

## Concrete Usage in Cold Weather

*Careful consideration needs to be given to the vulnerability of newly placed concrete during cold weather periods. Concrete is particularly vulnerable to frost damage during the first three days of early hardening.*

The following advice is meant as a guideline for good practice in placing concrete in cold conditions.

### **Cold-Weather Concreting**

Both concrete temperature at the time of delivery and ambient air temperature need to be assessed when working with concrete in cold conditions.

Temperatures at 0 °C or below, water in the concrete shall freeze, and the ice formed will expand causing irreparable damage. BSI standard sets the minimum temperature of fresh concrete on delivery, to be no less than 5°C. They further state the temperature of the concrete should not fall below 5°C until 5 MPa is achieved.

Where it is not always practicable to analyse the temperature and strength gain of curing concrete, the following should help ensure good practice in cold weather.

Take note of the weather forecasts for the days when concrete is to be placed ([www.met-office.gov.uk](http://www.met-office.gov.uk)). As a guideline, the minimum ground surface temperature should be 2°C and rising.

Concrete should be transported and placed as quickly as possible to avoid heat loss during transportation.

Where formwork is used, and or any surface which shall come into contact with the fresh concrete, needs to be free from ice and frost. It is worth noting, that formwork should not be removed prematurely. Concrete poured in cold conditions generally takes longer to develop strength. In removing formwork too early strength failures in certain circumstances may arise. For further data on strike times, refer to (*BS EN 1992-1-1:2004+A1:2014*). Keeping the concrete warm (above 5°C) in the initial 48 hours will allow for the strength to develop, although this shall be at a slower rate, the overall concrete strength should not be affected.

To protect concrete against cold conditions, it is worth observing the following. Freshly poured surfaces should be covered immediately with a suitable thermal blanket. It is worth noting, that polythene sheets offer little in the way of thermal insulation but can help against wind chill. Timber form works in conjunction with a suitable covering and offers adequate protection. Steel formwork should be insulated.

S. Morris Ltd will always contact you on days when they feel the temperature is outside of the BSI guidelines. In these instances, you shall be advised of the issues. It will be for you, the purchaser, to determine if you can adequately protect the concrete should you wish to proceed. Alternatively, wait for more suitable weather conditions.

