



SEWER SYSTEMS

ULTRA RIB

The solution for sustainable & low maintenance sewer and drainage systems

Radius Systems - The smart choice for plastic pipe solutions

Strategic pipelines tend to be some of the most challenging in terms of the engineering, the most demanding in terms of reliability and usually represent significant investment for the new owner. To get the most from your new investment we understand that it is vitally important the design is optimised, that a full system easily installed is available and, should the need arise, that the means to adapt or repair it in the future are available. Here at Radius Systems, we have the experience, the skills and the resources to work alongside you at each stage of the process to ensure that you get the best value from your investment and that the journey from design to commissioning is straightforward and above all, predictable.

Our heritage and our experience in the manufacture of plastic pipe systems goes back over 40 years from our time as pioneers, introducing the first polyethylene pipes for natural gas distribution. This pioneering spirit has stayed with us ever since, as we have evolved the technology, expanding the use of plastic pipe systems to the water and wastewater industry, bringing state of the art products for trouble free and reliable performance.

If you are looking for an experienced partner who can help you deliver, then look no further.



Ultra-Rib Sewer System

Thermoplastic structured solid wall pipe for gravity sewer application

Radius Systems' Ultra-Rib is a lightweight and easy to joint all socketed thermoplastic gravity system for buried non pressure sewer applications. Designed with increased circumferential ring stiffness (Class 8 KPa), Ultra-Rib provides improved resistance to pipeline deflection and buckling, and combines the proven benefits and flexibility of thermoplastic materials with a unique design profile.

Applications for the Radius Systems Ultra-Rib system

Ultra-Rib is designed for use in domestic drains, public and private sewers and highway drainage schemes. The system can be used in conjunction with BS EN1401 pipes and fittings or connected to clay or concrete pipes using adaptors from the Ultra-Rib range.

Benefits of the system

- Robust and light in weight
- All socketed system
- Ease of jointing with high performance sealing ring
- No requirement for pipe end chamfering prior to jointing
- External captive ring seal, securely located between the ribs
- Increased circumferential ring stiffness (Class 8 KPa)
- Excellent flow and self cleansing characteristics
- Equivalent bore size in diameters 150mm, 225mm and 300mm to clay and concrete systems
- Joint flexibility with up to 2½° deflection at each ring seal joint
- Full range of adaptors to alternative materials, uPVC, clay and concrete

Approvals

BSI Kitemark

Radius Systems' Ultra-Rib pipes in sizes 150mm to 300mm are third party certified to [Water Industry Specification 04-35-01](#) 'Specification for thermoplastic structured wall pipes, joints and couplers with a smooth bore for gravity sewers for the size range 150-900mm inclusive' by the British Standards Institute. The kitemark license number is [KM 56662:2001](#).

British Board of Agrément (BBA)

The [Radius Systems Ultra-Rib](#) system in diameters 150mm to 300mm has been assessed by the British Board of Agrément and has been granted the following certificates of approval:

[BBA certificate number 97/3335](#) 'The system is for use in domestic drains and public and private sewers in accordance with the [Water Industry Specification 04-35-01](#)'. Ultra-Rib is listed in [Water UK / WRc plc 'Sewer for Adoption'](#) website: www.wrcplc.co.uk/sfa.

[BBA certificate number 89/R044](#) Issue 2, 'The system is for use in highway drainage where pipes and fittings to [BS4660:1989](#) and [BS5481:1977 \(1989\)](#) can be used in accordance with the Department for Transport (DFT) requirements and the conditions set out in the design data and installation parts of this Certificate'.



The Ultra-Rib system conforms to WIS 04-35-01

Note

[BS4660:1989](#) and [BS5481:1977 \(1989\)](#) have now been superseded by [BS EN 1401:1998](#). [Radius Systems' Ultra-Rib](#) pipes are manufactured under a quality system approved to [BS EN ISO 9001:2000](#).

Ultra-Rib Sewer System

Materials

Ultra-Rib pipes are manufactured from unPlasticised Polyvinyl Chloride (uPVC). Ultra-Rib fittings are manufactured from uPVC or Polypropylene (PP) depending on the diameter and component.

Ultra-Rib sealing rings in diameters 150mm, 225mm and 300mm are manufactured from Styrene Butadene Rubber (SBR).

Colour

Ultra-Rib pipes and fittings are coloured terra-cotta (golden brown)

Diameters

Ultra-Rib pipes are available in the following diameters:

| Nominal diameter (mm) | Nominal internal diameter (mm) | Nominal external diameter (mm) |
|-----------------------|--------------------------------|--------------------------------|
| 150 | 150 | 170 |
| 225 | 225 | 250 |
| 300 | 300 | 335 |



The pipe is coloured terra cotta making it easily identifiable as a sewer pipe

Design & Installation

When designed and installed in accordance with the Radius Systems installation instructions, the design life of the Radius Systems Ultra-Rib gravity sewer system is no less than that of clay or concrete materials.

Guidance on the design and installation of thermoplastic pipes for gravity sewer applications may be obtained in the following documents:

- BS EN1295-1: Structural design of buried pipelines under various conditions of loading - Part 1: General requirements
- BS EN752-4: 1998, Drain and sewer systems outside buildings - Part 4: Hydraulic design and environmental considerations
- BS EN1610: 1998, Construction and Testing of drains and sewers
- IGN 4-08-01, Bedding and sidefill materials for buried pipelines
- WIS 4-08-02, Specification for bedding and sidefill materials for buried pipelines
- ENV 1046 - 2001: Plastic piping and ducting systems - Systems outside building structures for the conveyance of water or sewage - Practices for installations below and above ground
- The Building Regulations 2000, 'Approved document H'
- Sewers for Adoption 6th Edition
- Civil Engineering Specification for the Water Industry.

^a Radius Systems reserves the right to change the fittings material without prior notice

Structural design of buried Ultra-Rib pipelines

Where structural design calculations are to be undertaken to determine the structural stability of buried Ultra-Rib pipes, the flexible design approach as detailed within

BS EN 1295-1: 1998 should be used. The flexible pipe design is based upon the [Iowa Spangler Theory](#), which in its most simplistic form states the following:

$$\text{Pipe deformation} = \frac{\text{Vertical pressure on pipe}}{\text{Pipe stiffness} + \text{Soil stiffness}}$$

For relevant design guidance on this subject, reference should be made to the following documents:

- BS EN 1295-1, Structural Design of buried pipelines under various conditions of loading - Part 1: General conditions
- Information & Guidance Note 4-08-01 'Bedding and sidefill materials for buried pipelines'
- Water Industry Specification 4-08-02 'Specification for bedding and sidefill materials for buried pipelines'

Hydraulic design of Ultra-Rib pipelines

Radius Systems' Ultra-Rib pipes are considered to be hydraulically smooth. For the hydraulic design of sewers when using the [Colebrook-White equation](#), the

following roughness values (K_s) have been taken from the Water UK publication, Sewer For Adoption 6th Edition and should be used for guidance purposes.

| | |
|------------------------------------|----------------------|
| Surface water gravity sewer design | $K_s = 0.6\text{mm}$ |
| Foul water gravity sewer design | $K_s = 1.5\text{mm}$ |

For more technical information on our Ultra-Rib system, please visit our website www.radius-systems.com.



Ultra-Rib Sewer System

Jointing Ultra-Rib

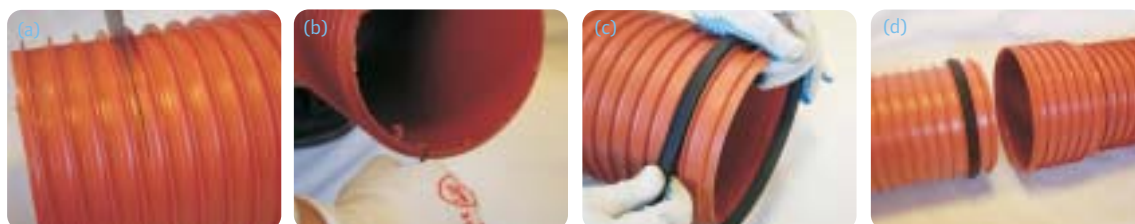
The Ultra-Rib system utilises a spigot end and socket (push fit) joint with a rubber ring seal to provide a leak-tight connection when jointing pipe to pipe and pipe to fittings.

The pipe should be cut at the position indicated in (a). There is no requirement to chamfer the spigot end of the pipe, however, the removal of the 'cutting burr' is recommended (b.).

The sealing ring is placed between the 2nd and 3rd rib from the spigot end of the pipe (c). Once positioned between the ribs, the ring seal is effectively captive and displacement during jointing should not occur. Care should be taken to ensure that the ring seal is correctly positioned and not twisted. Lubricant should be applied prior to jointing the spigot end to the socket end (d).

Cutting the pipe

Where it is necessary to cut Ultra-Rib pipes, then the pipe should be cut midway between the two larger ribs. These ribs may be used as a cutting guide to enable the pipe to be cut square, using a general purpose 10 t.p.i hand saw. Remove any swarf from the pipe spigot end.



Pipe weight

Average weight per metre of pipe

| Nominal diameter (mm) | Average weight (kg/m) |
|-----------------------|-----------------------|
| 150 | 1.95 |
| 225 | 5.00 |
| 300 | 7.80 |

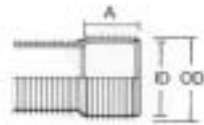
Pack quantities

| Nominal diameter (mm) | | 150 | 225 | 300 |
|---------------------------|--------|------|------|------|
| Pipe per pack | | 30 | 12 | 9 |
| Pack length 3m pipe (m) | | 3.25 | 3.25 | 3.30 |
| Pack frame dimensions (m) | Height | 0.92 | 0.82 | 1.06 |
| Pack frame dimensions (m) | Width | 1.13 | 1.12 | 1.14 |

Product range

Pipe

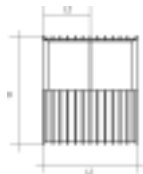
Single socket



| Size (mm) | Socket dimensions (mm) | | | Product Code (based on 3m lengths) |
|-----------|------------------------|-------|-------|------------------------------------|
| | OD | ID | A | |
| 150 | 188 | 170.0 | 95.0 | 6U3S |
| 225 | 276 | 250.9 | 126.0 | 9U3S |
| 300 | 372 | 336.2 | 165.0 | 12U3S |

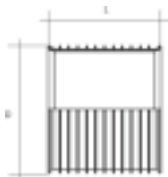
Fittings

Couplers - double socket with central stop



| Size (mm) | Dimensions (mm) | | | Product Code |
|-----------|-----------------|-----|-----|--------------|
| | D | L1 | L2 | |
| 150 | 170 | 185 | 87 | 6UD |
| 225 | 250 | 239 | 113 | 9UD |
| 300 | 335 | 300 | 148 | 12UD |

Couplers - double socket without central stop



| Size (mm) | Dimensions (mm) | | Product Code |
|-----------|-----------------|-----|--------------|
| | D | L | |
| 150 | 170 | 185 | 6UDSC |
| 225 | 250 | 240 | 9UDSC |
| 300 | 335 | 300 | 12UDSC |

Note: All socketed pipe and fittings are supplied with sealing rings

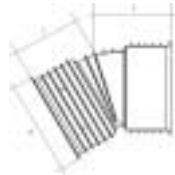
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Product range

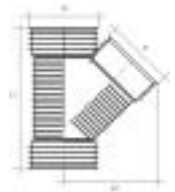
Fittings

Short radius bends



| Angle | Size (mm) | Dimensions (mm) | | Product Code |
|-------|-----------|-----------------|-----|--------------|
| | | D | L | |
| 45° | 150 | 170 | 138 | 6U25D |
| 45° | 225 | 250 | 196 | 9U25D |
| 45° | 300 | 335 | 285 | 12U25D |
| 30° | 150 | 170 | 125 | 6U27D |
| 30° | 225 | 250 | 205 | 9U27D |
| 30° | 300 | 335 | 230 | 12U27D |
| 15° | 150 | 170 | 114 | 6U29D |
| 15° | 225 | 250 | 162 | 9U29D |
| 15° | 300 | 335 | 200 | 12U29D |

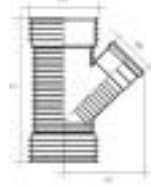
45° Equal junctions - all socket



| Size (mm) | D | Dimensions (mm) | | Product Code |
|-----------|-----|-----------------|-----|--------------|
| | | L1 | L2 | |
| 150 | 170 | 429 | 265 | 6UJD |
| 225 | 250 | 615 | 439 | 9UJD |
| 300 | 335 | 798 | 567 | 12UJD |

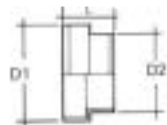
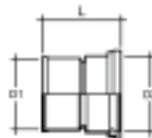
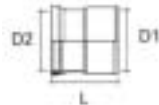
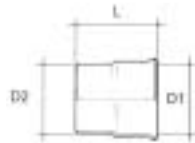
Note:
All socketed pipe and fittings are supplied with sealing rings

45° Unequal junctions - all socket^b



| Size (mm) | Dimensions (mm) | | | | Product Code |
|--------------|-----------------|-----|-----|-----|--------------|
| | D1 | D2 | L1 | L2 | |
| 150 x 110 | 170 | 110 | 455 | 466 | 6U4D33 |
| 150 x 160 | 170 | 160 | 455 | 350 | 6U6D33 |
| 225 x 110 | 250 | 110 | 586 | 465 | 9U4D33 |
| 225 x 150 | 250 | 170 | 586 | 461 | 9U6JD |
| 225 x 160 | 250 | 160 | 586 | 371 | 9U6D33 |
| 300 x 110 | 335 | 110 | 798 | 549 | 12U4D33 |
| 300 x 150 | 335 | 170 | 798 | 451 | 12U6JD |
| 300 x 160 | 335 | 160 | 798 | 433 | 12U6D33 |
| 300 x 225 | 335 | 250 | 798 | 568 | 12U9JD |

Adaptors



| Description | Size (mm) | Dimensions (mm) | | | Product Code |
|--|-------------------|-------------------|-------------------|-------------------|-----------------------|
| | | D1 | D2 | L | |
| Adaptor with Ultra-Rib socket to BS EN 1401 spigot - Push fit connection | 150 | 170 | 160 | 180 | 6U71 |
| Adaptor 150mm Ultra-Rib spigot to 160mm BS EN 1401 socket - Push fit connection | 150 | 170 | 160 | 121 | 6U72 |
| Adaptor with Ultra-Rib socket to BS EN 1401 socket - Push fit connection | 150 | 170 | 160 | 177 | 6U77 |
| Adaptor with 150mm Ultra-Rib socket to 150mm Supersleeve socket Push fit connection | 150 | 170 | 180 | 239 | 6U70SS |
| Adaptor with 150 Ultra-Rib socket to 150mm Densleeve socket - Push fit connection | 150 | 170 | 150 | 100 | 6U70DS |
| Adaptor with Ultra-Rib socket to BS EN 1401 clay and concrete socket - Mechanical connection | 150 225 300 | 170 250 335 | 150 278 378 | 100 134 160 | 6U70 9U70 12U70 |

^b Some branches include a PVDC-u adaptor

Ultra-Rib Sewer System

Product range

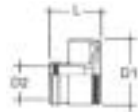
Fittings

End caps and socket plugs



| Description | Size (mm) | Dimensions (mm) | | Product Code |
|-------------|-----------|-----------------|-----|--------------|
| | | D | L | |
| End cap | 150 | 170 | 181 | 6U68 |
| Socket plug | 225 | 250 | 103 | 9U68 |
| Socket plug | 300 | 335 | 168 | 12U68 |

Level invert reducers



| Size (mm) | Dimensions (mm) | | | Product Code |
|-----------|-----------------|-----|-----|--------------|
| | D1 | D2 | L | |
| 150 x 110 | 170 | 110 | 112 | 6U4T |
| 225 x 150 | 250 | 170 | 145 | 9U6T |
| 300 x 225 | 335 | 250 | 153 | 12U9T |

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Ancillaries

Testing plugs



| Size (mm) | Pipe size range (mm) | Product Code |
|-----------|----------------------|--------------|
| 150 | 141 to 165 | 6UTP |
| 225 | 215 to 241 | 9UTP |
| 300 | 295 to 325 | 12UTP |

Sealing rings



| Size (mm) | Product Code |
|-----------|--------------|
| 150 | 6U86 |
| 225 | 9U86 |
| 300 | 12U86 |

Lubricant



| Description | Product Code |
|-------------|--------------|
| 500g tub | LUB500 |



Installation & Training

Prior to installing the Radius Systems Ultra-Rib sewer system for the first time, it is recommended that training on the correct method of installation should be carried out by all installers. Radius Systems provide a bespoke training course on Ultra-Rib system installation. For further details, please contact our Training Business Department on 01773 811112.

How to order Ultra-Rib

Ultra-Rib is available to order through Radius Systems' Customer Services Department. Please contact us on:
T: +44 (0)1773 811112
F: +44 (0)1773 812343
E: sales@radius-systems.co.uk

Technical support

We offer full technical support for all our products. All our technical information, including Installation and Maintenance guidelines on Ultra-Rib, is available to download from our website.

Please visit our website: www.radius-systems.co.uk for more details.

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