

BRIDGES

- ✎ Excellent corrosion protection
- ✎ Longer durability
- ✎ Saves resources

Dehumidification of bridges and affixed constructions

Corrosion damage can lead to large costs in bridge construction worldwide.

The bridge construction is assured against corrosion through development of an environment that keeps a maximum of 50% RH around the steel construction. The girders, on which the tracks lay upon, can be protected against corrosion by the circulation of dry air through the truss, whereas the corrosion protection paint is expensive and demands maintenance. Painting the bridge increases the weight.

Even affixed constructions can be dehumidified instead of using corrosion protection paint. A dehumidifier demands minimal maintenance and saves a lot of time compared to personnel applying corrosion protection paint. Corrosion protection is also necessary in spots very difficult to reach and dry air is often the preferred method.

The impressive Millau Bridge in the southern part of France (picture up to the right) is dehumidified by several DST-dehumidifiers. The 2 kilometres plus long bridge is the connection on the A75 motorway between Bezier and Clermont-Ferrand.

Eiffage (the company standing behind the bridge construction) guarantees that the bridge will have a service life of 120 years. One of the measures taken in order to keep up with that guarantee is the dehumidification of the bridge's inner parts as protection against corrosion.

Several DST-dehumidifiers have been installed on the bridge inside beneath the roadbed. The dry air spreads out through a channel system.



For more information or enquiries contact your nearest DST representative, see www.dst-sg.com

References

Seibu Giken DST AB dehumidifiers are, among others, used on the following bridges:

South Africa: Nelson Mandela-bridge

France: Millau Bridge

Switzerland: Lorraine Bridge

Sweden: Liljeholm Bridge, Sickla Bridge,

Fotö/Hönö Bridge, Vallsundsbron -Östersund

Norway: Triangle link, Flå Bridge, Mjosund bridge,

Langnes Bridge, Nord-Trøndelag, Grong Bridge,

Nord-Trøndelag

Example of dehumidified bridge:

Liljeholmsbron in Stockholm

The Liljeholmen bridge is actually made up of two bascule bridges dating back many years. The oldest bridge was commissioned as far back as 1928, followed by the other in 1954. Inside the Liljeholmen bridge, you will find the machinery which operates the opening mechanism, a 500-tonne counterweight for the relevant bridge, and gigantic gearwheels. These have to be rustproofed, and this is where dehumidification has its part to play.

Rustproofing inside the bridge

If parts of the machinery and gearwheels were to be rustproofed to the exact letter of the regulations relating to rustproofing, the road surface would have had to have been broken up and the bascule bridge lifted. Of course, the disruption to traffic would be enormous, and costs would be through the roof. However, there is a simpler and far more cost effective solution to the problem: dehumidifying the area to be protected against corrosion.

An air dehumidifier reduces the relative humidity to the desired level. If the relative humidity is lower than about 50% RH, steel and iron will not rust. The moisture is the villain of the piece, and that is what is removed.



R-061R unit from Seibu Giken DST, installed in Liljeholmen bridge.

Installation

In the summer and autumn of 2001, a consultant company with ongoing control responsibility for the bridge, contacted Garnsviken, a DST-representative company with previous experience of bridge dehumidification.

A decision was made to start off with a trial installation. A DST dehumidifier was installed in one of the bridges, and the relative humidity was then logged carefully. The result was positive: the relative moisture level fell, and another DST dehumidifier was installed in the other bridge.

Dehumidification – a long-term and economical investment

Rustproofing is costly, sometimes tricky to implement and requires a lot of staff, so dehumidification as a means of corrosion protection in closed areas has become an ever more common solution (the Nelson Mandela bridge in South Africa is another example).

Dehumidification is also more environmentally friendly than rustproofing. In the case of the Liljeholmen bridge, more and more frequent cleaning of the bridge, combined with dehumidification, has led to this important part of the road network being kept in good condition.



Traffic over the Liljeholmen bridge in southern Stockholm, looking towards Söder. The bridges are kept in good condition by two DST dehumidifiers.