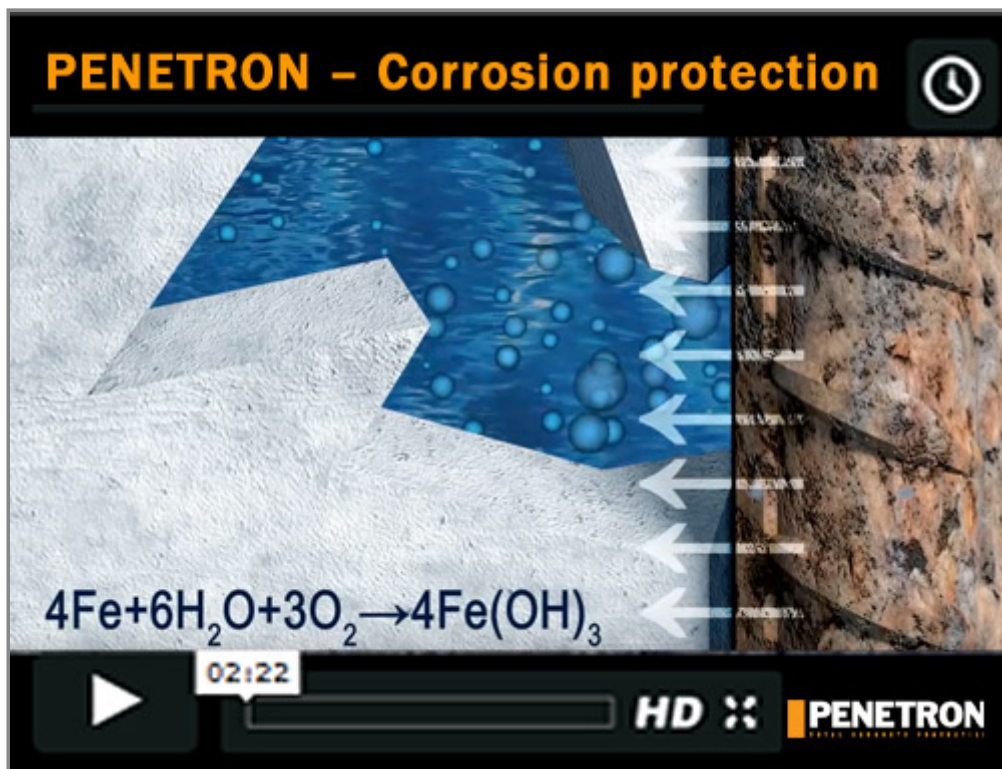




Reinforcement steel corrosion is of particular concern on concrete bridges, as they are subjected to heavy stress and often span long distances without support.

Initially expected to last a century or so, many bridge structures designed in the 1960's now endure much more weight due to higher traffic volumes, bigger cars and heavier lorries. Currently, more than 54,000 out of America's 613,000 bridges are rated structurally deficient, yet are still crossed 174 million times a day. At the present rate of repair and replacement, it will take 37 years to fix all the problems. A 1999 study shows that 30% of road bridges surveyed in Europe have some sort of defect, particularly corrosion of their reinforcement steel structures.*

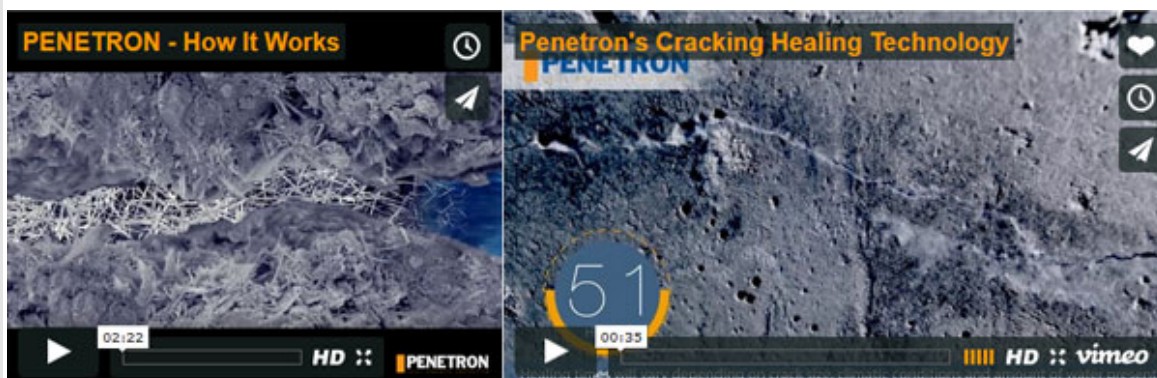
Because thousands of bridges are coming to the end of their days, road authorities worldwide need to take urgent action to combat corrosion on their bridge structures. Refurbishment is possible, but also slow and very costly. In many cases, it is more expensive than building a completely new bridge. New structures can take advantage of the newest admixtures, such as PENETRON ADMIX, which provide a self-healing capability and can extend concrete design life by 60 years or more, even in critical environments.



To learn more about how concrete corrosion manifests and how we can prevent it, peruse some of our recent case studies on how bridges from around the world now benefit from Penetron crystalline technology.

Jozef Van Beeck
Director, International Sales & Marketing

* Source: *The Economist* – August 18th, 2018 [read article](#)



PENETRON WORLDWIDE

Lennox Bridge, Parramatta, Australia
My Loi Bridge, Vietnam
Fumin Bridge, Shenyang, China
Golden Bridge, Vladivostok, Russia
Water Power Plant Aqueduct, Rotheau, Austria.
Nanxi Bridge, Yibin, China
Irkutsk Bridge, Irkutsk, Russia
HaiHe River Bridge, Tianjin, China
Kama River Bridge, Tatarstan, Russia
Third Nanjing Yangtze River Bridge, Nanjing, China
American Bridge, St. Petersburg, Russia



DOWNLOAD
THE PENETRON
BROCHURE



SEND TO A
FRIEND



SUBSCRIBE



HOW
PENETRON
WORKS

VIEW A 3 MINUTE
VIDEO DEMONSTRATION

Laimazhuang Bridge, Beijing, China

Millennium Cable Bridge, Kazan, Russia

Leninskiy Bridge, Russia

Cathedral of Christ the Savior and Pedestrian Bridge, Moscow, Russia



FOLLOW US   Follow

PENETRON – Protection against corrosion of reinforcement steel



A worldwide challenge, corrosion of reinforcement steel is the main reason for concrete deterioration. Failure of concrete structures due to corrosion has major safety implications for critical infrastructure, such as highways, tunnels, bridges and other projects exposed to aggressive environments. The National Association of Corrosion Engineers (NACE) in the USA estimates the direct cost of corrosion for highway bridges alone to be USD 13.6 billion every year.

[Read full article.](#)

PENETRON WORLDWIDE

Lennox Bridge, Parramatta, Australia



Located in Parramatta in the Sydney metropolitan area, the Lennox Bridge is a sandstone, single arch bridge spanning the Parramatta River. The bridge was originally designed and built in 1836 and is one of Australia's oldest bridges. Recently, the bridge stonework was cleaned and renovated, and a historically correct balustrade with a projecting cornice was added.

PENETRON ADMIX was used to treat over 600 m³ of concrete for both the north and south portals, the roof slabs, walls and the base slab of the bridge. PENESEAL SW-55 waterstop was installed in all horizontal and vertical construction joints (200 m). PENETRON slurry and PENESEAL MORTAR were used to treat the external tie bolt holes.

My Loi Bridge, Vietnam



My Loi Bridge is located in the Mekong Delta province of Tien Giang. The bridge opened to traffic on August 2015. It is 1,422 m (4,700-feet) long and 12 m (40-feet) wide and was completed after only 18 months of construction. My Loi Bridge helped reshape the transport route in the Southern region by spanning the Vam Co River and replacing a ferry service, reducing the travel distance from Go Cong to Ho Chi Minh City from 100 km (62 miles) to 25 km (16 miles).

The Penetron System and, in particular, PENESEAL PRO, a certified "green" product, were applied to waterproof 16,000 m² (176,000 square feet) of the bridge deck to ensure comprehensive waterproofing and meet environmental goals.

Fumin Bridge, Shenyang, China



Completed in December 2003, Fumin Bridge is a 602 m (2,000-feet) long cable-stayed bridge over the Hun River in Shenyang, China. At a height of 67.5 m (223-feet) and 32.5 m (107-feet) wide, it accommodates two lanes of traffic in each direction. It connects Shenyang's Fengle district with Hunan District on the southern riverbank.

PENETRON coating material was applied to the bridge's exposed concrete deck to provide a permanent waterproof seal.

Golden Bridge, Vladivostok, Russia



Constructed for the 2012 Asia-Pacific Economic Cooperation (APEC) Meeting, the Zolotoy Bridge (Golden Bridge) officially opened in August 2012, at the time, the world's 12th longest cable-stayed bridge (1,388 m / 4,580-feet). The USD 620-million bridge connects the city of Vladivostok to both shores of the Golden Horn Bay. The construction proceeded despite harsh weather and seismic conditions; it took 46 months to complete.

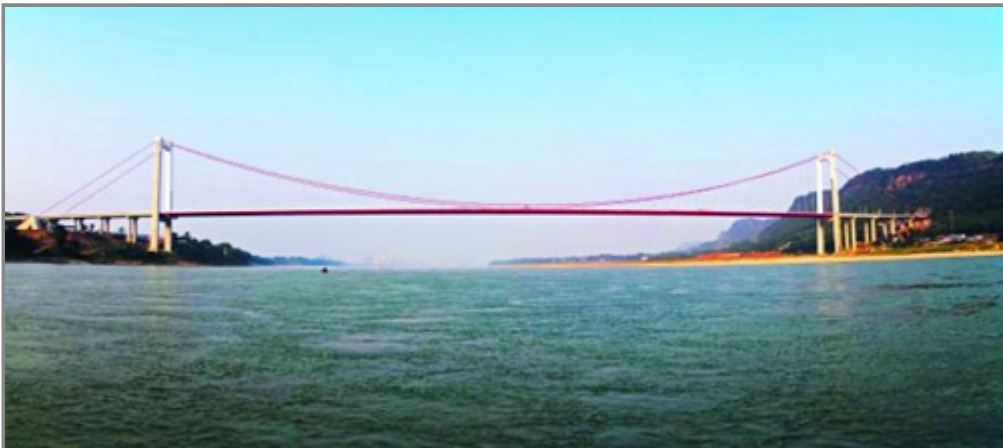
To ensure the highest level of durability for the supporting concrete pillars, the PENETRON System was applied to the structure. PENETRON ADMIX was used for waterproofing concrete pylons, as well as the monolithic pre-stressed concrete slab decking.

Water Power Plant Aqueduct, Rotheau, Austria.



The Rotheau water power plant was built in the 1920's to supply the local industry with electricity. The concrete aqueduct, which was built over a small creek, supplied the plant with water. About 80 years later, water leakage in several areas of the aqueduct required repairs to prevent any further loss of water and to protect the embedded reinforcement steel from corrosion. In order to carry out the repairs, the water flow was stopped, and the aqueduct was repaired from the inside (positive side). Damaged concrete areas were renewed, and the whole area was covered with a PENETRON coating. Once the aqueduct was filled with water, the crystalline PENETRON material sealed all leaks within a few days. The photo shows the intact aqueduct 12 years after the PENETRON application.

Nanxi Bridge, Yibin, China



Nanxi Bridge was opened in 2012 as part of the G93 Chengdu-Chongqing Ring Expressway across the Yangtze River in Nanxi District, Yibin, Sichuan in China. With a span of 820 m (2,700-feet) and a total length of 1,295 m (4,300-feet), the Nanxi Bridge is one of the longest suspension bridges in the world. The USD 95-million project is 24.5 m (81-feet) wide and accommodates a two-way four-lane highway designed for speeds of up to 80km/h (50-mph).

A PENETRON coating was applied to waterproof the concrete bridge deck and the concrete chambers around the steel cable anchors. In total, 26 tons of PENETRON crystalline material were applied to the Nanxi Bridge.

Irkutsk Bridge, Irkutsk, Russia



Irkutsk, Siberia's largest city, is bisected by the Angara River. As a key part of the city's transport infrastructure, the Irkutsk Bridge is 1,625 m (5,360-feet) long and 32 m (106-feet) wide. Construction work on the bridge was conducted in harsh climatic conditions; in-situ pre-stressed reinforced concrete was used.

PENETRON was utilized extensively on the concrete railing, roadway and sidewalks. PENETRON ADMIX was used for the concrete pillars holding up the bridge.

HaiHe River Bridge, Tianjin, China



Located in Tianjin, China, the HaiHe River Bridge connects the city's Hedong District with the Jianshan District on the southern riverbank. The HaiHe River Bridge has a length of 868 m (2,870-feet) and a width of 39.5 m (130-feet) to accommodate a two-way, three lane highway. The three-span continuous beam design employs intermediate shaped concrete piers as foundations.

To waterproof and protect the 8-cm (3") thick cast in-situ, reinforced concrete screed of the bridge deck, a total of 40 tons of PENETRON crystalline material were applied.

Kama River Bridge, Tatarstan, Russia



The Kama Bridge is a part of the longest artificial road structure in Russia (as measured by the length of elevated roadway). With a total length of 14 km (9-miles), the structure has three bridges: over the Kama River (1,608 m / 1-mile), over the Arkharovka River (550 m / 1,815-feet) and over the Kurlyanka River (70 m / 230-feet). The bridges are a key part of the major Kazan-Chistopol-Bugulma-Orenburg Highway.

To ensure a comprehensive waterproofing solution, PENETRON crystalline products were used on all pillars and concrete structures exposed to water or road salts.

Third Nanjing Yangtze River Bridge, Nanjing, China



Opened to traffic in 2005, the Third Nanjing Yangtze River Bridge is Nanjing City's first cable-stayed bridge. As part of the G42 Shanghai-Chengdu Expressway and the G2501 Nanjing Ring Expressway, it was constructed in slightly more than two years at a cost of USD 490-million. The main span measures 648 m (2,140-feet), while the total length of the bridge is 4.7 km (3-miles).

Designed by China's Highway Planning and Design Institute, the bridge is 37.5 m (124-feet) wide and accommodates three lanes of traffic in each direction (with a center lane for emergencies). The bridge deck is supported by 168 stay cables from two impressive 215 m (710-feet) tall towers.

PENETRON crystalline coating was applied to waterproof and protect the exposed concrete bridge deck.

American Bridge, St. Petersburg, Russia



Initially built in 1840-1850, the Nikolayevskiy Bridge got its name, "the American Bridge," during the 1887-1889 restoration that utilized then-new American technologies. The latest bridge reconstruction completely upgraded the bridge and infrastructure.

The PENETRON System was used to ensure the impermeability of the bridge's concrete structures.

Laimazhuang Bridge, Beijing, China



Located in the northern metropolitan area of Beijing, China, the Laimazhuang Bridge is a 1 km (0.6-mile) long, four-lane bridge connecting Shunyi and Shahe Districts. The bridge is part of Beijing's city ring road.

Approximately 12.6 tons of PENETRON crystalline material were applied to waterproof and seal the concrete bridge deck.

Millennium Cable Bridge, Kazan, Russia



With its distinctive M-shaped 45 m (150-feet) tall pylon, the Millennium Cable Bridge celebrated Kazan's 1,000-year anniversary in 2005. The USD 112-million project created the tallest bridge in Kazan, an 835 m (2,740 ft) long bridge that carries three lanes of traffic (each way) and pedestrian walkways spanning the Kazanka River.

To ensure the highest level of durability for the supporting concrete pillars, the PENETRON System was applied to the structure.

Leninskiy Bridge, Russia



While the new, eight-lane bridge over the Kama River inherited the previous Soviet name, it was totally rebuilt after more than 50 years of service. The new bridge features eight lanes and a separate pedestrian zone. The total length of the bridge is 172 m (570-feet).

The PENETRON System was applied to ensure the highest level of durability for the supporting concrete pillars.

Cathedral of Christ the Savior and Pedestrian Bridge, Moscow, Russia



A comprehensive renovation and upgrade of the foundations of this historic cathedral and the adjoining footbridge – a popular Russian tourist destination – was carried out during challenging weather conditions.

PENETRON ADMIX was used to treat all concrete structures to ensure permanent freeze-thaw resistance.

