Hyspec VCT Rubber Ring Joint Concrete Pipes

Technical Guide D1.2

Specifically designed for New Zealand's unpredictable conditions, Hyspec VCT Concrete Pipe offers a hydraulic seal throughout the pipeline whilst still providing the benefits of a flexible joint.

Applications

Stormwater and sewer pipelines

High loading installations under highways and deep embankments

Approvals/Standards

Hyspec VCT pipes are designed and manufactured to comply with the requirements of AS/NZS 4058:2007

Routine factory testing ensures compliance with these requirements

Rubber rings are manufactured in accordance with AS 1646:2000. Elastomeric Seals for Waterwork Purposes

Product Attributes

Rubber ring hydraulic joint

Strong & durable

Proven history

Quality

ISO 9001:2008 Quality Management Standard

We are the supply partner of choice for New Zealand's civil construction industry, specialising in water and infrastructure based solutions.

HYNDS PIPE SYSTEMS

Specifically designed for New Zealand's unpredictable conditions, Hyspec VCT Concrete Pipe offers a hydraulic seal throughout the pipeline whilst still providing the benefits of a flexible joint.

Hyspec VCT Concrete Pipe Construction

Hyspec VCT concrete pipes are manufactured using the computer-controlled counter rotating packerhead trowel system. This process produces a high-quality thin walled concrete pipe which has been proven in New Zealand conditions for over 10 years.

Spun concrete pipe has been used in New Zealand since the 1930's. Hydura VCT concrete pipes are also available for extra durable pipelines *(refer to product sheet D1.11)*.

Design Specifications

- Hyspec VCT pipe is manufactured to AS/NZS 4058:2007
- DN 225-600 diameters
- Hyspec VCT pipes have circular reinforcing cages.

Strength Classes

- Hyspec VCT is available in two main strength classes, with Class 2 being the standard load strength and Class 4 offering increased strength.
- Class 2 (X) – yellow marking
- Class 4 (Z) – red marking
- Higher class strengths are available for very high load situations.
- Strength design assistance is available from the Hynds Technical Services Department.

Availability

- Hyspec VCT RRJ pipes DN 225–600 are manufactured and supplied only in the North Island.

Installation

Refer to "AS/NZS 3725:2007 Design for Installation of Buried Concrete Pipe" for details on the calculation of vertical working loads and pipe installation options and procedures.

- Hyspec VCT pipes are manufactured in convenient lengths to allow efficient delivery and off-loading on site.
- Joint gaps between the pipes ensure that the pipes are able to deflect without damage. Nominal joint gaps are detailed in *Table 1*.
- Where the pipe is to be deflected, it is essential that the joint gap is reduced to a minimum before the pipe is deflected within the recommended limits.
- All vertical and horizontal deflections should be within the recommended range of the joint gap.

Joint Configuration

- Allows a flexible pipeline with hydraulic integrity.
- There are a wide range of ever changing ground conditions which, when combined with superimposed loads, can cause the original pipeline alignment to alter significantly:
  - Changes in the character of the bedding and compaction conditions may cause differential settlement and movement in any buried pipeline.
  - Movement between pipes can also occur from traffic and construction loads, backfilling, or inadequate bearing capacity.
- To avoid these disturbances and maintain the desired pipeline performance, flexible joints are required in all pipelines. The Hyspec VCT pipe joint utilises a "D" ring seal to meet the necessary flexure characteristics.
- The joint system has been designed to allow:
  - Angular rotation of adjacent pipe lengths to accommodate axial bending;
  - Telescopic action of adjacent pipe lengths to accommodate axial movement;
  - Resistance against excessive radial shear which could lead to seal failure and possible root penetration.
- The "D" ring is placed on the first step of the spigot *(refer to Figure 4)* with the flat face on the concrete. The ring must be evenly tensioned by 'pinging' the ring around the perimeter of the spigot, ensuring that it rolls evenly into position. It will compress to form a watertight seal when the pipes are pushed home.

TABLE 1 **Hyspec VCT Concrete Pipe Range**

	Ref.	Nominal Pipe Diameter					
		225	300	375	450	525	600
Internal Diameter	ID	225	300	375	450	525	600
Wall Thickness	t	35	35	35	40	45	50
Weight of Pipe (kg)	–	161	253	313	433	568	726
Overall length	B	2078	2578	2578	2592	2595	2599
Barrel Outside Diameter	C	295	370	445	530	615	700
Barrel Length	D	2000	2500	2500	2500	2500	2500
(*)Joint Laying Gap (x)	nom	4	4	4	5	5	5
	max	8	8	8	10	10	10
Effective Length		2004	2504	2504	2505	2505	2505
Collar Diameter	E	376	453	536	631	724	817
Collar length	F	95	95	95	115	130	140
Bell Length	G	176	181	198	219	236	253
Rubber Ring Code		R0225V	R0300V	R0375V	R0450V	R0500V	R0600V

Note: *(*) Refer to Figure 4*

- *Weight calculation based on a nominal density of 2500 kg/m³*
- *All dimensions in mm*

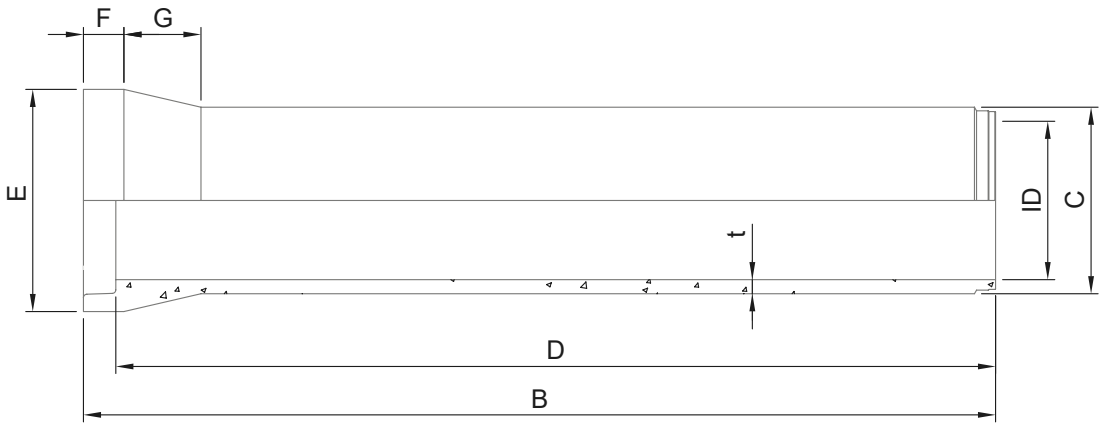


FIG. 1 VCT Pipe dimensions

FIG. 2 Schematic elevation/cross section of Hyspec VCT concrete

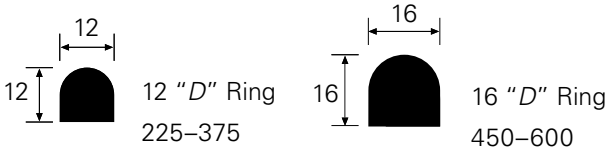
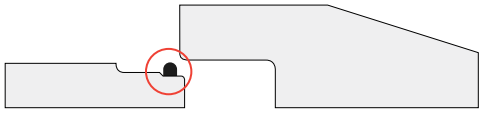


FIG. 3 "D" Ring profiles

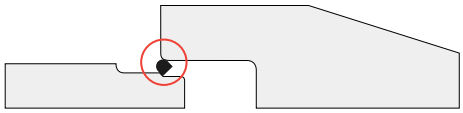
Step 1

Place D ring on first step of spigot as shown *(Do not lubricate)*. The ring should be evenly tensioned by 'pinging' the ring around the spigot.



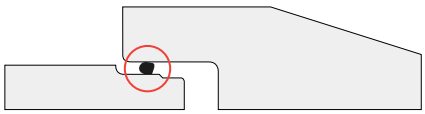
Step 2

Move spigot with ring towards collar. Push the pipe until it locks uniformly between the collar lead-in and the spigot.



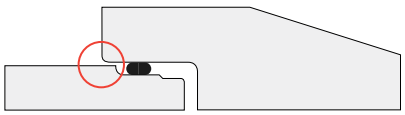
Step 3

As the spigot is being pushed into the collar, the D ring will rotate and compress between the two surfaces.



Step 4

Continue the jointing movement.
As the ring rotates past 180° a positive jointing action occurs.



Step 5

The joint is fully home at a ring rotation of approximately 270°. Between 180° and 270° the joint is stable.

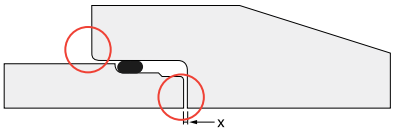


FIG. 4 Jointing using D Ring

Also refer to:

- *D1.1 Hynds Hyspec Spun Rubber Joint Pipes*
- *D1.3 Hythrust Jacking Pipe System*
- *D1.4 Hynds Skid Ring Joint*
- *D1.5 Hyspec Flush Joint Pipes*
- *D1.11 Hynds Hydura Concrete Pipe*
- *D1.13 Bicrete*