



TYTON DUCTILE IRON PIPE SYSTEMS

PN 35 RUBBER RING JOINT DN 100 - DN 750

FOR POTABLE WATER, RAW WATER AND SEWERAGE RISING MAINS APPLICATIONS

Class PN 35 matches the maximum flange table rating of the most common water industry applications.

Peace of mind considering water hammer rogue surges, cyclic stresses, varying soil loads, unpredictable traffic loads, and all unforeseen rigours of a pipe system in construction, operation and maintenance

Beam strength, heavy duty ring stiffness and critical buckling resistance across the entire size range

Operational savings and benefits via larger bores with reduced headlosses, reduced pumping costs and increased flows



EXTERNAL ZINC & SYNTHETIC RESIN COATING

The external barrel is protected with a 200g/m² metallic zinc layer and finished with a synthetic resin pore sealer providing active corrosion protection. Active protection means the pipe continues to be protected in the case of superficial damage to the external coating

HYDROLINE-C, CSC & CA LININGS

Our HYDROLINE linings are centrifugally spun cement mortar linings. Pipes are spun with high radial acceleration, around 100g and are simultaneously vibrated, producing a very dense smooth lining of extremely low permeability

From years of proven in service experience, HYDROLINE is hydraulically smooth with Colebrook-White k factors for all new pipes commonly in the order of 0.01-0.03mm

HYDROLINE protects the ductile iron actively due to the chemistry at the iron and cement interface. The cement mortar forms a passive film that inhibits oxidation of the pipe surface and stifles bacteriological action

TYTONXCEL

TYTONXCEL reflects state-of-the-art manufacturing and evolving water industry demands. Efficiency gains and cost savings are achieved without sacrificing the time proven superior performance capabilities associated with ductile iron

LINING OPTIONS

HYDROLINE-C is a centrifugally spun cement mortar lining made up of Type SR (Sulphate Resisting) Blast Furnace Slag cement standard internal lining

HYDROLINE-CSC is HYDROLINE-C with an added Seal Coat to inhibit the leaching of lime where very aggressive, soft waters of low hardness (total alkalinity <30mg/L) or high dissolved CO₂ are being conveyed

TYTONXTREME

TYTONXTREME incorporates our HYDROLINE-CA calcium aluminate cement mortar lining. This lining protects the internal surface from corrosion, tuberculation and bacteriogenic acid attack when conveying aggressive fluids common in sewage and wastewater pipelines

For the transportation of wastewater of the following types:

- Gravity sewage and under pressure networks
- Domestic waste waters
- Perfectly watertight
- For effluents between pH4 and pH12

TYTONXTEND

When it comes to mine subsidence, embankment slippage, soil settlement or ground movements, **TYTONXTEND** is without comparison

Based on the robust TYTON pipe joint, **TYTONXTEND** incorporates an extended socket throat which accommodates erratic and unpredictable ground strain in both axial and rotational movement. The pipelines integrity is preserved and vital water or sewer lines remain uncompromised.

TYTONXTEND is available in all HYDROLINE options

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Nominal size		Symbol	Units	100	150	200	225	250	300	375	450	500	600	750
KEY METRICS	Nominal Pressure	PN	Nom	35	35	35	35	35	35	35	35	35	35	35
	Mean external diameter	ϕ_y	mm	122	177	232	259	286	345	426	507	560	667	826
	Effective Laying Length	L_e	m	5.75	5.75	5.75	5.75	5.75	5.75	5.75	5.75 "	5.75	6.00	6.00
	Joint deflection	°	deg	3.5	3.5	3.5	3.5	3.5	2.5	2.5	2.5	2.5	2.5	1
UNLINED PIPE	Mean internal diameter	DI	mm	112	167	222	249	275	332	411	490	542	646	802
	Pipe barrel mass per metre	m_y	kg/m	13.0	19.0	25.1	29.2	34.8	47.3	67.7	91.7	109.8	149.8	219.9
	Pipe mass including socket	M_y	kg	79	115	153	178	211	285	413	555	662	934	1,380
SOCKET	Socket mass	S	kg	4.3	5.9	8.6	10.4	11.3	13.4	23.7	27.7	30.3	35.6	60.8
DI WALL THICKNESS	Nominal	t	mm	5.0	5.0	5.0	5.2	5.6	6.3	7.3	8.3	9.0	10.3	12.2
	Minimum	a	mm	3.5	3.5	3.5	3.5	3.6	4.3	5.3	6.3	7.0	8.3	10.2
CEMENT MORTAR LINED PIPE	Mean internal diameter	D_c	mm	102	157	212	239	265	322	401	480	532	636	790
	Nominal CML thickness	$t_{c\ nom}$	mm	5	5	5	5	5	5	5	5	5	5	6
	Minimum CML thickness	$t_{c\ min}$	mm	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4.5
	Pipe barrel mass per metre	m_t	kg/m	17.0	25.2	33.3	38.4	44.9	59.6	83.0	110.0	130.1	174.0	255.9
	Pipe mass including socket and CML	ML	kg	102	150	200	232	270	356	501	661	779	1,080	1,596
THEORETICALLY RATED PRESSURES	Allowable Operating Pressure	AOP	MPa	7.06	4.83	3.67	3.50	3.57	3.53	3.53	3.52	3.54	3.53	3.50
	Maximum Allowable Operating Pressure	MAOP	MPa	8.47	5.79	4.40	4.20	4.28	4.24	4.23	4.23	4.25	4.23	4.20
	Allowable Site Test Pressure	ASTP	MPa	8.82	6.03	4.59	4.38	4.46	4.42	4.41	4.40	4.43	4.41	4.38
	Burst pressure	BURST	MPa	21	14	11	11	11	11	11	11	11	11	11
STRUCTURAL & HYDRAULIC PROPERTIES	Transform wall thickness	t_t	mm	4.35	4.35	4.35	4.55	4.95	5.65	6.65	7.65	8.35	9.65	11.65
	Celerity of mean CML bore	c	m/s	1,260	1,190	1,130	1,114	1,110	1,095	1,082	1,073	1,070	1,061	1,055
	Barrel ring stiffness	S_D	N/m/m	695,000	219,900	95,900	78,600	75,100	63,500	54,800	49,400	47,700	43,500	40,300
	Buckling pressure	P	kPa	7,332	2,320	1,012	829	792	670	578	521	503	459	425
FREIGHT	Pipes (lined) per truck	P/T	n	190	130	90	72	70	56	40	24	24	12	8
	kilos per truck	n x M_t	kg	19,379	19,570	18,017	16,652	18,883	19,943	20,042	15,841	18,678	8,636	12,769
WATER MASS	Mass of water contained in pipe	m_w	kg/m	8	19	35	45	55	82	127	181	222	318	490
MASS FULL	Mass of pipe full of water	M_T	kg/m	26	46	70	85	102	144	214	296	358	498	756
BENDING MOMENT AND FOS AGAINST FLEXURAL YIELD	Moment = $wL^2/8$ for simply supported beam over ELL	M_B	kNm	1.05	1.85	2.84	3.44	4.13	5.82	8.66	12.00	14.50	21.98	33.36
	$y = DE/2$	y	mm	61	89	116	130	143	173	213	254	280	334	413
	$I = n/64 (D_o^4 - D_i^4)$	I	mm ⁴	1.99E+06	6.21E+06	1.42E+07	2.10E+07	3.18E+07	6.68E+07	1.55E+08	3.11E+08	4.65E+08	9.32E+08	2.18E+09
	$\sigma = My/I$ Note max $M = 3wL^2/8$	σ_y	MPa	97	79	70	64	56	45	36	29	26	24	19
	FOS = Yield stress / Working stress	FOS	η	3.1	3.8	4.3	4.7	5.4	6.7	8.4	10.2	11.5	12.7	15.8
Density of water = 1,000kg/m ³														
Yield stress of ductile iron = 300MPa														

VIADUX WATER NETWORK SYSTEMS

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