

Foreva® Ultrasound

Treatment of cement-grouted prestressing tendons by impregnation with corrosion inhibitors using ultrasound assisted impregnation.



BENEFITS OF FOREVA® ULTRASOUND

- + Unique method of protecting prestressing reinforcements against corrosion
- + Preventive and curative treatment
- + Extends tendon life span
- + Applied without restriction to operating requirements

PROBLEMS FACED

Due to their design, some structures are highly vulnerable to prestressing wire breakage; this is particularly the case for the support area of independent-span post-tensioned prestressed concrete beam viaducts (VIPP). Prestressing reliability is a major concern with regard to user safety and traffic continuity. As the prestressing tendon reinforcements inside the concrete are difficult to access, solutions for treating chloride contamination are currently scarce.

WITH FOREVA® ULTRASOUND

Freyssinet offers a technique that involves injecting an inhibitor solution into the cement grout around the tendon and distributing it so that it completely covers the surface of the prestressing wires, stopping corrosion activity to secure and extend the life span of structures requiring treatment.



OPERATION

- The existing grout is impregnated with the inhibitor solution using an ultrasonic pump that generates ultra-rapid high- and low-pressure cycles.
- The solution impregnates the pores and microcracks present in the grout and covers the entire surface of the reinforcements.

INHIBITOR SELECTION

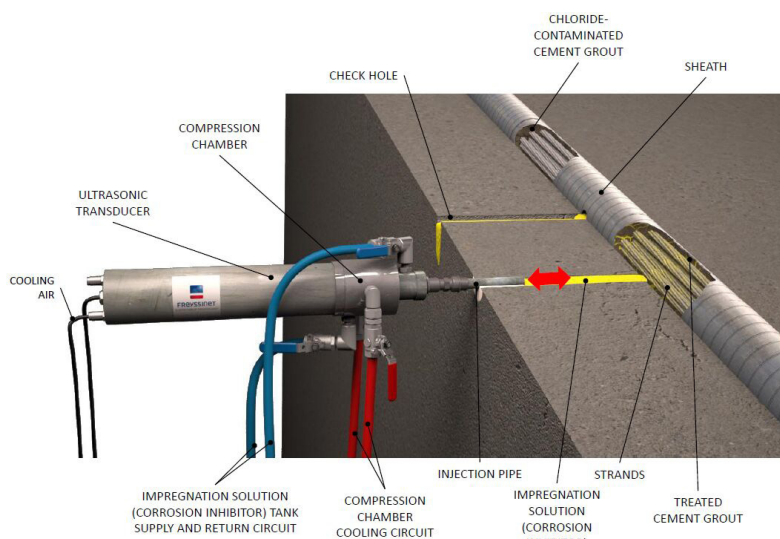
- The solution used is a calcium nitrite-based inhibitor, the main feature of which is that it stops any corrosion activity that has started in chloride-contaminated concrete.

APPLICATION

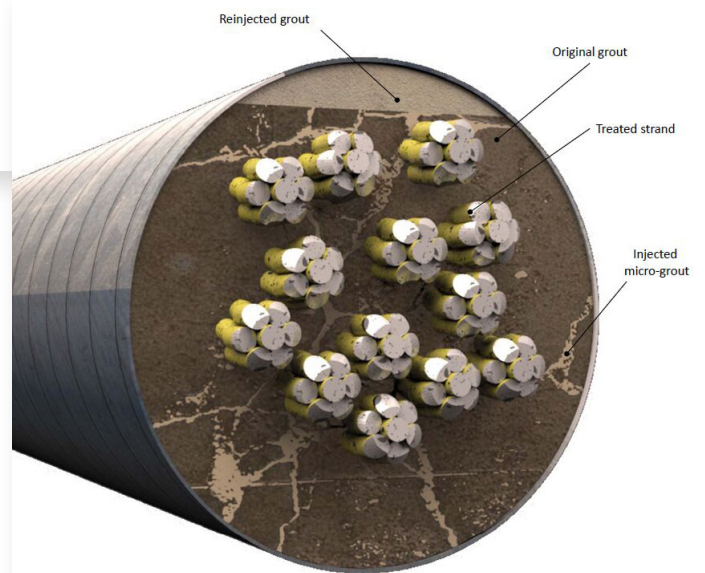
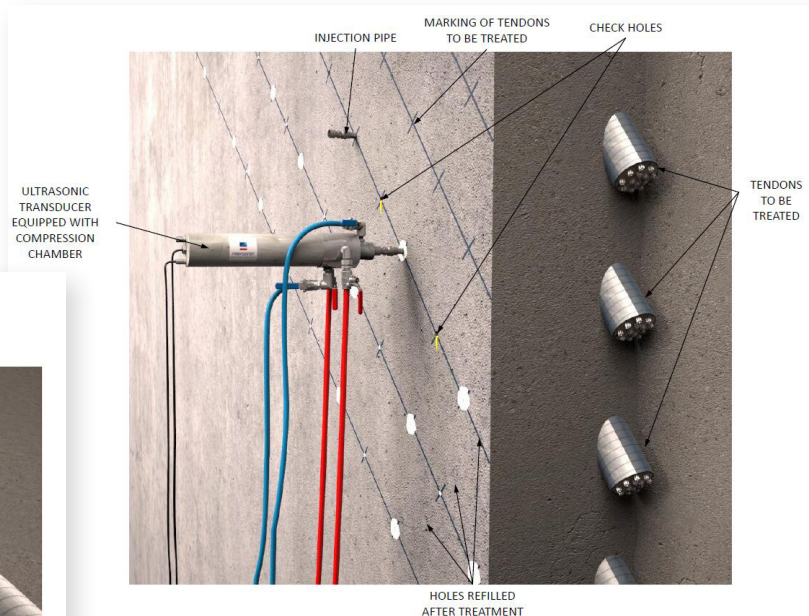
1. Drill holes in the concrete coating every 50 cm.
2. Map the distribution of the chloride contamination.
3. Impregnate the cement grout with the inhibitor solution using the ultrasonic pump.
4. Inject a microfine cement grout.

OPERATION

Impregnation system set-up ▶



▶ Impregnation diagram



▶ Results after impregnation and regrouting

CASE STUDY

VIPP 211 CHASSE-SUR-RHÔNE

The Chasse-sur-Rhône overpass (VIPP 211) is located on the ASF network south of Lyon. Built in 1963, it is an independent-span post-tensioned prestressed concrete beam viaduct (VIPP) made up of nine spans with a total length of around 300 m. It was susceptible to risk of brittle fracture in the event of partial fracture of the prestressing. ASF therefore commenced studies and associated reinforcement works with the objective of ensuring an adequate level of service of this structure for a further fifty years.

Freyssinet was in charge of the rehabilitation works and implemented a new method known as Foreva® Ultrasound, designed to extend the service life of the prestressing tendons.

