

# POLYMERIC, HYBRID AND PORCELAIN RAILWAY INSULATORS

Long life and reliable performance in the  
toughest environmental conditions



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Rugged, Reliable Insulator Solutions for Railway Applications

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Since the 1970's, TE Connectivity products, including well-known brands like Raychem and Simel, have been used in power supply and railway applications all over the world.

Today, those same reliable products are being used to modernize railway infrastructure like never before. Our wide range of polymeric, hybrid and porcelain insulators are enabling continuous and reliable power supply to optimize networks for increased capacity and improved passenger comfort.

## Serving the Industry with Proven Technology and Support

As the only provider of ceramic, hybrid, Ethylene Vinyl Acetate (EVA) and silicone insulators in the railway catenary market, TE is uniquely qualified to understand the merits of each material technology. TE's initial EVA products were first installed in their current formulation in the 1970's, and have proven to need no service in the field, demonstrating robustness and reliable performance in the harsh environment of rail applications. Since the 1990s, our insulator products have been installed globally, including in some of the world's most notable railway projects like Network Rail (UK), SNCF (France), Deutsche Bahn (Germany), Swedish Rail SJ AB (Sweden), and Japan Rail (Japan).

Even the best technology must be backed up by thorough and consistent quality and customer support programs. From our electrical and mechanical testing laboratories, TE's engineers drive international standards for rail industry components ensuring optimal product performance. In the field, TE engineers work closely with their customers by providing local-language support, technical design assistance and training to ensure customer satisfaction.



### COMPOSITE INSULATORS

consist of a polymeric housing over a pultruded fiberglass rod to which galvanized steel or aluminum end fittings are attached. By molding directly over the end fitting, moisture ingress to the fiberglass rod is prevented by creating a chemical bond between the fitting and EVA. Rail insulators are produced using Raychem proprietary EVA.

#### KEY FEATURES

- Proven interfacial seal system
- Solid polymer core
- Non tracking, UV resistant EVA housing



### HYBRID INSULATORS

consist of a high strength ceramic core with a polymeric housing. The best features of ceramic and polymeric insulators are combined, resulting in high mechanical strength and excellent electrical behavior under polluted conditions.

#### KEY FEATURES

- High-strength porcelain core
- Protected creepage silicone housing
- Corrosion-resistant galvanized steel end fitting
- Designed especially for highly polluted areas



### PORCELAIN INSULATORS

are the traditional choice for distribution line, busbar and apparatus insulation. Manufactured from high-quality, non-porous electrical porcelain, they provide a long life and cost-effective solution for the majority of applications.

#### KEY FEATURES

- High-quality, non-porous electrical porcelain
- Reliable performance over a wide range of environmental conditions
- Routine testing to recognized international and national standards

### EVA

EVA is Raychem-designed mineral-filled, semi-crystalline material that has several times the strength, tear resistance and modulus than silicone insulator materials.

It has superior resistance to bird/rodent attack and acid environments. Its toughness prevents mechanical damage during the installation phase. In Tracking- and Erosion-Resistant Testing (TERT), EVA passes both the 4.5kV constant voltage (IEC 60587) and the more severe stepped voltage TERT test (ASTM D2303). EVA is designed to be highly hydrophobic, UV resistant, self-extinguishing, self-cleaning under dry arc banding conditions and passes railway smoke toxicity requirements.



EVA is qualified in both 1000hr salt fog and 5000hr multi-stress tests and has a successful service history in tough desert and coastal applications.

EVA is the preferred material in tunnel applications at several rail networks. In a tunnel, EVA is exposed to all the usual contamination (iron oxide, salt, industrial pollutants etc.), but does not have the natural washing provided by rain in an open track environment. EVA will perform reliably for longer intervals between cleaning – up to 15 years.



EVA RRA insulator installed in Austrian Blisadona tunnel

## OVERVIEW OF INSULATORS

Type	Material	Mechanical rating (kN)	Application	System voltage (kV)	
				from	to
<b>Medium voltage tension insulators</b>					
RST (PRI)	EVA	up to 120	Utility, Railway	1	60
Suspension	Porcelain	up to 120	Utility, Railway	1	275
<b>Medium voltage line post insulators</b>					
RLP (PLI)	EVA	up to 14	Utility, Railway	1	52
HSHI	Hybrid (Porcelain core & polymeric housing)	up to 12.5	Utility	1	25
Line Post	Porcelain	up to 12.5	Utility, Railway	1	72
<b>Medium voltage station post insulators</b>					
RAP (PSI)	EVA	up to 18	Utility, OEM, Railway	1	52
EPBI	EVA	up to 4.5	Utility, OEM, Railway	1	36
Station Post	Porcelain	up to 6	Utility, OEM, Railway	1	72
<b>Medium voltage pin insulators</b>					
Pin	Porcelain	up to 13	Utility	1	36
<b>Spool insulators</b>					
Spool	Porcelain	up to 20	Utility	n.a.	n.a.
<b>Strain insulators</b>					
Strain	Porcelain	220	Utility	n.a.	n.a.
<b>Insulators for railway application</b>					
RRA	EVA	on request	Railway	15 *	25*
HCI	Hybrid (Porcelain core & polymeric housing)	on request	Railway	15	25*
Tension and Strut	Porcelain	on request	Railway	1.5(DC)	25*

\* single phase voltage

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