



(Lofoten Islands, Norway)

ENERGY

Wood replacement hybrid pole | Factsheet

EURO POLES

# HYBRID POLE AS REPLACEMENT FOR WOODEN POLES

Direct replacement for impregnated wooden poles

Re-use of existing accessories

Combines advantages of steel and composite

Very long lifetime, cost efficient and easy to handle

Solution for rock foundation

The Euro poles hybrid pole combines the cost effectiveness and technical reliability of steel with the insulating properties and high flexibility of composite.

Safe. Economic. Environmentally friendly. Very long lifetime.

The concept of combining two different materials with one another is what makes the Euro poles hybrid pole the best option for extending or replacing overhead power lines.

A polygonal solid steel lower section is inserted and bolted into a composite upper section. The hybrid pole can be used as a direct replacement for impregnated wooden poles. Existing accessories and all joining elements can be re-used.





Hybrid pole with curved base post-type insulator cross beam



Hybrid pole triangular system



The tubular round composite top section is fixed to the steel bottom section with a push-in connection.

The lower section is made of steel, while the upper part is a cylindrical pipe made of spun composite sealed with a plastic cap.

Thanks to the modular hybrid design, the cross beams can be connected easily according to individual requirements and the poles can be climbed quickly and safely.

The hybrid pole is easy to handle in terms of the calculations involved and the installation as such, so it is particularly suitable for 1:1 pole replacement.

## MATERIAL – STEEL AND COMPOSITE WELL COMBINED



The hybrid pole offers high strength and minimal deflection with low pole weight compared to wooden poles. Even under extreme weather conditions, its performance is outstanding. Shear vibrations and galloping performance due to ice build up on cables are not an issue. The hybrid poles are constructed to handle extreme wind loads and harsh weather all year. Steel and composite are not susceptible to insect infestation, damage by wild animals or rotting. The non-conductivity of the system is achieved due to the high dielectric strength/insulating properties of the composite top section.

### Steel – durable and strong

Steel is a well-approved and reliable material. Due to the duplex surface treatment of galvanizing and coating there is no risk of corrosion.



### Composite – flexible and non-conductive

In the composite top section, drill holes and cut-outs can be done either in the factory or on site, providing greater flexibility. Existing attachments like cross-beams, clamps and sleeves can be re-used.

The hollow pole is ideal for safely accommodating cable and, if required, earthing.

The interface between the steel and composite sections is a structural element that is designed to yield in a specific way in case of an extreme event. For example, if the pole is struck by a falling tree, the upper section breaks off and can simply be replaced, while the steel section underneath stays in place.

The poles can be colour-coordinated to match any environment. Even high, seasonal temperature changes will not damage the coating. The hybrid pole can be dismantled and easily repositioned if necessary.

>>> THE TECHNOLOGY: RELIABLE, DURABLE AND FLEXIBLE TO PROVIDE THE MAXIMUM POSSIBLE OPERATIONAL RELIABILITY <<<

## HANDLING AND TRANSPORT – MADE EASY

The hybrid pole from Euro poles can replace wooden poles 1:1 at the same location, depending on the requirements of the network operator. There is no need to perform complicated pole and line designs or to redo structural analyses.

Thanks to the low weight no heavy machinery is required for installation. This in turn facilitates official permitting processes and simplifies coordination with landowners.

Thanks to its excellent features the hybrid pole can be installed at almost any location, from built up

areas, forests and rocky mountains. There is no need for the kind of occupational safety measures necessary when handling impregnated wooden poles. The hybrid pole does not pollute the soil in anyway compared to creosote impregnated wooden poles.

No special provisions have to be made for storage and transportation. For shipping by truck, the pole can be transported assembled in one piece. If a container is necessary the top and bottom sections can be transported separately and assembled on site.

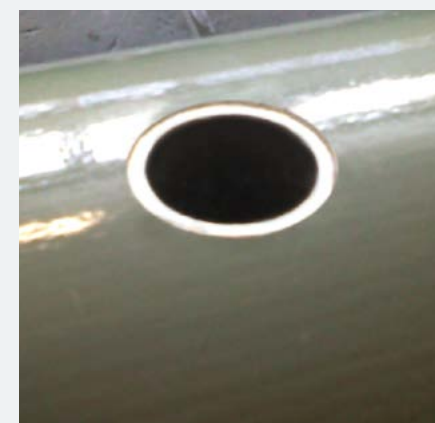
>>> SIMPLE AND CONVENIENT HANDLING <<<



## ACCESSORIES – FLEXIBLE GUY MOUNTING FOR QUICK ALIGNMENT AND LEVELLING

As well as the hybrid pole, Euro poles naturally also offers all necessary accessory parts, from pipe sleeves and clamps through drilling templates to cable run-ups, termination rings and support rings.

Various cross beams (X, Y, square profile cross beams, single and multiple cross beams with tie rods etc.) are included in our standard range.



Pipe sleeves



Removable collar for fixation of staywires and mainstays



Termination ring, cable openings and mainstays



# IN-GROUND FOUNDATION – SIMPLY EASY



## Easy installation

The hybrid pole is designed so that it can be simply put into a hole in the ground, then filled up with earth, gravel, stones and compacted. No concrete whatsoever is needed.



## Pressure plate

For lengths over 16 m or if the soil is loose and/or there is rising water a pressure plate is used which is simply attached to the pole.



## Ribbed pole

In the case of higher effective loads, a hybrid pole with a welded-on steel rib at ground level can be used. Again, the pole is embedded without concrete and immediately ready for use.



# PREPARATION – SIMPLE AS IT GETS

The composite top section can be readily handled using standard tools, including at the pole installation site. A wide range of cross beams, termination and support rings can therefore be easily fitted. Cable slots and threaded bushings for cable strain relief and if required earthing can also be produced quickly.

The cross beams usually used for wooden poles can be attached effortlessly.

## Picture 1:

The drill holes can be placed easily, quickly and safely using a drilling template.

## Picture 2:

A simple battery-powered drill with a milling attachment is adequate for drilling the holes. The pole can be worked in a horizontal or vertical position.

## Picture 3:

Easy mounting of a cross beam at the installation site.

# ROCKFOUNDATION – MAXIMUM FLEXIBILITY



Flange



Dowel



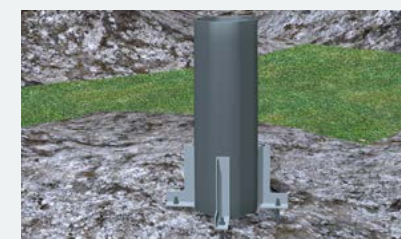
Sleeve



Pot

Rockfoundation provides maximum flexibility for Norwegian ground conditions near sea or on top of the mountain.

# SLIPOVER CONNECTION – FAST AND STRONG



Our slipover connection is one of the most popular foundation solutions. Significant advantage is that foundation and lower part of pole could be completely well prepared before erecting pole. In next step pole has just to be slipped over. The slip over connection simplifies aligning the poles to ensure straight poles. By using a short upper part, to handle aligning is made easy.



## INSTALLATION AND CLIMBING – QUICK AND SAFE



A small digger with lifting gear is sufficient for placing the pole.



Installation on steep slope, access via mobile ladder.



Professional fall arrest system and mobile ladders.



Use of climbing irons.

## VALUE FOR MONEY – UNBEATABLE COMBINATION

Hybrid poles have a very long lifetime, are reliable, require nearly no maintenance and compared to wood poles inspection cycles can be extended.

Because installation of the hybrid pole is so easy, there is no need for expensive heavy machinery or costly

work to install access paths and roads. If the hybrid pole gets damaged, it is generally sufficient to replace the composite part and not the entire pole. So costs for repairs are massively reduced. Minor damage to the coating can be easily and quickly touched up.

>>> THE POLE OFFERS AN ABSOLUTELY EXCELLENT SOLUTION. <<<

### TECHNICAL DATA

- Octagonal tapered steel bottom section
- Cylindrical composite pipe 168 mm diameter
- Lengths from 7 – 21 m
- Embedding depth: 1/6 of total length
- Loads: adapted to customer requirements and standard wooden pole structures

Standard types of hybrid poles	Working load	Length of composite top section	Comparable breaking load of wood pole
light	3 KN	3 m	7,2 KN
medium	4,16 KN	2 m	10 KN
stout	6,24 KN	2 m	15 KN
extra stout	8,32 KN	1,5 m	20 KN



## FOCUS ON SAFETY – NO CHANCE FOR ACCIDENTS



For Eurocoles, the health of assembly and maintenance personnel is a top priority. Proven climbing systems on the steel lower section and professional fall arrest systems ensure the maximum possible safety when working on the poles.

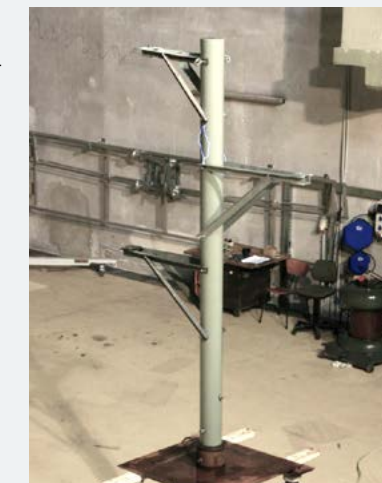
With the Eurocoles hybrid pole there is absolutely no risk of injuries to arms, hands and legs due to wooden splinters or spikes. The insulated composite upper section prevents electrocution risk.

>>> SIMPLE, UNCOMPLICATED HANDLING <<<

## PIONEERING QUALITY – THANKS TO PROVEN STANDARDS

Hybrid poles from Eurocoles meet the usual standards for overhead line construction. All products undergo a continuous process of refinement, testing and certification and are therefore always up-to-date in respect of industry standards and regulatory provisions, so they also meet international quality requirements.

- Complies with overhead line standard EN 50341
- Certified according to EN 1090-2 steel structures
- Hot dip galvanised steel bottom section to EN ISO 1461 and DASt Standard 022
- Foundation stability verification
- Eurocoles is certified to DIN EN 9001 and DIN EN ISO 14001
- CE-marking



Example of a disruptive discharge test on the composite top section on the basis of IEC 479, VDE 0303 and the VDE-AR- N 4210-11 Code of Practice.

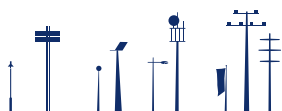
### SUMMARY:

Hybrid poles from Eurocoles can replace wooden poles 1:1.

They are extremely reliable, need nearly no maintenance, have a very long lifetime and therefore they are perfect solution for cost-efficient and safe electricity supply.

Cost efficient by perfect combination of steel and composite





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