LIGNODUR®
terrafina
floor board systems

Technical information
Contents

1. General information
   1.1 Validity 2
   1.2 Applications 2
   1.3 Quality / eco-balance / efficiency 2
   1.4 Functioning guarantee 2

2. Product information
   2.1 Description 2
   2.2 Technical data 3
   2.3 Surface quality 3
   2.4 Colour / colour development 4
   2.5 Weathering 4
   2.6 Thermal properties 5
   2.7 Chemical properties 5

3. Practical information
   3.1 Maintenance / care 5
   3.2 Cleaning recommendations 5

4. Transport / storage 6

5. Processing / assembly 6
   5.1 Processing 6
   5.2 Sub-structure / assembly 6
   5.3 Dis- and Reassembly of floor boards 7
   5.4 Completion 7
   5.5 Expansion 7
   5.6 Slope 7

6. Disposal 8

7. Validity 8
Technical information

1. General information

1.1 Validity
This technical information is valid for WPC floor boards, LIGNODUR® terrafina type, consisting of floor boards, sub-structure profiles, installation and starter clips, end caps, aluminium end profiles, WPC corner profile as well as various fixation aids. LIGNODUR® terrafina floor boards must only be installed using the accessories of the terrafina system.

1.2 Applications
LIGNODUR® terrafina floor boards and sub-structure profiles are designed to be used as floor covering, like terraces, balconies, stairs, roof gardens, promenades, as pool and pond edges or as jetty planks. (Regarding planks stress from the below caused by e.g. waves or boats must be avoided).

Any different application must be considered improper and may lead to damage to property or person. The profiles should not be used for cantilever constructions, because an official technical approval has not been applied for. Please check prior to use, if LIGNODUR® terrafina is suitable for the intended application. Turn to an approved stress analyst, where required.

1.3 Quality / eco-balance / efficiency
LIGNODUR® terrafina is developed in Germany and produced using high-tech production plants. Various regular controls during the production process, comprehensive laboratory tests as well as voluntary checks conducted by independent institutes provide permanent compliance with desired quality standards.

LIGNODUR® terrafina meets the quality and inspection requirements of the quality label "Qualitäts- und Prüfbestimmungen für Holz-Polymer-Werkstoffe" of the independent quality association "Qualitätsgemeinschaft Holzwerkstoffe e.V."

LIGNODUR® terrafina is made of domestic soft wood only. All our suppliers are PEFC certified and operate on the principle of sustainable forest management. Tropical wood is not used. Therefore, we actively contribute to the preservation of the forests worldwide.

The main raw materials are of German origin, a fact that shortens transport routes. The proportion of fossil raw materials of LIGNODUR® terrafina is only about 20%. By choosing the extrusion process energy consumption is reduced.

LIGNODUR® terrafina is 100% recyclable. In view of its longevity and low maintenance the LIGNODUR® terrafina floor board system is a very economic decking system as well as a most ecological product for many years.

1.4 Functioning guarantee
The LIGNODUR® terrafina floor boards are made of a wood-polymer compound (WPC - wood-polymer composite), which offers almost constant and long-lasting product qualities. Apart from legal claims by virtue of warranty as per German law, we voluntarily grant the consumer an unlimited guarantee regarding product quality – aside any legal enactment. The manufacturer grants the consumer a ten year functioning guarantee on all terrafina components from date of purchase.

Appropriate installation and designated use of the floor boards are compulsory. Please also see our installation instructions and terms of guarantee.

2. Product information

2.1 Description
LIGNODUR® is a PVC-based material containing wood flour (wood-polymer compound) with a wood proportion of more than 50%. This innovative material group (WPC = wood-polymer composite) brings together the stability of wood fibre and the longevity of synthetic material. High-quality stabilizers and pigments provide an excellent resistance to weathering.

The wood fibres used as well as the surface, which is roughened during a special brushing process, endow the product with its mechanical properties as well as its optics and haptics.

Compared to wood LIGNODUR® terrafina is not only dimensionally more stable and requires less maintenance, but it is also more resistant to weathering. The floor boards are safe for bare fee, as they are free from cracks and splinters and very anti-slip even when wet.

Low dimensional changes due to moisture, high resistance against modification caused by mould and mildew resistance to salt water as well as self-extinguishing properties complete the advantages of the innovative WPC material.
The intelligent click and clamp system allows a quick installation. In using the invisible mounting clips a small joint is produced. The profiles can be installed at almost any angle relating to the sub-structure.

LIGNODUR® terraflina floor boards are available as hollow chamber or as massive profiles.

The product lines classic/elegance come in fine and coarse structure as well as 4 colour shades. The product line massiv offers the designs plain and shipdeck in 2 colours.

One feature of the LIGNODUR® terraflina floor board system is a high mechanical load capacity of short-term lumped loads of up to 300 kg and short-term area loads of up to 1,000 kg/m².

If exposed to long-term load (>1 day) permanent deformation may occur from 25% of these values on. In this case additional support has to be provided.

The standards of the association of the German wood-based panel industries „VHI“ are easily met.

Technical data sheets are available on request.

2.3 Surface quality

The textured surface is additionally roughened during a special brushing process which endows the floor boards with its natural wooden optics and haptics.

The brushing of the floor boards is executed in one direction only. During the brushing process the wooden particles rise. In order to achieve a uniform colour finish of the finished decking, the individual floor boards have to be installed in the same direction.

Due to its roughened structure, the LIGNODUR® terraflina floor board is rated R 12 (=safe-very safe)

2.2 Technical data

<table>
<thead>
<tr>
<th>standard lengths</th>
<th>classic / elegance</th>
<th>massiv</th>
</tr>
</thead>
<tbody>
<tr>
<td>floor boards</td>
<td>4000 / 5000 / 6000 mm</td>
<td></td>
</tr>
<tr>
<td>sub-structure profile</td>
<td>80 x 35 mm</td>
<td>4000 / 6000 mm</td>
</tr>
<tr>
<td></td>
<td>60 x 17 mm</td>
<td>3000 / 4000 mm</td>
</tr>
<tr>
<td>aluminium end profiles</td>
<td>4000 mm</td>
<td></td>
</tr>
<tr>
<td>WPC corner profile 3,5 mm</td>
<td>4000 mm</td>
<td></td>
</tr>
</tbody>
</table>

| floor boards – dimensions | 146 mm ( +2 / -0 ) + 4 mm joint |
| deck width                | 150 mm ( +2 / -0 ) |
| height                    | 25 mm ( ± 0,5 ) | 21 mm ( -1 / +0 ) |
| weight                    | 2,4 kg/lfm | 3,8 kg/lfm |

| sub-structure profile – dimensions |
| width x height | 80 x 35 mm |
| or width x height | 60 x 17 mm |

| aluminium end profiles – dimensions |
| width x height | 25 x 52 mm |
| or width x height | 25 x 38 mm |

WPC-corner profile 3,5 mm width x height | 30 x 64 mm

| variable construction heights |
| with sub-structure profile |
| 80 x 35 mm | 60 mm | 56 mm |
| 60 x 17 mm | 42 mm | 38 mm |
in the anti-slip classification, and, thus, is suitable for use in wet barefoot as well as public areas (slip resistance as per DIN 51130 in work rooms and work areas with increased risk of accident, class R 12, slip resistance as per DIN 51097 wet barefoot areas, class C).

In the long run, this requires maintenance according to the instructions.

2.4 Colour / colour development
The floor board colour may change slightly over the years – without, however, losing its colour character.

Given the high proportion of natural substances certain fluctuations in texture and colour are inevitable. The positive effect is a vivid appearance of the surface.

During the production process the fibres are distributed homogeneously in the PVC, coated, dried and, due to the resulting temperature, slightly discoloured. During the subsequent brushing process the fibres are laid open at the surface and features, normally characteristic of natural wood, are adopted to a small extent.

In the course of weathering the wood ingredient Lignin is released. As Lignin reacts with the UV radiation of the sunlight, the wood fibres at the board surface turn lighter or yellowish after 4-8 weeks.

In the course of further weathering (approx. 6 months) the wood discolouring is reversed, so that the wooden particles run through the natural greying process. The colour

2.5 Weathering period  Examples of weathering based on floor board LIGNODUR® terrafina classic, coarse structure

<table>
<thead>
<tr>
<th>Original</th>
<th>6 weeks</th>
<th>half a year</th>
<th>one year</th>
</tr>
</thead>
<tbody>
<tr>
<td>light brown</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dark brown</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>graphite</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>stone grey</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
impression is more greyish and blunter. These are natural processes, which are unavoidable by reason of the high wood proportion. Consequently, darker colours regain in intensity, whereas lighter colours rarely change. Graphite darkens after approximately one year and returns to the original tone of colour, dark brown will also increase in colour intensity and light brown will end in a slightly lighter tone of colour compared to the original one.

However, the colour character as well as the properties of LIGNODUR terrafina will remain. Slight variations in colour support the natural wood character.

In case of larger areas we recommend to mix floor boards of different lots and to lay them in a staggered or running bond pattern.

Moreover, we recommend moving the objects on the terrace now and then in order to avoid differences in colour.

2.6 Thermal properties
Irrespective of the chosen colour the LIGNODUR® terrafina floor boards are subject to warming by solar radiation – like other building materials. Please consider this when using it as a barefoot floor board, above all in unfavourable locations with high permanent solar radiation and low air circulation.

The warming of the surface has no impact on either the mechanical properties or the capacity of the floor boards.

2.7 Chemical properties
LIGNODUR® terrafina floor boards do not contain toxic constituents or heavy metals like lead or cadmium.

LIGNODUR® terrafina is made of rot-proof material. It is sufficiently resistant to mould and mildew. LIGNODUR® terrafina is rated durability class 1, as its low water absorption causes no irreversible damage.

LIGNODUR® terrafina floor boards are resistant to chloric and salty air, and suitable for pool and maritime uses.

We recommend to finish areas in swimming pools etc. (chloric air) with end caps or WPC corner profiles, as aluminium profiles may turn spotty upon long-term use.

3. Practical information
3.1 Maintenance and care
Unlike wooden terraces, LIGNODUR® terrafina floor boards do not require an annual protective painting (oil or glaze).

However, a basic cleaning of the surface should be effected once or twice a year using a pressure washer with fan-shaped beam at a distance of at least 20 cm in lengthwise profile direction. Using a dirt blaster is not advisable.

In order to keep the surface permanently clean, we recommend to sweep the decking regularly and to rinse the surface with a sufficient quantity of water using also a scrub and a mild all-purpose cleaner or suds.

However, as there are wood fibres laid open at the surface, stains may remain visible, most of all those from fatty and oily foods as well as from substances leaving heavy stains like red wine and mustard. As a consequence, it is generally advisable to remove dirt promptly.

Moreover, most stains are widely removed by natural weathering like rain and solar radiation within a few weeks. In case surfaces are not or hardly exposed to weathering (rain), the stains may remain over a long period, unless they are treated immediately.

Never use aggressive agents, brushes or scotch spoons, as the surface may get mattified and appear brighter.

Stubborn, ordinary stains on terraces may be removed using the terrafina cleaning set. Please also see the detailed instructions in our cleaning recommendations.

The cleaning recommendations are as follows (in extracts):

<table>
<thead>
<tr>
<th>Dirt</th>
<th>Ajax</th>
<th>Sagrotan</th>
<th>Orange cleaner</th>
<th>Microfibre sponge</th>
<th>Paper towels</th>
<th>Sand paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaning in general</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water marks</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fat removal</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coloured stains</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fox marks</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burn marks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
General dirt:
Regular sweeping and rinsing with plenty of water (warm, not hot) using scrubs and mild all-purpose cleaner helps keeping the terrace tidy. If simple rinsing is not sufficient, the floor may be treated using a pressure washer. Apply it with a fan-shaped beam at a distance of at least 20 cm in lengthwise profile direction. It is not allowed to use a dirt blaster.

Grease:
to be removed with the Orange cleaner from the terrafina cleaning set. It is sprayed on and left on for a few minutes (depending on dirt density), then removed using a dry, strong piece of paper or cotton cloth and dabbed off. An initial dark colouring will disappear within a short time. Light marginal stains may be removed using standard cleaner (cf. above). In case grease has acted on over a long period, the treatment may have to be repeated.

Dyeing foods
Standard bleaching, chloric bath room cleaners may be used (e.g. Sagrotan). Apply the cleaner shortly and rinse with water or remove with a fibre cloth.

Burn marks or other severe damaging should be removed using coarse sandpaper. Work in lengthwise profile direction only. This treatment will slightly change the colour shade. However, in the course of time, it will blend in. Never use steel brushes, as abrasion will change the colour shade.

Water stains:
Especially at first, water stains may occur under unfavourable conditions (like partly roofed surfaces in connection with little slope) after a rain shower at the transition area between wet and dry surface.

This is a natural process and weakens with every rain shower, because the substances producing the water stains are washed out of the wood by and by. Water marks do not give reason for complaint.

They may be removed as follows: wet the entire surface and clean it using a scrub or fibre floor cloth and standard floor cleaner (e.g. Ajax), afterwards. It takes some time to dissolve the substances. Consequently, a short reaction time of the cleaner is insufficient. The procedure may have to be repeated.

A guarantee for complete removal of stains cannot be granted.

4. Transport/storage

The profiles come in bundles of two pieces (for the massiv type à 5/6 m you have bundles of 1 pc.) shrinked in foil and protected by a protective edge cover made of cardboard. Please always make sure that the foil is not damaged during storage.

Up to the installation, the floor boards and sub-structure profiles have to be stored packed, full-size supported and dry. Humidity like condensation water must not penetrate into the packaging.

If humidity penetrates due to damaged packaging, the foil has to be removed completely and sufficient drying and/or ventilation of the profiles have to be provided. Improper storage may lead to irreversible deformation.

5. Processing/installation

Please note the detailed information given in our installation instructions:

a. Installation instructions floor boards
b. Installation of the sub-structure on sealed surfaces (plate anchor)
c. Installation of the sub-structure on crushed stone (concrete anchor)

5.1 Processing:
LIGNODUR® terrafina may be sawn, milled and drilled using standard wood working tools. Smooth cut surfaces, burr removing and the like are advisable, especially for adherents.

We recommend using LIGNODUR® construction adhesive or another comparable PUR construction adhesive.

5.2 Sub-structure/installation:
Generally, a proper slope, sufficient ventilation of the terrace as well as avoidance of condensation water under the floor boards have to be made sure.

Please also see the information under point 5.6 slope.

The ground must be statically weight bearing and frost-proof. In case the ground is not sufficiently weight-bearing this may lead to damages to the construction and persons or property located thereon.
Depending on the ground, different installation techniques are possible (on crushed stone, on sealed surfaces, on existing steel or wooden constructions or on even concrete surfaces).

For this purpose, sub-structure profiles in two different heights (35 mm and 17 mm) were developed.

When using the high sub-structure profile (80 x 35 mm) a distance of max. 600 mm between the fixation and supporting points has to be observed. Using the low sub-structure profile (60 x 17 mm) this distance is reduced to max. 150 mm.

The mounting of the floor boards is possible at almost any angle in relation to the sub-structure.

In case the floor boards are mounted at an angle of 90°, the sub-structure profiles have to be installed at a centre distance of max. 550 mm (sub-structure profile 80 x 35 mm) and of max. 500 mm (sub-structure profile 60 x 17 mm).

The distances described herein are designed for short-term lumped loads of up to 300 kg and short-term area loads of up to 1000 kg/m².

The distances have to be reduced in case of:

- loads exceeding the mentioned values
- loads acting on points or areas for a longer period (>1 day)
- smaller bearing capacity of soil
- mounting angles different from 90°

An incorrect design layout may lead to damages to the construction and the property located thereon. The profiles have no approval issued by the building authorities and may not be used for self-supporting constructive purposes. Please check if LIGNODUR® terrafina is suitable for the intended application prior to use and consult an authorized stress analyst.

The outer sub-structure profiles of every sub area have to be fixed directly to the ground by either using screws of adhesive or some component of the LIGNODUR terrafina range of products.

The installation of the floor boards is easy and time-saving owing to the invisible joining system with starter and installation clips. The first floor board has to be locked audibly onto the fixed starter clip, the following floor boards are clicked onto the loosely mounted installation clip. In using the installation clip a small joint is produced.

5.3 Dis- and Reassembly of floor boards:
Faulty boards may very simply be declamped and exchanged. Please note the descriptions given under 27.1.-27.3 of the installation instructions for floor boards.

5.4 Completion:
It is not compulsory to seal the floor boards and/or the decking; however, it is advisable for the hollow chamber profile types classic and elegance for optical reasons, because less dirt and water may penetrate.

In order to design rectangular terrace edges beautiful end caps, a stainless steel-coloured end profile as well as a WPC corner profile, perfectly matching the floor board colour, are available.

We recommend to pretreat the edges of cut, adherents and profiles with primer and to use the LIGNODUR construction adhesive.

After applying the adhesive, it should be pressed on or weighted for approx. 15 min. until it has hardened.

Massiv type boards do not require a finish. Round edges and tree section may be realized without problems.

5.5 Expansion:
Due to the high wood proportion LIGNODUR terrafina is subject to natural expansion based on temperature and humidity. Sufficient joints between the floor boards and existing building parts (like house wall, garden wall) have to be provided. This joint (Y) is at least 3 mm per lm on both sides of both floor board or sub-structure profile (Y=3 mm x lm) or at least 10 mm.

5.6 Slope:
In case of classic / elegance type boards a slope of at least 2% is vital!

We recommend to mount floor boards massiv type, design shipdeck with a slope of 1% in order to guarantee a better draining of the joints.

The floor boards massiv type, design plain do not require a slope (0%).
The slope can be produced in different ways:

- classically by mounting the whole area at an angle in lengthwise profile direction.

- by creating a roof pitch, i.e. the peak is in the middle of the board falling down towards both ends. This cuts in half the total height difference required. Moreover, it is the best way to prevent water from penetrating into the profiles.

- by creating an alternating pitch: if several boards are mounted in a row, highest and lowest point may alternatingly be positioned in the joint area.

Areas touching buildings should always be realized with a slope directed away from the house. This enables you to lay the area close to the house horizontally, a fact often desired for optical reasons or reasons of installing patio doors.

In case of rectangular projects, you may divide the decking diagonally and achieve this effect on both sides of the building.

In order to avoid slightest modification of the surface or the soil (e.g. deformation caused by permanent stress, changes of the soil caused by local settlement or damage by frost, tension due to moisture etc.) it is vital always to mount the floor boards on at least 3 sub-structure profiles.

In case of faulty installation the material may warp, hence, hollow chambers between the sub-structure profiles must not be filled and permanent water-logging in the hollow profiles as well as below the boards must be avoided.

Please guarantee sufficient ventilation of the decking.

6. Disposal

LIGNODUR® terrafina is 100% recyclable. Oddments may be disposed of with household or industrial waste. Larger quantities may be disposed of with bulky waste or taken to recycling centres directly.

Please ask your city/ municipal administration for possibilities of recycling or disposal in an appropriate way.

7. Validity

Our installation instructions, technical information and brochures are based on current technical knowledge and are subject to modification and adaptation to technical progress without notice.

As possibilities of design and installation are unlimited, only standard applications are described herein. As far as special solutions are concerned, e.g. installation in the garden with concrete anchor or on sealed surfaces (like balconies, roof terraces), separate instructions are available. The installation instructions for floor boards always have to be taken into consideration, too.

The instructions are published in the Internet under www.terrafina.de.

Please make sure that the most current version is available. In case of doubt, please contact your local dealer or send us an e-mail under terrafina@moeller-proflixsysteme.de.
classic
elegance
massiv
Wood-polymer material made of:
- wood
  (from sustainable forestry)
- industrial polymer
  (unmixed)