HL Plastics began manufacturing plastic piling in 1994 in Derbyshire and has constantly and consistently increased its share of the market as more customers become aware of the benefits. HL Plastics is part of the Flamstead Group of companies and has over 30 years experience in the plastic extrusion industry.

Plastic piling is available ex-stock in a variety of lengths and is manufactured under the Liniar brand in HL Plastics’ own factory in the UK.

We have a versatile range of piling systems, including the traditional standard pile shape that can be configured as ‘Z-ribbed’ (for light use) or ‘box’ (for heavier use), and the facility for tying back and creating 90 degree corners.

Liniar also offers a CPD UK accredited seminar for training purposes, so you can be sure you’re getting the right product to meet your requirements.

Scale models of plastic piling are available on request direct from the manufacturer.

Made in Britain

Our extrusion facility in Derbyshire boasts the largest mixing plant in Europe, and continued investment in the factory, facilities and research and development keeps Liniar at the forefront of innovation.
Plastic piling solutions

Plastic piling has a number of benefits over traditional steel, timber or concrete piling; mainly cost, durability, ease of handling and environmental.

Benefits to the Liniar range of plastic piling:
- Does not rot or rust
- Manufactured from recycled plastic
- Has no risk of sparking
- Manufactured in the UK by ourselves
- Maintains its original appearance over time
- Not affected by salt water
- Resistant to the majority of chemicals
- Available with a wood composite fascia - a hard engineering solution with a soft engineering appearance
- Can be easily cut or bored
- Maintenance free
- Has a clean consistent appearance
- Has the ability to create curved walls
- 90° corner pile is available
- Resistant to rodent and marine borer attack
- Resistant to the majority of chemicals
- Lighter than steel, so easier to transport and handle

Plastic piling design and installation

HL Plastics has the capability to manufacture plastic piling in a wide range of lengths, direct from our UK factory.

The piling is generally produced in grey from 100% recycled materials, but it can also be made in a variety of colours to suit individual requirements, subject to minimum order quantities.

We manufacture a wide range of piling styles dependent on strength, ease of installation and type of appearance required.

These include Standard Pile, Flat Pile, Trench Pile, Full Pan Pile and Log Pile.

Full specifications for all our piling products can be found on pages 8 - 10.

Plastic piling can be installed by mechanical or manual installation.

In many situations, particularly when short lengths of plastic piling are being installed, it can be inserted into the ground using a maul and pile cap. This is often the case in peat land areas, where the ground conditions are more favourable.

When installing longer lengths, or where the ground conditions are more difficult, a piling hammer should be used. The Liniar team can help you choose the most suitable type dependent on the application, and refer you to an appropriate rental supplier.
Plastic piling is extremely versatile and can be used in a number of applications across different industry sectors:

- Riverbank, stream, pond, lake and reservoir bank retention and restoration
- Fishing lake and fish farm bank reinforcement
- Inland marina and waterway walls and banks
- Creating well defined drainage culverts and channels for agricultural land and house/urban development
- Blocking of ditches on peat bogs and other nature reserve situations
- General bank retention
- Trench shoring
- Permanent shuttering/land remediation cut-off walls
- Highway applications
- Non-piling applications including soil boxes, railway ballast retention and compost containers.

One of the most popular uses for plastic piling is to stabilise slopes by the side of highways. The Transport Research Laboratory (TRL) conducted major research into the use of plastic piling and published a report into their findings. Guidance on the Structural Use of Plastic Sheet Piling in Highway Applications (ref: TRL 533). A copy of this research is available by contacting the TRL.
Trench Shoring

Retaining
Case studies

1. Highways

Plastic piling enjoys considerable success within water related industries and Liniar uses this experience to benefit other industries including the highways industry.

The Transport Research Laboratory conducted major research into the benefits of plastic piling for highways applications and published a report into their findings.

Plastic piling from Liniar was specified by the local authority in Newport Pagnell to prevent bank erosion and maintain a safe carriageway that runs adjacent to a stream.

Morcon Foundations of Derby installed 92 metres of piling, which is an environmentally friendly and lightweight solution to bank erosion.

Morcon’s Contract Manager said:

“...with the correct type of hammer for the soil conditions, plastic sheet piles are quick and easy to install and cutting the tops to the finished line is a simple task.”

2. Marinas/sea defences

Plastic piling is highly effective within water related situations, especially where a clean and consistent appearance is important.

Plastic piling was used along a 160 metre stretch of the River Tawe, as part of the regeneration of the Swansea Waterfront site.

Plastic piling from Liniar was used to face the filled concrete manhole rings that formed a cornered retaining wall the length of the bank defences.

Lengths of the recycled PVC sheets were bolted on to the rings to create a consistent and protective fascia.

Plastic piling was chosen over steel or concrete due to the aesthetics of the finished project, its ease of handling, cost effectiveness and durability.
3. Floodwalls

Plastic piling provides a comprehensive solution for flood prevention schemes and is an environmentally friendly and cost effective alternative to steel piling; it does not rot or rust and is maintenance free.

CeTeau, a Dutch company with offices in Malaysia and Thailand was contracted to find a flood prevention solution by several businesses affected by the 2011 Bangkok floods.

Liniar plastic piling was specified and installed, then concrete walls built on top of the pile, ensuring the flood water was unable to get either under or over the wall.

The engineers came up with an innovative solution to install the plastic piling to a 5m depth.

They hailed the Liniar pile a success due to the lightweight nature, the fact that it is easy and cost effective to transport, easy to handle manually on site and made from recycled plastic.

CeTeau Managing Director, Tijl Pieter de Zwart commented:

“We are delighted to have pioneered this innovative way to install plastic piling to such a great depth, as it offers much more flexibility than the steel version.

The team at HL Plastics have been very responsive to our needs and it is a pleasure to deal with them. We hope our relationship continues long into the future.”

For further information and to read more case studies on all of our products visit:

www.liniar.co.uk
Standard Pile - Box Format
LSP400Y

By inserting every other pile the opposite way round the sheets are configured into a ‘box’ format.

This configuration creates a much deeper profile with more strength.

---

### Standard Pile - Box Technical Engineering Values

<table>
<thead>
<tr>
<th>Material</th>
<th>Weight (sheet) kg/m²</th>
<th>Density kg/m³</th>
<th>Initial Tan Modulus kN/mm²</th>
<th>Section Modulus cm³/m</th>
<th>Maximum Moment kNm/m</th>
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</thead>
<tbody>
<tr>
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<td>3.23</td>
<td>1450</td>
<td>2.55</td>
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</table>

<table>
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<tr>
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<th>Material Thickness mm</th>
<th>Weight (sheet) mm</th>
<th>Tensile Yield Strength N/mm²</th>
<th>Secant Modulus kN/mm²</th>
<th>Section Modulus cm³/m</th>
<th>Allowable Moment kNm/m</th>
</tr>
</thead>
<tbody>
<tr>
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<td>315/315</td>
<td>40</td>
<td>2.15</td>
<td>357</td>
<td>4.73</td>
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</table>

---

### Standard Pile - Box Format
LSP400Y

The Standard Pile is a medium strength product, which has the versatility to be used in either of the 2 formats.

The ‘Z’ Ribbed format covers slightly more ground and has a shallower front - on profile.

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### Standard Pile - Z Ribbed Technical Engineering Values

<table>
<thead>
<tr>
<th>Material</th>
<th>Weight (sheet) kg/m²</th>
<th>Density kg/m³</th>
<th>Initial Tan Modulus kN/mm²</th>
<th>Section Modulus cm³/m</th>
<th>Maximum Moment kNm/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC</td>
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<td>2.55</td>
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<td>4.0</td>
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</table>

<table>
<thead>
<tr>
<th>Width (sheet) mm</th>
<th>Material Thickness mm</th>
<th>Weight (sheet) mm</th>
<th>Tensile Yield Strength N/mm²</th>
<th>Secant Modulus kN/mm²</th>
<th>Section Modulus cm³/m</th>
<th>Allowable Moment kNm/m</th>
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</thead>
<tbody>
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<td>330/330</td>
<td>40</td>
<td>2.15</td>
<td>100</td>
<td>1.33</td>
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</tbody>
</table>
Full Pan Pile
LFP100Y

Similar in appearance to some steel sheet piles, the Full Pan Pile has benefits in terms of the ease of installation.

It is also stronger than the existing Standard Pile when used in Z ribbed format.

Its uncluttered design is suitable for installations where appearance is important and the clean look of plastic piling can be seen.

<table>
<thead>
<tr>
<th>Material</th>
<th>PVC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width (sheet) mm</td>
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</tr>
<tr>
<td>Material/Thickness mm</td>
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<td>Weight (sheet) kg/m²</td>
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<td>Weight (wall) kg/m²</td>
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<tr>
<td>Density kg/m³</td>
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<tr>
<td>Initial Tan Modulus kN/mm²</td>
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<tr>
<td>Secant Modulus kN/mm²</td>
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<tr>
<td>Moment of Inertia cm²/m</td>
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</tbody>
</table>

Trench Pile
LTP200Y

The trench sheet pile is designed as a shuttering for temporary or permanent ground works in the utility sector.

The unique corrugated design provides additional strength and it is much lighter and easier to handle than steel and therefore cheaper to transport.

PVCu also eliminates the risk of sparking.

"...The use of plastic piling may also provide a low cost alternative to steel piling in many temporary works situations met during the civil engineering construction of bridges, tunnels, drainage systems, manholes, etc."

Source: TRL Report (TRL 533) - Guidance on the structural use of plastic sheet piling in highway applications.
Material: PVC

**Width (sheet) mm:** 429

**Weight (sheet) kg/m:** 3.20

**Density kg/m³:** 1450

**Weight (wall) kg/m²:** 11.42

**Moment of Inertia cm⁴/m²:** 3306

**Section Modulus cm³/m:** 23

**Tensile Yield Strength N/mm²:** 40

**Modulus of Elasticity N/mm²:** 2300

**Initial Tan Modulus kN/mm²:** 2.55

**Moment of Inertia cm⁴/m²:** 81

**Maximum Moment kNm/m:** 0.92

**Log Pile**

A tubular design with wood composite fascia, Log Pile delivers all the benefits of a ‘hard’ engineering solution with a ‘soft’ engineering appearance.

Posts can be driven through the centre of each tube for added strength.

**Flat Pile**

The Flat Pile can be used on installations where no great strength is required and where a clean straight line of piles is preferred.

Examples are the damming of peat bogs, or as a heavy-duty edging or raised bed retaining profile.

**Physical Properties**

**Mechanical Properties**

Engineering Values represent results of testing when Piling is installed in the format as illustrated above only. Calculations are based on Tensile Strength of material = 40N/mm². Allowable moment = Tensile Yield Strength x Section Modulus

Factor of Safety = 3

**Log Pile**

LFP300Y

The Flat Pile can be used on installations where no great strength is required and where a clean straight line of piles is preferred.

Examples are the damming of peat bogs, or as a heavy-duty edging or raised bed retaining profile.

**Physical Properties**

**Mechanical Properties**

Engineering Values represent results of testing when Piling is installed in the format as illustrated above only. Calculations are based on Tensile Strength of material = 40N/mm². Allowable moment = Tensile Yield Strength x Section Modulus

Factor of Safety = 3
The information provided represents average values, which are believed to be accurate. No warranty of any kind is made as to the suitability of Liniar plastic piling for any particular application or the results obtained there from.

**Accessories**

**Capping Strip**
Fixes through the face of the piles to cap off the open tops.

**Corner Pile**
Connects 2 lines of sheets at 90° and is ideal for creating coffer dams or for bank retention in artificial fish farm pools.

**2-Way Connector Pile**
The Connector Pile allows 2 parallel runs of sheets to be connected to each other.

**3-Way Connector Pile**
Allows for another line of sheets to be created behind at 90° to the main wall.

**Mini Pile**
A much smaller sheet often used in domestic situations for lawn edging or raised

**Sheet Pile Driving Cap**
To aid installation of plastic piling.

**Log Pile Driving Cap**
To aid installation of log pile.

**Log Pile Cap**
Providing an attractive finish to log pile installations.