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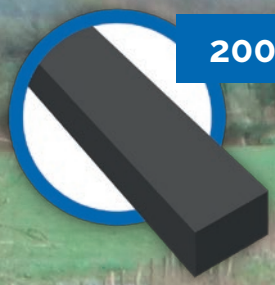
Royal Lankhorst Euronete

KLP® Hybrid Polymer Sleepers

100 series KLP® Track Sleepers



200 series KLP® Switch & Crossing Sleepers

400 series KLP® Bridge Sleepers

Why choose KLP® Hybrid Polymer Sleepers?

- Excellent damping due to highly ductile polymers
- Sound & vibration reduction
- High stiffness & low thermal expansion due to steel reinforcement
- Design life of 50 years
- Low Life Cycle Costs
- High chemical resistance & no cracking
- 100% recycled & 100% recyclable
- Machinable and installable like timber
- No glass fiber dust emission during drilling

Sustainable polymer railway solutions

KLP® HYBRID POLYMER SLEEPERS

WireCo® WorldGroup

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The increasing scarcity of hardwood and the ban on creosote were the main drivers for Lankhorst to develop the KLP® Hybrid Polymer Sleeper, which is manufactured out of 100% recycled material, as a sustainable and maintenance free alternative to timber sleepers. In particular situations it also offers an excellent alternative to concrete, especially when this material is too rigid for the application. All types of KLP® Hybrid Polymer Sleepers have been specifically engineered for their own application, be it light or heavy rail.

The maintenance free KLP® Hybrid Polymer Sleeper is manufactured from a high quality, ductile polymer with steel bars encased. This hybrid construction provides both high strength properties as well as excellent damping characteristics and herein lies the main technical advantage compared to composite sleepers with glass fiber, making KLP® Hybrid Polymer Sleepers suitable for strength critical and impact critical situations. The steel reinforcement is located where it is most effective and does not interfere with the installation of fastening systems. This helps it achieve longitudinal and lateral stiffness to maintain the track gauge under all load and climate conditions, while the recycled polymer simultaneously acts as an effective impact absorber and sound damper, resulting in a reduced noise and longer lasting infrastructure.

The KLP® Hybrid Polymer Sleeper, designed for longevity, keeps these properties during its lifetime of over 50 years. A solid investment resulting in low Life Cycle Costs. Furthermore the sleepers manufactured from 100% recycled polymers are fully recyclable again after their long life.

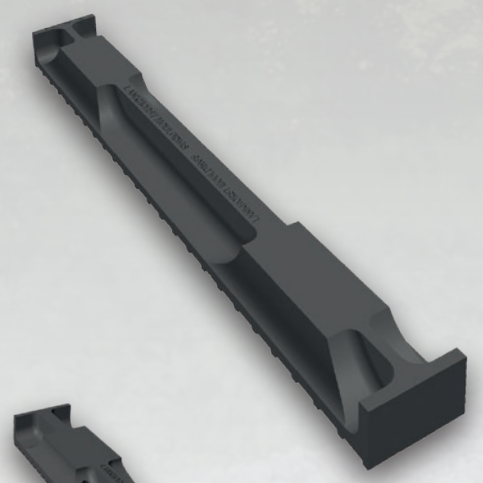
The first sleepers were installed in track in 2006 and have been performing successfully with no maintenance required and no signs of wear and tear. Since the introduction Lankhorst has supplied various types of the KLP® Hybrid Polymer Sleeper to several projects in The Netherlands, Germany, Belgium, France, Austria, Switzerland, Sweden, UK, Gabon, Malaysia, Mexico and New Zealand.

KLP® Hybrid Polymer Track Sleeper - 100 series

KLP® Hybrid Polymer Track Sleeper - type 101

Size: (W)275 x (H)150 x (L)2400 mm

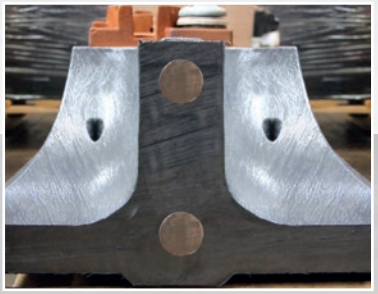
- Ideally suitable for light rail purposes with axle loads up to 15 tons
- Fully embedded in ballast-bed due to optimized design
- High lateral and vertical resistance due to the profiled shape
- Design can be customized to include 3rd rail applications



KLP® Hybrid Polymer Track Sleeper HS - type 102

Size: (W)250 x (H)160 x (L)2600 mm

- Ideally suitable for main, side and industrial track with axle loads up to 25 tons
- Fully embedded in ballast-bed due to optimized design
- High lateral and vertical resistance due to the profiled shape
- Design can be customized to include 3rd rail applications & for different rail gauges



KLP® HYBRID POLYMER SLEEPERS

KLP® Hybrid Polymer Sleepers

KLP® Hybrid Polymer Switch & Crossing Sleeper - 200 series

KLP® Hybrid Polymer Switch & Crossing Sleeper - type 201

Size: (W)250/260 x (H)150 x (L)2000 - 5200 mm

- Ideally suitable for main track, switches and crossings with axle loads up to 25 tons
- Suitable for ballasted and unballasted track
- High degree of flexibility regarding installation of base plates
- Single product length up to 5200 mm
- Connectable type 501 - for lengths up to 10400 mm*

KLP® Hybrid Polymer Switch & Crossing Sleeper HS - type 202

Size: (W)250/260 x (H)150 x (L)2000 - 5200 mm

- Ideally suitable for heavy rail purposes with axle loads up to 35 tons
- Suitable for ballasted and unballasted track
- High degree of flexibility regarding installation of base plates
- Single product length up to 5200 mm
- Connectable type 502 - for lengths up to 10400 mm*

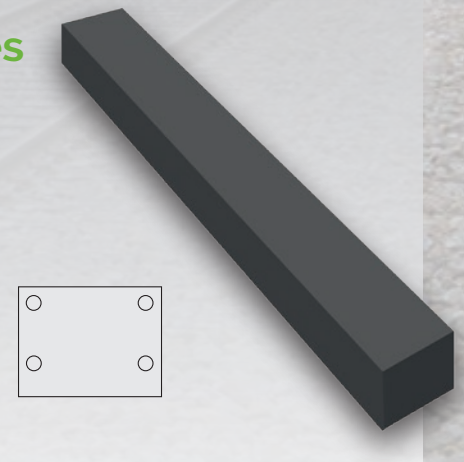
* *Sleepers are installed from both sides and connected after installation; ideal on locations with limited working space and furthermore less deep holes need to be dug. Due to its unique design, the stiffness remains constant over the whole length of the mounted sleeper.*

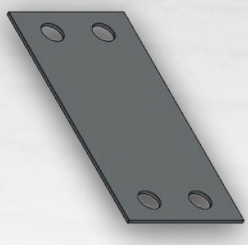
KLP® Hybrid Polymer Bridge Sleeper - 400 series

KLP® Hybrid Polymer Bridge Sleeper HS - type 401

Size: (W)250 x (H)150/180/210/240/270 x (L) 2000 - 2800 mm

- Ideally suitable for girder bridges
- Suited for bridges with offset, non-offset and canted conditions
- Significant noise reduction of 3 - 5 dB compared to wooden sleepers
- 25 mm milling zone to compensate for height differences
- Detailed compensation in height differences can be achieved with KLP® Shims





KLP® Shims

KLP® Shims, made from the same polymer as the sleepers, are typically used to fill out the minor height differences for KLP® Hybrid Polymer Bridge Sleepers and are available in thicknesses of 2 mm, 5 mm and 10 mm. KLP® Shims are installed between the sleeper and the base plate.

Dimensions, specifications, certificates

Feel free to contact us regarding specifications and available certificates. Other dimensions of the 100, 200 and 400 series are available upon request. We will gladly assist you with your local type approval process.

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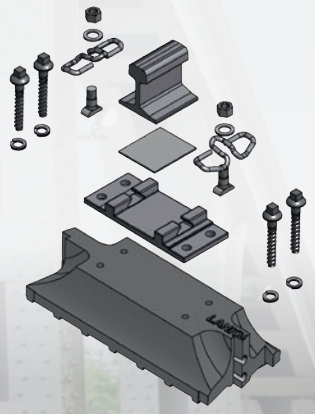

KLP® Pre-drilling and Mounting Service

Lankhorst offers a pre-drilling and mounting service for a faster installation on location. Whether you want pre-drilled sleepers or even if you require pre-mounting of base plates.

History of Royal Lankhorst Euronete

1803 - Nicolaas Jurjan Lankhorst started a rope manufacturing factory in Sneek, The Netherlands. At that time ropes were made of natural fibers.

1964 - A revolution took off in rope production; plastics were introduced and by that new rope types, with a more consistent quality and longer lifetime.

1975 - The waste materials of the plastic rope production proved to be useful for a second life. Lankhorst started to produce the first plastic molded products out of it.

1986 - Lankhorst Recycling was born. The plastic product program was extended ever since.

1998 - The Portuguese Grupo Euronete and Lankhorst merged into one new Lankhorst Euronete Group.

2003 - Queen Beatrix of the Kingdom of the Netherlands granted the predicate "Royal" to the company.

2004 - KLP® Hybrid Polymer Sleepers were developed.

2006 - First KLP® Hybrid Polymer Sleeper in track in The Netherlands.

KLP® Hybrid Polymer Track Sleepers, Zwolle (The Netherlands).

KLP® Hybrid Polymer Bridge Sleepers, Gent (Belgium).

Production facilities in Sneek, The Netherlands.

KLP® Hybrid Polymer Switch & Crossing Sleepers, Monterrey (Mexico).

KLP® HYBRID POLYMER SLEEPERS

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