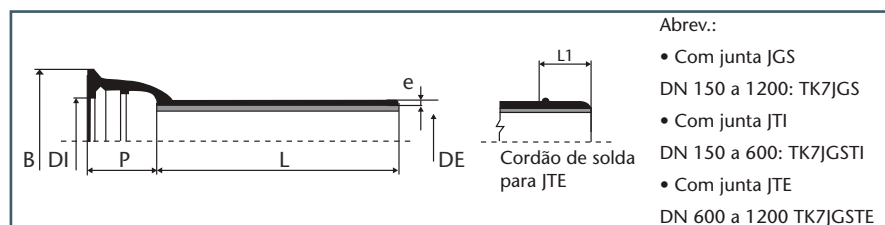


## TUBOS PONTA E BOLSA

### Tubo Classe K7



	DN	L	L1	DE	DI	B	P	e Ferro	Massa aprox.	
									por metro	total
		m	mm	mm	mm	mm	mm	mm	kg	kg
Integral	Natural	150	6	170,0	173,0	243,0	100,5	5,2	23,3	139,8
		200	6	222,0	225,0	296,0	106,5	5,4	31,9	191,4
		250	6	274,0	277,0	353,0	105,5	5,5	40,3	241,8
		300	6	326,0	329,0	410,0	107,5	5,7	49,8	298,8
	Clássica	350	6	378,0	381,0	465,0	110,5	5,9	64,9	389,4
		400	6	429,0	432,0	517,0	112,5	6,3	77,9	467,4
		450	6	480,0	483,0	575,0	115,5	6,7	91,7	550,2
		500	6	532,0	535,0	630,0	117,5	7,0	106,1	636,6
		600	6	135,0	635,0	638,0	739,0	7,7	137,9	827,4
		700	7	148,0	738,0	741,0	863,0	8,4	176,5	1235,5
		800	7	150,0	842,0	845,0	974,0	9,1	216,3	1514,1
		900	7	148,0	945,0	948,0	1082,0	9,8	259,4	1815,8
		1000	7	155,0	1048,0	1051,0	1191,0	10,5	316,2	2213,4
		1200	7	165,0	1255,0	1258,0	1412,0	11,9	411,9	2883,3

Revestimentos:

#### Linha Natural (DN150 a 300):

- internamente: argamassa de cimento alto-forno.
- externamente: liga de zinco mais alumínio e pintura epóxi azul.

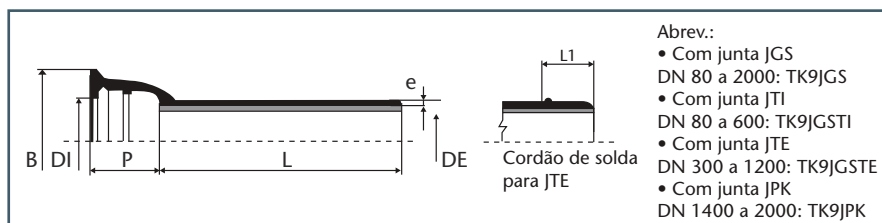
#### Linha Clássica (DN350 a 1200):

- internamente: argamassa de cimento alto-forno.
- externamente: zinco metálico e pintura betuminosa.

#### Linha Integral (DN150 a 1200):

- internamente: argamassa de cimento aluminoso.
- externamente: zinco metálico e pintura epóxi vermelha.

## Tubo Classe K9



	DN	L	L1	DE	DI	B	P	e Ferro	Massa aprox.		
									por metro	total	
		m		mm	mm	mm	mm	mm	kg	kg	
Integral	Natural	80	6		98,0	101,0	168,0	92,5	6,0	14,5	87,0
		100	6		118,0	121,0	189,0	94,5	6,0	18,1	108,6
		150	6		170,0	173,0	243,0	100,5	6,0	27,3	163,8
		200	6		222,0	225,0	296,0	106,5	6,3	36,7	220,2
		250	6		274,0	277,0	353,0	105,5	6,8	48,0	288,0
		300	6	115,0	326,0	329,0	410,0	107,5	7,2	60,4	362,4
	Clássica	350	6	114,0	378,0	381,0	465,0	110,5	7,7	79,7	478,2
		400	6	113,0	429,0	432,0	517,0	112,5	8,1	94,7	568,2
		450	6	120,0	480,0	483,0	575,0	115,5	8,6	111,8	670,8
		500	6	125,0	532,0	535,0	630,0	117,5	9,0	129,3	775,8
		600	6	135,0	635,0	638,0	739,0	122,5	9,9	168,4	1010,4
		700	7	148,0	738,0	741,0	863,0	147,5	10,8	215,1	1505,7
		800	7	150,0	842,0	845,0	974,0	147,5	11,7	264,1	1848,7
		900	7	148,0	945,0	948,0	1082,0	147,5	12,6	317,2	2220,4
		1000	7	155,0	1048,0	1051,0	1191,0	157,5	13,5	375,0	2625,0
		1200	7	165,0	1255,0	1258,0	1412,0	167,5	15,3	505,3	3537,1
		1400 a 2000	Consultar								

4

Revestimentos:

**Linha Natural (DN80 a 300):**

- internamente: argamassa de cimento alto-forno.
- externamente: liga de zinco mais alumínio e pintura epóxi azul.

**Linha Clássica (DN350 a 2000):**

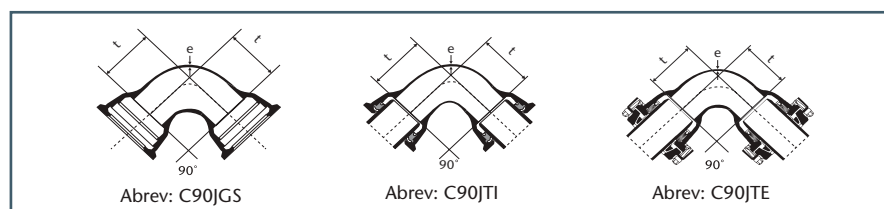
- internamente: argamassa de cimento alto-forno.
- externamente: zinco metálico e pintura betuminosa.

**Linha Integral (DN80 a 2000):**

- internamente: argamassa de cimento aluminoso.
- externamente: zinco metálico e pintura epóxi vermelha.

## CONEXÕES COM BOLSAS

Curva 90° com Bolsas, JGS, JTI e JTE



		DN	Dimensões e Massas				
			t	e	Massas JGS	Massas JTI	Massas JTE
			mm	mm	kg	kg	kg
Integral	Natural	80	100	7,0	10,0	10,0	
		100	120	7,2	13,2	13,2	
		150	170	7,8	21,6	21,6	
		200	220	8,4	33,9	33,9	
		250	270	9,0	47,9	47,9	
		300	320	9,6	70,4	70,4	144,6
	Clássica	350	370	10,2	96,0	96,0	175,0
		400	420	10,8	105,0	105,0	206,0
		450	470	11,4	163,0	163,0	280,4
		500	520	12,0	178,0	178,0	327,8
		600	620	13,2	274,0	274,0	477,4

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

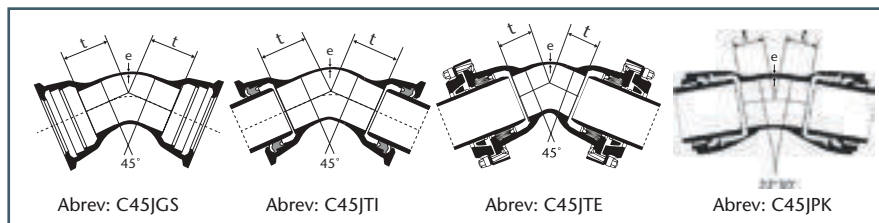
**Linha Clássica (DN350 a 600):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN80 a 600):**

- internamente e externamente, pintura epóxi vermelha.

### Curva 45° com Bolsas, JGS, JTI, JTE e JPK



		DN	Dimensões e Massas					
			t	e	Massas JGS	Massas JTI	Massas JTE	Massas JPK
			mm	mm	kg	kg	kg	kg
Integral	Natural	80	55	7,0	9,1	9,1		
		100	65	7,2	12,9	12,9		
		150	85	7,8	18,7	18,7		
		200	110	8,4	29,0	29,0		
		250	130	9,0	39,2	39,2		
		300	150	9,6	53,4	53,4		
	Clássica	350	175	10,2	61,3	61,3	140,3	
		400	195	10,8	83,0	83,0	184,0	
		450	220	11,4	105,5	105,5	222,9	
		500	240	12,0	128,0	128,0	277,8	
		600	285	13,2	175,0	175,0	378,4	
		700	330	14,4	322,0		611,6	
		800	370	15,6	416,0		735,4	
		900	415	16,8	500,0		910,1	
		1000	460	18,0	710,0		1257,2	
		1200	550	20,4	1050,0		1607,6	
	1400 a 2000	Consultar						

4

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

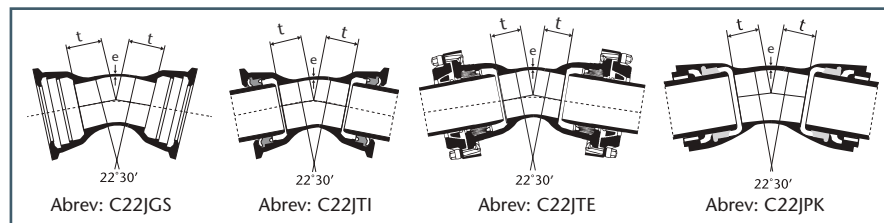
**Linha Clássica (DN350 a 2000):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN80 a 2000):**

- internamente e externamente, pintura epóxi vermelha.

### Curva 22°30' com Bolsas, JGS, JTI, JTE e JPK



		DN	Dimensões e Massas					
			t	e	Massas JGS	Massas JTI	Massas JTE	Massas JPK
			mm	mm	kg	kg	kg	kg
Integral	Natural	80	40	7,0	8,5	8,5		
		100	40	7,2	11,4	11,4		
		150	55	7,8	17,6	17,6		
		200	65	8,4	26,2	26,2		
		250	75	9,0	33,8	33,8		
		300	85	9,6	45,2	45,2	119,4	
	Clássica	350	95	10,2	50,1	50,1	129,1	
		400	110	10,8	63,1	63,1	164,1	
		450	120	11,4	81,0	81,0	230,8	
		500	130	12,0	97,4	97,4	247,2	
		600	150	13,2	157,0	157,0	360,4	
		700	175	14,4	222,0		511,6	
		800	195	15,6	324,0		643,4	
		900	220	16,8	372,0		782,1	
		1000	240	18,0	520,0		1067,2	
		1200	285	20,4	654,0		1211,6	
		1400 a 2000	Consultar					

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

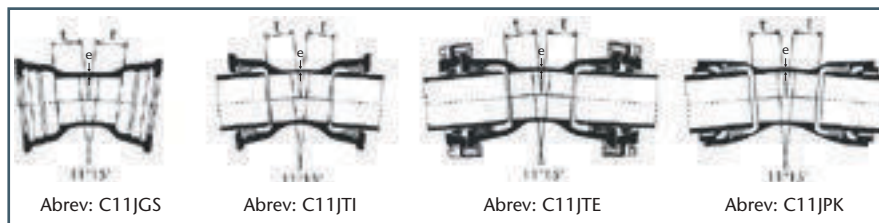
**Linha Clássica (DN350 a 2000):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN80 a 2000):**

- internamente e externamente, pintura epóxi vermelha.

### Curva 11°15' com Bolsas, JGS, JTI, JTE e JPK



		DN	Dimensões e Massas					
			t	e	Massas JGS	Massas JTI	Massas JTE	Massas JPK
			mm	mm	kg	kg	kg	kg
Integral	Natural	80	30	7,0	8,8	8,8		
		100	30	7,2	10,8	10,8		
		150	35	7,8	16,8	16,8		
		200	40	8,4	27,6	27,6		
		250	50	9,0	34,2	34,2		
		300	55	9,6	44,6	44,6		
	Clássica	350	60	10,2	48,0	48,0	127,0	
		400	65	10,8	56,1	56,1	157,1	
		450	70	11,4	71,0	71,0	188,4	
		500	75	12,0	81,6	81,6	231,4	
		600	85	13,2	106,0	106,0	309,4	
		700	95	14,4	190,0		479,6	
		800	110	15,6	272,0		591,4	
		900	120	16,8	310,0		720,1	
		1000	130	18,0	392,0		939,2	
		1200	150	20,4	582,0		1139,6	
		1400 a 2000		Consultar				

4

Revestimento:

#### Linha Natural (DN80 a 300):

- internamente e externamente, pintura epóxi azul.

#### Linha Clássica (DN350 a 2000):

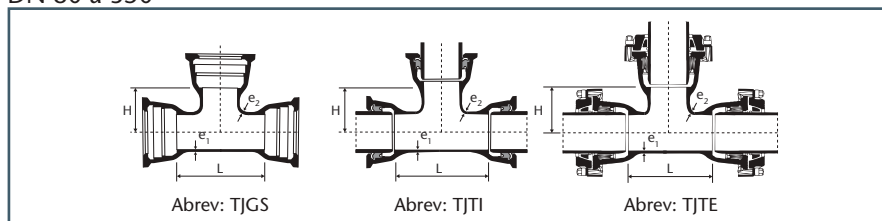
- internamente e externamente, pintura betuminosa.

#### Linha Integral (DN80 a 2000):

- internamente e externamente, pintura epóxi vermelha.

## Tê com Bolsas, JGS, JTI e JTE

DN 80 a 350



		DN	dn	Dimensões e massas							
				Corpo		Derivação		Massas JGS	Massas JTI	Massas JTE	
											L
				m	mm	mm	mm	kg	kg	kg	
Integral	Natural	80	80	170,0	7,0	85,0	7,0	14,0	14,0		
		100	80	170,0	7,2	95,0	7,0	17,1	17,1		
			100	190,0	7,2	95,0	7,2	18,4	18,4		
		150	80	170,0	7,8	120,0	7,0	22,9	22,9		
			100	195,0	7,8	120,0	7,2	25,0	25,0		
			150	285,0	7,8	125,0	7,8	29,7	29,7		
		200	80	175,0	8,4	145,0	7,0	32,3	32,3		
			100	200,0	8,4	145,0	7,2	32,8	32,8		
			150	255,0	8,4	150,0	7,8	38,9	38,9		
			200	315,0	8,4	155,0	8,4	45,5	45,5		
		250	80	180,0	9,0	170,0	7,0	39,0	39,0		
			100	200,0	9,0	170,0	7,2	39,5	39,5		
			250	375,0	9,0	190,0	9,0	58,9	58,9		
		300	80	180,0	9,6	195,0	7,0	50,0	50,0		124,2
			100	205,0	9,6	195,0	7,2	54,7	54,7		128,9
			150	260,0	9,6	200,0	7,8	57,5	57,5		131,7
			200	320,0	9,6	205,0	8,4	67,6	67,6		141,8
			250	375,0	9,6	210,0	9,0	77,6	77,6		151,8
			300	435,0	9,6	220,0	9,6	83,0	83,0		157,2
	Clássica	350	100	205,0	10,2	220,0	7,2	65,0	65,0	144,0	
			200	328,0	10,2	235,0	8,4	76,2	76,2	155,2	
			250	360,0	10,2	250,0	9,0	77,0	77,0	156,0	
			350	495,0	10,2	250,0	10,2	105,0	105,0	184,0	

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

**Linha Clássica (DN350):**

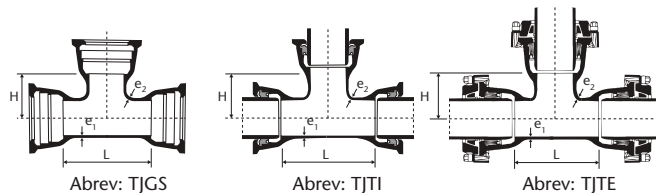
- internamente e externamente, pintura betuminosa.

**Linha Integral (DN80 a 350):**

- internamente e externamente, pintura epóxi vermelha.

## Tê com Bolsas, JGS, JTI e JTE

DN 400 a 600



	DN	dn	Dimensões e massas						
			Corpo		Derivação		Massas JGS	Massas JTI	Massas JTE
			L	e1	H	e2			
			m	mm	mm	mm	kg	kg	kg
Integral	Clássica	400	80	185,0	10,8	245,0	7,0	74,5	175,5
			100	210,0	10,8	245,0	7,2	73,9	174,9
			200	325,0	10,8	260,0	8,4	92,2	193,2
			300	440,0	10,8	270,0	9,6	114,6	215,6
			400	560,0	10,8	280,0	10,8	132,9	233,9
		500	80	190,0	12,0	295,0	7,0	103,0	252,8
			100	215,0	12,0	295,0	7,2	103,0	252,8
			200	330,0	12,0	310,0	8,4	118,1	267,9
			300	450,0	12,0	320,0	9,6	157,4	307,2
			500	680,0	12,0	340,0	12,0	198,0	347,8
	600		100	220,0	13,2	345,0	7,2	140,0	343,4
			200	340,0	13,2	360,0	8,4	168,0	371,4
			300	455,0	13,2	370,0	9,6	197,0	400,4
			400	570,0	13,2	380,0	10,8	225,0	428,4
			600	800,0	13,2	400,0	13,2	287,0	490,4

4

Revestimento:

**Linha Clássica (DN400 a 2000):**

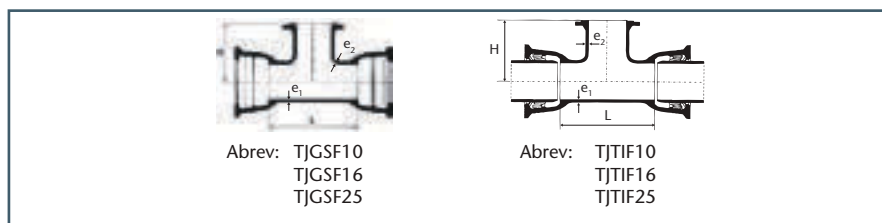
- internamente e externamente, pintura betuminosa.

**Linha Integral (DN400 a 2000):**

- internamente e externamente, pintura epóxi vermelha.



### Tê com Bolsas e Flange – JGS e JTI – DN 80 a 300



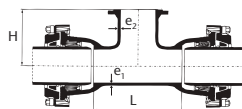
DN	dn	Dimensões e Massas									
		Dimensões				Massas JGS			Massas JTI		
		Corpo		Derivação		PN10	PN16	PN25	PN10	PN16	PN25
		L	e1	H	e2						
		m	mm	mm	mm						
Integral	Natural	80	50	170,0	7,0	155,0	7,0		11,0		11,0
			80	170,0	7,0	165,0	7,0		14,7		14,7
		100	50	200,0	7,2	175,0	7,0		13,0		13,0
			80	170,0	7,2	175,0	7,0		17,7		17,7
		150	100	190,0	7,2	180,0	7,2	19,3		20,5	19,3 20,5
			50	170,0	7,8	210,0	7,8		19,2		19,2
			80	170,0	7,8	205,0	7,0		23,3		23,3
			100	195,0	7,8	210,0	7,2	25,2		27,8	25,2 27,8
		200	150	255,0	7,8	220,0	7,8	31,0		30,0	31,0 30,0
			50	175,0	8,4	230,0	7,0		25,6		25,6
			80	175,0	8,4	235,0	7,0		33,6		33,6
			100	200,0	8,4	240,0	7,2	34,5		39,0	34,5 39,0
			150	255,0	8,4	250,0	7,8	39,8		45,0	39,8 45,0
			200	315,0	8,4	260,0	8,4	41,5		53,0	41,5 53,0
		250	50	195,0	9,0	260,0	7,0		35,5		35,5
			80	180,0	9,0	265,0	7,0		39,7		39,7
			100	200,0	9,0	270,0	7,2	41,0		41,3	41,0 41,3
			250	375,0	9,0	300,0	9,0	62,8		64,9	62,8 64,9
		300	100	205,0	9,6	300,0	7,2	59,0		60,0	59,0 60,0
			150	260,0	9,6	275,0	7,8	60,0	60,0	63,0	60,0 63,0
			200	320,0	9,6	320,0	8,4	70,0		78,0	70,0 78,0
			250	380,0	9,6	330,0	9,0	82,3	83,2	85,3	82,3 83,2 85,3
			300	435,0	9,6	340,0	9,6	87,3		94,0	87,3 94,0

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

## Tê com Bolsas e Flange – JTE – DN 80 a 300



Abrev: TJTEF10  
TJTEF16  
TJTEFT25

DN	dn	Dimensões e Massas							
		Dimensões				Massas JTE			Massas JPK
		Corpo		Derivação		PN10	PN16	PN25	PN10, 16 e 25
		L	e1	H	e2				
		m	mm	mm	mm				
Integral	Natural	80	50	170,0	7,0	155,0	7,0		
			80	170,0	7,0	165,0	7,0		
		100	50	200,0	7,2	175,0	7,0		
			80	170,0	7,2	175,0	7,0		
		150	100	190,0	7,2	180,0	7,2		
			50	170,0	7,8	210,0	7,8		
			80	170,0	7,8	205,0	7,0		
			100	195,0	7,8	210,0	7,2		
		200	150	255,0	7,8	220,0	7,8		
			50	175,0	8,4	230,0	7,0		
			80	175,0	8,4	235,0	7,0		
			100	200,0	8,4	240,0	7,2		
			150	255,0	8,4	250,0	7,8		
			200	315,0	8,4	260,0	8,4		
		250	50	145,0	9,0	260,0	7,0		
			80	180,0	9,0	265,0	7,0		
			100	200,0	9,0	270,0	7,2		
			250	375,0	9,0	300,0	9,0		
		300	100	205,0	9,6	300,0	7,2	130,2	131,2
			150	265,0	9,6	310,0	7,8	131,2	134,2
			200	320,0	9,6	320,0	8,4	141,2	141,2
			250	380,0	9,6	330,0	9,0	153,5	154,4
			300	435,0	9,6	340,0	9,6	158,5	158,5

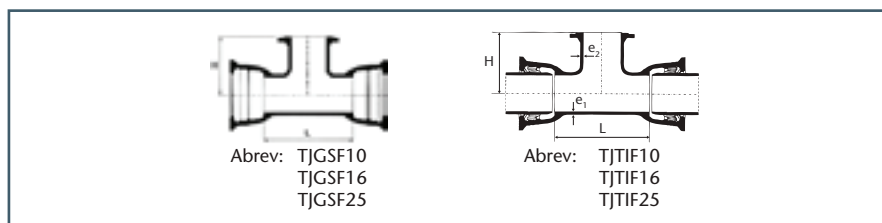
4

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

## Tê com Bolsas e Flange – JGS e JTI – DN 350 a 700



DN	dn	Dimensões e Massas									
		Dimensões				Massas JGS			Massas JTI		
		Corpo		Derivação		PN10	PN16	PN25	PN10	PN16	PN25
		L	e1	H	e2						
		m	mm	mm	mm						
Integral	Clássica	100	205,0	10,2	330,0	7,2	53,8	65,0	53,8	65,0	
		200	365,0	10,2	350,0	8,4	82,0	84,0	82,0	82,0	84,0
		250	385,0	10,2	380,0	9,0	85,1	86,1	88,1	85,1	86,1
		350	495,0	10,2	380,0	10,2	112,0	115,0	123,0	112,0	115,0
		100	210,0	10,8	420,0	7,2	75,2	76,5	75,2	76,5	
		200	325,0	10,8	440,0	8,4	93,8	96,1	93,8	93,8	96,1
		300	440,0	10,8	400,0	9,6	115,7	120,9	115,7	115,7	120,9
		400	560,0	10,8	420,0	10,8	139,0	151,0	162,0	139,0	151,0
		450	450	620	11,4	460	11,4	Consultar			
		100	215,0	12,0	405,0	7,2	106,8	105,7	106,8		105,7
		200	330,0	12,0	425,0	8,4	126,0	126,2	126,8	126,0	126,2
		300	445,0	12,0	460,0	9,6	163,0	166,0	163,0	163,0	166,0
		400	565,0	12,0	480,0	10,8	192,0	198,0	209,0	192,0	198,0
		500	680,0	12,0	500,0	12,0	223,0	238,0	250,0	223,0	238,0
		100	220,0	13,2	480,0	7,2	140,0		140,0		
		200	340,0	13,2	500,0	8,4	165,0	175,0	177,0	165,0	175,0
		300	455,0	13,2	520,0	9,6	205,0	210,0	205,0	205,0	210
		400	570,0	13,2	540,0	10,8	244,0	251,0	266,0	244,0	251,0
		600	800,0	13,2	580,0	13,2	334,1	352,0	367,0	334,1	352,0
		200	345,0	14,4	525,0	8,4	249,0	272,0	278,0		
		600	925,0	14,4	585,0	13,2	496,0	468,5	482,5		
		700	925,0	14,4	600,0	14,4	536,0	481,5	516,5		

Revestimento:

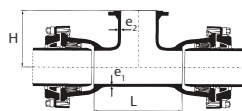
**Linha Clássica (DN350 a 700):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN350 a 700):**

- internamente e externamente, pintura epóxi vermelha.

## Tê com Bolsas e Flange – JTE – DN 350 a 700



Abrev: TJTEF10  
TJTEF16  
TJTEF25

DN		dn	Dimensões e Massas						
			Dimensões				Massas JTE		
			Corpo		Derivação		PN10	PN16	PN25
m	mm	mm	mm	kg	kg	kg			
Integral	350	100	205,0	10,2	330,0	7,2	128,3		139,5
		200	325,0	10,2	350,0	8,4	156,5	156,5	158,5
		250	385,0	10,2	360,0	9,0	159,6	160,6	162,6
		350	495,0	10,2	380,0	10,2	186,5	189,5	197,5
	400	100	210,0	10,8	360,0	7,2	172,2		173,5
		200	325,0	10,8	380,0	8,4	190,8	190,8	193,1
		300	440,0	10,8	400,0	9,6	212,7	212,7	217,9
		400	560,0	10,8	420,0	10,8	236,0	248,0	259,0
	450	450	620	11,4	460	11,4			
	500	100	215,0	12,0	420,0	7,2	249,7		248,6
		200	330,0	12,0	440,0	8,4	268,9	269,1	269,7
		300	445,0	12,0	460,0	9,6	305,9	305,9	308,9
		400	565,0	12,0	480,0	10,8	334,9	340,9	351,9
		500	680,0	12,0	500,0	12,0	365,9	380,9	392,9
	600	100	220,0	13,2	480,0	7,2	336,4		
		200	340,0	13,2	500,0	8,4	361,4	371,4	373,4
		300	455,0	13,2	520,0	9,6	401,4	401,4	406,4
		400	570,0	13,2	540,0	10,8	440,4	447,4	462,4
		600	800,0	13,2	580,0	13,2	530,5	548,4	563,4
	700	200	345,0	14,4	525,0	8,4	530,9	547,9	552,9
		600	925,0	14,4	585,0	13,2	712,7	738,7	752,7
		700	925,0	14,4	600,0	14,4	811,9	751,7	786,7

Revestimento:

**Linha Clássica (DN350 a 700):**

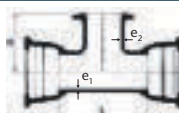
- internamente e externamente, pintura betuminosa.

**Linha Integral (DN350 a 700):**

- internamente e externamente, pintura epóxi vermelha.

4

## Tê com Bolsas e Flange – JGS – DN 800 a 1800



Abrev: TJGSF10  
TJGSF16  
TJGSF25

		DN	dn	Dimensões e Massas							
				Dimensões				Massas JGS			
				Corpo		Derivação		PN10	PN16	PN25	
											L
m	mm	mm	mm	kg	kg	kg					
Integral	Clássica	800	200	350,0	15,6	585,0	8,4	317,0	355,0	355,0	
			400	580,0	15,6	615,0	10,8	464,0	464,0	439,3	
			600	1045,0	15,6	645,0	13,2	596,0	630,3	644,9	
			800	1045,0	15,6	675,0	15,6	596,4	679,3	715,6	
		900	200	355,0	16,8	645,0	8,4	323,9	335,0	410,0	
			400	590,0	16,8	675,0	10,8	502,2	508,4	519,7	
			600	1170,0	16,8	705,0	13,2	763,0	789,5	803,4	
			800	1170,0	16,8	750,0	15,6	854,6	883,2	932,8	
			900	1170,0	16,8	750,0	16,8	925,2	949,4	1010,0	
		1000	200	360,0	18,0	705,0	8,4	456,0	485,0	496,2	
			400	595,0	18,0	735,0	10,8	596,0	637,4	659,8	
			600	1290,0	18,0	765,0	13,2	949,2	936,8	982,2	
			800	1290,0	18,0	800,0	15,6	1015,2	1082,0	1144,2	
			1000	1290,0	18,0	825,0	18,0	1093,0	1124,0	1310,2	
		1200	200	370,0	20,4	850,0	8,4	650,0	756,0	928,0	
			600	840,0	20,4	885,0	13,2	1118,5	1326,0	1385,0	
			800	1070,0	20,4	915,0	15,6	1569,0	1606,0	1637,0	
		1400 a 1800	Consultar								

Revestimento:

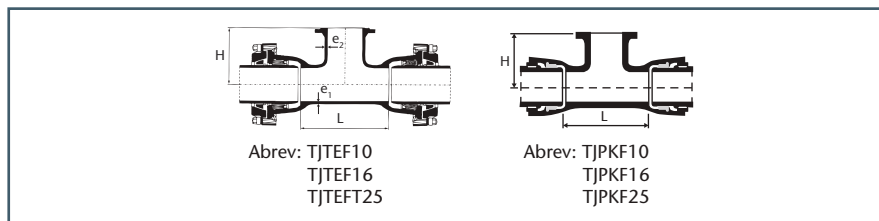
**Linha Clássica (DN800 a 1800):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN800 a 1800):**

- internamente e externamente, pintura epóxi vermelha.

## Tê com Bolsas e Flange – JTE e JPK – DN 800 a 1600



	DN	dn	Dimensões e Massas								
			Dimensões				PN25	Massas JTE			Massas JPK
			Corpo		Derivação			PN10	PN16	PN25	PN10, 16 e 25
			L	e1	H	e2					
			m	mm	mm	mm					
Integral	Clássica	800	200	350,0	15,6	585,0	8,4	629,3	612,5	614,5	
			400	580,0	15,6	615,0	10,8	761,3	709,3	720,3	
			600	1045,0	15,6	645,0	13,2	893,3	920,3	934,9	
			800	1045,0	15,6	675,0	15,6	893,7	969,3	1005,6	
	900	200	355,0	16,8	645,0	8,4	711,6	783,7	713,6		
		400	590,0	16,8	675,0	10,8	889,9	896,1	907,4		
		600	1170,0	16,8	705,0	13,2	1369,7	Consultar			
		800	1170,0	16,8	750,0	15,6	1412,7				
		900	1170,0	16,8	750,0	16,8	1443,7				
	1000	200	360,0	18,0	705,0	8,4	960,2	1004,2	975,1		
		400	595,0	18,0	735,0	10,8	1100,2	1141,6	1152,8		
		600	1290,0	18,0	765,0	13,2	1442,2	1461,0	1475,2		
		800	1290,0	18,0	800,0	15,6	1508,2	1586,2	1637,2		
		1000	1290,0	18,0	825,0	18,0	1628,2	1574,2	1803,2		
	1200	200	370,0	20,4	850,0	8,4	1261,6	1155,6	1433,6		
		600	840,0	20,4	885,0	13,2	1831,6	1605,6	1872,6		
		800	1070,0	20,4	915,0	15,6	2074,6	2093,6	2142,6		
	1400 a 1800	Consultar						Consultar			

4

Revestimento:

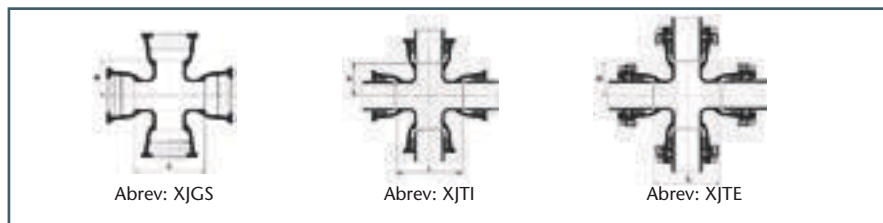
**Linha Clássica (DN800 a 1800):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN800 a 1800):**

- internamente e externamente, pintura epóxi vermelha.

### Cruzeta com Bolsas – JGS, JTI e JTE



	DN	dn	Dimensões e Massas				
			L	H	Massas JGS	Massas JTI	Massas JTE
			mm	mm	kg	kg	kg
Integral	Natural	80	160	80	16,0	16,0	
		100	165	95	23,1	23,1	
			190	95	25,1	25,1	
		150	165	120	27,9	27,9	
			195	120	29,7	29,7	
			255	125	37,95	37,9	
		200	170	145	33,6	33,6	
			200	145	38,2	38,20	
			255	150	46,3	46,30	
			315	155	55,65	55,6	
		250	170	170	42,70	42,7	
			200	170	44,00	44,0	
			375	190	77,40	77,4	
		300	175	195	50,10	50,1	125,50
			205	195	56,6	56,6	132,00
			320	205	75,20	75,2	150,60
			435	220	104,0	104,0	254,80

Revestimento:

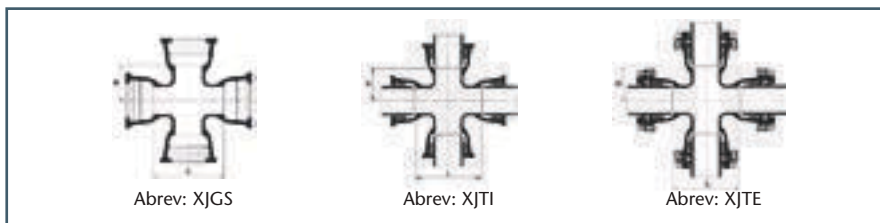
**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

**Linha Integral (DN80 a 300):**

- internamente e externamente, pintura epóxi vermelha.

## Cruzeta com Bolsas – JGS, JTI e JTE



		DN	dn	Dimensões e Massas				
				L	H	Massas JGS	Massas JTI	Massas JTE
				mm	mm	kg	kg	kg
Integral	Clássica	350	100	205	220	64,5	64,5	142,5
			200	325	230	82,7	82,7	160,7
			250	495	250	92,2	92,2	170,2
		400	80	180	245	79,80	79,8	175,80
			100	210	245	82,20	82,2	178,20
			200	325	260	104,00	109,0	200,00
		500	400	560	280	158,8	158,8	350,80
			80	185	295	108,0	108,0	255,20
			100	215	295	107,0	107,0	254,20
		600	200	330	305	132,0	132,0	279,20
			300	450	320	160,0	160,0	382,60
			500	680	340	223,0	223,0	514,40
		600	100	220	345	143,0	143,0	314,00
			200	340	355	175,0	175,0	346,00
			300	455	370	207,0	207,0	453,40
			400	570	380	240,0	240,0	507,00
			600	800	400	330,0	330,0	672,00

4

Revestimento:

**Linha Clássica (DN350 a 600):**

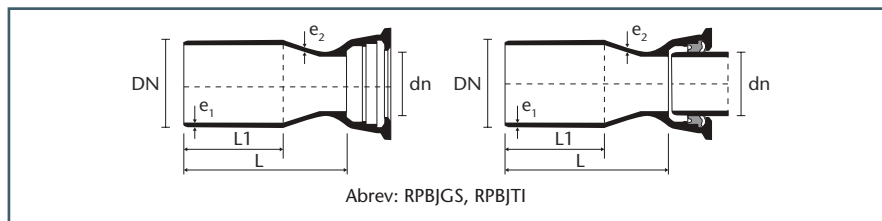
- internamente e externamente, pintura betuminosa.

**Linha Integral (DN350 a 600):**

- internamente e externamente, pintura epóxi vermelha.



## Redução Ponta e Bolsa JGS, JTI



		DN	dn	Dimensões e Massas					Massas JGS kg	Massas JTI kg
				L	e1	L1	e2			
				mm	mm	mm	mm			
Integral	Natural	80	75	200	7,0	82	7,0	5,20	5,20	
		100	80	200	7,2	92	7,0	7,80	7,80	
		150	80	300	7,8	98	7,0	11,50	11,50	
			100	300	7,8	98	7,2	12,50	12,50	
		200	80	300	8,4	104	7,0	12,30	12,30	
			100	300	8,4	104	7,2	14,60	14,60	
			150	300	8,4	104	7,8	17,00	17,00	
		250	150	350	9,0	104	7,8	22,10	22,10	
			200	250	9,0	104	8,4	22,30	22,30	
		300	150	450	9,6	105	7,8	28,80	28,80	
			200	350	9,6	105	8,4	28,85	28,85	
			250	250	9,6	105	9,0	30,50	30,50	
	Clássica	350	200	460	10,2	108	8,4	38,00	38,00	
			250	360	10,2	108	9,0	36,50	36,50	
			300	260	10,2	108	9,6	39,60	39,60	
		400	250	470	10,8	110	9,0	48,20	48,20	
			300	370	10,8	110	9,6	44,80	44,80	
			350	270	10,8	110	9,6	42,40	42,40	
		500	350	480	12,0	115	9,6	78,70	78,70	
			400	380	12,0	115	10,8	62,40	62,40	
		600	400	580	13,2	120	10,8	105,00	105,00	
			500	380	13,2	120	12,0	90,00	90,00	

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

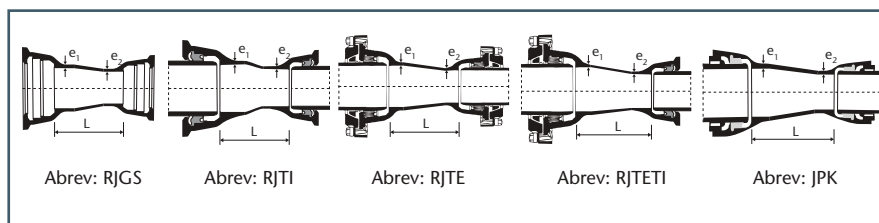
**Linha Clássica (DN350 a 600):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN80 a 600):**

- internamente e externamente, pintura epóxi vermelha.

## Redução com Bolsas JGS, JTI, JTE, JTETI e JPK



DN	dn	Dimensões e Massas							
		L	e1	e2	RJGS	RJTI	RJTE	RJTETI	JPK
		mm	mm	mm	kg	kg	kg	kg	kg
Integral	Clássica	200	360	10,2	8,4	47,38	47,38		86,88
		350	250	10,2	9,0	46,40	46,40		85,90
		300	160	10,2	9,6	45,01	45,01	121,61	84,51
		250	360	10,8	9,0	59,20	59,20		109,70
		300	260	10,8	9,6	55,14	55,14	142,74	105,64
		350	160	10,8	10,2	56,21	56,21	146,21	106,71
		350	360	12,0	10,2	100,98	100,98	215,38	175,88
		400	260	12,0	10,8	112,00	112,00	237,40	186,90
		400	460	13,2	10,8	139,50	139,50	291,70	241,20
		500	260	13,2	12,0	148,50	148,50	176,60	250,20
		700	500	14,4	12,0	222,90		442,58	
		600	280	14,4	13,2	193,52		440,00	
		800	600	15,6	13,2	299,60		561,00	
		900	700	16,8	14,4	391,96		741,79	
		1000	800	18,0	15,6	431,70		865,00	
		900	280	18,0	16,8	447,04		925,69	
		1200	1000	480	20,4	700,00		1252,40	
		1400 a 2000	Consultar						

Revestimento:

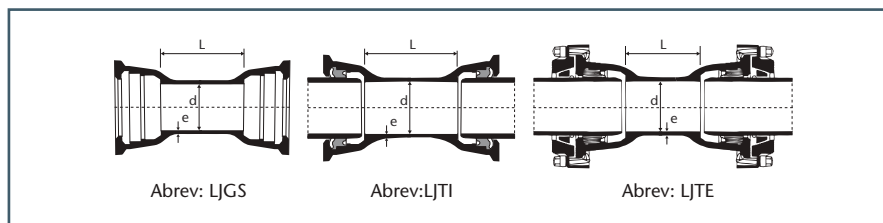
**Linha Clássica (DN350 a 2000\*):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN350 a 2000\*):**

- internamente e externamente, pintura epóxi vermelha.

## Luva com Bolsas LJGS, LJTI e LJTE



		DN	Dimensões e Massas					
			d	e	L	LJGS	LJTI	LJTE
			mm	mm	mm	kg	kg	kg
Integral	Natural	50	78	7,0	155	3,70	3,70	
		75	104	7,0	160	5,44	5,44	
		80	109	7,0	160	10	10	
		100	130	7,2	160	11,70	11,70	
		150	183	7,8	165	16,70	16,70	
		200	235	8,4	170	24,20	24,20	
		250	288	9,0	175	30,20	30,20	
		300	340	9,6	180	38,90	38,90	
	Clássica	350	393	10,2	185	48,20	48,20	127,20
		400	445	10,8	190	52,20	52,20	153,20
		450	498	11,4	195	69,20	69,20	184,60
		500	550	12,0	200	81,00	81,00	230,80
		600	655	13,2	210	125,00	125,00	328,40
		700	760	14,4	220	181,00		470,56
		800	865	15,6	230	324,40		643,40
		900	970	16,8	240	340,00		778,10
		1000	1075	18,0	250	350,00		897,20
		1200	1285	20,4	270	436,00		993,60

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

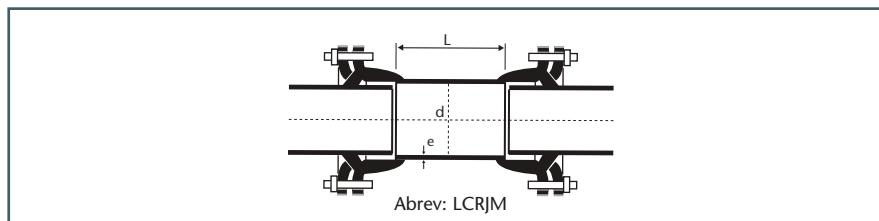
**Linha Clássica (DN350 a 1200):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN50 a 1200):**

- internamente e externamente, pintura epóxi vermelha.

## Luva de Correr com Bolsa Junta Mecânica – LCRJM



		DN	Dimensões e Massas			
			d	e	L	Massas
			mm	mm	mm	kg
Integral	Natural	50	78	7,0	155	14,64
		75	104	7,0	160	12,94
		80	109	7,0	160	14,34
		100	130	7,2	160	19,14
		150	183	7,8	165	27,56
		200	235	8,4	170	41,36
		250	288	9,0	175	64,48
		300	340	9,6	180	76,68
	Clássica	350	393	10,2	185	111,43
		400	445	10,8	190	133,5
		450	494	11,4	195	159,3
		500	550	12,0	200	194
		600	655	13,2	210	242,4
		700	760	14,4	220	324,12
		800	865	15,6	230	419,84
		900	970	16,8	240	539,6
		1000	1075	18,0	250	700
		1200	1285	20,4	270	922

4

Revestimento:

**Linha Natural (DN50 a 300):**

- internamente e externamente, pintura epóxi azul.

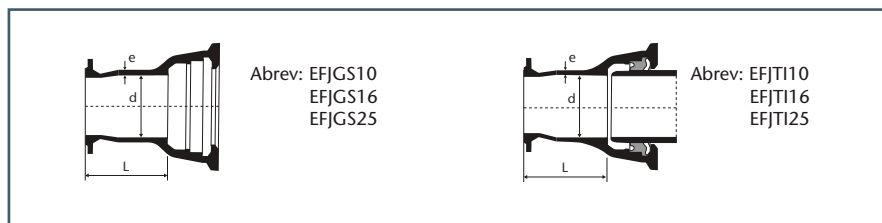
**Linha Clássica (DN350 a 1200):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN50 a 1200):**

- internamente e externamente, pintura epóxi vermelha.

## Extremidade Flange e Bolsa, JGS e JTI



		DN	Dimensões e Massas								
			d	e	L	Massas EFJGS			Massas JTI		
						PN10	PN16	PN25	PN10	PN16	PN25
						mm	mm	mm	kg	kg	kg
Integral	Natural	80	109	7,0	130	8,1			9,3		
		100	130	7,2	130	9,8		10,5	9,8		10,5
		150	183	7,8	135	15,7		16,5	15,7		16,5
		200	235	8,4	140	20,9		23,8	20,9		23,8
		250	288	9,0	145	28,8		33,7	28,8		33,7
		300	340	9,6	150	37,6		41,0	37,6		41
	Clássica	350	393	10,2	155	44	49,8	56	44	49,8	56
		400	445	10,8	160	53,1	60,2	70,4	53,1	60,2	70,4
		450	498	11,4	165	69,6	74,0	85	69,6	74	85
		500	550	12,0	170	81,6	95,8	105,6	81,6	95,8	105,6
		600	655	13,2	180	106	133	147	106	133	147
		700	760	14,4	190	163	237	187,5			
		800	865	15,6	200	210	219,5	244			
		900	970	16,8	210	258	296,5	300			
		1000	1075	18,0	220	321	361	380			
		1200	1285	20,4	240	460	437,5	487,5			
		1400 a 2000	Consultar								

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

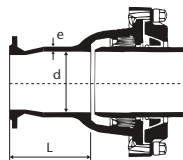
**Linha Clássica (DN350 a 2000):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN80 a 2000):**

- internamente e externamente, pintura epóxi vermelha.

## Extremidade Flange e Bolsa, JTE



Abrev: EFJTE10  
EFJTE16  
EFJTE25

		DN	Dimensões e Massas								
			d	e	L	Massas EFJTE			Massas JPK		
						PN10	PN16	PN25	PN10	PN16	PN25
						mm	mm	mm	kg	kg	kg
Integral	Natural	80	109	7,0	130						
		100	130	7,2	130						
		150	183	7,8	135						
		200	235	8,4	140						
		250	288	9,0	145						
		300	340	9,6	150	74,7	78,1				
	Clássica	350	393	10,2	155	83,5	89,3	95,5			
		400	445	10,8	160	103,6	110,7	120,9			
		450	498	11,4	165	120,1	124,5	135,5			
		500	550	12,0	170	132,1	146,3	156,1			
		600	655	13,2	180	156,5	183,5	197,5			
		700	760	14,4	190	307,8	381,8	332,3			
		800	865	15,6	200	354,8	364,3	388,8			
		900	970	16,8	210	402,8	414,3	444,8			
		1000	1075	18,0	220	465,8	505,8	524,8			
		1200	1285	20,4	240	604,8	582,3	632,3			
		1400 a 2000	Consultar								

4

Revestimento:

### Linha Natural (DN80 a 300):

- internamente e externamente, pintura epóxi azul.



### Linha Clássica (DN350 a 2000):

- internamente e externamente, pintura betuminosa.

### Linha Integral (DN350 a 2000):

- internamente e externamente, pintura epóxi vermelha.

## CAP

DN 80 a 250		DN 300 a 600		Abrev.: • Com junta JGS DN 80 a 600: KJGS • Com junta JTI DN 80 a 600: KJTI • Com junta JTE DN 300 a 600: KJTE
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		DN	Dimensões e Massas			
			P	Massas		
				JGS	JTI	JTE
				mm	kg	kg
Integral	Natural	80	82	3,2	3,2	-
		100	88	4,7	4,7	-
		150	94	9,4	9,4	-
		200	100	13,6	13,6	-
		250	103	18,7	18,7	-
		300	105	32,1	32,1	69,8
	Clássica	350	107	40,3	40,3	79,3
		400	110	51,5	51,5	99,5
		450	113	64,8	64,8	121,8
		500	115	78,5	78,5	155,2
		600	120	113,7	113,7	201,8

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

**Linha Clássica (DN350 a 600):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN80 a 600):**

- internamente e externamente, pintura epóxi vermelha.

## TUBOS COM FLANGES, COM OU SEM ABA DE VEDAÇÃO

Montados por dilatação térmica e interferência e Roscados

	Abrev.: Sem aba de vedação PN 10: TFL10 PN 16: TFL16 PN 25: TFL25	Com aba de vedação PN 10: TFLAV10 PN 16: TFLAV16 PN 25: TFLAV25		Abrev.: Sem aba de vedação PN 10: TFP10 PN 16: TFP16 PN 25: TFP25	Com aba de vedação PN 10: TFP10 PN 16: TFP16 PN 25: TFP25
	Abrev.: Sem aba de vedação PN 10: TFB10 PN 16: TFB16 PN 25: TFB25	Com aba de vedação PN 10: TFB10 PN 16: TFB16 PN 25: TFB25		Abrev.: Sem aba de vedação TCL	Com aba de vedação TCLAV

DN		Dimensões e Massas							
		Tubo Cilíndrico				Bolsa	Flange		
		Comprimento Máximo L	Diâmetro Externo DE	Espessura Nominal e	Massas com cimen- to	Massas	Massas		
		m	mm	mm	kg/m	kg	PN 10	PN 16	PN 25
Integral	Natural	80	5,8	98	6,0	13,9	3,4	4,0	
		100	5,8	118	6,0	17,2	4,3	4,5	5,0
		150	5,8	170	6,0	26,0	7,1	8,0	9,0
		200	5,8	222	6,3	34,8	10,3	10,0	12,0
		250	5,8	274	6,8	45,4	14,2	14,5	17,5
		300	5,8	326	7,2	57,1	18,6	18,0	23,0
	Clássica	350	5,8	378	7,7	75,5	23,7	23,0	26,0
		400	5,8	429	8,1	89,5	29,3	28,0	34,0
		450	5,8	480	8,6	105,1	35,6	34,5	42,0
		500	5,8	532	9,0	121,8	42,8	38,0	53,0
		600	5,8	635	9,9	158,2	59,3	56,0	82,0
		700	6,8	738	14,4	260,1	79,1	76,0	91,0
		800	6,8	842	15,6	318,9	102,6	98,0	Ver tubos fundidos com flanges integrados, página seguinte.
		900	6,8	945	16,8	383,0	129,9	125,0	
		1000	6,8	1048	18,0	452,3	161,3	150,0	
		1200	6,8	1255	20,4	607,8	237,7	220,0	

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente: argamassa de cimento alto-forno.
- externamente: zinco alumínio + pintura epóxi azul.

**Linha Clássica (DN 350 a 1200):**

- internamente: argamassa de cimento alto-forno.
- externamente: zinco metálico + pintura betuminosa.

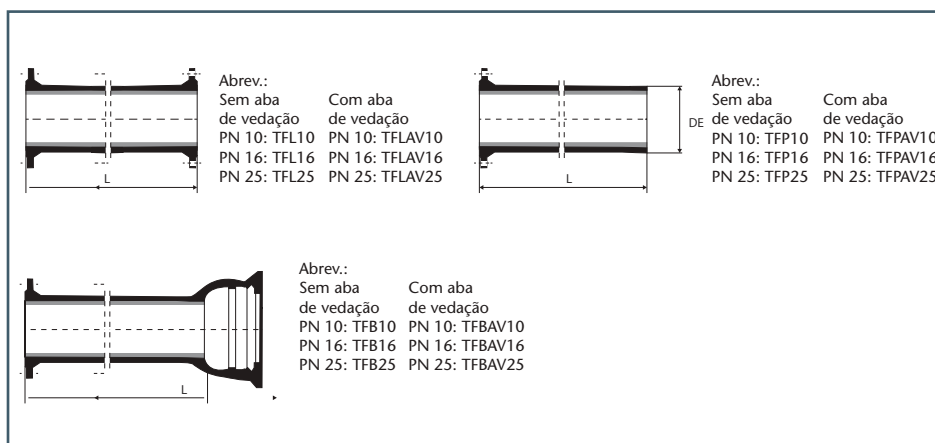
**Linha Integral (DN 80 a 1200):**

- internamente: argamassa de cimento aluminoso.
- externamente: zinco metálico + pintura epóxi vermelha.

4



## Tubos com Flanges Integrais – Tubos Fundidos



		DN	Dimensões e Massas						
			Corpo Cilíndrico				Bolsa	Flange	
			Comprimento Máximo L	Diâmetro Externo DE	Espessura Nominal e	Massas com cimento	Massas	Massas	
								PN 16	PN 25
m	mm	mm	kg/m	kg	kg	kg			
Integral	Clássica	800	2	842	18,2	332	102,6	117	166
		900	2	945	19,6	402	129,9	149	209
		1000	2	1048	21,0	478	161,3	192	270
		1200	2	1255	23,8	648	237,7	284	384

Revestimento:

### Linha Clássica (DN 800 a 1200):

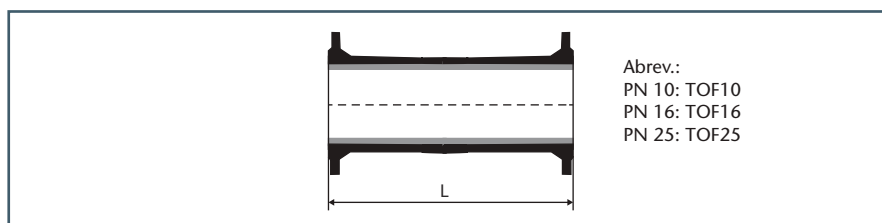
- internamente: argamassa de cimento alto-forno.
- externamente: zinco metálico + pintura betuminosa.

### Linha Integral (DN 800 a 1200):

- internamente: argamassa de cimento aluminoso.
- externamente: zinco metálico + pintura epóxi vermelha.

## CONEXÕES COM FLANGES

### Toco com Flanges



		Dimensões e Massas					
		Massas L = 0,25 m			Massas L = 0,50 m		
		PN 10	PN 16	PN 25	PN 10	PN 16	PN 25
		kg	kg	kg	kg	kg	kg
Integral	Natural	50	7,5		10,0		
		80	11,5		15,0		
		100	14,0		19,0		
		150	24,0		32,0		34,0
		200	32,0		43,0		47,0
		250	44,0		60,0		67,0
		300	56,0		76,0		86,0
	Clássica	350	70,0	76,0	92,0	88,0	94,0
		400	85,0	97,0	119,0	114,0	126,0
		450	95,0	110,0	133,0	137,0	152,0
		500	116,0	146,0	170,0	156,0	186,0
		600	165,0	217,0	245,0	217,0	269,0
		700	219,0	249,0	319,0	286,0	316,0
		800	279,0	317,0	415,0	361,0	399,0
		900	350,0	398,0	518,0	450,0	498,0
		1000	419,0	503,0	659,0	538,0	622,0
		1200	597,0	725,0	925,0	755,0	883,0

4

Revestimento:

#### Linha Natural (DN50 a 300):

- internamente e externamente, pintura epóxi azul.

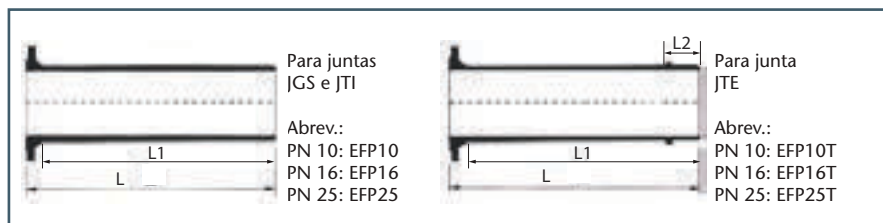
#### Linha Clássica (DN350 a 1200):

- internamente e externamente, pintura betuminosa.

#### Linha Integral (DN50 a 1200):

- internamente e externamente, pintura epóxi vermelha.

## Extremidade Flange e Ponta



		Dimensões e Massas					
	DN	L	L1	L2	Massas		
					PN 10	PN 16	PN 25
		mm	mm	mm	kg	kg	kg
Integral	Natural	80	350	215	-	8,5	
		100	360	215	-	10,9	10,2
		150	380	225	-	17,7	
		200	400	230	-	23,2	23,2
		250	420	240	-	32,0	32,0
		300	440	250	115,0	53,7	47,5
	Clássica	350	460	260	114,0	52,0	64,0
		400	480	270	113,0	73,5	81,0
		450	500	280	120,0	84,0	96,0
		500	520	290	125,0	114,0	121,0
		600	560	310	135,0	152,0	168,0
		700	600	330	148,0	203,0	229,0
		800	600	330	150,0	246,0	294,0
		900	600	330	148,0	333,33	295,0
		1000	600	330	155,0	363,0	447,0
		1200	600	330	165,0	456,0	620,0

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

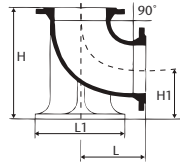
**Linha Clássica (DN350 a 1200):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN80 a 1200):**

- internamente e externamente, pintura epóxi vermelha.

## Curva 90° com Flanges e Pé



Abrev.:  
 PN 10: CP90FF10  
 PN 16: CP90FF16  
 PN 25: CP90FF25

		DN	Dimensões e Massas						
			L	L <sub>1</sub>	H	H <sub>1</sub>	Massas		
							PN 10	PN 16	PN 25
							mm	mm	mm
Integral	Natural	80	165	180	275	110	14,1		
		100	180	200	305	125	17,0		18,0
		150	220	250	380	160	28,0		30,0
		200	260	300	450	190	43,5		47,0
		250	350	350	575	225	71,0		78,0
		300	400	400	655	255	102,0		112,0
	Clássica	350	450	450	740	290	136,0	141,0	159,0
		400	500	500	820	320	172,0	183,0	206,0
		450	550	550	905	355	231,0	246,0	269,0
		500	600	600	985	385	276,0	306,0	330,0
		600	700	700	1150	450	423,0	476,0	504,0
		700	800	800	1320	520	550,0	560,0	590,0

4

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

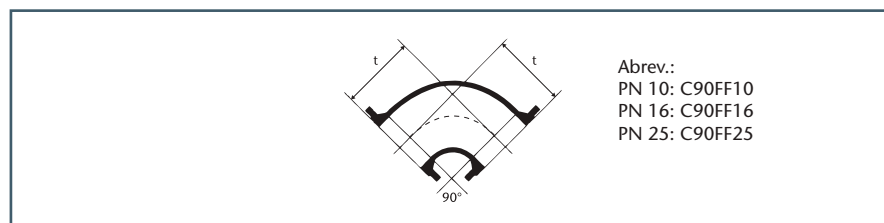
**Linha Clássica (DN350 a 700):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN80 a 700):**

- internamente e externamente, pintura epóxi vermelha.

## Curva 90° com Flanges



		DN	Dimensões e Massas			
			t	Massas		
				PN 10	PN 16	PN 25
			mm	kg	kg	kg
Integral	Natural	50	150	6,0		
		80	165	9,5		
		100	180	11,0		12,0
		150	220	18,0		20,0
		200	260	28,0		32,0
		250	350	46,0		53,0
		300	400	66,0		76,0
	Clássica	350	450	87,0	93,0	110,0
		400	500	110,0	121,0	144,0
		450	550	195,0	210,0	233,0
		500	600	174,0	204,0	228,0
		600	700	267,0	320,0	348,0
		700	800	380,0	410,0	480,0
		800	900	525,0	563,0	662,0
		900	1000	690,0	738,0	858,0
		1000	1100	892,0	975,0	1132,0
		1200	1300	1421,0	1549,0	1749,0

Revestimento:

**Linha Natural (DN50 a 300):**

- internamente e externamente, pintura epóxi azul.

**Linha Clássica (DN350 a 1200):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN50 a 1200):**

- internamente e externamente, pintura epóxi vermelha.

## Curva 45° com Flanges



Abrev.:  
PN 10: C45FF10  
PN 16: C45FF16  
PN 25: C45FF25

		Dimensões e Massas			
	DN	t	Massas		
			PN 10	PN 16	PN 25
		mm	kg	kg	kg
Integral	Natural	80	9,5		
		100	10,5		11,5
		150	17,0		19,0
		200	26,0		30,0
		250	52,0		59,0
		300	74,0		84,0
	Clássica	350	74,0	80,0	97,0
		400	91,0	102,0	125,0
		450	158,0	173,0	196,0
		500	138,0	168,0	192,0
		600	204,0	257,0	285,0
		700	295,0	325,0	395,0
		800	400,0	438,0	536,0
		900	516,0	564,0	685,0
		1000	664,0	747,0	903,0
		1200	1043,0	1171,0	1371,0

4

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

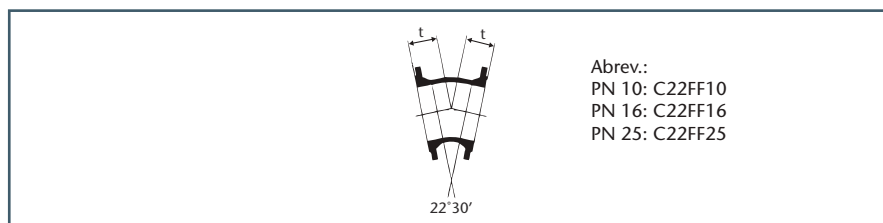
**Linha Clássica (DN350 a 1200):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN80 a 1200):**

- internamente e externamente, pintura epóxi vermelha.

## Curva 22°30' com Flanges



		DN	Dimensões e Massas			
			t	Massas		
				PN 10	PN 16	PN 25
				mm	kg	kg
Integral	Natural	80	105	13,0		
		100	110	17,0		18,0
		150	119	28,0		30,0
		200	131	41,0		45,0
		250	149	56,0		62,0
		300	210	73,0		83,0
	Clássica	350	179	99,0	105,0	121,0
		400	239	124,0	136,0	158,0
		450	209	156,0	171,0	194,0
		500	224	180,0	210,0	234,0
		600	254	258,0	305,0	333,0
		700	284	344,0	374,0	444,0
		800	314	472,0	510,0	608,0
		900	344	605,0	653,0	773,0
		1000	374	781,0	865,0	1021,0
		1200	434	1110,0	1238,0	1438,0

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

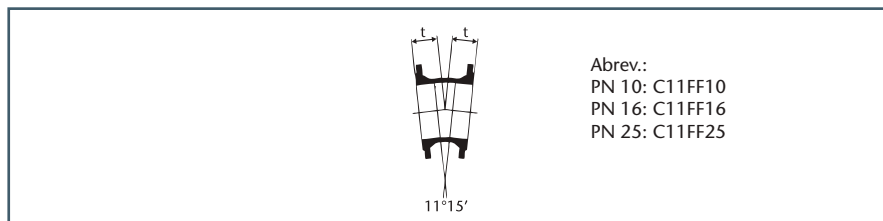
**Linha Clássica (DN350 a 1200):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN80 a 1200):**

- internamente e externamente, pintura epóxi vermelha.

## Curva 11°15' com Flanges



	DN	Dimensões e Massas			
		t	Massas		
			PN 10	PN 16	PN 25
		mm	kg	kg	kg
Integral	Natural	80	11,0		
		100	16,0	17,0	
		150	25,0	27,0	
		200	36,0	40,0	
		250	49,0	55,0	
		300	62,0	72,0	
	Clássica	350	83,0	88,0	105,0
		400	104,0	116,0	138,0
		450	132,0	147,0	170,0
		500	149,0	179,0	203,0
		600	207,0	259,0	287,0
		700	274,0	304,0	374,0
		800	374,0	412,0	510,0
		900	473,0	521,0	641,0
		1000	609,0	693,0	849,0
		1200	927,0	1055,0	1255,0

4

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

**Linha Clássica (DN350 a 1200):**

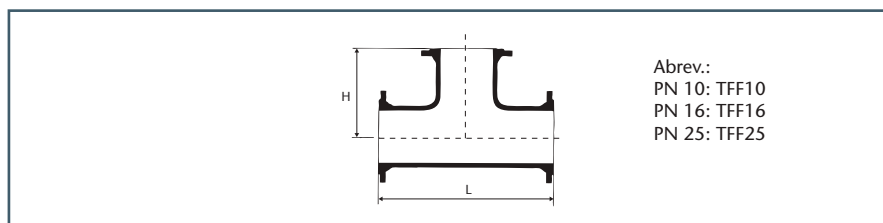
- internamente e externamente, pintura betuminosa.

**Linha Integral (DN80 a 1200):**

- internamente e externamente, pintura epóxi vermelha.



## Tê com Flanges – DN 80 a 300



DN	dn	Dimensões e Massas				
		L	H	Massas		
				PN 10	PN 16	PN 25
		mm	mm	kg	kg	kg
Integral	Natural	80	50	320	160	19,0
			80	330	165	15,3
		100	50	360	160	16,0
			80	360	175	18,1
			100	360	180	18,5
		150	50	440	210	26,0
			80	440	205	30,0
			100	440	210	28,5
			150	440	220	32,0
		200	50	520	235	48,0
			80	520	235	43,5
			100	520	240	41,0
			150	520	250	44,0
			200	520	260	47,0
		250	50	700	265	67,0
			80	700	265	69,0
			100	700	275	67,0
			150	700	300	71,0
			200	700	325	73,0
			250	700	350	80,0
		300	80	800	295	88,6
			100	800	300	92,0
			200	800	350	100,0
			300	800	400	119,0

Revestimento:

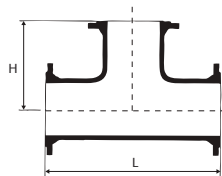
**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

**Linha Integral (DN80 a 300):**

- internamente e externamente, pintura epóxi vermelha.

## Tê com Flanges – DN 350 a 600



Abrev.:  
PN 10: TFF10  
PN 16: TFF16  
PN 25: TFF25

		DN	dn	Dimensões e Massas				
				L	H	Massas		
						PN 10	PN 16	PN 25
						mm	mm	kg
Integral	Clássica	350	100	850	325	112,0	118,0	135,0
			200	850	325	117,0	123,0	142,0
			300	850	425	133,0	139,0	160,0
			350	850	425	139,0	148,0	173,0
		400	80	900	350	152,0	152,0	168,0
			100	900	350	138,0	149,0	172,0
			150	900	350	207,0	150,0	172,0
			200	900	350	142,0	153,0	178,0
			300	900	450	159,0	171,0	198,0
			400	900	450	172,0	189,0	223,0
		450	100	950	375	173,0	188,0	212,0
			200	950	375	180,0	195,0	220,0
			300	950	475	187,0	202,0	230,0
			400	950	475	204,0	225,0	259,0
			450	950	475	207,0	229,0	264,0
	500	100	1000	400	205,0	235,0	259,0	
		200	1000	400	209,0	239,0	265,0	
		300	1000	500	219,0	249,0	278,0	
		400	1000	500	234,0	270,0	305,0	
		500	1000	500	243,0	293,0	329,0	
	600	100	1100	450	298,0	350,0	379,0	
		200	1100	450	293,0	346,0	376,0	
		300	1100	550	303,0	355,0	388,0	
		400	1100	550	316,0	375,0	414,0	
		500	1100	550	313,0	380,0	420,0	
		600	1100	550	352,0	432,0	474,0	

Revestimento:

**Linha Clássica (DN350 a 600):**

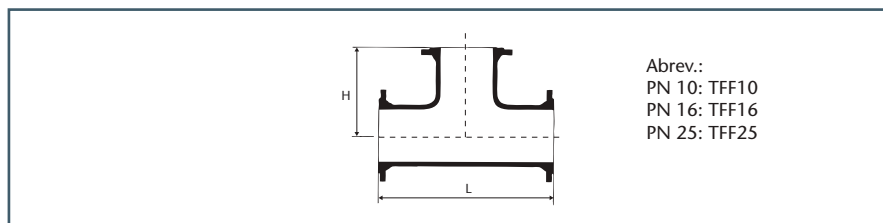
- internamente e externamente, pintura betuminosa.

**Linha Integral (DN350 a 600):**

- internamente e externamente, pintura epóxi vermelha.

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## Tê com Flanges – DN 700 a 1200



Integral	Clássica	DN	dn	Dimensões e Massas			
				L	H	Massas	
						PN 10	PN 16
				mm	mm	kg	kg
	700		200	650	525	267,0	297,0
			400	870	555	341,0	456,0
			600	1200	600	495,0	505,0
			700	1200	600	478,0	523,0
	800		200	690	585	350,0	389,0
			400	910	615	438,0	482,0
			600	1350	645	609,0	674,0
			800	1350	675	658,0	716,0
	900		200	730	645	434,0	482,0
			400	950	675	537,0	592,0
			600	1500	705	782,0	856,0
			800	1500	748	930,0	940,0
			900	1500	750	854,0	925,0
	1000		200	770	705	544,0	626,0
			400	990	735	663,0	751,0
			600	1650	765	1001,0	1110,0
			1000	1650	825	1106,0	1230,0
	1200		200	850	825	809,0	937,0
			250	850	830	1150,0	1140,0
			400	1070	855	965,0	1099,0
			600	1240	885	1105,0	1259,0
			800	1470	915	1368,0	1515,0
			1000	1700	935	1564,0	1734,0
			1200	1950	975	1863,0	2055,0

Revestimento:

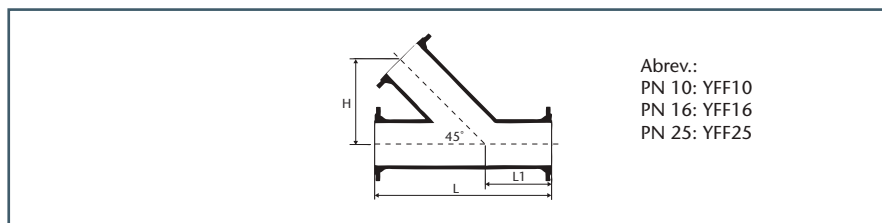
**Linha Clássica (DN700 a 1200):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN700 a 1200):**

- internamente e externamente, pintura epóxi vermelha.

## Junção 45° com Flanges



	DN	dn	Dimensões e Massas					
			L	L <sub>1</sub>	H	Massas		
						PN 10	PN 16	PN 25
			mm	mm	mm	kg	kg	kg
Integral	Natural	50	360	90	170	11,1		
		80	400	90	195	17,2		
		100	430	125	215	20,8		21,0
			430	102	215	21,0		22,5
		150	530	118	270	33,0		36,0
			530	88	270	36,0		39,0
		200	600	95	321	47,0		52,0
			600	134	321	51,0		56,0
			600	95	321	55,0		60,0
		250	700	55	363	72,0		79,0
			700	100	363	76,0		84,0
			700	115	363	80,0		90,0
		300	800	128	412	103,0		114,0
			800	127	412	140,4	140,4	159,0
			800	135	412	111,0		126,0
	Clássica	400	960	145	472	168,0	178,0	205,0
			960	145	512	173,0	189,0	222,0

4

Revestimento:

**Linha Natural (DN50 a 300):**

- internamente e externamente, pintura epóxi azul.

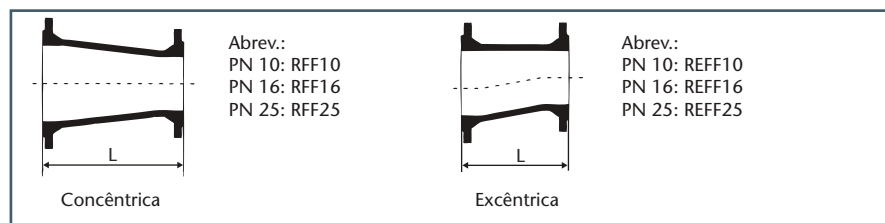
**Linha Clássica (DN400):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN50 a 300):**

- internamente e externamente, pintura epóxi vermelha.

## Redução com Flanges – DN 80 a 300



		DN	dn	Dimensões e Massas							
				L	Massas						
					Concêntrica			Excêntrica			
					PN 10	PN 16	PN 25	PN 10	PN 16	PN 25	
			mm	kg	kg	kg	kg	kg	kg	kg	
Integral	Natural	80	50	200	8,4			8,0			
			75	205	8,3			-			
		100	50	300	15,5		16,0	9,5		10,0	
			80	200	9,5			9,5		10,0	
		150	80	400	25,6		26,5	17,2		18,2	
			100	300	15,5		17,0	15,0		16,5	
		200	100	600	30,5		33,0	27,5		30,0	
			150	300	22,0		25,0	22,0		25,0	
		250	100	300	40,0	42,4	53,3	-			
			150	600	45,0		49,0	39,0		43,0	
			200	300	30,0		35,5	30,0		35,0	
		300	150	600	52,0		58,0	46,0		52,0	
			200	600	58,0		65,0	51,0		58,0	
			250	300	40,0		49,0	40,0		49,0	

Revestimento:

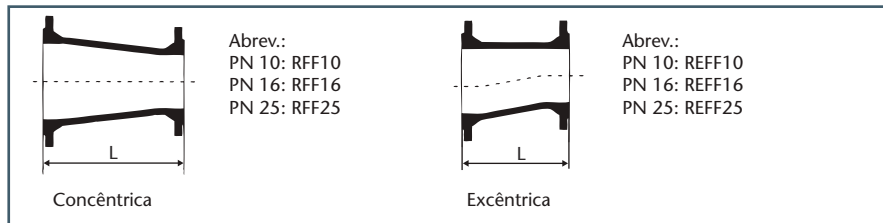
**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

**Linha Integral (DN80 a 300):**

- internamente e externamente, pintura epóxi vermelha.

## Redução com Flanges – DN 350 a 1200



DN	dn	Dimensões e Massas						
		L	Massas					
			Concêntrica			Excêntrica		
			PN 10	PN 16	PN 25	PN 10	PN 16	PN 25
		mm	kg	kg	kg	kg	kg	kg
Integral	Clássica	200	600	46,0	92,0			
		350	250	600	85,15	89,0		
		300	300	49,5	52,0	66,0		
		250	600	78,0	84,0	98,0	72,0	77,0
		300	600	76,0	82,0	98,0	79,0	84,0
		350	310	58,0	67,0	86,0		
		300	600	94,0	101,0	118,0		
		350	600	97,0	107,0	127,0		
		400	300	105,0	119,0	140,0		
		350	600	132,9	146,0			
		400	600	110,0	130,0	153,0		
		450	300	125	165			
		400	600	190	192	220		
		450	600	190	192	220		
		500	600	149,0	190,0	216,0		
		700	600	195,0	236,0	285,0		
		800	700	250,0	285,0	396,0		
		900	800	308,0	352,0	461,0		
		1000	900	373,0	438,0	576,0		
		1200	1000	790	614,0	720,0	898,0	

4

Revestimento:

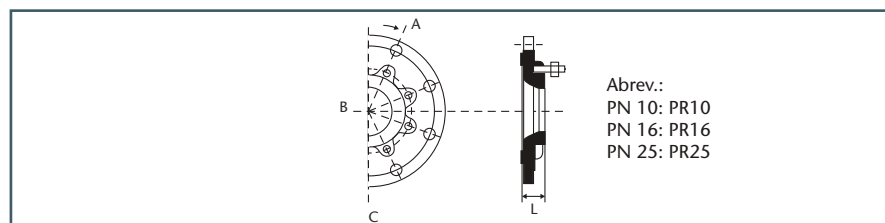
**Linha Clássica (DN350 a 1200):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN350 a 1200):**

- internamente e externamente, pintura epóxi vermelha.

## Placa de redução



		DN	dn	Dimensões e Massas					
				PN 10		PN 16		PN 25	
				L	Massas	L	Massas	L	Massas
				mm	kg	mm	kg	mm	kg
Integral	Natural	100	50	40	5,0	40	5,0	40	5,0
		200	80	40	13,0	40	13,0	40	17,0
			100	40	13,0	40	13,0	47	17,0
		250	200	44	32,0	44	32,0	50	37,0
	Clássica	350	150	48	38,0	54	50,0	60	59,0
			250	48	32,0	54	36,0	60	48,0
		400	150	48	38,0	54	45,0	60	56,0
			200	48	39,5	54	40,0	60	59,0
			250	48	39,0	54	46,0	60	61,0
			300	49	38,0	55	44,0	61	60,0
		450	350	52	45,0	58	57,0	63	70,0
		500	350	54	56,0	60	70,0	65	85,0
			400	54	53,0	60	65,0	65	83,0
		600	150	33	138,0	39	164,0	45	178,0
			450	50	94,0	53	120,0	76	134,0
		700	500	56	102,0	67	134,0	76	178,0
		900	700	63	165,0	73	200,0	86	237,0
		1000	700	63	222,0	73	285,0	90	277,0
			800	68	209,0	77	260,0	90	308,0

Revestimento:

**Linha Natural (DN100 a 250):**

- internamente e externamente, pintura epóxi azul.

**Linha Clássica (DN400):**

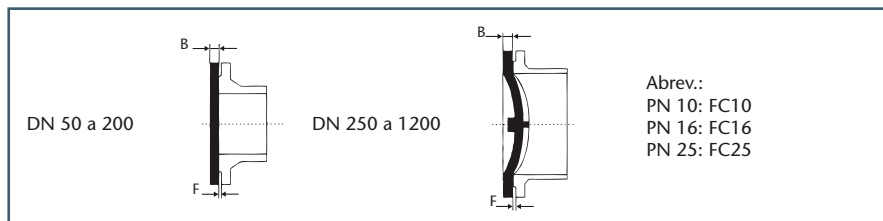
- internamente e externamente, pintura betuminosa.

**Linha Integral (DN50 a 300):**

- internamente e externamente, pintura epóxi vermelha.

Nota: Fornecido somente com os parafusos prisioneiros.

## Flange Cego



		DN	Dimensões e Massas						
			F	PN 10		PN 16		PN 25	
				B	Massas	B	Massas	B	Massas
				mm	mm	kg	mm	kg	mm
Integral	Natural	50	3	16,0	2,4	16,0	2,4	16,0	2,4
		80	3	16,0	3,6	16,0	3,6	16,0	3,6
		100	3	16,0	4,3	16,0	4,3	16,0	4,8
		150	3	16,0	7,2	16,0	7,2	17,0	8,3
		200	3	17,0	11,0	17,0	11,0	19,0	13,3
		250	3	19,0	17,0	19,0	17,0	21,5	21,0
		300	4	20,5	24,0	20,5	24,0	23,5	30,0
	Clássica	350	4	20,5	30,0	22,5	33,0	26,0	43,0
		400	4	20,5	36,0	24,0	44,0	28,0	58,0
		450	4	21,5	68,0	26,0	75,5	30,5	87,0
		500	4	22,5	56,0	27,5	77,0	32,5	94,0
		600	5	25,0	85,0	31,0	121,0	37,0	144,0
		700	5	27,5	123,0	34,5	156,0	41,5	215,0
		800	5	30,0	172,0	38,0	218,0	46,0	304,0
		900	5	32,5	224,0	41,5	286,0	50,5	397,0
		1000	5	35,0	293,0	45,0	387,0	55,0	535,0
		1200	5	40,0	575,0	52,0	662,0	64,0	843,0

4

Revestimento:

**Linha Natural (DN50 a 300):**

- internamente e externamente, pintura epóxi azul.

**Linha Clássica (DN350 a 1200):**

- internamente e externamente, pintura betuminosa.

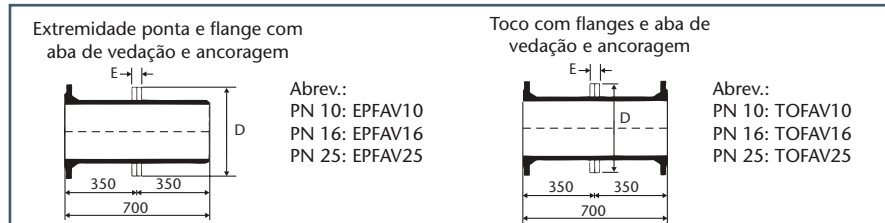
**Linha Integral (DN50 a 1200):**

- internamente e externamente, pintura epóxi vermelha.



## PEÇAS DE MONTAGEM E MANUTENÇÃO

### Peças com aba de vedação e ancoragem



		DN	Dimensões e Massas								Empuxo Axial Máximo Admissível
			D	E	Massas						
					Ponta e Flange			Toco com Flanges			
					PN 10	PN 16	PN 25	PN 10	PN 16	PN 25	
			mm	mm	kg	kg	kg	kg	kg	kg	
Integral	Natural	80	200	16	17,0			20,0		17	
		100	220	16	21,0			25,5		30	
		150	285	16	32,0		33,0	40,0		42,0	66
		200	340	17	46,0		48,0	56,0		60,0	118
		250	400	19	58,0		61,5	72,5		79,0	184
		300	455	20,5	75,0		81,0	93,0		104,0	265
	Clássica	350	505	20,5	89,0	92,5	101,0	112,0	118,5	135,0	360
		400	565	21,5	108,0	114,0	127,0	136,0	148,0	172,0	470
		500	670	22,5	147,0	164,0	177,0	197,0	217,0	242,0	740
		600	780	25	197,0	226,0	241,0	253,0	308,0	337,0	1060
		700	895	27,5	244,0	272,0	299,0	320,0	363,0	425,0	1440
		800	1015	30	314,0	335,0	389,0	412,0	452,0	555,0	1880
		900	1115	32,5	345,0	408,0	474,0	470,0	557,0	683,0	2830
		1000	1230	35	487,0	533,0	619,0	637,0	725,0	889,0	2950
		1200	1455	40	637,0	695,0	817,0	857,0	979,0	1201,0	4250

Revestimento:

**Linha Natural (DN80 a 300):**

- internamente e externamente, pintura epóxi azul.

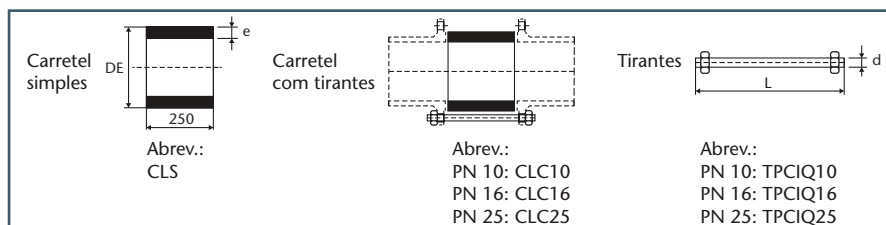
**Linha Clássica (DN350 a 1200):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN80 a 1200):**

- internamente e externamente, pintura epóxi vermelha.

## Carretel



		DN	Dimensões e Massas														
			Carretel a Recortar L = 0,25m			Tirantes											
						PN 10				PN 16				PN 25			
			e	DE	Mas- sas	Quan- tida- de	L	d	Mas- sas	Quan- tida- de	L	d	Mas- sas	Quan- tida- de	L	d	Mas- sas
			mm	mm	kg		mm	mm	kg		mm	mm	kg		mm	mm	kg
Integral	Natural	50	24	98,0	10,0	4	360	16	2,5	4	360	16	2,5	4	360	16	2,5
		80	26,0	130,0	15,5	8	360	16	5,0	8	360	16	5,0	8	360	16	5,0
		100	26,5	153,0	19,0	8	360	16	5,0	8	360	16	5,0	8	370	20	7,0
		150	29,5	209,0	30,0	8	370	20	7,0	8	370	20	7,0	8	380	24	9,6
		200	32,0	264,0	42,0	8	370	20	7,0	12	370	20	10,6	12	380	24	14,5
		250	34,5	319,0	55,0	12	370	20	10,6	12	380	24	14,4	12	430	27	20,4
		300	34,5	369,0	62,0	12	380	20	10,6	12	380	24	14,4	16	430	27	27,2
	Clássica	350	38	426,0	84,0	16	390	20	14,0	16	400	24	21,0	16	450	30	35,7
		400	38,5	477,0	95,0	16	400	24	19,2	16	430	27	27,2	16	460	33	44,8
		450	38,5	527,0		20	400	24	22,3	20	430	27	31,4	20	460	33	49,8
		500	41,0	582,0	125,0	20	400	24	24,0	20	450	30	44,6	20	460	33	56,0
		600	41,0	682,0	148,0	20	430	27	34,0	20	460	33	56,0	20	480	36	71,0
		700	48,5	797,0	204,0	24	430	27	40,8	24	460	33	67,2	24	490	39	107,0
		800	52,0	904,0	249,0	24	450	30	53,5	24	480	36	85,5	24	520	45	153,1
		900	52,0	1004,0	278,0	28	450	30	62,4	28	480	36	99,4	28	520	45	178,6
		1000	55,5	1111,0	329,0	28	460	33	78,4	28	490	39	124,9	28	550	52	253,1
		1200	60,0	1320,0	424,0	32	480	36	113,6	32	520	45	204,2	32	550	52	289,3

4

Revestimento:

**Linha Natural (DN50 a 300):**

- internamente e externamente, pintura epóxi azul.

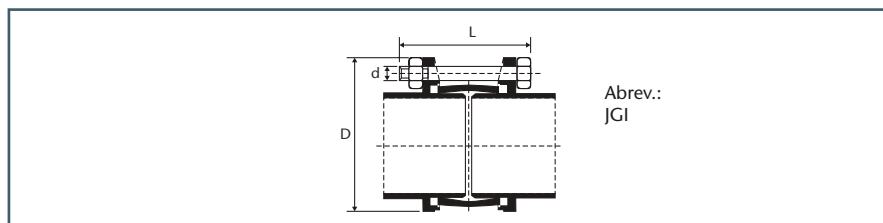
**Linha Clássica (DN400 a 1200):**

- internamente e externamente, pintura betuminosa.

**Linha Integral (DN50 a 1200):**

- internamente e externamente, pintura epóxi vermelha.

## Junta Gibault



DN	Dimensões e Massas					
	D	Tirante		Quantidade de Parafusos	Massas com Parafusos	PSA
		d	L			
		mm	mm		kg	MPa
50	165	20	130	3	3,1	2,5
80	194	20	130	3	7,0	2,5
100	220	20	160	3	5,2	2,5
150	279	24	200	3	9,2	2,5
200	343	24	200	3	17,5	2,5
250	399	24	200	4	29,4	1,6
300	458	24	200	4	34,0	1,6
350	521	24	200	6	46,3	1,6
400	580	24	200	6	54,3	1,6
450	614	24	200	6	59,2	1,6
500	678	24	230	6	68,5	1,6
600	788	24	230	6	101,0	1,6

Revestimento:

- internamente e externamente, pintura betuminosa.

## Ultralink



Tipo	Campo de Diâmetro Externo DE		Pressão de Serviço PSA	Dimensões e Massas						
	Mín	Máx		L	L1		D	J		Massas
					Mín	Max		Mín	Max	
	mm	mm	MPa	mm	mm	mm	mm	mm	mm	kg
A	49	71	1,6	182	104	152	176	4	20	3,6
B	62	84		182	104	152	190	4	20	4,1
C	80	102		182	107	155	208	5	20	4,9
D	97	127		232	127	188	240	7	25	7,7
E	123	153		232	135	197	267	8	25	8,9
F	151	181		232	144	207	295	9	29	10,4
H	211	241		262	163	228	357	13	38	14,8
J	260	290		292	179	246	407	15	48	18,1
K	306	336		292	194	263	455	18	58	22,9

4

Revestimento:

- peças metálicas (exceto parafusos): interna e externamente com epóxi;
- parafusos: revestimento à base de zinco.

Deflexão angular admissível no assentamento (2 juntas) = 2°

Torque de aperto dos parafusos: 60mN