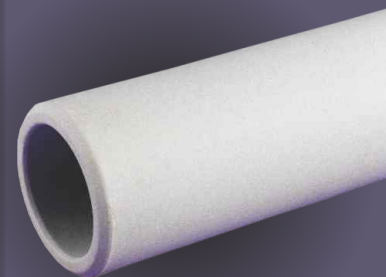


NAYLOR
THERMACHEM

Made in the UK
Excellent Construction Products

Thermachem

drainage solutions
for aggressive
environments



Ceramic stoneware
system for
resistance to high
temperatures,
aggressive chemicals
and thermal shock

email: thermachem@naylor.co.uk

web: www.naylor.co.uk



Winners -
Growing Business



Winner - Best SME



**MADE IN
BRITAIN**



**MADE IN
SHEFFIELD**

Telephone:

+44 (0)1226 794056

Email:

**[thermachem@
naylor.co.uk](mailto:thermachem@naylor.co.uk)**

Contents

Properties of Thermachem

1

Applications and Case Studies

2

Coupling options

3

Chemical resistance table

4-5

Product range

6-10

Technical information and installation

11

Hydraulic flow tables

12

Trench beddings

13





Properties of Thermachem

Thermachem is a highly advanced chemical stoneware manufactured from a pure ball clay and added minerals including silica and alumina. The mix is subjected to extreme firing temperatures to produce an almost impermeable ceramic material. The resultant pipe system has many advantages when used in aggressive environments including:

- Excellent resistant to aggressive chemicals in the full pH scale – pH0 to pH14
- Resistant to constant thermal shock of up to 120 degrees Celsius
- Resistance to higher temperatures when thermal shock is managed.
- High strength, allowing for use in heavy trafficked areas and/or with little or no bedding material.
- Long design life, often in excess of 50 years.
- Range of coupling options to suit individual project requirements
- No loss of strength, form or resistance properties during life span.
- Simple to install

Thermal Shock

Thermal shock can create cracks and fractures in standard materials when they are constantly exposed to large temperature differentials. Naylor Thermachem has been independently tested to handle thermal shock of 120 deg C.

High Temperatures

Constant high temperatures effluents can weaken some drainage materials leading to potential deformation in the pipeline. Naylor Thermachem can handle temperatures of up to 200 deg C with no loss of performance in the pipe material or coupling.

Chemicals

Thermachem can handle a wide range of aggressive chemicals including chemicals in the full pH scale and aggressive acids. For the majority of chemicals Thermachem will provide excellent resistance at its full thermal shock and temperature capabilities.

Brewery



Power Plants



Food Processing



Dairies



Chemical Plants



Hospitals



Laboratories



Industry



Contaminated ground,
chemical spills

Thermachem drainage applications

Naylor Thermachem drainage is specified and used wherever there is a potential issue with thermal shock and/or aggressive chemicals attacking the drainage pipelines.

Naylor has case study details on projects supplied to a number of the industries and applications shown above. Visit the Thermachem section of our website or contact us for details.

Technical Support

Naylor's technical team can help with advice on the most appropriate drainage solution for your project.

Call us on 01226 794056

or E-mail on thermachem@naylor.co.uk with details of your drainage requirements and we'll help point you in the right direction.

Quality Assurance

Naylor Thermachem is manufactured to the standards of BSEN295. All diameters up to DN300 plus all couplings other than the Fluoropolymer BandSeal have EN295 certification, under Kitemark certificate No: KM 20173. Contact Naylor for further details and a copy of the certificate.

Naylor has BS EN ISO 9001 : 2008 certification. Certificate No: FM 01420.

Thermachem Coupling options

A range of couplings are available in the Thermachem range to suit the individual nature of each project. Coupling choices can be combined on a project, utilising more cost effective options once effluents have cooled and or become diluted from downstream inlets. The table below outlines the coupling options.

Push Fit Couplings

Description	Code	Max. intermittent temp.	Max. continuous temp.
EPDM Seal	PF-EPDM	120°	110°
Nitrile Seal	PF-NIT	120°	100°

Band-Seal Couplings

Description	Code	Max. intermittent temp.	Max. continuous temp.
EPDM Band-Seal	BS-EPDM	120°	110°
Nitrile Band-Seal	BS-NIT	120°	100°
FKM Band-Seal	BS-FKM	200°	200°
Fluoropolymer Band-Seal	BS-FP	200° *	200° *

* For any requirements above 100 degrees Celsius please contact Naylor for confirmation of coupling suitability.

Chemical resistance of couplings

Refer to the chemical resistance chart on pages 4 and 5 to determine the most appropriate coupling solution for your project. If the chemicals been discharged are not shown or if you require further clarification contact the Thermachem technical support team on thermachem@naylor.co.uk or +44 (0) 1226 794056.



EPDM Push Fit



Nitrile Push Fit



EPDM Band-Seal



Thermachem Drainage & Coupler

Chemical & Substance Resistance Table

If you need information on any chemicals that don't appear on the list or require clarification on any conditions please contact Naylor's technical Thermachem team on +44 (0) 1226 794056 or thermachem@naylor.co.uk

This table is intended as a guide for use by specifiers and contractors and is based on research of openly available data undertaken by Naylor. It has been compiled with great care but it is recommended that anyone using the table checks material suitability with another source to cover for any potential errors. As Naylor cannot be aware of site conditions and actual chemicals discharged Naylor can not provide any warranties against chemical attack.

If you do find anything wrong with this table please let us know and we'll put it right.

Key to use

✓	Excellent for use
?	See comments and check suitability with Naylor
✗	Unsatisfactory for use

Chemical / Substance	Alternative Name(s)	Chemical or Molecular Formula (if relevant)	Thermachem	COUPLER TYPE						Condition of use if ? (Contact Naylor for clarification of conditions)
				EPDM Push fit	Nitrile Push fit	EPDM Band-Seal	Nitrile Band-Seal	FKM Band-Seal	Fluoropolymer Liner Band-Seal	
Acetic acid (30%)	Ethanoic acid / Vinegar / Glacial acetic	CH ₃ COOH	✓	✓	✓	✓	✓	✓	✓	
Acetone	Dimethyl ketone / DMK	(CH ₃) ₂ CO	✓	✓	✗	✓	✗	✗	✓	
Aluminium chloride		AlCl ₃	✓	✓	✓	✓	✓	✓	✓	
Aluminium phosphate		AlPO ₄	✓	✓	✓	✓	✓	✓	✓	
Aluminium sulphate		Al ₂ (SO ₄) ₃	✓	✓	✓	✓	✓	✓	✓	
Ammonium carbonate		(NH ₄) ₂ CO ₃	✓	✓	✗	✓	✗	✗	✓	
Ammonium chloride	Sal Ammoniac	NH ₄ Cl	✓	✓	✓	✓	✓	✓	✓	
Ammonium hydroxide	Household ammonia / Ammonia solution	NH ₄ OH	✓	✓	✗	✓	✓	✓	✓	
Amyl chloride		C ₅ H ₁₁ Cl	✓	✗	✗	?	?	✓	✓	
Aniline	Phenylamine / Aminobenzene	C ₆ H ₅ NH ₂	✓	✗	✗	✗	✗	?	✓	FKM will provide good resistance
Aniline hydrochloride	Anilinium chloride	C ₆ H ₅ ClN	?	?	?	?	?	?	✓	Resistance unknown - contact Naylor for info.
Barium bromide		BaBr ₂	✓	✓	✓	✓	✓	✓	✓	
Barium carbonate		BaCO ₃	✓	✓	✓	✓	✓	✓	✓	
Barium chloride		BaCl ₂	✓	✓	✓	✓	✓	✓	✓	
Barium sulphate		BaSO ₄	✓	✓	✓	✓	✓	✓	✓	
Benzaldehyde	Benzoic aldehyde / Oil of bitter almonds	C ₆ H ₅ CHO	✓	✓	✗	✗	✗	✗	✓	
Benzene	Benzol	C ₆ H ₆	✓	✗	✗	✗	✗	✓	✓	
Benzoic acid		C ₆ H ₅ COOH	✓	✗	✗	✗	✗	✓	✓	
Benzyl alcohol	Phenylmethanol / Phenylcarbinol	C ₆ H ₅ CH ₂ OH	✓	✗	✗	?	✗	✓	✓	Slow attack possible
Borax	Sodium tetraborate / Sodium borate	Na ₂ B ₄ O ₇ · 10H ₂ O	✓	✓	✓	✓	✓	✓	✓	
Boric acid	Boracic acid / Ortho boric acid	H ₃ BO ₃	✓	✓	✓	✓	✓	✓	✓	
Bromine		Br ₂	✓	✗	✗	✗	✗	?	✓	FKM provides good resistance
Butyl alcohol	N-Butanol	C ₄ H ₉ OH	✓	?	✓	?	✓	✓	✓	OK in small amounts, otherwise slow attack
Butyl acetate	Butyl ethanoate	C ₆ H ₁₁ O ₂	✓	✗	✗	✗	✗	✗	✓	
Butyric acid	Butanoic acid	CH ₃ CH ₂ CH ₂ COOH	✓	✓	✗	✗	✗	✓	✓	
Calcium chloride		CaCl ₂	✓	✓	✓	✓	✓	✓	✓	
Calcium hydroxide	Hydrated lime / Lime / Slaked lime	Ca(OH) ₂	?	✓	✓	✓	✓	✓	✓	Slow attack from frequent hot discharges
Calcium hypochlorite	Chlorine powder / Bleach powder	Ca(ClO) ₂	✓	?	?	?	?	✓	✓	Resistance unknown - contact Naylor for info.
Chloroacetic acid	Monochloroacetic acid (MCA)	ClCH ₂ CO ₂ H	✓	✗	✗	✗	✗	✓	✓	
Chloric acid		HClO ₃	✓	?	✗	?	✗	?	✓	Potential slow attack on EPDM and FKM
Chlorobenzene	Benzene Chloride / Phenyl Chloride	C ₆ H ₅ Cl	✓	✗	✗	✗	✗	?	✓	FKM provides good resistance
Chloroform	Trichloromethane	CHCl ₃	✓	✗	✗	✗	?	?	✓	FKM provides good resistance
Chlorosulfuric acid	Sulfurochloridic acid	HSO ₃ Cl	✓	✗	✗	?	?	?	✓	Contact Naylor re FKM
Citric acid		C ₆ H ₈ O ₇ · H ₂ O	✓	?	?	?	?	?	✓	Slow attack from strong solutions
Cobalt chloride		CoCl ₂	✓	✓	✓	✓	✓	✓	✓	
Copper nitrate	Cupric nitrate	Cu(NO ₃) ₂	✓	✓	✓	✓	✓	✓	✓	
Copper sulphate	Blue vitriol / Cupric sulphate	CuSO ₄	✓	✓	✓	✓	✓	✓	✓	
Ether			✓	✗	✗	?	?	?	✓	
Ethyl alcohol	Ethanol / Alcohol	C ₂ H ₅ OH	✓	✓	✓	✓	✓	✗	✓	
Fatty acids			✓	✗	?	?	?	✓	✓	Resistance unknown - contact Naylor for info.
Formaldehyde	Methanal	CH ₂ O	✓	✓	✗	✓	✗	?	✓	FKM provides good resistance
Formic acid	Methanoic acid	HCOOH	✓	✓	✗	✓	✗	✗	✓	
Fruit Juices			✓	✓	✓	✓	?	?	✓	FKM provides good resistance
Furfural			✓	✗	✗	?	?	?	✓	Contact Naylor re FKM
Gallic acid			✓	?	?	?	?	?	✓	Resistance unknown - contact Naylor for info.
Hydrobromic acid	Hydrogen bromide	HBr	✓	✓	✗	✓	✗	✓	✓	
Hydrochloric acid	Muriatic acid	HCl	✓	?	?	?	?	?	✓	EPDM OK to 20°C, NBR OK to 60°C and 10% conc. FKM OK to 37% conc and 52°C
Hydrofluoric acid	Hydrogen fluoride	HF	✗	✗	✗	✗	✗	?	✓	FKM good resistance if cold.
Hydrogen peroxide	Hydrogen dioxide / Hydroperoxide	H ₂ O ₂	✓	✗	✗	✗	✗	?	✓	Contact Naylor re FKM
Isopropyl Alcohol	Isopropanol / 2-Propanol	C ₃ H ₈ O	✓	✓	✗	✓	✗	✓	✓	
Kerosene	Aviation fuel / Jet fuel		✓	✗	?	✗	✓	✓	✓	Potential slow attack
Lactic acid	Milk acid / Sour milk acid	C ₂ H ₄ OHCOOH	✓	✓	✓	✓	✓	✓	✓	
Lead (II) acetate	Sugar of lead	(Pb(CH ₃ COO) ₂)	✓	✓	?	✓	?	✗	✓	Potential slow attack
Magnesium chloride		MgCl ₂	✓	✓	✓	✓	✓	✓	✓	
Magnesium nitrate		Mg(NO ₃) ₂	✓	✓	✓	✓	✓	✓	✓	
Magnesium sulphate	Epsom salts	MgSO ₄	✓	✓	✓	✓	✓	✓	✓	
Malic Acid	2-hydroxybutanedioic acid	HO ₂ CCH ₂ CHOHCO ₂ H	✓	✗	✓	✗	✓	✓	✓	
Mercury			✓	✓	✓	✓	✓	✓	✓	
Methanol			✓	✓	✓	✓	✓	✓	?	FKM provides good resistance

Key to use

✓	Excellent for use
?	See comments and check suitability with Naylor
✗	Unsatisfactory for use

Chemical / Substance	Alternative Name(s)	Chemical or Molecular Formula (if relevant)	Thermachem	COUPLER TYPE						Condition of use if ? (Contact Naylor for clarification of conditions)
				EPDM Push fit	Nitrile Push fit	EPDM Band-Seal	Nitrile Band-Seal	FKM Band-Seal	Fluoropolymer Liner Band-Seal	
Methyl alcohol	Methanol / Wood alcohol	CH ₃ OH	✓	✓	✓	✓	✓	✓	✓	FKM provides fair resistance
Methyl Chloride			✓	✗	✗	?	?	?	?	FKM provides fair resistance
Naphthalene	Tar Camphor / Moth Repellant	C ₁₀ H ₈	✓	✗	✗	✗	✗	✓	✓	
Nickel chloride		NiCl ₂	✓	✓	✓	✓	✓	✓	✓	
Nickel nitrate		Ni(NO ₃) ₂	✓	✓	✓	✓	✓	✓	✓	
Nickel sulphate		NiSO ₄	✓	✓	✓	✓	✓	✓	✓	
Nitric acid	Aqua fortis	HNO ₃	✓	?	✗	?	✗	?	✓	EPDM OK if very dilute, FKM provides good resistance
Oxalic acid		H ₂ C ₂ O ₄	✓	?	?	✓	?	✓	✓	Only use up to 20°C, potential slow attack on NBR
Perchloric Acid	Hyperchloric acid	HClO ₄	✓	?	✗	?	✗	✗	✓	Potential slow attack
Petroleum	Gasoline		✓	✗	?	✗	✓	✓	✓	Slow attack, increasing with temperature.
Phosphoric acid	Orthophosphoric acid	C ₃ O ₄ P	✓	?	✗	?	✗	✓	✓	OK to 20% conc.
Picric acid			✓	✗	✗	?	?	✓	✓	
Potassium bromide		KBr	✓	✓	✓	✓	✓	✓	✓	
Potassium carbonate	Potash	K ₂ CO ₃	?	✓	✓	✓	✓	✓	✓	Hot, strong solution may attack clay
Potassium chlorate		KClO ₃	✓	✓	✓	✓	✓	✓	✓	
Potassium chloride		KCl	✓	✓	✓	✓	✓	✓	✓	
Potassium chromate	Dipotassium salt	K ₂ CrO ₄	✓	✓	✓	✓	✓	✓	✓	
Potassium cyanide	Potassium prussate	KCN	?	✓	✓	✓	✓	✓	✓	Hot, strong solution may attack clay
Potassium dichromate	Potassium bichromate	K ₂ Cr ₂ O ₇	✓	✓	✓	✓	✓	✓	✓	
Potassium fluoride		KF	✓	✓	✗	✓	✗	?	✓	Contact Naylor re FKM
Potassium hydroxide	Caustic potash	KOH	?	✓	✓	✓	✓	✗	✓	OK to 6% conc. and 50°C. Potential slow attack above.
Potassium nitrate	Saltpetre / Nitrate of potash	KNO ₃	✓	✓	✓	✓	✓	✓	✓	
Potassium permanganate	Permanganate of potash	KMnO ₄	✓	✓	✗	✓	✗	✓	✓	
Potassium sulphate		K ₂ SO ₄	✓	✓	✓	✓	✓	✓	✓	
Potassium sulphide			✓	✓	✓	✓	✓	✓	✓	
1-Propanol	n-propyl-alcohol / n-Propanol / propan-1-ol	CH ₃ CH ₂ CH ₂ OH	✓	✓	✓	✓	✓	✓	✓	
Propylene dichloride			✓	✗	✗	?	?	?	✓	Contact Naylor re FKM
Sal ammoniac			✓	✓	✓	✓	✓	✓	✓	
Silver nitrate	Lunar Caustic	AgNO ₃	✓	✓	?	✓	?	✓	✓	Moderate resistance
Sodium acetate		CH ₃ COONa	✓	✓	?	✓	?	✗	✓	Potential slow attack
Sodium bicarbonate	Bicarbonate of Soda / Baking soda	NaHCO ₃	✓	✓	✓	✓	✓	✓	✓	
Sodium bisulphate			✓	✓	?	✓	?	✓	✓	Resistance unknown - contact Naylor for info.
Sodium bisulphite			✓	✓	✓	✓	✓	✓	✓	
Sodium bromide		NaBr	✓	✓	?	✓	?	?	✓	Nitrile OK to 20°C, contact Naylor re FKM
Sodium carbonate	Washing soda	Na ₂ CO ₃	✓	✓	✓	✓	✓	✓	✓	
Sodium chlorate		NaClO ₃	✓	✓	✓	✓	✓	✓	✓	
Sodium chloride	Common salt	NaCl	✓	✓	✓	✓	✓	✓	✓	
Sodium cyanide		NaCN	?	✓	✓	✓	✓	?	✓	Hot, strong solution may attack Thermachem, contact Naylor re FKM
Sodium fluoride			?	✓	✓	✓	✓	✓	✓	Resistance unknown - contact Naylor for info.
Sodium hydroxide	Caustic soda	NaOH	?	✓	?	✓	?	?	✓	Thermachem OK if cold and up to 4%. NBR slowly attacked. FKM provides fair resistance
Sodium hypochlorite	Bleach	NaClO	✓	?	?	?	?	✓	✓	Attacked by strong solutions
Sodium nitrate	Chile saltpetre	NaNO ₃	✓	✓	?	✓	?	✓	✓	Potential slow attack
Sodium sulphate	Thenardite	Na ₂ SO ₄	✓	✓	✓	✓	✓	?	✓	FKM provides good resistance
Sodium sulphide		Na ₂ S	✓	✓	✓	✓	✓	✓	✓	
Sodium Sulphite			✓	✓	✓	✓	✓	✓	✓	
Stannic chloride	Tin (IV) chloride	SnCl ₄	✓	✗	✓	✗	✓	✓	✓	
Stannous chloride	Tin (II) chloride	SnCl ₂	✓	✗	✓	✗	✓	✓	✓	
Sulphur chloride			✓	✗	✗	?	?	✓	✓	
Sulphuric acid	Oil of Vitreol	H ₂ SO ₄	✓	?	✗	?	✗	?	✓	Up to 50% concentration OK if 20°C or below.
Sulphurous acid		H ₂ SO ₃	✓	?	?	?	?	✓	✓	Potential slow attack
Toluene	Methylbenzene	C ₆ H ₅ CH ₃	✓	✗	✗	✗	✗	?	✓	FKM provides good resistance
Trichloroethylene		C ₂ HCl ₃	✓	✗	✗	✗	✗	?	✓	FKM provides good resistance
Trisodium phosphate	Sodium Phosphate	Na ₃ PO ₄	✓	✓	✓	✓	✓	✓	✓	
Turpentine	Pine Oil	C ₁₀ H ₁₆	✓	✗	✗	✗	✗	✓	✓	
Urea	Carbamide	CO(NH ₂) ₂	✓	✗	✗	✗	✗	✓	✓	
Xylene (ortho-, meta- and para-)	Dimethyl benzene	C ₆ H ₄ (CH ₃) ₂	✓	✗	✗	✗	✗	✗	?	FKM provides good resistance
Zinc sulphate	White vitriol	ZnSO ₄	✓	✓	✓	✓	✓	✓	✓	

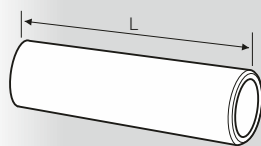
If you need information on any chemicals that don't appear on the list or require clarification on any conditions please contact Naylor's technical Thermachem team on +44 (0) 1226 794056 or thermachem@naylor.co.uk

This table is intended as a guide for use by specifiers and contractors and is based on research of openly available data undertaken by Naylor.

It has been compiled with great care but it is recommended that anyone using the table checks material suitability with another source to cover for any potential errors. As Naylor cannot be aware of site conditions and actual chemicals discharged Naylor can not provide any warranties against chemical attack. If you do find anything wrong with this table please let us know and we'll put it right.

Drainage Product Range

Pipes



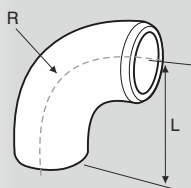
DN	Code	L
100	83036	1.25M
150	83030	1.25M
200	†	1.25M
225	83037	1.25M
250	†	1.25M
300	83044	1.25M
375	83450	1.25M
450	83122	1.25M
500	83190	1.00M

Different lengths available to order. † Contact Naylor for Code

Bends (90°)



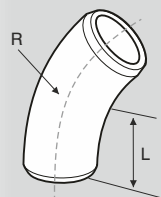
15°, 30° and 60° Bends also available



DN	Code	L	R
100	83382	190	150
150	83385	230	190
200	83112	250	250
225	83041	310	250
250	83060	310	300
300	83045	360	300
375	†	*	*
450	83135	*	*
500	†	*	*

† Contact Naylor for Code * Dimensions on request

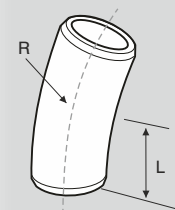
Bends (45°)



DN	Code	L	R
100	83383	190	375
150	83387	230	475
200	83102	250	600
225	83040	310	600
250	83061	310	600
300	83033	360	600
375	†	*	*
450	†	*	*
500	†	*	*

† Contact Naylor for Code * Dimensions on request

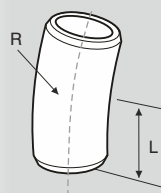
Bends (22½°)



DN	Code	L	R
100	83377	150	750
150	83402	180	900
200	†	*	*
225	83039	250	1200
250	83031	*	*
300	8303	250	1200
375	†	*	*
450	†	*	*
500	†	*	*

† Contact Naylor for Code * Dimensions on request

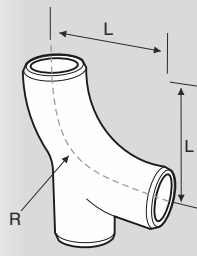
Bends (11¼°)



DN	Code	L	R
100	83376	120	1500
150	83401	175	1750
200	†	245	2400
225	83038	245	2400
250	83032	245	2400
300	83035	245	2400
375	†	*	*
450	†	*	*
500	†	*	*

† Contact Naylor for Code * Dimensions on request

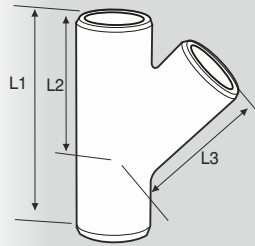
Rest Bend



DN	Code	L	R
100	83073	250	220
150	83089	270	250
200	†	*	*
225	83484	310	250
250	†	*	*
300	83085	360	300
375	†	*	*
450	†	*	*
500	†	*	*

† Contact Naylor for Code * Dimensions on request

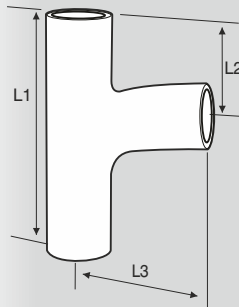
Oblique Junction 45°



DN	Code	L1	L2	L3
100x100	83378	380	250	240
150x100	83379	450	330	300
150x150	83384	450	330	350
200x150	†	*	*	*
200x200	83113	*	*	*
225x100	83042	500	380	375
225x150	83031	500	360	420
225x225	83043	700	530	500
250x150	†	*	*	*
250x200	83062	*	*	*
250x250	83126	*	*	*
300x100	83024	500	360	420
300x150	83025	600	480	490
300x200	83158	*	*	*
300x225	83047	750	530	550
300x250	83159	*	*	*
300x300	83048	900	600	615

† Contact Naylor for Code * Dimensions on request

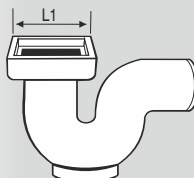
Curved Square Junction 90°



DN	Code	L1	L2	L3
100x100	83074	380	145	180
150x100	83080	450	225	180
150x150	83081	450	185	225
200x150	†	*	*	*
200x200	83115	*	*	*
225x100	83487	500	175	275
225x150	83082	600	220	290
225x225	83083	700	290	300
250x150	83125	*	*	*
250x200	83063	*	*	*
250x250	83064	*	*	*
300x100	†	500	200	300
300x150	83486	600	240	320
300x200	83160	*	*	*
300x225	83420	750	330	370
300x250	83058	*	*	*
300x300	83428	900	350	550

† Contact Naylor for Code * Dimensions on request

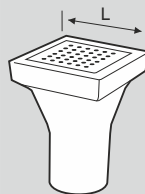
Square P Gully



DN	Code	L1
100	83101	150
100	83189	225
150	83188	225
200	†	275
225	†	300

† Contact Naylor for Code * Dimensions on request

Square Hopper



DN	Code	L
100	83110	150
100	†	200
150	83307	225
225	†	300

Also available in larger diameters and different configurations.
† Contact Naylor for Code * Dimensions on request

Horizontal Inlet



DN Outlet	Code	DN Inlet	L
100	83482	100	150
150	†	150	225
150	†	100	225
200	†	200	275
200	†	150	275
225	†	225	300
225	†	150	300
225	†	100	300

Also available in larger diameters and different configurations.
† Contact Naylor for Code * Dimensions on request

Vertical Inlet



DN Outlet	Code	DN Inlet	L
100	83483	100	100
150	†	100	100
150	†	150	150
200	†	200	200
200	†	150	150
225	†	100	100
225	†	150	150
225	†	225	225

Also available in larger diameters and different configurations.
† Contact Naylor for Code * Dimensions on request

Rectangular Inlet



DN	Code	L	W	H
100	†	335	205	265
150	†	335	205	175

Also available in larger diameters and different configurations.
† Contact Naylor for Code

Low Back Trap

P Outlet 92½°

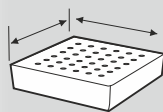


DN	Code
100	83388
150	83071
200	†
225	†
250	†
300	83124

Also available in larger diameters.
† Contact Naylor for Code * Dimensions on request

Loose Grate

For P Gully & Hoppers

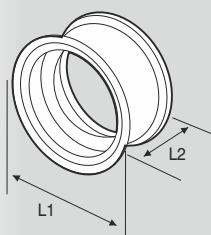


Size	Code
150x150	83111

Made from Pipe material
Made to Order

Push Fit Couplings

EPDM Seals as standard
Nitrile also available



DN	Code - EPDM	Code - Nitrile	L1	L2
100	83103	83203	155	90
150	83104	83204	220	120
225	83105	83207	320	155
250	†	†	350	155
300	83106	83208	410	190

† Contact Naylor for Code * Dimensions on request

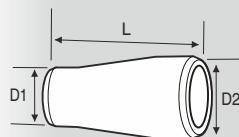
Band-Seal Couplings



DN	OD	Name	Code EPDM	Code Nitrile	Code FKM	Code Fluoropolymer
100	131	NSC137	76004	76342	*	21074
150	187.5	NSC200	76009	76351	*	21045
200	254	NSC275	76013	76408	*	*
225	278	NSC290	76014	76480	*	21046
250	318	NSC335	76017	76356	*	*
300	380	NSC385	76020	76412	*	21051
375	455	NSC455	76025	76416	*	*
450	585	NSC600	76033	76423	*	*
500	645	NSC601	76036	*	*	*

† Contact Naylor for Code

Taper



DN D1 - D2	Code	L
100-150	83398	300
150-200	†	*
150-225	83029	380
200-250	†	*
225-300	83046	500
250-300	†	*

† Contact Naylor for Code * Dimensions on request

Stoppers



DN	Code
100	83171
150	83151
200	83067
225	83SP/09
250	83066
300	83150
375	†
450	†
500	83192

† Contact Naylor for Code

Pipes



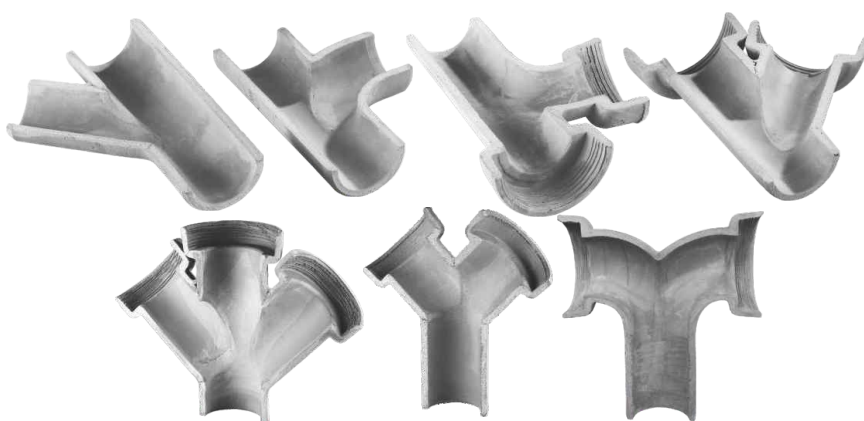
DN	Code Butt	Code Socketed	L
100	83084	†	1.0M
150	83059	83488	1.0M
225	83169	†	1.0M
300	83003	†	1.0M
375	†	†	1.0M
400	†	†	1.0M
450	†	†	1.0M

† Contact Naylor for Code

Junctions & Tapers

A full range of bends, junctions and tapers are available as half or $\frac{3}{4}$ sections to use as channel pieces.

Contact Naylor if required for product codes.



Custom Chambers

Naylor can manufacture chambers with an internal diameter of up to DN500 with heights of up to 1.5metres. Custom inlets and outlets can be included to suit the needs of the application. Naylor can provide drawings of chambers to your specification.

Bespoke Fabrications

Naylor offers a complete range of custom fabrications to suit your project. With our extrusion and hand moulding capability we can manufacture most items up to DN500 in diameter including special junctions, tapers and gullies to meet the specific requirements of the project.



Technical Information

Thermachem has the following typical properties:

Water absorption: <1.0%
System watertightness: 50kPa (0.5bar)
Coupling Type: System G - Plain ended pipes

Pipe OD's and weights

Pipe Diameter	Pipe OD mm	Min. Crushing Strength kN/m	Approx. Weight Kg	Bending Moment Resistance (kN/m)	Max. deviation from straightness (mm/m)
DN100	131 +/-2	34	17	1.7	5
DN150	188 +/-2.75	40	31.5	4.6	4.5
DN200	254 +/-4	56	55	9.9	4
DN225	278 +/-4	45	63	9.0	4
DN250	318 +/-4	70	75	‡	4
DN300	380 +/-4	72	110	‡	4
DN375	455 +/-5	48	‡	‡	3
DN450	585 +/-6	72	‡	‡	3
DN500	610 +/-6	80	‡	‡	3

‡Contact Naylor for information

All products supplied are guaranteed to be in accordance with EN295 requirements. The above properties are typical and supplied for guidance only. Actual properties can vary due to the nature of manufacturing with ceramic products. If you need a specific material specification to be achieved please contact Naylor for guidance.

Installation

Installation should be in accordance with EN1610:2015. Further illustrated installation instructions are available from Naylor on request.



Hydraulic Flow

Surface water flow table (for DN 100 - DN 500)

PIPE FLOWING FULL Ks VALUE = 0.6mm

ks value 0.6mm	PIPE SIZE (mm)															
	DN 100		DN 150		DN 225		DN 300		DN 375		DN 400		DN 450		DN 500	
	VEL m/s	DIS l/s	VEL m/s	DIS l/s	VEL m/s	DIS l/s	VEL m/s	DIS l/s	VEL m/s	DIS l/s	VEL m/s	DIS l/s	VEL m/s	DIS l/s	VEL m/s	DIS l/s
1 / 10	2.47	19.41	3.22	56.87	4.18	166.02	5.01	354.36	5.77	637.40	6.01	755.25	6.47	1029.13	6.91	1357.06
1 / 20	1.75	13.73	2.28	40.21	2.95	117.39	3.54	250.57	4.08	450.71	4.25	534.04	4.58	727.71	4.89	959.58
1 / 30	1.43	11.21	1.86	32.83	2.41	95.85	2.89	204.59	3.33	368.00	3.47	436.04	3.74	594.17	3.99	783.50
1 / 40	1.24	9.71	1.61	28.44	2.09	83.01	2.51	177.18	2.89	318.70	3.01	377.62	3.24	514.57	3.46	678.53
1 / 50	1.11	8.68	1.44	25.43	1.87	74.25	2.24	158.47	2.58	285.06	2.69	337.76	2.89	460.24	3.09	606.89
1 / 60	1.01	7.92	1.31	23.22	1.70	67.78	2.05	144.67	2.36	260.22	2.45	308.33	2.64	420.14	2.82	554.02
1 / 70	0.93	7.34	1.22	21.50	1.58	62.75	1.89	133.94	2.18	240.92	2.27	285.46	2.45	388.98	2.61	512.92
1 / 80	0.87	6.86	1.14	20.11	1.48	58.70	1.77	125.29	2.04	225.36	2.12	267.02	2.29	363.85	2.44	479.79
1 / 90	0.82	6.47	1.07	18.96	1.39	55.34	1.67	118.12	1.92	212.47	2.00	251.75	2.16	343.04	2.30	452.35
1 / 100	0.78	6.14	1.02	17.98	1.32	52.50	1.59	112.06	1.82	201.56	1.90	238.83	2.05	325.44	2.19	429.14
1 / 110	0.75	5.85	0.97	17.15	1.26	50.06	1.51	106.84	1.74	192.18	1.81	227.72	1.95	310.29	2.08	409.17
1 / 120	0.71	5.60	0.93	16.42	1.21	47.93	1.45	102.29	1.67	184.00	1.73	218.02	1.87	297.08	2.00	391.75
1 / 130	0.69	5.38	0.89	15.77	1.16	46.05	1.39	98.28	1.60	176.78	1.67	209.47	1.79	285.43	1.92	376.38
1 / 140	0.66	5.19	0.86	15.20	1.12	44.37	1.34	94.71	1.54	170.35	1.61	201.85	1.73	275.05	1.85	362.69
1 / 150	0.64	5.01	0.83	14.68	1.08	42.87	1.29	91.50	1.49	164.58	1.55	195.00	1.67	265.72	1.78	350.39
1 / 175	0.59	4.64	0.77	13.59	1.00	39.69	1.20	84.71	1.38	152.37	1.44	180.54	1.55	246.01	1.65	324.40
1 / 200	0.55	4.34	0.72	12.72	0.93	37.12	1.12	79.24	1.29	142.53	1.34	168.88	1.45	230.12	1.55	303.45
1 / 225	0.52	4.09	0.68	11.99	0.88	35.00	1.06	74.71	1.22	134.38	1.27	159.22	1.36	216.96	1.46	286.09
1 / 250	0.49	3.88	0.64	11.37	0.84	33.20	1.00	70.87	1.15	127.48	1.20	151.05	1.29	205.83	1.38	271.41
1 / 275	0.47	3.70	0.61	10.84	0.80	31.66	0.96	67.57	1.10	121.55	1.15	144.02	1.23	196.25	1.32	258.78
1/300	0.45	3.54	0.59	10.38	0.76	30.31	0.92	64.70	1.05	116.37	1.10	137.89	1.18	187.89	1.26	247.76

These gradients are not recommended

Foul water flow table (for DN 100 - DN 500)

PIPE FLOWING FULL Ks VALUE = 1.5mm

ks value 0.6mm	PIPE SIZE (mm)															
	DN 100		DN 150		DN 225		DN 300		DN 375		DN 400		DN 450		DN 500	
	VEL m/s	DIS l/s	VEL m/s	DIS l/s	VEL m/s	DIS l/s	VEL m/s	DIS l/s	VEL m/s	DIS l/s	VEL m/s	DIS l/s	VEL m/s	DIS l/s	VEL m/s	DIS l/s
1 / 10	2.12	16.64	2.79	49.24	3.65	145.00	4.40	311.20	5.09	562.00	5.31	666.65	5.72	910.19	6.12	1202.28
1 / 20	1.50	11.77	1.97	34.82	2.58	102.53	3.11	220.05	3.60	397.40	3.75	471.39	4.05	643.60	4.33	850.14
1 / 30	1.22	9.61	1.61	28.43	2.11	83.71	2.54	179.67	2.94	324.47	3.06	384.89	3.30	525.50	3.54	694.14
1 / 40	1.06	8.32	1.39	24.62	1.82	72.50	2.20	155.60	2.54	281.00	2.65	333.32	2.86	455.10	3.06	601.14
1 / 50	0.95	7.44	1.25	22.02	1.63	64.84	1.97	139.17	2.28	251.34	2.37	298.13	2.56	407.05	2.74	537.67
1 / 60	0.86	6.79	1.14	20.10	1.49	59.19	1.80	127.05	2.08	229.44	2.17	272.16	2.34	371.59	2.50	490.83
1 / 70	0.80	6.29	1.05	18.61	1.38	54.80	1.66	117.62	1.92	212.42	2.01	251.97	2.16	344.02	2.31	454.42
1 / 80	0.75	5.88	0.99	17.41	1.29	51.26	1.56	110.03	1.80	198.70	1.88	235.70	2.02	321.80	2.16	425.07
1 / 90	0.71	5.55	0.93	16.41	1.22	48.33	1.47	103.73	1.70	187.33	1.77	222.22	1.91	303.40	2.04	400.76
1 / 100	0.67	5.26	0.88	15.57	1.15	45.85	1.39	98.41	1.61	177.72	1.68	210.81	1.81	287.83	1.94	380.19
1 / 110	0.64	5.02	0.84	14.85	1.10	43.72	1.33	93.83	1.53	169.45	1.60	201.00	1.73	274.43	1.85	362.50
1 / 120	0.61	4.80	0.80	14.21	1.05	41.86	1.27	89.84	1.47	162.24	1.53	192.44	1.65	262.75	1.77	347.07
1 / 130	0.59	4.61	0.77	13.66	1.01	40.21	1.22	86.31	1.41	155.87	1.47	184.89	1.59	252.44	1.70	333.45
1 / 140	0.57	4.45	0.74	13.16	0.97	38.75	1.18	83.17	1.36	150.20	1.42	178.17	1.53	243.26	1.64	321.32
1 / 150	0.55	4.30	0.72	12.71	0.94	37.44	1.14	80.35	1.31	145.11	1.37	172.13	1.48	235.01	1.58	310.43
1 / 175	0.51	3.98	0.67	11.77	0.87	34.66	1.05	74.39	1.22	134.34	1.27	159.36	1.37	217.58	1.46	287.40
1 / 200	0.47	3.72	0.62	11.01	0.82	32.42	0.98	69.59	1.14	125.67	1.19	149.07	1.28	203.53	1.37	268.84
1 / 225	0.45	3.51	0.59	10.38	0.77	30.57	0.93	65.61	1.07	118.48	1.12	140.54	1.21	191.89	1.29	253.46
1 / 250	0.42	3.33	0.56	9.85	0.73	29.00	0.88	62.24	1.02	112.40	1.06	133.33	1.14	182.04	1.22	240.46
1 / 275	0.40	3.17	0.53	9.39	0.70	27.65	0.84	59.34	0.97	107.17	1.01	127.12	1.09	173.57	1.17	229.27
1/300	0.39	3.04	0.51	8.99	0.67	26.47	0.80	56.82	0.93	102.61	0.97	121.71	1.04	166.18	1.12	219.50

These gradients are not recommended

Trench Beddings

Depths of cover between which Naylor pipes conforming to BS EN 295 can be laid in any width of trench.

DN	Minimum Crushing Strength <i>a</i> <i>b</i>		Bedding Class	Bedding Factor	Depth of cover to crown of pipe			
					Main Traffic Roads		Fields and Gardens	
	<i>a</i>	<i>b</i>			<i>a</i>	<i>b</i>	<i>a</i>	<i>b</i>
100	34	40	D or N F B or S	1.1	0.4 - 7.1	0.4 - 8.4	0.4 - 7.3	0.4 - 8.7
				1.9	0.4 - 10.0+	0.4 - 10.0+	0.4 - 10.0+	0.4 - 10.0+
				2.5	0.4 - 10.0+	0.4 - 10.0+	0.4 - 10.0+	0.4 - 10.0+
150	34	49	D or N F B or S	1.1	0.6 - 4.5	0.6 - 5.6	0.6 - 5.0	0.6 - 5.9
				1.9	0.6 - 8.5	0.6 - 10.0+	0.6 - 8.7	0.6 - 10.0+
				2.5	0.6 - 10.0+	0.6 - 10.0+	0.6 - 10.0+	0.6 - 10.0+
225	36	45	D or N F B or S	1.1	0.9 - 2.6	0.9 - 3.9	0.6 - 3.5	0.6 - 4.4
				1.9	0.6 - 5.9	0.6 - 7.6	0.6 - 6.2	0.6 - 7.8
				2.5	0.6 - 8.0	0.6 - 10.0+	0.6 - 8.2	0.6 - 10.0+
300	48	72	D or N F B or S	1.1	0.8 - 2.7	0.6 - 5.1	0.6 - 3.5	0.6 - 5.1
				1.9	0.6 - 6.0	0.6 - 9.4	0.6 - 6.3	0.6 - 9.5
				2.5	0.6 - 8.1	0.6 - 10.0+	0.6 - 8.3	0.6 - 10.0+
375	45	60	D or N F B or S	1.1	-	0.8 - 3.0	0.6 - 2.7	0.6 - 3.8
				1.9	0.6 - 4.5	0.6 - 6.4	0.6 - 5.0	0.6 - 6.7
				2.5	0.6 - 6.3	0.6 - 6.7	0.6 - 6.6	0.6 - 8.8
400	64	80	D or N F B or S	1.1	0.8 - 2.9	0.6 - 4.2	0.8 - 3.7	0.6 - 4.7
				1.9	0.6 - 6.3	0.6 - 8.0	0.6 - 6.6	0.6 - 8.2
				2.5	0.6 - 8.5	0.6 - 10.0+	0.6 - 8.7	0.6 - 10.0+
450	54	72	D or N F B or S	1.1		0.6 - 3.0	0.6 - 2.7	0.6 - 3.8
				1.9	0.6 - 4.5	0.6 - 6.5	0.6 - 5.0	0.6 - 6.7
				2.5	0.6 - 6.3	0.6 - 8.7	0.6 - 6.6	0.6 - 8.9
500	60	80	D or N F B or S	1.1		0.8 - 3.0	0.6 - 2.7	0.6 - 3.8
				1.9	0.6 - 4.5	0.6 - 6.4	0.6 - 5.0	0.6 - 6.7
				2.5	0.6 - 6.3	0.6 - 8.7	0.6 - 6.6	0.6 - 8.8

Other crushing strengths may be available.

For further details see the products information leaflet or consult the Technical sales Department.



**Naylor Industries plc - more
than 100 years production
and supply to the
Construction Industry**

- **Clay Pipes** - for open trench and trenchless construction
- **Thermachem** - pipes and industrial ceramics for hot/aggressive environments
- **Band-Seal** - flexible pipe couplings
- **Plastic Pipes** - Twinwall ducting and drainage; land drainage
- **Gardenware** - The Yorkshire Flowerpot range of frostproof pots



**INVESTORS
IN PEOPLE**

Gold
Until 2019

NAYLOR
THERMACHEM

Made in the UK
Excellent Construction Products

**NAYLOR DRAINAGE
LIMITED**

CLOUGH GREEN, CAWTHORNE
BARNSELY
SOUTH YORKSHIRE, S75 4AD
ENGLAND

TELEPHONE: 01226 794056
FACSIMILE: 01226 790531
EMAIL: THERMACHEM@NAYLOR.CO.UK
WEB: WWW.NAYLOR.CO.UK/CHEMICAL-AND-THERMAL/