



DOW ENDURANCE™ Compounds for Power Cables that will Connect Sochi to the World

The case

The Krasnodar region of Russia experienced unprecedented growth due to preparations for the Olympic Winter Games held in Sochi and the surrounding countryside in 2014. To support this growth, increased electrical capacity was needed to power Olympic venues as well as to spur economic development in this resort region following the games.



WORLDWIDE PARTNER

The DOW ENDURANCE™ family of semiconductive and insulation materials from Dow Electrical & Telecommunications (Dow E&T) is developed to last for decades of service, and met the requirements of the Olympic Development Authority, the state



corporation which controls the construction of Olympic installations, or Olympstroy as it is known in Russia. Presented by Sevkabel Group, one of the three largest cable manufacturers in Russia and Dow Inside licensee, the bid included solutions for medium (MV) and

high voltage (HV) cables using DOW ENDURANCE compounds. The decision to accept this bid was based on several factors:

- History of more than 25 years' in-ground service for this water tree-retardant, crosslinked polyethylene compound (TR-XLPE)
- The solution had to be sustainable and environmentally friendly, which requires high-performance TR-XLPE cables
- Dow's MV and HV materials have a successful track record in Russia
- DOW ENDURANCE family of products meets global industry standards
- Cables made with DOW ENDURANCE meet the challenge of difficult natural conditions for reliable energy supply

All were key factors because the cables must provide high-quality performance while ensuring durable and reliable power supply after the Olympic Games.

With product and technical support from Dow E&T, Sevkabel completed several projects including installations for Olympstroy in Sochi and for FSK (Federal Grid) in the mountain resort of Krasnaya Polyana and the ski resort complexes in Rosa-Hutor and Imeretinskaya Valley.

For these projects, 54 km of 110 kV and 340 km of 10 kV DOW ENDURANCE™ cables were supplied by Sevkabel.

The Challenge

Indoor and outdoor lighting adequate for performing and judging athletic events. Electricity for precise time-keeping instruments. Keeping the lights on and equipment working at hotels, restaurants and game venues. A power and telecommunications infrastructure capable of broadcasting to the world.

These were only a few of the many challenges to increase and maintain power transmission and distribution adequate not only for the Sochi Games, but also to support the expected growth of the tourism industry in the Krasnodar region for years to come. The biggest challenge that most energy consumers did not realize, but was very apparent to cable makers and regional utilities like Sevkabel and MRSK, was the terrain.

Encompassing both seaside and mountains, the unique topography of the region contains many natural obstacles including rock formations, dense forests, rivers and streams of various widths and depths. High population density and concentration of various civil facilities (natural parks, resorts, villages) added another dimension to the complexity of energy infrastructure. The power supply solution needed to take all of these challenges into account, and the answer was underground (UG) MV and HV cable installation with sustainable TR-XLPE insulation.

The Solution

Increasingly, UG power cables are being recognized for technical advantages and consistent performance including:

- 30 percent lower power loss versus overhead lines (OHL)
- Increased protection against external factors such as weather and vandalism
- Lower visual impact, which increases value of surrounding regions versus OHL
- Smaller right of way required for installation
- Lower short- and long-term maintenance costs

- Ability to go through, around or under natural obstacles
- Predicted cable life of 40 years
- Ecologically friendly and sustainable solution compared to traditional paper-impregnated oil-filled cables

The cable systems, comprising 6-220 kV that met or exceeded industry standards, were constructed with DOW ENDURANCE™ HFDK-4202 EC for MV cables and HFDK-4201 SC for HV cables and produced by Sevkabel. These super-clean insulation compounds helped provide the reliability and long service life needed to support the Krasnodar region well past the 2014 Olympic Winter Games and into the future.

Project Summary

Customer:	Sevkabel Group
Applications:	Insulation and cable jacket materials for MV and HV cables ranging from 6-220 kV
Materials used:	DOW ENDURANCE HFDK-4202 EC MV TR-XLPE insulation DOW ENDURANCE HFDK-0587 BK crosslinkable conductor shield and bonded insulation shield DOW ENDURANCE HFDK-4201 SC HV XLPE insulation DOW ENDURANCE™ HFDK-0587 BK S crosslinkable conductor shield and bonded insulation shield for HV cables DOW DGDR-6800 BK jacketing compound
Functional requirements:	Consistent performance and long-term reliability
Benefits:	Reliable, long-life cables that are water-tree and stress-crack resistant resulting in lower total system cost due to little to no short- or long-term maintenance
Projects completed:	54 km of 110 kV HV cables 340 km of 10 kV MV cables Expansion and renovation of power infrastructure for Olympic venues and mountain resorts

About Dow Electrical & Telecommunications

Dow E&T, a business unit of The Dow Chemical Company ("Dow"), is a leading global provider of products, technology, solutions and knowledge that sets standards for reliability, longevity, efficiency, ease of installation and protection that the power and telecommunications industries can count on in the transmission, distribution and consumption of power, voice and data. Understanding that collaboration is essential to success, Dow E&T works together with cable makers, other industry suppliers, utilities, municipalities, testing institutes and other organizations around the world to help develop solutions and create mutual value that will sustain these industries for years to come. For more information, visit www.dowhvpower.com.

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About Sevkabel Group



Sevkabel Group is one of the leading wire and cable producers in the Russian Federation and has all the technical, commercial and human resources capabilities to manufacture high-quality cables and wires. The company produces low, medium and high voltage power cables; LSOH (low smoke zero halogen) wire and cables; overhead insulated wires; fiber optic cables; marine cables and enameled and winding wires. The company is ISO certified and its end products meet strict international quality standard requirements including IEC, HD, VDE, NFC and SFS.

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