NATIONAL OFFICE

PO Box 4990

North Rocks NSW 2151 TEL: **(02) 8839 9006** FAX: **(02) 8839 9152**

SYDNEY

254 Woodpark Rd, Smithfield NSW 2164 TEL: **(02) 9604 2422** FAX: **(02) 9604 4435**

MELBOURNE

86 Whiteside Rd, Clayton VIC 3168 TEL: **(03) 9543 2311** FAX: **(03) 9543 7420**

BRISBANE

224 Musgrave Rd, Coopers Plains QLD 4108 TEL: **(07) 3277 2822** FAX: **(07) 3277 3696**

TOWNSVILLE

49 Enterprise Ave, Bohle QLD 4816 TEL: **(07) 4774 5044** FAX: **(07) 4774 5728**

ADELAIDE

550 Churchill Rd, Kilburn SA 5084 TEL: **(08) 8260 2077** FAX: **(08) 8349 6931**

PERTH

Sainsbury Rd, O'Connor WA 6163 TEL: **(08) 9337 4344** FAX: **(08) 9331 3383**

DARWIN

3846 Marjorie St, Pinelands NT 0829 TEL: **(08) 8932 8200** FAX: **(08) 8932 8211**

LAUNCESTON

15 Thistle St, South Launceston TAS 7249 TEL: **(03) 6344 2521** FAX: **(03) 6343 1100**

HOTLINE 13 11 69

E-mail info@vinidex.com.au

Website www.vinidex.com.au





Draincoil



CORRUGATED SUBSOIL DRAINAGE PIPE





Draincoil

CORRUGATED SUBSOIL DRAINAGE PIPE

product catalogue

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introduction ▶

Introduction

Draincoil

Draincoil corrugated subsoil drainage system is:

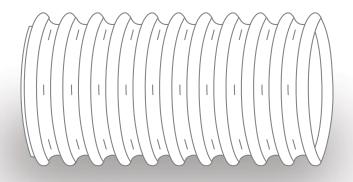
- Strong
- Flexible
- Effective
- Efficient
- · Easy to install
- · Easy to transport
- Corrosion resistant
- Available in coil lengths up to 200 metres

Even Drainage

Draincoil plastic pipes provide an even drainage pattern along the entire pipe length through uniform slot spacing in the valleys of the profile corrugations.

Strength

Excellent strength to resist external loads is achieved by the corrugated pipe structure.



CORRUGATED PROFILE: EXCELLENT STRENGTH TO RESIST EXTERNAL LOADS

Typical Applications for Draincoil Include:

Civil Projects

- Roads and highways
- Retaining walls and slopes
- Foundations of buildings and houses
- Sludge pits for quarries
- Sand leaching/heap leaching for mining
- Protections of underground masonry

Land Drainage

- Sports ovals
- Race tracks
- Golf courses
- Parks and gardens

Agricultural Drainage

- Salinity
- High rainfall
- High water table
- Hillside soaks



Features

Ease of Installation

Draincoil is available in easy-to-handle coils ranging in length from 20 to 200 metres. Because of its light weight, it car be transported over difficult terrain and across wet areas during installation. The long lengths facilitate high speed installation using a backhoe, chain digger or direct ploughing into the soil.

Flexible

Draincoil pipes can be installed continuously around curves and corners of 300mm radius without the need for additional fittings. Any soil movement is accommodated by the flexibility of Draincoil.

Robust

The corrugated structure provides excellent strength to resist external loads from either soil backfill or vehicles, once installed.

Effective Drainage

Drainage water enters Draincoil through the uniform slot patterns in the protected valleys of the corrugations. An even entry of water along the pipe length provides efficient and effective drainage.

Uniformly arrayed small holes and high hole density give optimum drainage, creating a uniform hydraulic gradient through the filter medium, and slots with an aspect ration minimum of 4:1 enable arch formation of small grains without clogging.

Corrosion Resistant

Draincoil is unaffected by aggressive soil conditions. The chemical resistance of the polyethylene and PVC materials used in its manufacture is well established and documented.





applications >

Applications

Drainage pipes are installed to take excess water away from an area to prevent water logging. Draincoil is ideally suited to the following applications.

Civil Projects

Changes in moisture content of the subsoil, particularly those with clay content, cause expansion and contraction, ground heaving and cracking. Excess water can greatly reduce the soil's load bearing capacity and shear strength. Subsoil drainage effectively pegs the watertable and stabilises the soil.

Roads and structures dependant on soil strength and stability should all be provided with adequate subsoil drainage. Such structures include retaining walls and the foundations of buildings and houses.

Draincoil can also prevent water penetration of underground masonry, which can cause damage to mortar and internal walls.

Mining projects use Draincoil for sand leaching/heap leaching and sludge pits for quarries.

Land Drainage

Recreational areas such as sports ovals, race tracks, golf courses and parks and gardens require surface water to drain away quickly after intense rainfall.

Agricultural Drainage

Draincoil assists in overcoming such problems as salinity, high rainfall, high watertable and hillside soaks.





DRAINCOIL – IDEAL FOR DRAINAGE OF SPORTS OVALS, RACE TRACKS, GOLF COURSES AND PARKS



product data ▶

Product Data

Draincoil is available in sizes 50mm, 65mm, 80mm, 100mm and 160mm. Easy to transport coil lengths range from 20 to 200 metres. Unslotted Draincoil is also available.



Pipe Dimensions

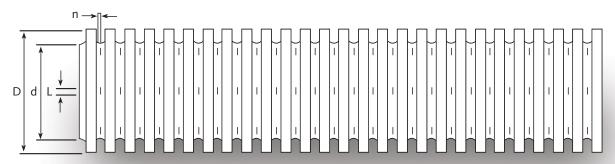


TABLE 1 - Pipe Dimensions

CLASS	NOMINAL DIAMETER DN (mm)	OUTSIDE DIAMETER D (mm)	INSIDE DIAMETER d (mm)	SLOT SIZE n x L (mm)	NO. OF SLOTTED ROWS	WATER ENTRANCE AREA (mm²/mm)	COIL LENGTH (m)	COIL MASS APPROX. (kg)
200	160	160	138	1.25 x 5	6	1500	20/60	17/53
400	50	50	44	1.25 x 4	6	1500	20/200	3.5/35
400	65	65	55	1.25 x 5	6	1500	20/200	4.6/46
400	80	80	68	1.25 x 5	6	1500	20/100	7.0/35
400	100	100	86	1.25 x 7.4	6	1500	20/100	9.5/48
1000	100	100	86	1.25 x 7.4	6	1500	100	70

Notes:

- Class 200 & Class 400 Polyethylene
- Class 1000 PVC
- Filtersock can be supplied separately or fitted on Draincoil



product data ▶

Classification

Pipe Stiffness

Australian Standard AS2439 Part 1 establishes classes of pipe based on stiffness, i.e. the ability to withstand force at a particular deflection. This class rating may be used as a guide to the type of wheel load or traffic conditions to be encountered in service.

TABLE 2 - Pipe Stiffness

CLASS	PIPE STIFFNESS 5% DEFLECTION	(kN/m²)* 10% DEFLECTION	APPLICATION
200	200	160	Surface land drainage
400	400*	300	Road or civil engineering works not subjected to heavy traffic loads
1000	1000	800	Works subject to heavy vehicular traffic loads

^{*} The units may be better understood as Newtons/mm/m eg. The pipe withstands a minimum force of 400N per millimetre deflection per metre length of pipe. The force decreases somewhat with increasing deflection. The reference deflection is 5% of diameter.

Average Slot Size

Slot sizes shown are an average based on a manufacturing tolerance as defined in Australian Standards. For further details refer to AS2439 Item 6.1.

Water Entrance (Clear Water Opening)

1500mm²/m clear water opening is the minimum requirement for the Australian Standard AS2439. Manufacturing tolerances and punching will generally result in larger clear water opening.

Sock Material

Sock Material is available in the standard "POLYESTER" material for general applications and as a special chemical resistant "POLYPROPYLENE" for mining and industrial applications.





product data >

Pipe Selection

TABLE 3 provides a guide to the flow capacity of each pipe.

For computational purposes, the following coefficients are suggested.

Darcy-Weisbach / Colebrook-White Hydraulic Roughness: 2.5 - 3.0mm Hazen-Williams C:80 Manning n: 0.014

These values are conservative but assume no silting.

TABLE 3 - Maximum Flow Capacity

GRADIENT	FLOW	DN50	DN65	DN80	DN100	DN160
1:50	m³/h	2.5	4.6	8.3	15.8	57.7
	m/s	0.5	0.5	0.6	0.8	1.1
1:100	m³/h	1.8	3.3	5.8	11.1	40.5
	m/s	0.3	0.4	0.4	0.5	0.8
1:200	m³/h	1.2	2.3	4.1	7.8	28.4
	m/s	0.2	0.3	0.3	0.4	0.5
1:300	m³/h	1.0	1.9	3.3	6.3	23.1
	m/s	0.2	0.2	0.3	0.3	0.4
1:500	m³/h	0.8	1.4	2.6	4.9	17.8
	m/s	0.1	0.2	0.2	0.2	0.3
1:750	m³/h	0.6	1.2	2.1	4.0	14.5
	m/s	0.1	0.1	0.2	0.2	0.3
1:1000	m³/h	0.5	1.0	1.8	3.4	12.5
	m/s	0.1	0.1	0.1	0.2	0.2

Gradient

TABLE 4 shows generally recommended gradients for Draincoil drainage installations.

- Careful attention must be given to control of trench/pipe grade
- · The grade should fall continuously without any low spots which may split up and cause a blockage
- · Laser-graded machines are increasingly used to obtain required tolerances

Recommended minimum flushing velocities are:

0.2 m/s - clay particles or fine silts that may enter pipe

0.5 m/s - fine sands or coarse silts that may enter pipe

TABLE 4 - Preferred Gradients

APPLICATION	MINIMUM GRADIENT	PREFERRED GRADIENT
Agricultural	0.2% or 1:500	0.4% or 1:250
Civil Engineering	0.5% or 1:200	1.0% or 1:100
Recreational	0.3% or 1:330	Between 1.0% & 3.0% or 1:100 & 1:33

Transport & Storage

Draincoil is easily transported, providing cost savings and convenience.

General precautions should be taken for potential damage from forklift forks, overtightening of strapping and sharp or heavy objects.

Coils of Draincoil should be stacked flat for any extended period of time. Long term storage under cover and in a cool place is recommended.

installation ▶

Installation

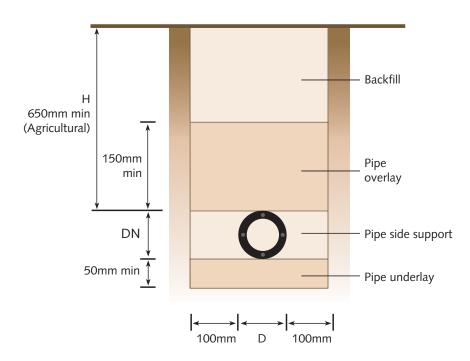
Draincoil can be easily installed due to its long coil lengths, flexibility and light weight. Subsoil drains can be installed by:

- Trenching
- · Ploughing into the ground

Draincoil pipes are flexible and when buried, develop an interaction with the surrounding soil to resist the loads on the system. Therefore, adequate soil support at the sides of the pipe is essential for proper performance.

Main Installation Features

- Trench width should be as narrow as practicable but approximately 200mm greater than pipe diameter to allow for compaction of pipe bedding material under the haunches.
- Selected overlay material to a minimum of 150mm over pipe.
- The above two features provide a filter zone.
- For agricultural applications, a minimum of 650mm cover should be maintained to avoid deep rippers and heavy machinery.
- A 50mm minimum pipe underlay of filter material should be first placed in the trench to take out any irregularities in the trench bed and provide a drainage path underneath the Draincoil pipe.
- Ensure that appropriate filter material aggregate or coarse sand is used. A maximum filter aggregate size of 13mm should be used.
- Trenches should have clearly cut sides to avoid contamination of the filter during construction.



GENERAL DIMENSIONS FOR MINIMUM COVER ARE GIVEN IN TABLES

TABLE 5 - Minimum Cover Over Pipe (Dimension H)

DRAINCOIL	MIN.COVER HEIGHT
Not subject to vehicular loading	300mm
Subject to vehicular loading: Not in roadways In sealed roadways Under unsealed roadways	450mm 600mm 750mm
Pipes in embankment conditions or subject to construction equipment loading	750mm
Agricultural applications subject to deep rippers & heavy machinery	650mm



installation ▶

Pipe Laying

- As most water enters the pipe from underneath, there is little point in installing a drain deep into a solid clay layer. Where such a layer occurs within the planned depth zone of the drainage system, the pipe should be installed just into this layer. In heavy clay soils, granular backfill should be brought to the top of the clay layer in order to keep the pipe at a minimum depth of 650mm.
- Always ensure that the pipe has only porous soil above, avoiding heavy clay backfill which restricts the flow of water to the pipe.
- The pipe should be kept in the centre of the trench and the filter material compacted under the haunches, around the sides and above the pipe.
- Draincoil may be connected to the stormwater system or to a soak pit.
- Draincoil connections must never be made into the sewerage system.

Depth and Spacing

Typical Depth & Spacing for Agricultural Subsurface Drains

TABLE 6 is a guide only. The design of a subsoil drainage system is influenced by a number of factors, including for example, topography, soil texture, tree spacing, vehicle access and proposed crop requirements.

The advice of relevant authorities and design specialists should be sought.



TABLE 6 - Depth & Spacing

SOIL TYPE	DEPTH (m) *	SPACING m)
Deep light sand	1.8 – 2.1	27 – 40 †
Loam	1.2	13
Clay loams & clay	0.9 – 1.1	7 – 13

^{*} The depth of the impermeable soil layer is the critical factor in determining maximum drain depth. Spacing varies depending on the soil texture. The relevant authority in each state is available to advise a drainage depth and spacing for the appropriate crop.



[†] Good results have been achieved at spacing up to 80 metres.

installation >

Fittings

The long lengths and flexibility of Draincoil, together with the typical features of a Draincoil installation usually result in a limited requirement for fittings.

Moulded couplings are available together with a comprehensive range of simple 'push on, clip over' fittings for 100mm Draincoil.

The 100mm fittings provide the following benefits:

- Easy jointing simple 'push on, clip over' joint. No slitting or wiring or tapping of pipe for manual joints.
- Comprehensive range makes major project installation easy (coupling, cap, 45° junction, tee, cross & adaptor are available).
- High strength moulded fittings.
- Adaptability custom fabricated adaptor available for jointing 100mm Draincoil drainage pipe with 90mm PVC stormwater pipe.

Custom fabricated fittings are also available.

Filter Sock

In some fine sand and coarse silt soils, a filter sock may be used to prevent fine granular filter material entering the slotted pipe.

The filter sock stabilises the soil by bridging the pipe corrugations and supporting the soil immediately around the pipe. This restricts the sediment from entering the drainline.





