

Clever use of liquid shim

Cost- and time-efficient refurbishment of crane rail supports

A material that has proven itself in bridge construction can also be used for the renovation of crane runways. The so-called liquid lining sheet meets all the requirements of Eurocode 1090-2 and provides the necessary design values for steel construction.

Grouting compounds for casting under crane rail supports are widely known and are considered standard. In addition to cement, polyester or epoxy resin mortar is also used here. This technology is mostly used for fixing crane rails to concrete. But what needs to be done if the slats are to be installed on a steel base? In this case, the requirements and conditions for standard grouting compounds are usually too high or not sufficiently technically defined. Small gaps of less than 2 mm in some cases make simple grouting impossible. High load requirements, such as low creep properties to avoid preload losses in the fastening screws, are just as much an issue as the coefficient of friction that can be achieved under load.

Proven material

The MM1018 material, which has already proven itself in the installation of bridge and building bearings, offers an efficient solution. Here, the conditions for steel-to-steel installation are comparable to those for the installation of crane rail slats on a steel girder or steel floor plate. The product, which is also known under the trade name Liquid Lining Sheet, meets all the requirements of Eurocode 1090-2. It therefore provides the necessary design values for steel construction and also has a general building authority approval from the German Institute for Building Technology IDIBt. The two-component reaction resin system can be used either as a paste or liquid and can be filled or injected. This means that even the smallest, non-specific gaps can be securely sealed.

The technical properties of the product are described below and examples are used to show how refurbishment measures can be carried out efficiently on steel-steel rail supports on cranes. By using MM1018 and an optimized installation method, technically demanding tasks could be solved, which enabled the continued use of the crane systems. Compared to new construction, considerable cost and time savings could be achieved with good remaining service lives (see table).



Outfield gantry crane before refurbishment: crane rail is wavy and tilted.



Filling the gap with the liquid shim and final assembly of the crane rail.

Practical examples

During the inspection of an outfield gantry crane, an urgent need for refurbishment was identified. The crane rail of the steel structure (span 90 m) was wavy and tilted. As a result, the safe transportation of loads of up to 32 t could no longer be guaranteed. The refurbishment of the gantry crane's rails began with the installation of a new rail support, which was connected to the steel

girder using steel bolts. During installation, a gap was set between the support and the existing beam so that the steel slats could be perfectly aligned with each other. In order to ensure efficient, permanent and precise frictional connection between the rail support and the steel girder, the gap compensation was carried out using liquid lining sheet. In preparation for the injection of the liquid gap compensation material MM1018 FL, the cavities between the

Table: Comparative figures between refurbishment and new acquisition

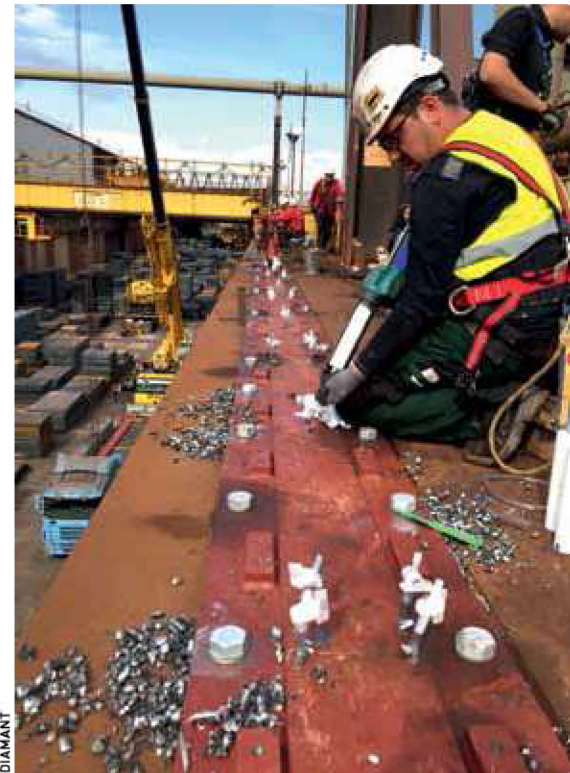
	Refurbishment	New acquisition
Costs	around 500.000 €	around 2.500.000 €
Refurbishment time/ Delivery time	4 weeks	around 1,5 years
Remaining term	around 15 years	around 20 years

*Attaching the new rail support with a visible gap to the existing support.*

support and the girder were first sealed with MM1018 SEAL.

The fast-curing, corrosion- and weather-resistant metal polymer enables pressure-tight joint sealing. It was then possible to start injecting the MM1018 FL liquid shim. The "liquid shim" was also favored for the renovation of the 300 m long rails of an

outfield bridge crane in a large steelworks. During an inspection of the crane with a maximum load-bearing capacity of 80 t, damage to the girder was discovered after the crane rail was removed. The injection of MM1018 was also used here in combination with the installation of new girder slats.

*Precise application of MM1018 on the 300 m long rail track of an outdoor overhead crane.*

Summary

In the holistic renovation of crane rails with MM1018 and reinforcing slats, a gap is deliberately left so that steel slats several hundred meters long can be placed and precisely aligned. As both sides of the rail supports are therefore perfectly aligned, this precise process can also be used successfully on old, weathered steel girder structures. The great advantage of the liquid lining sheet is that it flexibly fills every gap 100 percent and does not need to be mechanically processed or adjusted. The MM1018 material is characterized by very high compressive strength, fast curing and permanent resistance to corrosion and weathering. Thanks to these properties, the liquid shim is being used more and more frequently worldwide in the refurbishment of crane rails.



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