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Plastic Piling





Introduction

HL Plastics began manufacturing Plastic Piling in 1994 in Derbyshire and has consistently and constantly 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 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° corners. HL Plastics also offer a RIBA accredited CPD seminar for training purposes, so you can be sure you're getting the right product to meet your requirements.

Plastic Piling Solutions

Benefits of Plastic Piling

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

Scale models of Plastic Piling are available on request direct from the manufacturer:
sales@hlplastics.co.uk

Benefits to the HL Plastics' range of piling:

- Does not rot or rust
- Manufactured from recycled plastic
- Has no risk from sparking
- Manufactured in the UK by ourselves, so reduces the environmental impact of the cost of transport
- Maintains its original appearance over time
- Not affected by salt water
- Resistant to the majority of chemicals
- Resistant to rodent and marine borer attack
- Can be easily cut or bored
- Maintenance free
- Lighter than steel, so easier to handle and transport
- Has a clean, consistent appearance
- Available in a number of colours
- Has the ability to create curved walls and a 90° corner pile is available

Uses of Plastic Piling

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
- Creating well defined drainage culverts and channels for agricultural land and housing / urban development
- Inland marina and waterway walls and banks
- Blocking of ditches on peat bogs and other nature reserve situations
- General bank retention
- Trench sheeting
- Permanent shuttering / land remediation / cut-off walls
- Highway applications
- Non-piling applications include 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.



Inland Marina

Peat Bog Blocking



Trench Shoring

Highways



Slope Stabilisation

Sea Defence Cladding



Fish Farm/
Bank Retention



Floodwalls

Installation

In many situations, particularly when short lengths of Plastic Piling are being installed, it can be inserted into the ground by hand 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. HL Plastics can help you choose the most suitable type dependent on the application, and refer you to an appropriate rental supplier.

Design

HL Plastics have the capability to manufacture Plastic Piling in a wide range of lengths, which are then supplied direct from our UK factory. The Piling is generally produced in grey from 100% recycled PVC, 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, suitable for a number of different uses, dependent on strength, ease of installation and type of appearance required. These include Standard Pile, Flat Pile, Trench Pile and Full Pan Pile. Full specifications for all our piling products can be found on pages 5 and 6.

For further information and to download detailed drawings and specifications visit

www.hlplastics.co.uk

Or call **01332 883800**

Mechanical Installation



Manual Installation





Case Studies

Highways

Plastic Piling enjoys considerable success within water related industries and HL Plastics 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 highway applications and published a report of their findings.

Plastic Piling from HL Plastics was specified by the local authority in Newport Pagnell to prevent bank erosion and maintain a safe carriageway along a road 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 Contracts Manager, said "with the correct type of hammer for the soil conditions, plastic sheet piles are quick and easy to install, cutting the tops to the finished line and level is a simple task."

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 HL Plastics was used to face the filled concrete manhole rings that formed a cornered retaining wall the length of the bank defences. Lengths of recycled PVC sheet pile 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.



Floodwalls

Plastic Piling provides a comprehensive solution for flood prevention schemes, and is an environmentally friendly and cost effective alternative to steel piling: it doesn't rot or rust and is maintenance free.

HL Plastic Piling was used as part of the ongoing 20 year Lowland Flood Prevention Scheme along a section of the Norfolk Broads. 3km of standard pile was installed to increase the height of the existing flood defences, in an area that is already 1 metre below sea level. The 2.25 metre lengths were mechanically installed in a 'z' rib format to provide a complete defensive system.

Plastic Piling was chosen for this project due to its lightweight properties, ease of use and cost effectiveness.



Technical Specifications

Full Pan Pile (Ref: 1358/001)

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

It is also stronger than the existing Standard Pile when used in the 'Z-Ribbed' format.

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



Full Pan Pile Technical Engineering Values						
Material PVC	Weight (Sheet) kg/m 3.35	Weight (wall) kg/m ² 10.50	Density kg/m ³ 1450	Initial Tan Modulus kN/mm ² 2.55	Moment of Inertia cm ⁴ /m 688.5	Maximum Moment kNm/m 7.38
Width (sheet) mm 310o/a	Material Thickness mm 5	Lugs n/a	Tensile Yield Strength N/mm ² 40	Secant Modulus kN/mm ² 2.15	Section Modulus cm ³ /m 184.7	Allowable Moment kNm/m 2.46
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 = $\frac{\text{Tensile Yield Strength} \times \text{Section Modulus}}{3}$

Trench Pile (Ref: 788/004)

"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.

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.

UPVC also eliminates the risk of sparking.



Trench Pile Technical Engineering Values						
Material PVC	Weight (Sheet) kg/m 2.31	Weight (wall) kg/m ² 7.70	Density kg/m ³ 1450	Initial Tan Modulus kN/mm ² 2.55	Moment of Inertia cm ⁴ /m 343.6	Maximum Moment kNm/m 1.96
Width (sheet) mm 240o/a	Material Thickness mm 5	Lugs n/a	Tensile Yield Strength N/mm ² 40	Secant Modulus kN/mm ² 2.15	Section Modulus cm ³ /m 49	Allowable Moment kNm/m 0.65
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 = $\frac{\text{Tensile Yield Strength} \times \text{Section Modulus}}{3}$

Flat Pile (Ref: 788/003)

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.



Flat Pile Technical Engineering Values						
Material PVC	Weight (Sheet) kg/m 3.20	Weight (wall) kg/m ² 11.42	Density kg/m ³ 1450	Initial Tan Modulus kN/mm ² 2.55	Moment of Inertia cm ⁴ /m 81	Maximum Moment kNm/m 0.92
Width (sheet) mm 270o/a	Material Thickness mm 7	Lugs N	Tensile Yield Strength N/mm ² 40	Secant Modulus kN/mm ² 2.15	Section Modulus cm ³ /m 23	Allowable Moment kNm/m 0.31
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 = $\frac{\text{Tensile Yield Strength} \times \text{Section Modulus}}{3}$

Standard Pile - Z Ribbed Format (Ref: 1094/002)

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

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



Standard Pile Technical Engineering Values						
Material PVC	Weight (Sheet) kg/m 3.23	Weight (wall) kg/m ² 9.79	Density kg/m ³ 1450	Initial Tan Modulus kN/mm ² 2.55	Moment of Inertia cm ⁴ /m 510	Maximum Moment kNm/m 4.0
Width (sheet) mm 330o/a	Material Thickness mm 5	Lugs N	Tensile Yield Strength N/mm ² 40	Secant Modulus kN/mm ² 2.15	Section Modulus cm ³ /m 100	Allowable Moment kNm/m 1.33
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 = $\frac{\text{Tensile Yield Strength} \times \text{Section Modulus}}{3}$
Factor of Safety = 3

Standard Pile - Box Format (Ref: 1094/002)

By inserting every other pile the opposite way around the sheets are configured into 'box' format.

This configuration creates a much deeper profile with more strength.



Standard Pile Technical Engineering Values						
Material PVC	Weight (Sheet) kg/m 3.23	Weight (wall) kg/m ² 10.77	Density kg/m ³ 1450	Initial Tan Modulus kN/mm ² 2.55	Moment of Inertia cm ⁴ /m 2626	Maximum Moment kNm/m 14.2
Width (sheet) mm 315o/a	Material Thickness mm 5	Lugs N	Tensile Yield Strength N/mm ² 40	Secant Modulus kN/mm ² 2.15	Section Modulus cm ³ /m 357	Allowable Moment kNm/m 4.73
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 = $\frac{\text{Tensile Yield Strength} \times \text{Section Modulus}}{3}$
Factor of Safety = 3

Capping Strip

(Ref: H1397001)

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



Corner Pile

(Ref: 1300/002)

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

(Ref: 1329/001)

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



3-Way Connector Pile (Ref: I536/001)

Allows for another line of sheets to be created behind at 90° to the main wall, removing the need for steel tie bars in many cases.



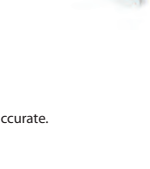
Mini Pile (Ref: 1300/001)

A much smaller sheet often used in domestic situations for lawn edging or raised bed retention.



Pile Cap (Ref: HLPL Pilinghead)

To aid manual installation of Plastic Piling, aluminium pile caps are available.



The information provided represents average values which are believed to be accurate. No warranty of any kind is made as to the suitability of HL Plastic Piling for any particular application or the results obtained there from.





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