

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.20		DOC:	2F11-15-190 - Sh. 3			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
Piping class 109							
Client Reference			Branch Table I109				
Service HOT AIR - TEMPORARY LINE FOR SULPHUR FURNACE DRYING			Corrosion Allow 1.27 mm				
			Welding Spec. SB-ATI-SP006/0 SB-ATI-SP007/0				
Base Material 11 CARBON STEEL			Applicable through				
Rating P006 PN 6			Min Max				
Finish SD4 EN1092-1 B1-Ra			Temperature °C 0 0				
Heat Treatment			Pressure Bar(g) 0 0				
Control level			Chgd Mod				
Note FOR SPECIAL PARTS, GENERAL NOTES, REMARKS AND REVISIONS SEE ON THE LAST SHEET							

P	Standard of design	Mod	Size	Thk.	Mod
I	3103	ASME B31.3/1992	8	2,24	
Temp. °C Press. Bar(g)			10	2,31	
480,0 0,10			15	2,77	
			20	2,87	
			25	3,38	
			32	3,56	
			40	3,68	
			50	3,91	
			65	3,18	
			80	3,18	
			100	3,18	
			125	3,96	
			150	3,96	
			200	3,96	
			250	3,96	
			300	4,78	
			350	5,0	
			400	5,0	

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DESMET - Ballestra	SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
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Piping class 109

450	5,0
500	5,0
550	6,0
600	6,0
650	6,0
700	6,0
750	6,0
800	6,0
850	6,0
900	6,0
950	6,0
1000	6,0
1050	6,0
1100	6,0
1200	6,0
1300	6,0
1400	6,0
1500	6,0

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.22		DOC:	2F11-15-190 - Sh. 3			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 109

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Pipe	8	50	ASME B36.10	PL	sch.40		Seamless	API 5L Gr.B						PIPE		
Pipe	65	300	ASME B36.10	PL			E.R.W.	API 5L Gr.B						PIPE		
Pipe	350	1500	SB-ATI-PT003/0	PL			Welded	Fe 410-1 KW - UNI 5869						PIPE		
Valve Butterfly	80	350	SB-ATI-VB001/0	WAFER	PN 6	EN1092-1 B1- Ra	Forged	ASTM A 105		B 52				VBY		
Valve Butterfly	400	1500	SB-ATI-VB005/0	FLG	*	SB-ATI-PF001(125÷25 0AARH)	Cast	ASTM A 216 Gr. WCB		B 61				VBY		
Valve Plug	8	25	SB-ATI-VM001/0	THRD-F NPT	PN 16		Forged	ASTM A 182 Gr. F316		M 53		SEE REMARK D		VPLG		
Blind & Spacer	400	1500	SB-ATI-PA001/0	WAFER	*	FF (125÷250 AARH)	From Plate	Fe 410-1 KW - UNI 5869						BSPA		
Spectacle Blind	20	350	SB-ATI-PD010/0	WAFER	PN 6	FF (125÷250 AARH)	From Plate	Fe 410-1 KW - UNI 5869						BSPE		
Flange Blind	10	350	EN 1092-1 Type 05		PN 6	EN1092-1 B1- Ra	Forged	ASTM A 105						FLB		
Flange Slip-On	10	350	EN 1092-1 Type 01		PN 6	EN1092-1 B1- Ra	Forged	ASTM A 105				SEE REMARK A		FLS		
Flange Slip-On	400	1500	SB-ATI-PF001/0		*	SB-ATI-PF001(125÷25 0AARH)	From Plate	Fe 510-C UNI 7070						FLS		
45° Elbow	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		45E		
45° Elbow	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						45E		
45° Elbow Long Radius	20	50	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						45ELR		
45° Elbow Long Radius	65	300	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						45ELR		
45° Miter	350	1500	SB-ATI-PC003/0	BE			Welded	Fe 410-1 KW - UNI 5869	R=1.5 D					45M		
90° Elbow	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						90E		
90° Elbow	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		90E		
90° Elbow Long Radius	20	50	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						90ELR		
90° Elbow Long Radius	65	300	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						90ELR		
90° Miter	350	1500	SB-ATI-PC003/0	BE			Welded	Fe 410-1 KW - UNI 5869	R=1.5 D					90M		
Reducer Concentric	20	50	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						REDC		
Reducer Concentric	65	300	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						REDC		
Reducer Concentric	350	1500	SB-ATI-PR001/0	BE			Welded	Fe 410-1 KW - UNI 5869						REDC		
Reducer Eccentric	20	50	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						REDE		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.22		DOC:	2F11-15-190 - Sh. 3			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 109

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Reducer Eccentric	65	300	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						REDE		
Reducer Eccentric	350	1500	SB-ATI-PR001/0	BE			Welded	Fe 410-1 KW - UNI 5869						REDE		
Tee Straight	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105				SEE REMARK C		TEE		
Tee Straight	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		TEE		
Tee Reducing	15	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105				SEE REMARK C		TEER		
Tee Reducing	15	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		TEER		
Reducing Insert M/F	8	50	SB-ATI-PR008/0	THRD-M NPT x THRD-F	3000#		Forged	ASTM A 105				SEE REMARK B		BUS		
Reducing Insert M/F	8	15	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 13				BUS		
Reducing Insert M/F	8	15	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 11				BUS		
Reducing Insert M/F	8	15	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 12				BUS		
Cap	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CAP		
Cap	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		CAP		
Cap	20	350	ASME B16.9	BE			Seamless	ASTM A 234 Gr. WPB				SEE REMARK A		CAP		
Coupling	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		CPL		
Coupling	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPL		
Coupling Half	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPLH		
Coupling Half	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		CPLH		
Coupling Reducing	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPLR		
Coupling Reducing	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		CPLR		
Cross Straight	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CRO		
Cross Straight	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		CRO		
Plug Hex.	8	50	SB-ATI-PR008/0	THRD-M NPT	3000#		Forged	ASTM A 105				SEE REMARK B		PLG		
Union	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						UN		
Union	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		UN		
Gasket	10	350	SB-ATI-PV009/5		PN 6	EN1092-1 B1- Ra	—	B2D	FLAT					GAS		
Gasket	400	1500	SB-ATI-PV009/5		*	SB-ATI-PF001(125÷25 0AARH)	—	A9D	FLAT-RING					GAS		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.22		DOC:	2F11-15-190 - Sh. 3			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 109

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Object	Standard of design			Material			Constructive characteristic			Tag		Default		Mod		
Stud Bolt + 2 Nuts			SB-ATI-PV008B/0 ASME B18.2.1 UNC/2.2 Tab.9		ASTM A 193 B7 / A 194 Gr.2H						x					

DESMET - Ballestra		PIPING CLASS BRANCH	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.25		DOC:	2F11-15-190			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

[illegible]

DESMET - Ballestra		PIPING CLASS BRANCH	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.25		DOC:	2F11-15-190			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

[illegible]

Run Size

Sizes translation Q=8, T8=10, M=15, 3Q=20, 1=25, 1Q=32, 1M=40, 2=50, 2M=65, 3=80, 4=100, 5=125, 6=150, 8=200, 10=250, 12=300, 14=350, 16=400, 18=450, 20=500, 22=550, 24=600, 26=650
28=700, 30=750, 32=800, 34=850, 36=900, 38=950, 40=1000, 42=1050, 44=1100, 48=1200, 52=1300, 56=1400, 60=1500

DESMET - Ballestra		PIPING CLASS NOTE	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.26		DOC:	2F11-15-190 - Sh. 3			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class: 109

Note:

SPECIAL PARTS:	
1) INSULATION SPECIFICATION: SB-ATI-SP030/0	
2) EXPANSION JOINTS: SB-ATI-PV004/0 OR AS AGREED DURING DESIGN DEVELOPMENT	
GENERAL NOTES:	
1) FOR TYPICAL INSTRUMENTS CONNECTIONS SEE SB-ATI-PV001/0	
2) FOR TEST TYPE SEE SB-ATI-SP009/0 SB-ATI-SP010/0	
REMARKS:	
A) FOR DN≥ 400 USE BLIND DISK WITH THICKNESS: 6mm FOR DN=350-700, 8mm FOR DN=800-900, 10 mm FOR DN=1000-1200, 12 mm FOR DN=1300-1400, 14 mm FOR DN=1500 (MATERIAL: STEEL PLATE Fe 410-1 KW - UNI 5869)	
B) USE ONLY FOR INSTRUMENTS, VENTS, DRAINS AND SAMPLING HATCHES	
C) FOR DN≥ 20 USE BRANCH CONNECTIONS PIPE-TO-PIPE	
D) USE FOR PRESSURE TAPS "P" AND SAMPLING HATCHES ONLY	
REVISIONS:	
Rev. 0 - Date 15/03/2012 - ISSUED	

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.29		DOC:	2F11-15-190 - Sh. 4			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
Piping class 124							
Client Reference Service SEE PIPING CLASS NOTE			Branch Table I124 Corrosion Allow 0.0 mm Welding Spec. SB-ATI-SP006/0 SB-ATI-SP007/0				
Base Material 11 CARBON STEEL Rating P006 PN 6 Finish SD4 EN1092-1 B1-Ra Heat Treatment Control level			Applicable through Temperature °C Pressure Bar(g) Chgd Mod				
Note FOR SERVICE, SPECIAL PARTS, GENERAL NOTES, REMARKS AND REVISIONS SEE ON THE LAST SHEET							

P	Standard of design	Mod	Size	Thk.	Mod
I	3103	ASME B31.3/1992	8	2,24	
Temp. °C			10	2,31	
			15	2,77	
Press. Bar(g)			20	2,87	
			25	3,38	
			32	3,56	
			40	3,68	
			50	3,91	
			65	3,18	
			80	3,18	
			100	3,18	
			125	3,96	
			150	3,96	
			200	3,0	
			250	3,0	
			300	3,0	
			350	3,0	
			400	3,0	

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.29		DOC:	2F11-15-190 - Sh. 4			

DESMET - Ballestra	SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
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Piping class 124

450	3,0
500	3,0
550	3,0
600	3,0
700	3,0
750	3,0
800	4,0
850	4,0
900	4,0
950	4,0
1000	4,0
1050	4,0
1100	4,0
1200	4,0
1300	5,0
1400	5,0
1500	5,0

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.32		DOC:	2F11-15-190 - Sh. 4			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 124

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Pipe	8	50	ASME B36.10	PL		sch.40	Seamless	API 5L Gr.B				SEE REMARK H		PIPE		
Pipe	65	150	ASME B36.10	PL			E.R.W.	API 5L Gr.B				SEE REMARK H		PIPE		
Pipe	200	1500	SB-ATI-PT002/0	PL			Welded	Fe 360 B - UNI 7070				SEE REMARK H		PIPE		
Valve Ball Full Port	8	50	SB-ATI-VS014/0	THRD-F NPT	200 LB		Forged	BRASS NICKEL PLATED		S 87				VBF		
Valve Butterfly	40	400	SB-ATI-VB008/0	WAFER	*	SB-ATI-PF001(125÷250AARH)	Cast	ALUMINIUM		B 68		SEE REMARK G		VBY		
Valve Butterfly	80	350	SB-ATI-VB004/0	FLG	*	SB-ATI-PF001(125÷250AARH)	Forged or cast	ASTM A 105 or ASTM A 216 WCB		B 60				VBY		
Valve Butterfly	400	1500	SB-ATI-VB005/0	FLG	*	SB-ATI-PF001(125÷250AARH)	Cast	ASTM A 216 Gr. WCB		B 61				VBY		
Valve Butterfly With Gasket	65	400	SB-ATI-VB013/0	WAFER	PN 6	UNI 2223 (125÷250AARH)	Cast	DUCTILE IRON		B 72		SEE REMARK D		VBY		
Valve Plug	8	20	SB-ATI-VM001/0	THRD-F NPT	PN 16		Forged	ASTM A 182 Gr. F316		M 53		SEE REMARK E		VPLG		
Valve Slide	150	1200	SB-ATI-VV001/0					CARBON STEEL		SV 10		SEE REMARK I		VSLI		
Blind & Spacer	350	1500	SB-ATI-PD002/0	WAFER	*	FF (125÷250AARH)	From Plate	Fe 360 B - UNI 7070						BSPA		
Spectacle Blind	40	300	SB-ATI-PD002/0	WAFER	*	FF (125÷250AARH)	From Plate	Fe 360 B - UNI 7070						BSPE		
Flange Blind	40	1500	SB-ATI-PF008/0		*	SB-ATI-PF008(125÷250AARH)	From Plate	Fe 360 B - UNI 7070						FLB		
Flange Slip-On	40	150	EN 1092-1 Type 01		PN 6	EN1092-1 B1- Ra	Forged	ASTM A 105				SEE REMARK C		FLS		
Flange Slip-On	40	1500	SB-ATI-PF001/0		*	SB-ATI-PF001(125÷250AARH)	From Plate	Fe 360 B - UNI 7070						FLS		
Flange Slip-On	200	400	EN 1092-1 Type 01		PN 2.5	EN1092-1 B1- Ra	Forged	ASTM A 105				SEE REMARK C		FLS		
45° Elbow	8	40	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		45E		
45° Elbow	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						45E		
45° Elbow Long Radius	20	50	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB				SEE REMARK A		45ELR		
45° Elbow Long Radius	65	150	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB				SEE REMARK A		45ELR		
45° Miter	200	1500	SB-ATI-PC003/0	BE			Welded	Fe 360 B - UNI 7070	R=1.5 D			SEE REMARK A		45M		
90° Elbow	8	40	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		90E		
90° Elbow	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						90E		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.32		DOC:	2F11-15-190 - Sh. 4			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 124

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
90° Elbow Long Radius	20	50	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB				SEE REMARK A		90ELR		
90° Elbow Long Radius	65	150	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB				SEE REMARK A		90ELR		
90° Miter	200	1500	SB-ATI-PC003/0	BE			Welded	Fe 360 B - UNI 7070	R=1.5 D			SEE REMARK A		90M		
Reducer Concentric	20	50	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						REDC		
Reducer Concentric	65	150	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						REDC		
Reducer Concentric	200	1500	SB-ATI-PR005/0	BE			Welded	Fe 360 B - UNI 7070						REDC		
Reducer Eccentric	20	50	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						REDE		
Reducer Eccentric	65	150	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						REDE		
Reducer Eccentric	200	1500	SB-ATI-PR005/0	BE			Welded	Fe 360 B - UNI 7070						REDE		
Tee Straight	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105				SEE REMARK F		TEE		
Tee Straight	8	40	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		TEE		
Tee Reducing	15	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105				SEE REMARK F		TEER		
Tee Reducing	15	40	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		TEER		
Reducing Insert M/F	8	40	SB-ATI-PR008/0	THRD-M NPT x THRD-F	3000#		Forged	ASTM A 105				SEE REMARK B		BUS		
Reducing Insert M/F	15	15	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 12				BUS		
Reducing Insert M/F	15	15	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 13				BUS		
Reducing Insert M/F	15	15	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 11				BUS		
Cap	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CAP		
Cap	8	40	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		CAP		
Coupling	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPL		
Coupling	8	40	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		CPL		
Coupling Half	8	40	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		CPLH		
Coupling Half	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPLH		
Coupling Reducing	8	40	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		CPLR		
Coupling Reducing	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPLR		
Cross Straight	8	40	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		CRO		
Cross Straight	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CRO		
Plug Hex.	8	40	SB-ATI-PR008/0	THRD-M NPT	3000#		Forged	ASTM A 105				SEE REMARK B		PLG		
Union	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						UN		
Union	8	40	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK B		UN		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.32		DOC:	2F11-15-190 - Sh. 4			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 124

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Gasket	40	400	SB-ATI-PV009/5		PN 6	EN1092-1 B1- Ra	_	B2C	FLAT			SEE REMARK C		GAS		
Gasket	40	1500	SB-ATI-PV009/5		*	SB-ATI-PF001(125÷25 0AARH)	_	A9C	FLAT-RING					GAS		
Gasket	200	400	SB-ATI-PV009/5		PN 2.5	EN1092-1 B1- Ra	_	B2C	FLAT			SEE REMARK C		GAS		

Object	Standard of design	Material	Constructive characteristic	Tag	Default	Mod
Machine Bolt + 1 Nut	SB-ATI-PV008A/0 - UNI 5727 + UNI 5592	4.6 UNI 3740 + 4A UNI 3740			x	

DESMET - Ballestra		PIPING CLASS BRANCH	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.35		DOC:	2F11-15-190			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

60 56 52 48 44 42 40 38 36 34 32 30 28 24 22 20 18 16 14 12 10 8 6 5 4 3 2M 2 1M 1Q 1 3Q M T8 Q

Run Size

Sizes translation Q=8, T8=10, M=15, 3Q=20, 1=25, 1Q=32, 1M=40, 2=50, 2M=65, 3=80, 4=100, 5=125, 6=150, 8=200, 10=250, 12=300, 14=350, 16=400, 18=450, 20=500, 22=550, 24=600, 28=700
30=750, 32=800, 34=850, 36=900, 38=950, 40=1000, 42=1050, 44=1100, 48=1200, 52=1300, 56=1400, 60=1500

DESMET - Ballestra		PIPING CLASS NOTE	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.36		DOC:	2F11-15-190 - Sh. 4			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class: 124

Note:	SERVICE: DEDUSTING AIR - DUSTY AIR (from SPRAY-DRY TOWER) - SUCTION AND DISCHARGE OF FANS (SABIZ PLANT) POWDERS DOWNFALL (DETERGENT, SODIUM PERBORATE/CARBONATE, TPP, SODIUM SULPHATE/TOLUENSULPHATE)
	<p>SPECIAL PARTS:</p> <p>1) INSULATION SPECIFICATION: SB-ATI-SP030/0</p> <p>2) FOR DIVERTING AND/OR SLEEVE VALVES (UNDER SILOS) SEE BALLESTRA'S STANDARD</p> <p>GENERAL NOTES:</p> <p>1) FOR TYPICAL INSTRUMENTS CONNECTIONS SEE SB-ATI-PV001/0</p> <p>2) FOR TEST TYPE SEE SB-ATI-SP009/0 SB-ATI-SP010/0</p> <p>3) FOR DEDUSTING SYSTEM USE "Y" CONNECTIONS (45 DEG OR LESS)</p> <p>REMARKS:</p> <p>A) FOR POWDER DOWNFALL DON'T USE ELBOWS BUT SLOPE PIPES (38 DEG OR LESS)</p> <p>B) USE ONLY FOR INSTRUMENTS, VENTS AND DRAINS</p> <p>C) USE FOR VALVES "B 72" AND/OR "DOUBLE FLAP DISCHARGERS"</p> <p>D) USE FOR "AIR FILTERS" BOTTOM DISCHARGE</p> <p>E) USE FOR PRESSURE TAPS "P" ONLY</p> <p>F) FOR $DN \geq 20$ USE BRANCH CONNECTIONS PIPE-TO-PIPE</p> <p>G) USE FOR DEDUSTING SYSTEM</p> <p>H) FOR DEDUSTING AIR AND DUSTY AIR PROVIDE ASSEMBLY/DISASSEMBLY FLANGING ON HORIZONTAL LINES (MAX LENGTH 5,8m)</p> <p>I) USE FOR BOTTOM DISCHARGE CUT OFF ON THE POWDER SILOS AND ON THE POWDER DOWNFALL PIPELINES</p> <p>REVISIONS:</p> <p>Rev. 0 - Date 15/03/2012 - ISSUED</p>

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.40		DOC:	2F11-15-190 - Sh. 5			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
Piping class 129							
Client Reference			Branch Table				
Service POWDERS PNEUMATIC TRANSP. AFTER ROTATING VALVE (SABIZ PLANT) FINE POWDERS RECOVERY AFTER EJECTOR (SABIZ PLANT)			Corrosion Allow 0.5 mm Welding Spec. SB-ATI-SP006/0 SB-ATI-SP007/0				
Base Material 11 CARBON STEEL			Applicable through				
Rating * *			Min Max				
Finish PF6 SB-ATI-PF002(125÷250AARH)			Temperature °C 0 0				
Heat Treatment			Pressure Bar(g) 0 0				
Control level			Chgd Mod				
Note FOR SPECIAL PARTS, GENERAL NOTES, REMARKS AND REVISIONS SEE ON THE LAST SHEET							

Temp. °C	Press. Bar(g)	Mod	Size	Thk.	Mod
100,0	1,00		50	3,18	
			65	3,18	
			80	3,18	
			100	3,18	
			125	3,96	
			150	3,96	
			200	3,96	
			250	3,96	
			300	4,78	

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.42		DOC:	2F11-15-190 - Sh. 5			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 129

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Pipe	50	300	ASME B36.10	BE			E.R.W.	API 5L Gr.B				SEE REMARK A		PIPE		
Flange Blind	50	300	SB-ATI-PF004/0		*	SB-ATI-PF004(125÷25 0AARH)	Forged	Fe 360 B - UNI 7070						FLB		
Flange Slip-On	50	300	SB-ATI-PF002/0		*	SB-ATI-PF002(125÷25 0AARH)	Forged	Fe 360 B - UNI 7070						FLS		
Elbow a=5°	50	150	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=1500mm					EL05		
Elbow a=5°	50	300	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=2000mm					EL05		
Elbow a=5°	200	300	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=2500mm					EL05		
Elbow a=10°	50	300	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=2000mm					EL10		
Elbow a=10°	50	150	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=1500mm					EL10		
Elbow a=10°	200	300	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=2500mm					EL10		
Elbow a=15°	50	150	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=1500mm					EL15		
Elbow a=15°	50	300	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=2000mm					EL15		
Elbow a=15°	200	300	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=2500mm					EL15		
Elbow a=30°	50	300	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=2000mm					EL30		
Elbow a=30°	50	150	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=1500mm					EL30		
Elbow a=30°	200	300	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=2500mm					EL30		
Elbow a=45°	50	150	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=1500mm					EL45		
Elbow a=45°	50	300	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=2000mm					EL45		
Elbow a=45°	200	300	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=2500mm					EL45		
Elbow a=60°	50	150	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=2000mm					EL60		
Elbow a=60°	50	150	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=1500mm					EL60		
Elbow a=90°	50	150	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=2000mm					EL90		
Elbow a=90°	50	150	SB-ATI-PC005/0	BW			Seamless	API 5L Gr.B	R=1500mm					EL90		
Reducer Concentric	50	300	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						REDC		
Reducer Eccentric	50	300	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						REDE		
Gasket	50	300	SB-ATI-PV009/5		*	SB-ATI-PF002(125÷25 0AARH)	–	B18C						GAS		
Nozzle Standard	50	300	MANUFACTURE STD	FLG	*	SB-ATI-PF004(125÷25 0AARH)								NZS		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.42		DOC:	2F11-15-190 - Sh. 5			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 129

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Nozzle Standard	50	300	MANUFACTURE STD	FLG	*	SB-ATI-PF002(125÷250AARH)								NZS		

Object	Standard of design	Material	Constructive characteristic	Tag	Default	Mod
Machine Bolt + 1 Nut	SB-ATI-PV008A/0 - UNI 5727 + UNI 5592	4.6 UNI 3740 + 4A UNI 3740			x	

DESMET - Ballestra		PIPING CLASS NOTE	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 16.08.43		DOC:	2F11-15-190 - Sh. 5			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class: 129

Note:

SPECA PARTS:

1) FLEXIBLE HOSES: SB-ATI-PV002/0

GENERAL NOTES:

1) INTERSECTIONS: USE PIPE -TO-PIPE ("Y" CONNECTIONS 45° OR LESS)

2) FOR TEST TYPE SEE SB-ATI-SP009/0 SB-ATI-SP010/0

REMARKS:

A) PROVIDE ASSEMBLY/DISASSEMBLY FLANGING OR HORIZONTAL LINES (MAX LENGTH 5,8m)

MOREOVER ALL INTERNAL WELDS BETWEEN PIPE AND FLANGES MUST BE BEVELLED AVOID SHARP CORNERS

REVISIONS:

Rev. 0 - Date 15/03/2012 - ISSUED

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.39.53		DOC:	2F11-15-190 - Sh. 6			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
Piping class 202							
Client Reference Service INSTRUMENT AND UTILITIES AIR - DRINKING WATER			Branch Table I202 Corrosion Allow 1.27 mm Welding Spec.				
Base Material 11b CARBON STEEL & GALV. C.S. Rating 0150 150 LB Finish RF1 RF (125÷250 AARH) Heat Treatment Control level			Applicable through Min Max Temperature °C 0 0 Pressure Bar(g) 0 0 Chgd Mod				
Note FOR SPECIAL PARTS, GENERAL NOTES, REMARKS AND REVISIONS SEE ON THE LAST SHEET							

P	Standard of design	Mod	Size	Thk.	Mod
I	3103	ASME B31.3/1992	3/8	2,31	
	Temp. °C	Press. Bar(g)	Mod	1/2	2,77
	120,0	10,00		3/4	2,87
				1	3,38
				1+1/4	3,56
				1+1/2	3,68
				2	3,91
				2+1/2	5,16
				3	5,49
				4	6,02

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.39.55		DOC:	2F11-15-190 - Sh. 6			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 202

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Pipe	3/8	4	ASME B36.10+Coupling ASME 3000#	THRD-M NPT	sch.40		Seamless	API 5L GR. B Galvanized						PIPE		
Air Trap	3/4	3/4	SB-ATI-VT012/0	THRD-F NPT	PN 25		Cast	DUCTILE IRON GGG40	Standard Manufacturer	T 72				ATRP		
Valve Ball Full Port	3/8	2	SB-ATI-VS014/0	THRD-F NPT	200 LB		Forged	BRASS NICKEL PLATED		S 87		SEE REMARK A		VBF		
Valve Butterfly With Gasket	2+1/2	4	SB-ATI-VB016/0	WAFER	150 LB	RF (125÷250 AARH)	Cast	DUCTILE IRON		B 74		SEE REMARK C		VBY		
Valve Check	3/8	4	SB-ATI-VR072/0	THRD-F NPT	200 LB		Forged	BRONZE		R 126				VCH		
Valve Globe	3/8	2	SB-ATI-VD001/0	THRD-F NPT	200 LB		Forged	BRONZE		D 51				VGLO		
Valve Plug	3/8	1	SB-ATI-VM003/0	THRD-F NPT	PN 10		Cast	DUCTILE IRON		M 58		SEE REMARK B		VPLG		
Strainer Y-Type	3/8	2	SB-ATI-VF018/0	THRD-F NPT	200 LB		Forged	BRONZE		F 70				STY		
Drip Ring	1/2	4	SB-ATI-PA006/0	WAFER	150 LB	FF (125÷250 AARH)	Forged	ASTM A 105 Galvanized						BRIN		
Spectacle Blind	1/2	4	SB-ATI-PD004/0	WAFER	150 LB	RF (125÷250 AARH)	Forged	ASTM A 105 Galvanized						BSPE		
Flange	1/2	4	ASME B16.5	THRD-F NPT	150 LB	RF (125÷250 AARH)	Forged	ASTM A 105 Galvanized						FL		
Flange Blind	1/2	4	ASME B16.5		150 LB	RF (125÷250 AARH)	Forged	ASTM A 105 Galvanized						FLB		
45° Elbow	3/8	4	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105 Galvanized						45E		
90° Elbow	3/8	4	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105 Galvanized						90E		
Tee Straight	3/8	4	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105 Galvanized						TEE		
Tee Reducing	3/4	4	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105 Galvanized						TEER		
Reducing Insert M/F	3/8	4	SB-ATI-PR008/0	THRD-M NPT x THRD-F	3000#		Forged	ASTM A 105 Galvanized						BUS		
Cap	3/8	4	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105 Galvanized						CAP		
Coupling	3/8	4	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105 Galvanized						CPL		
Coupling Half	3/8	4	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105 Galvanized						CPLH		
Coupling Reducing	1/2	4	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105 Galvanized						CPLR		
Cross Straight	3/8	4	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105 Galvanized						CRO		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.39.55		DOC:	2F11-15-190 - Sh. 6			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 202

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Plug Hex.	3/8	4	SB-ATI-PR008/0	THRD-M NPT	3000#		Forged	ASTM A 105 Galvanized						PLG		
Union	3/8	4	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105 Galvanized						UN		
Gasket	1/2	4	SB-ATI-PV009/5		150 LB	RF (125÷250 AARH)	—	B5C	FLAT					GAS		
Object			Standard of design			Material			Constructive characteristic	Tag			Default	Mod		
Stud Bolt + 2 Nuts			SB-ATI-PV008B/0 ASME B18.2.1 UNC/2.2 Tab.9			ASTM A 193 B7 / A 194 2H Galvanized							x			

DESMET - Ballestra		PIPING CLASS BRANCH	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.39.58		DOC:	2F11-15-190			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 202

Branch Table I202

Chgd

[illegible]

Run Size

Sizes translation T8=3/8, M=1/2, 3Q=3/4, 1=1, 1Q=1+1/4, 1M=1+1/2, 2=2, 2M=2+1/2, 3=3, 4=4

DESMET - Ballestra		PIPING CLASS NOTE	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.39.59		DOC:	2F11-15-190 - Sh. 6			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class: 202

Note:	SPECIAL PARTS:
	1) FLEXIBLE HOSES: SB-ATI-PV002/0
	2) INSULATION SPECIFICATION: SB-ATI-SP030/0
	GENERAL NOTES:
	1) FOR TYPICAL INSTRUMENTS CONNECTIONS SEE SB-ATI-PV001/0
	2) FOR TEST TYPE SEE SB-ATI-SP009/0
	REMARKS:
	A) USE AS BLOCK VALVE AND FOR VENTS, DRAINS & PRESSURE TAPS "P"
	B) USE FOR AIR CANNONS (BIG BLASTER)
	C) USE AS BLOCK VALVE AND CONTROL VALVE
	REVISIONS:
	Rev. 0 - Date 15/03/2012 - ISSUED

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.02		DOC:	2F11-15-190 - Sh. 7			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
Piping class 203							
Client Reference			Branch Table I203				
Service WATER (PROCESS-TREATED-COOLING-HOT-CHILLED-FIREFIGHTING) ANTIFREEZING SOLUTION			Corrosion Allow 1.27 mm				
			Welding Spec. SB-ATI-SP006/0 SB-ATI-SP007/0				
Base Material 11 CARBON STEEL			Applicable through				
Rating 0150 150 LB			Min				
Finish RF1 RF (125÷250 AARH)			Max				
Heat Treatment			Temperature °C				
Control level			Pressure Bar(g)				
			0				
			0				
			Chgd Mod				
Note FOR SPECIAL PARTS, GENERAL NOTES, REMARKS AND REVISIONS SEE ON THE LAST SHEET							

P	Standard of design	Mod	Size	Thk.	Mod
I	3103 ASME B31.3/1992		1/4	2,24	
Temp. °C Press. Bar(g)			3/8	2,31	
120,0 10,00			1/2	2,77	
			3/4	2,87	
			1	3,38	
			1+1/4	3,56	
			1+1/2	3,68	
			2	3,91	
			2+1/2	3,18	
			3	3,18	
			4	3,18	
			5	3,96	
			6	3,96	
			8	3,96	
			10	3,96	
			12	4,78	
			14	6,35	
			16	6,35	

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.03		DOC:	2F11-15-190 - Sh. 7			

DESMET - Ballestra	SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
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Piping class 203

18	6,35
20	6,35
24	6,35

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.05		DOC:	2F11-15-190 - Sh. 7			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 203

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Pipe	1/4	2	ASME B36.10	PL	sch.40		Seamless	API 5L Gr.B						PIPE		
Pipe	2+1/2	24	ASME B36.10	PL			E.R.W.	API 5L Gr.B						PIPE		
Pipe	4	24	ASME B36.10	PL			E.R.W.	API 5L Gr.B (Bitumen Coated)				SEE REMARK A		PIPE		
Sight Glass	1/2	12	SB-ATI-VI015/0	FLG	150 LB	RF (125÷250 AARH)	Forged or cast	ASTM A 105 or ASTM A 216 WCB		FG 61				SGH		
Sight Glass	1/2	12	SB-ATI-VI013/0	FLG	150 LB	RF (125÷250 AARH)	Forged or cast	ASTM A 105 or ASTM A 216 WCB		FG 60				SGH		
Valve Ball Full Port	1/4	2	SB-ATI-VS014/0	THRD-F NPT	200 LB		Forged	BRASS NICKEL PLATED		S 87		SEE REMARK G		VBF		
Valve Butterfly With Gasket	2+1/2	20	SB-ATI-VB016/0	WAFER	150 LB	RF (125÷250 AARH)	Cast	DUCTILE IRON		B 74		SEE REMARK F		VBY		
Valve Check	1/2	2	SB-ATI-VR072/0	THRD-F NPT	200 LB		Forged	BRONZE		R 126				VCH		
Valve Check	2+1/2	20	SB-ATI-VR071/0	WAFER	150 LB	RF (125÷250 AARH)	Cast	ASTM A 36 CADMIUM PLATED		R 124				VCH		
Valve Foot	1+1/2	20	SB-ATI-VR025/0	FLG	150 LB	RF (125÷250 AARH)	Cast	DUCTILE IRON		R 89				VFOT		
Valve Globe	1/4	2	SB-ATI-VD001/0	THRD-F NPT	200 LB		Forged	BRONZE		D 51				VGLO		
Valve Plug	1/4	1	SB-ATI-VM001/0	THRD-F NPT	PN 16		Forged	ASTM A 182 Gr. F316		M 53		SEE REMARK E		VPLG		
Strainer Temporary	1	12	SB-ATI-PV006/0	WAFER	150 LB	Flat Face Smooth	From Plate	ASTM A 570 Gr. 33		FT 15				STTMP		
Strainer Y-Type	3/8	2	SB-ATI-VF018/0	THRD-F NPT	200 LB		Forged	BRONZE		F 70				STY		
Strainer Y-Type	3	12	SB-ATI-VF021/0	FLG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 216 Gr. WCB		F 71				STY		
Drip Ring	1/2	24	SB-ATI-PA006/0	WAFER	150 LB	FF (125÷250 AARH)	Forged	ASTM A 105						BRIN		
Blind & Spacer	18	24	SB-ATI-PD006/0	WAFER	150 LB	RF (125÷250 AARH)	From Plate	ASTM A 570 Gr. 33						BSPA		
Spectacle Blind	1/2	16	SB-ATI-PD006/0	WAFER	150 LB	RF (125÷250 AARH)	From Plate	ASTM A 570 Gr. 33						BSPE		
Flange Blind	1/2	24	ASME B16.5		150 LB	RF (125÷250 AARH)	Forged	ASTM A 105						FLB		
Flange Slip-On	1/2	24	ASME B16.5		150 LB	FF (125÷250 AARH)	Forged	ASTM A 105				SEE REMARK B		FLS		
Flange Slip-On	1/2	24	ASME B16.5		150 LB	RF (125÷250 AARH)	Forged	ASTM A 105						FLS		
45° Elbow	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						45E		
45° Elbow	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK C		45E		
45° Elbow Long Radius	3/4	2	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						45ELR		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.05		DOC:	2F11-15-190 - Sh. 7			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 203

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
45° Elbow Long Radius	2+1/2	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						45ELR		
45° Elbow Long Radius	4	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB (Bitumen Coated)				SEE REMARK A		45ELR		
90° Elbow	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						90E		
90° Elbow	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK C		90E		
90° Elbow Long Radius	3/4	2	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						90ELR		
90° Elbow Long Radius	2+1/2	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						90ELR		
90° Elbow Long Radius	4	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB (Bitumen Coated)				SEE REMARK A		90ELR		
Reducer Concentric	3/4	2	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						REDC		
Reducer Concentric	2+1/2	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						REDC		
Reducer Eccentric	3/4	2	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						REDE		
Reducer Eccentric	2+1/2	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						REDE		
Reducer Eccentric	4	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB (Bitumen Coated)				SEE REMARK A		REDE		
Tee Straight	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK C		TEE		
Tee Straight	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105				SEE REMARK D		TEE		
Tee Reducing	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK C		TEER		
Tee Reducing	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105				SEE REMARK D		TEER		
Reducing Insert M/F	1/4	2	SB-ATI-PR008/0	THRD-M NPT x THRD-F	3000#		Forged	ASTM A 105				SEE REMARK C		BUS		
Reducing Insert M/F	1/2	1/2	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 13				BUS		
Reducing Insert M/F	1/2	1/2	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 12				BUS		
Reducing Insert M/F	1/2	1/2	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 11				BUS		
Cap	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CAP		
Cap	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK C		CAP		
Cap	3/4	24	ASME B16.9	BE	sch.40		Seamless	ASTM A 234 Gr. WPB						CAP		
Coupling	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK C		CPL		
Coupling	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPL		
Coupling Half	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK C		CPLH		
Coupling Half	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPLH		
Coupling Reducing	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK C		CPLR		
Coupling Reducing	1/2	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPLR		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.05		DOC:	2F11-15-190 - Sh. 7			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 203

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Cross Straight	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105								CRO
Cross Straight	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK C				CRO
Plug Hex.	1/4	2	SB-ATI-PR008/0	THRD-M NPT	3000#		Forged	ASTM A 105				SEE REMARK C				PLG
Union	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105								UN
Union	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK C				UN
Gasket	1/2	24	SB-ATI-PV009/5		150 LB	RF (125÷250 AARH)	—	B5C								GAS
Object			Standard of design			Material			Constructive characteristic			Tag			Default	Mod
Stud Bolt + 2 Nuts			SB-ATI-PV008B/0 ASME B18.2.1 UNC/2.2 Tab.9		ASTM A 193 B7 / A 194 Gr.2H								x			

DESMET - Ballestra		PIPING CLASS BRANCH	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.08		DOC:	2F11-15-190			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Branch Size	24	20	18	16	14	12	10	8	6	5	4	3	2M	2	1M	1Q	1	3Q	M	T8	Q	Branch	
24	I																					I	Pipe to Pipe
20	I	I																				TR	Tee Reducing
18	I	I	I																			TS	Tee Straight
16	I	I	I	I																			
14	I	I	I	I	I																		
12	I	I	I	I	I	I																	
10	I	I	I	I	I	I	I																
8	I	I	I	I	I	I	I	I															
6	I	I	I	I	I	I	I	I	I														
5	I	I	I	I	I	I	I	I	I	I													
4	I	I	I	I	I	I	I	I	I	I	I												
3	I	I	I	I	I	I	I	I	I	I	I	I											
2M	I	I	I	I	I	I	I	I	I	I	I	I	I										
2	I	I	I	I	I	I	I	I	I	I	I	I	I	I									
1M	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I								
1Q	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I							
1	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I						
3Q	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I					
M	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	TS				
T8	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I		TS			
Q	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	TR		TS		

Sizes translation $Q=1/4$, $T8=3/8$, $M=1/2$, $3Q=3/4$, $1=1$, $1Q=1+1/4$, $1M=1+1/2$, $2=2$, $2M=2+1/2$, $3=3$, $4=4$, $5=5$, $6=6$, $8=8$, $10=10$, $12=12$, $14=14$, $16=16$, $18=18$, $20=20$, $24=24$

DESMET - Ballestra		PIPING CLASS NOTE	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.10		DOC:	2F11-15-190 - Sh. 7			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class: 203

Note:	SPECIAL PARTS:
	1) FLEXIBLE HOSES: SB-ATI-PV002/0
	2) INSULATION SPECIFICATION: SB-ATI-SP030/0
	3) WATER TRACING SB-ATI-SP037/0: COOPER TUBE SB-ATI-PT009/0, CARBON STEEL FITTINGS "ERMETO" TYPE OR EQUIVALENT
	GENERAL NOTES:
	1) FOR TYPICAL INSTRUMENTS CONNECTIONS SEE SB-ATI-PV001/0
	2) FOR TEST TYPE SEE SB-ATI-SP009/0 SB-ATI-SP010/0
	REMARKS:
	A) USE FOR UNDERGROUND SYSTEM ONLY
	B) USE FOR "FF" FLANGES JOINT ONLY
	C) USE ONLY FOR INSTRUMENTS, VENTS, DRAINS AND SAMPLING HATCHES
	D) FOR DN=>3/4" USE BRANCH CONNECTIONS PIPE-TO-PIPE
	E) USE ONLY FOR PRESSURE TAPS "P"
	F) USE AS BLOCK VALVE AND HAND CONTROL VALVE
	G) USE AS BLOCK VALVE AND FOR VENTS, DRAINS AND SAMPLING HATCHES
	REVISIONS:
	Rev. 0 - Date 15/03/2012 - ISSUED

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.13		DOC:	2F11-15-190 - Sh. 8			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
Piping class 205							
Client Reference			Branch Table I205				
Service SATURATED STEAM & CONDENSATE (Low pressure - T=194°C P=12,9 Kg/cm2 MAX) NITROGEN			Corrosion Allow 1.27 mm				
			Welding Spec. SB-ATI-SP006/0 SB-ATI-SP007/0				
Base Material 11 CARBON STEEL			Applicable through				
Rating 0150 150 LB			Min				
Finish RF1 RF (125÷250 AARH)			Max				
Heat Treatment			Temperature °C				
Control level			Pressure Bar(g)				
			0				
			0				
			Chgd Mod				
Note FOR SPECIAL PARTS, GENERAL NOTES, REMARKS AND REVISIONS SEE ON THE LAST SHEET							

P Standard of design		Mod	Size	Thk.	Mod
I	3103	ASME B31.3/1992	1/4	2,24	
Temp. °C		Press. Bar(g)	Mod	3/8	2,31
194,0		12,90		1/2	2,77
				3/4	2,87
				1	3,38
				1+1/4	3,56
				1+1/2	3,68
				2	3,91
				2+1/2	3,18
				3	3,18
				4	3,18
				5	3,96
				6	3,96
				8	4,78
				10	4,78
				12	4,78

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.15		DOC:	2F11-15-190 - Sh. 8			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 205

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Pipe	1/4	2	ASME B36.10	PL	sch.40		Seamless	API 5L Gr.B						PIPE		
Pipe	2+1/2	12	ASME B36.10	PL			E.R.W.	API 5L Gr.B						PIPE		
Steam Trap	1/2	1	SB-ATI-VT010/0	THRD-F NPT	PN 25		Forged	AISI 304		T 71		SEE REMARK C		STRP		
Steam Trap	1/2	1	SB-ATI-VT005/0	SW-F	300 LB		Forged	ASTM A 105		T 66				STRP		
Steam Trap	1+1/2	1+1/2	SB-ATI-VT017/0	SW-F	600 LB		Forged	ASTM A 105		T 76				STRP		
Steam Trap	1+1/2	2	SB-ATI-VT010/0	THRD-F NPT	PN 16		Forged	AISI 304		T 71		SEE REMARK C		STRP		
Valve Ball Full Port	1/2	4	SB-ATI-VS074/0	LUG	150 LB	RF (125÷250 AARH)	Forged	CARBON STEEL		S 152		SEE REMARK E		VBF		
Valve Check	3/8	2	SB-ATI-VR018/0	SW-F	800#		Forged	ASTM A 105		R 83				VCH		
Valve Check	2+1/2	12	SB-ATI-VR030/0	FLG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 216 Gr. WCB		R 93				VCH		
Valve Gate	1/4	2	SB-ATI-VG001/0	SW-F	800#		Forged	ASTM A 105		G 61		SEE REMARK D		VGAT		
Valve Globe	1/4	2	SB-ATI-VD012/0	SW-F	800#		Forged	ASTM A 105		D 72				VGLO		
Valve Globe	2+1/2	12	SB-ATI-VD022/0	FLG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 216 Gr. WCB		D 79				VGLO		
Strainer Y-Type	1/2	2	SB-ATI-VF016/0	SW-F	800#		Forged	ASTM A 105		F 69				STY		
Strainer Y-Type	3	12	SB-ATI-VF021/0	FLG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 216 Gr. WCB		F 71				STY		
Flange Blind	1/2	12	ASME B16.5		150 LB	RF (125÷250 AARH)	Forged	ASTM A 105						FLB		
Flange Slip-On	1/2	12	ASME B16.5		150 LB	RF (125÷250 AARH)	Forged	ASTM A 105						FLS		
45° Elbow	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		45E		
45° Elbow	1/4	3/4	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						45E		
45° Elbow Long Radius	3/4	2	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						45ELR		
45° Elbow Long Radius	2+1/2	12	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						45ELR		
90° Elbow	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		90E		
90° Elbow	1/4	3/4	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						90E		
90° Elbow Long Radius	3/4	2	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						90ELR		
90° Elbow Long Radius	2+1/2	12	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						90ELR		
Reducer Concentric	3/4	2	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						REDC		
Reducer Concentric	2+1/2	12	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						REDC		
Reducer Eccentric	3/4	2	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						REDE		
Reducer Eccentric	2+1/2	12	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						REDE		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.15		DOC:	2F11-15-190 - Sh. 8			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 205

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Tee Straight	1/4	3/4	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105				SEE REMARK B		TEE		
Tee Straight	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		TEE		
Tee Reducing	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		TEER		
Tee Reducing	1/2	3/4	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105				SEE REMARK B		TEER		
Reducing Insert M/F	1/4	2	SB-ATI-PR008/0	THRD-M NPT x THRD-F	3000#		Forged	ASTM A 105				SEE REMARK A		BUS		
Reducing Insert M/F	1/4	3/4	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 12				BUS		
Reducing Insert M/F	1/4	3/4	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 11				BUS		
Reducing Insert M/F	1/4	3/4	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 13				BUS		
Cap	1/4	3/4	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CAP		
Cap	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		CAP		
Cap	3/4	12	ASME B16.9	BE	sch.40		Seamless	ASTM A 234 Gr. WPB						CAP		
Coupling	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		CPL		
Coupling	1/2	3/4	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPL		
Coupling Half	1/4	3/4	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPLH		
Coupling Half	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		CPLH		
Coupling Reducing	1/4	3/4	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPLR		
Coupling Reducing	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		CPLR		
Cross Straight	1/4	3/4	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CRO		
Cross Straight	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		CRO		
Plug Hex.	1/4	2	SB-ATI-PR008/0	THRD-M NPT	3000#		Forged	ASTM A 105				SEE REMARK A		PLG		
Gasket Spiral Wound	1/2	12	SB-ATI-PV009/5		150 LB	RF (125÷250 AARH)	—	G5N	INNER OUTER RING					GAS		
Object			Standard of design			Material			Constructive characteristic	Tag			Default	Mod		
Screws for valves			ASME B 18.2.1/UNC			ASTM A 193 B7										
Stud Bolt + 2 Nuts			SB-ATI-PV008B/0 ASME B18.2.1 UNC/2.2 Tab.9			ASTM A 193 B7 / A 194 Gr.2H							x			

DESMET - Ballestra		PIPING CLASS BRANCH	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.18		DOC:	2F11-15-190			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 205

Branch Table I205

Chgd

Branch Size	12	10	8	6	5	4	3	2M	2	1M	1Q	1	3Q	M	T8	Q
I	I															
I	I	I														
I	I	I	I													
I	I	I	I	I												
I	I	I	I	I	I											
I	I	I	I	I	I	I										
I	I	I	I	I	I	I	I									
I	I	I	I	I	I	I	I	I								
I	I	I	I	I	I	I	I	I	I							
I	I	I	I	I	I	I	I	I	I	I	I	I	TS			
I	I	I	I	I	I	I	I	I	I	I	I	I	TR	TS		
I	I	I	I	I	I	I	I	I	I	I	I	I	TR		TS	
I	I	I	I	I	I	I	I	I	I	I	I	I	TR	TR		TS

Branch

I

Pipe to Pipe

TR

Tee Reducing

TS

Tee Straight

Run Size

Sizes translation $Q=1/4$, $T8=3/8$, $M=1/2$, $3Q=3/4$, $1=1$, $1Q=1+1/4$, $1M=1+1/2$, $2=2$, $2M=2+1/2$, $3=3$, $4=4$, $5=5$, $6=6$, $8=8$, $10=10$, $12=12$

DESMET - Ballestra		PIPING CLASS NOTE	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.20		DOC:	2F11-15-190 - Sh. 8			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class: 205

Note:	SPECIAL PARTS:
	1) FLEXIBLE HOSES: SB-ATI-PV002/0 2) INSULATION SPECIFICATION: SB-ATI-SP030/0 3) STEAM TRACING SB-ATI-SP036/0: COPPER TUBE SB-ATI-PT009/0, BRASS FITTINGS "SERTO" TYPE OR EQUIVALENT
	GENERAL NOTES:
	1) FOR TYPICAL INSTRUMENTS CONNECTIONS SEE SB-ATI-PV001/0 2) FOR TEST TYPE SEE SB-ATI-SP009/0 SB-ATI-SP010/0
	REMARKS:
	A) USE ONLY FOR INSTRUMENTS, VENTS, DRAINS AND TRACING B) FOR DN=>1" USE BRANCH CONNECTIONS PIPE-TO-PIPE C) USE FOR SPECIAL EQUIPMENTS WHEN DEEMED BY PROCESS DEPARTMENT D) USE AS BLOCK VALVE AND FOR VENTS AND DRAINS E) USE ONLY FOR THE OPERATING CONDITION: P= 6 kg/cm2, T= 164°C
	REVISIONS:
	Rev. 0 - Date 15/03/2012 - ISSUED

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.23		DOC:	2F11-15-190 - Sh. 9			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
Piping class 206							
Client Reference			Branch Table I206				
Service AIR (PROCESS-COLD-COOLING-DEHUMIDIFIED)			Corrosion Allow 1.27 mm				
			Welding Spec. SB-ATI-SP006/0 SB-ATI-SP007/0				
Base Material 11 CARBON STEEL			Applicable through				
Rating 0150 150 LB			Min				
Finish RF1 RF (125÷250 AARH)			Temperature °C 0 0				
Heat Treatment			Pressure Bar(g) 0 0				
Control level			Chgd Mod				
Note FOR SPECIAL PARTS, GENERAL NOTES, REMARKS AND REVISIONS SEE ON THE LAST SHEET							

P	Standard of design	Mod	Size	Thk.	Mod
I	3103	ASME B31.3/1992	1/4	2,24	
Temp. °C Press. Bar(g) Mod			3/8	2,31	
			1/2	2,77	
			3/4	2,87	
			1	3,38	
			1+1/4	3,56	
			1+1/2	3,68	
			2	3,91	
			2+1/2	3,18	
			3	3,18	
			4	3,18	
			5	3,18	
			6	3,96	
			8	4,78	
			10	4,78	
			12	4,78	
			14	6,35	
			16	6,35	

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.23		DOC:	2F11-15-190 - Sh. 9			

DESMET - Ballestra	SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
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Piping class 206

18	6,35
20	6,35
24	6,35
26	6,0
28	6,0
30	6,0
32	6,0
34	6,0
36	6,0
38	6,0
40	6,0

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.25		DOC:	2F11-15-190 - Sh. 9			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 206

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Pipe	1/4	2	ASME B36.10	PL		sch.40	Seamless	API 5L Gr.B						PIPE		
Pipe	2+1/2	24	ASME B36.10	PL			E.R.W.	API 5L Gr.B						PIPE		
Pipe	4	24	ASME B36.10	PL			E.R.W.	API 5L Gr.B (Bitumen Coated)				SEE REMARK A		PIPE		
Pipe	26	40	SB-ATI-PT004/0	PL			Welded	ASTM A 570 Gr. 33 (Bitumen Coated)				SEE REMARK A		PIPE		
Pipe	26	40	SB-ATI-PT004/0	PL			Welded	ASTM A 570 Gr. 33						PIPE		
Valve Ball Full Port	1/4	2	SB-ATI-VS014/0	THRD-F NPT	200 LB		Forged	BRASS NICKEL PLATED		S 87		SEE REMARK H		VBF		
Valve Butterfly	18	24	SB-ATI-VB033/0	WAFER	150 LB	RF (125÷250 AARH)	Cast	DUCTILE IRON		B 87		SEE REMARK G		VBY		
Valve Butterfly	28	40	SB-ATI-VB034/0	WAFER	150 psi	FF (125÷250 AARH)	Cast	DUCTILE IRON		B 88		SEE REMARK L		VBY		
Valve Butterfly With Gasket	2+1/2	20	SB-ATI-VB057/0	WAFER	150 LB	RF (125÷250 AARH)	Cast	DUCTILE IRON		B 109		SEE REMARK N		VBY		
Valve Butterfly With Gasket	2+1/2	16	SB-ATI-VB030/0	WAFER	150 LB	RF (125÷250 AARH)	Cast	DUCTILE IRON		B 85		SEE REMARK O		VBY		
Valve Check	3/8	2	SB-ATI-VR033/0	THRD-F NPT	200 LB		Forged	BRONZE		R 96				VCH		
Valve Check	2+1/2	20	SB-ATI-VR022/0	WAFER	150 LB	RF (125÷250 AARH)	Cast	ASTM A 36 CADMIUM PLATED		R 87				VCH		
Valve Check	2+1/2	20	SB-ATI-VR053/0	WAFER	150 LB	RF (125÷250 AARH)	Forged	ASTM A 105		R 110		SEE REMARK F		VCH		
Valve Globe	1/4	2	SB-ATI-VD001/0	THRD-F NPT	200 LB		Forged	BRONZE		D 51				VGLO		
Valve Plug	1/4	1	SB-ATI-VM001/0	THRD-F NPT	PN 16		Forged	ASTM A 182 Gr. F316		M 53		SEE REMARK G		VPLG		
Strainer Y-Type	3/8	2	SB-ATI-VF018/0	THRD-F NPT	200 LB		Forged	BRONZE		F 70				STY		
Blind & Spacer	18	24	SB-ATI-PD005/0	WAFER	150 LB	FF (125÷250 AARH)	From Plate	ASTM A 570 Gr. 33						BSPA		
Blind & Spacer	26	40	SB-ATI-PD005/0	WAFER	150 psi	FF (125÷250 AARH)	From Plate	ASTM A 570 Gr. 33						BSPA		
Spectacle Blind	1/2	16	SB-ATI-PD005/0	WAFER	150 LB	FF (125÷250 AARH)	From Plate	ASTM A 570 Gr. 33						BSPE		
Flange Blind	1/2	24	ASME B16.5		150 LB	RF (125÷250 AARH)	Forged	ASTM A 105						FLB		
Flange Slip-On	1/2	24	ASME B16.5		150 LB	RF (125÷250 AARH)	Forged	ASTM A 105						FLS		
Flange Slip-On	1/2	24	ASME B16.5		150 LB	FF (125÷250 AARH)	Forged	ASTM A 105				SEE REMARK B		FLS		
Flange Slip-On	26	40	AWWA C207-TAB.1 CL.D		150 psi	FF (125÷250 AARH)	Forged	ASTM A 105						FLS		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.25		DOC:	2F11-15-190 - Sh. 9			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 206

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
45° Elbow	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		45E		
45° Elbow	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						45E		
45° Elbow Long Radius	3/4	2	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						45ELR		
45° Elbow Long Radius	2+1/2	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						45ELR		
45° Elbow Long Radius	4	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr.WPB (Bitumen Coated)				SEE REMARK A		45ELR		
45° Miter	26	40	SB-ATI-PC002/0	BE			Welded	ASTM A 570 Gr. 33 (Bitumen Coated)	R=1.5 D			SEE REMARK A		45M		
45° Miter	26	40	SB-ATI-PC004/0	BE			Welded	ASTM A 570 Gr. 33	R=1 D			SEE REMARK M		45M		
45° Miter	26	40	SB-ATI-PC002/0	BE			Welded	ASTM A 570 Gr. 33	R=1.5 D					45M		
90° Elbow	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		90E		
90° Elbow	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						90E		
90° Elbow Long Radius	3/4	2	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						90ELR		
90° Elbow Long Radius	2+1/2	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						90ELR		
90° Elbow Long Radius	4	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr.WPB (Bitumen Coated)				SEE REMARK A		90ELR		
90° Miter	26	40	SB-ATI-PC002/0	BE			Welded	ASTM A 570 Gr. 33	R=1.5 D					90M		
90° Miter	26	40	SB-ATI-PC004/0	BE			Welded	ASTM A 570 Gr. 33	R=1 D			SEE REMARK M		90M		
90° Miter	26	40	SB-ATI-PC002/0	BE			Welded	ASTM A 570 Gr. 33 (Bitumen Coated)	R=1.5 D			SEE REMARK A		90M		
Reducer Concentric	3/4	2	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						REDC		
Reducer Concentric	2+1/2	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						REDC		
Reducer Concentric	26	40	SB-ATI-PR002/0	BE			Welded	ASTM A 570 Gr. 33						REDC		
Reducer Eccentric	3/4	2	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						REDE		
Reducer Eccentric	2+1/2	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						REDE		
Reducer Eccentric	4	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr.WPB (Bitumen Coated)				SEE REMARK A		REDE		
Reducer Eccentric	26	40	SB-ATI-PR002/0	BE			Welded	ASTM A 570 Gr. 33						REDE		
Reducer Eccentric	26	40	SB-ATI-PR002/0	BE			From Plate	ASTM A 570 Gr. 33 (Bitumen Coated)				SEE REMARK A		REDE		
Tee Straight	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		TEE		
Tee Straight	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105				SEE REMARK E		TEE		
Tee Reducing	1/2	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		TEER		
Tee Reducing	1/2	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105				SEE REMARK D		TEER		
Reducing Insert M/F	1/4	1/2	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE				BUS		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.26		DOC:	2F11-15-190 - Sh. 9			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 206

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Reducing Insert M/F	1/4	1/2	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 12				BUS		
Reducing Insert M/F	1/4	1/2	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 13				BUS		
Reducing Insert M/F	1/4	2	SB-ATI-PR008/0	THRD-M NPT x THRD-F	3000#		Forged	ASTM A 105				SEE REMARK D		BUS		
Cap	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CAP		
Cap	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		CAP		
Cap	3/4	14	ASME B16.9	BE			Seamless	ASTM A 234 Gr. WPB				SEE REMARK C		CAP		
Coupling	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		CPL		
Coupling	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPL		
Coupling Half	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		CPLH		
Coupling Half	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPLH		
Coupling Reducing	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		CPLR		
Coupling Reducing	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPLR		
Cross Straight	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		CRO		
Cross Straight	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CRO		
Plug Hex.	1/4	2	SB-ATI-PR008/0	THRD-M NPT	3000#		Forged	ASTM A 105				SEE REMARK D		PLG		
Union	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						UN		
Union	1/4	2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		UN		
Gasket	1/2	24	SB-ATI-PV009/5		150 LB	RF (125÷250 AARH)	—	B5C						GAS		
Gasket	26	40	SB-ATI-PV009/5		150 psi	FF (125÷250 AARH)	—	B12C						GAS		

Object	Standard of design	Material	Constructive characteristic	Tag	Default	Mod
Stud Bolt + 2 Nuts	SB-ATI-PV008B/0 ASME B18.2.1 UNC/2.2 Tab.9	ASTM A 193 B7 / A 194 Gr.2H			x	

Piping Class	206	Branch Table	I206	Chgd
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Sizes translation Q=1/4, T8=3/8, M=1/2, 3Q=3/4, 1=1, 1Q=1+1/4, 1M=1+1/2, 2=2, 2M=2+1/2, 3=3, 4=4, 5=5, 6=6, 8=8, 10=10, 12=12, 14=14, 16=16, 18=18, 20=20, 24=24, 26=26, 28=28, 30=30, 32=32, 34=34, 36=36, 38=38, 40=40

DESMET - Ballestra		PIPING CLASS NOTE	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.30		DOC:	2F11-15-190 - Sh. 9			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class: 206

Note:	<p>SPECIAL PARTS:</p> <p>1) FLEXIBLE HOSES: SB-ATI-PV002/0</p> <p>2) INSULATION SPECIFICATION: SB-ATI-SP030/0</p> <p>3) EXPANSION JOINTS: SB-ATI-PV004/0 OR AS AGREED DURING DESIGN DEVELOPMENT (FOR METALLIC BELLOW TO PERFORM LIQUID PENETRANT TEST 100%)</p>
	<p>GENERAL NOTES:</p> <p>1) FOR TYPICAL INSTRUMENTS CONNECTIONS SEE SB-ATI-PV001/0</p> <p>2) FOR TEST TYPE SEE SB-ATI-SP009/0 SB-ATI-SP010/0</p> <p>REMARKS:</p> <p>A) USE FOR UNDERGROUND SYSTEM ONLY</p> <p>B) USE FOR "FF" FLANGES JOINT ONLY</p> <p>C) FROM DN 16" TO DN 28" USE BLIND DISK Thk 10mm FROM DN 30" TO DN 40" USE BLIND DISK Thk 14mm (MATERIAL: STEEL PLATE A 570 GR 33)</p> <p>D) USE ONLY FOR INSTRUMENTS, VENTS AND DRAINS</p> <p>E) FOR DN=>3/4" USE BRANCH CONNECTIONS PIPE-TO-PIPE</p> <p>F) TO USE ONLY WHEN DEEMED BY PROCESS DEPARTMENT</p> <p>G) USE ONLY FOR PRESSURE TAPS "P"</p> <p>H) USE AS BLOCK VALVE FOR VENTS, DRAINS AND SAMPLING HATCHES</p> <p>I) USE AS BLOCK VALVE AND HAND CONTROL VALVE</p> <p>L) USE AS HAND CONTROL VALVE</p> <p>M) USE FOR H2SO4 PRODUCTION PLANT</p> <p>N) USE ONLY FOR Max. OPERATING TEMPERATURE T=80°C</p> <p>O) USE FOR OPERATING TEMPERATURE FROM 81°C TO 130°C</p> <p>REVISIONS:</p> <p>Rev. 0 - Date 15/03/2012 - ISSUED</p>

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	1	02/08/2012
PUMA5	02/08/2012 9.46.47		DOC:	2F11-15-190 - Sh. 10			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
Piping class 212							
Client Reference			Branch Table I212				
Service SEE PIPING CLASS NOTE			Corrosion Allow 1.27 mm				
			Welding Spec. SB-ATI-SP006/0 SB-ATI-SP007/0				
Base Material 11 CARBON STEEL			Applicable through				
Rating 0150 150 LB			Min				
Finish RF1 RF (125÷250 AARH)			Max				
Heat Treatment			Temperature °C				
Control level			Pressure Bar(g)				
			0				
			0				
			Chgd Mod				
Note FOR SERVICE, SPECIAL PARTS, GENERAL NOTES, REMARKS AND REVISIONS SEE ON THE LAST SHEET							

P	Standard of design	Mod	Size	Thk.	Mod
I	3103	ASME B31.3/1992	1/4	2,24	
Temp. °C			3/8	2,31	
			1/2	2,77	
Press. Bar(g)			3/4	2,87	
			1	3,38	
			1+1/4	3,56	
			1+1/2	3,68	
			2	3,91	
			2+1/2	3,18	
			3	3,18	
			4	3,18	
			5	3,18	
			6	3,96	
			8	4,78	
			10	4,78	
			12	4,78	
			14	6,35	
			16	6,35	

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	1	02/08/2012
PUMA5	02/08/2012 9.46.47		DOC:	2F11-15-190 - Sh. 10			

DESMET - Ballestra	SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
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Piping class 212

18	6,35
20	6,35
24	6,35

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	1	02/08/2012
PUMA5	02/08/2012 9.46.49		DOC:	2F11-15-190 - Sh. 10			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 212

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Pipe	1/4	2	ASME B36.10	PL	sch.40		Seamless	API 5L Gr.B						PIPE		
Pipe	2+1/2	24	ASME B36.10	PL			E.R.W.	API 5L Gr.B						PIPE		
Sight Glass	1/2	12	SB-ATI-VI013/0	FLG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 216 Gr. WCB		FG 60				SGH		
Sight Glass	1/2	12	SB-ATI-VI015/0	FLG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 216 Gr. WCB		FG 61				SGH		
Valve 3-Way	1/2	1+1/4	SB-ATI-VS030/0	LUG	150 LB	RF (125÷250 AARH)	Forged	ASTM A 105		S 108				VB3		
Valve 3-Way	1+1/2	8	SB-ATI-VS024/0	LUG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 216 Gr. WCB		S 102				VB3		
Valve Ball Full Port	1/4	2	SB-ATI-VS019/0	THRD-F NPT	800#		Forged	ASTM A 105		S 98		SEE REMARK G		VBF		
Valve Ball Full Port	1/2	3	SB-ATI-VS050/0	LUG	150 LB	RF (125÷250 AARH)	Forged	ASTM A 105		S 127				VBF		
Valve Ball Full Port	4	8	SB-ATI-VS050/0	LUG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 216 Gr. WCB		S 127		SEE REMARK M		VBF		
Valve Ball Type Bottom	1/2	6	SB-ATI-VS051/0	LUG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 216 Gr. WCB		S 128				VBTS		
Valve Butterfly With Gasket	3	20	SB-ATI-VB030/0	WAFER	150 LB	RF (125÷250 AARH)	Cast	DUCTILE IRON		B 85		SEE REMARK F and L		VBV		
Valve Check	1/2	2	SB-ATI-VR018/0	SW-F	800#		Forged	ASTM A 105		R 83				VCH		
Valve Check	2+1/2	20	SB-ATI-VR055/0	WAFER	150 LB	RF (125÷250 AARH)	Forged	ASTM A 105		R 111				VCH		
Valve Check	8	20	SB-ATI-VR056/0	WAFER	150 LB	RF (125÷250 AARH)	Forged	ASTM A 105		R 112		SEE REMARK I		VCH		
Valve Check	8	20	SB-ATI-VR053/0	WAFER	150 LB	RF (125÷250 AARH)	Forged	ASTM A 105		R 110		SEE REMARK I		VCH		
Valve Globe	1/4	2	SB-ATI-VD036/0	SW-F	800#		Forged	ASTM A 105		D 87				VGLO		
Valve Globe	2+1/2	12	SB-ATI-VD034/0	FLG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 216 Gr. WCB		D 86		SEE REMARK M		VGLO		
Valve Plug	1/4	1	SB-ATI-VM001/0	THRD-F NPT	PN 16		Forged	ASTM A 182 Gr. F316		M 53		SEE REMARK H		VPLG		
Strainer Temporary	1	12	SB-ATI-PV006/0	WAFER	150 LB	Flat Face Smooth	From Plate	ASTM A 570 Gr. 33		FT 15				STTMP		
Strainer Y-Type	1/2	2	SB-ATI-VF016/0	SW-F	800#		Forged	ASTM A 105		F 69				STY		
Strainer Y-Type	3	12	SB-ATI-VF021/0	FLG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 216 Gr. WCB		F 71				STY		
Drip Ring	1/2	12	SB-ATI-PA006/0	WAFER	150 LB	FF (125÷250 AARH)	Forged	ASTM A 105						BRIN		
Spectacle Blind	1/2	12	SB-ATI-PD004/0	WAFER	150 LB	FF (125÷250 AARH)	From Plate	ASTM A 570 Gr. 33				SEE REMARK C		BSPE		
Flange Blind	1/2	24	ASME B16.5		150 LB	RF (125÷250 AARH)	Forged	ASTM A 105				SEE REMARK A		FLB		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	1	02/08/2012
PUMA5	02/08/2012 9.46.49		DOC:	2F11-15-190 - Sh. 10			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 212

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Flange Slip-On	1/2	24	ASME B16.5		150 LB	FF (125÷250 AARH)	Forged	ASTM A 105				SEE REMARK B		FLS		
Flange Slip-On	1/2	24	ASME B16.5		150 LB	RF (125÷250 AARH)	Forged	ASTM A 105				SEE REMARK A		FLS		
45° Elbow	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						45E		
45° Elbow	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		45E		
45° Elbow Long Radius	3/4	2	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB				SEE REMARK A		45ELR		
45° Elbow Long Radius	2+1/2	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB				SEE REMARK A		45ELR		
90° Elbow	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						90E		
90° Elbow	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		90E		
90° Elbow Long Radius	3/4	2	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB				SEE REMARK A		90ELR		
90° Elbow Long Radius	2+1/2	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB				SEE REMARK A		90ELR		
Reducer Concentric	3/4	2	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB				SEE REMARK A		REDC		
Reducer Concentric	2+1/2	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB				SEE REMARK A		REDC		
Reducer Eccentric	3/4	2	ASME B16.9	BE	sch.40		Wrought S	ASTM A 234 Gr. WPB						REDE		
Reducer Eccentric	2+1/2	24	ASME B16.9	BE			E.R.W.	ASTM A 234 Gr. WPB						REDE		
Tee Straight	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		TEE		
Tee Straight	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105				SEE REMARK E		TEE		
Tee Reducing	1/2	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		TEER		
Tee Reducing	1/2	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105				SEE REMARK E		TEER		
Reducing Insert M/F	1/4	1/2	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 12				BUS		
Reducing Insert M/F	1/4	1+1/2	SB-ATI-PR008/0	THRD-M NPT x THRD-F	3000#		Forged	ASTM A 105				SEE REMARK D		BUS		
Reducing Insert M/F	1/4	1/2	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 13				BUS		
Reducing Insert M/F	1/4	1/2	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 11				BUS		
Cap	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		CAP		
Cap	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CAP		
Cap	3/4	24	ASME B16.9	BE			Seamless	ASTM A 234 Gr. WPB						CAP		
Coupling	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		CPL		
Coupling	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPL		
Coupling Half	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		CPLH		
Coupling Half	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPLH		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	1	02/08/2012
PUMA5	02/08/2012 9.46.49		DOC:	2F11-15-190 - Sh. 10			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 212

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Coupling Reducing	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		CPLR		
Coupling Reducing	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPLR		
Cross Straight	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		CRO		
Cross Straight	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CRO		
Plug Hex.	1/4	1+1/2	SB-ATI-PR008/0	THRD-M NPT	3000#		Forged	ASTM A 105				SEE REMARK D		PLG		
Union	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK D		UN		
Union	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						UN		
Gasket	1/2	24	SB-ATI-PV009/5		150 LB	RF (125÷250 AARH)	—	B5B						GAS		

Object	Standard of design	Material	Constructive characteristic	Tag	Default	Mod
Screws for valves	ASME B 18.2.1/UNC	ASTM A 193 B7				
Stud Bolt + 2 Nuts	SB-ATI-PV008B/0 ASME B18.2.1 UNC/2.2 Tab.9	ASTM A 193 B7 / A 194 Gr.2H			x	

DESMET - Ballestra		PIPING CLASS BRANCH	PROJ:	2F11	REV:	1	02/08/2012
PUMA5	02/08/2012 9.46.52		DOC:	2F11-15-190			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Branch Size	24	20	18	16	14	12	10	8	6	5	4	3	2M	2	1M	1Q	1	3Q	M	T8	Q	Branch	
24	I																					I	Pipe to Pipe
20	I	I																				TR	Tee Reducing
18	I	I	I																			TS	Tee Straight
16	I	I	I	I																			
14	I	I	I	I	I																		
12	I	I	I	I	I	I																	
10	I	I	I	I	I	I	I																
8	I	I	I	I	I	I	I	I															
6	I	I	I	I	I	I	I	I	I														
5	I	I	I	I	I	I	I	I	I	I													
4	I	I	I	I	I	I	I	I	I	I	I												
3	I	I	I	I	I	I	I	I	I	I	I	I											
2M	I	I	I	I	I	I	I	I	I	I	I	I	I										
2	I	I	I	I	I	I	I	I	I	I	I	I	I	I									
1M	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I								
1Q	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I							
1	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I						
3Q	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I					
M	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	TS				
T8	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I		TS			
Q	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	TR		TS		

Sizes translation $Q=1/4$, $T8=3/8$, $M=1/2$, $3Q=3/4$, $1=1$, $1Q=1+1/4$, $1M=1+1/2$, $2=2$, $2M=2+1/2$, $3=3$, $4=4$, $5=5$, $6=6$, $8=8$, $10=10$, $12=12$, $14=14$, $16=16$, $18=18$, $20=20$, $24=24$

DESMET - Ballestra		PIPING CLASS NOTE	PROJ:	2F11	REV:	1	02/08/2012
PUMA5	02/08/2012 9.46.53		DOC:	2F11-15-190 - Sh. 10			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class: 212

Note:	SERVICE: SODIUM SILICATE SOLUTION - FUEL OIL - FUEL GAS - OLEUM - LIQUID RAW MATERIAL AND CAUSTIC SODA (from B.L. to Departement filters) - L.P. SLURRY - SO3 LOW TEMP. (to SO3 filters) - EXHAUST GAS (from Cyclon to Elec. filter) - NATURAL GAS
	<p>SPECIAL PARTS:</p> <p>1) FLEXIBLE HOSES: SB-ATI-PV002/0</p> <p>2) INSULATION SPECIFICATION: SB-ATI-SP030/0</p> <p>3) EXPANSION JOINTS: FOR EQUIPMENTS ON LOAD CELLS TO USE GC33 - SB-ATI-PV004/0, P=0,3 kg/cm2</p> <p>4) WATER JACKETED PIPE: TO USE PIPING PROJECT SPECIFICATION 203, FOR TYPICAL DETAILS SEE SB-ATI-SP042/0</p> <p>GENERAL NOTES:</p> <p>1) FOR TYPICAL INSTRUMENTS CONNECTIONS SEE SB-ATI-PV001/0</p> <p>2) FOR TEST TYPE SEE SB-ATI-SP009/0 SB-ATI-SP010/0</p> <p>REMARKS:</p> <p>A) ON JACKETED PIPES USE THE REQUIRED PIECES BY SB-ATI-SP042/0</p> <p>B) USE FOR FLAT FACE FLANGES JOINT ONLY</p> <p>C) DO NOT USE FOR OLEUM AND SODA</p> <p>D) USE ONLY FOR INSTRUMENTS, VENTS AND DRAINS. FOR VENTS IN SLURRY FILTERS USE VALVE M53</p> <p>E) FOR DN\geq 3/4" USE BRANCH CONNECTIONS PIPE-TO-PIPE</p> <p>F) USE AS BLOCK VALVE AND HAND CONTROL VALVE</p> <p>G) USE FOR VENTS, DRAINS AND SAMPLING HATCHES ONLY</p> <p>H) USE FOR PRESSURE TAPS "P" AND ALSO FOR VENTS ON SLURRY FILTERS</p> <p>I) USE ONLY WHEN DEEMED BY PROCESS DEPARTMENT</p> <p>L) USE FOR OPERATING PRESSURE TO 9,6 Kg/cm² AND OPERATING TEMPERATURE 130°C.</p> <p>M) USE ONLY FOR OPERATING PRESSURE 9,7 Kg/cm² AND GREATER (Special Use)</p> <p>REVISIONS:</p> <p>Rev. 0 - Date 15/03/2012 - ISSUED</p> <p>Rev. 1 - Date 02/08/2012 - REVISED SIZE RANGE AT VALVES S 98, B 85.</p>

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	1	02/08/2012
PUMA5	02/08/2012 9.46.56		DOC:	2F11-15-190 - Sh. 11			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
Piping class 215							
Client Reference			Branch Table I215				
Service SEE PIPING CLASS NOTE			Corrosion Allow 0.0 mm				
			Welding Spec. SB-ATI-SP006/0 SB-ATI-SP008/0				
Base Material 21 AISI 304			Applicable through				
Rating 0150 150 LB			Min Max				
Finish RF1 RF (125÷250 AARH)			Temperature °C 0 0				
Heat Treatment			Pressure Bar(g) 0 0				
Control level			Chgd Mod				
Note FOR SERVICE, SPECIAL PARTS, GENERAL NOTES, REMARKS AND REVISIONS SEE ON THE LAST SHEET							

P	Standard of design	Mod	Size	Thk.	Mod
I	3103 ASME B31.3/1992		1/4	2,24	
Temp. °C Press. Bar(g)			3/8	2,31	
150,0 15,00			1/2	2,77	
			3/4	2,87	
			1	3,38	
			1+1/4	3,56	
			1+1/2	3,68	
			2	3,91	
			2+1/2	2,11	
			3	2,11	
			4	2,11	
			5	2,77	
			6	2,77	
			8	2,77	
			10	3,4	
			12	3,96	
			14	3,96	
			16	4,19	

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	1	02/08/2012
PUMA5	02/08/2012 9.46.56		DOC:	2F11-15-190 - Sh. 11			

DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
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Piping class 215							
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18	4,19
20	4,78
24	5,54

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	1	02/08/2012
PUMA5	02/08/2012 9.46.58		DOC:	2F11-15-190 - Sh. 11			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 215

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Pipe	1/4	2	ASME B36.19	PL	sch.40 S		Seamless	ASTM A 312 TP304						PIPE		
Pipe	2+1/2	24	ASME B36.19	PL	sch.5S		E.R.W.	ASTM A 312 TP304						PIPE		
Sight Glass	1/2	10	SB-ATI-VI020/0	FLG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 Gr. CF8M		FG 65				SGH		
Sight Glass	1/2	10	SB-ATI-VI017/0	FLG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 Gr. CF8M		FG 64				SGH		
Valve 3-Way	1/2	1+1/4	SB-ATI-VS031/0	LUG	150 LB	RF (125÷250 AARH)	Forged	ASTM A 182 Gr. F316		S 109				VB3		
Valve 3-Way	1+1/2	8	SB-ATI-VS025/0	LUG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 Gr. CF8M		S 103		SEE REMARK I		VB3		
Valve Ball Full Port	1/4	1+1/2	SB-ATI-VS020/0	THRD-F NPT	800#		Forged	ASTM A 182 Gr. F316		S 99		SEE REMARK F		VBF		
Valve Ball Full Port	1/2	6	SB-ATI-VS045/0	LUG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 CF8		S 123				VBF		
Valve Ball Type Bottom	1/2	6	SB-ATI-VS046/0	LUG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 CF8		S 124				VBTS		
Valve Butterfly	3	24	SB-ATI-VB024/0	WAFER	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 CF8		B 80		SEE REMARK G AND E		VBY		
Valve Check	2	20	SB-ATI-VR043/0	WAFER	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 Gr. CF8M		R 102		SEE REMARK E		VCH		
Valve Check	3	20	SB-ATI-VR027/0	WAFER	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 CF8	Type 1	R 91				VCH		
Valve Check	8	20	SB-ATI-VR027/0	WAFER	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 CF8	Type 2	R 91		SEE REMARK E		VCH		
"Y" Valve Check	1/2	2+1/2	SB-ATI-VR028/0	FLG	150 LB	RF (125÷250 AARH)	Forged	ASTM A 182 Gr. F304		R 92				VCHY		
Valve Globe	1/4	1	SB-ATI-VD008/0	SW-F	800#		Forged	ASTM A 182 Gr. F316		D 62		SEE REMARK E		VGLO		
"Y" Valve Globe	1/2	2+1/2	SB-ATI-VD017/0	FLG	150 LB	RF (125÷250 AARH)	Forged	ASTM A 182 Gr. F304		D 75				VGLY		
Valve Plug	1/4	1	SB-ATI-VM001/0	THRD-F NPT	PN 16		Forged	ASTM A 182 Gr. F316		M 53		SEE REMARK H		VPLG		
Strainer Temporary	1	12	SB-ATI-PV006/0	WAFER	150 LB	FF (125÷250 AARH)	From Plate	ASTM A 570 Gr. 33		FT 15				STTMP		
Strainer Y-Type	1/2	6	SB-ATI-VF023/0	FLG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 Gr. CF8M		F 72				STY		
Drip Ring	1/2	12	SB-ATI-PA006/0	WAFER	150 LB	FF (125÷250 AARH)	Forged	ASTM A 182 Gr. F304						BRIN		
Blind & Spacer	18	24	SB-ATI-PD004/0	WAFER	150 LB	FF (125÷250 AARH)	From Plate	ASTM A 240 Gr. TP304						BSPA		
Spectacle Blind	1/2	16	SB-ATI-PD004/0	WAFER	150 LB	FF (125÷250 AARH)	From Plate	ASTM A 240 Gr. TP304						BSPE		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	1	02/08/2012
PUMA5	02/08/2012 9.46.58		DOC:	2F11-15-190 - Sh. 11			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 215

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Flange Blind + Disk	1/2	24	ASME B16.5 - SB-ATI-PR007/0 (DISK)		150 LB	RF (125÷250 AARH)	Forged	FLG: ASTM A 105 Galvanized - DISK: A240 TYPE 304				SEE REMARK A		FLB		
Flange Lap-Joint	1/2	24	ASME B16.5		150 LB	Flat Face Smooth	Forged	ASTM A 105 Galvanized				SEE REMARK A		FLJ		
45° Elbow	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F304				SEE REMARK C		45E		
45° Elbow	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F304						45E		
45° Elbow Long Radius	3/4	2	ASME B16.9	BE	sch.40 S		Wrought S	ASTM A 403 Gr. WP304				SEE REMARK B		45ELR		
45° Elbow Long Radius	2+1/2	24	ASME B16.9	BE	sch.5S		Wrought W	ASTM A 403 Gr. WP304				SEE REMARK B		45ELR		
90° Elbow	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F304				SEE REMARK C		90E		
90° Elbow	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F304						90E		
90° Elbow Long Radius	3/4	2	ASME B16.9	BE	sch.40 S		Wrought S	ASTM A 403 Gr. WP304				SEE REMARK B		90ELR		
90° Elbow Long Radius	2+1/2	24	ASME B16.9	BE	sch.5S		Wrought W	ASTM A 403 Gr. WP304				SEE REMARK B		90ELR		
Reducer Concentric	3/4	2	ASME B16.9	BE	sch.40 S		Wrought S	ASTM A 403 Gr. WP304				SEE REMARK B		REDC		
Reducer Concentric	2+1/2	24	ASME B16.9	BE	sch.5S		Wrought W	ASTM A 403 Gr. WP304				SEE REMARK B		REDC		
Reducer Eccentric	3/4	2	ASME B16.9	BE	sch.40 S		Wrought S	ASTM A 403 Gr. WP304						REDE		
Reducer Eccentric	2+1/2	24	ASME B16.9	BE	sch.5S		Wrought W	ASTM A 403 Gr. WP304						REDE		
Tee Straight	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F304				SEE REMARK B and D		TEE		
Tee Straight	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F304				SEE REMARK C		TEE		
Tee Reducing	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F304				SEE REMARK C		TEER		
Tee Reducing	1/2	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F304				SEE REMARK B and D		TEER		
Reducing Insert M/F	1/4	1/2	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 182 Gr. F304		TYPE 13				BUS		
Reducing Insert M/F	1/4	1/2	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 182 Gr. F304		TYPE 12				BUS		
Reducing Insert M/F	1/4	1/2	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 182 Gr. F304		TYPE 11				BUS		
Reducing Insert M/F	1/4	1+1/2	SB-ATI-PR008/0	THRD-M NPT x THRD-F	3000#		Forged	ASTM A 182 Gr. F304				SEE REMARK C		BUS		
Cap	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F304						CAP		
Cap	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F304				SEE REMARK C		CAP		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	1	02/08/2012
PUMA5	02/08/2012 9.46.59		DOC:	2F11-15-190 - Sh. 11			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 215

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Cap	3/4	2	ASME B16.9	BE	sch.40 S		Wrought S	ASTM A 403 Gr. WP304						CAP		
Cap	2+1/2	24	ASME B16.9	BE	sch.5S		Wrought W	ASTM A 403 Gr. WP304						CAP		
Coupling	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F304				SEE REMARK C		CPL		
Coupling	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F304						CPL		
Coupling Half	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F304				SEE REMARK C		CPLH		
Coupling Half	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F304						CPLH		
Coupling Reducing	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F304				SEE REMARK C		CPLR		
Coupling Reducing	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F304						CPLR		
Cross Straight	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F304				SEE REMARK C		CRO		
Cross Straight	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F304						CRO		
Stub-End	1/2	2	MSS SP-43	BE	sch.40 S		Wrought S	ASTM A 403 Gr. WP304	Type A					FLSE		
Stub-End	2+1/2	24	MSS SP-43	BE	sch.5S		Wrought W	ASTM A 403 Gr. WP304	Type A					FLSE		
Plug Hex.	1/4	1+1/2	SB-ATI-PR008/0	THRD-M NPT	3000#		Forged	ASTM A 182 Gr. F304				SEE REMARK C		PLG		
Union	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F304						UN		
Union	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F304				SEE REMARK C		UN		
Gasket	1/2	24	SB-ATI-PV009/5		150 LB	RF (125÷250 AARH)	—	B5F						GAS		

Object	Standard of design	Material	Constructive characteristic	Tag	Default	Mod
Screws for valves	ASME B 18.2.1/UNC	ASTM A 193 B7 Galvanized				
Stud Bolt + 2 Nuts	SB-ATI-PV008B/0 ASME B18.2.1 UNC/2.2 Tab.9	ASTM A 193 B7 / A 194 2H Galvanized			x	

DESMET - Ballestra		PIPING CLASS BRANCH	PROJ:	2F11	REV:	1	02/08/2012
PUMA5	02/08/2012 9.47.01		DOC:	2F11-15-190			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Branch Size	24	20	18	16	14	12	10	8	6	5	4	3	2M	2	1M	1Q	1	3Q	M	T8	Q	Branch	
24	I																					I	Pipe to Pipe
20	I	I																				TR	Tee Reducing
18	I	I	I																			TS	Tee Straight
16	I	I	I	I																			
14	I	I	I	I	I																		
12	I	I	I	I	I	I																	
10	I	I	I	I	I	I	I																
8	I	I	I	I	I	I	I	I															
6	I	I	I	I	I	I	I	I	I														
5	I	I	I	I	I	I	I	I	I	I													
4	I	I	I	I	I	I	I	I	I	I	I												
3	I	I	I	I	I	I	I	I	I	I	I	I											
2M	I	I	I	I	I	I	I	I	I	I	I	I	I										
2	I	I	I	I	I	I	I	I	I	I	I	I	I	I									
1M	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I								
1Q	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I							
1	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I						
3Q	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I					
M	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	TS				
T8	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	TS				
Q	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	TR	TS			

Sizes translation $Q=1/4$, $T8=3/8$, $M=1/2$, $3Q=3/4$, $1=1$, $1Q=1+1/4$, $1M=1+1/2$, $2=2$, $2M=2+1/2$, $3=3$, $4=4$, $5=5$, $6=6$, $8=8$, $10=10$, $12=12$, $14=14$, $16=16$, $18=18$, $20=20$, $24=24$

DESMET - Ballestra		PIPING CLASS NOTE	PROJ:	2F11	REV:	1	02/08/2012
PUMA5	02/08/2012 9.47.03		DOC:	2F11-15-190 - Sh. 11			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class: 215

Note:	SERVICE: SO3 LOW TEMP. (after SO3 filt.) - LIQUID RAW MATERIALS-SODIUM SULPHATE SOL. - SODIUM CHLORIDE SOL. - CAUSTIC SODA-AMMONIA SOL. - NONIONIC - METHYLESTER - DDBS - SULPH. FATTY ACIDS & ALCOHOLS - PROCESS WATER (after dept. filt.) - L.P. SLURRY (AISI) - DEMIN. WATER
	<p>SPECIAL PARTS:</p> <p>1) FLEXIBLE HOSES: SB-ATI-PV002/0</p> <p>2) INSULATION SPECIFICATION: SB-ATI-SP030/0</p> <p>3) EXPANSION JOINTS: FOR EQUIPMENTS ON LOAD CELLS TO USE GC33 - SB-ATI-PV004/0, P=0,3 kg/cm2</p> <p>4) WATER JACKETED PIPE: TO USE PIPING PROJECT SPECIFICATION 203, FOR TYPICAL DETAILS SEE SB-ATI-SP042/0</p> <p>GENERAL NOTES:</p> <p>1) FOR TYPICAL INSTRUMENTS CONNECTIONS SEE SB-ATI-PV001/0</p> <p>2) FOR TEST TYPE SEE SB-ATI-SP009/0 SB-ATI-SP010/0</p> <p>REMARKS:</p> <p>A) ON JACKETED PIPES USE FLANGES AS PER SB-ATI-SP042 (facing RF 125÷250 AARH - material: A182 F304)</p> <p>B) ON JACKETED PIPES USE THE REQUIRED PIECES BY SB-ATI-SP042</p> <p>C) USE ONLY FOR INSTRUMENTS, VENTS, DRAINS AND PRESSURE TAPS "P"</p> <p>D) FOR DN≥ 3/4" USE BRANCH CONNECTIONS PIPE-TO-PIPE</p> <p>E) USE ONLY WHEN DEEMED BY PROCESS DEPARTMENT</p> <p>F) USE FOR VENTS, DRAINS AND SAMPLING HATCHES ONLY</p> <p>G) USE AS BLOCK VALVE ONLY</p> <p>H) USE FOR PRESSURE TAPS "P" ONLY</p> <p>I) FOR DN 8" Maximum OPERATING PRESSURE CONDITION P=11.5 Bar</p> <p>REVISIONS:</p> <p>Rev. 0 - Date 15/03/2012 - ISSUED</p> <p>Rev. 1 - Date 02/08/2012 - REVISED SIZE RANGE AT VALVE B 80.</p>

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.53		DOC:	2F11-15-190 - Sh. 12			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
Piping class 216							
Client Reference			Branch Table I216				
Service SEE PIPING CLASS NOTE			Corrosion Allow 0.0 mm				
			Welding Spec. SB-ATI-SP006/0 SB-ATI-SP008/0				
Base Material 22 AISI 316			Applicable through				
Rating 0150 150 LB			Min Max				
Finish RF1 RF (125÷250 AARH)			Temperature °C 0 0				
Heat Treatment			Pressure Bar(g) 0 0				
Control level			Chgd Mod				
Note FOR SERVICE, SPECIAL PARTS, GENERAL NOTES, REMARKS AND REVISIONS SEE ON THE LAST SHEET							

P	Standard of design	Mod	Size	Thk.	Mod
I	3103 ASME B31.3/1992		1/4	2,24	
Temp. °C Press. Bar(g)			3/8	2,31	
150,0 15,00			1/2	2,77	
			3/4	2,87	
			1	3,38	
			1+1/4	3,56	
			1+1/2	3,68	
			2	3,91	
			2+1/2	2,11	
			3	2,11	
			4	2,11	
			5	2,77	
			6	2,77	
			8	2,77	
			10	3,4	
			12	3,96	
			14	3,96	
			16	4,19	

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.53		DOC:	2F11-15-190 - Sh. 12			

DESMET - Ballestra	SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
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Piping class 216

18	4,19
20	4,78
24	5,54

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.55		DOC:	2F11-15-190 - Sh. 12			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 216

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Pipe	1/4	2	ASME B36.19	PL	sch.40 S		Seamless	ASTM A 312 TP316						PIPE		
Pipe	2+1/2	24	ASME B36.19	PL	sch.5S		E.R.W.	ASTM A 312 TP316						PIPE		
Sight Glass	1/2	12	SB-ATI-VI020/0	FLG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 Gr. CF8M		FG 65				SGH		
Sight Glass	1/2	12	SB-ATI-VI017/0	FLG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 Gr. CF8M		FG 64				SGH		
Valve 3-Way	1/2	1+1/4	SB-ATI-VS031/0	LUG	150 LB	RF (125÷250 AARH)	Forged	ASTM A 182 Gr. F316		S 109				VB3		
Valve 3-Way	1+1/2	8	SB-ATI-VS025/0	LUG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 Gr. CF8M		S 103		SEE REMARK H		VB3		
Valve Ball Full Port	1/4	1+1/2	SB-ATI-VS020/0	THRD-F NPT	800#		Forged	ASTM A 182 Gr. F316		S 99		SEE REMARK F		VBF		
Valve Ball Full Port	1/2	6	SB-ATI-VS047/0	LUG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 Gr. CF8M		S 125				VBF		
Valve Ball Type Bottom	1/2	6	SB-ATI-VS049/0	LUG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 Gr. CF8M		S 126				VBTS		
Valve Butterfly	8	24	SB-ATI-VB025/0	WAFER	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 Gr. CF8M		B 81		SEE REMARK I AND E		VBY		
Valve Check	2	20	SB-ATI-VR043/0	WAFER	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 Gr. CF8M		R 102		SEE REMARK E		VCH		
Valve Check	3	20	SB-ATI-VR042/0	WAFER	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 Gr. CF8M Type 1		R 101				VCH		
Valve Check	8	20	SB-ATI-VR042/0	WAFER	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 Gr. CF8M Type 2		R 101		SEE REMARK E		VCH		
"Y" Valve Check	1/2	2+1/2	SB-ATI-VR028/0	FLG	150 LB	RF (125÷250 AARH)	Forged	ASTM A 182 Gr. F316		R 92				VCHY		
Valve Globe	1/4	1	SB-ATI-VD008/0	SW-F	800#		Forged	ASTM A 182 Gr. F316		D 62		SEE REMARK E		VGLO		
"Y" Valve Globe	1/2	2+1/2	SB-ATI-VD017/0	FLG	150 LB	RF (125÷250 AARH)	Forged	ASTM A 182 Gr. F304		D 75				VGLY		
Valve Plug	1/4	1	SB-ATI-VM001/0	THRD-F NPT	PN 16		Forged	ASTM A 182 Gr. F316		M 53		SEE REMARK G		VPLG		
Strainer Temporary	1	16	SB-ATI-PV006/0	WAFER	150 LB	FF (125÷250 AARH)	From Plate	ASTM A 570 Gr. 33		FT 15				STTMP		
Strainer Y-Type	1/2	6	SB-ATI-VF023/0	FLG	150 LB	RF (125÷250 AARH)	Cast	ASTM A 351 Gr. CF8M		F 72				STY		
Drip Ring	1/2	12	SB-ATI-PA006/0	WAFER	150 LB	FF (125÷250 AARH)	Forged	ASTM A 182 Gr. F316						BRIN		
Blind & Spacer	18	24	SB-ATI-PD004/0	WAFER	150 LB	FF (125÷250 AARH)	From Plate	ASTM A 240 Gr. TP316						BSPA		
Spectacle Blind	1/2	16	SB-ATI-PD004/0	WAFER	150 LB	FF (125÷250 AARH)	From Plate	ASTM A 240 Gr. TP316						BSPE		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.55		DOC:	2F11-15-190 - Sh. 12			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 216

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Flange Blind + Disk	1/2	24	ASME B16.5 - SB-ATI-PR007/0 (DISK)		150 LB	RF (125÷250 AARH)	Forged	FLG: ASTM A 105 Galvanized - DISK: A240 TYPE 316				SEE REMARK A		FLB		
Flange Lap-Joint	1/2	24	ASME B16.5		150 LB	Flat Face Smooth	Forged	ASTM A 105 Galvanized				SEE REMARK A		FLJ		
45° Elbow	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F316						45E		
45° Elbow	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F316				SEE REMARK C		45E		
45° Elbow Long Radius	3/4	2	ASME B16.9	BE	sch.40 S		Wrought S	ASTM A 403 Gr. WP316				SEE REMARK B		45ELR		
45° Elbow Long Radius	2+1/2	24	ASME B16.9	BE	sch.5S		Wrought W	ASTM A 403 Gr. WP316				SEE REMARK B		45ELR		
90° Elbow	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F316				SEE REMARK C		90E		
90° Elbow	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F316						90E		
90° Elbow Long Radius	3/4	2	ASME B16.9	BE	sch.40 S		Wrought S	ASTM A 403 Gr. WP316				SEE REMARK B		90ELR		
90° Elbow Long Radius	2+1/2	24	ASME B16.9	BE	sch.5S		Wrought W	ASTM A 403 Gr. WP316				SEE REMARK B		90ELR		
Reducer Concentric	3/4	2	ASME B16.9	BE	sch.40 S		Wrought S	ASTM A 403 Gr. WP316				SEE REMARK B		REDC		
Reducer Concentric	2+1/2	24	ASME B16.9	BE	sch.5S		Wrought W	ASTM A 403 Gr. WP316				SEE REMARK B		REDC		
Reducer Eccentric	3/4	2	ASME B16.9	BE	sch.40 S		Wrought S	ASTM A 403 Gr. WP316						REDE		
Reducer Eccentric	2+1/2	24	ASME B16.9	BE	sch.5S		Wrought W	ASTM A 403 Gr. WP316						REDE		
Tee Straight	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F316				SEE REMARK C		TEE		
Tee Straight	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F316				SEE REMARK B and D		TEE		
Tee Reducing	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F316				SEE REMARK C		TEER		
Tee Reducing	1/2	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F316				SEE REMARK B and D		TEER		
Reducing Insert M/F	1/4	1/2	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 182 Gr. F316		TYPE 13				BUS		
Reducing Insert M/F	1/4	1/2	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 182 Gr. F316		TYPE 12				BUS		
Reducing Insert M/F	1/4	1/2	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 182 Gr. F316		TYPE 11				BUS		
Reducing Insert M/F	1/4	1+1/2	SB-ATI-PR008/0	THRD-M NPT x THRD-F	3000#		Forged	ASTM A 182 Gr. F316				SEE REMARK C		BUS		
Cap	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F316						CAP		
Cap	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F316				SEE REMARK C		CAP		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.55		DOC:	2F11-15-190 - Sh. 12			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 216

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Cap	3/4	2	ASME B16.9	BE	sch.40 S		Wrought S	ASTM A 403 Gr. WP316						CAP		
Cap	2+1/2	24	ASME B16.9	BE	sch.5S		Wrought W	ASTM A 403 Gr. WP316						CAP		
Coupling	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F316				SEE REMARK C		CPL		
Coupling	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F316						CPL		
Coupling Half	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F316				SEE REMARK C		CPLH		
Coupling Half	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F316						CPLH		
Coupling Reducing	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F316				SEE REMARK C		CPLR		
Coupling Reducing	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F316						CPLR		
Cross Straight	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F316				SEE REMARK C		CRO		
Cross Straight	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F316						CRO		
Stub-End	1/2	2	MSS SP-43	BE	sch.40 S		Wrought S	ASTM A 403 Gr. WP316	Type A					FLSE		
Stub-End	2+1/2	24	MSS SP-43	BE	sch.5S		Wrought W	ASTM A 403 Gr. WP316	Type A					FLSE		
Plug Hex.	1/4	1+1/2	SB-ATI-PR008/0	THRD-M NPT	3000#		Forged	ASTM A 182 Gr. F316				SEE REMARK C		PLG		
Union	1/4	1/2	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 182 Gr. F316						UN		
Union	1/4	1+1/2	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 182 Gr. F316				SEE REMARK C		UN		
Gasket	1/2	24	SB-ATI-PV009/5		150 LB	RF (125÷250 AARH)	—	B5F						GAS		

Object	Standard of design	Material	Constructive characteristic	Tag	Default	Mod
Screws for valves	ASME B 18.2.1/UNC	ASTM A 193 B7 Galvanized				
Stud Bolt + 2 Nuts	SB-ATI-PV008B/0 ASME B18.2.1 UNC/2.2 Tab.9	ASTM A 193 B7 / A 194 2H Galvanized			x	

DESMET - Ballestra		PIPING CLASS BRANCH	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.58		DOC:	2F11-15-190			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 216

Branch Table I216

Chgd

[illegible]

Run Size

Sizes translation $Q=1/4$, $T8=3/8$, $M=1/2$, $3Q=3/4$, $1=1$, $1Q=1+1/4$, $1M=1+1/2$, $2=2$, $2M=2+1/2$, $3=3$, $4=4$, $5=5$, $6=6$, $8=8$, $10=10$, $12=12$, $14=14$, $16=16$, $18=18$, $20=20$, $24=24$

DESMET - Ballestra		PIPING CLASS NOTE	PROJ:	2F11	REV:	0	15/03/2012
PUMA5	15/03/2012 15.40.59		DOC:	2F11-15-190 - Sh. 12			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: Inc	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class: 216

Note:	SERVICE: DDB & DDBS NEUTRALIZED - FATTY ACIDS - SODIUM SULPHITE - L.P. PERFUME - SOAP & NEUTRALIZED FATTY ACIDS AND ALCOHOLS - SULPHONATED & NEUTRALIZED METHYLESTER - DEMINERALIZED WATER
	<p>SPECIAL PARTS:</p> <p>1) FLEXIBLE HOSES: SB-ATI-PV002/0</p> <p>2) INSULATION SPECIFICATION: SB-ATI-SP030/0</p> <p>3) EXPANSION JOINTS: FOR EQUIPMENTS ON LOAD CELLS TO USE GC33 - SB-ATI-PV004/0, P=0,3 kg/cm2</p> <p>4) WATER JACKETED PIPE: TO USE PIPING PROJECT SPECIFICATION 203, FOR TYPICAL DETAILS SEE SB-ATI-SP042/0</p> <p>GENERAL NOTES:</p> <p>1) FOR TYPICAL INSTRUMENTS CONNECTIONS SEE SB-ATI-PV001/0</p> <p>2) FOR TEST TYPE SEE SB-ATI-SP009/0 SB-ATI-SP010/0</p> <p>REMARKS:</p> <p>A) ON JACKETED THE PIPES USE FLANGES AS PER SB-ATI-SP042/0 (Facing RF 125÷250 AARH - Material A182 F316)</p> <p>B) ON JACKETED THE PIPES USE THE REQUIRED PIECES BY SB-ATI-SP042/0</p> <p>C) USE ONLY FOR INSTRUMENTS, VENTS, DRAINS AND PRESSURE TAPS "P"</p> <p>D) FOR DN ≥ 3/4" USE BRANCH CONNECTIONS PIPE-TO-PIPE</p> <p>E) USE ONLY WHEN DEEMED BY PROCESS DEPARTMENT</p> <p>F) USE FOR VENTS, DRAINS AND SAMPLING HATCHES ONLY</p> <p>G) USE FOR PRESSURE TAPS "P" ONLY</p> <p>H) FOR DN 8" MAXIMUM OPERATING PRESSURE CONDITION P=11.5 Bar</p> <p>I) USE AS BLOCK VALVE AND HAND CONTROL VALVE</p> <p>REVISIONS:</p> <p>Rev. 0 - Date 15/03/2012 - ISSUED</p>

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	0	02/08/2012											
PUMA5	02/08/2012 9.13.42		DOC:	2F11-15-190 - Sh. 13														
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm											
Piping class 125																		
Client Reference Service ENZYME DOWNFALL			Branch Table Corrosion Allow 0.0 mm Welding Spec. SB-ATI-SP006/0 SB-ATI-SP008/0															
Base Material 21 AISI 304 Rating * * Finish FF9 FF Smooth Heat Treatment Control level			Applicable through <table><tr><td></td><td>Min</td><td>Max</td></tr><tr><td>Temperature °C</td><td>0</td><td>0</td></tr><tr><td>Pressure Bar(g)</td><td>0</td><td>0</td></tr></table> <table><tr><td>Chgd</td><td>Mod</td></tr></table>						Min	Max	Temperature °C	0	0	Pressure Bar(g)	0	0	Chgd	Mod
	Min	Max																
Temperature °C	0	0																
Pressure Bar(g)	0	0																
Chgd	Mod																	
Note FOR SPECIAL PARTS, GENERAL NOTES, REMARKS AND REVISIONS SEE ON THE LAST SHEET																		

P	Standard of design	Mod	Size	Thk.	Mod
I	3103	ASME B31.3/1992	8	2,24	
	Temp. °C	Press. Bar(g)	10	2,31	
	120,0	0,10	15	2,77	
			20	2,87	
			25	3,38	
			50	3,0	
			65	3,0	
			80	3,0	
			100	3,0	
			125	3,0	
			150	3,0	
			200	3,0	
			250	3,0	
			300	3,0	
			350	3,0	
			400	3,0	
			450	3,0	
			500	3,0	

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	0	02/08/2012
PUMA5	02/08/2012 9.13.42		DOC:	2F11-15-190 - Sh. 13			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
Piping class 125							
600		3,0					

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	02/08/2012
PUMA5	02/08/2012 9.13.44		DOC:	2F11-15-190 - Sh. 13			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 125

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Pipe	8	25	ASME B36.19	PL		sch.40	Seamless	ASTM A 312 TP304				SEE REMARK A		PIPE		
Pipe	50	600	SB-ATI-PT007/0	PL			From Plate	ASTM A 240 Gr. TP304						PIPE		
Flange Lap-Joint	50	600	SB-ATI-PF012/0		*	SB-ATI-PF012 FF Smooth	From Plate	Fe 360 B - UNI 7070 - Galvanized						FLJ		
45° Elbow	8	40	SB-ATI-PR008/0	THRD-F NPT		3000#	Forged	ASTM A 182 Gr. F304				SEE REMARK A		45E		
90° Elbow	8	40	SB-ATI-PR008/0	THRD-F NPT		3000#	Forged	ASTM A 182 Gr. F304				SEE REMARK A		90E		
Reducer Concentric	50	600	SB-ATI-PR003/0	BE			From Plate	ASTM A 240 Gr. TP304						REDC		
Reducer Eccentric	50	600	SB-ATI-PR003/0	BE			From Plate	ASTM A 240 Gr. TP304						REDE		
Tee Straight	8	40	SB-ATI-PR008/0	THRD-F NPT		3000#	Forged	ASTM A 182 Gr. F304				SEE REMARK A		TEE		
Tee Reducing	15	40	SB-ATI-PR008/0	THRD-F NPT		3000#	Forged	ASTM A 182 Gr. F304				SEE REMARK A		TEER		
Reducing Insert M/F	8	40	SB-ATI-PR008/0	THRD-M NPT x THRD-F		3000#	Forged	ASTM A 182 Gr. F304				SEE REMARK A		BUS		
Cap	8	40	SB-ATI-PR008/0	THRD-F NPT		3000#	Forged	ASTM A 182 Gr. F304				SEE REMARK A		CAP		
Coupling	8	40	SB-ATI-PR008/0	THRD-F NPT		3000#	Forged	ASTM A 182 Gr. F304				SEE REMARK A		CPL		
Coupling Half	8	40	SB-ATI-PR008/0	THRD-F NPT		3000#	Forged	ASTM A 182 Gr. F304				SEE REMARK A		CPLH		
Coupling Reducing	8	40	SB-ATI-PR008/0	THRD-F NPT		3000#	Forged	ASTM A 182 Gr. F304				SEE REMARK A		CPLR		
Cross Straight	8	40	SB-ATI-PR008/0	THRD-F NPT		3000#	Forged	ASTM A 182 Gr. F304				SEE REMARK A		CRO		
Stub-End	50	600	SB-ATI-PF009/0	BE			From Plate	ASTM A 240 Gr. TP304						FLSE		
Plug Hex.	8	40	SB-ATI-PR008/0	THRD-M NPT		3000#	Forged	ASTM A 182 Gr. F304				SEE REMARK A		PLG		
Union	8	40	SB-ATI-PR008/0	THRD-F NPT		3000#	Forged	ASTM A 182 Gr. F304				SEE REMARK A		UN		
Gasket	50	600	SB-ATI-PV009/5		*	SB-ATI-PF012 FF Smooth	—	A9C	FLAT-RING					GAS		
Object	Standard of design		Material		Constructive characteristic		Tag		Default		Mod					
Machine Bolt + 1 Nut			SB-ATI-PV008A/0 - UNI 5727 + UNI 5592 4.6 UNI 3740 Galvanized + 4A UNI 3740 Galvanized x													

DESMET - Ballestra		PIPING CLASS NOTE	PROJ:	2F11	REV:	0	02/08/2012
PUMA5	02/08/2012 9.13.45		DOC:	2F11-15-190 - Sh. 13			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class: 125

Note:

SPECAL PARTS:
1) FOR DIVERTING AND/OR SLEEVE VALVES SEE BALLESTRA'S STANDARD

GENERAL NOTES:
1) FOR TYPICAL INSTRUMENTS CONNECTIONS SEE SB-ATI-PV001/0
2) FOR TEST TYPE SEE SB-ATI-SP009/0 SB-ATI-SP010/0
3) FOR ELBOWS USE CUT PIPES WITH SLOPE 38 DG. OR LESS

REMARKS:
A) USE FOR INSTRUMENTS ONLY

REVISIONS:
Rev. 0 - Date 02/08/2012 - ISSUED

DESMET - Ballestra		PIPING CLASS	PROJ:	2F11	REV:	0	02/08/2012
PUMA5	02/08/2012 9.13.48		DOC:	2F11-15-190 - Sh. 14			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm
Piping class 126							
Client Reference			Branch Table I126				
Service H.P. SLURRY - H.P. PROCESS AIR			Corrosion Allow 1.27 mm				
			Welding Spec. SB-ATI-SP006/0 SB-ATI-SP007/0				
Base Material 11 CARBON STEEL			Applicable through				
Rating 0600 600 LB			Min Max				
Finish LM1 LM (125÷250 AARH)			Temperature °C 0 0				
Heat Treatment			Pressure Bar(g) 0 0				
Control level			Chgd Mod				
Note FOR SPECIAL PARTS, GENERAL NOTES, REMARKS AND REVISIONS SEE ON THE LAST SHEET							

P	Standard of design	Mod	Size	Thk.	Mod
I	3103 ASME B31.3/1992		8	2,24	
Temp. °C Press. Bar(g)			10	2,31	
80,0 98,00			15	2,77	
			20	2,87	
			25	3,38	
			32	3,56	
			40	3,68	
			50	3,91	
			65	5,16	
			80	5,49	
			100	6,02	
			125	9,53	
			150	10,97	

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	02/08/2012
PUMA5	02/08/2012 9.13.50		DOC:	2F11-15-190 - Sh. 14			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 126

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Pipe	8	150	ASME B36.10	PL			Seamless	ASTM A 106 Gr. B						PIPE		
Valve Ball Full Port	15	100	SB-ATI-VS070/0	LUG	600 LB	LF (125÷250 AARH)	Forged	CARBON STEEL		S 148				VBF		
Valve Check	15	25	SB-ATI-VR007/0	FLG	600 LB	LF (125÷250 AARH)	Forged	ASTM A 105		R 59		SEE REMARK D		VCH		
Valve Gate	8	50	SB-ATI-VG001/0	SW-F	800#		Forged	ASTM A 105		G 61		SEE REMARK C		VGAT		
Flange Slip-On	15	150	ASME B16.5		600 LB	LM (125÷250 AARH)	Forged	ASTM A 105						FLS		
Flange Slip-On	15	150	ASME B16.5		600 LB	LF (125÷250 AARH)	Forged	ASTM A 105						FLS		
45° Elbow	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						45E		
45° Elbow	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		45E		
45° Elbow Long Radius	20	150	ASME B16.9	BE			Wrought S	ASTM A 234 Gr. WPB						45ELR		
90° Elbow	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						90E		
90° Elbow	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		90E		
90° Elbow Long Radius	20	150	ASME B16.9	BE			Wrought S	ASTM A 234 Gr. WPB						90ELR		
Reducer Concentric	20	150	ASME B16.9	BE			Wrought S	ASTM A 234 Gr. WPB						REDC		
Reducer Eccentric	20	100	ASME B16.9	BE			Wrought S	ASTM A 234 Gr. WPB						REDE		
Tee Straight	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		TEE		
Tee Straight	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105				SEE REMARK B		TEE		
Tee Reducing	15	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105				SEE REMARK B		TEER		
Tee Reducing	15	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		TEER		
Reducing Insert M/F	8	15	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 13				BUS		
Reducing Insert M/F	8	50	SB-ATI-PR008/0	THRD-M NPT x THRD-F	3000#		Forged	ASTM A 105						BUS		
Reducing Insert M/F	8	15	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 12				BUS		
Reducing Insert M/F	8	15	SB-ATI-PR007/0	SW-F x PL	3000#		Forged	ASTM A 105		TYPE 11				BUS		
Cap	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		CAP		
Cap	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CAP		
Cap	20	150	ASME B16.9	BE			Seamless	ASTM A 234 Gr. WPB						CAP		
Coupling	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPL		
Coupling	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		CPL		
Coupling Half	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		CPLH		
Coupling Half	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPLH		

DESMET - Ballestra		PIPING CLASS DETAIL	PROJ:	2F11	REV:	0	02/08/2012
PUMA5	02/08/2012 9.13.50		DOC:	2F11-15-190 - Sh. 14			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 126

Object	From From	To (M) To (R)	Standard of design	End	Rat.	Finish	Construction	Material	Constructive Characteristic	Tag	Thk.	Note	Eqp. Coll.	Alias.	Pos.	Mod
Coupling Reducing	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		CPLR		
Coupling Reducing	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CPLR		
Cross Straight	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		CRO		
Cross Straight	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						CRO		
Plug Hex.	8	50	SB-ATI-PR008/0	THRD-M NPT	3000#		Forged	ASTM A 105				SEE REMARK A		PLG		
Union	8	15	SB-ATI-PR007/0	SW-F	3000#		Forged	ASTM A 105						UN		
Union	8	50	SB-ATI-PR008/0	THRD-F NPT	3000#		Forged	ASTM A 105				SEE REMARK A		UN		
Gasket	15	150	SB-ATI-PV009/5		600 LB		–	B4C						GAS		

Object	Standard of design	Material	Constructive characteristic	Tag	Default	Mod
Screws for valves	ASME B 18.2.1/UNC	ASTM A 193 B7				
Stud Bolt + 2 Nuts	SB-ATI-PV008B/0 ASME B18.2.1 UNC/2.2 Tab.9	ASTM A 193 B7 / A 194 Gr.2H			x	

DESMET - Ballestra		PIPING CLASS BRANCH	PROJ:	2F11	REV:	0	02/08/2012
PUMA5	02/08/2012 9.13.52		DOC:	2F11-15-190			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class 126

Branch Table I126

Chgd

[illegible]

Sizes translation Q=8, T8=10, M=15, 3Q=20, 1=25, 1Q=32, 1M=40, 2=50, 2M=65, 3=80, 4=100, 5=125, 6=150

DESMET - Ballestra		PIPING CLASS NOTE	PROJ:	2F11	REV:	0	02/08/2012
PUMA5	02/08/2012 9.13.53		DOC:	2F11-15-190 - Sh. 14			
DESMET - Ballestra		SABIZ 8000 kg/h	Size: mm	Thk: mm	Temp: °C	Pres: Bar(g)	Corr: mm

Piping Class: 126

Note:	SPELAL PARTS:
	1) INSULATION SPECIFICATION: SB-ATI-SP030/0
	GENERAL NOTES:
	1) FOR TYPICAL INSTRUMENTS CONNECTIONS SEE SB-ATI-PV001/0
	2) FOR TEST TYPE SEE SB-ATI-SP009/0 SB-ATI-SP010/0
	REMARKS:
	A) USE ONLY FOR INSTRUMENTS, VENTS AND DRAINS
	B) FOR DN \geq 20 USE BRANCH CONNECTIONS PIPE-TO-PIPE
	C) USE FOR STEAM NOZZLES CIRCUIT ONLY
	D) USE ONLY WHEN DEEMED BY PROCESS DEPARTMENT
	REVISIONS:
	Rev. 0 - Date 02/08/2012 - ISSUED