Extreme Heat, High Contact Pressure: New Sliding Material for Dubai

MAURER-Innovation MSM® Plus endures 60 °C and 40 MPa.

Dubai, Munich. **Dubai is known for its extreme and innovative structures – correspondingly high are the requirements of the Roads & Transport Authority (RTA). For the bridges of the new Dubai Water Canal structural bearings were requested which could withstand a contact pressure of 40 MPa at a temperature of 60 °C. For these bridges, MAURER employed and tested the new MAURER Sliding Material Plus (MSM® Plus). This material is also being used by competing companies.**

The Dubai Water Canal is a completely new water link which was built between October 2013 and November 2016. With a length of 3 km and a width of up to 120 m, it reaches from the Business Bay to the Persian Gulf. Four bridges with a clearance of 8 m already span the canal. Along the banks, hundreds of hotels, restaurants and shops shall be built in passageways.

At first glance this is a bridge like any other. But it is one of the drei bridges over the Dubai Water Canal for which as a worldwide first time a sliding material was specified that had to be proven for 60 °C and 40 MPa.

Photo: MAURER

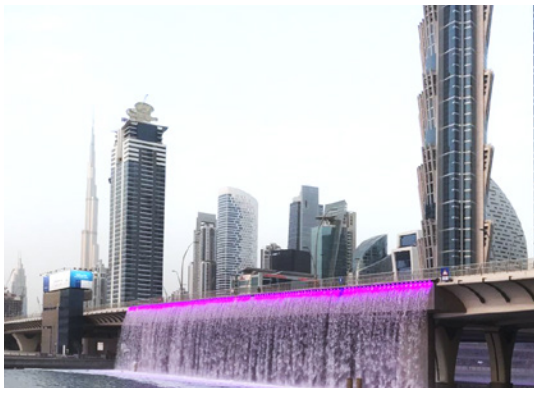
Uniquely high technical requirements

The bridge bearings for the three bridges were supplied by three different companies. However, uniform for all the three companies were the high technical requirements, explains Mr. Raad Hamood, Sales Manager Middle East at MAURER. "In this combination of high contact pressure and high temperature, this requirement was worldwide a first time!" Due to the high temperatures that prevail in Dubai, the sliding material in the bearings must withstand 60 °C, and because of the high live load must be proven at a contact pressure of 40 MPa.

When these requirements were set by the RTA in 2014, the bearing experts of MAURER were already in the process of enhancing the existing MSM® sliding material. Usually, sliding material is being tested at room temperature. Tests of the new MSM® Plus which were conducted at the material testing institute of Stuttgart University (MPA) were however adapted to the specification of RTA. A so called cold-flow-test was successfully conducted, however in a specially specified combination of temperature and contact pressure.

MSM® Plus fulfilled all expectations. According to the test certificate of MPA it can cater for a combination of contact pressure and temperature of 40 MPa and 60 °C.

Because all contractors had to comply to this extraordinary specification, but only the new MAURER sliding material (MSM® Plus) could fulfil, in all three bridges MSM® Plus was employed, independent of the contractor.



Dubai as you know it: the skyline and a new bridge over the new Dubai Water Canal, of which emerges a waterfall in shining and changing colours.

Photo: MAURER

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The bridge for which MAURER the bridge bearing supplied is a concrete bridge with traffic 4 lanes in each direction. The individual bridge sections are connected by way of prestressing elements. The bridge bearings are classical pot bearings – also a special in case of Dubai, because in Dubai only pot bearings are specified.

The first bearings were delivered in 2014. The installation of all 143 bearings was carried out in 2015. The bearings can accommodate forces of up to 30 MN and display a diameter of ca. one meter.

The Water Canal was opened for traffic – thus flooded – in October 2016. The bridges were opened for traffic end of 2016.

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Quick facts about MAURER SE

The MAURER Group is a leading specialist in mechanical engineering and steel construction with over 1,000 employees worldwide. The company is market leader in the area of structural protection systems (bridge bearings, expansion joints, seismic devices, tuned mass dampers, monitoring systems). It also develops and produces vibration isolation of structures and machines, roller coasters and Ferris wheels as well as special structures in steel.

MAURER participates at many spectacular projects worldwide, like for example the world's biggest structural bearings for the Signature Bridge in Wazirabad, Delhi, earthquake resistant expansion joints for the Bosporus bridges in Turkey, semi-active tuned mass dampers for the Danube City tower in Vienna, or uplift bearings for the Zenit-Football-Arena in St. Petersburg. Among the most prestigious steel structures are the BMW World in Munich or the Terminal 2 of Munich Airport. MAURER's most spectacular amusement rides include the world's biggest transportable Ferris wheel R80 XL in Mexico, the Rip Ride Rockit Roller Coaster in the Universal Studios Orlando or the Fiorano GT Challenge in Abu Dhabi.

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