

Gebr. Lotter KG - Kummestat Stahl, 60486 Frankfurt am Main, Germany

## Patented thermal system passes fire test successfully

The patented Lotter-Roth thermal system, which was already introduced in the 02/2012 issue of CPI, enables precast concrete production facilities to be able to manufacture thermally active precast components for climate control in buildings (heating and/or cooling) in both a rapid and uncomplicated way. This Lotter-Roth thermal system has now cleared the last hurdle – proof of compliance with F90 and F120 fire protection stipulations – before market launch.

Nowadays, fire protection requirements are becoming increasingly tighter, in particular with industrial and commercial building structures. All the parts and construction components utilised must, as a general rule, currently exhibit proof of 90 minutes resistance (F90) to fire. More recently, a 120 minute resistance (F120) to fire has been stipulated for a growing number of buildings. This was the motivation for carrying out fire testing to determine the fire resistance class of the Lotter-Roth thermal system according to DIN EN 1365.2 at the internationally renowned "Institute for Building Materials, Concrete Structures and Fire Protection (Institut für Baustoffe, Massivbau und Brandschutz, IBMB)" testing facility at Technical University Braunschweig.

Concreted floor elements with a built-in Lotter-Roth thermal system were placed in a fire testing chamber, loaded with weights of approximately 6 tonnes in addition to the test floor's dead weight and a flame applied from beneath. This fire test is intended to simulate various fire scenarios that might occur in buildings. Temperature sensors had been built into the test floor during its manufacture with a view to ascertaining

and documenting its behaviour under such temperatures and loading during testing.

The temperature in the fire testing chamber rises to several hundred degrees within a few minutes. After flames had been applied for 90 minutes, the test floor had yielded by 12 cm under the heavy load and the temperature in the chamber had risen to 975°C. However, the measuring instruments did not indicate any danger of failure.

The testing was terminated after flames had been applied for more than 120 minutes. The test floor had by then yielded 15 cm under its heavy loading and the temperature in the chamber had risen to 1,034°C. The test floor still held up well and would have withstood a still longer period under flame.

Once the floor had been hoisted from the fire testing chamber, it could be viewed from beneath. No damage could be detected with the exception of minor, superficial spalling. Likewise, the floor's structural safety had in no way been endangered despite the immense loading, as the reinforcement had not even been protected.

In its expert assessment, the Braunschweig Material Testing Institute (Materialprüfanstalt, MPA) will thus in future certify the Lotter-Roth thermal system's suitability for use – without restrictions – in compliance with the increased stipulations concerning fire resistance classes F30, F60, F90 and even F120. This means that construction components with a built-in Lotter-Roth thermal system are able to be employed in buildings with the greater F90 and F120 fire protection requirements [highly fire retarding].

### FURTHER INFORMATION

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State after 120 minutes – the test floor had yielded 15 cm under the heavy loading and the temperature in the fire testing chamber had risen to 1,034°C



Hoisting the floor at the end of testing and visual inspection - with the exception of minor, superficial spalling, no damage could be detected