SIKA WIND ENERGY SOLUTIONS
FROM BLADE TO BASE
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.
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 approval), 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

SIKA WIND ENERGY SOLUTIONS
FROM BLADE TO BASE
SIKA WIND ENERGY SOLUTIONS
FROM BLADE TO BASE

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

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

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

NACELLES AND MACHINE PARTS
- Weather resistant sealing
- Fast setting element bonding
- Corrosion and mechanical protection

REPAIR AND MAINTENANCE
- Blade repair and renovation
- Waterproofing and protecting
- Coating repair

THE BASE FOUNDATION
- Performance enhancing admixtures and additives
- Waterproofing surfaces
- Base grouting

MOULD MANUFACTURING
- Fabrication of models
- Production of moulds
- Blade shell infusion
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 tooling boards.
- **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.

Recommended Sika products
- **SikaPower®**
  - High performance, non-sagging, long open time, fast curing structural polyurethane adhesive for blade bonding.
- **SikaForce®-7816 series**
  - High performance, non-sag polyurethane putty for leading edge profile filling.
- **SikaForce®-7812 series**
  - 2-component, non-sag 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.

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. Sikadur® and SikaGrout® series 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.

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.

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 SikaHyflex®
  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® Separoll®
  Mould release agents for easy de-moulding.
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

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sika® ViscoCrete®</td>
<td>Superplasticizer to improve workability and increase strength and durability of high performance concrete.</td>
</tr>
<tr>
<td>Sika® ViscoFlow®</td>
<td>Superplasticizer for production of mass concrete and realization of extended workability times.</td>
</tr>
<tr>
<td>SikaPump®</td>
<td>Pumping agent to enhance pumpability and reduce pumping pressure, especially in case of difficult mix designs and unfavourable grading curves.</td>
</tr>
<tr>
<td>SikaFume®</td>
<td>Additive based on silica fume to enhance durability.</td>
</tr>
<tr>
<td>SikaFiber®</td>
<td>Micro- and macrofibers for enhanced durability and reinforcing of concrete.</td>
</tr>
<tr>
<td>SikaLastic®</td>
<td>Spray or roller applied waterproofing mortar, polyurethane/polyurea coatings with crack bridging properties with UV resistance.</td>
</tr>
<tr>
<td>SikaGrout®</td>
<td>High performance, shrinkage compensated, 1-component cement based precision grouts for filling under base plates.</td>
</tr>
<tr>
<td>Sika® Igolflex®</td>
<td>One or two component solvent-free bituminous coatings.</td>
</tr>
</tbody>
</table>
REPAIR AND MAINTENANCE

Blades, concrete elements and steel structures

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

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.

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.
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.
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