

B LIGNOLOC®
A BECK brand



**COLLATED
WOODEN NAILS**

SUSTAINABLE AND EFFICIENT.

LIGNOLOC[®]

is the first high-performance fastening system in the world made of the renewable raw material wood.



TABLE OF CONTENT

Approvals	5
Indigenous beech wood	6
Exemplary ecology	7
Lignin adhesion	8
The LIGNOLOC® F44 system	10
The LIGNOLOC® F60 system	11
LIGNOLOC® wooden nail with head for façades	12
LIGNOLOC® wooden nail with stepped head	16
LIGNOLOC® F33 pneumatic nailer	18
LIGNOLOC® wooden nails: Key benefits	20
Use in ecological wood processing	22
Use in industrial production	24
Better ideas - excite	26
Awards	27





” The European Technical Approval makes our vision of sustainable building with sustainable fastening systems even more tangible and it is the official confirmation that this is not just a crazy abstract idea, but a completely well thought-out and marketable concept. For us it represents the first major step out of the niche towards the mass market. “

Christian Beck, General Manager & CEO

THE FIRST COLLATED NAIL MADE OF WOOD

Ecological wood processing down to the smallest detail? With LIGNOLOC® we rethought fastening and developed a new generation of fastening systems, being sustainable and efficient at the same time. LIGNOLOC® is the first ever pneumatically driven wooden nail for future-oriented use in industrial production and ecological timber construction (among many other applications).

The revolutionary LIGNOLOC® wooden nails are made from indigenous beech wood and provide a maximum tensile strength similar to that of aluminium nails. Their mechanical properties allow the nails to be driven into solid structural timber* and wooden materials with the FASCO® LIGNOLOC® pneumatic nailer, without pre-drilling, to form an inseparable bond with the timber.

LIGNOLOC® wooden nails offer an advantage over fasteners made of aluminium or steel in that they form no thermal bridges and leave no traces of corrosion in the wood. If the workpiece subsequently needs to be shaped or machined, then this is possible without any cutting tool wear.

* For wood with a density of 350 to 500 kg/m³ and in compliance with edge distances specified in Eurocode 5



APPROVALS FOR LIGNOLOC® WOODEN NAILS



NATIONAL TECHNICAL APPROVAL / GENERAL CONSTRUCTION TECHNIQUE PERMIT Z-9.1-899:

On August 28, 2020, the German Institute for Construction Engineering (Deutsches Institut für Bautechnik – DIBt) issued the “National technical approval / general construction technique permit” for “Load-bearing timber connections using LIGNOLOC® wooden nails”. The approval enables the planning, design and execution of load-bearing connections in timber frame construction. Planks and panels made of solid timber, wood-based materials or gypsum fiber can be attached to wood building materials using LIGNOLOC® wooden nails. In addition, connections can be made with LIGNOLOC® to produce bracing and load-bearing wall diaphragms.



ETA-23/0041: Our LIGNOLOC® wooden nails without head can be supplied with an European Technical Assessment (ETA) and are officially approved for use in load-bearing connections in all EU member states. On request we would be pleased to provide you with the corresponding documentation.



ETA L230330: Our LIGNOLOC® wooden nails without head can be supplied with an European Technical Assessment (ETA) and are officially approved for use in load-bearing connections in all EU member states. On request we would be pleased to provide you with the corresponding documentation.



INDIGENOUS BEECH WOOD THE RAW MATERIAL FOR LIGNOLOC® WOODEN NAILS

Beech is the wood best suited for the manufacturing of LIGNOLOC® wooden nails, because its vertical growth gives it the most homogeneous cell structure.

The nail is hardened by compressing the cell structure and permeating it with resin. This also gives the wood tremendous durability – outdoors as well.

Since beechwood is an indigenous and renewable raw material, this is particularly good for our environmental balance and rounds off our ecological approach to timber construction.



LIGNOLOC®

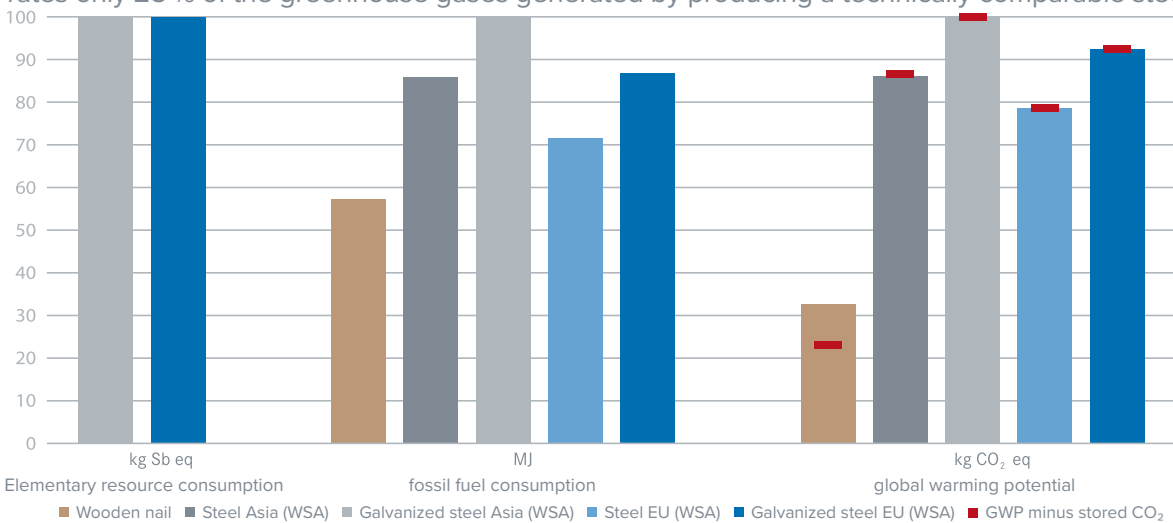
offers great potential for
sustainable construction
and living.



EXEMPLARY ECOLOGY

66 % LESS GREENHOUSE GASES THAN METAL NAILS

From production through recycling, LIGNOLOC® wooden nails distinguish themselves with their environmentally friendly properties. European beech is a renewable raw material with short transport distances. According to a study from the Nova Institute, production of a LIGNOLOC® wooden nail generates only 25 % of the greenhouse gases generated by producing a technically comparable steel nail.



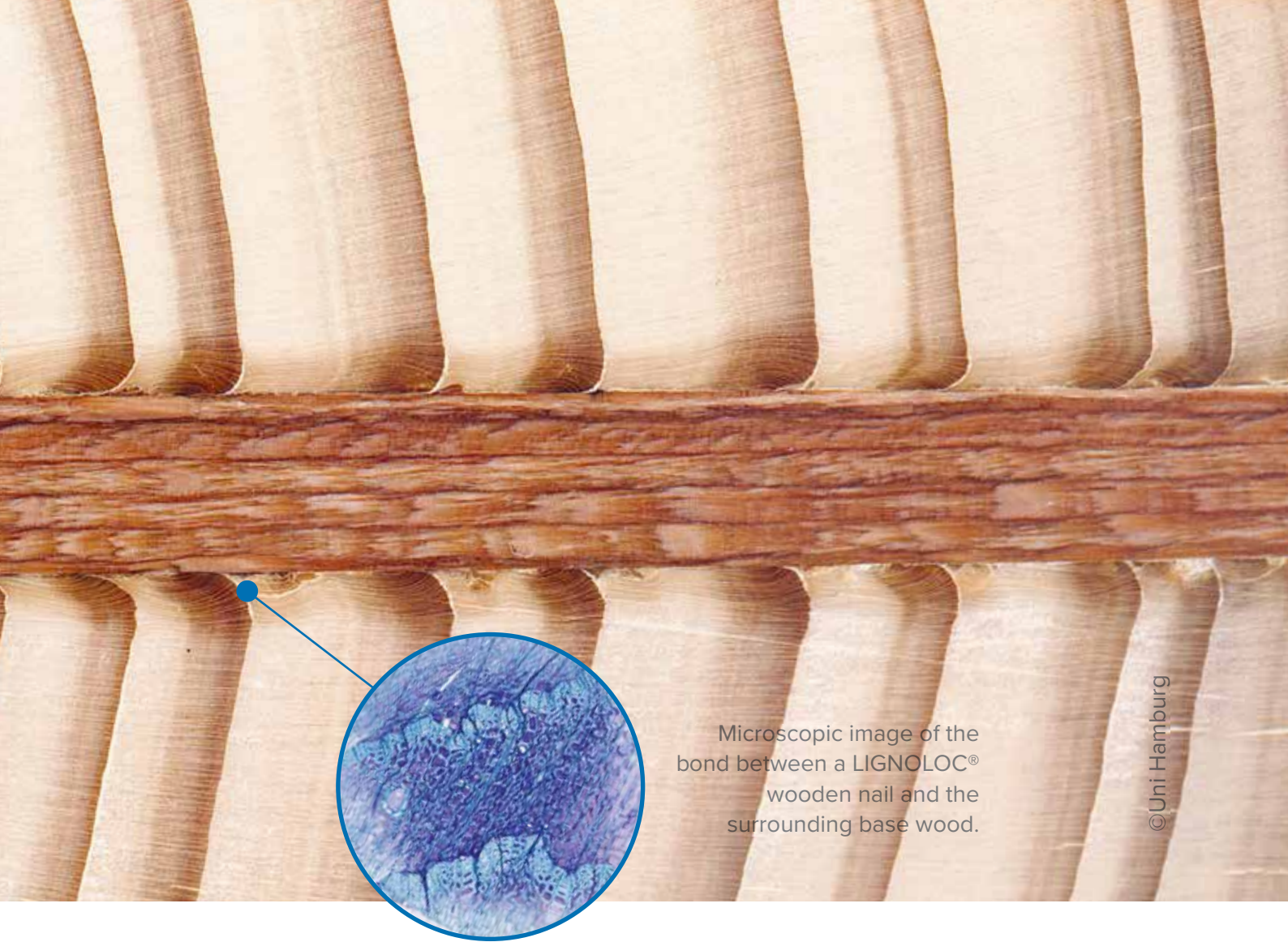
The graph shows the relative impacts of the LIGNOLOC® with 3,7 mm diameter compared to a functionally similar steel nail with 2,8 mm diameter made of European or Asian steel with or without zinc coating. LIGNOLOC® performs better in use of resources of elements and fossil fuels and it has a smaller impact in CO₂ emission. The red line is an indicator for the stored amount of biogenic CO₂ within the nail. Source: Nova Institute



HIGH HOLDING POWER THANKS TO **LIGNIN ADHESION**

SCIENTIFICALLY CONFIRMED LIGNOLOC® WOODEN NAILS BOND WITH THE SURROUNDING WOOD

Lignin adhesion characterizes the bonding phenomenon arising when two or more pieces of wood or components of lignin-rich materials like bamboo undergo rapid heating, typically in the millisecond range, reaching temperatures of approximately 160 °C or higher, followed by compression. The temperature-induced chemical transformation of the embedded lignin renders it soft and adhesive, solidifying upon cooling. The cohesive forces persist, effectively bonding the two pressed lignin-rich layers. The process of lignin adhesion occurs especially when wooden nails are driven into wood.



Microscopic image of the bond between a LIGNOLOC® wooden nail and the surrounding base wood.

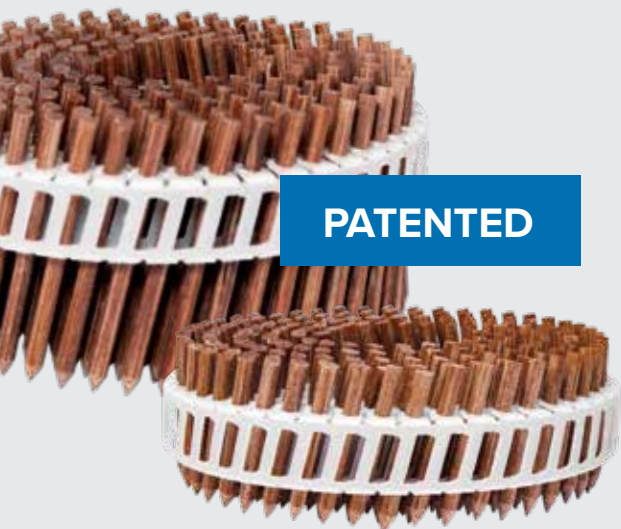
©Uni Hamburg

The ensuing surface friction between the nail and the wood matrix elevates the surface temperature beyond 160 °C. The driving action of the nail displaces the wood matrix, prompting a reactionary "pushback" against the nail. When utilizing LIGNOLOC® wooden nails, optimal conditions are established, featuring high temperature and flank pressure, thus triggering lignin adhesion. This gives the wooden nail twice the pull-out strength of a geometrically comparable steel nail.



THE LIGNOLOC® F44 SYSTEM

THE FIRST COLLATED NAIL MADE OF WOOD



LIGNOLOC® F44 WOODEN NAILS*

Diameter:	3,7 mm 0.146"
Lengths:	38 / 50 / 55 / 60 mm 1 ½ - 2 ¾"
Material:	Compressed beech wood
Colour:	Natural
Coil capacity:	170 nails
Collation Type:	15° coil LIGNOLOC®
Flexural strength:	1400 Nmm

LIGNOLOC® F44 PNEUMATIC NAILER*

FROM FASCO®



Height:	322 mm 12.67"
Width:	130 mm 5.12"
Length:	275 mm 10.82"
Weight:	2,40 kg 5.29 lbs
Pressure:	7 - 8 bar 100 - 120 psi
Actuation system:	Single shot & contact actuation
Loading:	Coil

THE LIGNOLOC® F60 SYSTEM

THE NEW DIMENSION IN COLLATED WOODEN NAILS

LIGNOLOC® F60 WOODEN NAILS*

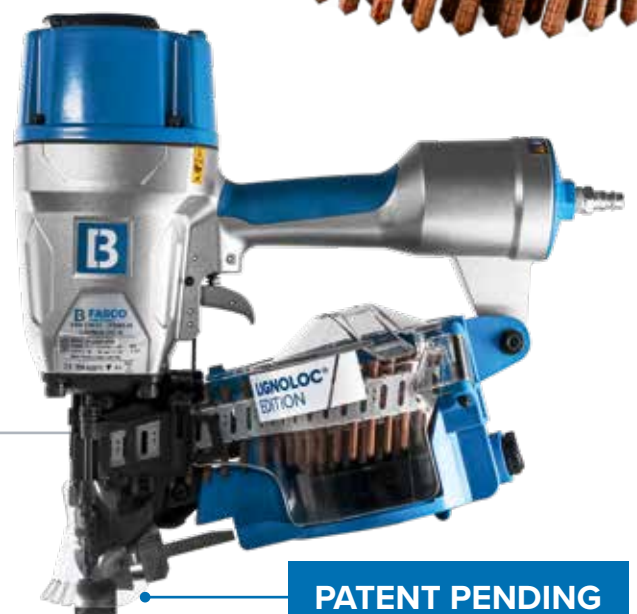
Diameter:	4,7 - 5,3 mm 0.185" - 0.209"
Lengths:	65 / 75 / 90 mm 2 ½ / 3 / 3 ½"
Material:	Compressed beech wood
Colour:	Natural
Coil capacity:	94 100 nails
Collation Type:	15° coil LIGNOLOC®
Flexural strength:	2250 - 3560 Nmm

LIGNOLOC® F60 WOODEN NAILS WITH HEAD*

Diameter:	4,7 mm 0.185"
Length:	58 mm 2 5/16"
Head:	6,3 mm 0.248"
Material:	Compressed beech wood
Coil-capacity:	100 nails
Collation:	15° coil LIGNOLOC®

LIGNOLOC® F60 PNEUMATIC NAILER* FROM FASCO®

Height:	387 mm 15.24"
Width:	142 mm 5.60"
Length:	369 mm 14.53"
Weight:	3,95 kg 8.70 lbs
Pressure:	7 - 8 bar 100 - 120 psi
Actuation system:	Single shot**
Loading:	Coil



* Subject to change without notice

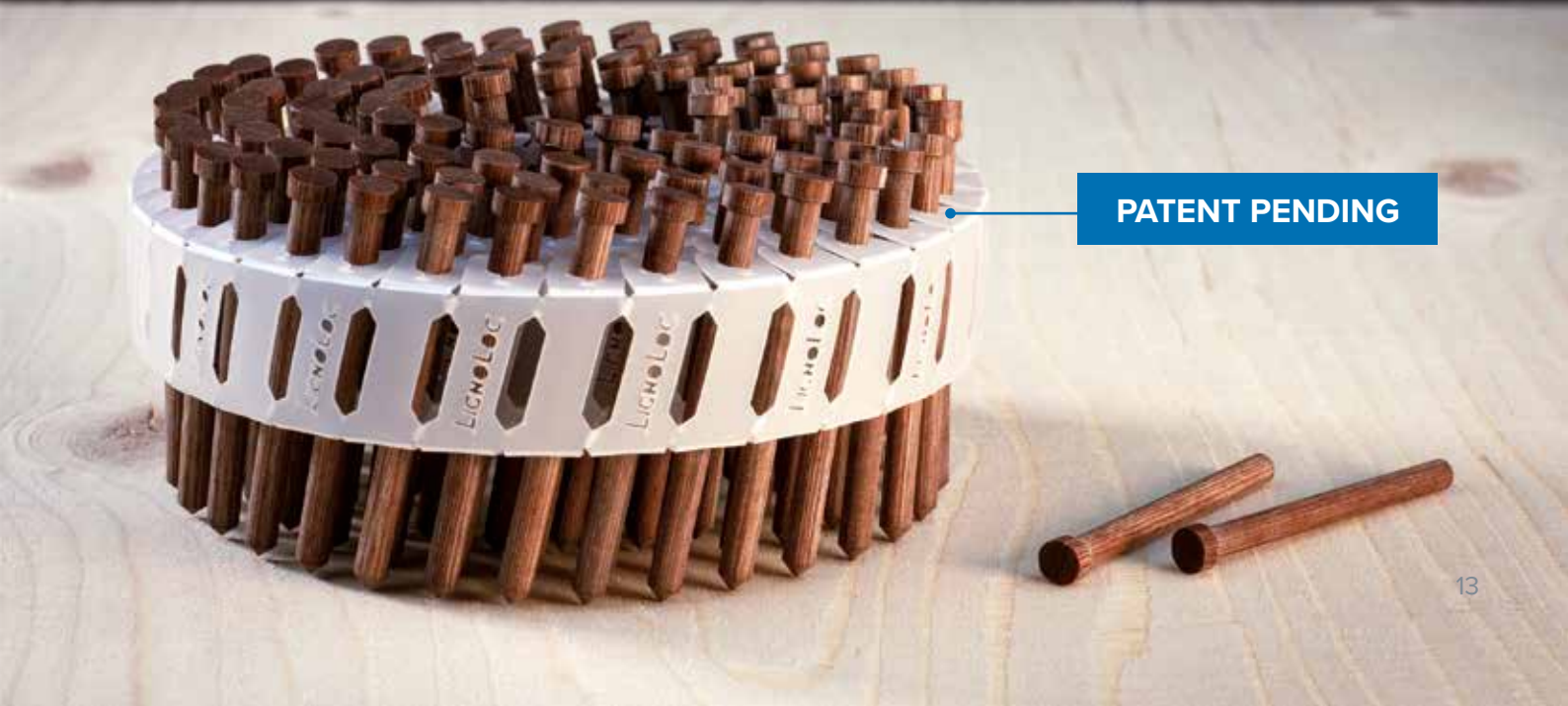
** Switchable trigger for contact actuation
is included for self-assembly



LIGNOLOC® WOODEN NAIL WITH HEAD FOR FAÇADES

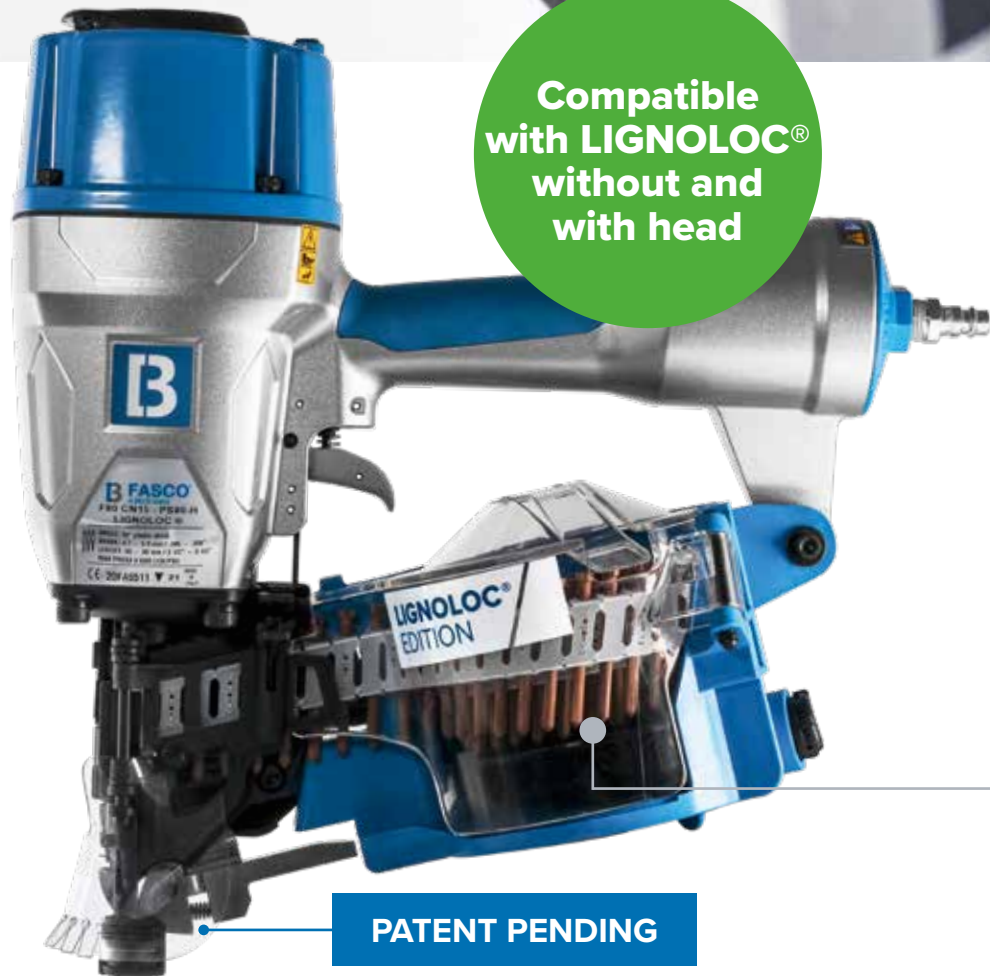
At **BECK** in Mauerkirchen, we are continuing our 360-degree approach of the wooden nail system. It has a blunt anti-splitting point and is suitable for the most common softwood façades as well as a variety of other applications, both indoors and outdoors, such as privacy screens, garden houses, garden pavilions, room dividers, etc.

Diameter:	4,7 mm 0.185"
Length:	58 mm, 78 mm 2 5/16", 3"
Head:	6,3 mm 0.248"
Material:	Compressed beech wood
Coil-capacity:	100 nails
Collation:	15° coil LIGNOLOC®
Tool:	FASCO® F60 CN15-PS90-H LIGNOLOC® (older tools can be retrofitted)





Compatible
with LIGNOLOC®
without and
with head



PATENT PENDING



LIGNOLOC® F60 PNEUMATIC NAILER* FROM FASCO®

Height:	387 mm 15.24"
Width:	142 mm 5.60"
Length:	369 mm 14.53"
Weight:	3,95 kg 8.70 lbs
Pressure:	7 - 8 bar 100 - 120 psi
Actuation system:	Single shot**
Loading:	Coil
Tool:	FASCO® F60 CN15-PS90-H LIGNOLOC®



* Subject to change without notice

** Switchable trigger for contact actuation
is included for self-assembly



LIGNOLOC® STEPPED

The new LIGNOLOC® with a diameter of 3.5 mm and a length range of 22-40 mm is ideal for filigree precision work, particularly in kitchen or furniture construction, as well as for fine work in interior fittings or interior wall paneling. The nail with head impresses with its stepped shaft, which minimizes wood splitting, making it a perfect choice for carpenters and joiners.

Diameter:	3,5 mm 0.138"
Length:	22 - 40 mm 7/8 - 1 9/16"
Head:	4,2 mm 0.165"
Material:	Compressed beech wood
Coil-capacity:	150 nails
Collation:	15° Coil LIGNOLOC®
Tool:	FASCO® F33 CN15-PS40 LIGNOLOC®





Compatible
with LIGNOLOC®
wooden nail
stepped





LIGNOLOC® F33 PNEUMATIC NAILER* FROM FASCO®

Height:	290 mm 11.42"
Width:	110 mm 4.33"
Length:	263 mm 10.35"
Weight:	1,87 kg 4.12 lbs
Pressure:	6 - 7 bar 80 - 100 psi
Actuation system:	Single sequential actuation & Contact actuation
Loading:	Coil
Tool:	FASCO® F33 CN15-PS40 LIGNOLOC®





LIGNOLOC® WOODEN NAILS: KEY BENEFITS

QUICK PROCESSING – NO PRE-DRILLING*

LIGNOLOC® wooden nails are fired in pneumatically. This completely eliminates the need for pre-drilling* and gluing, such as that for wooden dowels, thereby saving time and money.



CORROSION-RESISTANT AND DIMENSIONALLY STABLE

LIGNOLOC® wooden nails cannot rust and their special composition makes them resistant to swelling and fungal infestation. They are suitable for use in utilisation categories 1, 2 and 3 as per Eurocode 5 / DIN EN 1995-1-1.



* For wood weighing 350 to 500 kg/m³ and in compliance with edge distances specified in Eurocode 5



ECOLOGICALLY MORE SUSTAINABLE THAN METAL NAILS

From production through recycling, LIGNOLOC® wooden nails distinguish themselves with their environmentally friendly properties. Furthermore, the material uniformity has thermal benefits – the wooden nails form no thermal bridges.



POST-PROCESSING WITHOUT ANY TOOL WEAR

LIGNOLOC® wooden nails conserve cutting tools and saw blades. Post-processing of prefabricated wooden elements or machining is simplified because of no metallic foreign bodies.





USE IN ECOLOGICAL WOOD PROCESSING METAL-FREE AND SUSTAINABLE

The LIGNOLOC® system from BECK opens up countless application options for you – whether it be indoors, in covered outdoor areas or in areas susceptible to corrosion:

- Laminated wood construction and solid wood wall systems
- Solid wood applications
- Decorative interior timber cladding
- Wooden furniture
- Sauna construction
- Floors: OSB and solid wood floorboards
- Reclaimed wood processing
- Boat building
- Wooden coffins
- Fixing boards
- and many more

RECLAIMED WOOD PROCESSING

LIGNOLOC® wooden nails made from old wood blend harmoniously into the wood structure and do not need to be concealed after installation. This time benefit makes wood recycling even more attractive.



INTERIOR TIMBER CLADDING

For aesthetic reasons, interior paneling made of wood is mostly fastened invisibly. With LIGNOLOC® wooden nails, these panels can now be mounted visibly as well.



WOODEN FURNITURE

Wood is alive – LIGNOLOC® lives along with it. LIGNOLOC® wooden nails are ideal for use in natural furniture production, lending its appearance a finishing touch, both indoors and in covered outdoor areas.



We would be pleased to help you with possible applications.
Contact us at www.beck-fastening.com/en/contact or +43 7724 2111-0.

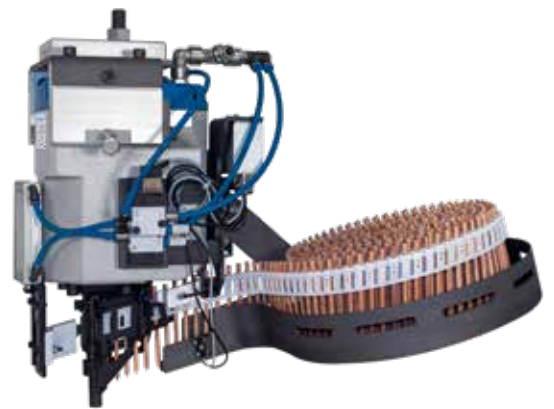


USE IN INDUSTRIAL PRODUCTION TIME-SAVING MATERIAL UNIFORMITY

The ecological and functional benefits of LIGNOLOC® wooden nails can also be utilised industrially. LIGNOLOC® can be processed both with LIGNOLOC® hand-held pneumatic nailers and with LIGNOLOC® HEADs from FASCO® in automated systems.

FASCO® LIGNOLOC® HEAD*

Weight:	14 kg 30.865 lbs
Operating pressure:	min. 7 - 8 bar 100 - 120 psi
Firing speed:**	max. 4 shots per second at max. 14 m/min feed rate
Trigger system:	Pneumatic remote release
Magazine type:	15° plastic sheet of 850 LIGNOLOC® wooden nails Integrated belt separator



* Subject to change without notice ** Using a 50 mm coil LIGNOLOC®

Currently connection to the following systems is possible:



Weinmann und Techno-wood are trademarks of their respective owners.

CROSS-LAMINATED TIMBER (CLT) PRODUCTION GLUED AND VACUUM-PRESSED

LIGNOLOC® wooden nails for fixing the CLT visible layer are not only aesthetically more appealing than aluminium nails, they also cause no damage to the vacuum membrane of the press.



SOLID WOOD WALL SYSTEMS

LIGNOLOC® is an alternative to wooden dowels in solid wood wall construction, offering a metal-free, quick layer connection mechanism. In contrast to steel fasteners, the walls can be post-processed without cutting tool wear.



PALLET PRODUCTION

Pallets nailed together with LIGNOLOC® protect the transported goods and have no protruding nail heads to cause scratches. At the end of their service life, the pallets can easily be chopped up and recycled.



We would be pleased to help you with possible applications.
Contact us at www.beck-fastening.com/en/contact or +43 7724 2111-0.



FIND OUT MORE ABOUT
LIGNOLOC®

BETTER IDEAS – EXCITE

With LIGNOLOC® we have created a revolutionary product that excites with its unique vision and convincing features and wins awards such as the internationally renowned German Design Award for innovative product design, the Innovation Award Architecture + Building or the Green Product Award. We celebrate every award, but we are even more enthusiastic about the projects implemented and our customers' success with LIGNOLOC®. Because that is what it is about. Below you can see selected reference projects.



© ICD Stuttgart

BUGA 2019

Garden Exhibition, Heilbronn,
Germany (April - October, 2019)



SHIPWRECK LODGE

Skeleton Coast, Namibia (April, 2018)



Photography: Daniel Sebaldt

STUDENT-PROJECT 1000x

SummerFAB at Wentworth (April, 2018)



© ICD Stuttgart

AWARDS



SWIMMING HALL
HjeltefjordenArena, Norway
(November, 2019)



FAMILY HOTEL
Wuyuan, China (2020)



BUTCHERY SALES ROOM
Lohrhaupten, Germany (April, 2018)

BECK is a family company founded in 1904. Since more than 85 years, BECK is one of the world's leading manufacturers of innovative fastening solutions.

Whether it be developments in response to customer requirements or to keep ahead of the market – innovation is the driving force behind BECK. The company's in-house R&D team searches tirelessly for new solutions to provide BECK customers with greater user comfort and cost-effectiveness.

BECK is now a globally active, family-owned company with sites in Austria, Germany, Italy, Poland and the USA.

RAIMUND BECK NAGELTECHNIK GMBH

Raimund-Beck-Str. 1
5270 Mauerkirchen | Austria
T +43 7724 2111-0 | F +43 7724 2111-20
sales.int@beck-fastening.com | www.beck-fastening.com

BECK AMERICA, Inc.

105 Industrial Park Drive
35661 Muscle Shoals, AL | USA
P +1 800 239-8665
sales.us@beck-fastening.com | www.beck-fastening.com

