PROCESS FM

blutop FM

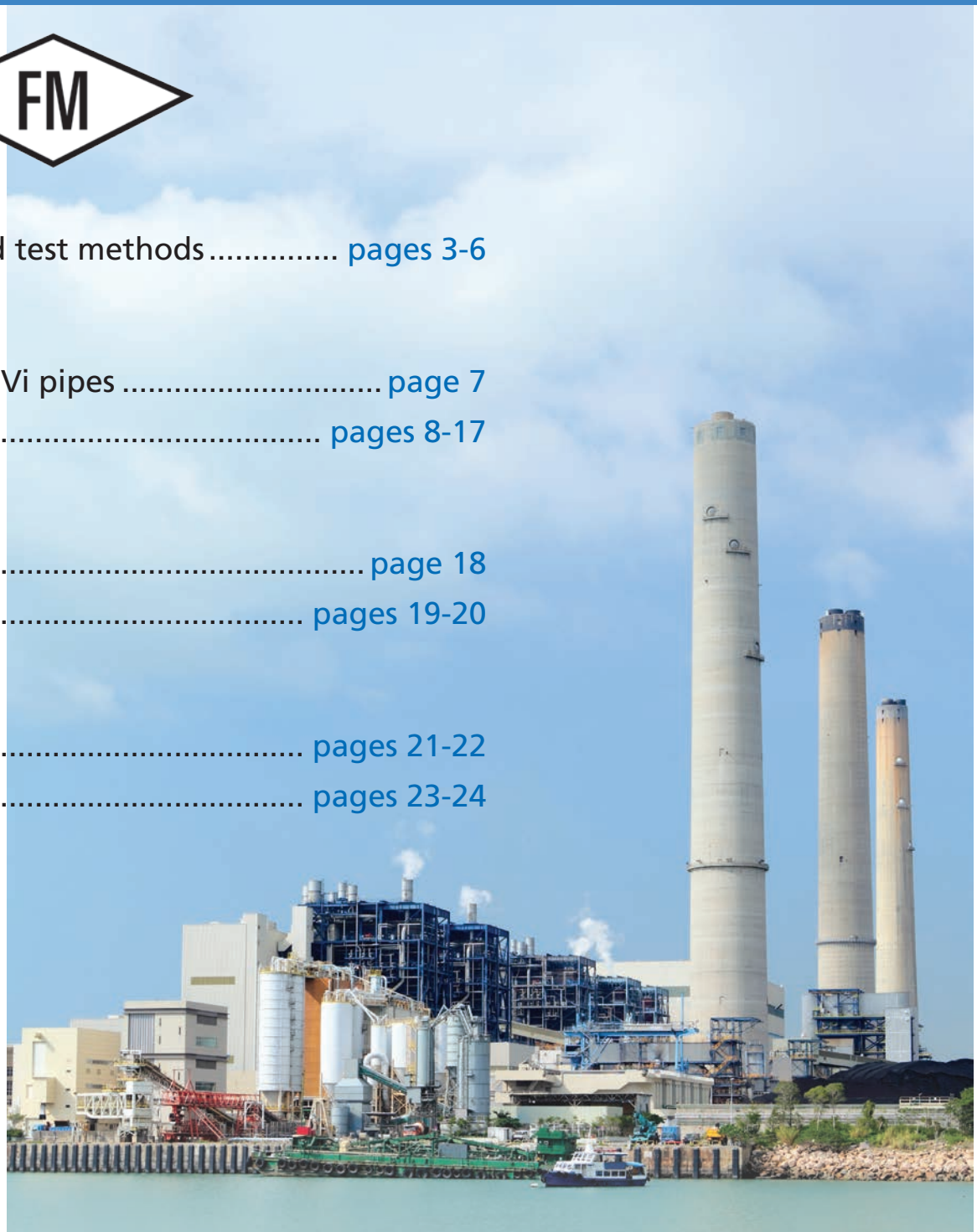
DUCTILE IRON PIPELINE

Pipes – Fittings – Valves for fire protection of industrial sites and public equipments

Comprehensive pipe solutions

PAM SAINT-GOBAIN

contents

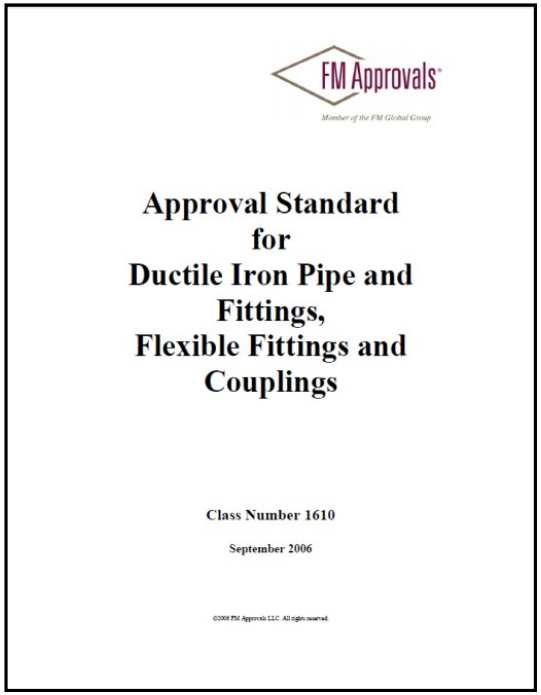


KEY POINTS OF THE RANGE :
DUCTILE IRON, BACKBONE OF PIPEWORKS FOR FIRE PROTECTION

- Ductile iron pipes and fittings are vital components of fire protection networks, with valves, pillar hydrants and aerial sprinklers networks.
- All of these components , individually tested and approved by FM, form a fire protection system with a high level of performance required for any industrial site.
- Ductile iron pipes and fittings run through all areas and irrigate all installations and buildings of plants. Their resistance to physical and chemical stresses, and pressure is crucial.
- Ductile iron is the REFERENCE material of FM underground networks.

KEY POINTS OF THE RANGE : CONFORMITY, CONTROLS

- Pipes and fittings approved by FM approval standard conform to the EN 545 first.
- However, the FM certification referential specifies paticular requirements and test methods, aiming at testing the complete capacity of pipes and fittings, with other components, the overall reliability and effectiveness of the fire protection system.
- The FM CN 1610 approval standard completes the EN 545 standard, by adding some specific performance requirements, for example :
  - The Minimum Rated Working Pressure (RWP) is 12.05 bar
  - The specified test pressures are a multiple (x2 and x4) of the RWP
  - Over the RWP value, the manufacturer has the possibility to test and have certified products with values above 12.05 bar
  - This volontary process also requires to test with 2 and 4x the targed certified performance .


FM Approvals
Member of the FM Global Group

Approval Standard
for
Ductile Iron Pipe and
Fittings,
Flexible Fittings and
Couplings

Class Number 1610

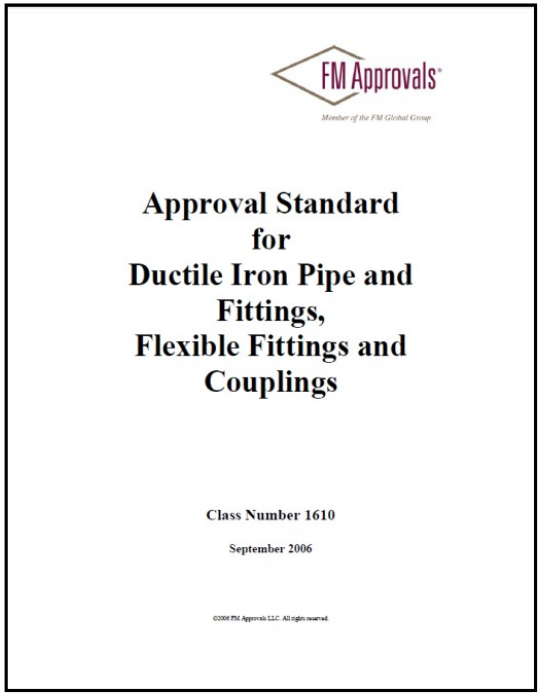
September 2006

FM tests of Process and Process VI pipes and fittings

KEY POINTS OF THE OFFER : CONFORMITY, CONTROLS

- The FM requirements and tests are complementary to the EN 545 standard.
- The certification requirements are specific.

EN 545	FM CN 1610
PFA, vary from 40 to 30 bar depending on the DN (from 100 up to 400)	Rated Working Pressure (RWP): 12.05 bar
Tightness of the joints to the pressure	
1.5 x PFA + 5 bar	**RWPx 2 --> 12.05 x 2= 24.1 bar minimum**
Tests at maximum annulus and maximum deflection with shearing effect during 2 hours	Tests at maximum deflection and gap values during 5mn
Resistance of hydrostatic pressure	
non applicable	**RWP X 4 --> 12.05 X 4 = 48.2 bar minimum**
	Tests at maximum angulard deflection during 5 mn
	RWP > 12.05 bar: at the choice of the manufacturer



FM tests for Blutop® pipes and fittings

KEY POINTS OF THE RANGE : HIGH CERTIFIED PERFORMANCE

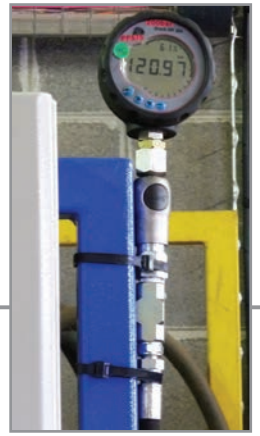
- SG PAM ranges approved by the FM approvals offer high performances above the minimum requirements of the FM approval standard.
- In this way, they offer a great level of performance, durability and reliability, and provide to the engineers, site owners and their fire departements with a great safety margins, whereas ensuring a useful adaptation to any changes of fire protection systems.
- For example, a PROCESS pipe approved by FM with a 30 bar RWP is tested at 120 bar.

FM APPROVED

Certificate of Compliance

Description	Nominal Pipe Size, mm.	Rated Working Pressure bar (psi)	Notes: (see end of listing)
Pipe			
Standard Pipe			
Standard Push-On (unrestrained)	100 through 300	25 (363)	
Standard Vi self-restrained gasket	100, 125	20 (290)	
	150	16 (232)	
	200, 250, 300	14 (203)	
"Process" Pipe			
Pipe, Unrestrained (Push-On)	100	27.5 (400)	
Pipe, Unrestrained (Push-On)	150	27.5 (400)	
Pipe, Unrestrained (Push-On)	200	30 (440)	
Pipe, Unrestrained (Push-On)	250	27.5 (400)	
Pipe, Unrestrained (Push-On)	300	27.5 (400)	
Pipe, Unrestrained (Push-On)	400	21.25 (308)	

Extract of the compliance certificate to the FM 1610 approvals standards regarding the Process range (table below)
View of the DN200 pressure testing device's dial



FM Approvals

Not to be distributed outside of FM Approvals and its affiliates except by Customer

APPROVAL REPORT

Project No:	0003055922 Reissue 1
Class:	1610
Product Name:	Ductile Iron Pipe and Fittings
Product Type:	Ductile Iron Pipe and Fittings
Name of Listing Company:	Saint-Gobain PAM
Address of Listing Company:	21 Avenue Camille Cavallier 54700 Pont-a-Mousson, France
Customer ID:	1000001419-5
Customer website	www.saint-gobain.com

Prepared by
Bruce D. Wood
Senior Engineer

Reviewed by
Stanley M. Ziobro
Technical Team Manager

David B. Fuller
AVP, Manager - Fire Protection

October 2, 2015
Date of Approval

May 31, 2016
Date of Reissue

FM Approvals
1151 Boston-Providence Turnpike
PO Box 9102
Norwood, MA 02062

Page 1 of 10

KEY POINTS OF THE RANGE :
ADAPTED SOLUTIONS FOR ALL THE FIRE NETWORKS CONFIGURATIONS

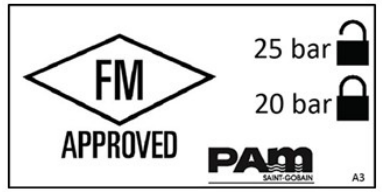
- SGPAM ranges of pipes and fittings for the fire protection pipeworks, based on installation needs.
  - 1 - PROCESS : from DN 100 up to DN 400, achievement of not restrained networks
  - 2 - PROCESS Vi : from DN 100 up to DN 400, specific pipes and joints with inserts allow achieving restrained networks when layouts or installations conditions require it
- The fittings of PROCESS and PROCESS Vi are identical. They are both avaible on Epoxy cataphoresis 70 µm coating and on Epoxy powder 250 µm coating.
  - 3 - BLUTOP®: DN/OD 110 & 160: Ductile iron pipes with a diameter compatible with alternative solutions in PE. Specific fittings, Epoxy Powder 250 µm coating

KEY POINTS OF THE OFFER :
A CLEAR AND COMPREHENSIVE MARKING OF THE CERTIFIED PRODUCTS AND CHARACTERISTICS

- Pipes: individual ink-jet marking, with certified pressures and a restrained and not restrained icon (A).
- Fittings: individuel highly resistant label with certified restrained and not restrained pressures icon (B).

A

B



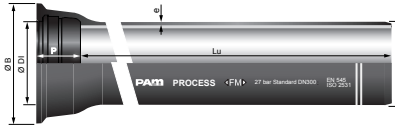
All FM approval documents (plants and products) are available to download at www.pamline.com

«PROCESS» pipes with Standard gasket DN100-400

For ductile iron pipeworks for fire protection (not restrained).

Pressure strength tested according to FM Approval Class Number 1610, including specific watertightness test of joints and mechanical resistance (hydrostatic) pressure test.
In compliance with EN545 for the other normative requirements.
References and prices of pipes do not include the supplies and the prices of joints.

DN	Lu	Pressure not restrained certified by FM	Ø DE	Ø DI	P	Ø B	metric mass	reference
mm	*m*	*bar*	*mm*	*mm*	*mm*	*mm*	*kg/m*	
100	6	27.5	117.8	121.4	94.5	188.0	14.85	251912
150	6	27.5	169.7	173.4	100.5	242.0	22.15	253563
200	6	30	221.6	225.2	106.5	295.0	30.20	251915
250	6	27.5	273.0	276.8	105.5	352.0	42.21	251938
300	6	27.5	324.9	328.8	107.5	409.2	55.55	251937
400	6	21.25	427.7	431.9	112.5	516.2	79.40	251935



«PROCESS» Vi pipes with Standard Vi gasket

For restrained ductile iron pipeworks for fire protection (Vi).

Pressure strength tested according to FM Approval Class Number 1610, including specific watertightness test of joints and mechanical resistance (hydrostatic) pressure test.
In compliance with EN545 for the other normative requirements.
References and prices of pipes do not include the supplies and the prices of joints.

DN	Lu	Pressure VI certified by FM	Ø DE	Ø DI	P	Ø B	metric mass	reference
mm	*m*	*bar*	*mm*	*mm*	*mm*	*mm*	*kg/m*	
100	6	18	117.8	121.4	94.5	188.0	17.25	253549
150	6	19	169.7	173.4	100.5	242.0	25.70	251934
200	6	19	221.6	225.2	106.5	295.0	33.50	251932
250	6	16	273.0	276.8	105.5	352.0	47.43	251930
300	6	14	324.9	328.8	107.5	409.2	63.85	251929
400	6	13	427.7	431.9	112.5	516.2	91.30	251927

- External coating: zinc-aluminium alloy (85/15, 400g/m², [except DN 100: zinc 200g/m²]) + black coating.
- Internal coating: cement mortar.

«PROCESS» joints for not-restraint purpose

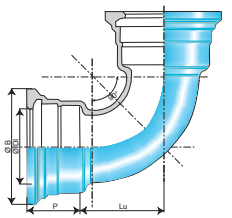
DN	Pressure not restrained certified by FM	reference
mm	*bar*	
100	27.5	JSB10BA
150	27.5	JSB15BA
200	30	JSB20BA
250	27.5	JSB25BA
300	27.5	JSB30BA
400	21.25	JSB40BA

«PROCESS» Vi insert joints for restraint purpose

DN	Pressure VI certified by FM	reference
mm	*bar*	
100	18	JSB10CA
150	19	JSB15DA
200	19	JSB20DA
250	16	JSB25DA
300	14	JSB30CA
400	13	JSB40CA

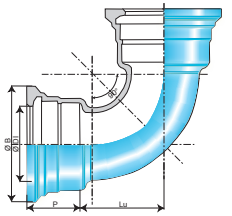
90° (1/4) bend with Standard joint

DN	Lu	P	Ø DI	Ø B	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference
mm	mm	mm	mm	mm	kg	bar	bar			
100	105	88	121.4	187.5	10.0	25	20	SSB10CA00NNF	A3	SSB10CA00TTF
150	152.5	94	173.4	241.0	18.1	25	16	SSB15CA00NNF	A4	SSB15CA00TTF
200	200	100	225.5	294.0	29.2	25	14	SSB20CA00NNF	A5	SSB20CA00TTF
250	252	105	277.3	351.0	49.6	25	14	SSB25CA00NNF	A5	SSB25CA00TTF
300	304	110	329.3	408.3	72.7	25	14	SSB30CA00NNF	A5	SSB30CA00TTF
400	436	112	432.4	515.3	141.0	15	12	SSB40CA00NNF	D2	SSB40CA00TTF



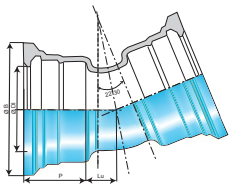
45° (1/8) bend with Standard joint

DN	Lu	P	Ø DI	Ø B	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference
mm	mm	mm	mm	mm	kg	bar	bar			
100	65	88	121.4	187.5	8.9	25	20	SSB10CB00NNF	A3	SSB10CB00TTF
150	92.5	94	173.4	241.0	15.6	25	16	SSB15CB00NNF	A4	SSB15CB00TTF
200	100	100	225.5	294.0	23.7	25	14	SSB20CB00NNF	A5	SSB20CB00TTF
250	136	105	277.3	351.0	40.5	25	14	SSB25CB00NNF	A5	SSB25CB00TTF
300	167.5	110	329.3	408.0	59.0	25	14	SSB30CB00NNF	A5	SSB30CB00TTF
400	189	112	432.4	515.3	88.5	15	12	SSB40CB00NNF	D2	SSB40CB00TTF



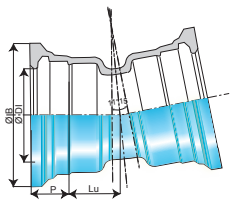
22.5° (1/16) bend with Standard joint

DN	Lu	P	Ø DI	Ø B	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference
mm	mm	mm	mm	mm	kg	bar	bar			
100	35	88	121.4	187.5	7.8	25	20	SSB10CD00NNF	A3	SSB10CD00TTF
150	42	94	173.4	241.0	12.2	25	16	SSB15CD00NNF	A4	SSB15CD00TTF
200	51	100	225.5	294.0	18.9	25	14	SSB20CD00NNF	A5	SSB20CD00TTF
250	70	105	277.3	351.0	32.2	25	14	SSB25CD00NNF	A5	SSB25CD00TTF
300	70	110	329.3	408.3	42.2	25	14	SSB30CD00NNF	A5	SSB30CD00TTF
400	92	112	432.4	515.3	68.7	15	12	SSB40CD00NNF	D2	SSB40CD00TTF



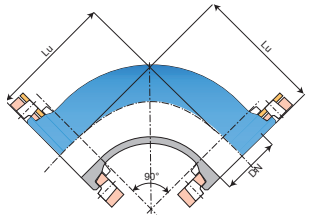
11.25° (1/32) bend with Standard joint

DN	Lu	P	Ø DI	Ø B	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference
mm	mm	mm	mm	mm	kg	bar	bar			
100	40	88	121.4	187.5	7.9	25	20	SSB10CE00NNF	A3	SSB10CE00TTF
150	46	94	173.4	241.0	12.6	25	16	SSB15CE00NNF	A4	SSB15CE00TTF
200	52	100	225.5	294.0	19.2	25	14	SSB20CE00NNF	A5	SSB20CE00TTF
250	55	105	277.3	351.0	30.5	25	14	SSB25CE00NNF	A5	SSB25CE00TTF
300	50	110	329.3	408.3	39.7	25	14	SSB30CE00NNF	A5	SSB30CE00TTF
400	58	112	432.4	515.3	61.5	15	12	SSB40CE00NNF	D2	SSB40CE00TTF



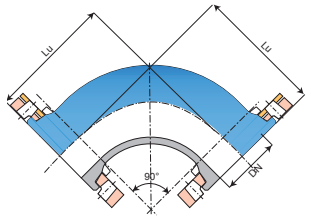
Flanged 90° (1/4) bend with mobile flanges PN16

DN	Lu	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference	
mm	mm	kg	bar					
100	180	14.0	16	16	BAB10CA10NNF	C	BAB10CA10TTF	
150	220	25.0	16	16	BAB15CA10NNF	C	BAB15CA10TTF	
200	260	40.5	16	16	BAB20CA20NNF	C	BAB20CA20TTF	
250	350	64.0	16	16	BAB25CA20NNF	C	BAB25CA20TTF	
300	400	91.0	16	16	BAB30CA20NNF	C	BAB30CA20TTF	



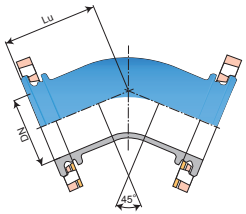
Flanged 90° (1/4) bend with mobile flanges PN25

DN	Lu	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference	
mm	mm	kg	bar					
100	180	14.0	25	25	BAB10CA30NNF	A2	BAB10CA30TTF	
150	220	25.0	25	25	BAB15CA30NNF	A2	BAB15CA30TTF	
200	260	40.5	25	25	BAB20CA30NNF	A2	BAB20CA30TTF	
250	350	64.0	25	25	BAB25CA30NNF	A2	BAB25CA30TTF	
300	400	91.0	25	25	BAB30CA30NNF	A2	BAB30CA30TTF	
400	500	171.5	15	25	BAB40CA30NNF	D	BAB40CA30TTF	



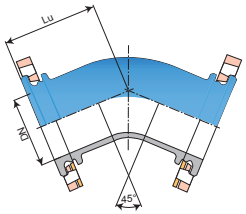
Flanged 45° (1/8) bend with mobile flanges PN16

DN	Lu	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference	
mm	mm	kg	bar					
100	140	13.6	16	16	BAB10CB10NNF	C	BAB10CB10TTF	
150	109.0	23.0	16	16	BAB15CB10NNF	C	BAB15CB10TTF	
200	131.0	34.0	16	16	BAB20CB20NNF	C	BAB20CB20TTF	
250	190.0	52.9	16	16	BAB25CB20NNF	C	BAB25CB20TTF	
300	210.0	73.3	16	16	BAB30CB20NNF	C	BAB30CB20TTF	



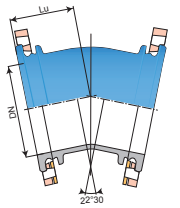
Flanged 45° (1/8) bend with mobile flanges PN25

DN	Lu	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference	
mm	mm	kg	bar					
100	140	13.6	25	25	BAB10CB30NNF	A2	BAB10CB30TTF	
150	109.0	23.0	25	25	BAB15CB30NNF	A2	BAB15CB30TTF	
200	131.0	34.0	25	25	BAB20CB30NNF	A2	BAB20CB30TTF	
250	190.0	52.9	25	25	BAB25CB30NNF	A2	BAB25CB30TTF	
300	210.0	73.3	25	25	BAB30CB30NNF	A2	BAB30CB30TTF	
400	237.5	133.0	15	25	BAB40CB30NNF	D	BAB40CB30TTF	



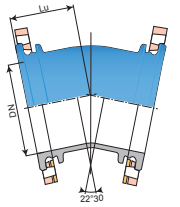
Flanged 22° (1/16) bend with mobile flanges PN16

DN	Lu	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference	
mm	mm	kg	bar					
100	110.0	12.0	16	16	BAB10CD10NNF	C	BAB10CD10TTF	
150	109.0	20.4	16	16	BAB15CD10NNF	C	BAB15CD10TTF	
200	131.0	30.0	16	16	BAB20CD20NNF	C	BAB20CD20TTF	
250	190.0	48.0	16	16	BAB25CD20NNF	C	BAB25CD20TTF	
300	210.0	65.5	16	16	BAB30CD20NNF	C	BAB30CD20TTF	



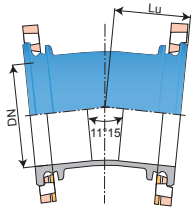
Flanged 22° (1/16) bend with mobile flanges PN25

DN	Lu	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference	
mm	mm	kg	bar					
100	110.0	12.0	25	25	BAB10CD30NNF	A2	BAB10CD30TTF	
150	109.0	20.4	25	25	BAB15CD30NNF	A2	BAB15CD30TTF	
200	131.0	30.0	25	25	BAB20CD30NNF	A2	BAB20CD30TTF	
250	190.0	48.0	25	25	BAB25CD30NNF	A2	BAB25CD30TTF	
300	210.0	65.5	25	25	BAB30CD30NNF	A2	BAB30CD30TTF	
400	237.5	113.0	15	25	BAB40CD30NNF	D	BAB40CD30TTF	



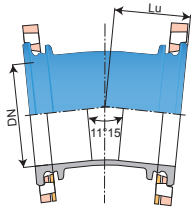
Flanged 11.25° (1/32) bend with mobile flanges PN16

DN	Lu	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference	
mm	mm	kg	bar					
100	115.0	12.3	16	16	BAB10CE10NNF	C	BAB10CE10TTF	
150	113.0	20.5	16	16	BAB15CE10NNF	C	BAB15CE10TTF	
200	132.0	30.0	16	16	BAB20CE20NNF	C	BAB20CE20TTF	
250	165.0	45.7	16	16	BAB25CE20NNF	C	BAB25CE20TTF	
300	175.0	60.7	16	16	BAB30CE20NNF	C	BAB30CE20TTF	



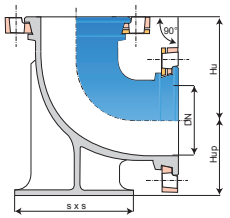
Flanged 11.25° (1/32) bend with mobile flanges PN25

DN	Lu	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference	
mm	mm	kg	bar					
100	115.0	12.3	25	25	BAB10CE30NNF	A2	BAB10CE30TTF	
150	113.0	20.5	25	25	BAB15CE30NNF	A2	BAB15CE30TTF	
200	132.0	30.0	25	25	BAB20CE30NNF	A2	BAB20CE30TTF	
250	165.0	45.7	25	25	BAB25CE30NNF	A2	BAB25CE30TTF	
300	175.0	60.7	25	25	BAB30CE30NNF	A2	BAB30CE30TTF	
400	203.0	106.0	15	25	BAB40CE30NNF	D	BAB40CE30TTF	



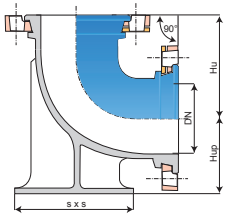
Flanged Duckfoot bend with mobile flanges PN16

DN	Hu	Hup	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference	
mm	mm	mm	kg	bar					
100	180	125	18.2	16	16	BAB10CF10NNF	C	BAB10CF10TTF	
150	220	160	33.5	16	16	BAB15CF10NNF	C	BAB15CF10TTF	
200	260	190	51.0	16	16	BAB20CF20NNF	C	BAB20CF20TTF	
250	350	225	90.0	16	16	BAB25CF20NNF	C	BAB25CF20TTF	
300	400	255	124.5	16	16	BAB30CF20NNF	C	BAB30CF20TTF	



Flanged Duckfoot bend with mobile flanges PN25

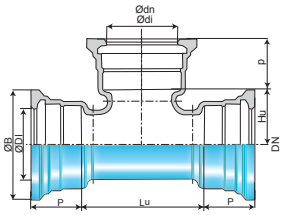
DN	Hu	Hup	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference	
mm	mm	mm	kg	bar					
100	180	125	18.2	25	25	BAB10CF30NNF	A2	BAB10CF30TTF	
150	220	160	33.5	25	25	BAB15CF30NNF	A2	BAB15CF30TTF	
200	260	190	51.0	25	25	BAB20CF30NNF	A2	BAB20CF30TTF	
250	350	225	90.0	25	25	BAB25CF30NNF	A2	BAB25CF30TTF	
300	400	255	124.5	25	25	BAB30CF30NNF	A2	BAB30CF30TTF	



All socket tee with Standard joint

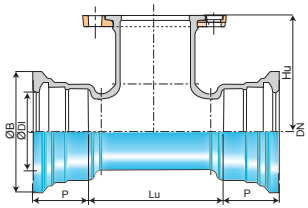
DN	Ø dn	Lu	P	Ø Dl	Ø B	Hu	P	Ø Di	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference	
mm	mm	mm	mm	mm	mm	mm	mm	mm	kg	bar	bar				
100	100	210	88	121.4	187.5	105	88	121.4	14.9	25	20	SSB10TE0FNNF	A3	SSB10TE0FTTF	
150	100	190	94	173.4	241	140	88	121.4	21.0	25	16	SSB15TE0FNNF	A4	SSB15TE0FTTF	
150	150	305	94	173.4	241	152.5	94	173.4	27.0	25	16	SSB15TE0JNNF	A4	SSB15TE0JTTF	
200	100	195	100	225.5	294	170	88	121.4	27.5	25	14	SSB20TE0FNNF	A5	SSB20TE0FTTF	
200	150	250	100	225.5	294	177.5	94	173.4	32.3	25	14	SSB20TE0JNNF	A5	SSB20TE0JTTF	
200	200	360	100	225.5	294	180	100	225.5	40.7	25	14	SSB20TE0KNNF	A5	SSB20TE0KTTF	
250	100	234	105	277.3	351	183	88	121.4	41.3	20	14	SSB25TE0FNNF	B3	SSB25TE0FTTF	
250	150	251	105	277.3	351	164.5	94	173.4	44.6	20	14	SSB25TE0JNNF	B3	SSB25TE0JTTF	
250	200	344	105	277.3	351	168	100	225.5	53.0	20	14	SSB25TE0KNNF	B3	SSB25TE0KTTF	
250	250	404	105	277.3	351	202	105	277.3	63.6	20	14	SSB25TE0LNNF	B3	SSB25TE0LTTF	
300	100	237	110	329.3	408.3	213	88	121.4	56.0	20	14	SSB30TE0FNNF	B3	SSB30TE0FTTF	
300	150	347	110	329.3	408.3	194.5	94	173.4	64.0	20	14	SSB30TE0JNNF	B3	SSB30TE0JTTF	
300	200	347	110	329.3	408.3	198	100	225.5	68.4	20	14	SSB30TE0KNNF	B3	SSB30TE0KTTF	
300	250	467	110	329.3	408.3	207	105	277.3	83.4	20	14	SSB30TE0LNNF	B3	SSB30TE0LTTF	
300	300	467	110	329.3	408.3	233.5	110	329.3	89.9	20	14	SSB30TE0MNNF	B3	SSB30TE0MTTF	
400	200	330	176	432.4	521	154	224.5	258.5	165.5	15	13	AFB40TE0KADF**	D3		
400	250	390	176	432.4	521	160.6	276.5	265	181	15	13	AFB40TE0LADF**	D3		
400	300	440	176	432.4	521	173.5	328.5	270	197	15	13	AFB40TE0MADF**	D3		
400	400	560	176	432.4	521	176	432.4	280	259	15	13	AFB40TE0NADF***	D3		

** Sockets Universal Tyton *** Sockets Universal Standard



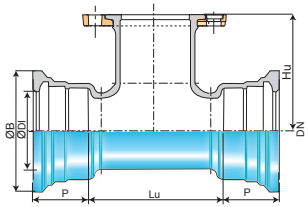
Double socket tee with flanged branch (mobile flange) with Standard joint PN16

DN	Ø dn	Lu	P	Ø DI	Ø B	Hu	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference
mm	mm	mm	mm	mm	mm	mm	kg	bar	bar	bar			
100	100	210	88.0	121.4	187.5	180.0	17	**16**	**14**	16	SSB10UD1FNNF	C3	SSB10UD1FTTF
150	100	190	94.0	173.4	241.0	215.0	21.4	**16**	**14**	16	SSB15UD1FNNF	C3	SSB15UD1FTTF
150	150	305	94.0	173.4	241.0	220.0	29.5	**16**	**14**	16	SSB15UD1JNNF	C3	SSB15UD1JTTF
200	100	195	100.0	225.5	294.0	245.0	29.1	**16**	**14**	16	SSB20UD1FNNF	C3	SSB20UD1FTTF
200	150	250	100.0	225.5	294.0	245.0	34.9	**16**	**14**	16	SSB20UD1JNNF	C3	SSB20UD1JTTF
200	200	360	100.0	225.5	294.0	260.0	44.6	**16**	**14**	16	SSB20UD2KNNF	C3	SSB20UD2KTTF
250	100	234	105.0	277.3	351.0	270.0	43.4	**16**	**14**	16	SSB25UD1FNNF	C3	SSB25UD1FTTF
250	150	251	105.0	277.3	351.0	280.0	49.5	**16**	**14**	16	SSB25UD1JNNF	C3	SSB25UD1JTTF
250	200	344	105.0	277.3	351.0	290.0	59.9	**16**	**14**	16	SSB25UD2KNNF	C3	SSB25UD2KTTF
250	250	404	105.0	277.3	351.0	300.0	69.1	**16**	**14**	16	SSB25UD2LNNF	C3	SSB25UD2LTTF
300	100	237	110.0	329.3	408.3	300.0	58.1	**16**	**14**	16	SSB30UD1FNNF	C3	SSB30UV1FTTF
300	150	347	110.0	329.3	408.3	310.0	71.2	**16**	**14**	16	SSB30UD1JNNF	C3	SSB30UD1JTTF
300	200	347	110.0	329.3	408.3	320.0	75.4	**16**	**14**	16	SSB30UD2KNNF	C3	SSB30UD2KTTF
300	250	467	110.0	329.3	408.3	305.0	89.0	**16**	**14**	16	SSB30UD2LNNF	C3	SSB30UD2LTTF
300	300	467	110.0	329.3	408.3	340.0	97.2	**16**	**14**	16	SSB30UD2MNNF	C3	SSB30UD2MTTF



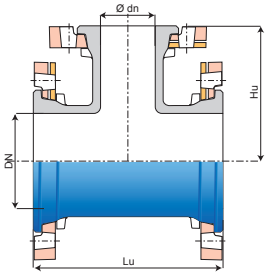
Double socket tee with flanged branch (mobile flange) with Standard joint PN25

DN	Ø dn	Lu	P	Ø DI	Ø B	Hu	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference
mm	mm	mm	mm	mm	mm	mm	kg	bar	bar	bar			
100	100	210	88.0	121.4	187.5	180.0	17.0	**25**	**20**	25	SSB10UD3FNNF	A3	SSB10UD3FTTF
150	100	190	94.0	173.4	241.0	215.0	21.9	**25**	**16**	25	SSB15UD3FNNF	A4	SSB15UD3FTTF
150	150	305	94.0	173.4	241.0	220.0	30.5	**25**	**16**	25	SSB15UD3JNNF	A4	SSB15UD3JTTF
200	100	195	100.0	225.5	294.0	245.0	29.6	**25**	**14**	25	SSB20UD3FNNF	A4	SSB20UD3FTTF
200	150	250	100.0	225.5	294.0	245.0	29.6	**25**	**14**	25	SSB20UD3JNNF	A4	SSB20UD3JTTF
200	200	360	100.0	225.5	294.0	260.0	47.0	**25**	**14**	**25**	SSB20UD3KNNF	**A4**	SSB20UD3KTTF
250	100	234	105.0	277.3	351.0	270.0	43.9	**20**	**14**	**25**	SSB25UD3FNNF	**B3**	SSB25UD3FTTF
250	150	251	105.0	277.3	351.0	280.0	50.5	**20**	**14**	25	SSB25UD3JNNF	B3	SSB25UD3JTTF
250	200	344	105.0	277.3	351.0	290.0	61.4	**20**	**14**	25	SSB25UD3KNNF	B3	SSB25UD3KTTF
250	250	404	105.0	277.3	351.0	300.0	72.1	**20**	**14**	25	SSB25UD3LNNF	B3	SSB25UD3LTTF
300	100	237	110.0	329.3	408.3	300.0	58.6	**20**	**14**	25	SSB30UD3FNNF	B3	SSB30UD3FTTF
300	150	347	110.0	329.3	408.3	310.0	72.2	**20**	**14**	25	SSB30UD3JNNF	B3	SSB30UD3JTTF
300	200	347	110.0	329.3	408.3	320.0	77.1	**20**	**14**	25	SSB30UD3KNNF	B3	SSB30UD3KTTF
300	250	467	110.0	329.3	408.3	305.0	91.9	**20**	**14**	25	SSB30UD3LNNF	B3	SSB30UD3LTTF
300	300	467	110.0	329.3	408.3	340.0	100.8	**20**	**14**	25	SSB30UD3MNNF	B3	SSB30UD3MTTF
400	200	315	112	432.4	515.3	380	104.9	**15**	**13**	25	SSB40UD3KNNF	D3	SSB40UD3KTTF
400	250	429	112	432.4	515.3	390	124.6	**15**	**13**	25	SSB40UD3LNNF	D3	SSB40UD3LTTF
400	300	429	112	432.4	515.3	400	133.7	**15**	**13**	25	SSB40UD3MNNF	D3	SSB40UD3MTTF
400	400	545	112	432.4	515.3	420	166	**15**	**13**	25	SSB40UD3NNNF	D3	SSB40UD3NTTF



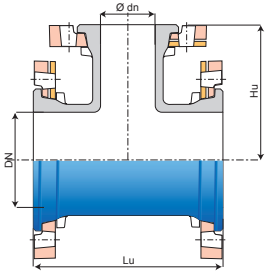
All flanged tee with mobile flanges PN16

DN	Ø dn	Lu	Hu	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference	
mm	mm	mm	mm	kg	bar					
100	100	360	180	20.5	16	16	BAB10UE1FNNF	C	BAB10UE1FTTF	
150	100	440	210	33.5	16	16	BAB15UE1FNNF	C	BAB15UE1FTTF	
150	150	440	220	38.0	16	16	BAB15UE1JNNF	C	BAB15UE1JTTF	
200	100	520	240	48.0	16	16	BAB20UE2FNNF	C	BAB20UE2FTTF	
200	150	520	250	52.1	16	16	BAB20UE2JNNF	C	BAB20UE2JTTF	
200	200	520	260	55.5	16	16	BAB20UE2KNNF	C	BAB20UE2KTTF	
250	100	430	270	56.7	16	16	BAB25UE2FNNF	C	BAB25UE2FTTF	
250	150	447	280	68.9	16	16	BAB25UE2JNNF	C	BAB25UE2JTTF	
250	200	540	290	80.0	16	16	BAB25UE2KNNF	C	BAB25UE2KTTF	
250	250	600	300	92.0	16	16	BAB25UE2LNNF	C	BAB25UE2LTTF	
300	100	450	300	74.3	16	16	BAB30UE2FNNF	C	BAB30UE2FTTF	
300	150	560	310	96.0	16	16	BAB30UE2JNNF	C	BAB30UE2JTTF	
300	200	560	320	108.0	16	16	BAB30UE2KNNF	C	BAB30UE2KTTF	
300	250	680	305	117.0	16	16	BAB30UE2LNNF	C	BAB30UE2LTTF	
300	300	680	340	126.0	16	16	BAB30UE2MNNF	C	BAB30UE2MTTF	



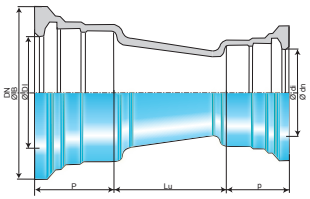
All flanged tee with mobile flanges PN25

DN	Ø dn	Lu	Hu	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference	
mm	mm	mm	mm	kg	bar					
100	100	360	180	20.5	25	25	BAB10UE3FNNF	A2	BAB10UE3FTTF	
150	100	440	210	33.5	25	25	BAB15UE3FNNF	A2	BAB15UE3FTTF	
150	150	440	220	38.0	25	25	BAB15UE3JNNF	A2	BAB15UE3JTTF	
200	100	520	240	48.0	25	25	BAB20UE3FNNF	A2	BAB20UE3FTTF	
200	150	520	250	52.1	25	25	BAB20UE3JNNF	A2	BAB20UE3JTTF	
200	200	520	260	55.5	25	25	BAB25UE3KNNF	A2	BAB20UE3KTTF	
250	100	430	270	56.7	20	25	BAB25UE3FNNF	B2	BAB25UE3FTTF	
250	150	447	280	68.9	20	25	BAB25UE3JNNF	B2	BAB25UE3JTTF	
250	200	540	290	80.0	20	25	BAB25UE3KNNF	B2	BAB25UE3KTTF	
250	250	600	300	92.0	20	25	BAB25UE3LNNF	B2	BAB25UE3LTTF	
300	100	450	300	74.3	20	25	BAB30UE3FNNF	B2	BAB30UE3FTTF	
300	150	560	310	96.0	20	25	BAB30UE3JNNF	B2	BAB30UE3JTTF	
300	200	560	320	108.0	20	25	BAB30UE3KNNF	B2	BAB30UE3KTTF	
300	250	680	305	117.0	20	25	BAB30UE3LNNF	B2	BAB30UE3LTTF	
300	300	680	340	126.0	20	25	BAB30UE3MNNF	B2	BAB30UE3MTTF	
400	200	605	380	164.9	15	25	BAB40UE3KNNF	D	BAB40UE3KTTF	
400	250	724	390	187.0	15	25	BAB40UE3LNNF	D	BAB40UE3LTTF	
400	300	724	400	193.7	15	25	BAB40UE3MNNF	D	BAB40UE3MTTF	
400	400	840	420	235.0	15	25	BAB40UE3NNNF	D	BAB40UE3NTTF	



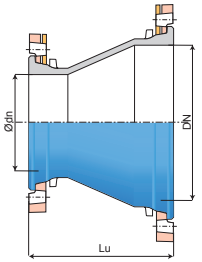
Taper with Standard joint

DN	Ø dn	Lu	P	Ø DI	Ø B	p	Ø Di	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference
mm	mm	mm	mm	mm	mm	mm	mm	kg	bar	bar			
150	100	130	94	173.4	241	88	121.4	11.1	**25**	**16**	SSB15VE0FNNF	A4	SSB15VE0FTTF
200	100	230	100	225.5	294	88	121.4	17.3	**25**	**14**	SSB20VE0FNNF	A5	SSB20VE0FTTF
200	150	125	100	225.5	294	94	173.4	16.7	**25**	**14**	SSB20VE0JNNF	A5	SSB20VE0JTTF
250	150	225	105	277.3	351	94	173.4	26.0	**25**	**14**	SSB25VE0JNNF	A5	SSB25VE0JTTF
250	200	125	105	277.3	351	100	225.5	25.3	**25**	**14**	SSB25VE0KNNF	A5	SSB25VE0KTTF
300	150	321.5	110	329.3	408.3	94	173.4	36.0	**25**	**14**	SSB30VE0JNNF	A5	SSB30VE0JTTF
300	200	222	110	329.3	408.3	100	225.5	36.0	**25**	**14**	SSB30VE0KNNF	A5	SSB30VE0KTTF
300	250	123	110	329.3	408.3	105	277.3	36.0	**25**	**14**	SSB30VE0LNNF	A5	SSB30VE0LTTF
400	250	335	112	432.4	515.3	105	277.3	65.0	**15**	**13**	SSB40VE0LNNF	D3	SSB40VE0LTTF
400	300	260	112	432.4	515.3	110	329.3	60.0	**15**	**13**	SSB40VE0MNNF	D3	SSB40VE0MTTF



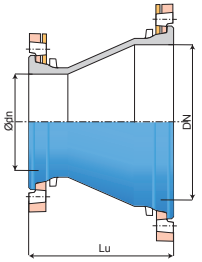
Flanged taper with mobile flanges PN16

DN	Ø dn	Lu	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference
mm	mm	mm	kg	bar				
150	100	306	17.2	16	16	BAB15VE1FNNF	C	BAB15VE1FTTF
200	100	385	24.7	16	16	BAB20VE2FNNF	C	BAB20VE2FTTF
200	150	304	26.0	16	16	BAB20VE2JNNF	**C**	BAB20VE2JTTF
250	150	319	38.0	16	16	BAB25VE2JNNF	**C**	BAB25VE2JTTF
250	200	300	37.0	16	16	BAB25VE2KNNF	C	BAB25VE2KTTF
300	150	424	50.0	16	16	BAB30VE2JNNF	C	BAB30VE2JTTF
300	200	323	53.1	16	16	BAB30VE2KNNF	C	BAB30VE2KTTF
300	250	300	58.3	16	16	BAB30VE2LNNF	C	BAB30VE2LTTF



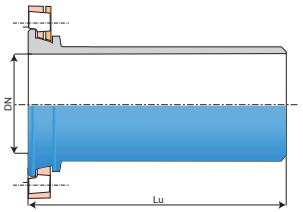
Flanged taper with mobile flanges PN25

DN	Ø dn	Lu	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference
mm	mm	mm	kg	bar				
150	100	306	17.2	25	25	BAB15VE3FNNF	A2	BAB15VE3FTTF
200	100	385	24.7	25	25	BAB20VE3FNNF	A2	BAB20VE3FTTF
200	**150**	**304**	**26.0**	25	**25**	BAB20VE3JNNF	**A2**	BAB20VE3JTTF
250	150	319	38.0	25	25	BAB25VE3JNNF	**A2**	BAB25VE3JTTF
250	200	300	37.0	25	25	BAB25VE3KNNF	A2	BAB25VE3KTTF
300	150	424	50.0	25	25	BAB30VE3JNNF	A2	BAB30VE3JTTF
300	200	323	53.1	25	25	BAB30VE3KNNF	A2	BAB30VE3KTTF
300	250	300	58.3	25	25	BAB30VE3LNNF	A2	BAB30VE3LTTF



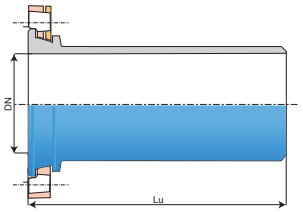
Flanged spigot with mobile flanges PN16

DN	Lu	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating		Epoxy Powder 250 µm coating	
					reference		reference	
mm	mm	kg	bar					
100	350	6.50	16	16	NEB10BU10NNF	C	SEB10BU10TTF	
150	400	14.96	16	16	NEB15BU10NNF	C	SEB15BU10TTF	
200	400	22.00	16	16	NEB20BU20NNF	C	SEB20BU20TTF	
250	400	32.02	16	16	NEB25BU20NNF	C	SEB25BU20TTF	
300	450	41.62	16	16	NEB30BU20NNF	C	SEB30BU20TTF	



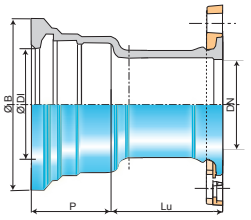
Flanged spigot with mobile flanges PN25

DN	Lu	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating		Epoxy Powder 250 µm coating	
					reference		reference	
mm	mm	kg	bar					
100	350	6.50	25	25	NEB10BU30NNF	A2	SEB10BU30TTF	
150	400	14.96	25	25	SEB15BU30NNF	A2	SEB15BU30TTF	
200	400	22.00	25	25	NEB20BU30NNF	A2	SEB20BU30TTF	
250	400	32.02	25	25	SEB25BU30NNF	A2	SEB25BU30TTF	
300	450	41.62	25	25	SEB30BU30NNF	A2	SEB30BU30TTF	
400	480	83.0	21.25	25	SEB40BU30NNF	B2	SEB40BU30TTF	



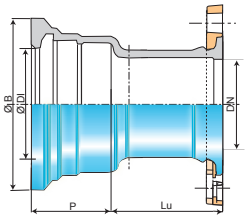
Flanged socket with Standard Joint / PN16

DN	Lu	P	Ø DI	Ø B	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	PN	Epoxy cataphoresis 70 µm coating		Epoxy Powder 250 µm coating	
									reference		reference	
mm	mm	mm	mm	mm	kg	bar	bar					
100	110	88	121.4	187.5	8.7	16	16	16	SSB10BE10NNF	C	SSB10BE10TTF	
150	115	94	173.4	241.0	14.8	16	16	16	SSB15BE10NNF	C	SSB15BE10TTF	
200	120	100	225.5	294.0	23.5	16	14	16	SSB20BE20NNF	C3	SSB20BE20TTF	
250	135	105	277.3	351.0	33.9	16	14	16	SSB25BE20NNF	C3	SSB25BE20TTF	
300	130	110	329.3	408.3	44.9	16	14	16	SSB30BE20NNF	C3	SSB30BE20TTF	



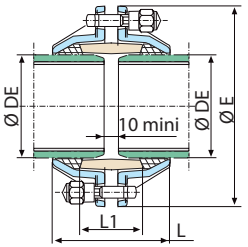
Flanged socket with Standard Joint / PN25

DN	Lu	P	Ø DI	Ø B	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	PN	Epoxy cataphoresis 70 µm coating		Epoxy Powder 250 µm coating	
									reference		reference	
mm	mm	mm	mm	mm	kg	bar	bar					
100	110	88	121.4	187.5	10.0	25	20	25	SSB10BE30NNF	A3	SSB10BE30TTF	
150	115	94	173.4	241.0	14.8	25	16	25	SSB15BE30NNF	A4	SSB15BE30TTF	
200	120	100	225.5	294.0	23.5	25	14	**25**	SSB20BE30NNF	A5	SSB20BE30TTF	
250	135	105	277.3	351.0	33.9	25	14	**25**	SSB25BE30NNF	A5	SSB25BE30TTF	
300	130	110	329.3	408.3	44.9	25	14	25	SSB30BE30NNF	A5	SSB30BE30TTF	
400	140	112	432.4	515.3	78.0	21	13	25	SSB40BE30NNF	B3	SSB40BE30TTF	



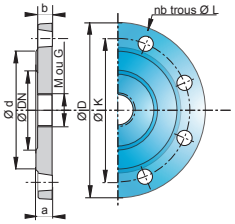
Link collar

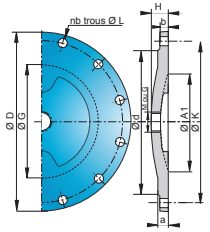
DN	DE mini	DE maxi	L1	mass	Pressure certified by FM (not restrained)	PN	reference	
mm	mm	mm	mm	kg	bar			
100	117	120	65	6.18	20	25	MCB10KAEHTTF	B2
150	168	172	75	9.60	16	16	MCB15KADHTTF	C
200	220	223	80	14.00	16	16	MCB20KADHTTF	C
250	272	275	90	18.10	16	16	MCB25KADHTTF	C
300	323	327	95	22.20	16	16	MCB30KADHTTF	C



Blank flange PN16

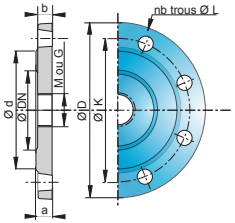
DN	Ø D	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference
mm	mm	kg	bar				
100	235	4.8	16	16	BBB10QN20NNF	C	BBB10QN20TTF
150	300	8.6	16	16	BBB15QN20NNF	C	BBB15QN20TTF
200	360	13.9	16	16	BBB20QN20NNF	C	BBB20QN20TTF
250	425	22.0	16	16	BBB25QN20NNF	C	BBB25QN20TTF
300	485	33.0	16	16	BBB30QN20NNF	C	BBB30QN20TTF

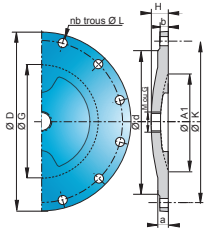




Blank flange PN25

DN	Ø D	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference		Epoxy Powder 250 µm coating reference
mm	mm	kg	bar				
100	235	4.8	25	25	BBB10QN30NNF	A2	BBB10QN30TTF
150	300	8.6	25	25	BBB15QN30NNF	A2	BBB15QN30TTF
200	360	13.9	25	25	BBB20QN30NNF	A2	BBB20QN30TTF
250	425	22.0	25	25	BBB25QN30NNF	A2	BBB25QN30TTF
300	485	33.0	25	25	BBB30QN30NNF	A2	BBB30QN30TTF
400	620	63.0	21.25	25	BBB40QN20NNF	B2	BBB40QN20TTF



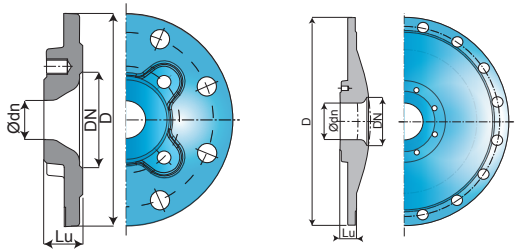


Reducing flange T1 PN16

DN	Ø D	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference	
mm	mm	kg	bar			
200	100	10.7	16	16	BBB20RN2FNNGF	C
250	100	17.9	16	16	BBB25RN2FNNGF	C
300	200	29.00	16	16	BBB30RN2KNNGF	C

Reducing flange T1 PN25

DN	Ø D	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference	
mm	mm	kg	bar			
200	100	16.5	25	25	BBB20RN3FNNGF	A2
250	100	25.6	25	25	BBB25RN3FNNGF	A2
300	200		25	25	Please advise	A2

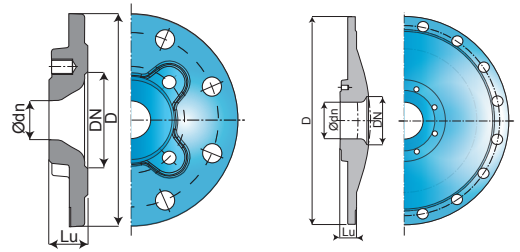


Reducing flange T2 PN16

DN	Ø D	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference	
mm	mm	kg	bar			
300	100	24.9	16	16	BBB30RN2FNNGF	C
300	150	25.7	16	16	BBB30RN2JNNGF	C

Reducing flange T2 PN25

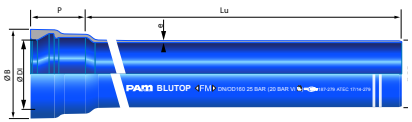
DN	Ø D	mass	Pressure certified by FM (not restrained)	PN	Epoxy cataphoresis 70 µm coating reference	
mm	mm	kg	bar			
300	100		25	25	Please advise	C
300	150		25	25	Please advise	C



BLUTOP® pipes

BLUTOP® pipes DN/OD 110-160, with BLUTOP®, BLUTOP® Vi, and BLUTOP® Vi+ joints.
For restrained (Vi) and not restrained (NV) ductile iron networks for fire protection.
According to FM Approval Class Number 1610 referential, to the 1610 ISO 16631:2016 norm, and to CSTB 17/14-279 technical advice.
The FM Blutop® performances concern only the assembling between ductile iron pipes and fittings, and the connected gaskets.

DN	Lu	Pressure not restrained certified by FM	Pressure Vi certified by FM	Ø DE	Ø DI	P	Ø B	metric mass	reference	
mm	*m*	*bar*	*bar*	*mm*	*mm*	*mm*	*mm*	*kg/m*		
110	6.000	25	25	110.0	112.8	87.0	149.5	7.600	251914	
160	6.000	25	20	160.0	163.3	97.5	202.0	11.800	251918	



- External coating: zinc-aluminium (400 g/m²) + blue epoxy paint (thickness 100 microns).
- Internal coating: ultramarine blue thermoplastic polymer DUCTAN – thickness 300 microns.

BLUTOP® joints for not-restraint purpose

Ø DE	joint	Pressure not restained certified by FM	reference	
mm		*bar*		
110	BLUTOP®	25	JXM11BA	
160	BLUTOP®	25	JXM16BA	

BLUTOP® Vi and Vi+ inserts joints for restraint purpose

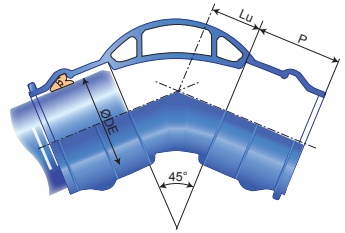
Ø DE	joint	Pressure VI certified by FM	reference	
mm		*bar*		
110	BLUTOP® Vi+	25	JXM11CAF	
160	BLUTOP® Vi	20	JXM16CA	

The Vi+ DN 110 FM joint is specifically made of 13 metallic inserts.

Joint Vi+

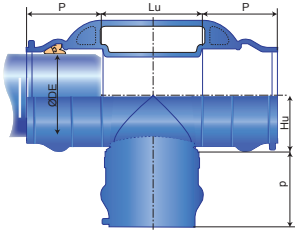
BLUTOP® bends

DN	angle	Ø DE	P	Lu	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	reference	
mm	*degree*	*mm*	*mm*	*mm*	*kg*	*bar*	*bar*		
110	90° (1/4)	110	99.0	85.0	7.1	25	25	KXM11CA00TTF	A2
110	45°(1/8)	110	99.0	60.0	6.2	25	25	KXM11CB00TTF	A2
110	22°30 (1/16)	110	99.0	30.0	5.5	25	25	KXM11CD00TTF	A2
110	11°15 (1/32)	110	99.0	30.0	5.8	25	25	KXM11CE00TTF	A2
160	90° (1/4)	160	114.0	130.0	12.3	25	20	KXM16CA00TTF	A2
160	45°(1/8)	114	114.0	70.0	10.3	25	20	KXM16CB00TTF	A2
160	22°30 (1/16)	160	114.0	35.0	9.2	25	20	KXM16CD00TTF	A2
160	11°15 (1/32)	160	114.0	35.0	9.1	25	20	KXM16CE00TTF	A2



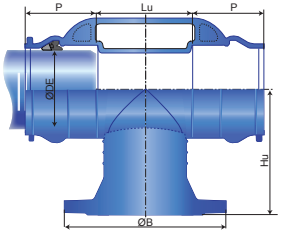
BLUTOP® all sockets tee

DN/OD	Ø DE	P	p	Lu	Hu	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	reference	
mm	*mm*	*mm*	*mm*	*mm*	*mm*	*kg*	*bar*	*bar*		
110	110X110	99.0	99.0	134.0	67.0	**8.7**	25	25	KXM11TD3FTTF	A2
160	160X110	114.0	99.0	125.0	92.0	**13.0**	25	20	KXM16TD3FTTF	A3
160	160X160	114.0	114.0	175.0	92.0	**15.1**	25	20	KXM16TD3JTTF	A3



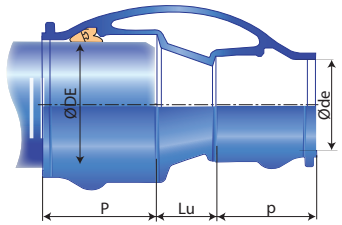
BLUTOP® double socket tee with flanged branch, Blutop® Joint

DN/OD	Ø DE	P	p	Lu	Hu	Ø ext. B	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	reference	
mm	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*kg*	*bar*	*bar*		
110	110X100	100	99.0	125.0	170.0	235.0	12.4	25	25	KXM11TD3FTTF	A2
160	160X100	100	114.0	125.0	205.0	235.0	17.0	25	20	KXM16TD3FTTF	A3
160	160X150	150	114.0	175.0	220.0	300.0	21.6	25	20	KXM16TD3JTTF	A3



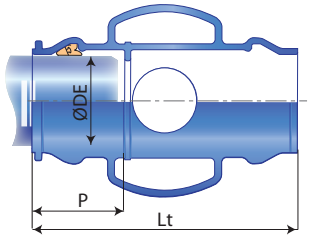
BLUTOP® taper

DN/OD	Ø DE	Ø de	P	p	Lu	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	reference	
mm	*mm*	*mm*	*mm*	*mm*	*mm*	*kg*	*bar*	*bar*		
160	160	110	114.0	99.0	55.0	7.4	25	20	KXM16VE0ETTF	A3



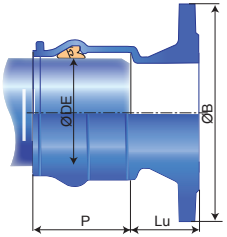
BLUTOP® sliding collar

DN/OD	Ø DE	P	L	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	reference	
mm	*mm*	*mm*	*mm*	*kg*	*bar*	*bar*		
110	110	99.0	275	7.3	25	25	KXM11MM00TTF	A2
160	160	114.0	315	10.7	25	20	KXM16MM00TTF	A3



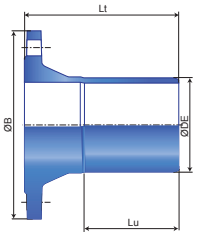
BLUTOP® flanged socket with Standard Joint

DN/OD	Ø DE	Ø dn	p	Lu	Ø B	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	reference	
mm	*mm*	*mm*	*mm*	*mm*	*mm*	*kg*	*bar*	*bar*		
110	110	100	99.0	68	235	7.4	25	25	KXM11BE3FTTF	A2
160	160	150	114.0	68	300	12.1	25	20	KXM16BE3JTTF	A3



BLUTOP® flanged spigot

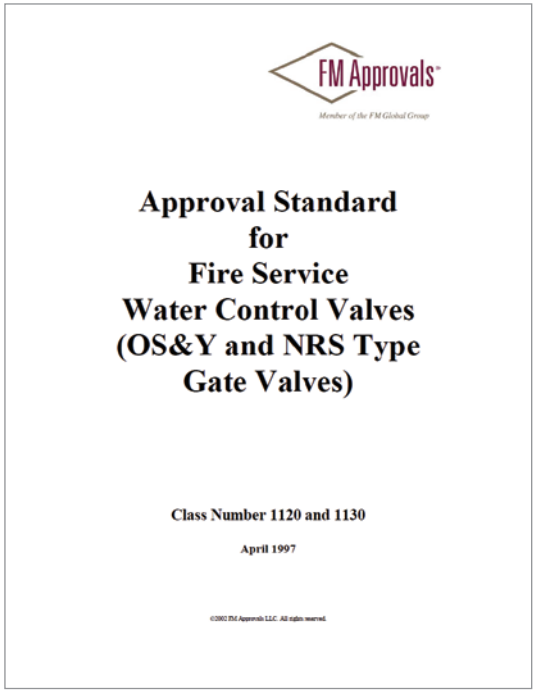
DN/OD	Ø DE	Ø B	L	Lu	mass	Pressure certified by FM (not restrained)	Pressure certified by FM (Vi restrained)	reference	
mm	*mm*	*mm*	*mm*	*mm*	*kg*	*bar*	*bar*		
110	110	235	180	110	6.7	25	25	KXM11BU3FTTF	A2
160	160	300	197	127	12.1	25	20	KXM16BU3JTTF	A3



KEY POINTS OF THE OFFER: FUNCTIONALITIES

- Gate valves installed on fire protection pipelines are always in the «open» position: no accidental closing is possible.
- Gate valves are also fitted with:
  - a position indicator indicating that the valve is on the «open position»,
  - a locking device of the opening and closing mecanism (handwheel or handle)
- EURO® 20 gate valves (to DN 100 up to 400) approved «FM » include:
  - EURO® 21 flange gate valves, long spacing - Series 15 (DN + 200mm) according to the EN 558-1
  - EURO® 23 flange gate valves, short spacing- Series 14 (0,4 DN + 150mm) according to the EN 558-1
- EURO® 20 gate valves «FM» approved have only a clockwise closing direction.
- EURO® 20 gate valves «FM» approved can be equipped with:
  - a post indicator or
  - a wall indicator.
- Post indicator and wall indicator can be equipped with a control valve supervisory switch (PCVS) which remotely signals the opening position of the gate valve.
- EURO® 20 NG «FM» approved is usually used buried and equipped with a post indcator «FM» approved that allows remotely the operation, the locking and the viewing of the valve gate «open/closed» position.

KEY POINTS OF THE OFFER: CONFORMITY, CONTROLS


FM Approvals
Member of the FM Global Group

Approval Standard
for
Fire Service
Water Control Valves
(OS&Y and NRS Type
Gate Valves)

Class Number 1120 and 1130

April 1997

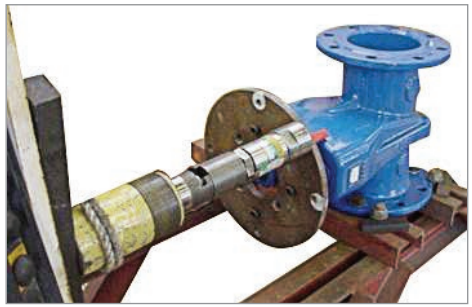
- EURO® 20 gate valves «FM» approved conform with European safety standards.
- To apply for FM certification, they must in addition comply with specific requirements of the approval standard: «Approval Standard for Fire Service Water Control Valves (OS&Y and NRS Type Gate Valves). Class Number 1120/1130 April 1997».
- The requirements of the «FM CN 1120 & 1130» exceed EN standards. For example:
  - Mechanical resistance tests at the maximal torque

Resistance of valves to opening - closing stresses
Maximum torques applied during opening and closing

DN	EN 1074 1&2	FM CN 1120 / 130
	(Nm)	*(Nm)*
100	200	271
125	250	340
150	300	407
200	400	542
250	500	814
300	300	1085
400	800	1390

KEY POINTS OF THE OFFER: CONFORMITY, CONTROLS

- Tightness tests of the high pressure sitting



Tightness of sitting at high pressure

EN 1074 1&2	FM CN 1120 / 130
1.1 x PFA	2 x PFA

- Mechanical resistance of the top flanges

Resistance of bearing flanges for post & wall indicators
Load application on post/wall indicatos bearing flange

EN 1074 1&2	FM CN 1120 / 130
none	2.95 tons

- The gate valves are individually identified and traced by means of two riveted tags :
  - A: All the performance indications certified by FM Approvals
  - B: All the useful indications for the traceability: year of manufacture, unique identification number
- The datas are recorded at the factory quality department in Toul (54).

- EURO® 20 type 21 and 23 without flanges, with cap top AWWA
- EURO® 20 type 21 and 23 with flanges and cap top AWWA
  - DN100–300 (type 21) and DN100-400 (type 23)

EURO® 20 approved by FM with and without flanges

DN		pressure certified by FM (bar)	pressure certified by FM (psi)	spacing between flanges	PN	without flange / with cap top AWWA			with flange / with cap top AWWA		
mm	inch					reference	mass kg		reference	mass kg	
100	4	16	235	type 21-Series S15	10/16	RDB10AQCHR	20.8		RDB10AMCHR	33	
				type 23-Series S14	10/16	RDB10BQCHR	19.8		RDB10BMCHR	31	
125	5			type 21-Series S15	10/16	RDB12AQCHR	28.9		RDB12AMCHR	41	
				type 23-Series S14	10/16	RDB12BQCHR	26.4		RDB12BMCHR	38.5	
150	6			type 21-Series S15	10/16	RDB15AQCHR	36.9		RDB15AMCHR	50	
				type 23-Series S14	10/16	RDB15BQCHR	33.2		RDB15BMCHR	46.3	
200	8			type 21-Series S15	10	RDB20AQBHR	76.2		RDB20AMBHR	95	
					16	RDB20AQAHR	76.2		RDB20AMAHR	95	
				type 23-Series S14	10	RDB20BQBHR	68.2		RDB20BMBHR	87	
					16	RDB20BQAHR	68.2		RDB20BMAHR	87	
250	10	14	200	type 21-Series S15	10	RDB25AQBHR	121.8		RDB25AMBHR	148	
					16	RDB25AQAHR	121.8		RDB25AMAHR	148	
				type 23-Series S14	10	RDB25BQBHR	110.0		RDB25BMBHR	136.2	
					16	RDB25BQAHR	110.0		RDB25BMAHR	136.2	
300	12			type 21-Series S15	10	RDB30AQBHR	182.2		RDB30AMBHR	159	
					16	RDB30AQAHR	196.3		RDB30AMAHR	159	
				type 23-Series S14	10	RDB30BQBHR	196.3		RDB30BMBHR	182.4	
					16	RDB30BQAHR	196.3		RDB30BMAHR	182.4	
400	16	12	175	type 23-Series S14	10	REB40BQBHR	299.5		REB40BMBHR	322.7	
					16	REB40BQAHR	299.5		REB40BMAHR	322.7	

Without flanges

With flanges

- EURO® 20 type 21 and 23 with «wall indicator» without electrical detector.
- EURO® 20 type 21 and 23 with «post indicator» without electrical detector.
- The post-indicator and the wall-indicator can be equipped with a control valve supervisory switch (PCVS) which signals remotely the opening position of the gate.
- The EURO® 20 NG approved «FM» is usually used buried and equipped with a post indicator approved «FM» that allows remotely the manoeuvre, the locking and the viewing of the valve opening.

EURO® 20 approved by FM with wall / post indicator

DN		pressure certified by FM (bar)	pressure certified by FM (psi)	spacing between flanges	PN	E20 with «Wall indicator» *			E20 with «Post indicator» *		
mm	inch					reference	mass kg		reference	mass kg	
100	4	16	235	type 21-Series S15	10/16	RDB10AMCHW	64		RDB10AMCHP	173	
				type 23-Series S14	10/16	RDB10BMCHW	62		RDB10BMCHP	171	
125	5			type 21-Series S15	10/16	RDB12AMCHW	72		RDB12AMCHP	181	
				type 23-Series S14	10/16	RDB12BMCHW	70		RDB12BMCHP	179	
150	6			type 21-Series S15	10/16	RDB15AMCHW	81		RDB15AMCHP	190	
				type 23-Series S14	10/16	RDB15BMCHW	78		RDB15BMCHP	187	
200	8			type 21-Series S15	10	RDB20AMBHW	126		RDB20AMBHP	235	
					16	RDB20AMAHW	126		RDB20AMAHP	235	
				type 23-Series S14	10	RDB20BMBHW	120		RDB20BMBHP	229	
					16	RDB20BMAHW	120		RDB20BMAHP	229	
250	10	14	200	type 21-Series S15	10	RDB25AMBHW	179		RDB25AMBHP	288	
					16	RDB25AMAHW	179		RDB25AMAHP	288	
				type 23-Series S14	10	RDB25BMBHW	167		RDB25BMBHP	276	
					16	RDB25BMAHW	167		RDB25BMAHP	276	
300	12			type 21-Series S15	10	RDB30AMBHW	205		RDB30AMBHP	349	
					16	RDB30AMAHW	240		RDB30AMAHP	349	
				type 23-Series S14	10	RDB30BMBHW	181		RDB30BMBHP	325	
					16	RDB30BMAHW	181		RDB30BMAHP	325	
400	16	12	175	type 23-Series S14	10	REB40BMBHW	240		REB40BMBHP	393	
					16	REB40BMAHW	240		REB40BMAHP	393	

Wall indicator

Post indicator

Potter PCVS position indicator of opening valves. Can be installed on all valves and all DN.
Reference :162148

SAINT-GOBAIN PAM worldwide

www.pamline.com

SAINT-GOBAIN PAM
Head office
21, avenue Camille Cavallier
54705 PONT-A-MOUSSON CEDEX
FRANCE
Phone : +33 (0) 3 83 80 73 50
Fax : +33 (0) 3 83 80 76 60

Water - Sewage - Municipal Castings Marketing
21, avenue Camille Cavallier
54705 PONT-A-MOUSSON CEDEX
FRANCE
Phone: +33 (0)3 83 80 67 89

ALGERIA
SAINT-GOBAIN PAM ALGERIE
Lieu-dit Ben Danoun, section 7
îlot 301, BP. 77 C
35 350 - Khemis El Khechna . Willaya de Boumerdes
Phone: + 213 770 510 534

ARGENTINA
SAINT-GOBAIN PAM ARGENTINA
Bouchard y Enz
1836 - LLAVALLOL - BUENOS AIRES - Argentina
Phone: + 54 11 42 98 9600

AUSTRALIA
SAINT-GOBAIN PAM
15 Edgars Road
THOMASTOWN VIC 3074 - Australia
Phone: + 61 (0) 3 9358 6122

AUSTRIA
SAINT-GOBAIN GUSSROHR VERTRIEB ÖSTERREICH GmbH
Archenweg, 52
A-6020 - INNSBRUCK - Austria
Phone: + 43 512 34 17 17 11

BELGIUM
SAINT-GOBAIN PIPE SYSTEMS
Raatshovenstraat, n°2
B-3400 - LANDEN - Belgium
Phone: + 32 11 88 01 20

BRAZIL
SAINT-GOBAIN CANALIZACAO LTDA
7ª Andar Condomínio do Edifício Praia de Botafogo
22250-040 - RIO DE JANEIRO - RJ - Brazil
Phone: + 55 21 2128 1677

CHILE
SAINT-GOBAIN CANALIZACIÓN CHILE S.A.
Antillanca Norte 600
Parque Industrial Vespucio, Comuna de Pudahuel
SANTIAGO DE CHILE - Chile
Phone: + (56-02) 24441300

CHINA
SAINT-GOBAIN PAM CHINA (SHANGAI)
7th Floor, Office Tower
Bund Center - 222 Yan'an Road (East)
200002 - SHANGAI - China
Phone: + 86 21 6361 2142

SAINT-GOBAIN PAM CHINA (XUZHOU)
Dong Jiao Yangzhuang
PC 221004 - XUZHOU - Jiangsu Province - China
Phone: + 86 516 8787 8107

SAINT-GOBAIN PAM CHINA (MAANSHAN)
Hua Gong Road Cihu
PC 243052 - MAANSHAN Anhui Province - China
Phone: + 86 555 350 8040

COLOMBIA
SAINT-GOBAIN PAM COLOMBIA
Terminal terrestre de carga de Bogota
Etapa 1, Bodega 9, Modulo 3
Km 3,5 costado sur autopista - Medellin
COTA CUNDINAMARCA - Colombia
Phone: + 57 (1) 841 5832

CZECH REPUBLIC
SAINT-GOBAIN PAM CZ s.r.o.
Počernická 272/96
108 03 Praha 10 - Czech Republic
Phone: +420 296 41 1781

FINLAND
SAINT-GOBAIN RAKENNUSTUOTTEET OY / PIPE SYSTEMS
Strömberginkuja 2
03800 Helsinki
Phone: + 358 207 424 600

FRANCE & DOM-TOM
SAINT-GOBAIN PAM (HEAD OFFICE)
21, avenue Camille Cavallier
54705 PONT-A-MOUSSON CEDEX - France
Phone: +33 3 83 80 73 50

SAINT-GOBAIN PAM
(France Commercial Department)
CRD – Chemin de Blénod – B.P. 109
54704 PONT A MOUSSON CEDEX - France
Phone: +33 3 83 80 73 00

SAINT-GOBAIN PAM
(Europe and International Commercial Departments)
21 avenue Camille Cavallier
54705 - PONT A MOUSSON CEDEX - France
Phone: + 33 3 83 80 67 89

SAINT-GOBAIN PAM
(Local Agency of The Antilles)
Rue Alfred Lumière - ZI de Jarry - BP 2104
97122 - BAIE MAHAULT - Guadeloupe
Phone: + 33 590 26 71 46

GERMANY
SAINT-GOBAIN PAM DEUTSCHLAND
Saarbrucker Strasse 51
66130 - SAARBRUCKEN - Germany
Phone: + 49 681 87 010

GREECE
SAINT-GOBAIN HELLAS ABEE
5 Klissouras str,
14452 - METAMORFOSSI - ATHENS - Greece
Phone: + 30 210 61 47 500

HONG KONG
SAINT-GOBAIN PIPELINES
H15/F Hermes Commercial Centre - 4-4A Hillwood Road
TSIM SHA TSUI - KOWLOON - Hong Kong
Phone: + 852 27 35 78 26

INDIA
SAINT-GOBAIN PAM
Grindwell Norton Ltd
5th Level, Leela Business Park - Andheri-Kurla Road
MUMBAI - 400059 - India
Phone: + 91 22 402 12 121

ITALY
SAINT-GOBAIN PAM ITALIA SPA
Via Romagnoli n°6
I-20146 - MILANO - Italy
Phone: + 39 02 42 431

JORDAN
SAINT-GOBAIN PAM REGIONAL OFFICE
Abu Zaid Center - Office # 8
37 Saad Bin Abi Waqqas St, - PO BOX 831001
11183 AMMAN - Jordan
Phone: + 962 6 551 4438

KENYA
SAINT-GOBAIN DEVELOPMENT EAST AFRICA LTD
9 Riverside Drive,
Nairobi, Kenya
Phone: + 254 7 31 02 12 35

MOROCCO
SAINT-GOBAIN MAROC DEVELOPMENT
2 allée des Figuiers - Aïn Sebaâ
CASABLANCA - Morocco
Phone: + 212 522 341 438

MEXICO
SAINT-GOBAIN PAM MEXICO
HORACIO 1855-502 - Colonia Los Morales - Polanco
11510 - MEXICO D.F. - Mexico
Phone: + 52 55 5279 1601

NETHERLANDS
SAINT-GOBAIN PIPE SYSTEMS
Markerkant 10-17
1316 - AB ALMERE - the Netherlands
Phone: + 31 36 53 333 44

NORWAY
SAINT-GOBAIN PAM NORWAY
Brobekkveien 84
N-0582 OSLO - Norway
Phone: + 47 23 17 58 60

PERU
SAINT-GOBAIN PAM PERU
Avenida de los Faisanes N° 157 - Chorillos
LIMA 09 - Peru
Phone: + 511 252 40 34/35

POLAND
Saint-Gobain PAM Polska
Ul. Cybernetyki 21
PL-02-677 WARSZAWA - Poland
Phone: + 48 22 567 15 04

PORTUGAL
SAINT-GOBAIN PAM PORTUGAL
Est. Nac. 10 - Lugar de D. Pedro -Apartado 1708
P-2690-901 - SANTA IRIA DE AZOIA - Portugal
Phone: + 351 218 925 000

ROMANIA
SAINT-GOBAIN CONSTRUCTION PRODUCTS ROMANIA S.R.L. - PAM Business Unit
Str. Tipografilor nr. 11-15
S-Park/Corp - B3 B4 - Sector 1 - Cod 013714
BUCHAREST - Romania
Phone: + 40 21 207 57 37

SLOVAKIA
SAINT-GOBAIN CONSTRUCTION PRODUCTS PAM Business Unit
Dlha 1780/6
90031 Stupava
Phone: + 421 265 45 69 61

SOUTH AFRICA
SAINT-GOBAIN CONSTRUCTION PRODUCTS PAM Business Unit
N1 Business Park
Intersection of Old Johannesburg Road and Tlokwa Street
Samrand, 0157 - South Africa
Phone: +27 12 657 2800

SPAIN
SAINT-GOBAIN PAM ESPANA
C/ Príncipe de Vergara, 132 planta 7
28002 - Madrid - Spain
Phone: + 34 91 397 20 00

UNITED ARAB EMIRATES
SAINT-GOBAIN PAM GULF
Jebel Ali Free Zone, Plot No. S10817
POBOX 261484
Dubai - United Arab Emirates
Phone: + 971 4 801 1800

UNITED KINGDOM
SAINT-GOBAIN PAM UK
Lows Lane - Stanton-by-Dale
ILLKESTON - DERBYSHIRE - DE7 4QU
United Kingdom
Phone: + 44 115 930 5000

VIETNAM
SAINT-GOBAIN PAM VIETNAM
IPC TOWER / LEVEL9
1489 Nguyen Van Linh Street
District 7
HO CHI MINH CITY - Vietnam
Phone: +84 8 39 30 72 73