



Concrete in Hot or Cold Weather

Concrete is probably the most common material that we use on our construction projects, with the UK using approximately 90 million tonnes of concrete annually. This means that there are times when we may need to consider pouring concrete at both ends of the temperature scale – it's worth noting that UK temperatures often now range from -5 to 35 degrees. Concrete is highly sensitive to temperature at the time of placing and during early curing. Both hot and cold weather conditions can significantly affect how concrete behaves, and if not properly managed, can lead to long-term durability issues, reduced strength, and costly rework. This alert sets out the key risks and the practical steps required on site to manage them effectively.

Concreting Risks in Hot Weather

In hot weather, typically when temperatures exceed 25–30°C, the primary challenge is that concrete loses moisture too quickly. This rapid evaporation can cause plastic shrinkage cracking, often visible within hours of finishing. At the same time, the concrete may set faster than expected, making it harder to place and compact properly, which can lead to voids or honeycombing. Accelerated hydration can also reduce long-term strength and increase the risk of thermal cracking as the concrete cools.



- Schedule pours during cooler parts of the day, such as early morning, evening, or overnight.
- Monitor unauthorised addition of water to the mixes by delivery drivers or supply chain.
- Control the temperature of the concrete itself - typically not exceeding 30°C unless otherwise specified, and suppliers should be engaged early to consider the use of chilled water, ice, or appropriate admixtures to slow down the setting process.
- On site, formwork and subgrades should be dampened (without leaving standing water)
- Concrete should be placed and compacted without delay to avoid cold joints.
- Immediate and effective curing is essential in hot weather; this may include water curing, curing compounds, or protective

Concreting Risks in Cold Weather

In cold weather, generally below 5°C or when temperatures are falling, the risks are different but equally significant. Low temperatures slow down the hydration process, meaning strength gain is delayed and finishing becomes more difficult. The most serious risk is freezing of the concrete before it has gained sufficient strength, which can cause permanent damage and a substantial loss of structural performance. There is also an increased likelihood of surface defects such as scaling if curing is inadequate.



- Ensure that the ground, formwork, and reinforcement are free from ice and frost. Concrete should not be placed on frozen substrates under any circumstances. Particularly consider the temperature of metal decks on steel frames.
- Note that the risk is greater with early morning pours or when the temperature drops overnight.
- The temperature of the concrete at placement should typically be maintained at or above 5°C, and this may require the use of warm mixing water or approved accelerating admixtures.
- Once placed, the concrete must be protected immediately. Consider using thermal blankets, insulated formwork, or temporary enclosures, and in some cases providing controlled heating. The aim is to keep the concrete above the minimum temperature threshold until it has developed sufficient early strength.
- Water curing methods should be avoided where there is a risk of freezing; instead, insulated curing methods should be used.

Summary

Poor planning in extreme temperatures leads directly to defects—controls must be in place before every pour. Pre-pour checks should confirm that environmental conditions are within agreed limits and that appropriate controls are in place. Concrete temperature and ambient conditions should be recorded at the point of discharge, and any signs of abnormal behaviour—such as rapid stiffening, excessive slump loss, or early cracking—should trigger a stop and review of the works.

- All pours must demonstrate recorded compliance with temperature limits, curing arrangements, and supervision checks, with evidence retained in site quality records. Stop work if:
 - Concrete temperature exceeds specified limits (>30°C unless approved)
 - Substrate is frozen or frost affected.
 - No curing method is ready prior to pour.
 - Excessive slump loss or rapid stiffening observed.

☐	Brickwork / Blockwork	☐	Design	☐	DFMA (Offsite Manufacture)	☐	Doors & Windows	☐	Drainage	☐	Electrical	☐	FFE (Furnishings, Fixing & Equipment)
☐	Fire & Lightening	☐	Floor Coverings	☒	Frames & Superstructure	☐	Internal Walls, Partitions & Ceilings	☐	Joinery & General Carpentry	☐	Miscellaneous	☐	Painting
☐	Public Health (Water)	☐	Roads, Paths, Paving & Surfacing	☐	Roof	☐	Services & Systems	☐	Site Preparation Works	☒	Substructure	☐	Walling (Tiling & Finished)