



SIKA SOLUTIONS RENEWABLE ENERGY INDUSTRY

**BUILDING TRUST
CONSTRUIRE LA CONFIANCE**



SIKA - A COMMITTED PARTNER FOR A SUSTAINABLE ENERGY FUTURE

THANKS TO A DIVERSE AND FAVOURABLE GEOGRAPHY, CANADA CAN COUNT ON AN IMMENSE RESERVOIR OF RENEWABLE RESOURCES USABLE FOR THE GENERATION OF ENERGY INCLUDING MOVING WATER, WIND, BIOMASS, SOLAR, GEOTHERMAL, AND OCEAN ENERGY. THE COUNTRY IS ACTUALLY AMONGST THE TOP PRODUCERS AND USERS OF RENEWABLE ENERGY WORLDWIDE.

DID YOU KNOW THAT?

- In 2022, renewable energy sources provided 16.9 % of Canada's total primary energy supply.
- Moving water is the most important form of renewable energy source in Canada, accounting for 61.7 % of Canada's electricity generation in 2022*. In fact, Canada is the third-largest producer of hydroelectricity in the world.
- Wind energy and solar PV are the fastest growing sources of electricity in Canada. Cumulative installed capacity for solar PV has grown from 26 megawatts (MW) in 2007 to 6,452 MW in 2022, and for wind power has increased from 1,846 MW in 2007 to 15,132 MW in 2022*.

*Sources: Natural Resources Canada





WIND POWER

SIKA SOLUTIONS AT THE PRODUCTION PLANT

THANKS TO ITS VAST EXPERIENCE IN CONSTRUCTION MATERIALS AND INDUSTRIAL PRODUCTS, SIKA IS THE ONLY PARTNER ABLE TO PROVIDE A COMPLETE RANGE OF SOLUTIONS TO THE WIND INDUSTRY, FROM THE PRODUCTION PLANT TO THE INSTALLATION AT THE JOBSITE, ALONG WITH MAINTENANCE SYSTEMS AND TECHNICAL SUPPORT.

CONCRETE TOWER ELEMENTS CONSTRUCTION

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



CONCRETE ADMIXTURES AND ADDITIVES

- **Sika® ViscoCrete®:** Superplasticizer to improve workability and increase strength and durability of high-performance concrete
- **Sika Air®:** Air entraining admixture allowing for the development of stable air void systems to enhance durability in harsh freeze-thaw rich climates
- **SikaFiber®:** Micro- and macrofibres for enhanced durability and reinforcing of concrete
- **SikaRapid®:** Accelerators to gain high early strength for fast de-moulding of precast concrete tower segments
- **Sika® Separol®:** Mould release agents for easy de-moulding of precast tower segments
- **Sika Control® NS / SC & 75:** Shrinkage reducing and compensating admixture to control the shrinkage of the mass concrete
- **SikaCrete® M-100 & -950DP:** Supplementary cementitious materials (metakaolin & silica fume) to enhance the durability and longevity of the structures by reducing pore size, enhancing strength development and reducing chloride penetration
- **SikaControl®-312SE:** Strength-enhancing admixture to improve the hydration of cement particles to allow for more sustainable concrete mix designs
- **SikaCrete® UHPC:** High-performance, pre-dosed, multi-component solution to provide UHPC durability, ductility and enhanced strength to meet project requirements

CORROSION PROTECTION OF REINFORCED CONCRETE

- **Sika Ferrogard®-903+ / -908:** Surface-applied corrosion inhibitors and penetrating sealers for reinforced concrete
- **SikaTop® Armatec-110 EpoCem®:** Epoxy resin for repairs to reinforced concrete and for preventive protection of reinforcement

PROTECTION OF CONCRETE ELEMENTS

- **Sikagard® coatings:** Elastic or rigid water-based acrylic, resin-based protective coatings which ensure an effective barrier against carbonation and chloride ingress



WIND POWER

SIKA SOLUTIONS AT THE JOBSITE

BUILDING THE FOUNDATION

The size of a wind turbine's foundation always depends on the model and the characteristics of the soil. A typical 3 MW wind turbine will require a volume of concrete between 500 m³ and 550 m³ for its foundation. However, the new generation of turbines are larger and more powerful, and for those, the volume of concrete for the foundation can reach 900 m³. For example, the foundation volume for a 5 MW wind turbine is almost 800 m³ of concrete, for a total weight of over 1,900 tonnes. From mix design to transport, pumping, placing and finishing requirements for mass concrete, Sika offers a comprehensive range of admixtures and concrete additives that will help customers meet these challenges.

SIKA ADMIXTURES AND ADDITIVES

- **Sika® ViscoCrete®:** Superplasticizer to improve workability and increase strength and durability of high-performance concrete
- **Sika ViscoFlow®:** Workability retaining admixture extending the working time of concrete and grout mix designs for pouring and transportation
- **Sika Control® NS / SC & 75:** Shrinkage reducing and compensating admixture to control the shrinkage of the mass concrete
- **SikaCrete® M-100 & -950DP:** Supplementary cementitious materials (metakaolin & silica fume) to enhance the durability and longevity of the structures by reducing pore size and enhancing strength development
- **SikaSet®:** Accelerators to help pour and place concrete during the colder seasons
- **SikaFiber®:** Micro- and macrofibres for enhanced durability and reinforcing of concrete resistance
- **Sika Integral Watertight Products:** Sika watertight products offer hydrophobic and hydrophilic solutions to prevent water ingress overtime
- **SikaControl®-312SE:** Strength-enhancing admixture to improve the hydration of cement particles to allow for more sustainable concrete mix designs

PROTECTIVE COATINGS FOR REINFORCED CONCRETE ELEMENTS

For protection of concrete from carbonation and chloride ingress

- **Sikagard® coatings:** Elastic or rigid water-based, acrylic resin-based coatings

SEALING & BONDING FOR TOWER ELEMENTS

Sikaflex® stands for best-in-class and high-quality envelope sealants. Element bonding adhesives provide a rigid bond between elements to transfer load. They also have excellent adhesion to many other materials and can be used to bond different substrates.

- **Sikaflex®:** joint sealants providing chemical resistance, strong bond to construction materials, bubble-free curing and a high capacity to movement
- **Sikadur®:** epoxy adhesives used effectively to bond precast concrete elements together and provide a waterproof seal

GROUTING SOLUTIONS

Sika grouting technologies are based on cementitious, resin or polyurethane binders. Engineering grouts are designed to completely fill voids and transfer load.

- **SikaGrout®** (cementitious grouts) and **Sikadur®** (resin-based grouts) are designed to fill vertical or horizontal joints; to level interacting concrete surfaces and to fill very small holes
- **Cable grouts:** Cementitious injection grouts to fill small crevices around post-tensioned wires to protect the steel from corrosion
- **Sika® Intraplast® N:** Expanding grouting admixture providing the expansive nature required to have non-shrink grouts
- **Sika Ferrogard®:** range of Corrosion management solutions for reinforced concrete elements. Sika Ferrogard are surface-applied treatments of reinforced concrete composed of corrosion inhibitors and penetrating sealers

WATERPROOFING MEMBRANES

For protection of exposed concrete at the base of the wind turbine

- **Sikalastic® membranes:** PU-based, liquid-applied waterproofing membranes and coatings

WIND POWER

SIKA SOLUTIONS FOR REPAIR AND MAINTENANCE

BLADE REPAIR AND RENOVATION

Sika has developed several repair solutions that can be utilized 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, reattachment of parts or bulkhead repairs.

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 offers a complete range of protective coatings.

COATING REPAIRS

Before the commissioning of any wind turbine, its transport and assembly process onsite may already result in damage to the corrosion protection coating. For such repairs, Sika provides an innovative, abrasion resistant, single-layered, cartridge-packed, 2-component product for simple, high performance and durable coating repairs.



SOLAR POWER

SIKA SOLAR-READY ROOFS

A SOLAR ROOF OR ROOFTOP PHOTOVOLTAIC (PV) SYSTEM IS A SETUP WHERE ELECTRICITY-GENERATING SOLAR PANELS ARE MOUNTED ON THE ROOF, UTILIZING THE PRIME EXPOSURE OF THE ROOFTOP TO SUNLIGHT AND CREATING ONE OF THE MOST ENVIRONMENTALLY FRIENDLY ROOFS POSSIBLE.

BENEFITS OF SOLAR ROOFS:

- Cost savings through solar power purchase agreements, tax credits and income from sale of surplus electricity, if available locally
- Environmental win by obtaining electricity from a renewable resource without pollution
- Reliable source of energy in the case of electrical outage when the PV system has battery-powered storage
- Stable, relatively fixed costs as PV systems are less vulnerable to electricity rate hikes

SARNAFIL® ENERGYSMART MEMBRANES:

- **Sarnafil® G410 and Sarnafil® S327 EnergySmart** are single-ply, PVC membranes with high reflectivity that can be used as a substrate for the installation of bifacial solar systems. The high reflectivity of this type of membrane promote high transfer of sunlight from the waterproofing layer back to the rear side of the solar panels not directly exposed to the sun, which in turn increases the energy production efficiency
- **Sikaplan® (fastened & adhered versions) EnergySmart roof membrane**, a highly reflective, PVC thermoplastic membrane compatible with the installation of bifacial solar systems

HYDROTECH MM6125® MEMBRANE:

- **Hydrotech MM6125® membrane: Monolithic Membrane 6125® (MM6125®)** is a hot applied rubberized asphalt for use in waterproofing. MM6125® is a thick, tough, flexible and self-healing membrane which has been successfully used worldwide on all types of horizontal and vertical structures including plazas, parking decks, fountains, water basins, planters, tunnels, bridges, mud slabs, foundation walls, roofs and vegetative roofs. Using pitch pan flashing to install & to support the solar panels, gives one of the best membrane options for projects with solar panels
- **Hydrotech Gardenroof® Assembly systems**, including vegetative (intensive or extensive) and blue roofs (stormwater management) represent roofing assembly systems compatible with solar panels



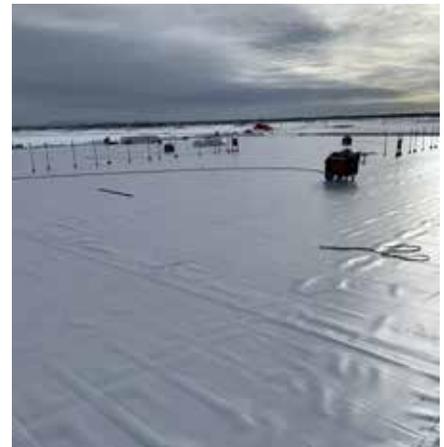
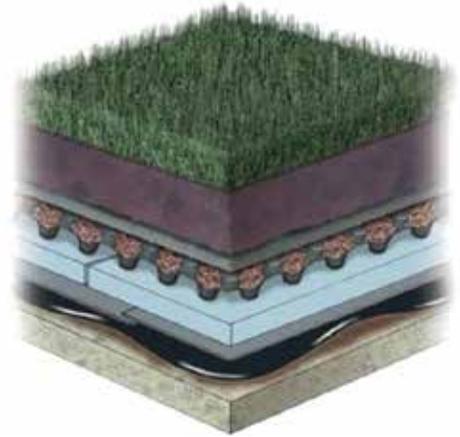
SOLAR POWER

COMPLEMENTARY SOLUTIONS

ROOF EXPANSION JOINTS:

Expansion or movement joints bisect the entire structure. This means that structural as well as building enclosure materials specified to waterproof, roof, clad, and cover the structure are divided by the intersecting opening that is the expansion joint. Consequently, expansion joint openings must be filled, sealed, and/or covered with materials that restore the function of the materials bisected.

- **Roofjoint** is a patented dual-seal, double-flanged, extruded thermoplastic rubber system for sealing expansion joints in roofs, plaza assemblies, green and vegetative roofs. Watertightness is achieved through positive integration with the roofing membrane and a purpose-designed system for transitioning between the joint in the roof and joints in walls



HYDROPOWER GENERATION

UNDERSTANDING THE DIFFERENT TYPES OF DAMS BY CONSTRUCTION TYPE AND MATERIALS

BENEFITING IN FROM OVER 80 YEARS OF EXPERIENCE IN THE MOST CHALLENGING DAM PROJECTS AROUND THE GLOBE.

SIKA CAN PROVIDE A FULL RANGE OF PRODUCTS AND SYSTEMS FOR CONSTRUCTION OF DAMS FROM THE BASE FOUNDATIONS TO THE CREST, ALONG WITH REFURBISHMENT SOLUTIONS.

UNDERSTANDING DAMS

Each dam is different. The design and construction materials used are largely dependent on the size and shape of the river and the valley. Dams can be made from two main types of materials:

- **Earth Dams:** including earth-filled, rock-filled and concrete faced rock-filled (CFRD)
- **Concrete Dams:** including conventional concrete (CVC) and roller-compacted concrete (RCC)

Earth- and rock-fill dams generally have a solid core of impermeable clay in the middle to prevent water leakage and an outer layer of rock or concrete sections for strength. Concrete dams are made of high strength, solid concrete walls designed to resist the required pressure of water. Roller-Compacted Concrete is now one of the most widely used technologies for dam building today, because it effectively combines the performance of concrete and the ease of construction of an earth dam.

A SIKA SOLUTION FOR EACH COMPONENT OF THE DAM

MAIN DAM

In addition to the main dam, several other major structures are necessary to allow and ensure full operations. For example, on larger dam schemes such as hydropower plants, many secondary structures ranging from the spillways to the powerhouse, penstocks and galleries are included.

- **CVC & RCC Dams:**
 - Admixtures for concrete construction:** Sika® Plastiment®, Sika® Plastocrete®, Sikament®, SikaControl® AER and others for controlled curing of concrete
 - Corrosion protection:** Sika® FerroGard® corrosion inhibitor to prevent the corrosion of steel reinforcement
 - Waterproofing:** Sika Waterbar® Flexible PVC waterstops
- **Earth Dams:**
 - Admixtures for concrete construction:** Sika® Plastiment® (CFRD dams), Sika® Plastocrete® and Sika® ViscoCrete®
- **Grouting:** SikaGrout® series for grouting in and around the foundations, filling voids, holes and cavities in the hardened concrete, embedding structural elements and much more

SLOPE STABILIZATION

The application of shotcrete provides a protective coating over the slope's surface and also helps to consolidate and stabilize or "anchor" the surface.

- **Specialist shotcrete admixtures and concrete mixes for concrete construction:** Sika® Sigunit®, Sika® ViscoCrete®, SikaTard®, SikaFiber®, SikaFume® and the King® range of shotcrete mixes
- **Slope surface sealing:** Sika® Injection technology using flexible polyurethane and acrylic resin-based injection systems

SPILLWAY AND INTAKE STRUCTURES

These secondary structures are usually made of reinforced concrete and are used to collect water from the reservoir.

- **Construction of structures:** Sika offers a large variety of concrete admixtures and ancillary concreting products including plasticizers, high range superplasticizers, strength and durability, set and hardening accelerators, fibres, formwork release agents
- **Grouting:** Engineering grouts are designed to completely fill voids and transfer load directly within the concrete structure. SikaGrout® and Sikadur® include systems with cementitious, epoxy and polyurethane resin-based binders. They are ideal for filling both vertical and horizontal joints between structural elements, sealing voids and areas of honeycombing
- **Concrete protection:** Sikagard® coatings are used on concrete surfaces to provide overall protection against mechanical wear and chemical exposure, as well as an impermeable barrier to water penetration

UNDERGROUND WORKS

When a dam is to be built, a tunnel is frequently bored first, in order to divert water away from the actual dam construction site itself and so that it essentially bypasses it. The Sika product range for tunnels and below ground construction is absolutely extensive and the result of over a century of specific experience, continuous improvement and innovation in tunnelling. This extensive product range comprises all the latest technologies in concrete admixtures and additives, shotcrete mixes and admixtures, waterproofing solutions (PVC waterstops, PVC and TPO sheet membranes and injection products), grouting, TBM solutions, backfilling admixtures and other ancillary products.

POWERHOUSE

The building hosting the turbines, generators and their necessary auxiliary equipment is usually a large reinforced concrete structure having three distinct areas: the main powerhouse or generator room, the erection bay for transformer tanking and un-tanking, plus the service areas.

■ Structure construction:

Sika provides the widest range of concrete admixtures and additives to help ensure that the reinforced concrete structure can meet the various project requirements. Typical admixtures include Sika® ViscoCrete®, SikaControl®, SikaRapid®, etc.

■ Flooring:

Floors need to be mechanically and chemically resistant because of the maintenance work (accidental presence of oil, etc.) or forklift traffic. Depending on exposure scenario within the facility, epoxy-based coatings from the Sikafloor® range and Sikalastic® polyurethane membranes may be used to protect floors

■ Roofing:

Depending on the location and design of the powerhouse onsite, Sika can provide different and highly durable roofing systems. Typical systems are Sarnafil® and Sikaplan® single-ply membrane systems, and Hydrotech bituminous membrane systems

PENSTOCK AND GATES

The dam penstocks are large pipes that control and convey pressurized water to the powerhouse turbines. These can be designed and positioned to run along at ground level, or below ground as a buried pipe, depending on the topography and geology of the site. Powerful gates and mechanical filters are essential to avoid any solid materials that may be picked up, from entering and damaging the electromechanical generation equipment of the turbines.

■ Grouting:

For grouting of heavy machinery, equipment and base plate with subsequent high resistance to dynamic loading, heavy impact and vibration, even under water, Sika supplies SikaGrout®, a range of high performance, cementitious grouting systems and Sikadur® epoxy grouting systems

■ Steel protection:

Sikagard® coatings are widely used for many different protective coating applications internally and externally on penstocks, in and around the dam powerhouse and on ancillary structures to provide a durable protection

DAM REFURBISHMENT

As a global leader in the concrete repair, protection and refurbishment industry, Sika can provide systems to restore and rehabilitate dams that have deteriorated over time, due to corrosion, abrasion, structural damage, water infiltration, freeze/thaw, seismic activity and others.

SIKA SOLUTIONS

- Structural cracks injection: Sikadur® epoxy grouts
- Repair and maintenance concrete structures: Sika MonoTop® high performance, cementitious polymer-modified mortars
- Concrete protection against deleterious elements and against corrosion: Sikagard® & Sika® Ferrogard®
- Anchoring of various types of fittings and equipment to structures: Sika AnchorFix® range of chemical anchoring systems



YOUR SINGLE SOURCE SUPPLIER



ROOFING



CONCRETE



JOINT SEALING



SHOTCRETE



GROUTING & ANCHORING



CONCRETE REPAIR & PROTECTION



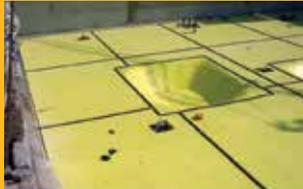
STRUCTURAL STRENGTHENING



TUNNELLING



FLOOR & WALL SYSTEMS



WATERPROOFING SYSTEMS



MASONRY



MINING

CONTACT US FOR MORE INFORMATION



Sika Canada Inc., a member of the Sika Group, is a leader in the field of speciality chemicals for construction and manufacturing industries. Our product lines feature high quality roofing systems, concrete admixtures, mortars and resins, sealants and adhesives, structural strengthening components, industrial and decorative flooring, as well as protective coatings and waterproofing systems. Our expertise is born out of a global presence and served by strong, local support. Sika has earned the trust of our customers for over 100 years, by delivering the highest standards of commitment and partnership.

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

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