

The components of your success

Special application of hydraulic cylinders: the bridge crushers



Efficient hydraulic cylinders from Liebherr enables successful laboratory tries.

Project scope

Researchers at the Technical University (TU) of Munich have developed a new test stand for concrete bridge beams. In order to better calculate the load-bearing capacity of these beams in the future, six hydraulic cylinders by Liebherr Components are used to press the element with full force until it breaks.

The cylinders provide a constantly increasing massive pressure by applying a maximum compressive force of up to 1.6 MN and a maximum traction force of 1.1 MN. The collected data helps in developing new, leaner constructions from ultra-high-performance concrete. Yet, above all, it could also help to rescue thousands of existing bridges.

Customer benefits

Due to an adaption of an existing cylinder, Liebherr is able to satisfy special requirements applied to test benches

- High efficient way of operation as compared to the cylinder size
- Six servo-hydraulically controlled cylinders offer the necessary flexibility
- Optimally matched external position transducers ensure precise positioning

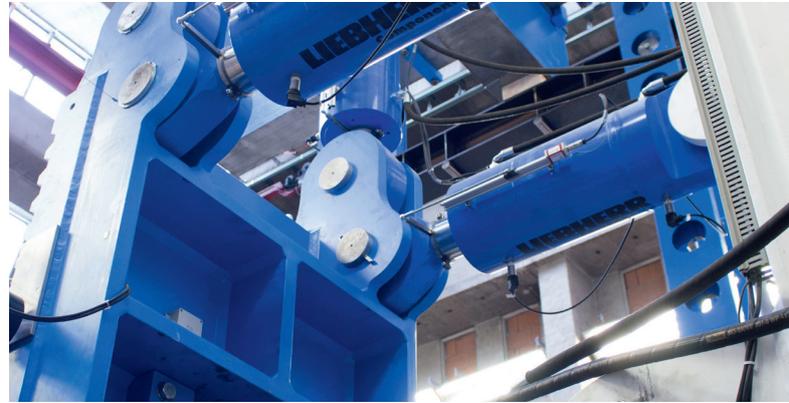
LIEBHERR

Application and product

Technical data

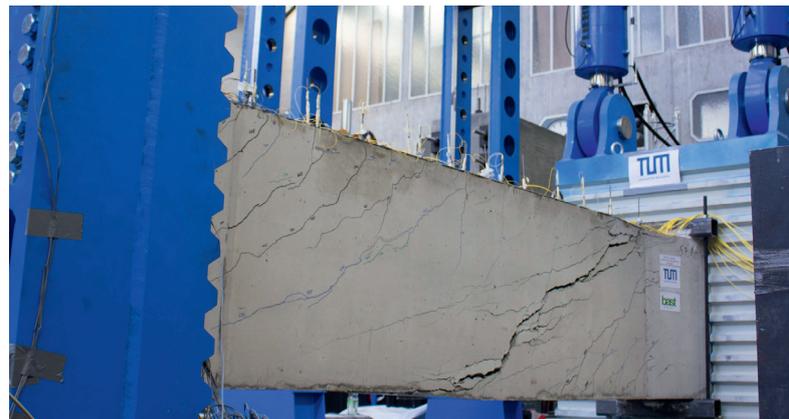
Hydraulic cylinders

Type	Differential cylinder
Operating pressure	250 bar
Piston rod diameter	140 mm
Piston diameter	260 mm
Installation length	1.250 mm
Stroke	300 mm



Project status

Since May 2017, prestressed concrete bridge beams have been examined weekly on the test stand at TU Munich. The acquired data enable better comprehension of the realistic load-bearing behaviour of the beams for the future improvement and expansion of the calculation modules. There is certainly a lot of testing to be done: for the coming year, sections with cross-section heights of 1.2 m are already being lined up. Tests are also being carried out on ultra-high-performance, fibre-reinforced concrete. This is three to five times stronger than traditional concrete.



Through intensive exchange, the special features of the design and mechanical interfaces were clarified in conjunction with Liebherr, and it all worked out perfectly despite time pressure.

Nicholas Schramm, research associate at TU München

