

CURING OF CAST STONE

Purpose of defining Curing Regimes

The purpose is to control the curing of Cast Stone until the initial water-filled spaces are occupied for the optimum time by the products of cement hydration. The process of cement hydration is a series of chemical reactions which require water to complete.

The failure to gain strength as a consequence of inadequate curing by loss of water by evaporation is more likely to occur in thinner and more cement rich products.

Control of initial curing of semi-dry products is more critical than for wet cast, as there is less water available for the hydration process and the surfaces are exposed to air, and hence evaporation, immediately after demoulding, rather than left covered by the sides of a mould.

Requirements of the Curing Regime

The Curing process should be carried out in a controlled environment for a period of at least 8 hours. The controlled area should as a minimum be covered or ideally consist of a dedicated curing chamber. Curing can either be by the natural heat of hydration or by an applied temperature process.

The required process is such that the Cast Stone surfaces are prevented from drying out as a consequent of drying air movement, and protected from low temperatures, for a minimum post casting period of 8 hours, where appropriate, a subsequent period of 3 or 4 days, during which the Cast Stone should be protected from the elements.

Humidity of the air surrounding the product during curing should be maintained as high as possible, with the prevention of moisture loss using covering techniques. Consideration should also be given to the availability of extra water either by the spraying of a fine mist of water onto the product or by the damping down of the surrounding area or other similar methods to ensure water is available for the hydration process.

Air movement should be prevented as far as practicable, except where the curing environment is kept equal to or greater than 95% relative humidity.

Advanced accelerated heat curing systems use a combination of dry heat and / or steam heating. These are used in conjunction with or without circulation and / or exhaust to provide acceleration of the curing process to achieve higher early strengths and enable a reduction in the ultimate curing times. For these systems the temperature should be controlled to prevent the rate of temperature increase being too great or the maximum temperature being greater than 45°C. A method for maintaining high relative humidity within the curing environment is essential.

The movement of the product should be kept to an absolute minimum during the curing process to reduce the possibility of any damage and cracking during the early post casting period.