



Densleeve

The Naylor Densleeve underground drainage system of plain-end vitrified clay pipes and fittings with flexible sleeve couplings, was developed for building drainage and associated sewerage and is all manufactured to comply with the stringent requirements of BS EN295.

Densleeve is available in diameters DN100, 150, 225 and 300; in addition DN200 and 250 are manufactured for key export markets.

When installed in general accordance with the Naylor Sitework Instructions the Naylor Densleeve system meets the latest technical requirements of the Building Regulations, BS8005 and BS8301.

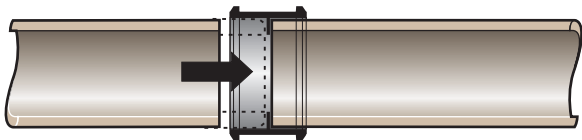
Description

Clayware

Vitrified clay plain-end pipes and fittings, manufactured in accordance with the requirements of BS EN295-1. The standard lengths of pipes are convenient for handling and laying and allow for flexible joints at sufficiently frequent intervals to enable the pipeline to withstand settlement or other ground movement after installation.

Sleeve Couplings

Manufactured in high impact polypropylene with elastomeric seals providing watertight, flexible mechanical joint assemblies, complying with BS EN295-1: System G.



Standard Coupling Seals

These are manufactured from elastomers conforming to the performance requirements of BS EN681-1. EPDM seals supplied as standard; Nitrile seals are also available for use in contaminated ground.

Joint Performance

Densleeve joint assemblies meet all the requirements of BS EN295-1. They accept angular deflection and shear resistance without leakage, when tested under an internal or external water pressure of 50kPa (5 metres head).

Aggressive Environments

The standard Densleeve pipes, polypropylene couplings and elastomeric sealing rings are resistant to attack from substances which are commonly encountered in sewers.

Where more aggressive effluents or environments are present, other types of coupling seals may be required. Alternatively, Naylor has a separate division, Hathernware, which manufactures chemical drainage - ceramic pipes for exceptional high temperature or chemically aggressive environments. Contact the Naylor Technical Sales Department for advice.

Specification

The following statement is a suitable clause for inclusion in contract specification.

Pipes and Fittings

Vitrified clay plain-end pipes & fittings with flexible polypropylene coupling joints, all to BS EN295-1 : System G. (Densleeve type as manufactured by Naylor Drainage Ltd, Clough Green, Cawthorne, Barnsley, S75 4AD, England).

Availability

Densleeve is available either directly from the manufacturer, from Naylor stocking depots or from hundreds of Merchant Stockists throughout Britain as well as Naylor Agents overseas. Contact the Naylor Sales Department for details.

Structural Performance

Densleeve pipes can usually be laid directly on a hand trimmed natural trench bottom with selected, excavated materials (Class D Bedding) used as backfill.

Crushing Strengths

BS EN295-1 includes a variety of crushing strengths for each nominal size of pipe as it takes into account the strength requirements in various parts of Europe. As it is impracticable for any single manufacturer to offer pipes and fittings in the full range of strengths, Naylor has standardised on the strengths shown in the table below.

Densleeve Packs

The pipe lengths detailed below are standard at the time of publication but may vary due to changes in manufacturing facilities.

Pipe Nominal Size (DN)	Crushing Strength kN/m (System G)	Class	Standard Length (metres)
100	40		1.6
150	40		1.75
200	56	240	1.75
225	45	200	1.75
250	70	280	1.75
300	72	240	2.00

Range

A full system is offered from DN100 to DN300 with an extensive range of fittings, including bends, junctions, tapers and access items, particularly suitable for building drainage applications.

Densleeve can be used in conjunction with other Naylor underground and with other above-ground systems. Connections are made by using purpose-made connectors and adaptors or by the use of Band-Seal couplings.

Pipe Trench Beddings

See the Naylor Drainage Design Handbook for the depths of cover between which Naylor Densleeve pipes conforming to BS EN295-1 can be laid in any width of trench.

Advantages

It is a major advantage of the Densleeve system that plain-end pipes can be quickly and easily cut to intermediate lengths on site and can still be jointed using normal couplings. This feature retains the ease in jointing, reduces wastage and damage and is particularly cost effective.

Flexibility

The flexible joints ensure that the pipeline will accommodate minor settlement and ground movement without failure.

Strength

Vitrified clay pipes and fittings are rigid and do not distort under loading. Their high inherent strength ensures stability even at extreme depths of cover.

Bedding Economy

Densleeve pipes can often be laid on the natural, trimmed trench bottom or where not possible on a 50mm bed of inexpensive granular material such as recycled aggregates. As dug material can be used for the backfill, all resulting in significant savings in granular bedding materials.

Chemical and Temperature Resistance

The Densleeve system has good corrosion resistance and can accommodate controlled discharges of up to 60-70°. For more extreme operational conditions, the Hatherware range of chemical drainage is available:

- FCR - Fully Chemically Resistant
- HT - High Temperature - For very high temperature discharges and thermal shock cycling.

Durability

The Densleeve system is extremely durable. For design purposes, a vitrified clay pipeline can be considered to have unlimited life.

Water Jetting

The Densleeve system, when installed in general accordance with the Naylor Sitework Instructions Booklet is guaranteed for the lifetime of the system against penetration of the pipe wall caused by high pressure water jetting when operated within the following maximum parameters.

- Pressure - 7500psi (510 bar)
- Flow rate - 20gals/min (1.5ltrs/sec)
- Time - Static for 5 minutes

Quick Installation

Pipe jointing is a straightforward manual push fit operation. Testing and backfilling can start immediately.

Pipe Lengths and Delivery

Naylor Pipes are supplied in easy-to-handle lengths. They are delivered in convenient packs with optional mechanical offloading equipment available on the delivery vehicle.

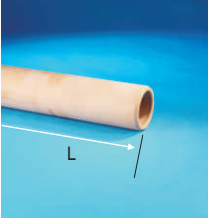
Easy Cutting

Where shorter lengths of pipe are required, pipes may be easily cut on site.

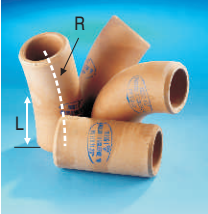
Pipes and Fittings

DN100, 150, 225 & 300 plain-end vitrified clay sewer pipes and fittings with sleeve joints, plus DN200 and 250 for overseas markets, to BS EN295. 15% of our Clayware products are made from recycled material.

Pipes & Bends



Pipes		
DN	CODE	L
100	17011	1.6M
150	17022	1.75M
200*	17018	1.75M
225	17020	1.75M
250*	17019	1.75M
300	17032	2.00M



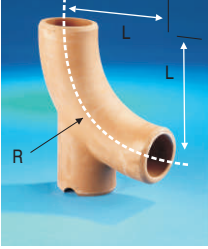
Bends (90°)				
DN	CODE	L	R	
100	19001	190	150	
150	19002	230	200	
200*	19003	250	250	
225	19004	310	250	
250*	19303	310	300	
300	19005	360	300	

(45°)				
DN	CODE	L	R	
100	19007	190	375	
150	19008	230	450	
200*	19009	250	600	
225	19010	310	600	
250*	19301	310	600	
300	19011	310	600	

(22½°)				
DN	CODE	L	R	
100	19016	150	750	
150	19017	180	900	
200*	19018	250	1200	
225	19019	250	1200	
250*	19299	250	1200	
300	19020	250	1200	

(11¼°)				
DN	CODE	L	R	
100	19021	120	1200	
150	19022	175	1750	
200*	19023	245	2400	
225	19024	245	2400	
250*	19298	245	2400	
300	19025	245	2400	


*Additional Overseas sizes. 15°, 30° and 60° Bends also available



Rest Bend				
DN	CODE	L	R	
100	19029	250	220	
150	19030	270	250	
225	19031	310	250	
300	19032	360	300	

These radiuses do not apply to fabricated products

Junctions




Oblique (45°)					
DN	CODE	L1	L2	L3	
100x100	19035	380	250	240	
150x100	19036	450	330	300	
150x150	19037	450	330	350	
225x100	19043	500	380	375	
225x150	19044	500	360	420	
225x225	19045	700	530	500	
300x100	19046	500	360	420	
300x150	19048	600	480	490	
300x225	19050	750	530	550	
300x300	19051	900	600	615	

Curved Square (90°)					
DN	CODE	L1	L2	L3	
100x100	19067	380	145	180	
150x100	19068	450	225	180	
150x150	19069	450	185	225	
225x100	19074	500	175	275	
225x150	19075	600	220	290	
225x225	19076	700	290	300	
300x100	19077	500	200	300	
300x150	19078	600	240	320	
300x225	19079	750	330	370	
300x300	19080	900	350	550	

Also available 200x150, 200x200, 250x150, 250x200, 250x250, 300x200, 300x250

Saddles




Oblique (45°)		
DN	DN Main	CODE
100	Small (up to 200)	19087
	Med. (up to 400)	19091
	Large (over 400)	19093
150	Med. (up to 400)	19099
	Large (over 400)	19101
225	Med. (up to 400)	19106
	Large (over 400)	19108

Square (90°)		
DN	DN Main	CODE
100	Small (up to 200)	19111
	Med. (up to 400)	19115
	Large (over 400)	19117
150	Med. (up to 400)	19123
	Large (over 400)	19125
225	Med. (up to 400)	19130
	Large (over 400)	19132

Fittings

15% of our Clayware products are made from recycled material.

Gullies



Universal Gully

DN Outlet	100
Top (L)	260x170
Depth (H1)	385
Depth (H2)	263
Code	19316

With horizontal back inlet 19315

Complete with removable internal trap, DN100 coupling outlet and black polypropylene top incorporating 152 x 152 plastic grate and bristled slot 159 x 70mm to accept round or square downpipes (max 70mm). Top and base can be independently repositioned through 360°.



Rainwater Gully

DN Outlet	100
Top (L)	165x165
Depth (H1)	330
Depth (H2)	208
Code	19332

With horizontal back inlet 19333

Complete with removable internal trap, DN100 coupling outlet and square black polypropylene top. Top and base can be independently repositioned through 360°.




Paving Gully

DN Outlet	100
Top (L)	170x170
Depth (H1)	385
Depth (H2)	263
Code	19318

With horizontal back inlet 19317

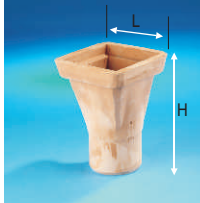
Complete with removable internal trap, DN100 coupling outlet and square black polypropylene top. Top and base can be independently repositioned through 360°.



Square P Gully

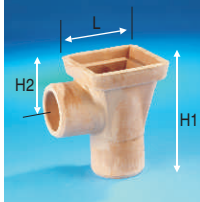
DN Outlet	100
L1	150x150
L2 (to centre)	350
H1	350
H2	180
Code	19267

Hoppers



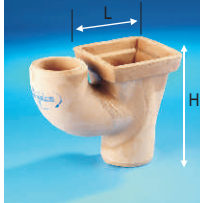
Square

DN	CODE	L	H
100	19204	150	285



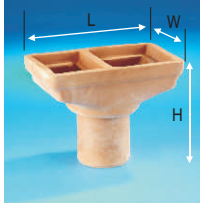
Horizontal 100mm Inlet

DN	CODE	L	H1	H2
100	19206	150	285	160



Vertical 100mm Inlet

DN	CODE	L	H
100	19213	150	285




Rectangular

DN	CODE	L	W	H
100	19193	335	205	265
150	19194	335	205	175

Back Inlet slot: 122x160

Raising Piece




Standard Raising Piece

H	CODE
225	07368

For 150mm Square Hoppers

Dished Tops



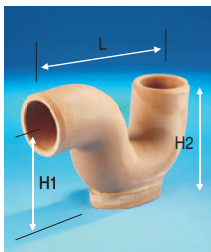
Square Dished Top

GRATE SIZE	L	W	D	CODE
125	245	245	100	07383
178	305	305	100	07385

For Outlet 100 & 150

Fittings

Low Back Trap



P Outlet 92½°

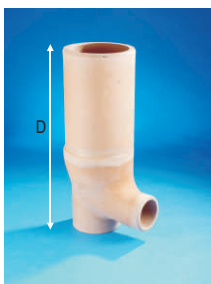
DN	CODE	L	H1	H2
100	19200	350	295	240
150	19201	450	400	320

Grates for P Gully and Hoppers

Grates, Plates & Sealing Frames

Product	Fig. No.	CODE	SIZE
Loose Grate:	410	60026	152x152
Hinged Locking Grate & Frame:	414	60048	152x152
Sealing Plate & Frame:	400	60011	152x152

Verminator




Verminator

DN	OUTLET	D	CODE
200	100	600	19057
200	150	600	19058

DN110 or 160 Inlet
Installed at the base of soil stack, the Verminator acts as an effective deterrent to sewer rats entering buildings.

Couplings and Connectors




Couplings

EPDM Seals as standard
Nitrile also available

DN	CODE	L1	L2
100	20008	155	90
150	20010	220	120
200*	20012	300	160
225	20013	320	155
250*	20028	350	155
300	20015	410	190

*Additional Overseas sizes. Made from 100% recycled polypropylene.



Uni-Drain Connector

For round or square waste & rainwater pipes

DN	CODE	L1	L2
100	15048	140	100

Nominal OD of waste pipe 34-82mm.
Connects to any DN100 below ground drainage system

Made from 100% recycled polypropylene.


Other Connectors



For soil & rainwater pipes			Nom. OD of Adaptor Pipe
Fig.	DN	CODE	
DC6	100	15021	110
DC7	150	15025	160
For underground cast iron			
DC9	100	15024	118
DC9a	150	15027	173
For plain-end thin wall clay			
DC10	100	15034	123
DC15	150	15035	180
DC18	150	15049	178
For twinwall - plastic surface water pipes			
DC150TD	150	15057	
DC225TD	225	15055	
DC300TD	300	15056	

Made from 100% recycled polypropylene.

Stoppers

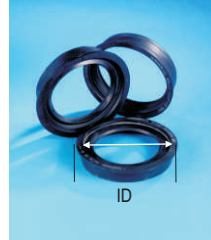


Polypropylene

DN	CODE	L1	L2
100	15009	160	45
150	15010	218	60
225	15012	317	80
Clay			
300	19133	410	95

Made from 100% recycled polypropylene.

Connectors to Concrete Gullies




Generally for use with Milton Milflex Gully & Manhole base

Nominal socket ID	CODE
200mm	15032
Other Concrete Gullies	
210mm	15033

Used with 150mm Densleeve (or 150mm thin walled clay / 160mm PVCu)

Access and Rodding Eye Points




Rodding Eye Point

Aluminium oval pattern connects with DN100 Standard Coupling
DN150 DC15 Connector
With removable plate for Rodding

DN	CODE	L	TOP
100	19033	135	205x150
150	19034	180	270x200

Square Rodding Eye Point






With removable screw down plate for Rodding

DN	CODE	TOP
100	15085	170x170
150	15085	170x170


Ideal for use in paved areas.
Connect with standard coupling and 45° bend.

Fittings

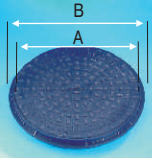
Access and Rodding Eye Points

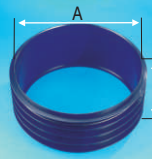
	Access Pipe		
	Sealing Plate & Frame - Alloy		
	CODE	ACCESS SIZE	
	60025	250x150	
	Oval Raising Piece		
	CODE	H	ACCESS
	07511	300	250x150
	Access Pipe		
	DN	CODE	L
	100	19154	450
	150	19156	450
	Oval Opening		

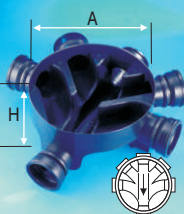
Inlet Adaptor

	PPIC inlet Adaptor	
	DN	CODE
	100	15072
	Converts DN110 chamber inlets to DN100 Densleeve	

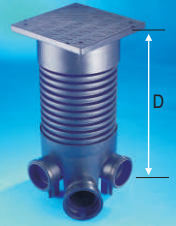
Plastic Inspection Chambers

	Cover and Frame			
	DN	CODE	A	B
	450	15003	455	595
	Light duty Polypropylene Dual Lock Cover and Frame Test Load 35kN Square covers available recessed to accept block paving. Size 580x580mm.			

	Rasing Piece			
	DN	CODE	A	H
	470	15063	500	215
	WEIGHT: 4Kg The raising piece is supplied complete with a rubber seal and can be cut to interim heights. MATERIAL: Polypropylene COLOUR: Black			

	Base Unit			
	DN	CODE	A	H
	470	15062	500	240
	WEIGHT: 4Kg Inlets x 5 DN100. Outlet x 1 DN100. Suitable for direct connection to the Naylor Densleeve vitrified clay underground drainage system.			

Universal Manhole

	Polypropylene Mini Access Chamber		
	DN	CODE	D
	250	15087	600
	Complete unit with cover and frame Inlets x 3 - DN100 Outlet x 1 - Dn150		

Plastic Inspection Chambers



	Denrod 500 Complete Chamber			
	DN	CODE	A	H
	500	15008	500	1000
	WEIGHT: 12Kg Inlets x 3 - DN100 or DN150. Outlet x 1 - DN150. NB. Inlet size is achieved by cutting off the relevant inlet cap. Outlet connects to DN150 Densleeve using Naylor DC7 Connector (Supplied). MATERIAL: High Density Polypropylene COLOUR: Black Use IC6 Cover and Frame for light duty applications. Made from 100% recycled material			

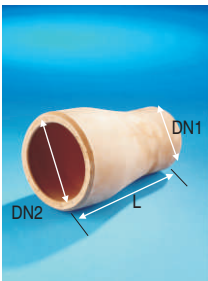
Fig. IC150

Adaptors

	To / From Densleal			
	DN	TYPE	CODE	L
100	1	19141	300	
	1a	19142	300	
	2	19149	150	
150	1	19143	300	
	1a	19144	300	
	2	19150	150	
225	1	19145	300	
	1a	19146	300	
	2	19151	300	
300	1	19147	320	
	1a	19148	320	
	2	19152	320	
	Type 1: Densleal Socket Type 1a: Plain end for cement jointing Type 2: With Densleal Spigot			

Fittings

Tapers



Taper		
DN D1-D2	CODE	L
100-150	19134	300
150-225	19138	380
225-300	19140	500

Sitework Equipment



Lubricant	
50001	1Kg Tub
50002	2.5Kg Tub

Supplied in plastic tubs.
 This vegetable-based lubricant is suitable for all types of push fit and gravity pipe systems.

Average Number of Joints per 1Kg Tub
 100 - DN100
 50 - DN150
 30 - DN225
 24 - DN300
 15 - DN375/400
 10 - DN450/500

NB: Measurements are only as a guideline