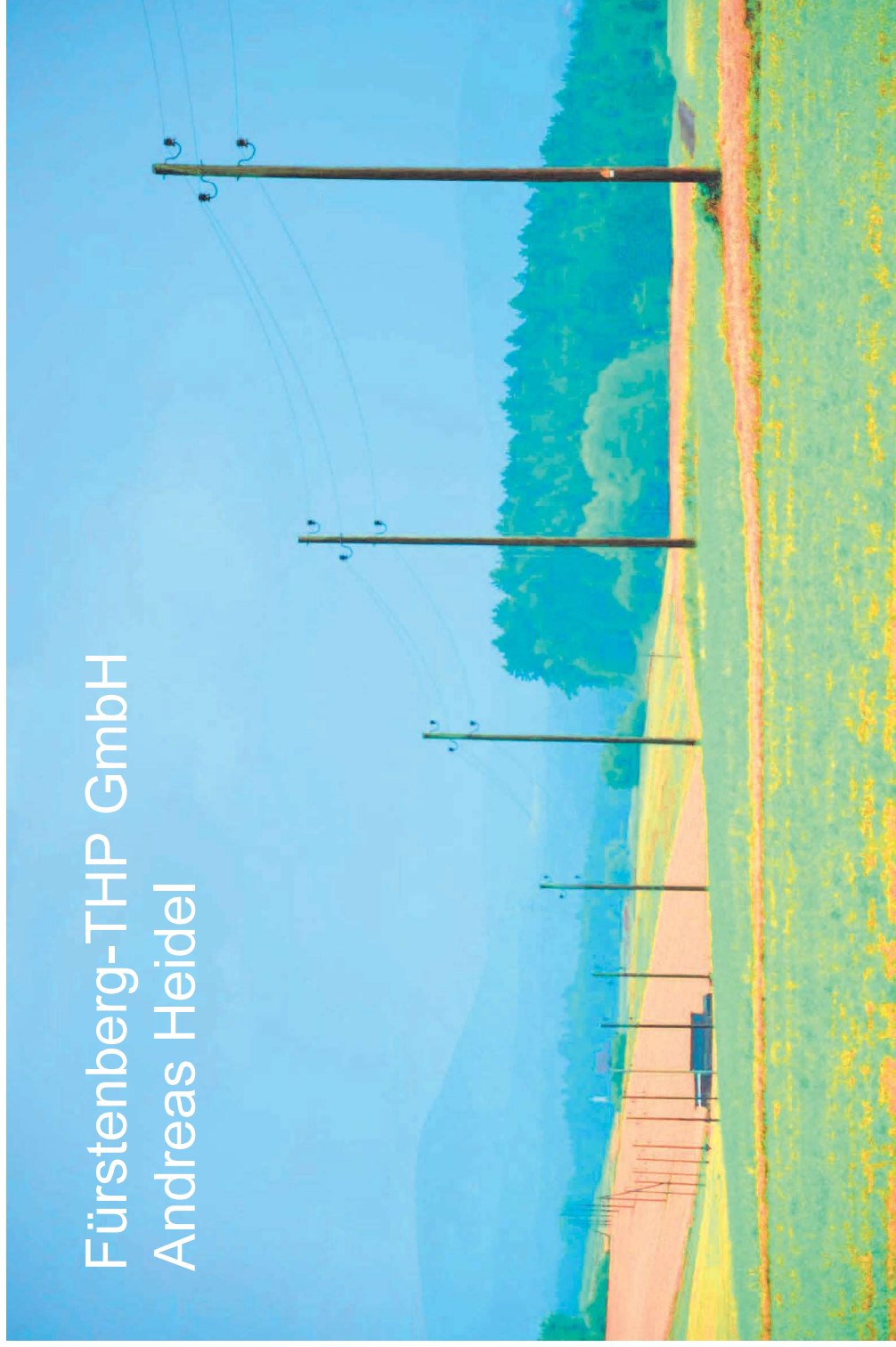




▼ New protection procedures – wooden poles

▶ **The wooden pole**

Fürstenberg-THP GmbH  
Andreas Heidel





## ▼ Introduction

### ▶ The wooden pole

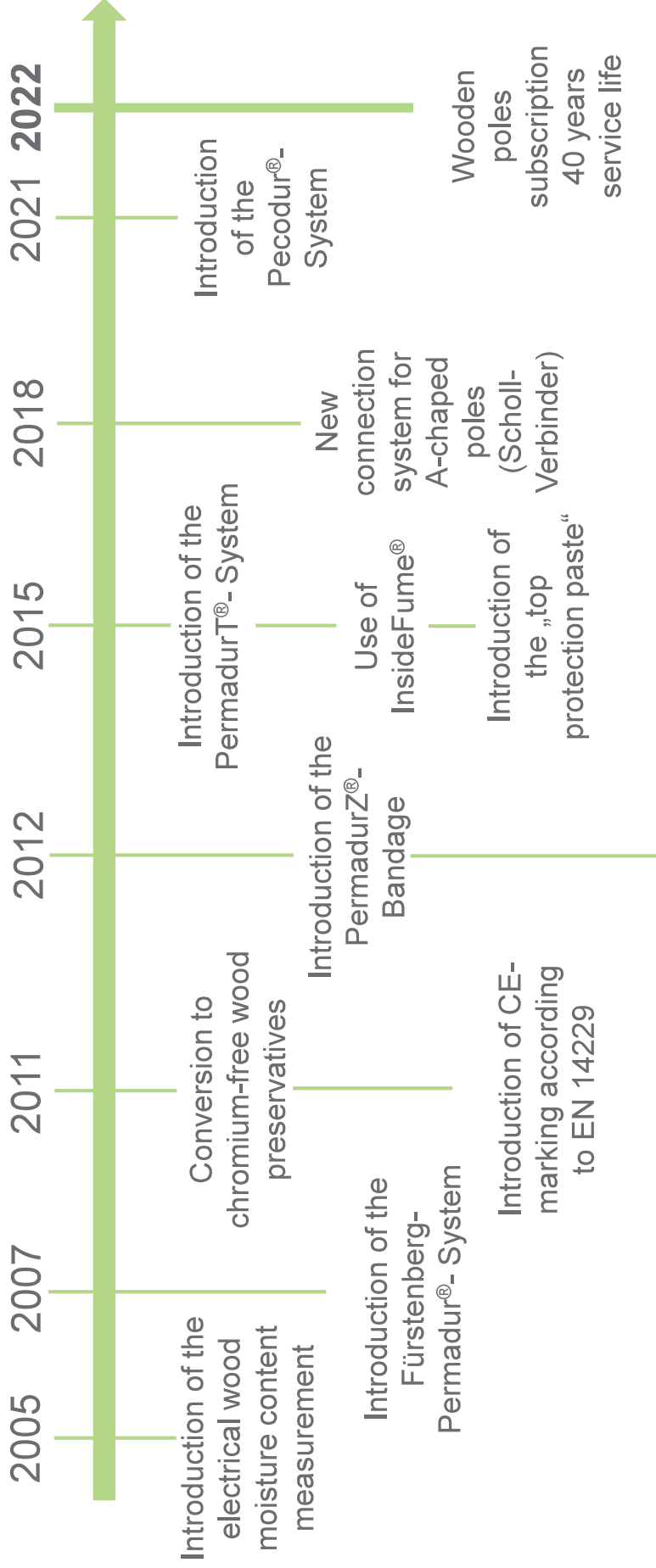


- Load carrying element used mainly in:
  - The field of **energy transmission**
  - The field of **telecommunication**
- Used wood species in northern Europe:
  - **Softwoods** (Spruce and Scots pine)
- Numerous positive properties compared to poles made from alternative materials:
  - Perfect weight to strength ratio
  - High insulation capacity
  - Reusability
- Foundation not required
  - Installation into the ground (1/6 pole length)
    - Energy transmission: min 1,6 m
    - Telecommunication: min 1,5 m



▶ Introduction

▶ **Development of wooden poles in the last 20 years**



Introduction of the Fürstenberg-Permadur®-System

Introduction of CE-marking according to EN 14229

Conversion to chromium-free wood preservatives

Introduction of the PermadurZ®-Bandage

Introduction of the PermadurT®-System

New connection system for A-shaped poles (Scholl-Verbinder)

Introduction of the Pecodur®-System

Wooden poles subscription 40 years service life

Labelling of each pole with a consecutive number for traceability

▼ Impregnation

▶ **Improvement of impregnation quality**

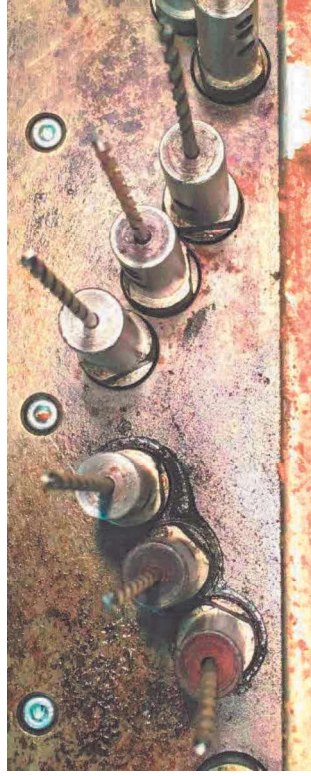


**1. Electrical wood moisture content measurement**

- Ensure the correct moisture content before impregnation (below fiber saturation)
- Individual measurement and protocolation
- “Wet” poles will return to the stock yard

**2. Perforation of the groundline area**

- Improvement of preservative penetration in the groundline area
- Drilling holes of 30 mm depth
- Drilling scheme to reach a spotless penetration





▶ Groundline protection systems

▶ **Fürstenberg-Permador®-System**





▼ Fürstenberg-Permador® System

▶ **General information**



- ▶ Start of development in 2005:
  - feasible alternative to conventional poles with creosote treated butt
  - Collaboration with authorized expert Norbert Marx
- ▶ Essential reasons for such a development were:
  - The creation of a mechanical stabilization of the groundline
  - A reduction of the leaching of the active substance through an effective isolation of the groundline
  - Increasing complaints respecting smell and stock yard contamination due to traditional creosoted poles (drip off)



▼ Fürstenberg-Permandur® System

▶ **General information**

➤ 3 versions for different fields of application



**Permandur® -System for  
energy transmission poles**



**PermandurT® -System  
for telecommunication  
poles**



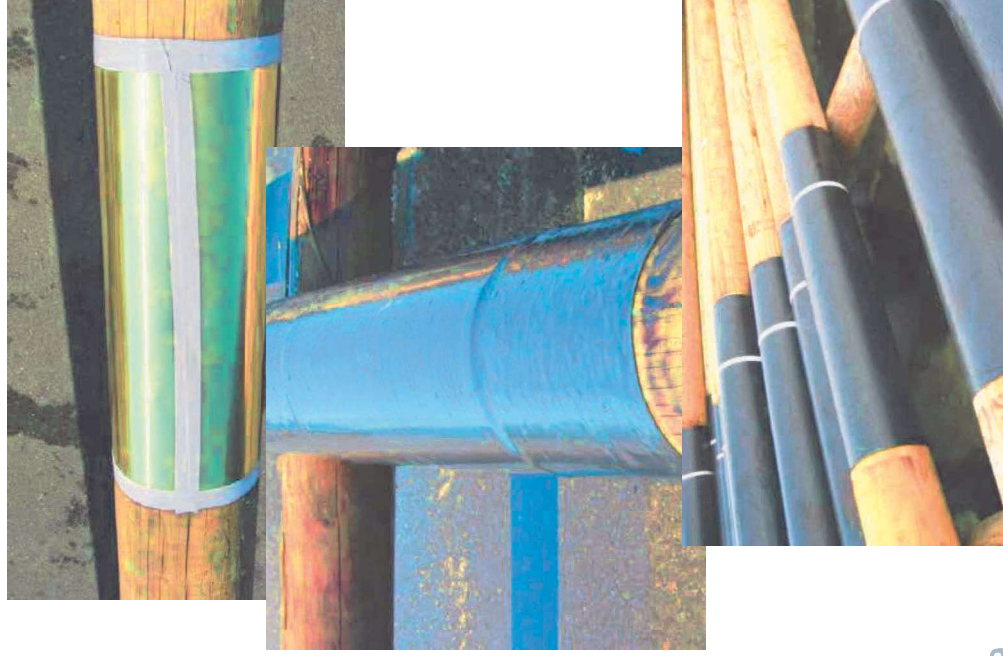
**PermandurZ® -Bandage  
for remedial treatment**



## ▶ Fürstenberg-Permador® System

### ▶ Assembly I

- ▶ Assembling the metal foil (brass)
  - Fixation with nails
  - Damage prevention of the sleeve by duct tape
- ▶ Covered brass foil with the sleeve:
  - Heated sleeve contracts firmly and the metal foil is tightly pressed to the pole
  - Reinforcement of the critical part of the pole by the metal foil and the sleeve.
  - Installation in the designated area (ground-/air-zone)
- ▶ Assurance of an easy perceptibility during installation:
  - Marking with a thin duct tape
  - Sign the correct installation depth





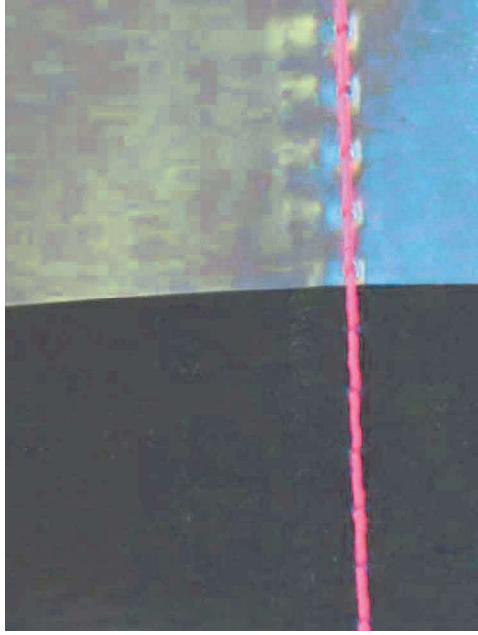


▼ Fürstenberg-PermaturZ® Bandage

▶ **Technical overview**



- Outer layer: 0,5 mm thick PE-foil
- Inner layer: 0,1 mm thick zinc-foil
- Glued and sawn together
- Shipped in boxes





▶ Fürstenberg-PermaturZ® Bandage

▶ **Mode of action**



- Expose the groundline level
- Wrap around the bandage
- Fixating with clamps



- Tighten the bandage
- Fixating with clamps

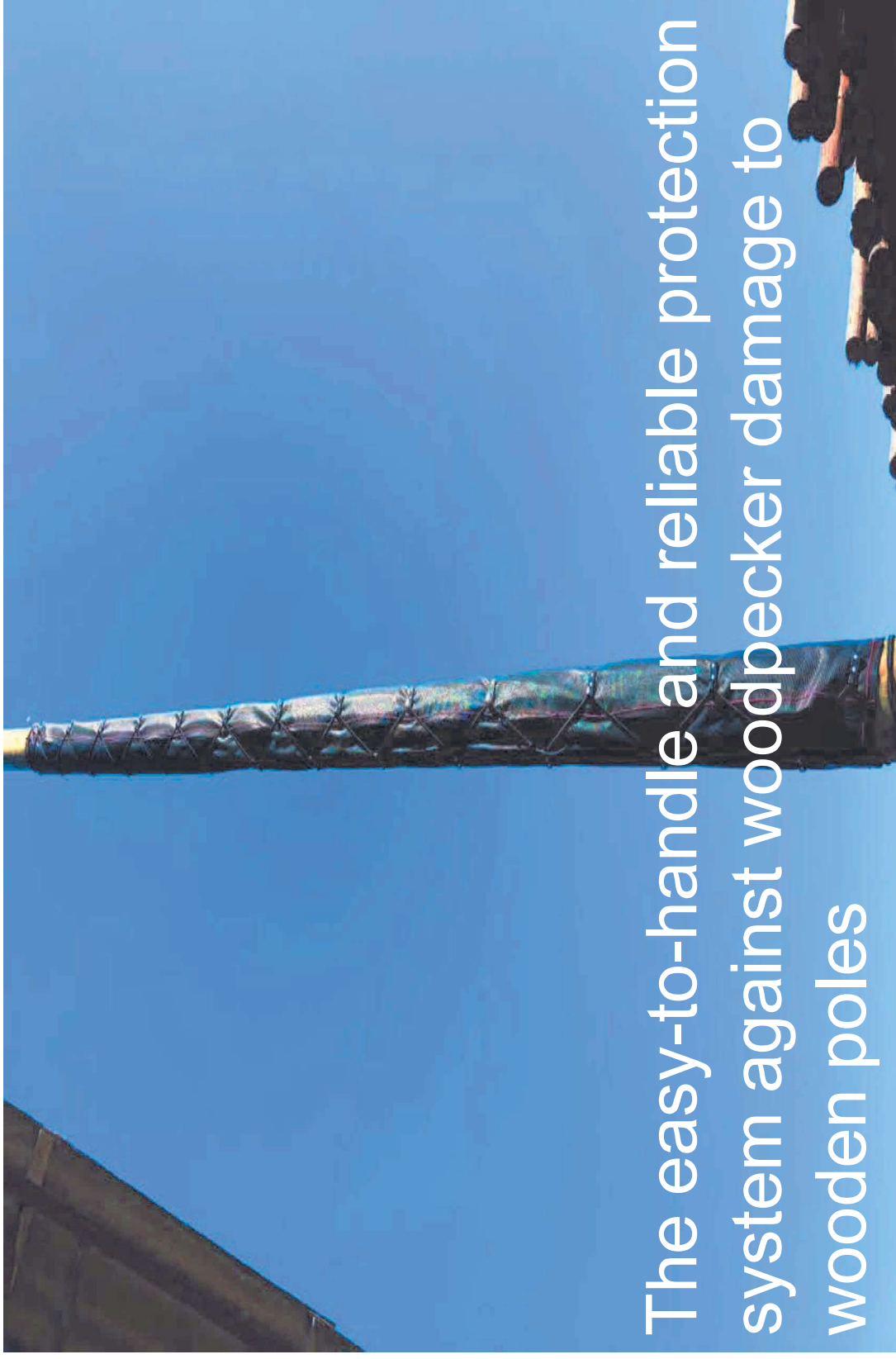


- Sealing with tape



▼ Dated 07 / 2022

▶ **Fürstenberg-Pecodur-System®**

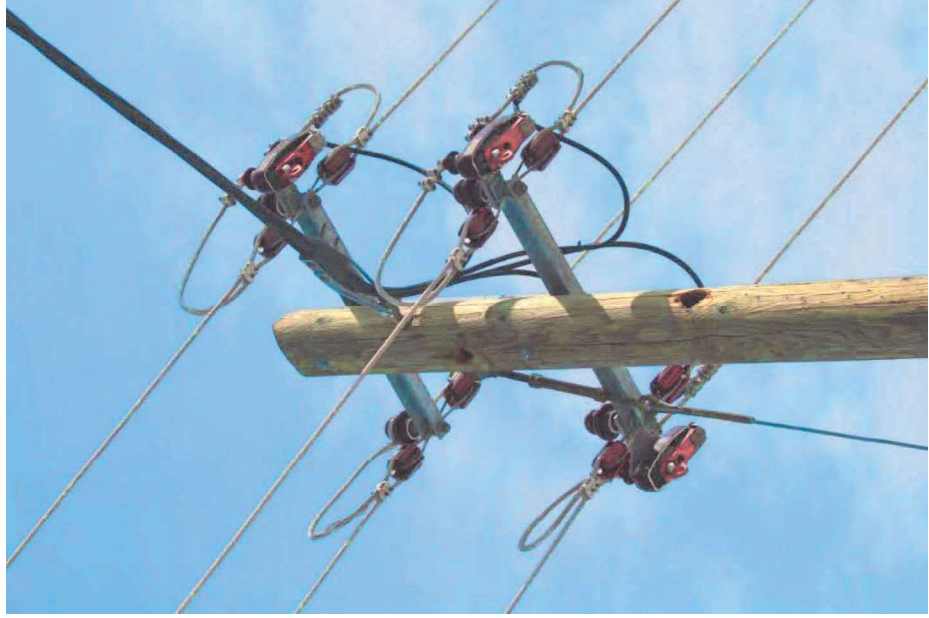


The easy-to-handle and reliable protection system against woodpecker damage to wooden poles



▶ Fürstenberg-Pecodur-System®

▶ **Background**



- ▶ Damages to wooden poles by woodpeckers is still a significant problem!!
- ▶ Confirmed by partners from:
  - Sweden
  - Great Britain
  - Spain
  - Finland
  - United States
- ▶ Annually replacement of approx. 500-1000 poles in Germany
  - Costs amount to approx. 1 million €/year

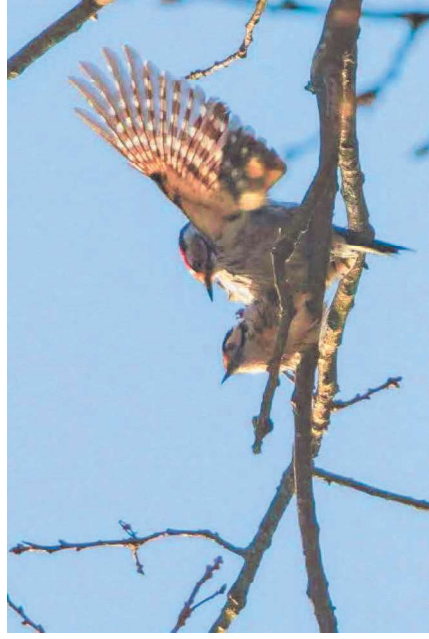


## ▶ Fürstenberg-Pecodur-System®

### ▶ **Philosophy and objectives**



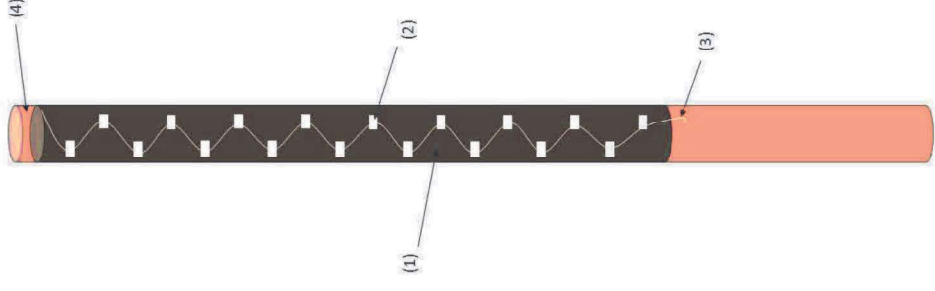
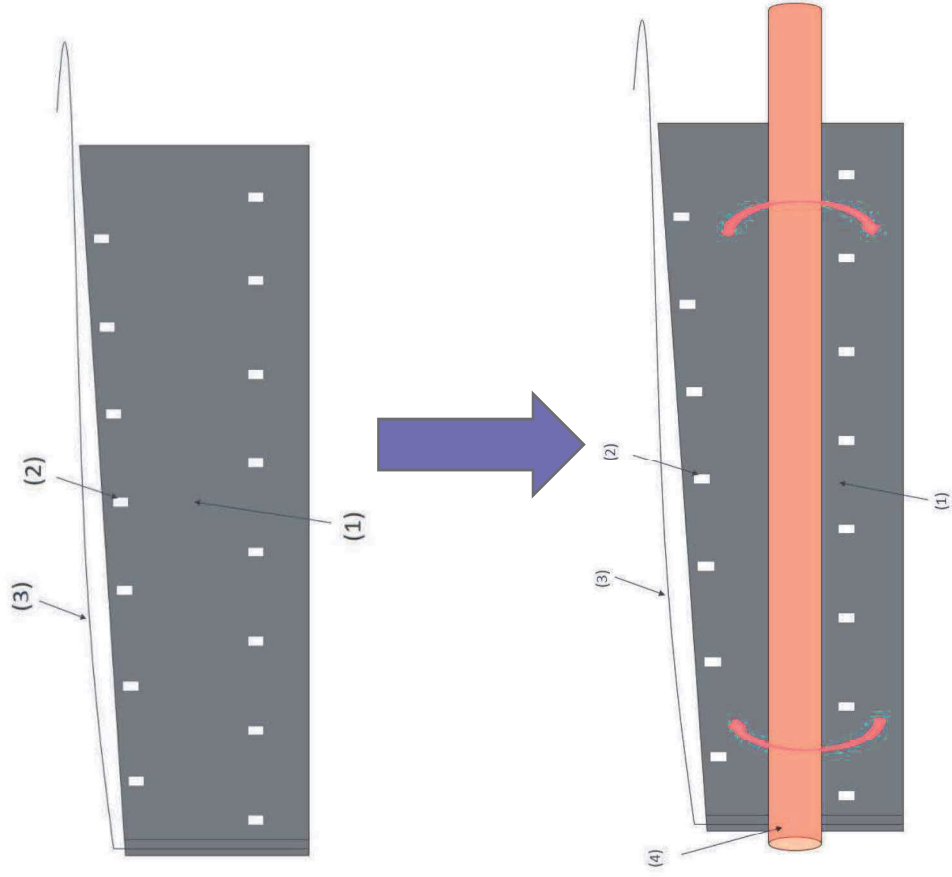
- ▶ Development of an easy-to-handle and reliable protection system against woodpecker damage on wooden poles
  - Cooperation with SVB Marx
- ▶ The main focus of the protection system is on the following aspects :
  - Non-lethal defense of the woodpecker
  - Possibility of further maintenance work without completely removing or destroying the system (climbing the pole)
  - Easy application of the protection system
- ▶ Cooperation with an ornithologist during the development process
  - Evaluate the way of life of the woodpecker
  - Ensuring the non-lethal mode of action of the protection system





▶ Fürstenberg-Pecodur-System®

▶ Design sketch





Further information

Warranty

**40 JAHRE STANDZEIT – UNSER ERFOLGSKONZEPT**

**CLEVERE LÖSUNGEN ZUR STANDZEITERHÖHUNG**

50 Jahre ist ein stolzes Jubiläum für die Holzindustrie. In den vergangenen 50 Jahren haben wir uns als Holzproduzent etabliert und haben uns durch unsere innovative Holzverarbeitung und Holzprodukte einen Namen gemacht. Heute sind wir ein Unternehmen, das sich durch seine innovative Holzverarbeitung und Holzprodukte auszeichnet. Wir sind stolz darauf, dass wir in den vergangenen 50 Jahren einen Namen gemacht haben, der für Qualität und Zuverlässigkeit steht.

**FÜR UNSERE KUNDEN JETZT GANZ EINFACH MIT DEM „HOLZMAST-ABO“**

Unser neues Konzept ist es, dass sich jeder Kunde den Mast mit Permadur® an die Masten für seinen Mastenmast anhängen kann. Das Mastenmast-Abonnement ist ein innovatives Konzept, das es unseren Kunden ermöglicht, die Kosten für die Mastenmasten zu senken und die Lebensdauer ihrer Masten zu verlängern. Das Mastenmast-Abonnement ist ein innovatives Konzept, das es unseren Kunden ermöglicht, die Kosten für die Mastenmasten zu senken und die Lebensdauer ihrer Masten zu verlängern.

**Das Konzept:**

- Eine Mastenmasten-Abonnement-Dauer von 10 Jahren
- Wenn Permadur® nach 10 Jahren abgebaut wird, wird die Mastenmasten-Abonnement-Dauer auf 20 Jahre verlängert.
- Die Mastenmasten-Abonnement-Dauer wird auf 40 Jahre verlängert.

Das Mastenmast-Abonnement ist ein innovatives Konzept, das es unseren Kunden ermöglicht, die Kosten für die Mastenmasten zu senken und die Lebensdauer ihrer Masten zu verlängern. Das Mastenmast-Abonnement ist ein innovatives Konzept, das es unseren Kunden ermöglicht, die Kosten für die Mastenmasten zu senken und die Lebensdauer ihrer Masten zu verlängern.

**Die Vorteile:**

- Ein Mastenmasten-Abonnement für 10 Jahre
- Ein Mastenmasten-Abonnement für 20 Jahre
- Ein Mastenmasten-Abonnement für 40 Jahre

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www.fuerstenberg-thp.de

**BESTE QUALITÄT HIGHEST QUALITY**

**FÜRSTENBERG HOZ-**

- **15-year warranty for poles with the Permadur® system**
  - Coverage of costs in the event of a warranty claim (rot in the groundline level)
    - Installation and removal
- **40 years of service life with the new "wooden pole subscription"**
  - In combination with the InsideFume® treatment
  - **Service life: Over 40 years of reliability**
- **What is the warranty for steel, concrete and fiberglass?**



▶ Further information

## ▶ Climate notification

- Established in 2023
- Raising customer awareness
- Potential of wood as a renewable and regional raw material for storing CO<sub>2</sub>
- Issued for all our wooden products

**CLIMATE NOTIFICATION**  
ABOUT ACCOMPLISHED CO<sub>2</sub>-STORAGE 2024

Holder of climate notification

**Holder**

With your purchase of **XXX pieces** of round wooden poles, you have achieved an additional CO<sub>2</sub> storage effect of **XXX tons.**

You have made an important contribution to climate protection!

**THANK YOU!**

Trees absorb carbon dioxide as they grow and store it throughout their lifespan. This reduces the entry of CO<sub>2</sub> into the atmosphere. When the tree is felled and processed into timber, the CO<sub>2</sub> remains bound in the wood product. The duration of CO<sub>2</sub> storage will be significantly extended (>30 years) by professional impregnation and the resulting longer 'shelf' life of the product. This means that impregnated wood products are part of a self-contained, neutral CO<sub>2</sub> cycle.

Hüfingen

FÜRSTENBERG-THP GmbH

FÜRSTENBERG HOZ