



SIKA WIND ENERGY SOLUTIONS FROM BLADE TO BASE

BUILDING TRUST





KNOWLEDGE YOU CAN TRUST

It is no coincidence that many of the world leading wind turbine producers rely on Sika products.

Sika's reputation for innovative spirit, quality and reliability is illustrated through a comprehensive portfolio of problem solving products in a diverse range of applications spanning more than 100 years.

That is why Sika is the only partner providing solutions to the wind industry from blade to base and is **committed to offer the right technical support for more economic, faster, safer and better results.**

CONTENT

04 Sika at a Glance

06 From Blade to Base

09 Nacelles and Machine Parts

10 Mould Manufacturing

11 Blade Manufacturing

13 Tower Construction

15 The Base Foundation

17 Repair and Maintenance

18 Sika - with You



NACELLE AND
MACHINE PARTS



MOULD
MANUFACTURING



BLADE
MANUFACTURING



TOWER
CONSTRUCTION



THE BASE
FOUNDATION



REPAIR AND
MAINTENANCE

SIKA AT A GLANCE

MORE THAN A HALF

OF THE GLOBALLY INSTALLED WIND TURBINES USE A SIKA PRODUCT.

1 MILLION TONNES

SIKA PRODUCTION IN 2014 OF PREMIXED MORTARS IN OVER 75 PLANTS WORLDWIDE.

OVER 10,000 STEEL TOWERS

ARE PROTECTED WITH SIKA ANTICORROSION COATINGS.

25 %

OF BLADES WORLDWIDE ARE BONDED WITH SIKA ADHESIVES.

1 HOUR

REPAIR OF WIND TURBINE BLADES.

THANKS TO SIKA'S RANGE OF WATER REDUCERS OVER

25,000 MILLION LITRES OF WATER

ARE SAVED ANNUALLY IN CONCRETE PRODUCTION.

IN THE LAST 10 YEARS

SIKA SOLD ENOUGH GROUTS TO FILL 2,000 OLYMPIC SIZE SWIMMING POOLS.

MORE THAN 100 YEARS

SIKA A SPECIALITY CHEMICAL COMPANY WITH A LEADING POSITION IN THE DEVELOPMENT AND PRODUCTION OF SYSTEMS AND PRODUCTS FOR BONDING, SEALING, DAMPING, REINFORCING, PROTECTING AND REPAIRING IN THE BUILDING, MOTOR AND RENEWABLE ENERGY SECTOR.

84 AWARDS

IN 16 YEARS, SIKA IS THE COMPANY WITH THE MOST CONCRETE REPAIR PROJECTS AWARDED WORLDWIDE BY THE INTERNATIONAL CONCRETE REPAIR INSTITUTE (ICRI).

SUBSIDIARIES

SIKA IN MORE THAN 90 COUNTRIES AROUND THE WORLD AND MANUFACTURERS IN OVER 160 FACTORIES, EMPLOYING >17,000 EMPLOYEES.

CONCRETE

Concrete admixtures can improve the sustainability of concrete in many different ways. The addition of special admixtures, such as stabilizing or water reducing admixtures enables the use of alternative and recycled materials, such as recycled aggregates, for the production of good quality concrete. In many cases the energy required to produce certain cement or concrete mixes will be positively impacted with the use of admixtures.

WATERPROOFING

Sika provides solutions for even the most challenging requirements with its unique waterproofing product portfolio, contributing to efficient, long-lasting infrastructure, be it for drinking water facilities (fulfilling the most stringent drinking water approvals), tunnels, bridges, basements and balconies.

ROOFING

With over 50 years of history, our roofing solutions are renowned for their durability and premium qualifications. We began providing waterproofing solutions for construction in 1910 and we now supply each year enough roofing membranes to cover the whole area of Manhattan.

FLOORING & COATING

Resilient systems for industrial and commercial buildings from pharmaceutical, food, public, educational, sport, health care, parking and residential based on synthetic resin and cementitious technologies as well as corrosion and fire protective coatings.

SEALING & BONDING

Construction is all about bringing building blocks together in a uniform building. Sealing and Bonding focuses on where these building blocks meet. Sika provides durable sealants for waterproofing between building elements for building envelopes, civil engineering and infrastructure applications. Sika's range of products include major technologies ranging from water-based to reactive systems and multi-purpose to highly specialized solutions.

REFURBISHMENT

In the 21st Century, reinforced concrete structures are built to serve the next generations. Most bridges are now designed to last more than 100 - 150 years. Years of research plus decades of practical experience have enabled us to develop fully comprehensive systems and solutions to restore, rehabilitate and protect concrete structures.

INDUSTRY

Sika Industry is a leading innovator and supplier of bonding, sealing, damping and reinforcing solutions for industrial markets like automotive, marine, transportation, building components and renewable energy. Our full range of technologies provides increased structural performance while improving production processes.



FROM BLADE TO BASE

ON LAND OR AT SEA



NACELLES AND MACHINE PARTS

- Weather resistant sealing
- Fast setting element bonding
- Corrosion and mechanical protection



MOULD MANUFACTURING

- Fabrication of models
- Production of moulds
- Blade shell infusion



BLADE MANUFACTURING

- Structural assembly of blade shells
- Surface finishing
- Element bonding



TOWER CONSTRUCTION

- Surface protection systems
- Grouting to fill voids
- Sealing and bonding between joints
- Performance enhancing admixtures and additives



THE BASE FOUNDATION

- Performance enhancing admixtures and additives
- Waterproofing surfaces
- Base grouting



REPAIR AND MAINTENANCE

- Blade repair and renovation
- Waterproofing and protecting
- Coating repair



FROM BLADE TO BASE

BASED ON OUR EXTENSIVE KNOWLEDGE OF THE WIND ENERGY SECTOR, SIKA OFFERS A FULL RANGE OF PRODUCTS AND SOLUTIONS FROM THE TIP OF THE BLADES TO THE BASE FOUNDATION.

NACELLES AND MACHINE PARTS

Sealing, bonding and protecting



PROTECTING THE TURBINE'S HEART FROM EXTREME CLIMATIC CONDITIONS IS THE KEY TO ENSURE TURBINE LONGEVITY.

Sika offers solutions to seal and bond nacelle covers and elements as well as a range of smart coatings to protect generator parts from corrosion and mechanical damage.

WEATHER RESISTANT SEALING

Thanks to their proven durability, adhesion and elasticity, Sikaflex® and Sikasil® sealants ensure excellent resistance to weathering and long-term protection against damage caused by water infiltration.

FAST SETTING ELEMENT BONDING

Elements such as cable fixings and noise insulation material can be rapidly and durably bonded within the nacelle.

CORROSION AND MECHANICAL PROTECTION

The Sika® Permacor® paint systems meet the highest standards of corrosion protection and are suitable for offshore applications. Thanks to the very high mechanical durability, the components such as hubs, base frames, machine housings etc. are already protected during transport and especially during construction.

Recommended Sika products

Sikaflex®

1- and 2-component elastic sealing and bonding polyurethane and hybrid systems with higher weather resistance.

Sikasil®

High performance silicone adhesives and sealants for highly exposed assemblies.

SikaForce®

2-component, high strength polyurethane adhesives for structural assembly.

SikaFast®

Fast curing structural adhesives with excellent adhesion on a wide range of substrates.

SikaCor® and Sika® Permacor®

Epoxy and polyurethane protective coating systems for machine parts meeting highest corrosion protection standards.



MOULD MANUFACTURING

Moulds, models and shells



INNOVATIVE SYSTEMS FOR THE CONSTRUCTION OF MODELS, MOULDS AND SHELLS.

FABRICATION OF MODELS

Biresin® model pastes based on epoxy or polyurethane resins, and SikaBlock® model and tooling boards, offer a wide range of solutions for the cost effective fabrication of perfect quality models and plugs. Sika products provide a number of benefits including fast production and simple alterations.

PRODUCTION OF MOULDS

Sika has a wide range of epoxy resins and gelcoats suitable for the production of composite moulds. Resins and gel coats are available with a large span of thermal performance to suit customers production processes.

BLADE SHELLS

Biresin® composite resins provide an extensive range of epoxy based systems for use in fibre reinforced composite applications. Our standard product range covers almost all aspects and processes for parts manufacturing. Sika also develops customised systems for specialised applications.

Recommended Sika products

Biresin® Paste

Polyurethane and epoxy pastes for the efficient production of large models and plugs.

SikaBlock®

A range of board materials with varying densities for easy fabrication of models, moulds and tools.

Biresin®

High performance 2-component epoxy resin infusion system for the manufacture of blade moulds and parts.

Biresin® Gel Coat

2-component epoxy gel coats for a range of applications.

Sika Release®

Silicon and halogen free, semi-permanent release agent for blade moulds.

BLADE MANUFACTURING

Bonding solutions



FOR OVER 20 YEARS SIKA HAS SUCCESSFULLY DEVELOPED BLADE BONDING SOLUTIONS IN COOPERATION WITH LEADING MANUFACTURERS TO PROVIDE LONG SERVICE LIFE AND IMPROVED PRODUCTION PROCESSES.

STRUCTURAL ASSEMBLY OF BLADE SHELLS

SikaForce® and SikaPower® structural adhesives have been used to successfully bond thousands of wind turbine blades. These products offer high strength and crack resistance, ideal rheology, fast curing yet long open time. Sika can also offer tailored products to meet specific requirements in terms of mechanical properties or workability features.

SURFACE FINISHING

SikaForce® products provide a range of solutions for finishing blades that have the unique ability to flow and fill gaps without leaving air bubbles.

ELEMENT BONDING

In blade manufacturing many internal and external elements require a wide range of different bonding properties such as open time, cure speed and other relevant mechanical properties. Our standard adhesive range includes products for bonding lightning protection, balancing blocks, vortex generators, winglets and many more.

Recommended Sika products

SikaPower®

Super toughened 2-component, low density, long open time, DNV-GL approved structural epoxy adhesives for wind turbine blade bonding.

SikaForce®- 7816 series

High performance, non-sagging, long open time, fast curing structural polyurethane adhesive for blade bonding.

SikaForce®- 7812 series

2-component, non-sag polyurethane putty for leading edge profile filling.

SikaForce®

2-component polyurethane potting systems specifically suited for counter balance blocks casting available in various densities and viscosities.

SikaFast®-5200 series

Fast 2-component structural acrylate adhesives with high tensile strength.



TOWER CONSTRUCTION

Producing, protecting, sealing, bonding and grouting



OWNERS, ENGINEERS AND CONTRACTORS NEED A RANGE OF PRODUCTS FOR FAST, EFFICIENT AND DURABLE ERECTION OF STEEL, CONCRETE OR HYBRID TOWERS.

SURFACE PROTECTION

Protecting the structure prolongs the longevity and prevents expensive damages and repairs. Coating systems are used to enhance the appearance and are specified to suit relevant regulations and service conditions. Sikagard® hydrophobic impregnations, rigid and flexible coating systems are proven to protect concrete from the ingress of deleterious substances harmful to steel reinforcement. SikaCor® and Sika® Permacor® high quality corrosion protection systems for interior and exterior surfaces of steel towers are based on high-strength, modern binder resins which enable very low solvent content formulations.

SEALING & BONDING BETWEEN JOINTS

Sikaflex® and SikaHyflex® stand for best-in-class and high quality envelope sealants. To achieve best performance for your application our assortment comprises of all major sealant technologies. Advanced polyurethane sealants for porous substrates and innovative silicones for non-porous substrates, or where a high adhesion is required, our unique silane-modified polymer range.

Element bonding adhesives provide a rigid bond between elements to transfer load. Sikadur® epoxy adhesives have been used effectively to bond precast concrete elements together and provide a waterproof seal. They also have excellent adhesion to many other materials and can be used to bond different substrates.

GROUTING TO FILL VOIDS

Sika grouting technologies are cementitious, resin or polyurethane binders. Engineering grouts are designed to completely fill voids and transfer load. SikaGrout® and Sikadur® are ideal for the filling of vertical or horizontal joints; for levelling of interacting concrete surfaces and filling very small holes. Sika cable grouts fill small crevices around post tensioned wires to protect the steel from corrosion.

CONCRETE CONSTRUCTION

For the construction of concrete towers Sika provides a large variety of concrete admixtures and auxiliary products. Mould release agents for easy de-moulding, superplasticizer for improved workability, strength and durability accelerators for a faster production process. Fibers can be used to reduce crack-width and to replace steel reinforcement. The use of curing compounds leads to higher durability as the concrete surface is protected after de-moulding.

Recommended Sika products

SikaCor® and Sika® Permacor®

2-component polyurethane or epoxy resin coatings for interior and exterior surfaces of steel towers.

Sikagard®

A range of elastic or rigid water based acrylic resin based protective coatings which ensure an effective barrier against carbonation and chloride ingress.

Sikaflex® and Sika Hyflex®

Joint sealants having chemical resistance, strong bond to construction materials, bubble free curing and a high capacity to movement.

Sikadur®-42 series

Grouts based on reactive resin binder. Non shrink epoxy and Polymethyl methacrylate (PMMA).

SikaGrout®-3000 series

1-component, ready to use, shrinkage compensated cementitious grouts to be pumped or poured.

Sikadur®-31 series

Structural bonding adhesives for concrete elements.

Sika® ViscoCrete®

Superplasticizer to improve workability and increase strength and durability of high performance concrete.

SikaRapid®

Accelerators to gain high early strength for fast de-moulding.

SikaFiber®

Micro- and macrofibers for enhanced durability and reinforcing of concrete.

Sika® Separol®

Mould release agents for easy de-moulding.

100 YEARS OF EXPERTISE

SINCE 1910, THE NAME SIKA STANDS FOR QUALITY AND RELIABILITY. YOU CAN RELY ON US TO PROVIDE PROBLEM SOLVING PRODUCTS FOR ALL YOUR NEEDS; FROM THE TIP OF THE BLADE TO THE BASE FOUNDATION.



THE BASE FOUNDATION

Admixtures, additives, waterproofing and grouting



BUILDING A SOLID BASE IS THE FOUNDATION TO A STRONG STRUCTURE.

PERFORMANCE ENHANCING ADMIXTURES AND ADDITIVES

In the manufacturing process of concrete foundations, Sika products are used from the very beginning. Our admixtures and additives are designed to optimize cost, workability and durability throughout the production and application processes. From project inception to concrete placement in the field, Sika provides the required support during the construction process.

WATERPROOFING SURFACES

Sika's solutions cover the full range of technologies used for waterproofing including flexible membrane systems, liquid applied membranes, waterproofing admixtures for mortars, joint sealants, waterproof ready-to-use mortars, injection grouts and coatings. Watertight systems are faced with more stringent requirements regarding easy application and durability in demanding environments.

BASE GROUTING

One of the essential requirements for high performance grouts is the consistent production and workability of the grout under difficult conditions, onshore and offshore. Our grouting mortars meet all of these demanding requirements, even in extreme temperatures.

Recommended Sika products

Sika® ViscoCrete®

Superplasticizer to improve workability and increase strength and durability of high performance concrete.

Sika® ViscoFlow®

Superplasticizer for production of mass concrete and realization of extended workability times.

SikaPump®

Pumping agent to enhance pumpability and reduce pumping pressure, especially in case of difficult mix designs and unfavourable grading curves.

SikaFume®

Additive based on silica fume to enhance durability.

SikaFiber®

Micro- and macrofibers for enhanced durability and reinforcing of concrete.

Sikalastic®

Spray or roller applied waterproofing mortar, polyurethane/ polyurea coatings with crack bridging properties with UV resistance.

SikaGrout®

High performing, shrinkage compensated, 1-component cement based precision grouts for filling under base plates.

Sika® Igoflex®

One or two component solvent-free bituminous coatings.

TECHNICAL SERVICE

AS A LEADING GLOBAL SUPPLIER WITH MORE THAN 90 LOCAL SUBSIDIARIES, WE GUARANTEE A QUICK ACCESS TO COMPETENT SUPPORT IN THE SELECTION, VALIDATION AND APPLICATION OF SIKA PRODUCTS, AT YOUR HEADQUARTERS OR ON THE JOB SITE.



REPAIR AND MAINTENANCE

Blades, concrete elements and steel structures



WIND TURBINES ARE GENERALLY SITUATED IN EXPOSED LOCATIONS WHERE NATURE TAKES ITS TOLL.

BLADE REPAIR AND RENOVATION

Maintenance and repair work on wind turbine blades has to be carried out rapidly and in a short time. For this Sika has developed several products so that downtime can be further minimised. The repair solutions can be utilised on the full range of in-service damage seen by wind turbine blades such as leading edge erosion, lightning strikes, scuffs and scratches, impact damage, surface pinholes, re-attachment of parts or bulkhead repair.

WATERPROOFING AND PROTECTING

Aggressive environmental influences, mechanical and physical attacks, as well as design or construction faults can all cause concrete damage including corrosion of the steel reinforcement. Sika provides an extensive range of thoroughly tested and proven repair materials and systems based on different technologies for each specific requirement and situation.

COATING REPAIR

Onshore and particularly offshore protective coating systems used for steel structures must meet highest requirements on corrosion protection, and exhibit ease of application in a range of difficult conditions including climate and accessibility. Especially transporting and assembling the heavy parts of wind turbines can cause damage to the corrosion protection coating. For the repair of damaged surfaces an innovative, abrasion resistant, single-layered, cartridge-packed, 2-component product has been developed and is the right choice whenever a simple, high performance and durable repair coating is required.

Recommended Sika products

Sikadur® Blade Repair Kit

Fast curing 2-component, hand lamination structural epoxy repair resin with DNV-GL approval.

SikaForce® Red & Blue

2-component, fast curing in 30 minutes, easy sanding polyurethane profile and surface fillers for wind turbine blade repair.

Sikaflex®

A range of Polyurethane and hybrid sealants for internal and external sealing applications with high weathering resistance.

SikaFast®

Fast curing 2-component acrylates for attachment of vortex generators and trailing edge diffusers.

Sika MonoTop® and Sika® EpoCem®

A range of normal and high performance cement based coatings for protecting steel reinforcement bars.

Sika MonoTop®

1-component, fibre reinforced, low shrinkage structural repair mortars for re-profiling damaged concrete and restoring structural integrity.

SikaCor® and Sika® Permacor®

1- or 2-component corrosion protection coatings for repairs of damaged steel components onshore and offshore.

KNOW-HOW

OUR UNEQUALLED RANGE OF TECHNOLOGIES AND EXPERIENCE ACQUIRED OVER 100 YEARS IN MANY CONSTRUCTION AND INDUSTRIAL MARKETS ALLOW US TO DESIGN PRODUCTS WITH UNIQUE PROPERTIES. WE DEVELOP OUR PRODUCTS FOR THE WIND MARKET WITH THE PARTICULAR REQUIREMENTS OF BUILDING, ERECTING AND REPAIRING WIND TURBINES IN MIND TO ENSURE UNMATCHED EASE OF USE AND PERFORMANCE.



SIKA WITH YOU



The total product range from **blade to base** allows Sika to keep pace with the ever-increasing demands of the wind turbine industry.



Sika's global **Technical Services** teams are focused on validating Sika materials to the processes, substrates and specification requirements.



Over 20 years of successful **experience** in supplying the renewable energy industries with high performing reliable products and solutions marks us out as one of the leading supply companies in this market sector.



Close **co-operation** with our customers ensures adequate performance throughout the design, prototyping, validation and application phases.

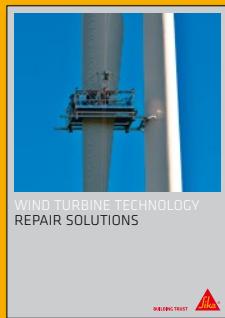
GLOBAL BUT LOCAL PARTNERSHIP



With 20 **Technology Centers** and a skilled staff of engineers and scientists, we are able to deliver a stream of new materials for different specifications to our customers in the wind energy market.

With over 90 local subsidiaries with the aim to make global technology meet **local expertise**, Sika transfers know-how locally on a global basis to guarantee local support in selection, validation and application of our products on job sites around the world.

ALSO AVAILABLE FROM SIKA



FOR MORE WIND ENERGY SOLUTION INFORMATION:



WE ARE SIKA

Sika is a specialty chemicals company with a leading position in the development and production of systems and products for bonding, sealing, damping, reinforcing and protecting in the building sector and the motor vehicle industry. Sika's product lines feature concrete admixtures, mortars, sealants and adhesives, structural strengthening systems, industrial flooring as well as roofing and waterproofing systems.

Our most current General Sales Conditions shall apply. Please consult the most current local Product Data Sheet prior to any use.



SIKA SERVICES AG
Tueffenwies 16
CH-8048 Zurich
Switzerland

Contact

Phone +41 58 436 23 68
Fax +41 58 436 23 77
www.sika.com
ses.sika.com

BUILDING TRUST

