SEDIVER

TOUGHENED GLASS INSULATORS FOR HVAC APPLICATIONS

Experts & Pioneers

WORLDWIDE - 2025

Sediver®,
experts and pioneers in insulation technology

Sediver® was established in 1898 in Saint-Yorre, France. Its history is shaped by a series of innovations and successes that have made Sediver® what it is today: the partner of choice for utilities worldwide.

We bring deep knowledge and on-the-ground experience in designing power lines and equipping them with high quality toughened glass insulators suitable for all environments.

Our significant recurring R&D investments have resulted in a level of technical know-how that is unique on the market. We are proud of the relationships we have built with our customers around the world. Our mission is to give everyone access to electricity while minimising environmental impacts.

Supported by a global network of business partners, we maintain the closest of relations with all our customers in over 150 countries.

This catalogue presents a selection of our Sediver® toughened glass insulator products, meeting customers' needs worldwide in terms of technical standards (ANSI/IEC/BS), best practices and environmental conditions. Sediver® toughened glass insulators satisfy and exceed the performance requirements of all standards.

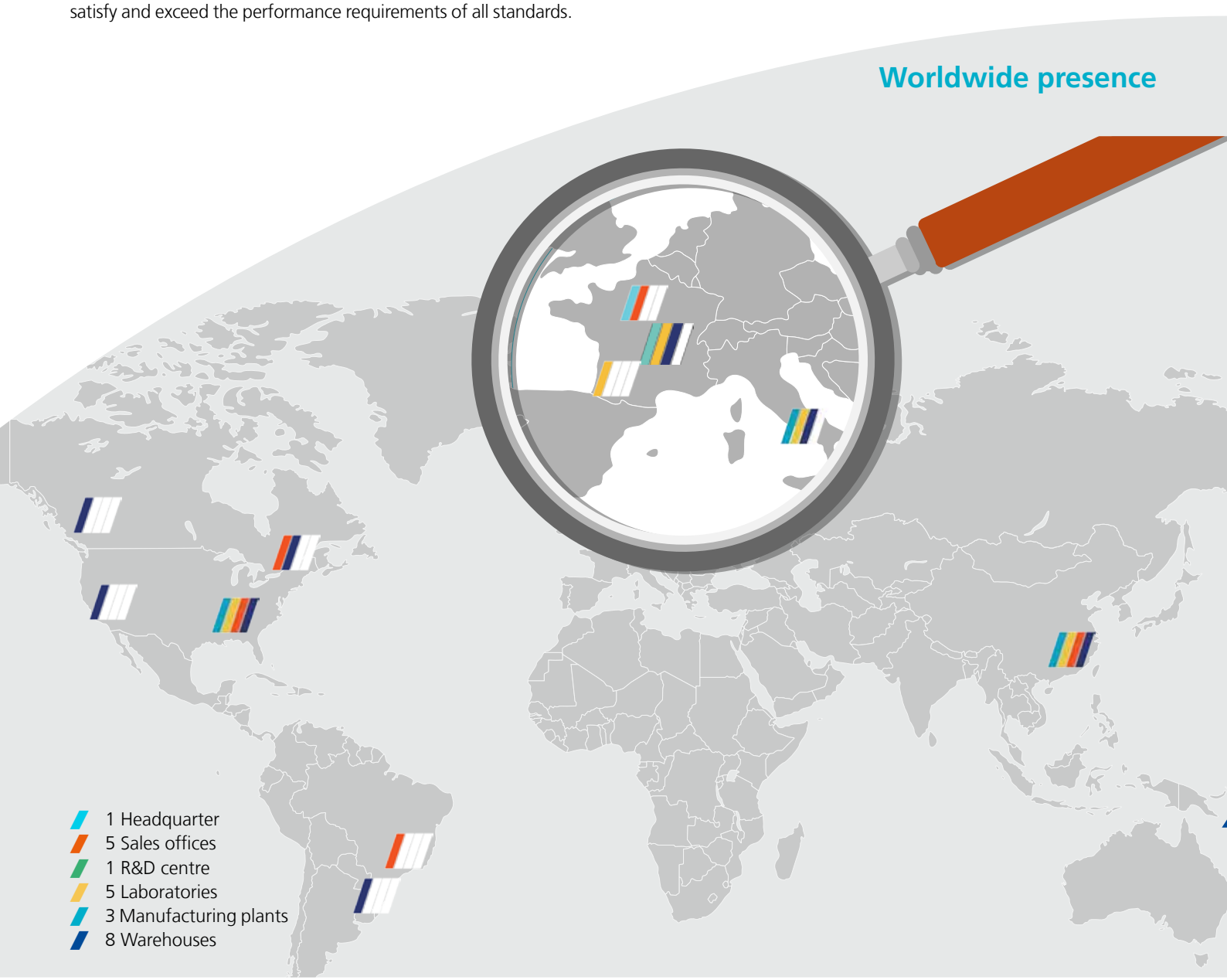
Over 600 toughened glass insulators installed in more than 150 countries on lines up to **1,100 kV AC**,

Over 11 toughened glass **DC** insulators installed on lines up to 800 kV,

15 million insulators installed on lines **≥735 kV AC/DC UHV.**

5+ million Sedicoat insulators, silicone-coated toughened glass insulators for both AC and DC applications.

Worldwide presence



We support the energy transition
by enabling a reliable and sustainable electricity supply

Our decades of experience have given us ample opportunities to experiment with and test different insulator technologies. Since 1947, we have maintained a sharp focus on the one technology capable of giving our customers the confidence and assurance they demand: toughened glass.

Since then, we have consistently innovated to improve our products for:

- greater efficiency in all operating conditions
- longer lifespans in all environments
- easier installation
- simpler line maintenance
- lower total cost of ownership.

And, as suppliers of one of the most extensive product lines on the market, we are positioned to support all types of project worldwide.

We manufacture
high quality toughened glass insulators

Why glass?

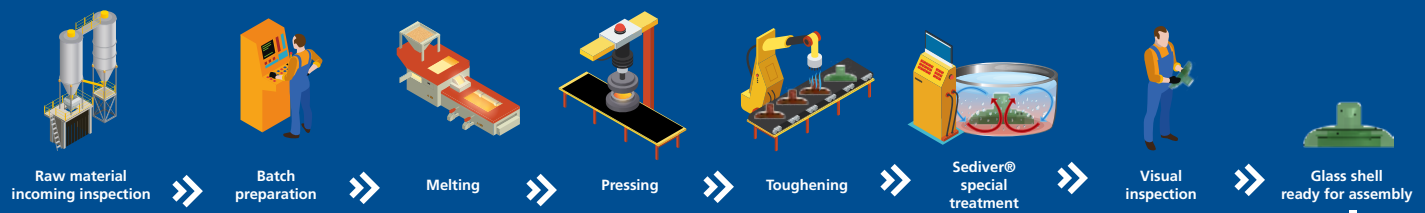
Glass is fully amorphous, it is a frozen liquid. This means it has no crystallographic structure responsible for ageing. Our unique manufacturing process makes glass even more reliable, stable and strong. We have decades of knowledge of this material, enabling us to provide our customers with unique benefits throughout the life cycle of their transmission line.

Our own distinctive manufacturing process

- A **high-purity** glass with an **outstandingly homogeneous chemical composition.**
- A unique know-how enabling us to create **complex glass shapes** and products up to 420 mm (16½") in diameter and weighing more than 10 kg (22 lbs).
- A toughening process developed by Sediver® that generates a compressive pre-stress on the surface of the glass shells, giving the glass a high mechanical strength and increasing its resistance to thermal shocks and mechanical impacts and its immunity to the effects of ageing.
- A highly automated manufacturing process perfected over the years by Sediver®, guaranteeing consistently high levels of quality in terms of materials and final product assembly.
- Assembly using a **specific hot curing process** and a chemically inert cement (high strength aluminous cement) immune to the cement growth phenomena, promising outstanding mechanical stability over time and very high mechanical strength.
- **Galvanisation and zinc sleeves that prevent corrosion of metal fittings** and help extend the service life of insulators.

- A **stringent quality system** comprising systematic controls and inspection of insulators during manufacturing, all **constantly and automatically monitored** and supervised by qualified inspectors.
- **A standardised process across all production facilities, guaranteeing consistent product performance worldwide.**
- **A quality assurance system** and individually marked units that ensure full traceability of all insulators.
- **A low shattering rate,** guaranteed <1/10,000 per year due to the high purity of our Sediver® glass and outstanding process.

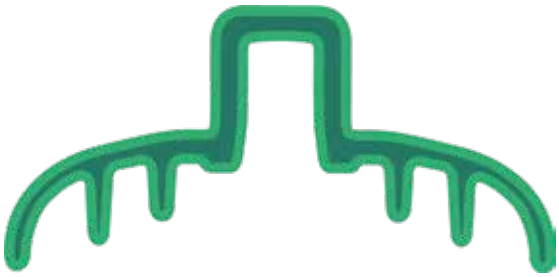
GLASS LINE



ASSEMBLY LINE

The toughening process

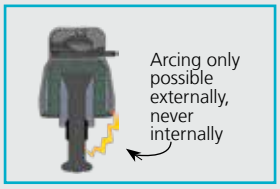
The toughening process **exposes the glass shell to pre-stress** through rapid and precisely controlled cooling. This creates **compressive forces** on the outer surface layer, counterbalanced by extension forces operating within the body of the glass shell.



Toughening improves our insulators:

- **High mechanical** strength
- **High resistance to thermal shocks**
- **No ageing**
- **High resistance to the most extreme surges,** including switching surges, steep front lightning strikes and power arcs
- Unique property of **breaking in a predictable pattern** in case of mechanical or electrical overstress: crumbling of the glass shell results always in fragments of safety glass with no razor-sharp shards
- **Binary nature:** exists in one of two well-defined states, either fully intact or as a mechanically and electrically safe stub. Visual inspection provides 100% infallible data at glance: no possible hidden cracks, easy inspection, no instruments needed

With glass, no line drops



Intact shell	Damaged shell
• Guaranteed absence of internal cracks and electrical punctures	• Residual mechanical strength: 80% mechanical rating guaranteed over prolonged periods, even in very harsh conditions
• 100% mechanical rating guaranteed over prolonged periods, even in very harsh conditions	• Residual electrical strength: no internal puncture and forcing overvoltage induces discharges externally
• 100% electrical strength	

Therefore

• Easier inspection: no need to climb structures or use sophisticated instruments	• No risk of separation or line drops
• Greater worker safety in live-line operations	• No urgency in replacing a unit with a broken shell
• Very low-cost inspection throughout the service life of the line	• Long-term savings in maintenance operations

Global user benefits

- Superior mechanical, electrical and safety performance.
- Very **resistant** to rough handling.
- **Easy transportation** and installation at site.
- **No risk of installing a damaged unit.**
- Residual mechanical strength: **no immediate need to replace an insulator with a broken glass shell.**
- **•A Sediver® glass insulator lifetime equal to or greater than that of conductors, hardware and structures.**
- Sediver® toughened glass insulators = **lowest life cycle cost of all insulating solutions.**

Our worldwide network of experts
at your service

Innovating to bring our customers greater added value every day

At Sediver®, we invest heavily in R&D. The drive to innovate is one of our biggest motivators. For a mission-critical product like high voltage transmission line insulators, innovation is not just possible, it's vital!

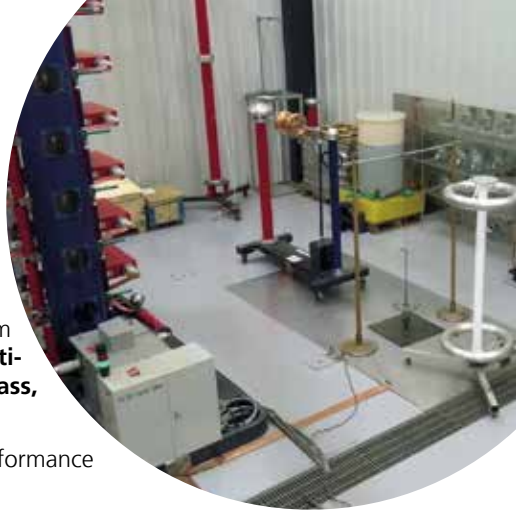
Our R&D department is actively committed to improving the performance, sustainability and reliability of our products and services.

- By **working closely with our customers** to help design the most efficient lines possible and developing custom solutions for their projects.
- By **developing products** for the environments in which they will be used. We deliver researched and tested solutions for efficient use, operation, maintenance and resistance to harsh environments.
- By **offering training classes** to help our customers keep abreast of the latest regulatory and technical requirements.
- By **sharing our results** with the international technical community and with grid operators worldwide through regular technical publications.

Technical support, from the outset

Our team offers:

- research and testing through our global network of laboratories, including electric field simulations and analysis
- development of string designs and custom solutions with dedicated quality and testing programmes
- in-field assessments of in-service insulators and on-site pollution measurements
- technical consultation for selecting insulation solutions and specifications
- solutions for technical issues relating to line operating conditions
- evaluation of end-of-life timelines for in-service insulators



Our laboratory network

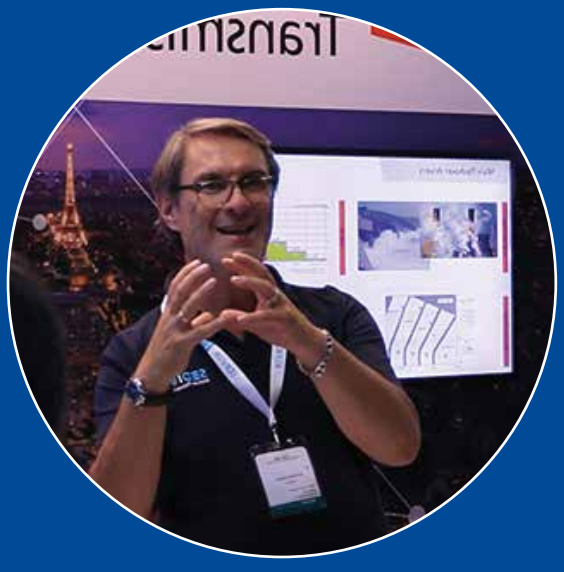
The equipment and facilities at our five research and testing centres guarantee excellent long-term insulator behaviour and performance. Sediver® laboratories are all **ISO 9001** or **ISO 17025 certified. We perform dielectric tests on single units and complete strings of insulators for glass, porcelain and composites according to the relevant IEC, ANSI and CSA standards.**

- Investigation and research in **material science**: vital to ensure a high level of insulator performance and reliability.
- **Mechanical** endurance testing: essential to design insulators offering excellent long-term behaviour under extreme service conditions.
- Evaluation of the insulators' **electrical** performance: fundamental to assess the performance of any type of insulator string configuration.
- Evaluation of the **pollution** performance of insulators and complete strings: critical for choosing the right insulator for a specific environmental condition.

Main testing equipment per country	China	France	Italy	USA
Dielectric tests on insulator units	✔	✔	✔	✔
Dielectric tests on complete strings		up to 800 kV*		
AC salt-fog pollution tests		250 kV		
AC Solid layer Pollution tests		250 kV		
DC pollution tests (salt fog/solid layer)		350 kV		
DC sample tests according to IEC 61325	✔	✔	✔	✔
DC type tests according to IEC 61325		✔		
Mechanical tests on insulator units	✔	✔	✔	✔
Thermal-mechanical tests	✔	✔	✔	✔
Long duration vibration tests on complete strings		2 Hz to 30 Hz *1		
Standard sample tests according to national and international standards	✔	✔	✔	✔
Fatigue test station		✔		

* line equipment

*1 2 Hz to 30 Hz, 60 kN per conductor, 6 conductors - 40 m span



Toughened glass insulators technology
The basics

Definitions

Selecting the right insulator profile for the line environment is essential to achieve the arcing and leakage distances required to avoid flashover.

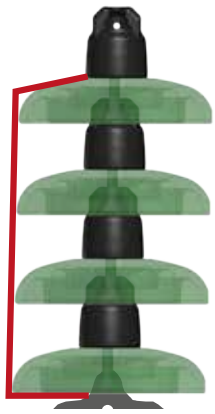


Figure 1

- **Arcing distance**: the shortest air distance between metal parts that can be used by an external arc (shown in red in Figure 1).
- **Leakage distance**: the distance along the glass shell surface of the insulator (shown in yellow in Figure 2).

Figure 2

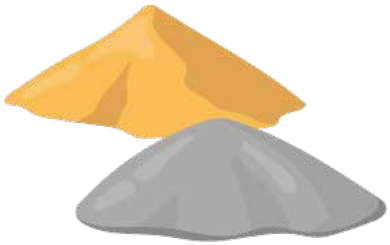
Unlike the arcing distance, which is the distance an electric arc has to bridge during lightning or other events, the **leakage distance is THE most important parameter in polluted environments.**

- **USCD**: the **U**nified **S**pecific **C**reepage **D**istance for an application given in mm/kV, where the leakage distance of a string of insulators is divided by the line's maximum phase-to-ground voltage.

Solid pollution

Any contaminants deposited over the surface of the insulator impacting the performance of the string.

INDUSTRIAL



SAND/DUST

COASTAL

ROAD SALT/SNOW & ICE

WILDLIFE

AGRICULTURAL

Types/sources of solid pollution

Measuring pollution levels

Evaluation of pollution levels involves washing an insulator's surface with deionised water and measuring the ESDD and the NSDD.

Quantifies the accumulation of conductive contaminants on an insulator.

Represents the amount of contamination on an insulator undissolved by water.

Pollution accumulation: What are the risks? How does flashover occur?

1- Pollution deposits, day after day, over the time, time driven process depending on environmental conditions, until it reaches a critical level

2- Wetting of the solid layer pollution by rain, dew, fog etc.

3- Development of surface leakage current in the conductive layer (pollution+water). This surface leakage current along the polluted surface generates dry bands.

4- Localised drying causes partial flashover of dry bands.

5- If the resistance of the remaining layer is low enough, arcs can extend along the insulator.

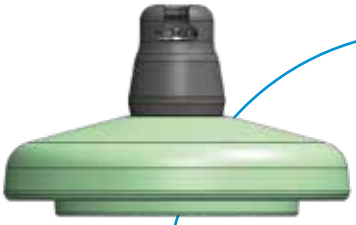
6- Flashover.

High voltage transmission lines
Choosing the right profile

For decades, Sediver® engineers have developed and designed different types of insulator for different types of climate and environment, as described in technical standard IEC 60815-1.

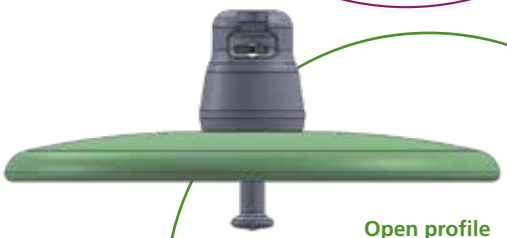
Standard profile

The standard profile is characterised by a leakage distance* higher than the values indicated in the ANSI C29.2B and by well-spaced under-ribs that allow an effective self-cleaning action by wind or rain. It is particularly effective in suspension and tension applications in very light to medium polluted areas (e.g. areas E1 to E4). It is the most commonly used profile for inland projects.



Fog type profile

The fog type profile is characterised by long and widely-spaced under-ribs, which prevent arc bridging between adjacent ribs. It is particularly effective in coastal areas (salt-fog environment) as well as in locally polluted areas where a higher specific leakage distance* is required (e.g. areas E5 to E7).



Open profile

The open type profile features no under-ribs to avoid the accumulation of solid pollution deposits (dust, sand) on its lower surface. It is particularly adapted to suspension and tension applications in dry desertic areas where wind is predominant and rain infre-quent (e.g. areas E1 to E4).

External shed profile

This profile offers a leakage distance* equivalent to the anti-pollution profile and is adapted to the most extreme cases of solid pollution. The elimination of the under-ribs reduces pollution build-up, promotes self-cleaning and facilitates manual cleaning when necessary (e.g. areas E5 to E7 in desert pollution)

* or creepage distance

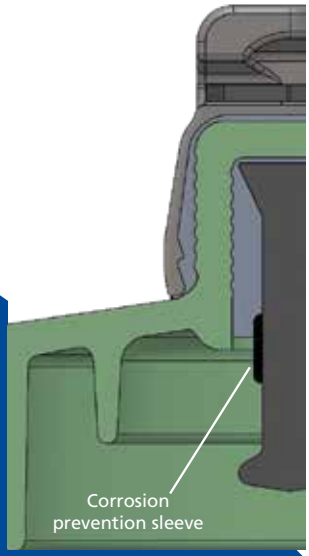
Corrosion prevention solutions

Corrosion prevention sleeve

In severely corrosive marine and industrial atmospheres, the galvanised coating on suspension insulator pins can deteriorate over time and result in corrosion of the pin itself. To prevent this form of pin damage, Sediver® can supply insulators equipped with a corrosion retardation sleeve made of high-purity zinc. These insulators are designated by a "Z" (F100PB/146 with zinc sleeve becomes F100PB/146Z).

Heavy galvanization

All Sediver® ferrous metal fittings are hot-dip galvanised. IEC 60383-1 and ASTM A153-82 require a zinc coating mass of 600/610 g/m² corresponding to a thickness of 85/86 µm. In severe conditions, where this standard protection is known to be insufficient, Sediver® offers enhanced cap and pin protection by increasing the zinc thickness to 120 µm, or up to 130 µm.

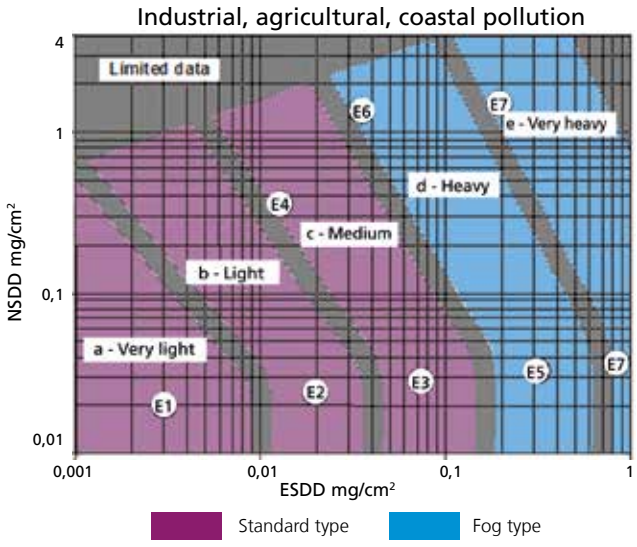


Selection criteria for pollution management

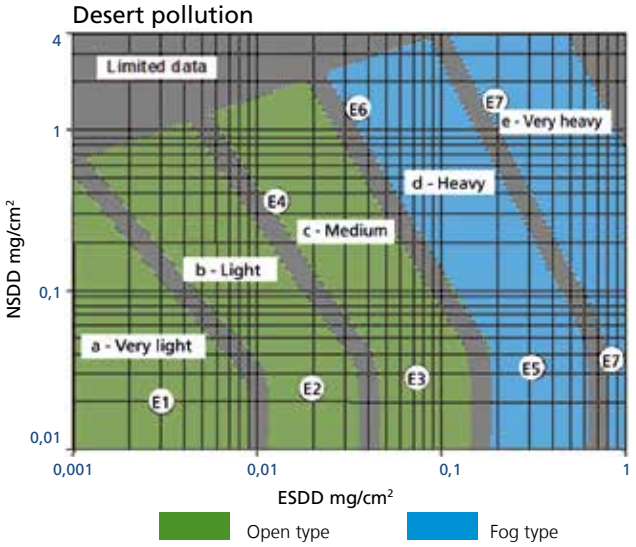
Choosing an insulator profile

Technical standard IEC 60815-1 defines five levels of pollution according to pollution severity: very light, light, medium, heavy and very heavy.

The levels of pollution are defined according to Equivalent Salt Deposit Density (ESDD) and Non-Soluble Deposit Density (NSDD) on the surface of the insulator.



In the case of industrial, agricultural and coastal pollution, Sediver® recommends use of the standard profile in very light, light and medium polluted areas and the fog type profile in heavy and very heavy polluted areas.

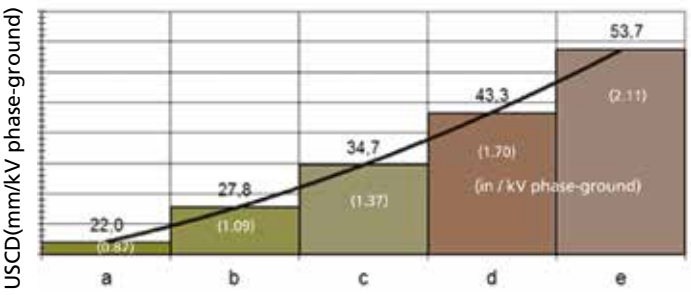


In the case of desert pollution, Sediver® recommends use of the open profile in very light, light and medium polluted areas and the fog type profile in heavy and very heavy polluted areas.

Insulation level

The number of insulators per string depends on the maximum voltage of the transmission line and the pollution severity of the region. It should be calculated in accordance with the specific creepage distance (USCD*) as defined by the IEC 60815-2 standard.

Reference USCD depending on the pollution level



(*) USCD = Leakage distance of the string of insulators divided by the RMS value of the highest power frequency voltage seen by the string (phase-ground).

String dimensioning example:

For a 230 kV line, located on the coast in a heavy pollution area (max. phase-ground voltage: 245 / √ 3)

Selected insulator: F120PB/146Z
(fog type profile with 445 mm leakage distance)

Total leakage distance needed: 43.3 x 245 / √ 3 = 6125 mm

Number of insulators in the string: 6125 / 445 = 14 insulators

Sedicoat - RTV coated insulators
Solution for pollution mitigation

A proven solution with 5 million insulators in service and over 25 years of satisfactory service

Sedicoat RTV coated glass insulators

Sediver® offers high quality factory coated glass insulators as part of its standard product range, created from extensive testing and vast field experience, with 5 million RTV coated glass insulators (Sedicoat) supplied over a period of more than 25 years worldwide.

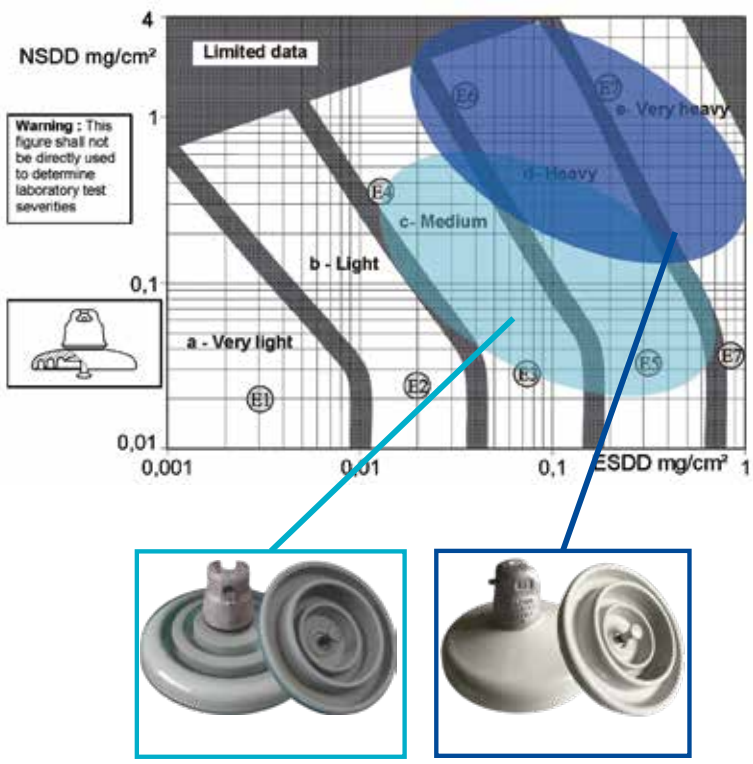
Sedicoat combines a high-performance material with a fully-controlled, industrial application process.

Sedicoat was developed to eliminate or dramatically reduce the need for washing insulator strings in areas of heavy and very heavy contamination. It also helps to improve insulator performance in areas of medium contamination, while retaining the inherent self-detecting features and longevity of toughened glass.

Initially, pollution was mitigated by fully coated insulators. Sediver® introduced under coated insulators for the first time in 2010 as an optional feature.

All Sediver® toughened glass insulator models can be coated

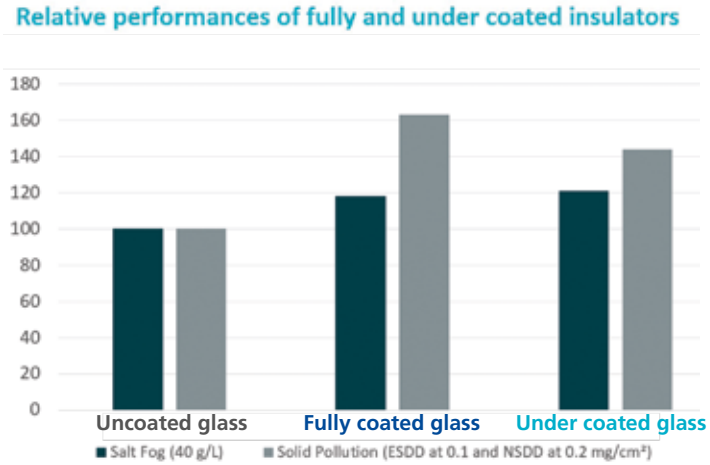
Insulator strings in very heavy (IEC) pollution classes generally require fully coated insulators. Under coated insulators are suitable for medium and heavy pollution areas (IEC), as shown below. In specific cases, where high NSDD levels are registered, Sediver® technical support can assist engineers to evaluate the best fit on a case-by-case basis.



Sediver's Sedicoat maintains the unique properties of our toughened glass insulators while eliminating the risk of flashover

Under coated insulators

In many cases, under coating is an optimal solution, as it performs almost as well as a fully coated insulator with the added benefit of packing and handling conditions similar to those of uncoated insulators. A comparison between fully and under coated insulators is shown below.



Sedicoat insulators for enhanced pollution performance

RTV coated insulators can be used to either optimise a string length at the design stage or improve the performance of insulators in existing lines in highly polluted environments, by increasing the effectiveness of the leakage distance compared to uncoated insulators.

For short line sections where the pollution deposit is homogeneous, use of coated glass may be justified for the entire line.

For longer lines with multiple pollution levels along the route, a flexible approach may be adopted by coating some sections only, increasing the effectiveness of the USCD (Unified Specific Creepage distance) wherever needed. In many cases this will help achieve a line design where similar string and tower designs can be used while adapting the string performance to each specific environment.

Long-term performance of coated glass insulators

The performance and lifetime of a silicone coating depends on the type of silicone, the adherence of the silicone layer to the glass shell, and the thickness and homogeneity of the coating.

Sediver® has set up a stringent R&D programme to ensure optimum performance. The silicones qualified by Sediver® are chosen specifically to resist the severe electrical conditions that cap and pin insulators face on overhead lines in polluted environments.

The coating is applied at the factory according to a specific industrial process qualified by Sediver®.

Sediver® performed extensive testing before offering this solution while monitoring closely, from the outset, how these insulators perform and age. To help end users make the right choice, Sediver® also recommends a selection method which includes 2,000-hour long-term ageing, multi-stress tests, shown below:

Left: test setup.

Middle and right: at the end of the test, the strong hydrophobicity and overall condition demonstrates the strong performance and lack of erosion on Sedicoat coated insulators after a 2,000-hour multi-stress test.

Safety reliability and peace of mind
with Sediver® toughened glass insulators

Safe handling and construction

Sediver® glass insulators resist mechanical impacts well, which makes stringing and line construction much easier and significantly reduces the number of accidentally damaged insulators compared with porcelain insulators.

In the unlikely event of a shell being damaged, any small fragments are harmless to personnel and equipment.

Lastly, damage during installation is clearly and immediately detected, so there is no risk of installing a damaged unit.

Easy inspection

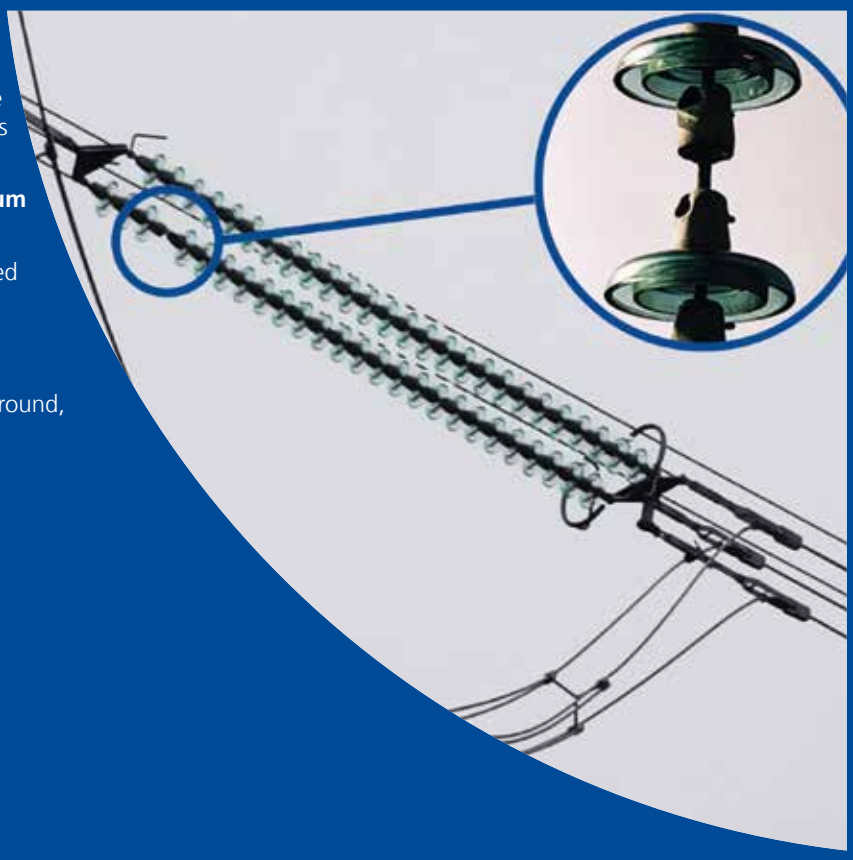
A quick visual inspection will provide 100% infallible data on the condition of a Sediver® toughened glass insulator.

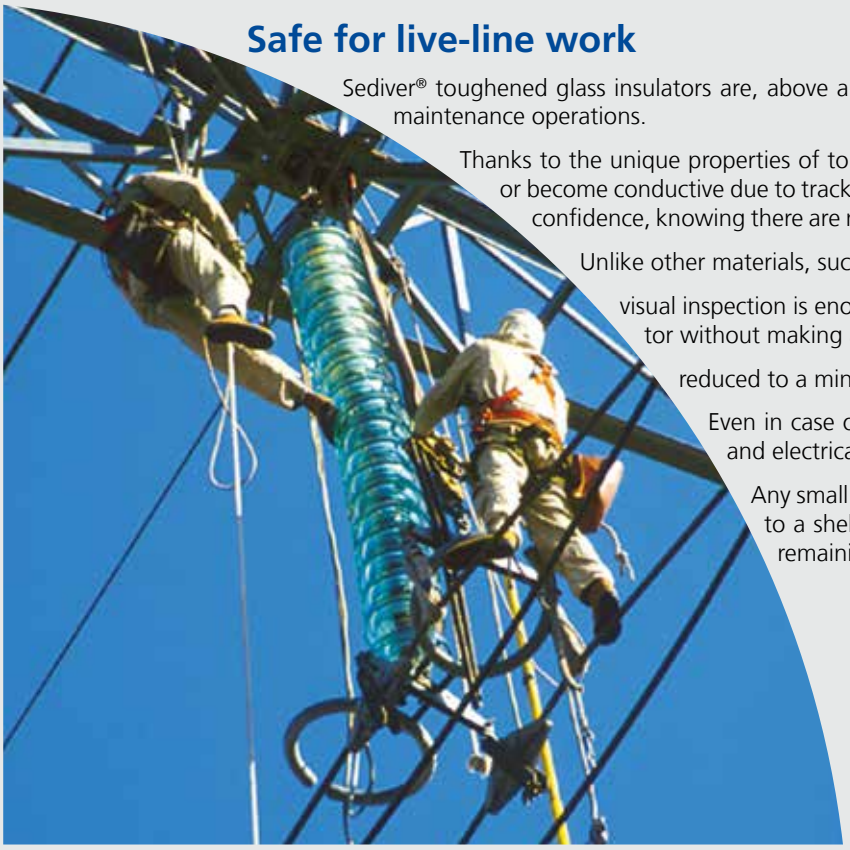
Inspection costs are therefore kept to a minimum throughout the line life cycle.

- No climbing, no bucket truck, no training needed
- No instruments required
- Maximum safety for live-line work
- Can be done by helicopter, drone or from the ground, covering many miles of line per day

No cracks or punctures

- Binary behaviour (intact or stub)
- Mechanically and electrically safe stub





Safe for live-line work

Sediver® toughened glass insulators are, above any other technology, highly suitable for safe live-line maintenance operations.

Thanks to the unique properties of toughened glass, which cannot have hidden punctures or become conductive due to tracking, maintenance crews can carry out live-line work in confidence, knowing there are no concealed risks from internally damaged insulators.

Unlike other materials, such as porcelain and composites, a quick and easy visual inspection is enough to identify the state of a toughened glass insulator without making any possible mistakes. Inspection costs are therefore reduced to a minimum throughout the line's life cycle.

Even in case of a missing shell, the remaining stub is mechanically and electrically safe, with a guaranteed 80% residual strength.

Any small fragments generated in the unlikely event of damage to a shell will not harm the personnel, the equipment or the remaining stub.

Peace of mind

Insulators must withstand both extreme environmental conditions and in-service stresses for over 50 years, without failures or service interruptions.

For example, insulator reliability during or after a fire is a key consideration for T&D line design or refurbishment.

Transmission line operators must evaluate the risk of a line drop in proximity to a fire, and the subsequent possibility of a catastrophic failure resulting from a degraded insulator.

The performance of a toughened glass insulator is not impaired after a fire*

- Non-combustible glass insulators
- Toughened glass: no crack propagation or puncture
- Easy visual inspection after fire
- Mechanically safe at high temperatures, even with a damaged shell

* Based on "Overhead Lines Under Extreme Heat Resulting from Wildfires" by Jean-Marie George (Scientific Director) and Sandrine Prat (PhD Research Manager) - T&D World library - Wildfire risk mitigation for electric utilities.

Specific applications

Choosing the right toughened glass insulator

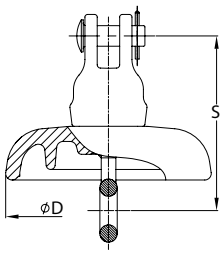
Distribution lines

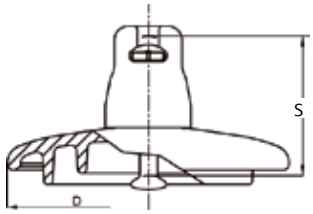
Sediver® toughened glass insulators are designed for distribution, so they are strong, hard-wearing and easy to inspect.

The toughened glass dielectric shell offers superior resistance to damage during shipment, storage, installation and service.

They are ideal for hotline work and pose no risk of line drops.

Damaged units can be easily detected by visual inspection. In the unlikely event of a damaged shell, any small fragments will not harm personnel or equipment.





Bird issue mitigation

Inclusion of an open profile insulator at the top of the string will (no need for additional hardware):

- protect the insulator string below
- maintain the existing string length
- maintain safe live-line working conditions
- reduce or eliminate the need for washing
- reduce or eliminate flashover due to bird mute

Ice bridging solutions in contaminated areas

The large diameter of the open profile glass shell is advantageous for alleviating ice bridging problems.

Flashover due to ice bridging can occur under specific climatic conditions where the ambient temperature is close to the melting point of ice. Urban areas where there are atmospheric particles and contaminants are most prone to ice bridging problems.

Using alternate shed profile insulators reduces the risk of flashover due to ice bridging, since it effectively doubles the length of the icicles required to bridge in between insulators.

This solution has been adopted by several Canadian utilities, and more than 25 years of service experience has shown it to be effective.

Other applications on demand

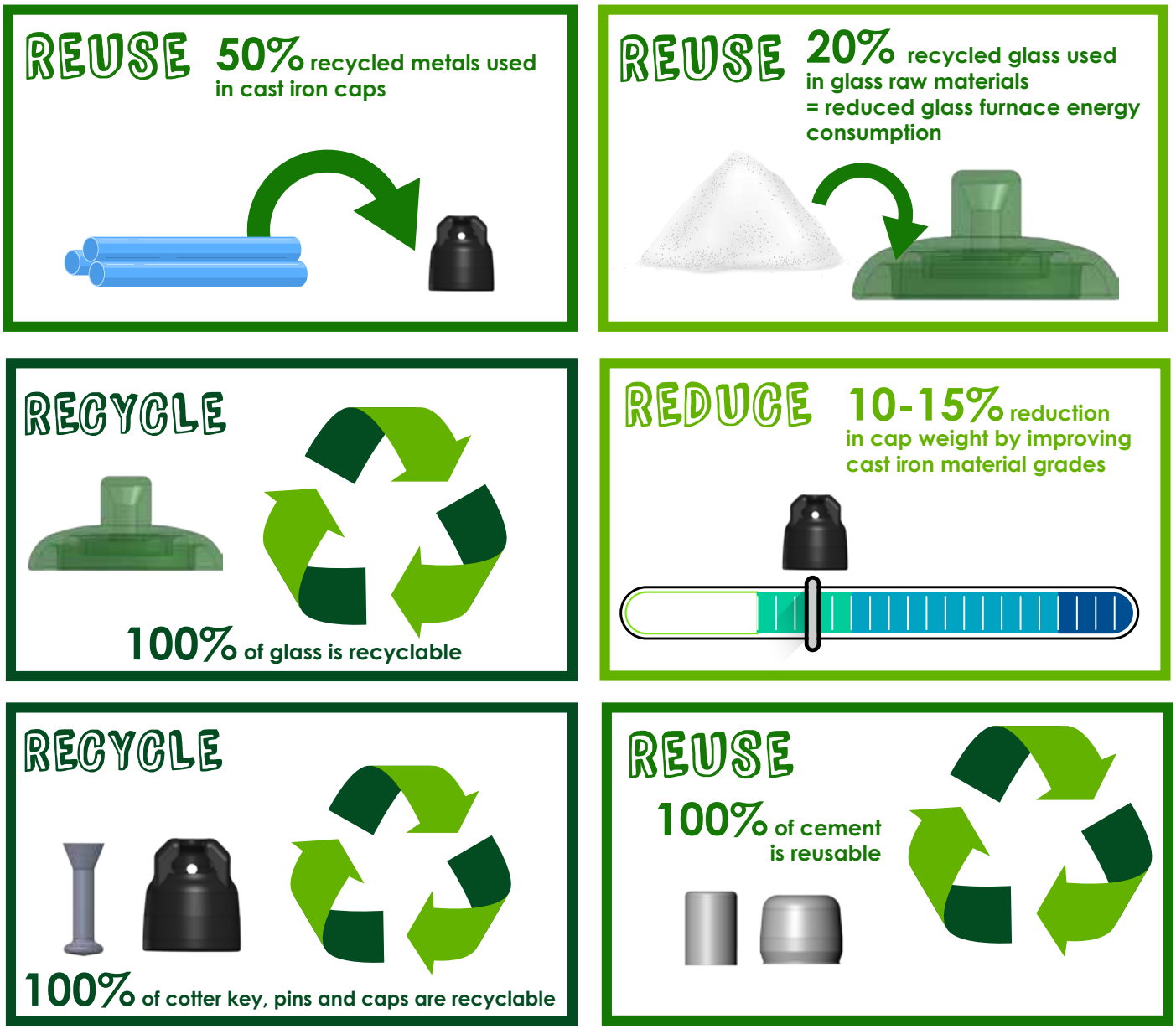
Our products are inherently
more resilient and sustainable

Sediver® toughened glass insulators in renewable applications

By supporting grid infrastructure expansion and decarbonisation, our core activity improves access to energy, facilitates integration of renewable energy and accelerates electrification:

- Our high-quality products have a service life which meets or exceeds that of all other components on the line: high-performance insulators translate into superior line reliability and fewer replacement needs.
- Our insulators have the unique ability to withstand mechanical, thermal and electrical stresses with no ageing or degradation of dielectric performance.
- Glass insulators are 100% recyclable.

Sustainability: we are committed to improving our environmental performance



Packaging Quality Matters

Packaging Units

The packaging and palletizing methods used by SEDIVER® are the result of a precise analysis of needs, the optimization of transport methods, and the latest packaging technologies. This ensures the design of highly reliable, well-adapted packaging.

All packaging units have been specifically developed to offer effective protection for our products during transport.

1. Primary Packaging: The Wooden Crate

Factory-assembled **SEDIVER®** insulators are short-chain packed in clear wooden crates, which constitute the primary packaging. They are primarily designed to support the weight of the products and ensure their protection. External metal ties make it easy to open and close the crate, while locking it firmly in place to maintain the integrity of the primary packaging during transport.

Additional protection can be added for specific products requiring a higher level of protection.

2. The logistical unit: Pallets for Crate Transport

The logistics unit consists of a wooden pallet holding a predefined number of crates, structured to meet logistical and safety constraints. Strapping is added on both sides of the pallet to hold the load in place during handling and transport. Finally, a plastic cover protects the products from external pollution, notably dust, ensuring that shipments arrive clean at our customers' locations.

3. Traceability Systems

Each case is specifically marked to identify the products it contains.

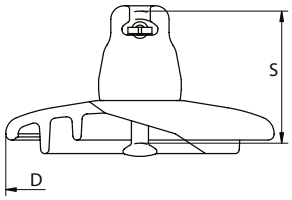
In addition, a traceability label is affixed to each logistics unit, listing product information, quality controls, and weight and size indications.

4. Customized packaging

SEDIVER® can design and propose customized packaging solutions to meet specific customer requirements, in line with our production standards.

Sediver® toughened glass suspension insulators
Ball & Socket type - 70 kN & 100 kN

IEC



		Standard Profile			
NEW CATALOG N°		F70CJ/127	F70CJ/146	F100CB/127	F100CB/146
OLD CATALOG N°		F70/127	F70/146	F100/127	F100/146
IEC class (1)		U70BS	U70BL	U100BS	U100BL
MECHANICAL CHARACTERISTICS					
Minimum mechanical failing load	kN	70	70	100	100
DIMENSIONS					
Diameter (D)	mm	255	255	255	255
Spacing (S)	mm	127	146	127	146
Creepage distance	mm	320	320	320	320
Metal fitting size (2)		16A	16A	16A	16A
ELECTRICAL CHARACTERISTICS (3)					
Power frequency withstand voltage					
- Dry one minute	kV	70	70	70	70
- Wet one minute	kV	40	40	40	40
Dry lightning impulse withstand volt.	kV	100	100	100	100
Puncture withstand voltage	kV	130	130	130	130
PACKING AND SHIPPING DATA					
Approx. net weight	kg	3.4	3.4	3.7	3.7
N° of insulators per crate		6	6	6	6
Volume per crate	m³	0.05	0.05	0.05	0.05
Gross weight per crate	kg	24	24	26	26
N° of insulators per pallet		96	96	96	96
Volume per pallet	m³	1.3	1.3	1.3	1.3
Gross weight per pallet	kg	403	403	432	432

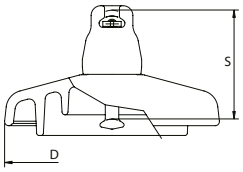
(1) in accordance with IEC publication 60305
(2) in accordance with IEC publication 60120
(3) in accordance with IEC publication 60383-1

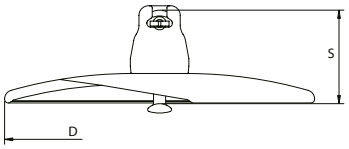
Corrosion prevention solution: Insulators with specific protection against corrosion are also available (see page 6)

For specific markets we also supply a range of customized products which are not shown here. Please contact our sales department for more details.

Sediver® toughened glass suspension insulators
Ball & Socket type - 70 kN & 100 kN

IEC





		Fog Type Profile				Open Type Profile
NEW CATALOG N°		F100PG/146	F70PB/146	F100PB/146	F100PF/146	F100AB/127
OLD CATALOG N°		F9P-A/146	F70P/146	F100P/146	F100PF/146	F100D/127
IEC class (1)			U70BLP	U100BLP		
MECHANICAL CHARACTERISTICS						
Minimum mechanical failing load	kN	100	70	100	100	100
DIMENSIONS						
Diameter (D)	mm	255	280	280	330	380
Spacing (S)	mm	146	146	146	146	127
Creepage distance	mm	390	445	445	545	365
Metal fitting size (2)		16A	16A	16A	16A	16A
ELECTRICAL CHARACTERISTICS (3)						
Power frequency withstand voltage						
- Dry one minute	kV	72	80	80	90	60
- Wet one minute	kV	42	50	50	55	50
Dry lightning impulse withstand volt.	kV	110	125	125	140	90
Puncture withstand voltage	kV	130	130	130	130	130
PACKING AND SHIPPING DATA						
Approx. net weight	kg	4.2	5.4	5.4	8.1	5.5
N° of insulators per crate		6	6	6	6	6
Volume per crate	m³	0.06	0.07	0.07	0.10	0.11
Gross weight per crate	kg	30	38	38	55	41
N° of insulators per pallet		96	72	72	54	90
Volume per pallet	m³	1.3	1.2	1.2	1.3	2.2
Gross weight per pallet	kg	488	468	468	512	621

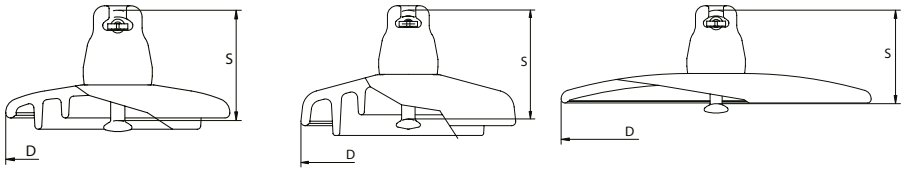
(1) in accordance with IEC publication 60305
(2) in accordance with IEC publication 60120
(3) in accordance with IEC publication 60383-1

Corrosion prevention solution: Insulators with specific protection against corrosion are also available (see page 6)

For specific markets we also supply a range of customized products which are not shown here. Please contact our sales department for more details.

Sediver® toughened glass suspension insulators
Ball & Socket type - 120 kN

IEC



		Standard Profile		Fog Type Profile		Open Type Profile
NEW CATALOG N°		F120CB/127	F120CB/146	F120PG/146	F120PB/146	F120AB/127
OLD CATALOG N°		F12/127	F12/146	F12P-A/146	F120P/146	F12D/127
IEC class (1)			U120B		U120BP	
MECHANICAL CHARACTERISTICS						
Minimum mechanical failing load	kN	120	120	120	120	120
DIMENSIONS						
Diameter (D)	mm	255	255	255	280	380
Spacing (S)	mm	127	146	146	146	127
Creepage distance	mm	320	320	390	445	365
Metal fitting size (2)		16A	16A	16A	16A	16A
ELECTRICAL CHARACTERISTICS (3)						
Power frequency withstand voltage						
- Dry one minute	kV	70	70	72	80	60
- Wet one minute	kV	40	40	42	50	50
Dry lightning impulse withstand volt.	kV	100	100	110	125	90
Puncture withstand voltage	kV	130	130	130	130	130
PACKING AND SHIPPING DATA						
Approx. net weight	kg	3.8	3.8	4.3	5.5	5.6
N° of insulators per crate		6	6	6	6	6
Volume per crate	m³	0.05	0.05	0.06	0.07	0.11
Gross weight per crate	kg	27	27	30	39	41
N° of insulators per pallet		96	96	96	72	90
Volume per pallet	m³	1.3	1.3	1.3	1.2	2.2
Gross weight per pallet	kg	442	442	498	475	630

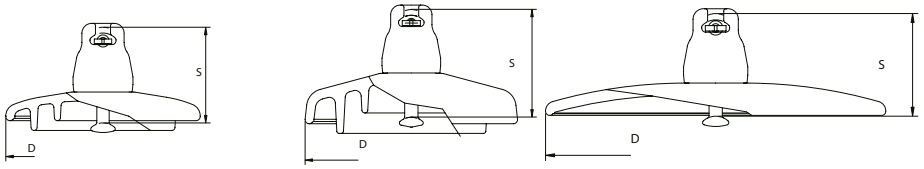
(1) in accordance with IEC publication 60305
(2) in accordance with IEC publication 60120
(3) in accordance with IEC publication 60383-1

Corrosion prevention solution: Insulators with specific protection against corrosion are also available (see page 6)

For specific markets we also supply a range of customized products which are not shown here. Please contact our sales department for more details.

Sediver® toughened glass suspension insulators
Ball & Socket type - 160 kN

IEC



		Standard Profile		Fog Type Profile		Open Type Profile
NEW CATALOG N°		F160CK/146	F160CK/170	F160PF/146	F160PF/170	F160AD/146
OLD CATALOG N°		F160/146	F160/170	F160P/146	F160P/170	F160D/146
IEC class (1)		U160BS	U160BL	U160BSP	U160BLP	
MECHANICAL CHARACTERISTICS						
Minimum mechanical failing load	kN	160	160	160	160	160
DIMENSIONS						
Diameter (D)	mm	280	280	330	330	420
Spacing (S)	mm	146	170	146	170	146
Creepage distance	mm	400	400	545	545	375
Metal fitting size (2)		20	20	20	20	20
ELECTRICAL CHARACTERISTICS (3)						
Power frequency withstand voltage						
- Dry one minute	kV	75	75	90	90	60
- Wet one minute	kV	45	45	55	55	50
Dry lightning impulse withstand volt.	kV	110	110	140	140	90
Puncture withstand voltage	kV	130	130	130	130	130
PACKING AND SHIPPING DATA						
Approx. net weight	kg	5.4	5.5	8.2	8.3	7.2
N° of insulators per crate		6	6	6	6	6
Volume per crate	m³	0.07	0.08	0.10	0.11	0.15
Gross weight per crate	kg	39	39	56	57	52
N° of insulators per pallet		72	72	54	54	36 | 54
Volume per pallet	m³	1.2	1.3	1.3	1.4	1.3 | 1.8
Gross weight per pallet	kg	475	484	517	524	338 | 495

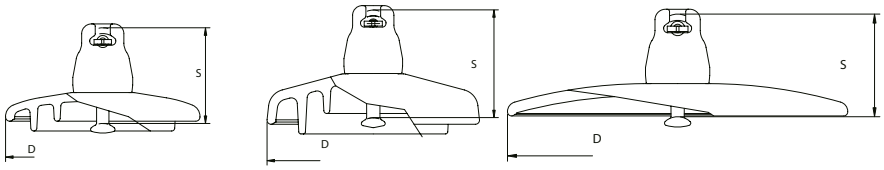
(1) in accordance with IEC publication 60305
(2) in accordance with IEC publication 60120
(3) in accordance with IEC publication 60383-1

Corrosion prevention solution: Insulators with specific protection against corrosion are also available (see page 6)

For specific markets we also supply a range of customized products which are not shown here. Please contact our sales department for more details.

Sediver® toughened glass suspension insulators
Ball & Socket type - 210 kN

IEC



		Standard Profile	Fog Type Profile	Open Type Profile
NEW CATALOG N°		F210CZ/170	F210PP/170	F210AI/170
OLD CATALOG N°		F21/170	F210P/170	F21D/170
IEC class (1)		U210B	U210BP	
MECHANICAL CHARACTERISTICS				
Minimum mechanical failing load	kN	210	210	210
DIMENSIONS				
Diameter (D)	mm	280	330	420
Spacing (S)	mm	170	170	170
Creepage distance	mm	390	550	370
Metal fitting size (2)		20	20	20
ELECTRICAL CHARACTERISTICS (3)				
Power frequency withstand voltage				
- Dry one minute	kV	75	90	60
- Wet one minute	kV	45	55	50
Dry lightning impulse withstand volt.	kV	110	140	90
Puncture withstand voltage	kV	130	130	130
PACKING AND SHIPPING DATA				
Approx. net weight	kg	6.6	9.5	8
N° of insulators per crate		6	6	6
Volume per crate	m³	0.08	0.11	0.17
Gross weight per crate	kg	46	64	59
N° of insulators per pallet		72	54	36 | 54
Volume per pallet	m³	1.3	1.3	1.5 | 2.1
Gross weight per pallet	kg	563	590	376 | 553

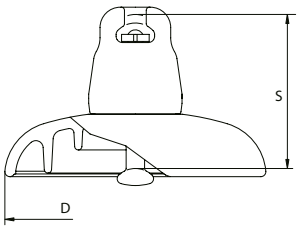
(1) in accordance with IEC publication 60305
(2) in accordance with IEC publication 60120
(3) in accordance with IEC publication 60383-1

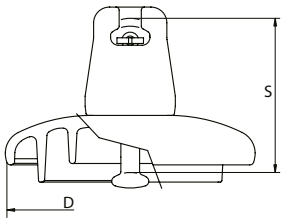
Corrosion prevention solution: Insulators with specific protection against corrosion are also available (see page 6)

For specific markets we also supply a range of customized products which are not shown here. Please contact our sales department for more details.

Sediver® toughened glass suspension insulators
Ball & Socket type - 240 kN & 300 kN

IEC





		Standard Profile		Fog Type Profile	
NEW CATALOG N°		F240CZ/170	F300CH/195	F300PK/195	F300PJ/195
OLD CATALOG N°		F24/170	F300/195	F300P/195	F30P/195
IEC class [1]			U300B		U300BP
MECHANICAL CHARACTERISTICS					
Minimum mechanical failing load	kN	240	300	300	300
DIMENSIONS					
Diameter (D)	mm	280	320	380	320
Spacing (S)	mm	170	195	195	195
Creepage distance	mm	390	480	690	595
Metal fitting size [2]		24	24	24	24
ELECTRICAL CHARACTERISTICS [3]					
Power frequency withstand voltage					
- Dry one minute	kV	75	85	100	90
- Wet one minute	kV	45	50	55	50
Dry lightning impulse withstand volt.	kV	110	130	150	135
Puncture withstand voltage	kV	130	130	130	130
PACKING AND SHIPPING DATA					
Approx. net weight	kg	6.8	9.8	13.6	10.7
N° of insulators per crate		6	5	4	5
Volume per crate	m³	0.08	0.10	0.11	0.10
Gross weight per crate	kg	47	56	62	60
N° of insulators per pallet		72	45	24 | 36	45
Volume per pallet	m³	1.3	1.4	1.0 | 1.5	1.4
Gross weight per pallet	kg	578	516	386 | 572	558

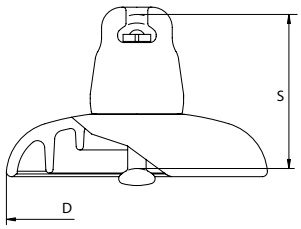
(1) in accordance with IEC publication 60305
(2) in accordance with IEC publication 60120
(3) in accordance with IEC publication 60383-1

Corrosion prevention solution: Insulators with specific protection against corrosion are also available (see page 6)

For specific markets we also supply a range of customized products which are not shown here. Please contact our sales department for more details.

Sediver® toughened glass suspension insulators
Ball & Socket type - 400 kN & 840 kN

IEC



		Standard Profile		
NEW CATALOG N°		F400CX/205	F530CT/240	F840NY/300
OLD CATALOG N°		F400/205	F530/240	F840/300
IEC class (1)		U400B	U530B	
MECHANICAL CHARACTERISTICS				
Minimum mechanical failing load	kN	400	530	840
DIMENSIONS				
Diameter (D)	mm	360	360	400
Spacing (S)	mm	205	240	300
Creepage distance	mm	550	635	700
Metal fitting size (2)		28	32	40
ELECTRICAL CHARACTERISTICS (3)				
Power frequency withstand voltage				
- Dry one minute	kV	90	90	100
- Wet one minute	kV	55	55	55
Dry lightning impulse withstand volt.	kV	140	140	140
Puncture withstand voltage	kV	130	130	130
PACKING AND SHIPPING DATA				
Approx. net weight	kg	13.6	18	29
N° of insulators per crate		4	4	2
Volume per crate	m³	0.10	0.12	0.11
Gross weight per crate	kg	62	80	63
N° of insulators per pallet		36	36	12 | 18
Volume per pallet	m³	1.3	1.6	0.9 | 1.3
Gross weight per pallet	kg	572	731	397 | 585

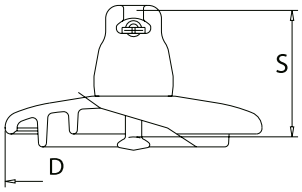
(1) in accordance with IEC publication 60305
(2) in accordance with IEC publication 60120
(3) in accordance with IEC publication 60383-1

Corrosion prevention solution: Insulators with specific protection against corrosion are also available (see page 6)

For specific markets we also supply a range of customized products which are not shown here. Please contact our sales department for more details.

Sediver® toughened glass suspension insulators
Ball & Socket type

ANSI

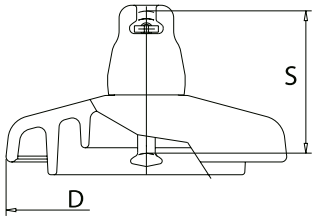


		Standard Profile			
CATALOG No		**N100/146DC**	**N14/146DC**	**N180/146DC**	**N21/156DC**
ANSI class		52-3-H	52-5-H	52-8-H	52-11
Ball and socket coupling		Type J	Type J	Type K	Type K
MECHANICAL CHARACTERISTICS					
Combined M&E strength	lbs	22,000	30,000	40,000	50,000
	kN	*100*	*136*	*180*	*222*
Impact strength	in-lbs	400	400	400	400
	N-m	*45*	*45*	*45*	*45*
Tension proof	lbs	11,000	15,000	20,000	25,000
	kN	*50*	*68*	*90*	*111*
DIMENSIONS					
Diameter (D)	in	10	10	11	11
	mm	*255*	*255*	*280*	*280*
Spacing (S)	in	5 3/4	5 3/4	5 3/4	6 1/8
	mm	*146*	*146*	*146*	*156*
Leakage distance	in	12 5/8	12 5/8	15	15
	mm	*320*	*320*	*380*	*380*
ELECTRICAL CHARACTERISTICS					
Low frequency dry flashover	kV	80	80	80	80
Low frequency wet flashover	kV	50	50	50	50
Critical impulse flashover +	kV	125	125	125	140
Critical impulse flashover -	kV	130	130	130	140
Low frequency puncture voltage	kV	130	130	130	130
R.I.V low frequency test voltage	kV	10	10	10	10
Max. RIV at 1 MHz	µV	50	50	50	50
PACKING AND SHIPPING DATA					
Approx. net weight per unit	lbs	8.1	10.1	12.8	13.9
No of insulators per crate		6	6	6	6
Volume per crate	ft³	1.977	1.977	2.472	2.472
Gross weight per crate	lbs	59.5	66.7	92.7	100.5
No. of insulators per pallet		72	72	54	54
Volume per pallet	ft³	35.3	35.3	42.3	42.3
Gross weight per pallet	lbs	790	880	934	1005

ANSI designations 52-3-L, 52-5-L, 52-8-L and custom products are also available

Sediver® toughened glass suspension insulators
Ball & Socket type

ANSI

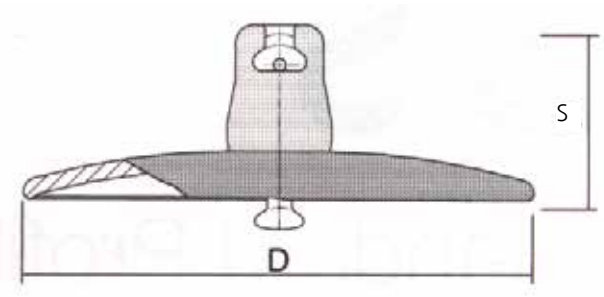


		Fog Profile				
CATALOG No		**N100P/146DC**	**N14P/146DC**	**N180P/160DC**	**N21P/171DC**	**F300P/195DC**
ANSI class						
Ball and socket coupling		Type J	Type J	Type K	Type K	IEC 24
MECHANICAL CHARACTERISTICS						
Combined M&E strength	lbs	22,000	30,000	40,000	50,000	66,000
	kN	*100*	*136*	*180*	*222*	*300*
Impact strength	in-lbs	400	400	400	400	400
	N-m	*45*	*45*	*45*	*45*	*45*
Tension proof	lbs	11,000	15,000	20,000	25,000	33,000
	kN	*50*	*68*	*90*	*111*	*150*
DIMENSIONS						
Diameter (D)	in	11	11	13	13	14 1/8
	mm	*280*	*280*	*330*	*330*	*360*
Spacing (S)	in	5 3/4	5 3/4	6 5/16	6 3/4	7 5/8
	mm	*146*	*146*	*160*	*171*	*195*
Leakage distance	in	17 1/2	17 1/2	21 5/8	21 5/8	25
	mm	*445*	*445*	*550*	*550*	*635*
ELECTRICAL CHARACTERISTICS						
Low frequency dry flashover	kV	100	100	105	100	105
Low frequency wet flashover	kV	60	60	65	60	65
Critical impulse flashover +	kV	140	140	145	150	170
Critical impulse flashover -	kV	140	140	145	150	160
Low frequency puncture voltage	kV	130	130	130	130	130
R.I.V low frequency test voltage	kV	10	10	10	10	10
Max. RIV at 1 MHz	µV	50	50	50	50	50
PACKING AND SHIPPING DATA						
Approx. net weight per unit	lbs	12.1	13.4	19.6	20.7	27.3
No of insulators per crate		6	6	6	6	5
Volume per crate	ft³	2.47	2.47	2.82	3.04	4.944
Gross weight per crate	lbs	84.9	87.3	126.4	140.4	167
No. of insulators per pallet		54	54	54	54	45
Volume per pallet	ft³	42.3	42.3	46	48	39.6
Gross weight per pallet	lbs	862	886	1245	1360	1607

ANSI designations 52-3-L, 52-5-L, 52-8-L and custom products are also available

Sediver® toughened glass suspension insulators
Ball & Socket type

ANSI

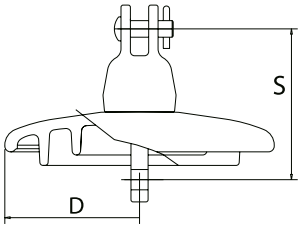


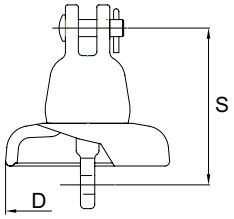
		Open Profile			
CATALOG No		**N100D/146DC**	**N14D/146DC**	**N160D/146DC**	**N21D/156DC**
ANSI class					
Ball and socket coupling					
MECHANICAL CHARACTERISTICS					
Combined M&E strength	lbs	22,000	30000	35000	50000
	kN	*100*	*140*	*160*	*222*
Impact strength	in-lbs	400	400	400	400
	N-m	*45*	*45*	*45*	*45*
Tension proof	lbs	11,000	15000	17500	25000
	kN	*50*	*70*	*80*	*111*
DIMENSIONS					
Diameter (D)	in	15	15	$16^{1/2}$	$16^{1/2}$
	mm	*380*	*380*	*420*	*420*
Spacing (S)	in	$5^{3/4}$	$5^{3/4}$	$5^{3/4}$	$6^{1/8}$
	mm	*146*	*146*	*146*	*156*
Leakage distance	in	$14^{3/8}$	$14^{3/8}$	15	$14^{1/2}$
	mm	*365*	*365*	*375*	*370*
ELECTRICAL CHARACTERISTICS					
Low frequency dry flashover	kV	65	65	70	70
Low frequency wet flashover	kV	50	50	55	55
Critical impulse flashover +	kV	100	100	105	105
Critical impulse flashover -	kV	100	100	105	105
Low frequency puncture voltage	kV	195	195	195	195
R.I.V low frequency test voltage	kV	10	10	10	10
Max. RIV at 1 MHz	µV	50	50	50	50
PACKING AND SHIPPING DATA					
Approx. net weight per unit	lbs	12,35	13,67	15,88	17,86
No of insulators per crate		6	6	6	6
Volume per crate	ft³	4,59	4,59	6,36	6,36
Gross weight per crate	lbs	92,61	98,12	119,07	127,89
No. of insulators per pallet		36/54	36/54	36/54	36/54
Volume per pallet	ft³	37,43/52,97	37,43/52,97	49,44/70,63	49,44/70,63
Gross weight per pallet	lbs	617,4/893,02	650,47/937,12	771,75/1126,75	826,87/1212,75

Custom products are also available

Sediver® toughened glass suspension insulators
Clevis coupling CT

ANSI





		Standard Profile					Ground wire insulator
CATALOG N°		**CT100/146DC**	**CT14/146DC**	**CT50/159**	**CT4/140**	**CT160/165**	**CT14-6/146DC**
ANSI class		52-4-H	52-6-H	52-9	52-1		
MECHANICAL CHARACTERISTICS							
Combined M&E strength	lbs	22,000	30,000	10,000	10,000		30,000
	kN	*100*	*136*	*45*	*50*		*136*
Impact strength	in-lbs	400	400	400	400		400
	N-m	*45*	*45*	*45*	*45*		*45*
Tension proof	lbs	11,000	15,000	5,000	5,000		15,000
	kN	*50*	*68*	*22.5*	*25*		*68*
DIMENSIONS							
Diameter (D)	In	10	10	6 5/16	6 5/16		6
	mm	*255*	*255*	*160*	*160*		*155*
Spacing (S)	In	5 3/4	5 3/4	6 1/4	5 1/2		5 3/4
	mm	*146*	*146*	*159*	*140*		*146*
Leakage distance	In	12 5/8	12 5/8	7 1/2	7 1/2		5 1/3
	mm	*320*	*320*	*190*	*190*		*135*
ELECTRICAL CHARACTERISTICS							
Low frequency dry flashover	kV	80	80	60	60		40
Low frequency wet flashover	kV	50	50	30	30		20
Critical impulse flashover pos.	kV	125	125	90	90		70
Critical impulse flashover neg.	kV	130	130	95	95		70
Low frequency puncture voltage	kV	130	130	110	110		90
R.I.V low frequency test voltage	kV	10	10	7.5	7.5		7.5
Max. RIV at 1 MHz	µV	50	50	50	50		50
PACKING AND SHIPPING DATA							
Approx. net weight per unit	lbs	9	9				5.5
N° of insulators per crate		6	6				6
Volume per crate	ft³	1.977	1.977				0.70
Gross weight per crate	lbs	59.5	66.7				32.2
No. of insulators per pallet		72|96	72|96				150
Volume per pallet	ft³	35.3|49.4	35.3|49.4				28.8
Gross weight per pallet	lbs	790|1050	880|1165				833

Custom products are also available

Sediver® model **CT14-6/146DC** is an ideal solution for supporting and insulating ground (shield) wires.

It can be installed in either suspension or dead-end configurations.

Sediver® toughened glass suspension insulators
IEC string electrical ratings - Standard profile

	Diameter / Spacing Ø 255/127			Diameter / Spacing Ø 255/146 - Ø 280/146		
NEW Catalog N°	**F70CJ/127 - F100CB/127 - F120CB/127**			**F70CJ/146 - F100CB/146 - F100PG/146 - F120CB/146 F120PG/146- F160CK/146 - B80PG/146 - B120CB/146 - B160CK/146**		
OLD Catalog N°	**F70/127 - F100/127 - F12/127**			**F70/146 - F100/146 - F9P-A/146 - F12/146 - F12P-A/146 - F160/146 - B8P-A/146 - B12/146 - B160/146**		
Number of units	Power frequency withstand voltage (kV)		Lightning impulse withstand voltage (kV)	Power frequency withstand voltage (kV)		Lightning impulse withstand voltage (kV)
	DRY	WET		DRY	WET	
2	113	65	175	130	75	195
3	157	100	245	180	115	275
4	204	135	320	235	155	360
5	244	170	395	280	195	430
6	283	200	460	325	230	505
7	326	231	525	375	265	580
8	365	261	585	420	300	660
9	404	283	660	465	325	730
10	444	326	720	510	375	800
11	478	357	785	550	410	880
12	518	383	850	595	440	955
13	552	413	920	635	475	1025
14	587	444	985	675	510	1095
15	622	470	1050	715	540	1160
16	657	496	1115	755	570	1230
17	696	522	1180	800	600	1300
18	744	552	1240	855	635	1370
19	761	578	1310	875	665	1440
20	796	609	1365	915	700	1510
21	826	635	1425	950	730	1575
22	861	661	1490	990	760	1640
23	896	687	1550	1030	790	1710
24	926	713	1610	1065	820	1775
25	957	744	1670	1100	855	1850
26	992	765	1735	1140	880	1920
27	1022	792	1800	1175	910	1990
28	1057	813	1860	1215	935	2060
29	1092	839	1920	1255	965	2130
30	1122	861	1980	1290	990	2200

For other values, please contact the Sediver® technical department.

These electrical ratings are applicable to Sediver® suspension insulator strings not equipped with arcing devices or grading rings

Sediver® toughened glass suspension insulators
IEC string electrical ratings - Standard profile

	Diameter / Spacing Ø 280/170			Diameter / Spacing Ø 320/195 - Ø 360/205		
NEW Catalog N°	**F160CK/170 - F210CZ/170 - F240CZ/170**			**F300CH/195 - F400CX/205**		
OLD Catalog N°	**F160/170 - F21/170 - F24/170**			**F300/195 - F400/205**		
Number of units	Power frequency withstand voltage (kV)		Lightning impulse withstand voltage (kV)	Power frequency withstand voltage (kV)		Lightning impulse withstand voltage (kV)
	DRY	WET		DRY	WET	
2	140	80	215	155	90	230
3	200	120	305	220	140	340
4	250	160	385	290	180	430
5	300	200	470	350	220	530
6	350	240	560	405	260	620
7	400	280	640	465	300	700
8	450	320	720	515	350	790
9	500	350	810	570	390	880
10	545	380	900	620	440	970
11	590	420	980	675	490	1060
12	635	455	1070	725	540	1150
13	675	490	1140	775	580	1240
14	720	520	1220	825	620	1330
15	760	550	1300	870	660	1425
16	810	585	1380	920	700	1520
17	850	615	1460	970	740	1610
18	895	650	1550	1020	780	1700
19	930	680	1620	1070	820	1790
20	970	710	1690	1110	860	1880
21	1000	740	1770	1160	900	1970
22	1050	775	1840	1210	940	2050
23	1090	805	1920	1260	980	2140
24	1130	835	2000	1310	1015	2230
25	1170	870	2080	1360	1050	2320
26	1210	900	2160	1410	1085	2410
27	1250	930	2240	1460	1120	2500
28	1290	960	2320	1510	1155	2600
29	1330	990	2400	1550	1190	2700
30	1370	1030	2480	1600	1225	2800

For other values, please contact the Sediver® technical department.

These electrical ratings are applicable to Sediver® suspension insulator strings not equipped with arcing devices or grading rings.

Sediver® toughened glass suspension insulators
IEC string electrical ratings - Fog profile

	Diameter / Spacing Ø 280/146 - Ø 330/146			Diameter / Spacing Ø 330/170		
NEW Catalog N°	**F70PB/146 - F100PB/146 - F120PB/146 F160PF/146 - F100PF/146**			**F160PF/170 - B160PF/170 - F210PP/170**		
OLD Catalog N°	**F70P/146 - F100P/146 - F120P/146 F160P/146 - 100PF/146**			**F160P/170 - B160P/170 - F210P/170**		
Number of units	Power frequency withstand voltage (kV)		Lightning impulse withstand voltage (kV)	Power frequency withstand voltage (kV)		Lightning impulse withstand voltage (kV)
	DRY	WET		DRY	WET	
2	140	85	210	150	105	235
3	195	115	295	210	150	335
4	240	150	380	265	190	435
5	290	180	465	320	230	535
6	335	210	530	370	270	625
7	380	240	600	420	300	710
8	425	270	680	470	335	800
9	465	300	760	515	365	890
10	510	330	840	570	395	980
11	550	360	920	610	430	1070
12	585	390	1000	660	460	1170
13	630	410	1080	700	490	1260
14	670	430	1160	745	520	1355
15	710	460	1240	785	550	1450
16	750	490	1320	830	575	1540
17	785	510	1410	870	605	1640
18	825	530	1500	910	630	1730
19	860	550	1580	950	655	1810
20	895	570	1655	990	680	1900
21	925	590	1730	1030	700	1990
22	960	610	1810	1060	720	2080
23	995	630	1885	1090	740	2160
24	1025	650	1950	1130	755	2245
25	1060	670	2025	1170	780	2325
26	109	690	2100	1200	800	2410
27	1120	710	2180	1250	825	2490
28	1155	730	2260	1290	850	2575
29	1185	750	2340	1330	885	2650
30	1215	770	2420	1360	910	2720

For other values, please contact the Sediver® technical department.

These electrical ratings are applicable to Sediver® suspension insulator strings not equipped with arcing devices or grading rings.

Sediver® toughened glass suspension insulators
IEC string electrical ratings - Open profile

	Diameter / Spacing Ø 380/127			Diameter / Spacing Ø 380/146 - Ø 420/146		
NEW Catalog N°	**F100AB/127 - F120AB/127**			**F160AD/146 - B160AD/146**		
OLD Catalog N°	**F100D/127 - F12D/127**			**F160D/146 - B160D/146**		
Number of units	Power frequency withstand voltage (kV)		Lightning impulse withstand voltage (kV)	Power frequency withstand voltage (kV)		Lightning impulse withstand voltage (kV)
	DRY	WET		DRY	WET	
2	95	75	160	110	85	165
3	135	110	225	160	125	235
4	175	145	290	205	165	310
5	215	180	355	255	205	380
6	255	210	420	305	240	450
7	290	245	490	355	280	525
8	330	280	555	405	320	595
9	370	310	620	455	360	670
10	410	345	685	505	395	740
11	450	380	750	555	435	810
12	490	410	815	605	470	885
13	530	445	885	655	510	955
14	570	480	950	705	550	1030
15	610	515	1015	755	590	1100
16	650	545	1080	800	625	1175
17	690	580	1145	850	665	1245
18	730	615	1210	900	705	1315
19	770	645	1280	950	745	1390
20	810	680	1345	1000	780	1460
21	850	715	1410	1050	820	1535
22	890	750	1475	1100	860	1605
23	930	780	1540	1150	895	1675
24	970	815	1605	1200	935	1750
25	1010	850	1675	1250	975	1825
26	1050	880	1740	1290	1010	1895
27	1090	915	1805	1350	1050	1965
28	1130	950	1870	1400	1090	2035
29	1170	980	1935	1450	1125	2110
30	1210	1015	2000	1495	1165	2180

For other values, please contact the Sediver® technical department.

These electrical ratings are applicable to Sediver® suspension insulator strings not equipped with arcing devices or grading rings.

Sediver® toughened glass suspension insulators
ANSI string electrical ratings - Standard profile

Standard profile suspension insulator string flashover voltages based on the test procedure of the American Standard ANSI C 29.2B.

	Diameter / Spacing Ø 10 / 5 3/4 - Ø 11 / 5 3/4				Diameter / Spacing Ø 11 / 6 1/8			
CATALOG N°	N100/146DC - N14/146DC - N180/146DC CT100/146DC - CT14/146DC				N21/156DC			
Number of units	Low frequency flashover voltage (kV)		Critical impulse flashover voltage (kV)		Low frequency flashover voltage (kV)		Critical impulse flashover voltage (kV)	
	DRY	WET	+	-	DRY	WET	+	-
2	145	90	220	225	145	90	230	230
3	205	130	315	320	210	130	325	330
4	270	170	410	420	275	170	425	440
5	325	215	500	510	330	215	515	540
6	380	255	595	605	385	255	610	630
7	435	295	670	695	435	295	700	720
8	485	335	760	780	490	335	790	810
9	540	375	845	860	540	375	880	900
10	590	415	930	945	595	415	970	990
11	640	455	1015	1025	645	455	1060	1075
12	690	490	1105	1115	695	490	1150	1160
13	735	525	1185	1195	745	525	1240	1245
14	785	565	1265	1275	790	565	1330	1330
15	830	600	1345	1360	840	600	1415	1420
16	875	635	1425	1440	890	635	1500	1510
17	920	670	1505	1530	935	670	1585	1605
18	965	705	1585	1615	980	705	1670	1700
19	1010	740	1665	1700	1025	740	1755	1795
20	1050	775	1745	1785	1070	775	1840	1890
21	1100	810	1825	1870	1115	810	1925	1985
22	1135	845	1905	1955	1160	845	2010	2080
23	1180	880	1985	2040	1205	880	2095	2175
24	1220	915	2065	2125	1250	915	2180	2270
25	1260	950	2145	2210	1290	950	2260	2365
26	1300	985	2220	2295	1330	958	2390	2465
27	1340	1015	2300	2380	1370	1015	2470	2555
28	1380	1045	2375	2465	1410	1045	2570	2650
29	1425	1080	2455	2550	1455	1080	2650	2740
30	1460	1110	2530	2635	1490	1110	2740	2830

For other values, please contact the Sediver® technical department.
These electrical ratings are applicable to Sediver® suspension insulator strings not equipped with arcing devices or grading rings.
According to the American Standard the average value of three tested strings shall equal or exceed:
95% of the guaranteed values as given in the data sheet, for low frequency dry flashover,
90% of the guaranteed values as given in the data sheet, for low frequency wet flashover,
92% of the guaranteed values as given in the data sheet, for critical impulse flashover.

These electrical ratings are applicable to Sediver® suspension insulator strings not equipped with arcing devices or grading rings

Sediver® toughened glass suspension insulators
ANSI string electrical ratings - Fog profile

Fog type profile suspension insulator string flashover voltages based on the test procedure of the American Standard ANSI C 29.2B.

	Diameter / Spacing Ø 11 / 5 3/4				Diameter / Spacing Ø 13 / 6 3/4			
Catalog N°	N100P/146DC - N14P/146DC				N21P/171DC			
Number of units	Low frequency flashover voltage (kV)		Critical impulse flashover voltage (kV)		Low frequency flashover voltage (kV)		Critical impulse flashover voltage (kV)	
	DRY	WET	+	-	DRY	WET	+	-
2	155	95	270	260	160	110	315	300
3	215	130	380	355	230	145	440	410
4	270	165	475	435	290	155	550	505
5	325	200	570	520	350	225	660	605
6	380	240	665	605	405	265	775	705
7	435	275	750	690	460	310	870	800
8	485	315	835	775	515	355	970	900
9	540	350	920	860	570	390	1070	1000
10	590	375	1005	950	625	430	1170	1105
11	640	410	1090	1040	680	460	1270	1210
12	690	440	1175	1130	735	495	1370	1315
13	735	470	1260	1220	790	530	1465	1420
14	785	500	1345	1310	840	565	1565	1525
15	830	525	1430	1400	885	595	1665	1630
16	875	555	1515	1490	935	630	1765	1735
17	920	580	1600	1595	980	660	1860	1845
18	965	615	1685	1670	1030	690	1960	1945
19	1010	640	1770	1755	1075	725	2060	2040
20	1055	670	1850	1840	1120	755	2155	2140
21	1100	695	1930	1925	1165	785	2245	2240
22	1145	725	2010	2010	1210	820	2340	2340
23	1190	750	2090	2095	1255	850	2430	2440
24	1235	780	2170	2180	1300	885	2525	2540
25	1280	810	2250	2265	1345	910	2620	2635
26	1325	835	2330	2350	1385	945	2710	2735
27	1370	860	2410	2435	1430	975	2805	2835
28	1410	890	2490	2520	1470	1005	2900	2935
29	1455	915	2560	2600	1515	1035	2980	3025
30	1495	940	2630	2680	1555	1065	3060	3120

For other values, please contact the Sediver® technical department.
These electrical ratings are applicable to Sediver® suspension insulator strings not equipped with arcing devices or grading rings.
According to the American Standard the average value of three tested strings shall equal or exceed:
95% of the guaranteed values as given in the data sheet, for low frequency dry flashover,
90% of the guaranteed values as given in the data sheet, for low frequency wet flashover,
92% of the guaranteed values as given in the data sheet, for critical impulse flashover.

These electrical ratings are applicable to Sediver® suspension insulator strings not equipped with arcing devices or grading rings.

Active contributions to international committees

Since beginning its international technical cooperation, Sediver® has been an active contributor to research and standardisation work in international committees and working groups dealing with all aspects of high voltage insulation. For example, Sediver® experts are involved in IEC working groups TC36B, CIGRE: B2, D1, C4 and contribute to the activities of the ANSI NEMA C29, IEEE OHL SC and CSA 411 standards committees.

Sediver® articles on glass in international publications:

- Matte A. / George JM "Aging infrastructure evaluation : the evaluation of aged high voltage ceramic suspension insulators - a synthesized analysis of in-service insulator aging assessments", 2024 CIGRE Canada Conference & Exhibition, 28 - 31 oct 2024, Winnipeg, Canada
- George JM "Pollution of overhead line insulators: update on standards and insulators performance under severe contamination for AC and DC lines", 2024 EDM, international conference on overhead lines, april 15-18, 2024, Fort Collins, U.S.A.
- George JM, Lepley D, "AC and DC pollution testing methods: accuracy and limitations", 2022 INMR World Congress, 16-19 Oct. 2022, Berlin, Germany
- Delhumeau F, Dumas C, George JM, "Simulation of electric field: what and what not to expect", 2022 INMR World Congress, 16-19 Oct. 2022, Berlin, Germany
- Espinosa C, Vo D, George JM, "Overhead line insulators in operating constraints under severely polluted conditions: the benefits of silicone coated glass insulators and their application at the PG&E diablo canyon nuclear power plant", 2022 CIGRE PARIS, 28 Aug.-2 Sep. 2022, Paris
- George JM, Pons C, Vosloo WL, "Assessment of performance of insulators through leakage current monitoring under contaminated conditions", CIGRE 2020 Paris, CIGRE e-session 48, 24 Aug.-3 Sep. 2020
- George JM, Prat S, "Insulators under fire", EDM 2019, International Conference on Overhead Lines, Design, Construction, Inspection and Maintenance, 25-28 Mar. 2019, Frt Collins, Colorado, USA
- Virlogeux F, Prat S, George JM, "Review of 20 years of silicone coated insulators in the field", INMR 2017 World Congress, 5-8 Nov. 2017, Barcelona, Spain
- George JM, Brocard E, Prat S, Virlogeux F, Lepley D, "Necessary Check Points & Testing for Screening the Quality of Insulators", INMR 2017 World Congress, 5-8 Nov. 2017, Barcelona, Spain
- Alles J, Beroual A, Brocard E, George JM, "Evaluation of Electrical Performance on High Voltage Glass Suspended Insulators", EIC 2017, Electrical Insulation Conference IEEE, 11-14 Jun. 2017, Baltimore, USA
- George JM, "Mitigation of severe contamination problems on overhead lines without the need for composite insulators", EDM International Conference on Overhead Lines, Fort Collins, Colorado, USA, April 2016
- Klassen D, Zoghby E, Kieloch Z, "Assessment of toughened glass insulators removed from HVDC lines after more than 40 years in service", CIGRE Canada Conference 2015
- George JM, Prat S, Virlogeux F, "Silicone coating on toughened glass insulator: Review of laboratory and field performance", INMR World Congress 2015, Munich, Germany, 2015
- Virlogeux F, Prat S, George JM, "Ageing and degradation mechanisms of silicone polymers used for outdoor electrical insulation", ISH 2015, Pilsen, Czech Republic
- Klassen D, Zoghby E, Kieloch Z, "Assessment of toughened glass insulators removed from HVDC lines after more than 40 years in service", CIGRE Canada Conference, 2015
- George JM, Prat S, Virlogeux F, "Coating Glass Insulators for Service in Severe Environments", INMR Quarter 4, 2014
- George JM, Lodi Z, "Mechanical and electrical behaviour of a damaged toughened glass insulator", EDM, Fort Collins, USA, 2014
- George JM, Prat S, Tartier S, Lodi Z, "Electrical characteristics and properties of a Stub", ISH 2013 Seoul, Korea
- George JM, Del Bello E, "Assessment of electrical and mechanical performance of toughened glass insulators removed from existing HV lines", CIGRE Regional Meeting, Calgary, Canada, August 2007
- Paiva O, Suassuna R, Dumora D, Parraud R, Ferreira L, Namora M, "Recommendations to solve corrosion problem on HV insulator strings in tropical environment", CIGRE Symposium Cairns, 2001, Paper 300-05
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- Mailfert R, Pargamin L, Riviere D, "Electrical Reliability of DC Line Insulators", IEEE Electrical Insulation 1981 No. 3
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