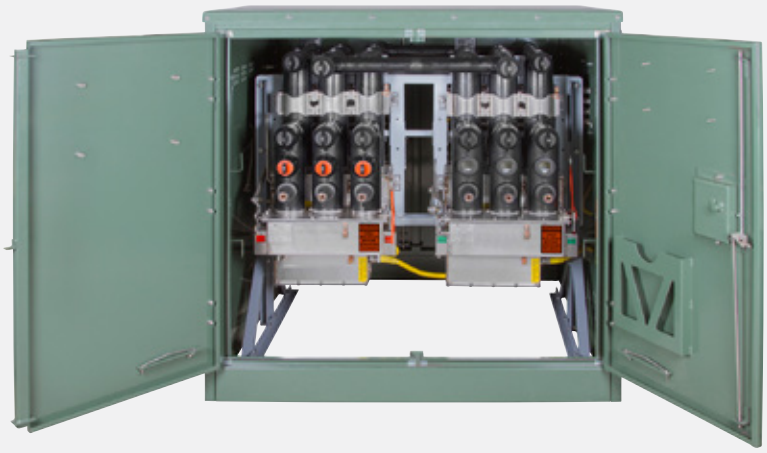
TECHNOLOGY COMPARISON

Elastimold™ solid-dielectric switchgear

Five reasons to choose solid-dielectric over oil-insulated switchgear



Oil-insulated medium voltage (MV) switchgear has been used for many years, but it comes with its own set of challenges. Here are some of the top issues you should consider when deciding between oil-insulated and solid-dielectric MV switchgear.

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

1 Environmental impact
Oil-insulated switchgear poses environmental concerns due to the use of mineral oil or synthetic oil as the insulation medium. An oil spill can result in significant soil and water contamination, and clean-up typically involves high costs. Stringent environmental regulations add additional burden in terms of reporting and costs to cover containment and disposal, or during decommissioning.

2 2) Fire hazard
The oil used in switchgear is flammable and creates a fire risk in the event of a fault or failure, potentially causing extensive damage to nearby equipment. Some advances have been made to enhance fire safety in oil-insulated switchgear; however, oil's inherent flammability remains a concern. Fire suppression systems and containment measures may be required to mitigate risks.

3 Maintenance costs and requirements
Regular maintenance is required to ensure oil-insulated switchgear is working properly. Maintenance involves oil sampling, filtration and periodic testing to detect problems before they escalate to a failure scenario. The cost of the oil can be significant, especially if it becomes contaminated and requires complete replacement. Lifecycle costs can escalate with rising oil costs. Oil-insulated systems that have been in use for many years are aging, leading to higher likelihood of insulating oil degradation.

4 Health and safety risks
Handling and working with oil-insulated systems requires specialized training to deal with the associated hazards. These training requirements add to the maintenance and lifecycle costs of oil-insulated switchgear.

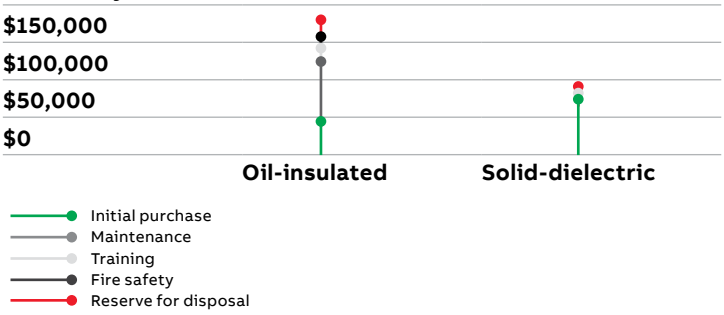
5 Technological advances
Advances in technology have led to insulation systems that are more environmentally friendly and carry low to no maintenance costs. Solid-dielectric switchgear can be more cost effective in the long run than oil-insulated switchgear, with its associated safety and environmental costs.

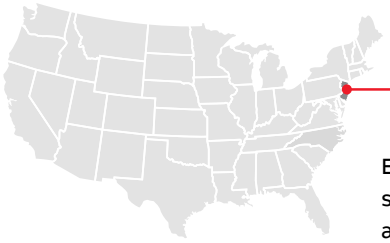
FAQs

We've always used oil-insulated switchgear. We know it works. Why would we switch to this new technology?
ABB's solid-dielectric technology isn't really new. Elastimold™ switchgear uses vacuum interruption with solid-dielectric insulation based on technology that's been field tested and field proven over 25 years. Utility companies that have already switched appreciate the advantages of our switchgear.

This solid-dielectric switchgear costs a lot more than oil-insulated switchgear. How could we justify that expense?
While there's an initial investment in a solid-dielectric switchgear, it's important to consider the total cost of ownership over the average 30-year switchgear lifespan. The hidden costs — and risks — associated with oil-insulated switchgear can add up. The reliability factor of solid-dielectric switchgear can deliver peace of mind and long-term savings, making it a smart value.

Total lifecycle costs oil-insulated vs. solid-dielectric





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

Case study example

Challenge
A Midwest municipal utility was using oil-filled pad-mount switchgear with both switching and overcurrent protection to serve critical loads throughout its distribution system. On a particularly cold winter day, one of the oil-filled units experienced a catastrophic failure, requiring site clean-up and installation of replacement switchgear. Because of concerns that moisture penetrating the cabinet might have contributed to the failure and a recent recommendation to conduct more frequent maintenance, the utility sought an alternative solution.

Solution
The utility selected Elastimold solid-dielectric switchgear. ABB's Elastimold engineers confirmed that the footprint was compatible with the existing pads. Because of the modular design consisting of molded vacuum switch (MVS) and molded vacuum interrupter (MVI) units, the engineers recommended a bus-on-top configuration that provided a clear area to accommodate the utility's existing conduit. This recommendation eliminated the need to build custom switchgear, reducing lead time. The units selected included up to six ways and used Elastimold self-powered controls. The specific site included three source switches (MVS3) and three load ways (MVI3), all with 600-amp interfaces. Overcurrent protection was provided by an internal control, embedded within the current transformer (CT) assembly and easily programmed via PC interface at the CT ports.

The utility also wanted spare units on hand for new services and emergencies. The spares were 5-way with two source switches (MVS3) and three load ways with a total of nine single-phase MVIs. The unused sixth way was for a future position. Protection was provided by an Elastimold model 80 external control, offering the choice of gang, three-phase or single-phase tripping for the single-phase MVIs.

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

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