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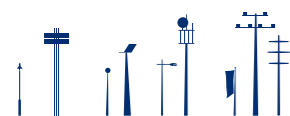
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Catenary systems for urban and
mainline mass transit

Catenary systems

TRAFFIC

EURO POLES



WELCOME TO EUROPOLES

Whether for high-speed lines for the ICE, or for commuter train lines – Europoles offers you the optimal pole solution for catenary systems in applications for urban and mainline mass transit.

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Scan this QR code with your smartphone and experience Europoles in moving pictures as well.

Europoles Plant in Korin

EUROPOLES – POLES ARE OUR PASSION

Europoles is a leading european pole manufacturer with over 1,500 employees. Our many sales offices and production facilities mean that we are nearly always in the vicinity of our customers in Europe, and we have a presence in the Middle East and Africa as well.

Over our company's 120 years of history, we have developed an extensive array of specialist knowledge when it comes to pole solutions. We possess engineering know-how for load-bearing systems ranging from the design phase to turnkey delivery.

It is our passion to take on new challenges. Our business units have extensive knowledge of the standards and special requirements in many different regions and countries of the world. We are a long-term partner that designs and implements individual solutions for our customers.

Our leading position with respect to the pole construction materials of steel, pre-stressed spun concrete and glass-fibre reinforced plastic (GRP) gives us an independent selection of the best possible material for each particular application. This may also include hybrid solutions. We are constantly developing these materials further and combining them with new, state-of-the-art production techniques. Whether it involves new concrete qualities, steels, laser welding or surface finishing methods – we advance innovation along with customer value.

Lighting

The Lighting business unit offers a broad spectrum of pole types. From standard poles to customer-specific solutions, everything comes to you from the same source. Whether the products are design-oriented or functional – from consultation through to structural analysis – we go by what the customer desires. We provide you with support for the details involved in pole footings and in connecting the lamps, floodlights or cameras to the load-bearing system. Besides steel as a raw material, we also offer concrete and GRP and can therefore meet your needs adequately.

Energy

In the Energy business unit, we offer a broad product portfolio for all voltage levels. Whether for concrete, steel or hybrid solutions (steel with GRP, concrete with steel) – what is of the essence to us is providing every customer as well as every location/route with a design that matches the specific circumstances. From routing considerations to footing/base solutions, traverses, assemblies and even on-site project management. We accompany our customers as a consultant until they have achieved their goals.

Electricity for telecommunications installations, for illuminating entire streets, on rough terrain or in remote off-grid areas: Europoles has developed a system that is completely independent of the power grid, producing its own power in an environmentally-friendly way. The system generates electricity using wind and solar power as well as fuel cells. This gives you flexibility in using resources and lets you make plans with confidence. The flexibility of these modern technologies ensures that you will always have electricity flowing. Remote system monitoring offers you additional security and comfort.

Communications

The Communications business unit designs and produces pole and roof stations for mobile communications customers. We offer complete solutions from a single source, from initial operation of the station to its subsequent service needs, be they inspections, swaps or software updates. This reduces the interfaces and expense for the customer when coordinating the various trades and services necessary for the smooth construction and efficient operation of mobile communications stations. We possess the required know-how, from

planning the stations to the final hand-over and systems technology – making everything available from a single source and thus ideal for the customer.

Surfaces & Design

Europoles is the expert in special surface finishes. Give your poles an innovative finish. Whether it is a silky gloss, coarse or fine-textured finish required, we are flexible in turning your wishes into reality. Special anti-graffiti or anti-poster surface finishes ensure that nothing sticks on your pole – except for its beautiful appearance.

Mobility

The Mobility business unit – rail, road, airport, seaport – provides its customers with high-tech solutions. Be it railway poles for high-speed routes or the most reliable lowering systems for airports – extremely high demands such as these have to be met reliably. Here as well, for the sake of the best solution for our customer, we resort to pre-stressed concrete, steel or, for railway crossing barriers, ultra-light GRP material.

Buildings & Security

In architecture, poles become columns. Design columns or storey

supports – they all have one thing in common: extremely high load-bearing capacity combined with a slender form. We make it possible to achieve greater visibility and new design potential. World-renowned buildings have already put this to use, applying new design concepts.

Europoles is a long-term system partner in all of its business units – from the design phase to implementation. We put our decades of experience to good use for the benefit of our customers.



WE ARE ALWAYS THERE FOR YOU ...

...in every project phase, with know-how and energy. This is how we safeguard your project and free up time for your key tasks. No other company in the world satisfies as many different pole design demands as Europoles. This is a wealth of experience that you should take advantage of... so that your project runs its course with no worries involved.

Our customers – our strengths



From small and medium-sized companies, to large corporate groups

- Companies that openly enter the market and exploit new chances
- Need innovative and precisely matched solutions
- Have achieved recognition with their competence and stability, and that expect the same from their partners



We are keenly aware of and fully appreciate

- Research and development, innovations, patents
- Project competence
- Capacity and investments



We are kind to the environment and to company budgets

- Reduced emissions – and materials and processes that are easy on resources
- Cost-benefit ratios that are optimized over the long run



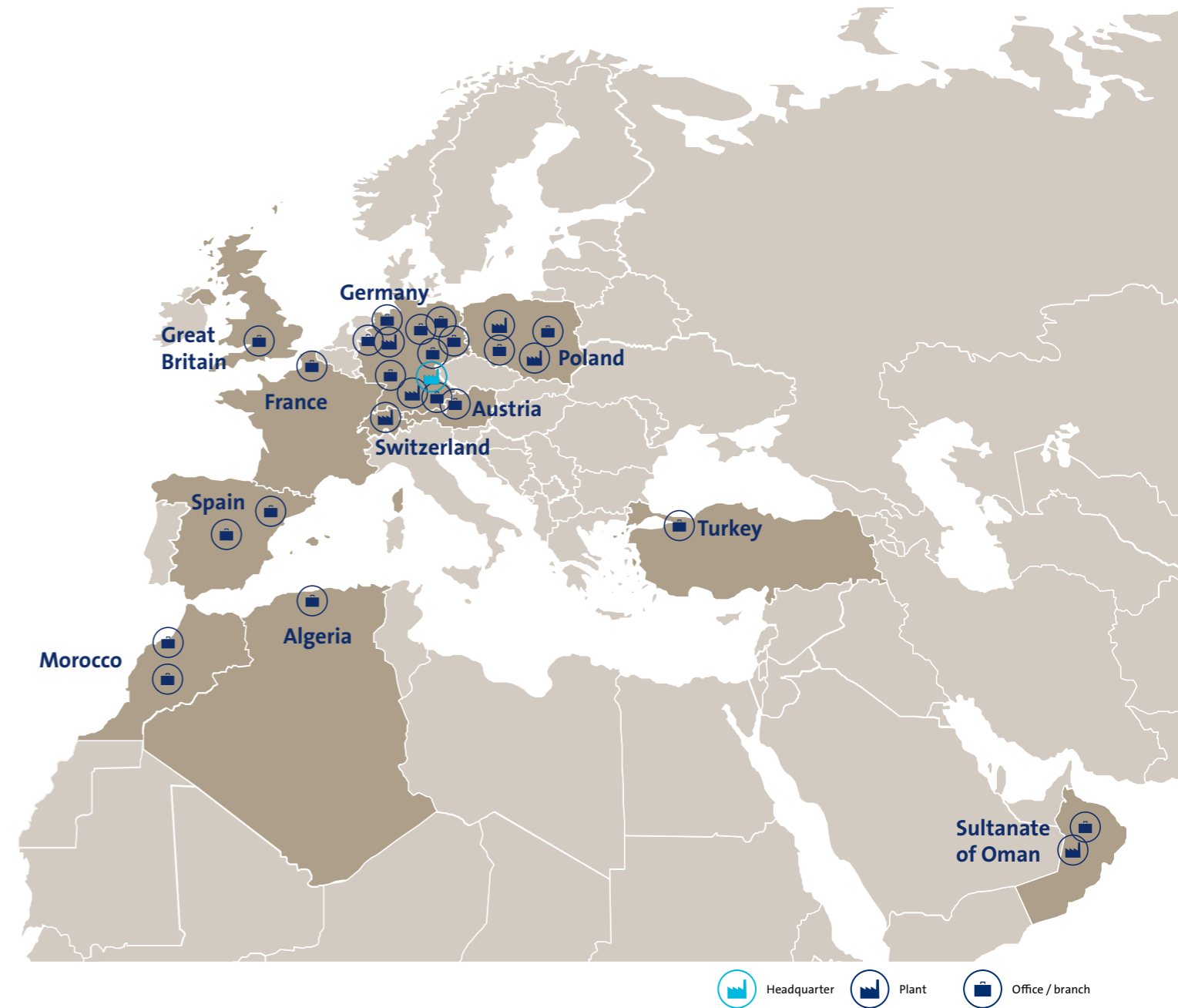
We arouse enthusiasm by all means

- Know-how, international competence, extensive experience, certifications
- Advanced technologies: spun concrete, laser welding, fibreglass rotation processes, sophisticated surface finishing



We are an attractive business partner and employer

- Highly motivated and eager-to-work teams with project experience
- Comprehensive consulting, planning, structural design and engineering, manufacturing, surface finishing, logistics, construction services, and maintenance



... AND (ALMOST) ANYWHERE

Headquarter:	Neumarkt i.d.OPf, Deutschland
Manufacturing locations:	
Concrete:	Deutschland, Oman, Marokko
Steel:	Deutschland, Polen, Schweiz
FRP:	Deutschland
Office / branch:	Deutschland, Großbritannien, Frankreich, Spanien, Polen, Algerien, Türkei, Marokko, Oman



INTERCITY RAIL TRAFFIC – NETWORKING THE METROPOLISES

New tracks are being laid in Europe. Borders have fallen; countries are growing together. There is an active expansion of rail infrastructure taking place. As a result, new infrastructure system solutions are being demanded from manufacturers and providers in order to meet the wide range of operators' needs.



HSR Nuremberg – Ingolstadt



HSR Madrid – Seville



Europoles – the leading manufacturer of catenary poles
Europoles has been producing spun concrete poles since the end of the 1950s and, to date, has provided over 100,000 concrete poles for the German railway system. During that time, concrete pole technology has been continually developed.

Europoles has the most up-to-date expertise and many years of experience in this industry. We provide effective carrier systems which make rail traffic attractive and economical.



HIGH SPEED LINE PROJECTS (Speeds up to 330 km/h)

- Nuremberg – Ingolstadt
- Madrid – Seville
- Cologne – Frankfurt/Main
- Munich – Augsburg
- Hannover – Berlin
- Kassel – Würzburg
- Karlsruhe – Basel
- Erfurt – Ilmenau
- Halle – Leipzig

POLES FOR HIGH-SPEED LINES – THE C-MAST SYSTEM

High-speed rail traffic has special requirements for catenary carrier systems. At speeds of 330 km/h, moving trains cause massive air currents which must not be allowed to affect the function of the catenary installations

. In order to meet these requirements, Euro poles, in cooperation with Deutsche Bahn, developed the C-Mast system, which is especially designed for this application. Today, this modular pole system is standard on all high-speed rail routes in Germany.

Thanks to the pre-stressed spun concrete construction with high-strength C80/95 concrete quality, the poles are maintenance-free and offer long-lasting corrosion protection. Their slender design makes it possible to erect the poles easily, even in tight spaces. A simple and fast foundation method was developed with the large pipe foundation. With their high stiffness, the poles exhibit the lowest static and dynamic deformation, thus preventing oscillation after the passage of trains.



HSR
Nuremberg –
Ingolstadt



Thanks to this design, there is almost no maintenance or follow-up costs in the long-term for the carrier systems. Operators have long-term benefits from the high cost effectiveness of the entire system.



HSR Nuremberg – Ingolstadt



HSR Cologne – Frankfurt/Main



HSR Kassel – Würzburg



FASTENING TECHNOLOGY

In Germany, the poles are equipped with screw sockets for fastening add-on components. Their advantages are:

- high defined load-bearing capacity
- long lifetime thanks to being embedded in concrete
- simple connection to the earthing system of the pole ensures easy earthing
- allows the economical design of the mechanised catenary installation

With the fastening height of the add-on components determined in the planning process, the correct height of the components is preset following the calibration of the poles. As a result, mechanised construction of the catenary installation is possible. The quick installation contributes significantly to the cost effectiveness of the system.

For international projects, many customers require a flexible fastening height for the add-on components. A variety of methods are available for this. They include traditional steel couplings, tension bands, and bolts in drill holes.



EUROPOLES AS A PARTNER FOR MAJOR INTERNATIONAL PROJECTS

Europoles impresses above all through its high production capacities, rapid ability to deliver, and constant monitoring of quality demands through internal and external testing.

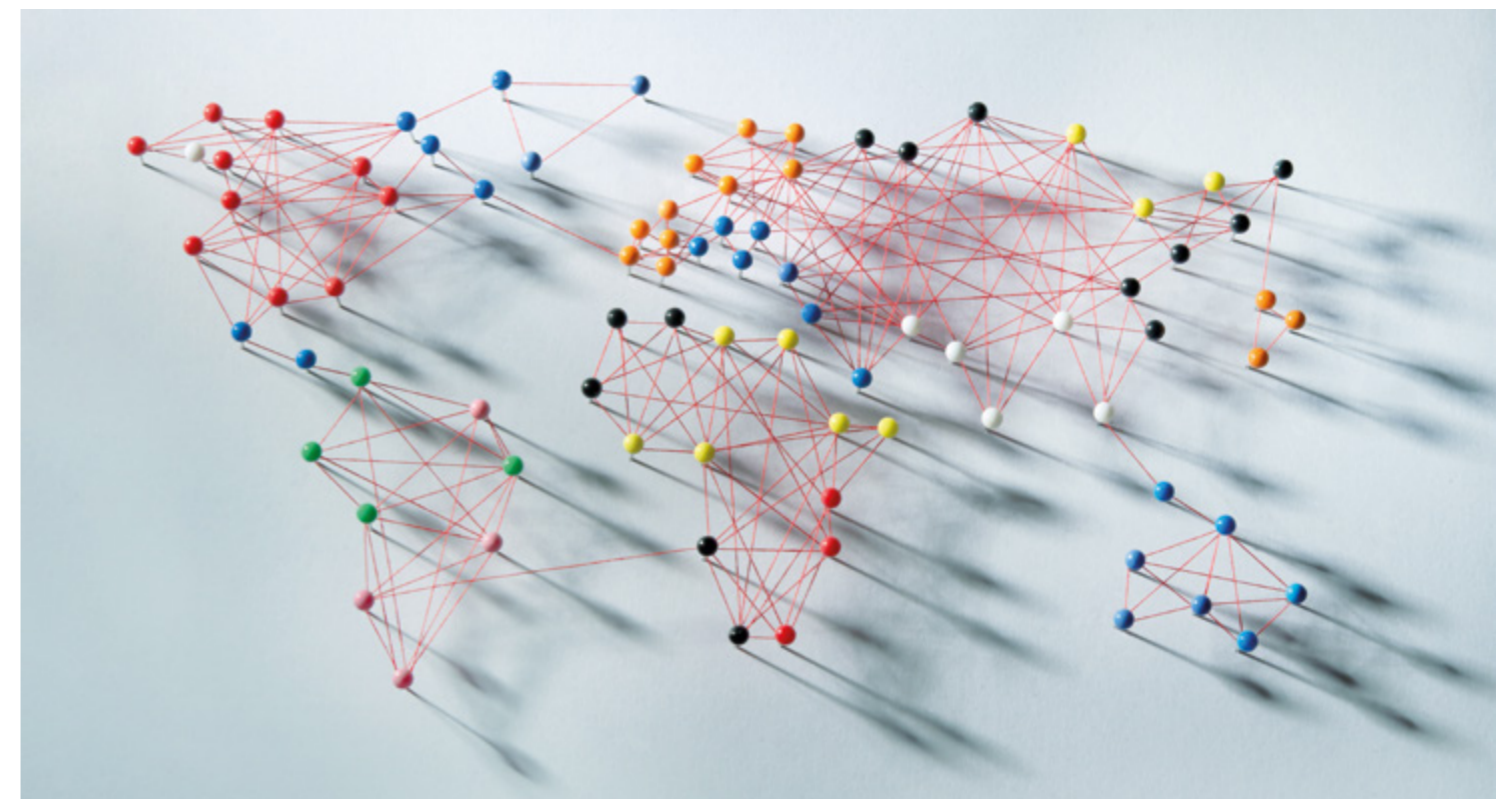
With our in-house statics and design department, we are able to call upon many years of empirical values in pole construction and foundation. Armed with this knowledge, we advise our customers on economical system solutions for poles and foundations specifically for their projects.

Abroad, we work together with competent partners locally on project planning and execution. These local partnerships greatly simplify the implementation of country-specific requirements and guidelines, thus saving a lot of time.

With our spun concrete plants in Germany, Morocco, and Oman, we are able to manufacture economically and in close proximity to our projects. We guarantee our high quality standards in all project phases, from planning support to the local production of poles – worldwide.



Europoles plant in Nizwa, Sultanate of Oman



A CITY'S ARTERIES – LOCAL PUBLIC TRANSPORT

In today's modern, populous cities, public transportation is one of the most important aspects of mobility. But public transportation is also playing an increasingly important role outside of these urban environments. Rail solutions are currently undergoing a renaissance. New technologies have increased the efficiency and cost effectiveness of this infrastructure.



Europoles offers the right pole solutions for catenary systems for local public transport, oriented to the individual requirements of each customer. We support our clients with comprehensive project management, from planning to project finish.

Steel or concrete, conical or cylindrical, circular, rhombic, or multi-sided poles. Beyond conventional standard poles, Europoles manufactures tailor-made carrier systems which integrate perfectly into the cityscape. Along with creative freedom, there is also technical variety. Extraordinary shapes, special colours, or special surface structures can be easily

realised, as can solutions with multiple functions, such as catenary poles which also hold street lighting. Especially for the often cramped spaces in the urban environment, Europoles offers space-saving complete solutions with slender poles and foundations.

Due to its many years of experience in this field, Europoles can combine innovation, design, quality, and cost effectiveness in its products. Consultation, statics, production, delivery, and foundation work from a single source – and one that guarantees planning confidence, fast project handling, and high cost effectiveness.



SPUN CONCRETE POLES – EXCITING TECHNOLOGY, COST EFFECTIVENESS, AND INNOVATIVE CAPACITY

Particularly in an urban environment, concrete poles offer significant advantages, such as scratch and impact resistance, resistance to extreme environmental influences and vandalism. They also impress with extremely low lifecycle costs.

Quality individualized

Just as it does with the poles for intercity railways, EuroPoles also manufactures concrete poles for local public transportation using the proven centrifugal process. The concrete pole plant in Neumarkt works with the most up-to-date spun concrete technology. Despite their enormous load capacity, overhead line

poles made from spun concrete have very small diameters and an impressively slender silhouette. The hollow space in the interior of the pole offers a well-protected space for supply and disposal lines. Special solutions and adjustments to local conditions are developed by our team of expert structural and design engineers.



Long service life –

positive ecological footprint

Spun concrete is a material with lots of amazing features: with a long life and an outstanding ecological footprint, it offers high planning reliability and the opportunity to invest in an environmentally friendly, high-class product. Poles made from spun concrete are up to 100% recyclable. Highly qualified personnel work to provide constant innovation, further development, and the highest quality. Fast and flexible production and on-time delivery are a matter of course for us.

Robust and stable

Poles from EuroPoles made from prestressed spun concrete stand out through their extremely robust design. The centrifugal process produces an absolutely smooth and pore-free concrete surface. In addition, its prestressing gives the pole a high stiffness. Spun concrete poles are not only immune to vandalism and the effects of fire, they are also resistant to oscillations from overhead lines. Even aggressive environmental effects such as frost or air pollution do not damage the poles. Together with the scratch and impact resistant surface, these characteristics provide a very long lifetime with low maintenance and thus significant cost savings over the long term.



STANDARD CONSTRUCTION – THE CLASSIC

Pre-stressed spun concrete poles are manufactured in a round-conical form with C80/95 concrete quality. All poles have CE certification. The manufacture and static dimensioning of the poles takes place in accordance with the respective country-specific standards.



lengths [m]	TENSILE FORCE CAPACITY 8 kN		TENSILE FORCE CAPACITY 10 kN		TENSILE FORCE CAPACITY 12 kN		TENSILE FORCE CAPACITY 14 kN		TENSILE FORCE CAPACITY 16 kN	
	Top [mm]	Foot [mm]	Top [mm]	Foot [mm]	Top [mm]	Foot [mm]	Top [mm]	Foot [mm]	Top [mm]	Foot [mm]
8,0	220	340	220	340	250	370	250	370	280	400
9,0	220	355	220	355	250	385	250	385	280	415
10,0	220	370	220	370	250	400	280	430	280	430
11,0	220	385	250	415	250	415	280	445	280	445
12,0	220	400	250	430	250	430	280	460	280	460
13,0	220	415	250	445	280	475	280	475	310	505
14,0	220	430	250	460	280	490	280	490	310	520
15,0	250	475	250	475	280	505	310	535	310	535
16,0	250	490	250	490	280	520	310	550	310	550

Lengths [m]	TENSILE FORCE CAPACITY 18 kN		TENSILE FORCE CAPACITY 20 kN		TENSILE FORCE CAPACITY 22 kN		TENSILE FORCE CAPACITY 24 kN		TENSILE FORCE CAPACITY 26 kN	
	Top [mm]	Foot [mm]	Top [mm]	Foot [mm]	Top [mm]	Foot [mm]	Top [mm]	Foot [mm]	Top [mm]	Foot [mm]
8,0	280	400	310	430	310	430	340	460	340	460
9,0	280	415	310	445	310	446	340	475	340	475
10,0	310	460	310	460	310	460	340	490	340	490
11,0	310	475	310	475	340	505	340	505	370	535
12,0	310	490	310	490	340	520	340	520	370	550
13,0	310	505	340	535	340	535	340	535	370	565
14,0	310	520	340	550	340	550	370	580	400	580
15,0	340	565	340	565	370	595	370	595	400	595
16,0	340	580	340	580	370	610	370	610	400	610

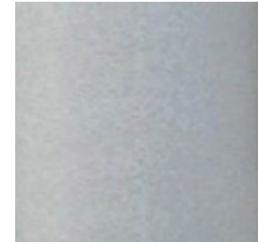
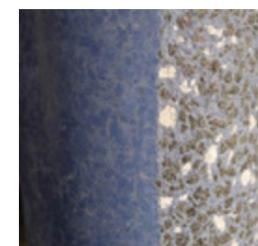
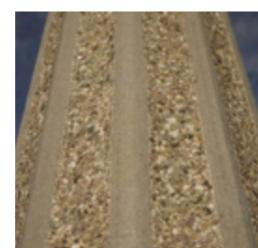
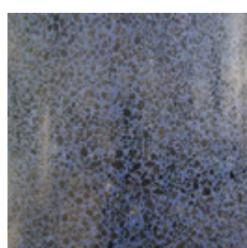
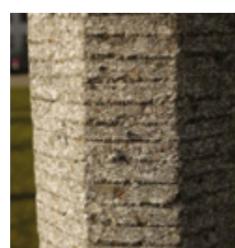
Lengths [m]	TENSILE FORCE CAPACITY 28 kN		TENSILE FORCE CAPACITY 30 kN		TENSILE FORCE CAPACITY 32 kN		TENSILE FORCE CAPACITY 34 kN		TENSILE FORCE CAPACITY 36 kN	
	Top [mm]	Foot [mm]	Top [mm]	Foot [mm]	Top [mm]	Foot [mm]	Top [mm]	Foot [mm]	Top [mm]	Foot [mm]
8,0	340	460	340	460	370	490	370	490	370	490
9,0	340	475	370	505	370	505	370	505	400	535
10,0	370	520	370	520	370	520	370	520	400	550
11,0	370	535	370	535	370	535	400	565	400	565
12,0	370	550	400	580	400	580	400	580	430	610
13,0	370	565	400	595	400	595	400	595	430	625
14,0	400	610	400	610	400	610	430	640	430	640
15,0	400	625	400	625	430	655	430	655	430	655
16,0	400	640	400	640	430	670	430	670	430	670

Deflection 1.5% ; Additional lengths and tensile force capacities on request



Round-conical, prestressed spun concrete poles in the city of Leipzig, Germany.

Figure 1 displays eight different cross-sections of concrete columns, labeled from left to right: round-conical, octagonal, round-stepped, concave, oval, square, multi-sided, and octagonal stepped. Below each cross-section is a corresponding longitudinal view of the column, showing its height and surface texture.

			
smooth	smooth	smooth	smooth / blasted
			
smooth / blasted	smooth / blasted	blasted	blasted
			
blasted	blasted	blasted	blasted
			
blasted	marble	tree structure	shell limestone

BRACKET FASTENING – VARIABLE OPTIONS

A variety of options are available for fastening add-on components such as cantilevers or bracing fittings. The standard here is the proven band clamping system or fixation via rope loops. Along with curved and ring clamp constructions, there is also the option of spinning insert screw sockets directly into the wall of the pole or using through holes for fastening.



Band clampings and rope loops

Screw socket solution

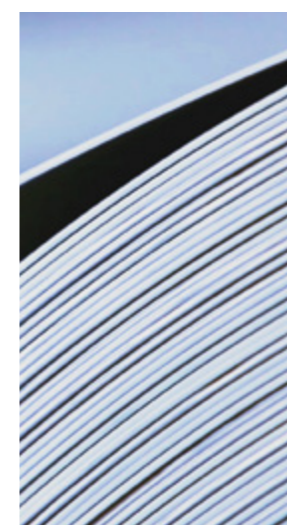
Solution with through holes

DECORATIVE LIGHTING BRACKETS



STEEL POLES – THE ALL-ROUNDERS

Our plant in Chrzanów, Poland has one of the most state-of-the-art production lines in Europe. This is the manufacturing location for our steel catenary poles and power-transmission poles, as well as floodlight and lighting poles. Every one of our products has a very important role to play. That is why quality, skills and the further training of our employees, and technological progress are key factors for us. Accuracy and precision, combined with the quality of the materials we use, guarantee for our customers the reliability and safety of our solutions.



Catenary poles for light rail traffic – Unlimited variability in solid steel

The design of catenary poles ranges from round-conical to round stepped poles to multi-sided and rhombic steel poles. Every pole is structurally designed in accordance with customer requirements and equipped with the add-on components needed. Depending on local requirements, we offer extensive integration with traffic management systems, signage, signallers, and lighting. Customised projects are a welcome challenge for which we will happily offer you the right solution.

Solid steel wall poles are known for their especially long service lives. They offer an impressive torsion bearing capacity and guarantee the highest operational

reliability. We support you in all services related to the carrier systems, from planning to realisation. Our range of services includes integrated consulting, planning, construction and statics, production, coating, logistics, and maintenance of your catenary installation projects. The poles are hot-dip galvanised inside and out to protect against corrosion in accordance with DIN EN ISO 1461 and can be coated with the desired colour in the plant.

We will be glad to answer your questions regarding planning the pole foundation. Possible foundation options can be found on page 26 and 27.

POLE TYPES – LIMITLESS VARIABILITY IN SOLID STEEL WALL DESIGN



Round-conical poles

The round-conical catenary pole consists of shaped, seam-welded steel plate which can be manufactured to a length of up to 14.3 metres without cross welding. Due to new manufacturing options, the smallest top end and foot diameters can be realised with large wall thickness.

Despite carrying high loads, Euro poles offer a slender pole design, which means they fit easily in the modern urban space. Thus, Euro poles meet the increasing aesthetic demands of the cityscape.

Round-stepped poles

The round-stepped catenary poles are flanged and peripherally welded on the butt joints. The dimensions are oriented on the available pipe diameters. The pipe lengths and cross-section changes are selected to create an appealing and attractive overall pole image.

Reference

The tram catenary poles which Euro poles erected outside the main Oslo railway station as part of the redesign of the station's forecourt were individually coordinated within the overall architectural concept. For the round-stepped steel poles with free lengths between eight and 12 metres and another 10.7 metre tall round-stepped pole, Euro poles developed a very slender pole geometry, despite large wall thicknesses, with tapers of up to 7.5 mm per metre. All visible welded seams were polished for aesthetic reasons. For maximum corrosion protection in the salty air of Oslo, all poles are coated in the MPB duplex process, which meets the corrosiveness categories C5-I and C5-M. An anti-graffiti coating protects them against vandalism.



Multi-sided poles

Solid steel poles with a multi-sided cross-section (triangular to hexagonal) can be manufactured up to a length of 14.3 metres without cross welding. Despite high wall thicknesses, the poles impress with their slender construction, which allows them to be ideally integrated into the cityscape.

Reference

The poles which Euro poles designed and developed for one of the busiest bridges in Lithuania, the Petro Vileišio bridge in Kaunas, are proof of our capability in this field: 30 octagonal tapered steel poles with a height of nine metres carry the catenary systems for the city's trolley buses and the street lighting system in the form of a 1.5 metre long 'Leipzig Wing' at the top of the pole. In addition, the poles have a cable connection for holiday illumination. Euro poles created four different foundation designs for installation, with the anchor bolts to transfer forces directly integrated into the reinforcement of the bridge.



Design solutions – room for your ideas

We would be pleased to work with you to develop design solutions that enhance the cityscape. Whether for the reproduction of a historic pole design or the development of a modern pole, with our in-house engineering, Euro poles is an ideal partner for creating special designs. From initial consultation through to engineering calculations, production, and delivery, we will help you realise your projects.





INFRASTRUCTURE SLIM FIT – OUR SLENDER SOLUTION



OCTAGONAL				
Lengths [m]	Tensile force capacity [kN]	Top [SW]	Foot [SW]	Taper [mm / m]
W	8	175	283	12
10,00	8	175	295	12
11,00	8	175	307	12
12,00	8	175	319	12
13,00	8	175	331	12
14,00	8	175	343	12
9,00	12	205	313	12
10,00	12	205	325	12
11,00	12	205	337	12
12,00	12	205	349	12
13,00	12	205	361	12
14,00	12	205	373	12
9,00	16	225	333	12
10,00	16	225	345	12
11,00	16	225	357	12
12,00	16	225	369	12
13,00	16	225	381	12
14,00	16	225	393	12
9,00	20	245	353	12
10,00	20	245	365	12
11,00	20	245	377	12
12,00	20	245	389	12
13,00	20	245	401	12
14,00	20	245	413	12
9,00	24	265	373	12
10,00	24	265	385	12
11,00	24	265	397	12
12,00	24	265	409	12
13,00	24	265	421	12
14,00	24	265	433	12

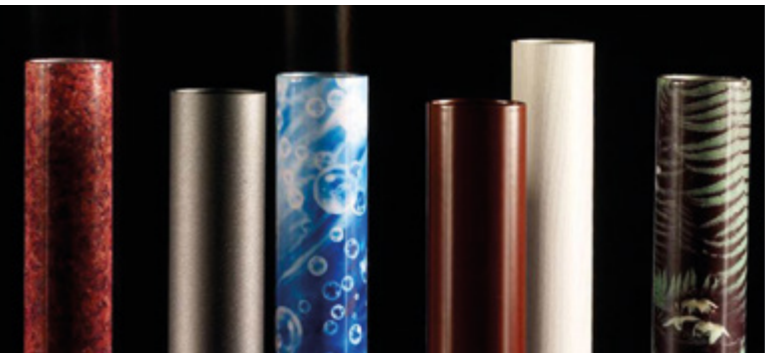
ROUND-CONICAL				
Lengths [m]	Tensile force capacity [kN]	Top [SW]	Foot [SW]	Taper [mm / m]
9,00	8	196	304	12
10,00	8	196	316	12
11,00	8	196	328	12
12,00	8	196	340	12
13,00	8	196	352	12
14,00	8	196	364	12
9,00	12	205	313	12
10,00	12	205	325	12
11,00	12	205	337	12
12,00	12	205	349	12
13,00	12	205	361	12
14,00	12	205	373	12
9,00	16	230	338	12
10,00	16	230	350	12
11,00	16	230	362	12
12,00	16	230	374	12
13,00	16	230	386	12
14,00	16	230	398	12
9,00	20	240	348	12
10,00	20	240	360	12
11,00	20	240	372	12
12,00	20	240	384	12
13,00	20	240	396	12
14,00	20	240	408	12
9,00	24	260	368	12
10,00	24	260	380	12
11,00	24	260	392	12
12,00	24	260	404	12
13,00	24	260	416	12
14,00	24	260	428	12



Scan this QR code with
your smartphone and
experience the bene-
fits of the surface
finish in moving pic-
tures.

COATING – CREATIVE, VERSATILE, AND COLOURFUL

Europoles is your expert for standard and special coatings using wet painting and powder coating. Depending on location, we will recommend the most economical coating solution for your project. The coating version will be determined according to the local corrosivity categories.



Anti-poster

- Protects all pole surfaces
- Transparent coating system
- Posters and stickers will not adhere to your pole

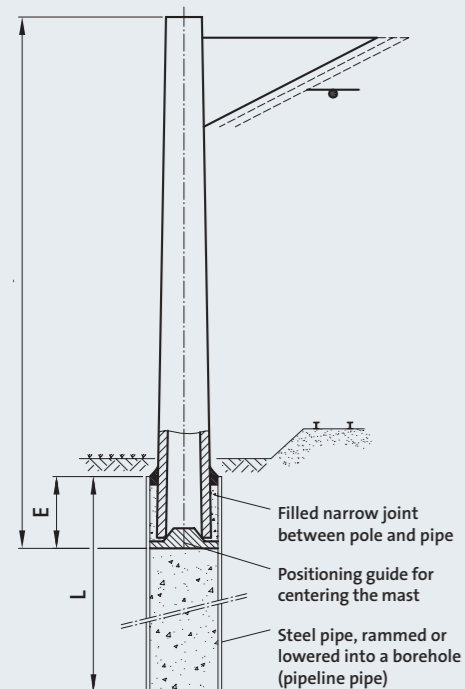
Anti-graffiti

- Protects your poles from graffiti, markers, and ink
- Transparent coating system
- Outstanding resistance to weather, high UV, and chemicals
- Creates a permanent barrier coat thanks to a homogeneous surface
- The protected surface can be repeatedly cleaned with a special cleaner without needing recoating
- Graffiti and paint can be easily removed from this surface

Basic Processing Guidelines	C1 – C3	C4 – C5	DESERT AREAS
Grinding off zinc run-off projections on zinc-plated poles/tubes	✓	✓	✓
Mechanical smoothing/dressing with zinc-plated poles/tubes	✓	✓	✓
Sweeping in the dry-blasting process			
Chrome III passivation up to 7.00 m	✓	✓	✓
Outgassing / tempering at approx. 260° / 15 min. OT	✓	✓	✓
Finish coat 1 approx. coat thickness in µm (microns)	80	80	80
Finish coat 2 approx. coat thickness in µm (microns)		80	80
Finish coat 3 approx. coat thickness in µm (microns)			80
Approx. total thickness of the coats in µm (microns)	80	160	240
Complies with DIN	12944 / 55633	12944 / 55633	goes beyond DIN
Prime examples	City and rural areas	Industry and coast	Desert
Duration of protection	15 years	15 years	15 years

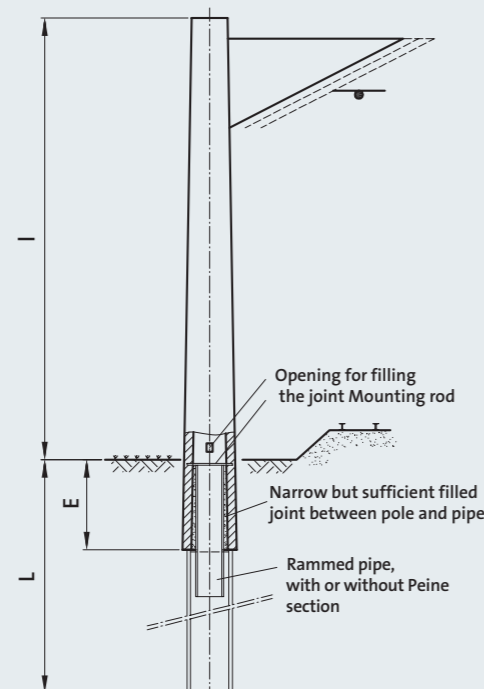
FOUNDATION OPTIONS – A SOLID BASE FOR THE HIGHEST DEMANDS

Depending on the requirements of the local conditions – for example soil conditions and space requirements – Euro poles offers the right pole foundation for your catenary system. We have compiled an overview of the most common foundation versions for light rail and intercity transport.



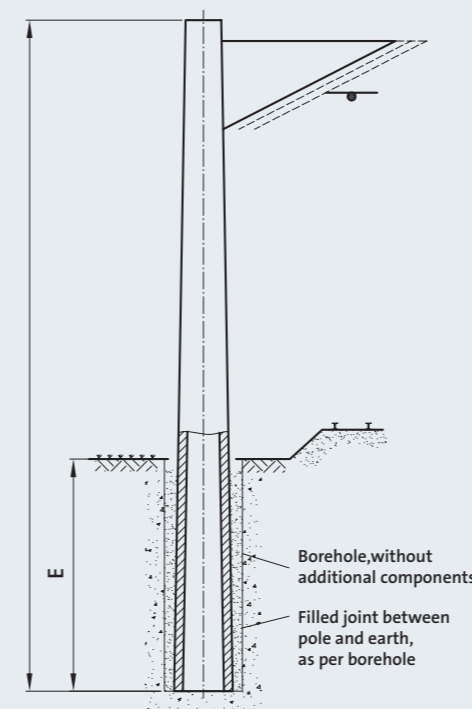
Pole outer pipe foundation

- No excavation is necessary
- Short pole insertion length possible
- Well suited for poorly supporting soils
- Fast and simple erection



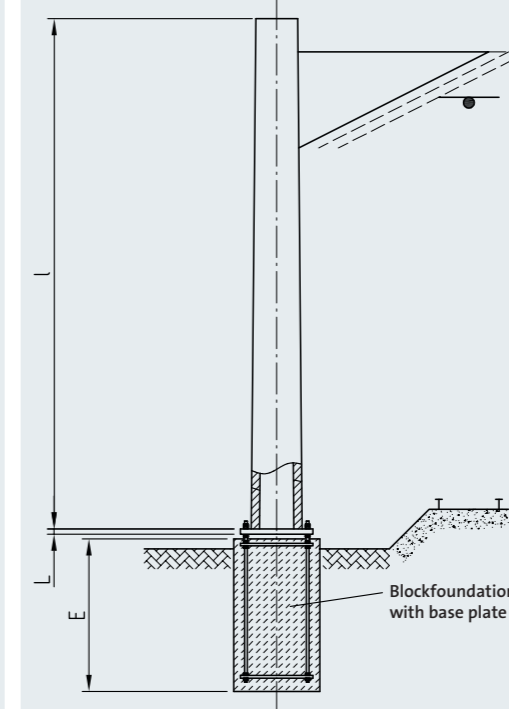
Pole inner pipe foundation

- No excavation is necessary
- Compact space requirements
- Well suited for poorly supporting soils



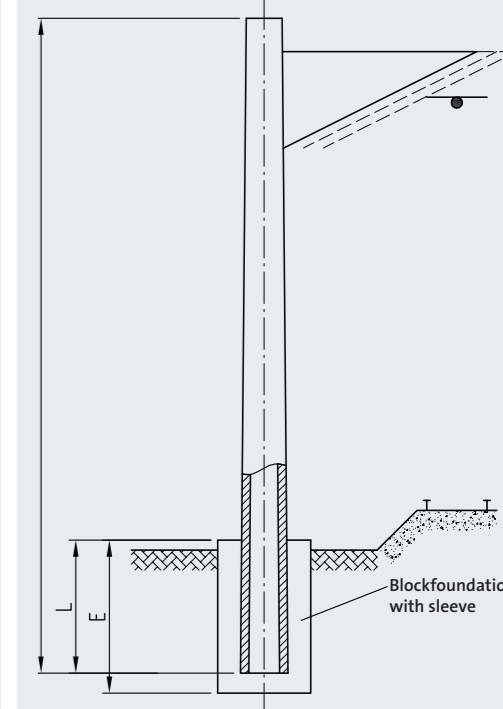
Borehole foundation

- Fast and easy erection
- Simple installation, with little mechanical work
- Excavation is necessary



Block foundation with base plate

- Block foundation with base plate
- Excavation is necessary
- Additional work for base plate and anchor rods
- Simple pole installation and exchange
- Shorter pole length



Block foundation with sleeve

- Excavation is necessary
- Increased time required
- Simple execution with little equipment required



BARRIERS FOR LEVEL CROSSINGS MADE FROM GRP – MORE SECURITY IN ROAD TRAFFIC

We deliver half-length, full-length, and pedestrian barrier poles: all of which must be easily visible and must reliably provide the required protection. Eurocoles, with its FRP level-crossing barrier poles, that are available as round and rectangular sections, fulfills precisely these requirements. As Q1 supplier for Deutsche Bahn AG for many years, these barriers fulfill the strict technical regulations of German National Railways and have proved widely popular both in Germany and around the world.



Our customers:
Deutsche Bahn AG | Scheidt & Bachmann GmbH |
Siemens AG | Pintsch Bamag GmbH |
Dr. techn. Josef Zelisko GmbH (Knorr Bremse)

Our references::
Germany | Austria | Saudi Arabia | Italy |
Switzerland | Netherlands | Norway | Great Britain |
Hungary | Greece | Poland

DIVERSITY

... that is impressive enough

FRP level-crossing barrier poles are available in standard white. Dying of the polyester resin, however, enables a great diversity of RAL color shades. Painting afterward is not necessary.

Every Eurocoles barrier pole is provided with a weather-resistant, highly reflective signal film that focuses incident light and reflects it without glare. Various types, colors, and dimensional patterns of the film are available, depending on country specifications.

Various special features can be integrated into these FRP poles: e.g. LED illumination and pole-fracture monitoring – which makes customized design and solutions possible.

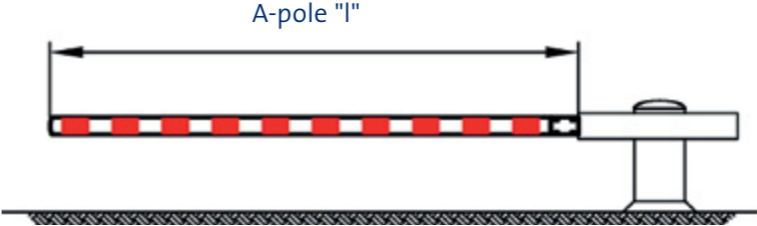


Flexible owing to modular design

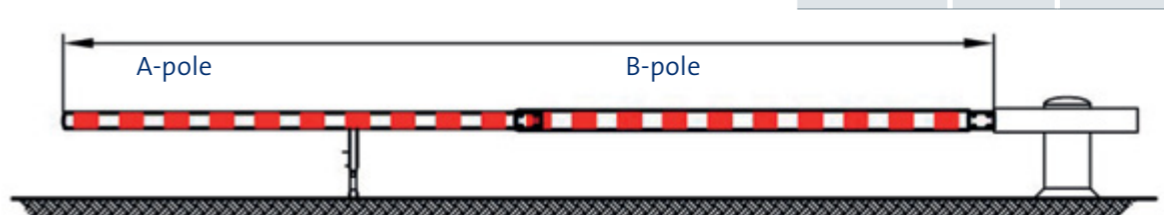
These barrier poles are modular in design and are available in various lengths. Pole sections A and B are individually exchangeable and can be newly configured as required. Special solutions are available upon request.

Barrier-pole sections and dimensions		
Standard pole lengths "l" (in m)	Length of pole section	
	A (in m)	B (in m)
3,0	3,0	–
4,0	4,0	–
5,0	5,0	–
6,0	6,0	–
7,0	5,0	2,0
8,0	6,0	2,0
9,0	5,0	4,0
10,0	6,0	4,0
11,0	5,0	6,0
12,0	6,0	6,0

Half-length barrier pole



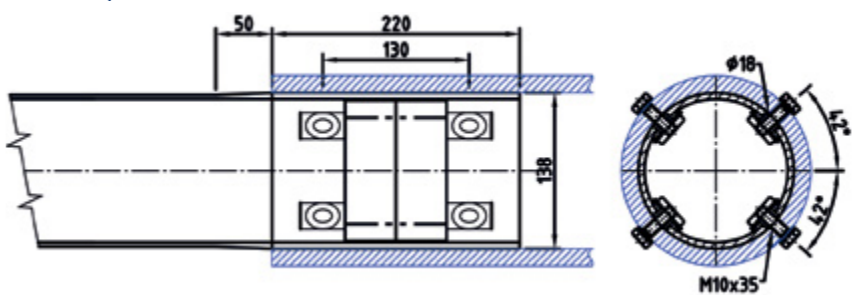
Full-length barrier pole



Barrier-pole mounting

Various mounting fixtures can be used to attach Eurocoles FRP barrier poles to any type of motor drive system. Eurocoles engineering staff develop any adapter solutions necessary.

Barrier-pole section A3 – A6



LONG LIFE

... despite wind and weather



The centrifugal manufacturing process provides Euro-poles FRP poles with a dense and absolutely smooth surface that is impervious to the weather. Such poles are also not subject to corrosion. In addition to their great ultraviolet resistance, this leads to a service life

of at least 25 years. This material is perfectly suited for all requirements placed on barrier poles, since FRP has excellent vibration-attenuation properties and can therefore resist great dynamic loads. This protects not only the pole, but also the motor drive system.

COST EFFECTIVE

... maintenance-free and without follow-up costs

Owing to their long service lives and lack of subsequent costs for maintenance and repair, Euro-poles FRP barrier poles are a highly cost-effective solution and are absolutely maintenance-free. The FRP profile section is rugged against dents, which reduces damages

to a minimum from transport, installation, and vandalism. The low intrinsic weight of the poles and their modular design with maximum segment lengths of 6 meters reduce costs for the motor drives and counterweights, and for transport. Handling and installation are possible by only one person.



SAFETY

... that you can count on



Owing to the great resistance of fiberglass-reinforced plastics (FRP) to vibrations, Euro-poles barrier poles for level crossings do not suffer from uncontrolled fatigue fracture. At level railway crossings with barriers, this plus in safety can save lives. Even in case of a crash, Euro-poles has provided for the safety of those involved. If a vehicle crashes through a closed barrier, it will break at pre-defined planned fracture points, at a short distance from the pole mounting point. These design features prevent the pole from bending and intruding into the track or roadway zones.

Unlike splintering breaks, these planned fractures are smooth and prevent further injuries – and minimize damage to the vehicles involved.

As excellent electrical insulation, FRP also provides maximum personal safety for the case that the pole comes into contact with the train catenary power lines. In addition, FRP is highly fire resistant – which is the reason that our FRP products are also widely used at airports, with their stringent safety regulations.

INNOVATION

Pole-breakage monitoring – another plus for safety

As a result of increasingly strict safety regulations on the international railway market, Euro-poles has developed a pole-breakage monitoring system for round bar-

rier poles. This system is based on a copper stranded conductor permanently embedded by centrifuging into the wall of the pole during production. This conductor is completely maintenance-free and reliably detects any fracture along the entire pole length, by interruption of a safety circuit.

If a vehicle crashes through the barrier pole, a transmitted signal will stop any approaching train. This signal is sent exclusively upon such fracture of a barrier pole.

pecial features:

- Absolutely maintenance-free copper stranded conductor, embedded by centrifuging
- Savings in costs and time by minimal expense for inspection of the barriers

