

High-Speed Rail Tunnel Repair

Guizhou, China (2019)

PRODUCTS USED:

Krytol Plug™ Krytol Repair Grout™ Krytol T1®

OWNER:

China State Railway Group Co., Ltd.

DISTRIBUTORS:

Beijing Huatie Hengrui Technology Co., Ltd.
Tianjin Hongba Waterproofing Materials Co., Ltd.

BACKGROUND

High-speed rail (HSR) traffic moves significantly faster than traditional rail traffic. As of 2018, China has the longest HSR network in the world with over 29,000 km (18,019.77 mi) of HSR laid. Their HSR transports billions of passengers and billions of tonnes in freight every year.

Creating this amazing way to travel is not without its challenges, however. For instance, engineers often have issues with waterproofing, especially when it comes to constructing the middle of an HSR's tunnel. These issues not only influence the project's consistency and durability, but they also directly affect the normal usage and safety of the whole railway.

When an HSR tunnel in Guizhou, a province in Southwest China, developed a consistent and massive leak, the China State Railway Group Co., Ltd. needed a long-term, durable solution with a short application time to ensure as little disruption as possible to railway operations.

The leak was massive. Its water flow was over 30 L per minute due to the immense pressure created from the 100 m (328.08 ft) of earth above the tunnel.

Exacerbating the problem was the fact that the tunnel's concrete surfaces were designed with extremely high standards of firmness and bonding strength to ensure the trains could move safely through the tunnel in excess of 250 km (155.34 mi) per hour. Any loose, flaking, or falling material could cause catastrophic damage to the trains. And any repairs would require the same exacting standards to ensure the HSR remained safe. Moreover, all the operating platforms and repair work were expected to be finished within three hours between 12 am and 3 am.

SOLUTION

Working with Beijing Huatie Hengrui Technology Co., Ltd., Tianjin Hongba Waterproofing Materials Co., Ltd. provided the solution the China State Railway Group Co., Ltd. was looking for: Kryton's safe and efficient repair system.



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The first step in this system was to clean up the leaking crack and remove loose concrete and other detritus. Next, grinders were employed to create a groove or chase at the leaking point, shaped for the application of Kryton's Krystol Plug. The plug was then applied, completely stopping the water flow. Krystol Repair Grout was then used to fill the chase flush to the surface of the tunnel wall. After the repair was completed, Krystol T1 was applied to prevent further concrete deterioration and leaks.

Kryton's repair products have assured the China State Railway Group Co., Ltd. that their HSR trains could once again move quickly and safely through a completely dry tunnel.



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