Heat treatment of UHPFRC

Type I heat treatment of UHPFRC is applied prior to setting to accelerate setting and hydration. The typical temperature range is moderate (50 to 60 °C), below 65 °C to avoid delayed ettringite formation. It is mostly aimed at optimizing the production cycle of prefabricated prestressed UHPFRC members for instance.

Type II heat treatment of UHPFRC is applied just after setting for typically 48 hours, around 90°C, in a moisture saturated environment. It has become a classical method to stabilize delayed response (creep and shrinkage) and accelerate and improve (by formation of new types of hydrates) the development of mechanical properties. More specifically, this type of heat treatment increases the efficiency of the pozzolanic reaction and the reaction of quartz powder, otherwise inert at ambiant temperatures. Among the most spectacular applications of UHPFRC with a thermal treatment of type II, one can cite the extension of the Haneda airport in Japan.

Today the thermal treatment of UHPFRC is no more systematically applied in prefabrication and more and more UHPFRC on the market are produced without any thermal treatment.

➔ *Following references report on various works on those two types of thermal treatments of UHPFRC at early age.*

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