tee	Butt-Weld. End	DN	15-150	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	A1350-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	50-150	ASTM	A350-LF2
RECB	Reducer Conc. Butt-Weld. End	DN	20-150	ASTM	A420-WPL6
REEB	Reducer Ecc. Butt-Weld. End	DN	20-150	ASTM	A420-WPL6
TERB	Tee Reducing Butt-Weld. End	DN	20-150	ASTM	A420-WPL6
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A350-LF2

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

BARF	Ball Valve Red. Bore Flanged	DN	15-150	Body:	ASTM	A352, A350
				Ball/Stem:		Monel
				Seats:		PTFE (-50, Dry chlorine)

* MISCELLANEOUS

GKTI	Gasket, RF. C.A.F.	DN	15-150	C.A.F.	
ORFS	Orifice Flange Set	DN	50-150		ASTM A350-LF2
STBT	Stud Bolt with Nuts		—	Studs:	ASTM A320-L7
				Nuts:	ASTM A194-4

Class No.:	CN16	Page:	3	Content:	Piping Components
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ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150
NOMINAL PIPE SIZE										
* PIPE										
Pipe		74.14.21	*	*	*	*	*	*	*	*
* FLANGES										
Blind Flange		76.62.12	*	*	*	*	*	*	*	*
Spectacle Blind Flange		76.88.00	*	*	*	*	*	*	*	*
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	76.31.39/40	*	*	*	*	*	*	*	*
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	76.35.84	*	*	*	*				
Coupling	Socket-Weld. End	76.35.28	*	*	*	*				
Cap	Socket-Weld. End	76.35.18	*	*	*	*				
* VALVES										
Ball Valve Red. Bore Flanged		75.72.11	*	*	*	*	*	*	*	*
* MISCELLANEOUS										
Gasket, RF. C.A.F.		85.31.15/17	*	*	*	*	*	*	*	*
Orifice Flange Set		60.88.00					*	*	*	*

Class No.:	CN16	Page:	4	Content:	Reducing Piping Components
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Run	Br.	BROB 76.80.00	RECB 76.31.72	REEB 76.31.73	TERB 76.31.85	TERS 76.35.85
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	*	*	*		

COMP. NAME	DESCRIPTION
BROS	Branch Fitting Outlet Socket Wekd. End
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

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

Class No.:	CN16	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	×	70 *
20	4	5/8	×	75 *
25	4	5/8	×	80 *
40	4	3/4	×	90 *
50	8	5/8	×	90 *
80	8	3/4	×	110 *
100	8	3/4	×	115 *
150	12	3/4	×	125 *

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.63
15	4	5/8	×	120 *
20	4	5/8	×	120 *
25	4	5/8	×	120 *
40	4	3/4	×	130 *
50	8	5/8	×	150 *
80	8	3/4	×	150 *
100	12	3/4	×	140 *
150	12	3/4	×	140 *

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.63
15	4	1/2	×	75 *
20	4	5/8	×	85 *
25	4	5/8	×	90 *
40	4	3/4	×	100 *
50	8	5/8	×	100 *
80	8	3/4	×	120 *
100	8	3/4	×	130 *
150	12	3/4	×	145 *

* DRAIN POINT Fig. 2J

Run	DN 20-50	Br	DN 20	No.
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF. C.A.F.				2
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* DRAIN POINT Fig. 2J

Run	DN 80-150	Br	DN 20	No.
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF. C.A.F.				2
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT Fig. 2J

Run	DN 20-50	Br	DN 20	No.
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF. C.A.F.				2
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* VENT POINT Fig. 2J

Run	DN 80-150	Br	DN 20	No.
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF. C.A.F.				2
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

Class No.: CP02	Page: 1	Content: General
Base Material: Alloy Steel (1.25 Cr - 0.5 Mo)	First Issue: Revision:	
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 1 mm	Sign:	

Temperature °C	0	50	100	150	200	250	300	350	400	450
Pressure Barg. DN 15-600	51.7	51.1	48.6	46.5	45.5	44.3	42.3	40.3	36.4	33.7

TABLE OF SCHEDULES

TABLE OF SCHEDULES			BRANCH CONNECTIONS 90 DEGREES																
			Run	BRANCH SIZE															
DN	Schedule	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			
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	40	300	C	C	C	C	E	E	E	E	E	E	A						
100	40	250	C	C	C	C	E	E	E	E	E	E							
150	40	200	C	C	C	C	E	E	E	E	A								
200	40	150	C	C	C	C	E	E	E	A									
250	40	100	C	C	C	C	D	D	A										
300	40	80	C	C	C	C	D	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 1.9.
- For design temperature of 400°C and below, application of ASTM A193-B7 bolting material, and asbestos filled gasket 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 outlet socket weld
D	Pipe to pipe
E	Branch outlet reducing butt-weld

Class No.:	CP02	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
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* 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	50-600	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

CHVF	Check Valve Flanged	DN	15-400	Body: ASTM A217-WC6, A182-F11 Trim: AISI 316, (L), Body Mat. All With Stellite /6 Facings
GAVB	Gate Valve Butt-Weld. End	DN	15-600	Body: ASTM A217-WC6, A182-F11 Trim: AISI 316, (L), Body Mat. All With Stellite /6 Facings
GLVB	Globe Valve Butt-Weld. End	DN	15-200	Body: ASTM A217-WC6, A182-F11 Trim: AISI 316, (L), Body Mat. All With Stellite /6 Facings
GLVF	Globe Valve Flanged	—		Body: ASTM A217-WC6, A182-F11 Trim: AISI 316, (L), Body Mat. All With Stellite /6 Facings

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-600	AISI 304, Graphite Filled CS Centring-, 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.:	CP02	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	450	500	600	
* PIPE																			
Pipe		74.33.11	*	*	*	*	*	*	*	*	*	*	*	*	*				
		74.00.00														*	*	*	
* FLANGES																			
Blind Flange		76.64.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Spectacle Blind Flange		76.88.06	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
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		75.39.13	*	*	*	*	*	*	*	*	*	*	*	*	*				
Gate Valve Butt-Weld. End		75.59.00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Globe Valve Butt-Weld. End		75.59.00	*	*	*	*	*	*	*	*	*								
Globe Valve Flanged		75.39.43	*	*	*	*	*	*	*	*	*								
* MISCELLANEOUS																			
Gasket, Spiral Wound		85.41.43	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Orifice Flange Set		60.00.00					*	*	*	*	*	*	*	*	*	*	*	*	

Class No.:	CP02	Page:	4	Content:	Reducing Piping Components
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Run	Br.	BROB 76.80.00	RECB 76.32.70	REEB 76.32.71	TERB 76.32.85	TERS 76.36.85
20 × 15			*	*	*	*
25 × 15			*	*	*	*
25 × 20			*	*	*	*
40 × 20			*	*	*	*
40 × 25			*	*	*	*
50 × 25			*	*	*	*
50 × 40			*	*	*	*
80 × 50		*		*		
100 × 50		*		*		
100 × 80		*	*	*		
150 × 80		*	*	*		
150 × 100		*	*	*		
200 × 80		*	*	*		
200 × 100		*	*	*		
200 × 150		*	*	*		
250 × 80		*				
250 × 100		*				
250 × 150		*	*	*		
250 × 200		*	*	*		
300 × 80		*				
300 × 100		*				
300 × 150		*	*	*		
300 × 200		*	*	*		
300 × 250		*	*	*		
350 × 80		*				
350 × 100		*				
350 × 150		*				
350 × 200		*	*	*		
350 × 250		*	*	*		
350 × 300		*	*	*		

Run	Br.	BROB 76.80.00	RECB 76.32.70	REEB 76.32.71
400 × 80		*		
400 × 100		*		
400 × 150		*		
400 × 200		*	*	*
400 × 250		*	*	*
400 × 300		*	*	*
400 × 350		*	*	*
450 × 80		*		
450 × 100		*		
450 × 150		*		
450 × 200		*		
450 × 250		*	*	*
450 × 300		*	*	*
450 × 350		*	*	*
450 × 400		*	*	*
500 × 80		*		
500 × 100		*		
500 × 150		*		
500 × 200		*		
500 × 250		*		
500 × 300		*	*	*
500 × 350		*	*	*
500 × 400		*	*	*
500 × 450		*	*	*
600 × 80		*		
600 × 100		*		
600 × 150		*		
600 × 200		*		
600 × 250		*		
600 × 300		*		
600 × 350		*		
600 × 400		*	*	*
600 × 450		*	*	*
600 × 500		*	*	*

COMP. NAME	DESCRIPTION
BROS	Branch Fitting Outlet Socket Wekd. End
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

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

Class No.:	CP02	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	×	70
20	4	5/8	×	75
25	4	5/8	×	80
40	4	3/4	×	90
50	8	5/8	×	90
80	8	3/4	×	110
100	8	3/4	×	115
150	12	3/4	×	125
200	12	7/8	×	140
250	16	1	×	160
300	16	1-1/8	×	170
350	20	1-1/8	×	180
400	20	1-1/4	×	190
450	24	1-1/4	×	195
500	24	1-1/4	×	210
600	24	1-1/2	×	235

BOLT SET SPECTACLE/SPACER

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	×	100
50	8	5/8	×	100
80	8	3/4	×	120
100	8	3/4	×	130
150	12	3/4	×	145
200	12	7/8	×	170
250	16	1	×	190
300	16	1-1/8	×	205
350	20	1-1/8	×	215
400	20	1-1/4	×	235
450	24	1-1/4	×	245
500	24	1-1/4	×	260
600	24	1-1/2	×	295

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.96
15	4	5/8	×	120
20	4	5/8	×	120
25	4	5/8	×	120
40	4	3/4	×	130
50	8	5/8	×	150
80	8	3/4	×	150
100	12	3/4	×	140
150	12	3/4	×	140
200	12	7/8	×	150
250	16	1	×	170
300	16	1-1/8	×	190
350	20	1-1/8	×	195
400	20	1-1/4	×	210
450	24	1-1/4	×	220
500	24	1-1/4	×	230
600	24	1-1/2	×	260

* DRAIN POINT Fig. 0J

Run DN 15-25 Br DN 15

Branch: Table Page 1	No.
Blind Flange	1
Gasket, RF. C.A.F.	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, RF. C.A.F.	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, RF. C.A.F.				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, RF. C.A.F.				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, RF. C.A.F.				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, RF. C.A.F.				2
Globe Valve Flanged				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

Class No.: CP04	Page: 1	Content: General
Base Material: Alloy Steel (5 Cr. - 0.5 Mo.)	First Issue: Revision:	
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 1 mm	Sign:	

Temperature °C	0	50	100	150	200	250	300	350	400	450
Pressure Barg. DN 15-600	51.7	51.7	51.5	50.2	48.7	46.3	42.8	40.3	36.4	30.9

TABLE OF SCHEDULES

DN	Schedule	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE																
		Run 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	40	300	C	C	C	C	E	E	E	E	E	E	A					
100	40	250	C	C	C	C	E	E	E	E	E	A						
150	40	200	C	C	C	C	E	E	E	E	A							
200	40	150	C	C	C	C	E	E	E	A								
250	40	100	C	C	C	C	E	D	A									
300	40	80	C	C	C	C	D	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 1.13.
- For design temperature of 400°C and below, application of ASTM A193-B7 bolting material, and asbestos filled gasket 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 outlet socket weld
D	Pipe to pipe
E	Branch outlet reducing butt-weld

Class No.:	CP04	Page:	2	Content:	Material Descriptions
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* PIPE

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

* 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	50-600	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	15-200	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-R
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.:	CP04	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	450	500	600	
* PIPE																			
Pipe		74.33.31	*	*	*	*	*	*	*	*	*	*	*	*	*				
		74.33.32														*	*	*	
* FLANGES																			
Blind Flange		76.64.10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Spectacle Blind Flange		76.88.07	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Spacer Ring Type (ANS Flanges)		76.88.00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Welding Neck Flange		76.64.84	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
* 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	76.36.84	*	*	*	*													
Coupling	Socket-Weld. End	76.36.28	*	*	*	*													
Cap	Socket-Weld. End	76.36.18	*	*	*	*													
* VALVES																			
Check Valve Flanged		75.39.13	*	*	*	*	*	*	*	*	*	*	*	*	*				
Gate Valve Flanged		75.39.33	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Globe Valve Flanged		75.39.43	*	*	*	*	*	*	*	*	*								
* MISCELLANEOUS																			
Gasket, Spiral Wound		85.41.43	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Orifice Flange Set		60.00.00					*	*	*	*	*	*	*	*	*	*	*	*	

Class No.:	CP04	Page:	4	Content:	Reducing Piping Components
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Run	Br.	BROB 76.80.00	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	× 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	*	*	*	*	*
350	× 50	*	*	*	*	*
350	× 80	*	*	*	*	*
350	× 100	*	*	*	*	*
350	× 150	*	*	*	*	*
350	× 200	*	*	*	*	*
350	× 250	*	*	*	*	*
350	× 300	*	*	*	*	*

Run	Br.	BROB 76.80.00	RECB 76.32.70	REEB 76.32.71
400	× 50	*		
400	× 80	*		
400	× 100	*		
400	× 150	*		
400	× 200	*	*	*
400	× 250	*	*	*
400	× 300	*	*	*
400	× 350	*	*	*
450	× 50	*		
450	× 80	*		
450	× 100	*		
450	× 150	*		
450	× 200	*	*	*
450	× 250	*	*	*
450	× 300	*	*	*
450	× 350	*	*	*
450	× 400	*	*	*
500	× 50	*		
500	× 80	*		
500	× 100	*		
500	× 150	*		
500	× 200	*	*	*
500	× 250	*	*	*
500	× 300	*	*	*
500	× 350	*	*	*
500	× 400	*	*	*
500	× 450	*	*	*
600	× 50	*		
600	× 80	*		
600	× 100	*		
600	× 150	*		
600	× 200	*	*	*
600	× 250	*	*	*
600	× 300	*	*	*
600	× 350	*	*	*
600	× 400	*	*	*
600	× 450	*	*	*
600	× 500	*	*	*

COMP. NAME	DESCRIPTION
BROS	Branch Fitting Outlet Socket Weld. End
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

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

Class No.:	CP04	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	× 70	*
20	4	5/8	× 75	*
25	4	5/8	× 80	*
40	4	3/4	× 90	*
50	8	5/8	× 90	*
80	8	3/4	× 110	*
100	8	3/4	× 115	*
150	12	3/4	× 125	*
200	12	7/8	× 140	*
250	16	1	× 160	*
300	16	1-1/8	× 170	*
350	20	1-1/8	× 180	*
400	20	1-1/4	× 190	*
450	24	1-1/4	× 195	*
500	24	1-1/4	× 210	*
600	24	1-1/2	× 235	*

BOLT SET SPECTACLE/SPACER

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	× 100	*
50	8	5/8	× 100	*
80	8	3/4	× 120	*
100	8	3/4	× 130	*
150	12	3/4	× 145	*
200	12	7/8	× 170	*
250	16	1	× 190	*
300	16	1-1/8	× 205	*
350	20	1-1/8	× 215	*
400	20	1-1/4	× 235	*
450	24	1-1/4	× 245	*
500	24	1-1/4	× 260	*
600	24	1-1/2	× 295	*

BOLT SET ORIFICE FLANGES

DN	No.	Inch	mm	81.38.96
15	4	5/8	× 120	*
20	4	5/8	× 120	*
25	4	5/8	× 120	*
40	4	3/4	× 130	*
50	8	5/8	× 150	*
80	8	3/4	× 150	*
100	12	3/4	× 140	*
150	12	3/4	× 140	*
200	12	7/8	× 150	*
250	16	1	× 170	*
300	16	1-1/8	× 190	*
350	20	1-1/8	× 195	*
400	20	1-1/4	× 210	*
450	24	1-1/4	× 220	*
500	24	1-1/4	× 230	*
600	24	1-1/2	× 260	*

* 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 50-600 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
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

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.: CS02	Page: 1	Content: General
Base Material: Stainless Steel AISI 316	First Issue: Revision:	
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 0 mm	Sign:	

Temperature °C	0	50	100	150	200	250	300	350	400
Pressure Barg. DN 15-300	49.6	48.1	42.2	38.5	35.7	33.5	31.6	30.4	29.2

TABLE OF SCHEDULES

TABLE OF SCHEDULES			BRANCH CONNECTIONS 90 DEGREES											
DN	Schedule	Run	BRANCH SIZE											
		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	10S	200	C	C	C	C	E	E	E	E	E			
40	10S	150	C	C	C	C	E	E	E	A				
50	10S	100	C	C	C	C	E	E	A					
80	10S	80	C	C	C	C	E	A						
100	10S	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 2.2.
- Blind flanges to be provided with liner.
- For economic reasons use lap-joint flanges from DN 15 up to DN 200.
- Spectacle blinds to be installed between welding neck flanges.
- 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.:	CS02	Page:	2	Content:	Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-300	ASTM	A312-TP316L (Seamless or Welded)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A312-TP316L (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-300	ASTM	A182-F316
SBFL	Spectacle Blind Flange	DN	15-300	ASTM	A240-TP316
WNFL	Welding Neck Flange	DN	15-300	ASTM	A182-F316

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-300	ASTM	A403-WP316L
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-300	ASTM	A403-WP316L
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-300	ASTM	A403-WP316L
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 Fitting Outlet	Socket-Weld. End	DN	15-40	ASTM	A182-F316
BROB	Branch Outlet Red.	Butt-Weld.	DN	50-300	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 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-CF8M, A182-F316
				Trim:	AISI	316, 316L
GAVF	Gate Valve Flanged	DN	15-300	Body:	ASTM	A351-CF8M, A182-F316
				Trim:	AISI	316, 316L
GLVF	Globe Valve Flanged	DN	15-200	Body:	ASTM	A351-CF8M, A182-F316
				Trim:	AISI	316, 316L

* MISCELLANEOUS

GKTI	Gasket, RF. C.A.F.	DN	15-300	C.A.F.	
ORFS	Orifice Flange Set	DN	50-300	ASTM	A182-F316
STBT	Stud Bolt with Nuts	—		Studs:	ASTM A193-B7
				Nuts:	ASTM A194-2H

Class No.:	CS02	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	*	*	*	*	*	*	*	*	*	*	*
Lap-Joint Flange		76.62.00	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange		76.88.07	*	*	*	*	*	*	*	*	*	*	*
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		75.40.33	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged		75.40.41	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS													
Gasket, RF. C.A.F.		85.31.15/17	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.00.00					*	*	*	*	*	*	*

Class No.:	CS02	Page:	4	Content:	Reducing Piping Components
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Run	Br.	BROB 76.80.00	RECB 76.33.70	REEB 76.33.71	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 Outlet Socket Weld. End
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

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

Class No.:	CS02	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	×	70	*
20	4	5/8	×	75	*
25	4	5/8	×	80	*
40	4	3/4	×	90	*
50	8	5/8	×	90	*
80	8	3/4	×	110	*
100	8	3/4	×	115	*
150	12	3/4	×	125	*
200	12	7/8	×	140	*
250	16	1	×	160	*
300	16	1 1/8	×	170	*

BOLT SET SPECTACLE/SPACER					
DN	No.	Inch	mm	81.38.61	
15	4	1/2	×	75	*
20	4	5/8	×	85	*
25	4	5/8	×	90	*
40	4	3/4	×	100	*
50	8	5/8	×	100	*
80	8	3/4	×	120	*
100	8	3/4	×	130	*
150	12	3/4	×	145	*
200	12	7/8	×	170	*
250	16	1	×	190	*
300	16	1 1/8	×	205	*

BOLT SET FOR ORIFICE FLANGES					
DN	No.	Inch	mm	81.38.61	
15	4	5/8	×	120	*
20	4	5/8	×	120	*
25	4	5/8	×	120	*
40	4	3/4	×	130	*
50	8	5/8	×	150	*
80	8	3/4	×	150	*
100	12	3/4	×	140	*
150	12	3/4	×	140	*
200	12	7/8	×	150	*
250	16	1	×	170	*
300	16	1 1/8	×	190	*

* DRAIN POINT Fig. 0I			
Run	DN 15-25	Br	DN 15
Branch: Table Page 1			
Blind Flange			
Gasket RF C.A.F.			
Gate Valve Flange			
Stud Bolt with Nuts			
Welding Neck Flange			

* DRAIN POINT Fig. 0I			
Run	DN 40-40	Br	DN 20
Branch: Table Page 1			
Blind Flange			
Gasket RF C.A.F.			
Gate Valve Flange			
Stud Bolt with Nuts			
Welding Neck Flange			

* DRAIN POINT Fig. 0J			
Run	DN 50-300	Br	DN 20
Branch: Table Page 1			
Blind Flange			
Gasket RF C.A.F.			
Gate Valve Flange			
Pipe Nipple 50 mm			
Stud Bolt with Nuts			
Welding Neck Flange			

* VENT POINT Fig. 1I			
Run	DN 15-25	Br	DN 15
Branch: Table Page 1			
Blind Flange			
Gasket RF C.A.F.			
Globe Valve Flange			
Stud Bolt with Nuts			
Welding Neck Flange			

* VENT POINT Fig. 1I			
Run	DN 40-40	Br	DN 20
Branch: Table Page 1			
Blind Flange			
Gasket RF C.A.F.			
Globe Valve Flange			
Stud Bolt with Nuts			
Welding Neck Flange			

* VENT POINT Fig. 1I			
Run	DN 50-300	Br	DN 20
Branch: Table Page 1			
Blind Flange			
Gasket RF C.A.F.			
Globe Valve Flange			
Pipe Nipple 50 mm			
Stud Bolt with Nuts			
Welding Neck Flange			

Class No.: CS04	Page: 1	Content: General
Base Material: Stainless Steel AISI 304, LT	First Issue: Revision:	
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 0 mm	Sign:	

Temperature °C		-200	0	50	100	125	150	
Pressure Barg.	DN 15-80	49.6	49.6	47.8	40.7	38.0	29.0	
	DN 100-150		42.0	42.0	42.0	39.0	32.0	24.0
	DN 200-300		31.0	31.0	31.0	29.0	23.0	18.0

TABLE OF SCHEDULES

DN	Schedule	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE											
		Run 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	10S	200	C	C	C	C	E	E	E	E	A		
40	10S	150	C	C	C	C	E	E	E	A			
50	10S	100	C	C	C	C	E	E	A				
80	10S	80	C	C	C	C	E	A					
100	10S	50	C	C	C	B	A						
150	10S	40	C	B	B	A							
200	10S	25	B	B	A								
250	10S	20	B	A									
300	10S	15	A										

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 2.1 and to ball valve rating acc. BS 5351.
- 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.:	CS04	Page:	2	Content:	Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-300	ASTM	A312-TP304 (Seamless or Welded)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A312-TP304 (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-300	ASTM	A182-F304
SBFL	Spectacle Blind Flange	DN	15-300	ASTM	A240-TP304
SPRT	Spacer Ring Type (ANS Flanges)	DN	15-300	ASTM	A240-TP304
WNFL	Welding Neck Flange	DN	15-300	ASTM	A182-F304

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-300	ASTM	A403-WP304
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-300	ASTM	A403-WP304
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-300	ASTM	A403-WP304
TEEB	Equal Tee	Butt-Weld. End	DN	15-300	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	50-300	ASTM	A182-F304
RECB	Reducer Conc. Butt-Weld. End	DN	20-300	ASTM	A403-WP304
REEB	Reducer Ecc. Butt-Weld. End	DN	20-300	ASTM	A403-WP304
TERB	Tee Reducing Butt-Weld. End	DN	20-50	ASTM	A403-WP304
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A182-F304

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

BARF	Ball Valve Red. Bore Flanged	DN	15-250	Body: ASTM A351-CF8M, A182-F316 Ball/Stem: AISI 316, 316L Seats: PTFE
GHVF	Check Valve Flanged	DN	15-300	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316, 316L
GAVF	Gate Valve Flanged	DN	15-300	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316, 316L
GLVF	Globe Valve Flanged	DN	15-200	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316, 316L

* MISCELLANEOUS

GKTI	Gasket, RF. C.A.F.	DN	15-300	C.A.F.
ORFS	Orifice Flange Set	DN	50-300	ASTM A182-F304
STBT	Stud Bolt with Nuts	—		Bolts: (Dia. 1 1/2") ASTM A193-B8M2 Nuts: ASTM A194 GR 8M Studs: ASTM A193-B8 Nuts: ASTM A194-8

Class No.:	CS04	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		74.36.10	*	*	*	*	*	*	*	*	*	*	*
* FLANGES													
Blind Flange		76.65.10	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange		76.88.07	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)		76.88.00	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange		76.65.79	*	*	*	*	*	*	*	*	*	*	*
* 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													
Ball Valve Red. Bore Flanged		75.72.00	*	*	*	*	*	*	*	*	*	*	*
Check Valve Flanged		75.40.13	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged		75.40.33	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged		75.40.41	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS													
Gasket, RF. C.A.F.		85.31.15/17	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.00.00					*	*	*	*	*	*	*

Class No.:	CS04	Page:	4	Content:	Reducing Piping Components
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Run × Br.	BROB 76.80.00	RECB 76.33.70	REEB 76.33.71	TERB 76.33.90	TERS 76.37.85
20 × 15		*	*	*	*
25 × 15		*	*	*	*
25 × 20		*	*	*	*
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 Outlet Socket Weld. End
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

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

Class No.:	CS04	Page:	5	Content:	Bolting and Assemblies
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BOLT SET FLANGED JOINTS

DN	No.	Inch	mm	81.38.43
15	4	1/2	×	70
20	4	5/8	×	75
25	4	5/8	×	80
40	4	3/4	×	90
50	8	5/8	×	90
80	8	3/4	×	110
100	8	3/4	×	115
150	12	3/4	×	125
200	12	7/8	×	140
250	16	1	×	160
300	16	1 1/8	×	170

BOLT SET SPECTACLE/SPACER

DN	No.	Inch	mm	81.38.43
15	4	1/2	×	75
20	4	5/8	×	85
25	4	5/8	×	90
40	4	3/4	×	100
50	8	5/8	×	100
80	8	3/4	×	120
100	8	3/4	×	130
150	12	3/4	×	145
200	12	7/8	×	170
250	16	1	×	190
300	16	1 1/8	×	205

BOLT SET FOR ORIFICE FLANGES

DN	No.	Inch	mm	81.38.43
15	4	5/8	×	120
20	4	5/8	×	120
25	4	5/8	×	120
40	4	3/4	×	130
50	8	5/8	×	150
80	8	3/4	×	150
100	12	3/4	×	140
150	12	3/4	×	140
200	12	7/8	×	150
250	16	1	×	170
300	16	1 1/8	×	190

* DRAIN POINT Fig. 2J

Run	DN 15-25	Br	DN 15	No.
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF C.A.F.				2
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* DRAIN POINT Fig. 2J

Run	DN 40-40	Br	DN 20	No.
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF C.A.F.				2
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

* DRAIN POINT Fig. 2J

Run	DN 50-300	Br	DN 20	No.
Branch: Table Page 1				1
Ball Valve Red. Bore Flanged				1
Blind Flange				1
Gasket RF C.A.F.				2
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 RF C.A.F.				2
Globe Valve Flange				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 RF C.A.F.				2
Globe Valve Flange				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 RF C.A.F.				2
Globe Valve Flange				1
Pipe Nipple 50 mm				1
Stud Bolt with Nuts				8
Welding Neck Flange				1

Class No.: CS05	Page: 1	Content: General
Base Material: Stainless Steel AISI 321/347	First Issue: Revision:	
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 0 mm	Sign:	

Temperature °C	0	50	75	100	125	150	175	200	
Pressure Barg. DN 15-80	49.6	48.1	45.0	42.2	38.0	29.0	20.0	11.0	
DN 100-150		41.2	41.2	41.2	39.0	32.0	24.0	17.0	9.0
DN 200-300		28.7	28.7	28.7	28.7	23.0	18.0	12.0	7.0

TABLE OF SCHEDULES

DN	Schedule	BRANCH CONNECTIONS 90 DEGREES BRANCH SIZE											
		Run 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	10S	200	C	C	C	C	E	E	E	E	A		
40	10S	150	C	C	C	C	E	E	E	A			
50	10S	100	C	C	C	C	E	E	A				
80	10S	80	C	C	C	C	E	A					
100	10S	50	C	C	C	B	A						
150	10S	40	C	B	B	A							
200	10S	25	B	B	A								
250	10S	20	B	A									
300	10S	15	A										

Notes:

- Design limits are acc. flange rating ANSI B16 Material Group 2.4 and to ball valve rating acc. BS 5351.
- Blind flanges to be provided with liner.
- For economic reasons use lap-joint flanges from DN 15 up to DN 200.
- Spectacle blinds to be installed between welding neck flanges.
- 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.:	CS05	Page:	2	Content:	Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-300	ASTM	A312-TP316L (Seamless or Welded)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A312-TP316L (Seamless)

* FLANGES

BLFL	Blind Flange	DN	15-300	ASTM	A182-F316
FLIN	Blind Flange Liner	DN	15-300	ASTM	A240-TP316
SBFL	Spectacle Blind Flange	DN	15-300	ASTM	A240-TP316
WNFL	Welding Neck Flange	DN	15-300	ASTM	A182-F316

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-300	ASTM	A403-WP316L
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-300	ASTM	A403-WP316L
E90B	Elbow 90 Deg.	Butt-Weld. End	DN	15-300	ASTM	A403-WP316L
STUB	End		DN	15-200	ASTM	A403-WP316L
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 Fitting Outlet Socket-Weld. End	DN	15-40	ASTM	A182-F316
BROB	Branch Outlet Red. Butt-Weld.	DN	50-300	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	20-50	ASTM	A403-WP316L
TERS	Tee Reducing Socket-Weld. End	DN	20-40	ASTM	A182-F316

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

BARF	Ball Valve Red. Bore Flanged	DN	15-250	Body: ASTM A351-CF8M, A182-F316 Int: AISI 316 (L)/ PTFE
GHVF	Check Valve Flanged	DN	15-300	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316 (L) + Stellite 6 Seat: PTFE, FKM
GAVF	Gate Valve Flanged	DN	50-300	Body: ASTM A351-CF8M, A182-F316 Trim: AISI 316 (L) + Stellite 6
GLBF	Globe Valve Flanged	DN	15-200	Body: ASTM A351-CF8M, A182-F316 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-F316
STBT	Stud Bolt with Nuts		—	Studs: Nuts:	ASTM A193-B7 ASTM A194-2H

Class No.:	CS05	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	*	*	*	*	*	*	*	*	*	*	*
* FLANGES													
Blind Flange		76.65.10	*	*	*	*	*	*	*	*	*	*	*
Blind Flange Liner		76.80.81	*	*	*	*	*	*	*	*	*	*	*
Lap-Joint Flange		76.62.00	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange		76.88.07	*	*	*	*	*	*	*	*	*	*	*
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													
Ball Valve Red. Bore Flanged		75.72.00	*	*	*	*	*	*	*	*	*	*	*
Check Valve Flanged		75.40.13	*	*	*	*	*	*	*	*	*	*	*
Gate Valve Flanged		75.40.33	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged		75.40.41	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS													
Gasket, Spiral Wound		85.41.46	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.00.00	*	*	*	*	*	*	*	*	*	*	*

Class No.:	CS05	Page:	4	Content:	Reducing Piping Components
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Run	Br.	BROB 76.80.00	RECB 76.33.70	REEB 76.33.71	TERB 76.33.85	TERS 76.37.85
20 × 15			*	*	*	*
25 × 15			*	*	*	*
25 × 20			*	*	*	*
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 Outlet Socket Weld. End
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

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

Class No.:	CS05	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	×	70	*
20	4	5/8	×	75	*
25	4	5/8	×	80	*
40	4	3/4	×	90	*
50	8	5/8	×	90	*
80	8	3/4	×	110	*
100	8	3/4	×	115	*
150	12	3/4	×	125	*
200	12	7/8	×	140	*
250	16	1	×	160	*
300	16	1 1/8	×	170	*

BOLT SET SPECTACLE/SPACER					
DN	No.	Inch	mm	81.38.61	
15	4	1/2	×	75	*
20	4	5/8	×	85	*
25	4	5/8	×	90	*
40	4	3/4	×	100	*
50	8	5/8	×	100	*
80	8	3/4	×	120	*
100	8	3/4	×	130	*
150	12	3/4	×	145	*
200	12	7/8	×	170	*
250	16	1	×	190	*
300	16	1 1/8	×	205	*

BOLT SET FOR ORIFICE FLANGES					
DN	No.	Inch	mm	81.38.61	
15	4	5/8	×	120	*
20	4	5/8	×	120	*
25	4	5/8	×	120	*
40	4	3/4	×	130	*
50	8	5/8	×	150	*
80	8	3/4	×	150	*
100	12	3/4	×	140	*
150	12	3/4	×	140	*
200	12	7/8	×	150	*
250	16	1	×	170	*
300	16	1 1/8	×	190	*

* DRAIN POINT Fig. 2I			
Run	DN 15-25	Br	DN 15
Branch: Table Page 1			
Ball Valve Red. Bore Flanged			
Blind Flange			
Gasket Spiral Wound			
Stud Bolt with Nuts			
Welding Neck Flange			

* DRAIN POINT Fig. 2I			
Run	DN 40-40	Br	DN 20
Branch: Table Page 1			
Ball Valve Red. Bore Flanged			
Blind Flange			
Gasket Spiral Wound			
Stud Bolt with Nuts			
Welding Neck Flange			

* DRAIN POINT Fig. 2I			
Run	DN 50-300	Br	DN 20
Branch: Table Page 1			
Ball Valve Red. Bore Flanged			
Blind Flange			
Gasket Spiral Wound			
Pipe Nipple 50 mm			
Stud Bolt with Nuts			
Welding Neck Flange			

* VENT POINT Fig. II			
Run	DN 15-25	Br	DN 15
Branch: Table Page 1			
Blind Flange			
Gasket Spiral Wound			
Globe Valve Flange Bellows Seal			
Stud Bolt with Nuts			
Welding Neck Flange			

* VENT POINT Fig. II			
Run	DN 40-40	Br	DN 20
Branch: Table Page 1			
Blind Flange			
Gasket Spiral Wound			
Globe Valve Flange Bellows Seal			
Stud Bolt with Nuts			
Welding Neck Flange			

* VENT POINT Fig. II			
Run	DN 50-300	Br	DN 20
Branch: Table Page 1			
Blind Flange			
Gasket Spiral Wound			
Globe Valve Flange Bellows Seal			
Pipe Nipple 50 mm			
Stud Bolt with Nuts			
Welding Neck Flange			

Class No.: CS06	Page: 1	Content: General
Base Material: Stainless Steel AISI 321/347	First Issue: Revision:	
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 0 mm	Sign:	

Temperature °C		0	50	100	150	200	250	300	350	400	450
Pressure Barg.	DN 15-250	49.6	47.9	41.5	37.5	34.4	32.1	30.4	29.4	28.6	28.4
	DN 300-		47.9	47.9	41.5	37.5	34.4	32.1	30.4	29.4	28.6

TABLE OF SCHEDULES

TABLE OF SCHEDULES			BRANCH CONNECTIONS 90 DEGREES											
		Run	BRANCH SIZE											
DN	Schedule	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	D	D	D	A				
50	40S	100	C	C	C	C	D	D	A					
80	40S	80	C	C	C	C	D	A						
100	40S	50	C	C	C	B	A							
150	40S	40	C	B	B	A								
200	20	25	B	B	A									
250	20	20	B	A										
300	20	15	A											

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 2.4 and to allowable internal pressure acc. ANSI B 31.3.
- 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
D	Pipe to pipe
E	Branch outlet reducing butt-weld

Class No.:	CS06	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-F321/347

* REDUCING FITTINGS

BROS	Branch Fitting Outlet Socket-Weld. End	DN	15-40	ASTM	A182-F321/347
BROB	Branch Outlet Red. Butt-Weld.	DN	50-300	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 buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

GHVF	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	15-200	Body: ASTM A351-CF8C, A182-F321 Trim: AISI 321

* MISCELLANEOUS

GKSW	Gasket, Spiral Wound	DN	15-300	AISI 304, Graphite Filled CS Centring-, AISI 403 Iner-R
ORFS	Orifice Flange Set	DN	50-300	ASTM A182-F321/347
STBT	Stud Bolt with Nuts	—		ASTM A453-GR. 660, CL.A.

Class No.:	CS06	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	*	*	*	*	*	*	*	*	*	*	*
* 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		75.40.33	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged		75.40.41	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS													
Gasket, Spiral Wound		85.41.43	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.00.00					*	*	*	*	*	*	*

Class No.:	CS06	Page:	4	Content:	Reducing Piping Components
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Run	Br.	BROB 76.80.00	RECB 76.33.70	REEB 76.33.71	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
BROS	Branch Fitting Outlet Socket Weld. End
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

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

Class No.:	CS06	Page:	5	Content:	Bolting and Assemblies
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BOLT SET FLANGED JOINTS					
DN	No.	Inch	mm	81.38.00	
15	4	1/2	×	70	*
20	4	5/8	×	75	*
25	4	5/8	×	80	*
40	4	3/4	×	90	*
50	8	5/8	×	90	*
80	8	3/4	×	110	*
100	8	3/4	×	115	*
150	12	3/4	×	125	*
200	12	7/8	×	140	*
250	16	1	×	160	*
300	16	1 1/8	×	170	*

BOLT SET SPECTACLE/SPACER					
DN	No.	Inch	mm	81.38.00	
15	4	1/2	×	75	*
20	4	5/8	×	85	*
25	4	5/8	×	90	*
40	4	3/4	×	100	*
50	8	5/8	×	100	*
80	8	3/4	×	120	*
100	8	3/4	×	130	*
150	12	3/4	×	145	*
200	12	7/8	×	170	*
250	16	1	×	190	*
300	16	1 1/8	×	205	*

BOLT SET FOR ORIFICE FLANGES					
DN	No.	Inch	mm	81.38.00	
15	4	5/8	×	120	*
20	4	5/8	×	120	*
25	4	5/8	×	120	*
40	4	3/4	×	130	*
50	8	5/8	×	150	*
80	8	3/4	×	150	*
100	12	3/4	×	140	*
150	12	3/4	×	140	*
200	12	7/8	×	150	*
250	16	1	×	170	*
300	16	1 1/8	×	190	*

* DRAIN POINT Fig. 0I			
Run	DN 15-25	Br	DN 15
Branch: Table Page 1			
Blind Flange			
Gasket RF C.A.F.			
Gate Valve Flanged			
Stud Bolt with Nuts			
Welding Neck Flange			

* DRAIN POINT Fig. 0I			
Run	DN 40-40	Br	DN 20
Branch: Table Page 1			
Blind Flange			
Gasket RF C.A.F.			
Gate Valve Flanged			
Stud Bolt with Nuts			
Welding Neck Flange			

* DRAIN POINT Fig. 0J			
Run	DN 50-300	Br	DN 20
Branch: Table Page 1			
Blind Flange			
Gasket RF C.A.F.			
Gate Valve Flanged			
Pipe Nipple 50 mm			
Stud Bolt with Nuts			
Welding Neck Flange			

* VENT POINT Fig. 1I			
Run	DN 15-25	Br	DN 15
Branch: Table Page 1			
Blind Flange			
Gasket RF C.A.F.			
Globe Valve Flange			
Stud Bolt with Nuts			
Welding Neck Flange			

* VENT POINT Fig. 1I			
Run	DN 40-40	Br	DN 20
Branch: Table Page 1			
Blind Flange			
Gasket RF C.A.F.			
Globe Valve Flange			
Stud Bolt with Nuts			
Welding Neck Flange			

* VENT POINT Fig. 1J			
Run	DN 50-300	Br	DN 20
Branch: Table Page 1			
Blind Flange			
Gasket RF C.A.F.			
Globe Valve Flange			
Pipe Nipple 50 mm			
Stud Bolt with Nuts			
Welding Neck Flange			

Class No.: CS07	Page: 1	Content: General
Base Material: Stainless Steel AISI 321, Stab. HT	First Issue:	Revision:
Rating: PN 50 (Class 300)	Date:	
Corrosion Allowance: 0 mm	Sign:	

Temperature °C		0	50	100	150	200	300	400	450	500	538
Pressure Barg.	DN 15-250	49.6	47.9	41.5	37.5	34.4	30.4	28.6	28.3	27.0	24.4
	DN 300-		47.9	47.9	41.5	37.5	34.4	30.4	28.6	28.3	27.0

TABLE OF SCHEDULES

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

Notes:

- Design limits are acc. flange rating ANSI B16.5 Material Group 2.4 and to allowable internal pressure acc. ANSI B 31.3.
- 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 outlet socket weld
E	Branch outlet reducing butt-weld

Class No.:	CS07	Page:	2	Content:	Material Descriptions
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* PIPE

PIPE	Pipe	DN	15-300	ASTM	A312-TP321 STAB. HT. (Seamless or Welded)
PNPP	Pipe Nipple 50 mm	DN	15-40	ASTM	A312-TP321 STAB. HT. (Seamless)

* 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-Smooth Finish	DN	15-300	ASTM	A182-F321 STAB. HT.

* FITTINGS

CAPB	Cap	Butt-Weld. End	DN	15-300	ASTM	A403-WP-S-321 STAB. HT.
E45B	Elbow 45 Deg.	Butt-Weld. End	DN	15-300	ASTM	A403-WP-S-321 STAB. HT.
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-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	50-300	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 buying description.
- Where both socket weld and butt weld fittings are specified, preference is subject to company approval.

* VALVES

GHVF	Check Valve Flanged	DN	15-300	Body: ASTM A351-CF8C, A182-F321 Trim: AISI 321 + Stellite 6
GAVF	Gate Valve Flanged	DN	15-300	Body: ASTM A351-CF8C, A182-F321 Trim: AISI 321 + Stellite 6
GLVF	Globe Valve Flanged	DN	15-200	Body: ASTM A351-CF8C, A182-F321 Trim: AISI 321 + Stellite 6

* MISCELLANEOUS

GKTI	Gasket, Spiral Wound	DN	15-300	AISI 316L Graphite Filled
ORFS	Orifice Flange Set	DN	50-300	ASTM A182-F321 STAB. HT.
STBT	Stud Bolt with Nuts	—		ASTM A453-GR. 660, CLA.

Class No.:	CS07	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		74.36.00	*	*	*	*	*	*	*	*	*	*	*
* FLANGES													
Blind Flange		76.65.00	*	*	*	*	*	*	*	*	*	*	*
Spectacle Blind Flange		76.88.07	*	*	*	*	*	*	*	*	*	*	*
Spacer Ring Type (ANS Flanges)		76.88.00	*	*	*	*	*	*	*	*	*	*	*
Welding Neck Flange - Smooth Finish		76.65.00	*	*	*	*	*	*	*	*	*	*	*
* FITTINGS													
Cap	Butt-Weld. End	76.33.21	*	*	*	*	*	*	*	*	*	*	*
Elbow 45 Deg.	Butt-Weld. End	76.33.37	*	*	*	*	*	*	*	*	*	*	*
Elbow 90 Deg.	Butt-Weld. End	76.33.39	*	*	*	*	*	*	*	*	*	*	*
Equal Tee	Butt-Weld. End	76.33.83	*	*	*	*	*	*	*	*	*	*	*
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		75.40.33	*	*	*	*	*	*	*	*	*	*	*
Globe Valve Flanged		75.40.41	*	*	*	*	*	*	*	*	*	*	*
* MISCELLANEOUS													
Gasket, RF. C.A.F.		85.31.15/17	*	*	*	*	*	*	*	*	*	*	*
Orifice Flange Set		60.00.00					*	*	*	*	*	*	*

Class No.:	CS07	Page:	4	Content:	Reducing Piping Components
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Run	Br.	BROB 76.80.00	RECB 76.33.70	REEB 76.33.71	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
BROS	Branch Fitting Outlet Socket Weld. End
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

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

Class No.:	CS07	Page:	5	Content:	Bolting and Assemblies
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BOLT SET FLANGED JOINTS					
DN	No.	Inch	mm	81.38.00	
15	4	1/2	×	70	*
20	4	5/8	×	75	*
25	4	5/8	×	80	*
40	4	3/4	×	90	*
50	8	5/8	×	90	*
80	8	3/4	×	110	*
100	8	3/4	×	115	*
150	12	3/4	×	125	*
200	12	7/8	×	140	*
250	16	1	×	160	*
300	16	1 1/8	×	170	*

BOLT SET SPECTACLE/SPACER					
DN	No.	Inch	mm	81.38.00	
15	4	1/2	×	75	*
20	4	5/8	×	85	*
25	4	5/8	×	90	*
40	4	3/4	×	100	*
50	8	5/8	×	100	*
80	8	3/4	×	120	*
100	8	3/4	×	130	*
150	12	3/4	×	145	*
200	12	7/8	×	170	*
250	16	1	×	190	*
300	16	1 1/8	×	205	*

BOLT SET FOR ORIFICE FLANGES					
DN	No.	Inch	mm	81.38.00	
15	4	5/8	×	120	*
20	4	5/8	×	120	*
25	4	5/8	×	120	*
40	4	3/4	×	130	*
50	8	5/8	×	150	*
80	8	3/4	×	150	*
100	12	3/4	×	140	*
150	12	3/4	×	140	*
200	12	7/8	×	150	*
250	16	1	×	170	*
300	16	1 1/8	×	190	*

* DRAIN POINT Fig. 0I			
Run	DN 15-25	Br	DN 15
No.			
Branch: Table Page 1			
Blind Flange			
Gasket Spiral Wound			
Gate Valve Flanged			
Stud Bolt with Nuts			
Welding Neck Flange			

* DRAIN POINT Fig. 0I			
Run	DN 40-40	Br	DN 20
No.			
Branch: Table Page 1			
Blind Flange			
Gasket Spiral Wound			
Gate Valve Flanged			
Stud Bolt with Nuts			
Welding Neck Flange			

* DRAIN POINT Fig. 0J			
Run	DN 50-300	Br	DN 20
No.			
Branch: Table Page 1			
Blind Flange			
Gasket Spiral Wound			
Gate Valve Flanged			
Pipe Nipple 50 mm			
Stud Bolt with Nuts			
Welding Neck Flange			

* VENT POINT Fig. 1I			
Run	DN 15-25	Br	DN 15
No.			
Branch: Table Page 1			
Blind Flange			
Gasket Spiral Wound			
Globe Valve Flange			
Stud Bolt with Nuts			
Welding Neck Flange			

* VENT POINT Fig. 1I			
Run	DN 40-40	Br	DN 20
No.			
Branch: Table Page 1			
Blind Flange			
Gasket Spiral Wound			
Globe Valve Flange			
Stud Bolt with Nuts			
Welding Neck Flange			

* VENT POINT Fig. 1J			
Run	DN 50-300	Br	DN 20
No.			
Branch: Table Page 1			
Blind Flange			
Gasket Spiral Wound			
Globe Valve Flange			
Pipe Nipple 50 mm			
Stud Bolt with Nuts			
Welding Neck Flange			