

TECHNOLOGY COMPARISON

Elastimold™ solid-dielectric switchgear

Six reasons to choose solid-dielectric over SF₆ gas-insulated switchgear



01 Elastimold solid-dielectric switchgear in a pad-mount enclosure with Tru-Break™ visual open

More and more utility companies are switching from SF₆ gas-insulated switchgear to solid-dielectric switchgear. Here are the top reasons to make the change.



- 1 Friendlier to the environment**
Utilities today are burdened with tracking and reporting pounds of SF₆ lost, fills per device and percent loss rates. Solid-dielectric switchgear produces no greenhouse gases, eliminating the need for costly and time-consuming environmental training, maintenance and reporting.
- 2 Safer for crews and communities**
Elastimold solid-dielectric switchgear is non-toxic and non-gaseous. There are no harmful gases, no oxygen displacement and no hazardous arcing byproducts, eliminating the need for expensive leak-detection systems and sniffers to detect SF₆ gas leaks and the need to maintain emergency response plans in case of leaks, fires and other hazards.
- 3 Less maintenance**
Solid-dielectric insulation does not deteriorate over time. Elastimold solid-dielectric switchgear is based on field-proven EPDM rubber components that have been used in medium voltage applications for decades. Switching is contained to a maintenance-free vacuum system, using no oil or gas.
- 4 Compact design for space efficiency**
Elastimold switchgear's modular design consists of switching, sectionalizing, automatic source transfer and overcurrent protection equipment. The modules can be configured in unlimited ways and fit into underground vaults, pad-mount enclosures or even mounted on a pole. In most cases, Elastimold switchgear can directly replace SF₆ switchgear in form, fit and function.
- 5 Lower risk of fire**
Solid-dielectric insulation is inherently non-flammable, reducing the risk of fires, which can spread from other failing devices in a vault or on a pole. SF₆ gas can ignite in the presence of an arc, creating hazardous byproducts and potentially causing a catastrophic fire.
- 6 Longevity and sustainability**
Solid-dielectric insulated switchgear has a longer life expectancy than SF₆ switchgear, due to leaks and gradual degradation, leading to increasing maintenance costs and reporting. Mandates from multiple state regulatory bodies require utilities to reduce SF₆ emissions by 1% every year over a 10-year period, with a complete phase-out by 2025 — which is fast approaching.

FAQs

What is SF₆?

SF₆ (sulfur hexafluoride) has been a widely used insulating gas since its introduction in medium voltage switchgear in 1982. SF₆ has good dielectric properties and can rapidly interrupt fault currents and quench arcs. Unfortunately, SF₆ is also the most potent greenhouse gas known to date, according to the EPA. It is 23,000 times more effective than CO₂ at trapping infrared radiation and has a stable molecular structure with an atmospheric lifetime of 3200 years. The EPA and many states have established programs to drive reduction of the use of SF₆ as an insulation medium. Both CARB in California and the Regional Greenhouse Gas Initiative covering 10 eastern states exemplify the growing push to find alternatives and replace SF₆.

What are some specific concerns with SF₆ for utility companies?

The burden is on the utility to maintain programs that effectively monitor equipment for leaks, track the amount of SF₆ used and lost to the atmosphere and provide for adequate personnel safety. SF₆ can displace oxygen in vaults and poses a risk of asphyxiation. In an arc flash, SF₆ creates hazardous byproducts, such as sulfur dioxide and sulfuryl fluoride. Fortunately, there is a viable alternative to SF₆ based on vacuum switching and solid-dielectric insulation — Elastimold™ switchgear.



Elastimold solid-dielectric switchgear is designed, assembled, tested and shipped from Hackettstown, New Jersey.

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Case study example

Challenge

A Midwest municipal utility contacted ABB Installation Products with an urgent need to replace existing SF₆ switchgear. Due to deterioration of the existing gear and a short timeframe, the utility wanted a replacement solution that was already designed and could be delivered quickly. Additional customer requirements included:

- No or low maintenance
- No oil or gas insulation system
- Highly reliable
- Minimal outage time
- No vault reconstruction
- Training on installation and operation
- Visible open indication

Solution

Elastimold solid-dielectric switchgear met all these needs — with its solid-dielectric and stainless steel construction coupled with proven vacuum technology that supports reliability. The component-based, modular rack system allows for assembly in difficult areas. Each individual 24"-wide rack holds one switch or interrupter and is designed to fit through a manhole into a vault. Once inside, the racks connect together with a simple hardware system, and IEEE 386 deadbreak interfaces complete the bus. All components are fully sealed and submersible up to 10 feet in water, and the proprietary EPDM molded rubber construction is deadfront, virtually eliminating any exposed live components. Elastimold solid-dielectric switchgear met all this customer's expectations, and the company is evaluating other areas of their distribution network for asset renewal using solid-dielectric switchgear.

To learn more about Elastimold switchgear, please contact your local sales representative.

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