ABB MICAFL Bushing service
Expertise for maximum reliability

ABB offers an extensive range of high-quality products. They can be adapted to different transformer and plant designs and thus meet the requirements of a wide variety of applications. We specialize in tailor-made solutions, including custom designs and small series production. Our range of products encompasses bushings for oil-air, oil-SF₆, oil-oil transformer systems, and air-SF₆ bushings for GIS. If you would like any more information, please contact us— we can address your individual needs in a highly professional, flexible, and efficient manner. Our bushings are developed and approved for internal applications. Bushings for other oils are available on request.

RIP Transformer bushings, oil-air
Series: JIP / RTKF NSI
Silicone composite insulator available with straight or helical sheds.
Voltage range: from 24 to 550 kV
Current range: up to 3000 A

RIP Transformer bushings, oil-SF₆
Series: JIP / RTKF
Porcelain insulator
Voltage range: from 24 to 550 kV
Current range: up to 3000 A

RIP Transformer bushings, air-air
Series: JIP / RTKF
Silicone composite insulator available with straight or helical sheds.
Voltage range: from 24 to 550 kV
Current range: up to 3000 A

RIP Air-GF bushings for GIS
Series: JIPK
Porcelain or silicone composite insulator
Voltage range: from 24 to 550 kV
Current range: up to 4000 A

RIP MIB bushings
Series: RMI Indoor-Outdoor
BHI Outdoor Indoor
BHI Outdoor-Outdoor
Porcelain or silicone composite insulator
Voltage range: from 24 to 300 kV
Current range: up to 3000 A

RIP Railway bushings
Series: RMI / RTAK porcelain insulator
Voltage range: from 15 to 36 kV
Current range: up to 2000 A

RIS Transformer bushings, oil-air
Series: EASY-Dry / DMB-OA
Silicone composite insulator with straight sheds.
Voltage range: from 24 to 170 kV
Current range: up to 2500 A

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MICAFIL bushings combine functionality, high performance and long service life.

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- The optimized solutions are based on partnerships with customers and our understanding of their needs.
- With proven components and a variety of designs, our RIP series meets customer-specific requirements.
Leaders in Bushing Technology

ABB Switzerland, MICAFIL bushings factory, based in Zurich, established itself as technology leader in bushings through its manufacture of traditional types such as DIP (Oil Impregnated Paper) and RBP (Resin Bonded Paper). It developed the world’s first RIP bushings (Resin Impregnated Paper) in 1950, before producing the first 420 kV RIP bushings at the end of the 1970s, and the first 550 kV RIP bushings in 1996.

With continuous striving for new, innovative solutions to meet our customers’ needs for their applications. Therefore, our state-of-the-art products, based on RIS (Resin Injected Synthetic), are a result of determined development involving the profound knowledge of ABB’s unique R&D global network. Modern bushing technologies set new standards of safety, reliability, quality and lead time.

ABB has access to comprehensive resources, particularly in the fields of high-voltage engineering, materials research, and applied physics.

Our portfolio of services

<table>
<thead>
<tr>
<th>Service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01. On-site bushing repair/installation</td>
<td>Our repair kits allow for our customers worldwide to repair bushings on site and bring them back into service as fast as possible. If you need help in replacing a bushing on a transformer, we can instruct ABB service staff in your area.</td>
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<tr>
<td>02. On-site bushing testing</td>
<td>Transformer bushings are key components in power transmission and distribution systems. The quality of their insulation is something normally taken for granted. However, that same insulation can announce its end by causing equipment failure, resulting in costly repairs or repairs and downtime. To avoid such a situation, the quality of the insulation should be monitored periodically by measuring capacitance and dissipation factor which give an indication of the quality of the insulation.</td>
</tr>
<tr>
<td>03. Factory repair and testing</td>
<td>Repairing and refurbishing a bushing instead of replacing it can, in certain cases, reduce capital maintenance costs and provide a quicker turnaround for the power system. This is preferably combined with comprehensive Factory Acceptance Testing (FAT) which includes: AC testing, impulse testing, partial discharge testing, as well as measurement of capacitance and dissipation factor. Depending on the results of the tests, a maintenance intervention or repair of the insulation core could be needed and can be done easily in our Factory. ABB is able to replace any Micafil bushing based on state-of-the-art RIS technologies, even if the bushing was not made by us. Our comprehensive knowhow and extensive manufacturing experience help us to redesign and replace every type of bushing you can find in the world.</td>
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<tr>
<td>04. Spare parts</td>
<td>Having critical parts on hand can significantly reduce downtime. We provide spare parts for all of our bushings for repair, even for units older than 40 years. We maintain a library of original design documents, which is based on a comprehensive archive covering an impressive number of bushing designs worldwide.</td>
</tr>
<tr>
<td>05. Customer training</td>
<td>On request, we can provide in-house training, with detailed programs customized for you and your staff. The training can cover: • Products • Handling and Installation of Bushings • Storage • Decision making.</td>
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<tr>
<td>06. Technical consulting</td>
<td>Based on our experience with graded bushings, we can help interpret your test data from the field and define the required actions together with you.</td>
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</table>

Product life cycle for bushing

ABB MICAFIL bushings typical life expectancy life cycles based upon the technology

<table>
<thead>
<tr>
<th>Bushing Type</th>
<th>Life Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIP</td>
<td>&gt;25 years</td>
</tr>
<tr>
<td>Producing since 1920</td>
<td></td>
</tr>
<tr>
<td>BIP</td>
<td>&gt;25 years</td>
</tr>
<tr>
<td>Producing since 1980</td>
<td></td>
</tr>
<tr>
<td>OIP</td>
<td>&gt;25 years</td>
</tr>
<tr>
<td>Produced from 1970-1988</td>
<td></td>
</tr>
<tr>
<td>RBP</td>
<td>&gt;25 years</td>
</tr>
<tr>
<td>Produced from 1990-1995</td>
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</tbody>
</table>

Bushings typically last as long as one would expect – it may only be approximately half of a typical transformer’s life-span. If the time in service, as indicated in the chart below, has elapsed, the risk of an insulation breakdown increases, particularly when the bushing is put under stress by temperature cycles and transient over-voltages. Therefore, bushings should not be neglected, but inspected and tested in a time-based or condition-based manner to prevent damage to the much more costly transformer.