

Pilot project: Bridge construction over the Highway A46 in just 100 days:

## **Metal polymer ensures force-locking at the "Lego Bridge"**

**After only 100 days, a new bridge over the Highway A46 near Hagen has now been completed. The basis for the rapid bridge construction was a new method in which precast components - such as oversized "Lego bricks" - were joined together. An elementary aspect was the secure one-hundred percent adhesion between the four steel girders of the bridge and the bearing surfaces embedded in the "Concrete Lego bricks".**

The bridge construction of the Hammacher Street, which crosses the Highway A46, is considered a pilot project in North Rhine-Westphalia. The decisive advantage of the new building block design: it is faster. Had it been built conventionally, it would have required more than 200 days of suspension.

The bridge consists almost entirely of prefabricated components. In the classical method, concrete parts are first cast at the construction site and then have to harden for a long time. A key factor in connecting the steel girders to the bearing surfaces in the concrete blocks was the special metal polymer MM1018 of the Mönchengladbach-based polymer and coating manufacturer Diamant Metallplastic.

MM1018 is a two component reaction resin system with high metallic filler content. This allows not only to close gaps between steel-steel joints permanently and safely, but also those of steel-concrete joints. There is no mechanical processing of the contact surface and supports required. Two different application variants of MM1018 are possible, which can be used depending on the situation.

The pasty material is suitable if parts to be joined over a large area are not yet permanently connected to one another, but they should ultimately be - as is the case with the "Lego Bridge" when connecting the steel girders to the concrete blocks.

The liquid variant of MM1018 is usually chosen for the "reactive" application - for the subsequent gap compensation in already installed steel structures. This variant was also used in the "Lego Bridge": it was used to fill the bearing surfaces of the so-called "toothbrushes" - ie the steel girder overhang, which was additionally bolted with tie rods behind the bearing surface. The special challenge was not to fill the screw holes. Because the screws had to remain free to preload in order to transfer the power to the right places.

*Diamant Metallplastic GmbH, headquartered in Mönchengladbach in the Rhineland, develops, formulates and produces metal polymers and coatings for the metalworking industry, casting, steel and bridge construction and shipbuilding. Founded in 1886 and still managed as a family business, Diamant Metallplastic GmbH has a global sales network with over 40 foreign agencies in major industrial centers around the world.*