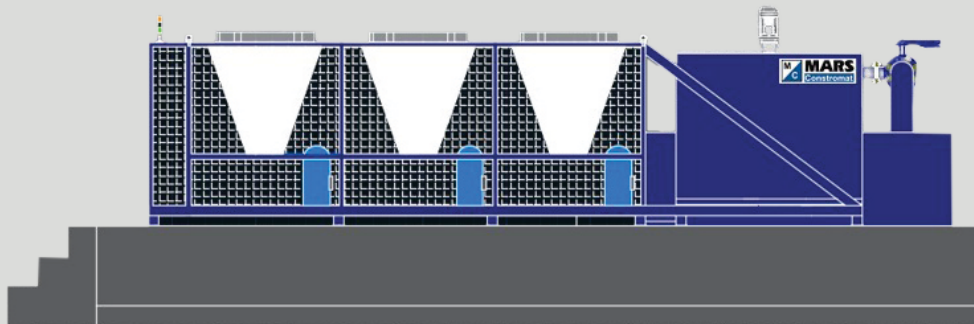


CHILLING PLANT



BATCHING PLANT CHILLERS | FLAKE ICE PLANTS | TEMPERATURE CONTROLLED CONCRETE

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The costs towards repair and rehabilitation of concrete structure have been found to be in such high magnitude that needs to construct durable structures have become imperative.

Concrete / Cementitious products have a similarity to human beings in the sense that how a new born baby is being taken care so much by means of timely vaccinations and other protection measures during the first few years after birth, the same applies to taking care of the structures built if concrete cement / mortar during the initial hours .days after they are cast in the structure.



In our experience in ready mix concrete industry in India over past 25 years, we have been seeing plastic shrinkage cracks in concrete being reported from lots of projects especially during the last decade or so. Hence, the need to understand **HOT WEATHER CONCRETING** especially with respect to tropical and dry regions of our country.

Hot weather may be defined as any period of high temperature in which special precautions need to be taken to ensure proper handling, placing, finishing and curing of concrete. Hot weather problems are mostly encountered in the summer but the associated climatic factors of high winds, relative humidity and solar radiation can occur at any time, especially in arid or tropical climates. Hot weather conditions can produce a rapid rate of evaporation of moisture from the surface of the concrete and accelerate setting time etc. Generally, high humidity tends to reduce the effects of hot weather in concreting.

But then, what is Hot Weather Concreting? The definition may vary from country to country. As per Bureau of Indian Standards IS:7861 (Part I), “Any operation of concreting done at atmospheric temperature above 40 degree Celsius or any operation of concreting (other than steam curing) where the temperature of concrete at time of its placement is expected to be beyond 40 degree Celsius is termed as **“HOT WEATHER CONCRETING”** We need to understand, foremost, the effect of hot weather on concrete, in the absence of special precautions, than concreting done at normal temperatures.

The principal general effects of hot weather concreting are as follows

Accelerated Setting: Cement Hydration results in setting and hardening of concrete. High temperature increases the hydration of cement resulting in faster setting which means the time available for workability (concrete in plastic state) of concrete is reduced.



Hydration of cement also releases heat. Hence, faster the cement hydration faster the heat generation and this increases concrete temperature, further speeding up the cement hydration or setting. While initial strength may not suffer, the long term strength (> 28 days strength) is affected. That is the reason why hot weather concreting needs special care especially on finishing and curing of concrete.

Reduction in Strength: High temperature necessitates addition of water at project site to enhance the workability of concrete and thereby reduction in concrete strength. It may also results in formation of cold joints in the structure cast.

Increased tendency to cracks: High temperatures, High wind velocity and low relative humidity can affect fresh concrete in two important ways. First, the high rate of evaporation may induce early plastic shrinkage cracks or cracks may be developed in the hardened concrete either by increased drying shrinkage resulting from greater mixing water used or by cooling of the concrete from its elevated initial temperature and secondly, the evaporation rate can remove surface water necessary for hydration and unless necessary curing practices done, it may affect the cement hydration process in the initial stages resulting in lower concrete strengths.

Thermal cracking also may result from rapid drops in the temperature of the concrete, from hot weather during concreting and the night, cooler temperature.

How to concrete in HOT WEATHER?

The key to successful hot weather concreting is

Recognition and understanding the factors that affect the concrete

Planning and necessary precautions to minimize their effects



We will now see some useful measures that need to be taken during hot weather concreting without compromising important parameters such as workability, strength, crack-free surface etc for better performance in the long run (i.e. high durable concrete structures).

The first immediate solution for concreting in arid and hot weather / low humid regions is to pour concrete during early morning or late evening. This may mitigate the bad effects to a large extent.

In case, if the concreting pour has to be done during the day, other precautionary measures as below could be undertaken for better results.

Hence, chilled water (or) flake ice is preferred during concreting at high temperatures. If at all ice is added to the mixing plant directly, it is added in the crushed state only (flaky) and complete melting is to be ensured before mixing of concrete ingredients is complete.

SPECIFICATION		54TR	75TR	100TR	125TR	150TR
CHILLED WATER OUTPUT	LPH	6,000	9,000	12,000	15,000	18,000
INLET WATER TEMPERATURE	°C	30°C (Maximum)				
CHILLED WATER OUTPUT TEMPERATURE	°C	2 °C – 5 °C (Minimum)				
REFRIGERANT		R407C				
CONDENSER TYPE		AIR COOLED FIN CONDENSER				
EVAPORATOR TYPE		BARE TUBE COIL EVAPORATOR				
COMPRESSOR		HERMETIC SEMI-HERMETIC				
OPERATING VOLTAGE	V	3 PHASE, 380 – 415 VOLTS, 50 HZ				
MAX CURRENT	A	135	165	220	280	350
MAX POWER	KW	80	95	127	160	192

* Chilling Plant > 150TR shall be supplied on order specific / project specific requirements

* Design parameters considering inlet water temperature not exceeding 30°C & ambient temperature 40°C

* The Data given in the brochure is subject to change without notice