Keeping bridges from crumbling

VESTOPLAST® from Evonik increases the lifespan of Russia's bridges.

Rain and wind, sun and heat, snow and ice. If there's one word that describes Russian weather, it's "extreme." With a landmass greater than any other country on earth, Russia is home to all of the world's climatic zones—and to over 6,000 bridges. Because these bridges need special protection from the elements, their structural elements are insulated with bituminous sheeting. Temperature stability and long life are key criteria for selecting insulating materials. In order to play it safe when it comes to quality, more and more manufacturers are turning to sheeting that has been modified with VESTOPLAST® from Evonik.

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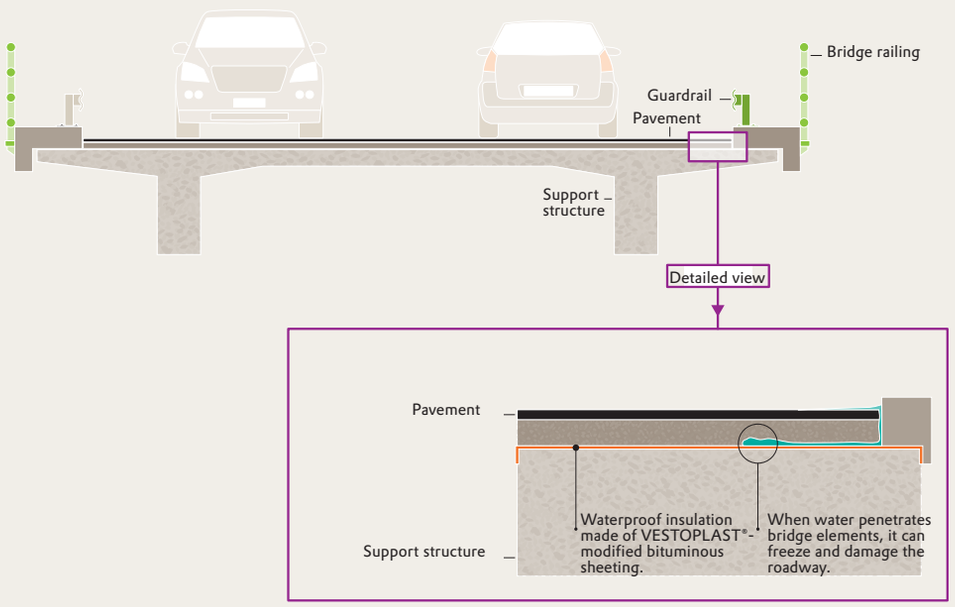
Evonik. Power to create.

Over 10 million people live in Russia's capital, and every day many of Moscow's inhabitants cross the Zhivopisny bridge—the tallest cable-stayed bridge in Europe. The bridge is exposed to Russia's formidable continental climate every day as well, with heat, freezing temperatures, moisture, road salt and UV radiation all wearing on its concrete and steel. And that could potentially result in corrosion, making it only a matter of time before cracks and flaws begin to appear in the supporting structures of the bridge.

A protective layer of sealant between supporting elements and the multilayered pavement improves the situation, as this is a sensitive area where water can collect and break down the concrete from within. How and why does water collect here? In order to provide drainage, road beds are built with a slight slope, permitting rainwater to run off into channels along the side of the road. Over a period of years, however, the joints between the deck and the side of the road weaken, allowing water to seep in between the support structure and the pavement—considerable damage to support elements is ultimately what results.

Modified bituminous sheeting has proven to be a reliable sealant. Oxidation processes, however, make pure bitumen brittle and prone



Bridge cross-section: VESTOPLAST®-modified bituminous sheeting protects the support elements of bridges from harmful environmental influences.

to cracking, while temperatures around 40 degrees Celsius cause it to soften. The solution? Combining the bitumen compound with special additives that improve stability under hot and cold conditions.

The right choice for hot or cold weather

Evonik's polymer-modified sheeting is the perfect solution. The bitumen in these products is combined with VESTOPLAST®, a polyolefin, i.e., a thermoplastic polymer, that forms a uniform matrix with bitumen. The advantage of the system is that it achieves ideal UV stability, while optimizing flexibility at low temperatures and flow properties under hot conditions.

The harsh winters and hot summers of Russia's continental climate are also a major reason why TechnoNICOL, a Russian manufacturer of construction and waterproofing materials, uses VESTOPLAST® for producing bituminous sheeting: the addition of VESTOPLAST® allows TechnoNICOL to use its product in any region. "Especially when we use it as insulation in bridge construction projects," explain product managers at TechnoNICOL. "After all, we have bridges in Siberia, where temperatures can fall to -50 degrees Celsius, and in southern Russia, where the air above the roadway can reach up to +55 degrees. Plus, the sheeting is chemical resistant, it forms a permanent bond with the substrate, and it remains stable over time." That makes it possible for the support structure of the bridges to last for a long time, while reducing maintenance costs that would be paid for out of public funds.

Proven effective many times over

TechnoNICOL bituminous sheet—and thus VESTOPLAST® from Evonik—is used predominantly in the roughly 6,000 bridges in Russia. The Zhivopisny Bridge in Moscow is one of these, as is the Presidential Bridge in Ulyanovsk, which is the longest bridge in Russia. VESTOPLAST®-containing sheeting has been installed here over an area of 160,000 square meters. On the bridges along the 47 kilometers of the Western High Speed Diameter Motorway encircling St. Petersburg, however, the corresponding figure is as high as 300,000 square meters.