Dufferin Concrete Technical Bulletin

Hot Weather Concreting Considerations for Standard Concrete Applications

What is considered Hot Weather?

As per CSA A23.1-7.1.1 hot weather concreting occurs when the ambient air temperature is at or above 27 °C, or when there is a probability of the temperature rising above to 27 °C during the placing period (as forecast by the nearest official meteorological office); additionally, low relative humidity conditions, high wind speeds, solar radiation or heat gain are other climatic factors that will trigger hot weather curing conditions.

Why consider Hot Weather?

These conditions can result in the following challenges for the concrete contractor:

- Increased concrete water demand
- Accelerated concrete slump loss
- Increased rate of setting leading to placing and finishing difficulties
- Increased tendency for plastic shrinkage cracking
- Increased concrete temperature resulting in lower ultimate strength
- Increased potential for thermal cracking

What are the maximum allowable temperatures?

MTO and projects following the Ontario Provincial Standards: As per OPSS 1350.05.05-D, the concrete temperature at the time of discharge from the truck shall be at or between 10 and 28 °C, with the exception of HPC and silica fume overlays, which shall be at or between 10 and 25 °C; additionally, when the air temperature exceeds 28 °C and the concrete temperature exceeds 25 °C, the concrete shall be discharged within 1 hour after the introduction of the mixing water.

CSA based projects and specifications: CSA A23.1-8.5.5 states that the maximum concrete temperature at delivery shall be specified when the owner requires a delivery temperature lower than the values given in Table 14.

Dufferin
Concrete
A CRH COMPANY

Table 14
Permissible concrete temperatures at placing
(See Clauses 5.2.5.4.1, 7.1.2.1, 7.4.1.3, and 8.5.5.)

	Temperatures, °C	
Thickness of section, m	Minimum	Maximum
< 0.3	10	32
0.3–1	10	30
1–2	5	25
> 2	5	20

Notes:
(1) *In no case shall the placing temperature for high-performance concrete exceed* 25 °C.
(2) *The placing temperature should be kept as close as possible to the suggested minimum temperatures shown in this Table. Higher temperatures result in an increase of mixing water, increased slump loss, and an increase in thermal shrinkage.*

How to plan to minimize the effects of Hot Weather?

Depending on the application and typre of finish some of the recommended protective measures include:

- **Ordering Superplasticizers and a slump which allows for rapid placement** and consolidation should be considered.

- Discuss with out Technical Services team the use of retarding admixtures or supplementary cementing materials, as this could affect the finishing of flatwork applications.

- Be ready to receive and place concrete, consider scheduling pours to start early in the morning or later in the afternoon and have sufficient manpower to manage the placement, finishing and curing process.

During the Hot Weather season when peak ambient temperatures exceed 25 °C around the placing period, **ice cooling might be required deliver concrete below the specified maximum concrete temperatures of your project**, this process requires additional setup costs and considerations. Please contact your Dufferin Concrete Sales Representative for more information.