



Vanguard
ELECTRIC



®

A Southern States Company

SS Southern
States

HYBRID and SEMI CONDUCTIVE GLAZED INSULATORS

The Solution to High-Pollution and
Extreme Environmental Conditions



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INTRODUCTION

General Info

Vanguard Electric, LLC is a U.S member company of the Southern States Group of companies (www.southernstatesllc.com) dedicated to sourcing top quality electrical components for internal use by other group companies, as well as by the customers they serve.

Vanguard Electric brings to its customers high quality products that have been carefully researched, vetted and adapted to the U.S market so they meet all technical requirements at very competitive prices. Our highly specialized team is dedicated to source OEM products from top world manufacturers that comply with the highest standards that we have defined for our brand. Vanguard Electric stands for quality, competitive pricing and total reliability on all aspects that are critical for your successful projects.

At **Vanguard Electric, LLC**, consistent with the spirit of the group we are part of, we recognize the importance of providing a quality product to our customers. Further, we believe that the customer's buying experience as a whole ultimately determines whether or not continued success is attainable. To ensure successful projects for our customers, we strive to offer a combination of features that we are confident will provide a very satisfactory experience with our company:

- Top quality product manufactured to our specification (and in full compliance of applicable U.S and international standards) by world-class manufacturers.
- Long-term relationships, in which our partners facilities are constantly monitored for the highest quality standards.
- Volume purchasing practices which results in savings to our customers.
- Competitive pricing so you know you are paying for top quality products but not for large overheads or overpriced brand names.
- Seasoned team of engineers and specialized consultants that provide our customers with effective and reliable support at every step (selection, application, troubleshooting, service).
- Tough quality assurance requirements, which we monitor constantly to assure compliance.
- Clear, complete and easily available technical information (online and in printed format).

- Professional inside sales group supported by a solid network of local agents in the U.S. We want to always be available to you.
- Domestic (U.S.A) service and support.
- Large stock of the most popular references used in the market (customer specific stocking programs available).

Vanguard Electric- Hybrid and Semi-Conductive Glazed Insulators

Whether insulator flashovers are the result of heavy pollution or extreme coastal conditions, the solution is Vanguard Electric's line of specialized insulators. The Vanguard Electric insulator line ranges from the innovative Hybrid Insulators to the mature technology of our Semi-Conductive Glazing Porcelain insulators. The depth our product line allows you to implement the solution that best addresses your needs and design philosophy.

General Features

- Manufactured in state of the art ISO9001 certified facilities.
- High strength solid-core porcelain.
- Designed in compliance to ANSI C29.9 and IEC TS62896 standards. (please contact us to certify compliance to other standards).
- Multiple options of shed designs, strength, leakage distance, color, fittings, special seismic requirements.
- ASTM A153M galvanized cast iron fittings are cemented to the porcelain using carefully formulated and cured high strength Portland cement and silica sand.
- **5 Year warranty.**



HYBRID INSULATORS

Overview

Vanguard Electric's innovative line of Hybrid Post Type Insulators are manufactured in state of the art ISO9001 certified factories. Our unique design and construction eliminates the need to choose between outstanding coastal and pollution performance typically found in polymer insulators and the strength, rigidity and durability of porcelain insulators. Vanguard Electric's Hybrid Insulators encompass the best of both, and are the ideal environmental and pollution resistance solution for high voltage switches, grounding switches, bus supports, reactor supports and capacitor bank supports. For example, bus supports require stiffness to withstand wind and earthquake forces while reactor supports rely on high mechanical stability.

Constructive Details

Vanguard Electric Hybrid insulators are manufactured and tested in accordance to IEC TS62896 "Hybrid Insulators for A.C and D.C High Voltage Applications" and applicable sections of ANSI C29.9. Special tests are conducted to guarantee the silicon rubber UV and aging performance. Vanguard Electric Hybrid Insulators are manufactured using high pressure multi-point injection molding of a carefully formulated silicon rubber compound (similar to what is used in most modern polymeric transmission and substation insulators) into a glazed solid porcelain core (manufactured with the same process as regular porcelain insulators). This process guarantees total bonding of the rubber to the porcelain. Hot Dip galvanized metal end fittings are cemented to the porcelain core using similar techniques as those used in regular porcelain insulators to guarantee an electrically stable, mechanically strong liquid tight interface. For further illustration please refer to Figure 2.



Figure 1.
Hybrid Insulators

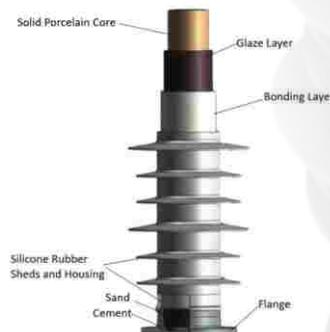


Figure 2.
Hybrid Insulator
Construction detail



SEMI-CONDUCTIVE GLAZED (SCG)

Overview

Vanguard Electric's innovative line of SCG Post Type Insulators are manufactured in state of the art ISO9001 certified factories. The SCG Insulators are a standard post type porcelain insulator with a special semi-conductive glazing. The glazing is the differentiating factor that gives them their outstanding performance in polluted or coastal environments. Semi-Conductive glazed insulators are based on a proven and mature technology used successfully by numerous utilities around the world for many years.

Insulators Constructive Details

Vanguard Electric Semi-Conductive glazed insulators are manufactured in compliance to ANSI C29.9 standards with the same wet process used for all our field proven standard post type insulators. The special glazing process incorporates a mixture of conductive metal oxide particles embedded into the standard glazing material. This turns the glazing into a semi-conductive surface which allows circulation of very low current through the insulator surface (< 1 mA). This low current provides the SCG insulators with the following two outstanding pollution and environmental performance characteristics:

- 1.- Constant circulation of a small current allows an even voltage distribution throughout the glazing and elevates the surface temperature of the insulator (a few degrees). This elevated temperature acts as a low power heater which accelerates the speed at which the insulator dries up after it has been subject to rain and condensation reducing the possibility of flashovers
- 2.- The small circulating current prevents cascading flashovers on dry band areas. Dry band areas are the result of un-even drying of wet pollution deposits which cause patches of low conductive dry areas on the wet surface. This may be the root cause of total flashover. This process is illustrated in Figure 4.



Figure 3.
Semi-conductive glazed insulators

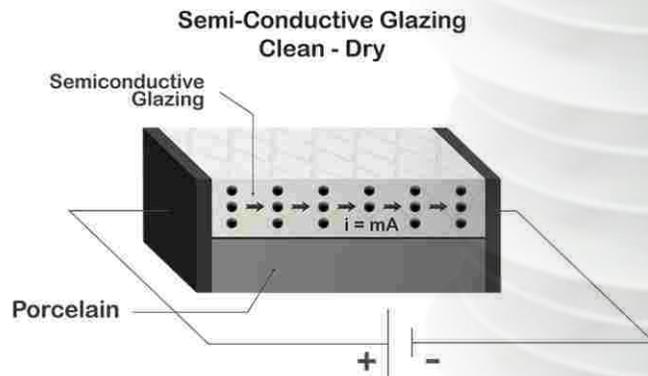
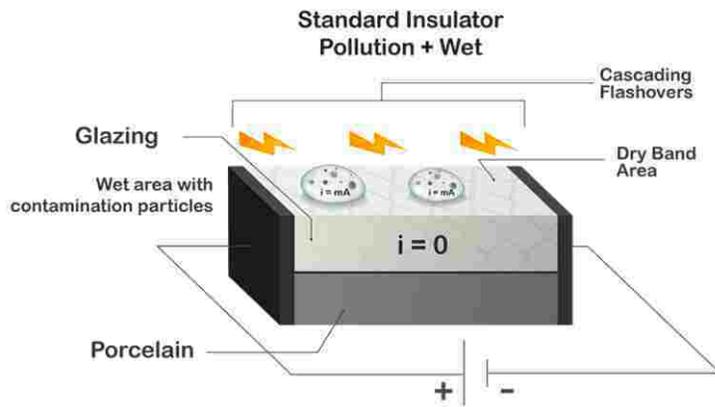
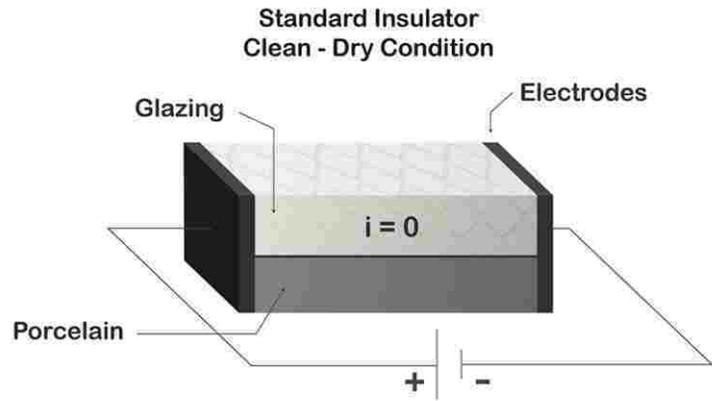


Figure 4. Semi-conductive Glazing Principle of operation

STANDARD vs. SEMI-CONDUCTIVE GLAZED vs HYBRID INSULATORS

Which solution works best for you?

	Performance in polluted or coastal environments	Effectiveness in preventing Dry band arcing (flashovers)	Breakage resistance (vandalism, mishandling)
Vanguard Electric Standard Porcelain Insulators	★ ★	★	★ ★
Vanguard Electric Semi-conductive Glazed Porcelain Insulators	★ ★ ★ ★	★ ★ ★ ★	★ ★
Vanguard Electric Hybrid Insulators	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★
Polymer Insulators (Fiberglass core)	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★

Note 1: All Porcelain insulators operating in polluted or coastal

HYBRID INSULATORS - RATINGS

Hybrid Insulators are custom designed and built to meet specific mechanical and electrical requirements. They are not a standard **stocked** product. Please contact Vanguard Electric for information on available designs or assistance with the development of a customized design for your requirements.

Lifetime maintenance cost	Cost	Mechanical Rigidity and Compression Strength	Weight
<p>\$\$\$\$\$</p> <p>Note 1</p>	\$	★ ★ ★ ★ ★	
\$\$	\$\$\$\$	★ ★ ★ ★ ★	
\$	\$\$\$\$	★ ★ ★ ★ ★	
\$\$	\$\$\$	★	

environments need constant washing or RTV coating to prevent flashovers

SEMI-CONDUCTIVE GLAZED INSULATORS - RATINGS

Please refer to our standard Post Type Insulator catalog available from our web page www.vanguardelec.com. Any standard ANSI C29.9 Post Type referenced in the catalog is available with SCG upon request. All special variations in leakage distance, strength, color, and bolt circles are also available with SCG.

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