



INFRAPIPE DATA SHEET

KRAH SPIRAL WOUND PIPE

DN450-DN3200 SN2-SN100+



INFRAPIPE is a New Zealand made spiral wound HDPE pipe system that is very light, very strong, with a 100 year design life and completely recyclable. Using the globally accepted [KRAH technology](#), INFRAPIPE is made with stiffness ratings from SN2-SN100+ under the AS/NZS 5065:2005 standard. Diameters range from 450 to 3200mm ID and pipes can be made to any wall thickness or length, joined easily and integrated into bends, risers and connectors. The strength of the system comes from the spiral wound core tube, the size and spacing of which allows a pipe to be configured as economically as possible for the site requirements.

APPLICATIONS

- Stormwater drainage
- Wastewater drainage
- Culverts
- Tanks
- Manholes and access chambers
- Wetwells and pump chambers
- Corrosive soils
- H₂S exposed pipe systems
- Marine locations

STANDARDS

1. Certified to AS/NZS 5065:2005 licence no. AMI 74961.
2. Pipes are tested by Infrapipe to AS/NZS5065:2005 in their test lab in accordance with ISO 9969:2016 *Thermoplastic pipes – Determination of Ring Stiffness*.
3. The rubber rings are certified to EN681-1.
4. INFRAPIPE Ltd is certified to ISO 9001:2015 licence no. AMI 78044.

FEATURES & BENEFITS

- | | |
|---|--|
| <ul style="list-style-type: none"> ✓ Best seismic resistance ✓ 100-year life ✓ 14 times lighter (7%) than concrete ✓ Stronger ✓ Quick to install ✓ Completely recyclable ✓ Easy to freight | <ul style="list-style-type: none"> ✓ Best abrasion resistance ✓ Chemically inert ✓ Biologically immune ✓ No maintenance ✓ Easy to modify or repair ✓ Each section customisable ✓ Less manholes required |
|---|--|

A Class 2 concrete DN1200 is 885kg/m. An INFRAPIPE SN4 DN1200 is 62kg/m

STIFFNESS RATING

Standard listed ratings are SN4,8,12 & 16. For no extra cost, when given Geotech, cover heights and water table data, INFRAPIPE can design and make a pipe to the exact ring stiffness required by the section of pipeline or even for each individual pipe. The savings from this flexibility can be huge - for a DN2500 this can save up to 48%!



ABRASION RESISTANCE

HDPE/PP has unrivalled resistance to abrasion – where a 600mm concrete pipe which is 46mm thick would last for 4,600 kcycles, the INFRAPIPE equivalent with a 5mm inner layer would last for 7,500 kcycles! Abrasion tests using the global standard Darmstadt procedure show the following abrasion in mm:

Thousand (k) cycles	INFRAPIPE	Concrete	PVC	FRP/GRP
50	0.1	0.3	0.05	0.15
100	0.15	0.7	0.1	0.3
150	0.2	1.5	0.2	0.5
300	0.25	-	0.35	0.9
450	0.3	-	0.55	1.3

DIMENSIONS & CAPACITY

INFRAPIPE is specified in DN – which is the ID of the pipe (some competitive alternatives use OD which can over-represent the capacity by 30%+). The Colebrook-White roughness coefficient for EZYFLOW is 0.003mm. The standard pipe length is 6000mm, effective length 5800mm but shorts can be made down to 1000mm.

Table 1. Dimensions and capacities for SN8 and SN16 (other SN ratings from 2 to 40+ available)

DN(ID)	Cross-sec Area mm	Equivalent to		25% burial					
				Cross-sec		SN8		SN16	
				2 of ID	3 of ID	Area mm	OD	Weight	OD
450	158,963	300	250	127,869	528	78	542	90	
525	216,366	375	300	174,045	617	108	645	154	
600	282,600	375	300	227,323	692	134	720	175	
700	384,650	450	375	309,412	820	202	842	212	
800	502,400	525	450	404,131	920	229	962	263	
900	635,850	600	525	511,478	1042	268	1096	329	
1000	785,000	700	600	631,454	1146	343	1196	390	
1100	949,850	800	600	764,059	1266	410	1332	428	
1200	1,130,400	900	700	909,294	1396	431	1464	463	
1350	1,430,663	1000	700	1,150,825	1584	526	1596	735	
1500	1,766,250	1100	800	1,420,772	1696	541	1776	889	
1600	2,009,600	1200	900	1,616,522	1864	710	1878	943	
1800	2,543,400	1350	1000	2,045,911	2032	703	2068	1609	
2000	3,140,000	1500	1200	2,525,816	2232	978	2308	1878	
2300	4,152,650	1600	1350	3,340,392	2572	1172	2634	2796	
2500	4,906,250	1800	1500	3,946,588	2778	1454	2842	3395	
3200	8,038,400	2300	1800	6,466,089	3500	2981	Ask		

ASSET LIFE

HDPE has a 100 year service [life as demonstrated here](#). As INFRAPIPE has superb abrasion and seismic resistance and is immune to chemical or biological attack in NZ conditions it is the pipe that is most certain to achieve this in the real world, and it can be recycled at the end!



SUPPORTING DOCUMENTS & FURTHER DETAIL

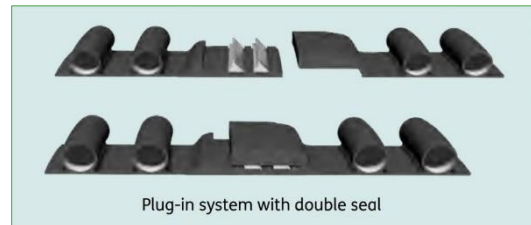
Further detail can be found in the Design Manuals for [Pipelines](#) and for [Tanks](#) and in the data sheets for [Manholes & structures](#) and for [solid wall pipe](#) plus the INFRAPIPE Material guide. Visit the [INFRAPIPE Downloads](#) section

JOINING METHODS

Rubber Ring Joint

KRAH Spiral Wound Pipe is joined by a single Rubber Ring Joint (Stormwater), a double Rubber Ring Joint (Wastewater) or the KRAH EF system. The grooves for the rings are machined to a tolerance of +/-0.1mm resulting in the most effective seal available in NZ.

Fig. 1 Double Rubber Ring Joint



KRAH EF Weld

The EF weld system entirely melts and then re-crystallises the plastic within an area constrained by bracing to form a completely homogenous structure.

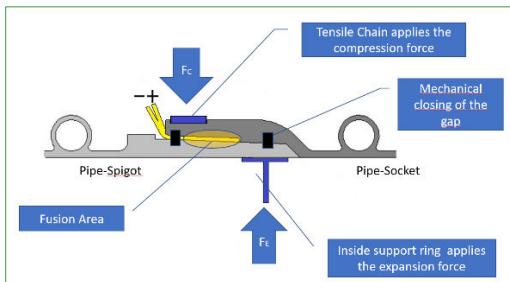


Fig. 2 EF Weld Joint

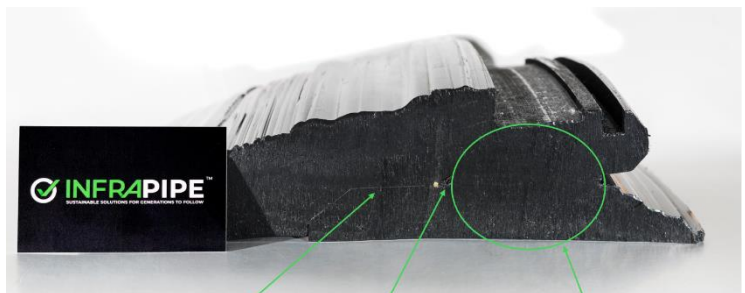
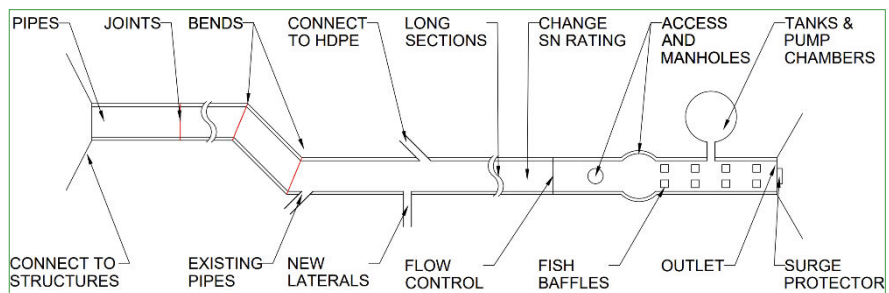


Fig. 3 Cross section showing EF post welding

COMPONENTS OF A PIPELINE

INFRAPIPE can easily integrate all of these requirements. Each pipe is custom-made for the requirements of the site which minimises installation time and cost.

Fig. 4 Diagram of pipeline components



BENDS, TEES AND OTHER MODIFICATIONS

Bends of any angle (horizontal, vertical or both) can easily be manufactured. Multiple pipes can be joined simultaneously and without manholes.

When adding other inflows – for which manholes are not required – the tee can be designed to optimise hydraulic efficiency by adding bends which minimise the converging angle as shown here.

A pipe can be designed for the shortest optimum route with manholes only required for inspection – or even then, cheaper integrated access options can be used as below.

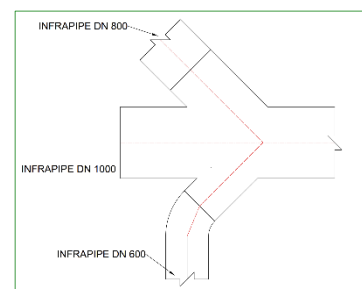


Fig. 5 Example of bends and tees



CONNECTIONS - LATERALS

Any lateral connection can be achieved using Fernco fittings, the HAS equipment by Krah or by integrating the connection into the pipe, no manhole needed!



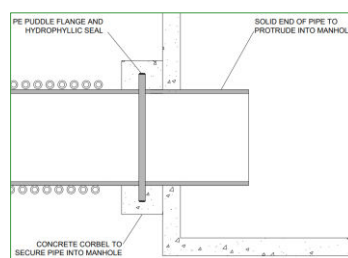
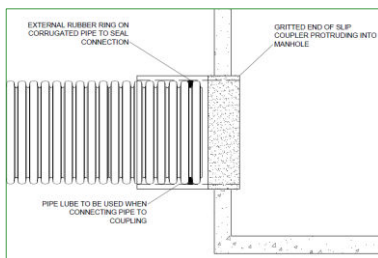
ACCESS & INSPECTION

Bends and tees minimise the need for manholes, so inspection points can be located only where needed. The ability to provide access through integrated risers, or for larger pipes tangential access further reduces the requirement for costly manholes which can reduce hydraulic efficiency.



CONNECTIONS TO MANHOLES

INFRAPIPE is joined to HDPE manholes with joins as above. For concrete manholes, connections can be achieved with a concrete corbel, a slip coupler or a manhole connector:



BUOYANCY, FAT ACCUMULATION AND PRESSURE

- HDPE pipes can be buoyant in high water tables; INFRAPIPE provides anchor systems.
- HDPE is the least attractive surface for fat, even before erosion, [as shown here](#).
- INFRAPIPE is rated to 3 bar for pressure applications. Higher pressure is available by moving to INFRAPIPE KRAH Solid Wall pipes which are available in all PN, all SDRs on all diameters.

INSTALLATION

INSTALLATION is in accordance with [this installation guide](#) which is a summary of the requirements of the relevant standards. More detail can be found in AS/NZS 2566.1:1998 *Buried Flexible Pipelines: Structural design* and AS/NZS 2566.2:2002 *Buried flexible pipelines – Installation*.

A team can typically lay 4 * 2.5m (9.6m) concrete pipes DN1200 in a day, but they can lay 8 * 6m (46.4m) DN1200 INFRAPIPE.

Lighter pipes = safer, faster work in the trench.



SUSTAINABILITY

HDPE/PP is the best material for the planet.

- ✓ [Polyethylene/polypropylene has been repeatedly proven to have a 100yr+ life.](#)
- ✓ Minimal erosion equates to minimal fugitive particles.
- ✓ Alternatives which are attacked by the environment will pollute the soil heavily.
- ✓ Alternatives which are susceptible to biological attack will decay and pollute.
- ✓ INFRAPIPE is completely recyclable. The asset owner has no end-of life disposal liability.
- ✓ All production waste is recycled.
- ✓ Lighter products require less freight, less cranes and less diggers.
- ✓ Lighter products use less global resources in their manufacture.

[The Infrapipe chart of chemical resistance can be found here.](#)