

**Quality exposed concrete surface components for railway bridge**

**Optimum concrete compaction results with external vibrators**

Munich (ABZ). - One of the most exacting challenges in concrete construction certainly is the production of buildings, structures and components made of quality exposed concrete surfaces - also known as fair-faced concrete. These surfaces decisively influence the architectural effect of a building or structural component and must do justice to physical appearance requirements according to the DIN Standard 18 127 "Concrete Surfaces and Formwork Shell". Three fundamental factors must be taken into account when trying to manufacture quality exposed concrete surfaces: the choice of an appropriate formwork system, the correct concrete mix (recipe) and the professional vibration of the fresh concrete. Whereas the composition of the correct concrete mix is regulated to the smallest detail, for example with the fraction of fly-ash to be used or the particle or grain size of the fine sand plus the existence of very precise regulations defining the formwork, no such clear and precise regulations exist regarding the compaction process. This critically important process step as far as the quality of the physical surface appearance of structures and components is concerned depends mainly on the professionalism and experience of the contractor plus the correct selection of the vibrating equipment.

In April 2004 Art Contractors GmbH was also confronted with the problem of choosing the right type of equipment. The intention was to manufacture a large number of exposed, high quality components for the railway bridge over the Weisse Elster river near Leipzig. Art Contractors decided to go ahead and use external vibrators manufactured by Wacker to make possible an optimum concrete vibration and to achieve quality exposed concrete surfaces.

The bauma 2004 in Munich became a must for Artl, and it turned out to be a rewarding visit for the contractor from Frankenhain. Here the construction professionals were able to familiarize themselves with the new generation of quality exposed concrete surface external vibrators of the type AR 36/6/042 manufactured by Wacker and mounted on Doka's tunnel formwork. The product demonstration convinced the specialized guests immediately. Artl Contractor GmbH took swift action and purchased the compaction equipment on the spot at the fair stand. The equipment included a special FUE-M/S 85 A inverter with radio remote control, additionally to six external vibrators of the type AR 36/6/042 with the corresponding SV 4 fixing devices for wooden frame formworks. As a specialist for quality exposed concrete surfaces, the AR 36 is not only responsible for optimum surface quality but also for an excellent compaction performance within the construction component. With its low weight and compact design it is also ideal for applications of many different types on formwork and special construction designs, especially for components difficult to access.

Special user-friendly fixing devices for different types of formwork make a quick assembly of the external vibrators without the need for tools possible. In addition to this, the complete system vibrator/fixing device have been precisely balanced out and is thus easy to handle for the operator. In spite of its compact design the AR 36 is equipped with a powerful motor, which makes it possible to maintain the preset speed range under even the most difficult working conditions. Immediately after the bauma the complete installation with six external vibrators was able to prove its worth successfully at various civil engineering applications and different wooden beam formworks. But the largest single challenge for the engineers working for Artl Contractors was the construction of the railway bridge over the Weisse Elster river near Leipzig.

The bridge has a total length of 293 m and a maximum height of 19,95 m. It consists of two single-cell caissons over seven fields with variable web heights. The new Wacker vibration equipment passed its test during applications with formworks for abutments, columns and, in part, with the casting pit for sections of especially difficult access, such as e.g. projections in the area of the tensioning and deflection locations. Two advantages quickly became evident for the Artl Contractors GmbH: "The compaction expenditure required from internal concrete vibrators was greatly reduced thanks to the additional use of the ARs while simultaneously achieving an increase in the quality of the exposed concrete surfaces" according to chief superintendent engineer, Mr. Jan Höpping. "We are very satisfied with the flexibility in performance of the external vibrators for quality exposed concrete surfaces."