

## Bridge over the Vistula river in Toruń (Poland)

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Designer having over 25 years experience in bridge designing, He have designed 10 largest bridges in Poland. He promotes the state-of-the-art technologies including recently FRP composites.

*Figure 1. The biggest arch bridge in Poland*

### 1 Abstract

The construction of the arch bridge in Toruń was one of the greatest and more spectacular engineering projects implemented during the recent years. In December 2013 the Poland's largest arch bridge was completed and opened. The bridge has two spans, 270m long each, and is used as a bridge crossing over the Vistula river (Fig.1). The bridge is over 1.9 km long counting the access overbridges (viaducts). The erection procedure of the bridge was unique and individual, as the structural scale suggests. Generally, the assembly covered junction of arch elements on the assembly site near the Vistula river bank and the pontoon water transport of arch girders, which were settled on the arch abutments. A unique affordable structural solution deals with the support footing of a great number of small concrete pre-cast piles transferring a giant horizontal force into the subsoil. The steel-arch is modeled by a hingeless system without a tie, transferring horizontal force into supports. A original solution of assembly geometry control system and monitoring system was applicate to floating erection. Innovation was done of introducing material for the pot bearings, whose durability was 5-times longer than the ordinary ones. A novel slide material PTFE was used, the so-called grey teflon of improved abrasion ability. The new PTFE solutions were recently applied for the spherical bearings, but never they have been for the pot bearings. The bearings worked out an individual product specification, based on experiments conducted in the EU laboratory. The world's pioneering enterprise is application of a hundred pot bearings for the bridge and viaducts.

**Keywords:** arch bridge, floating erection, pot bearing, monitoring system.