Concrete Setting Times

Initial set, as defined by ACI 116R, is a degree of stiffening of a mixture of cement less than final set, generally stated as an empirical value indicating the time in hours and minutes required for the cement paste to stiffen sufficiently to resist to an established degree, the penetration of a weighted test needle. The concrete setting time at various temperatures is given in **Table 1** below:

Temperature	Approximate Setting Time (hours)
100°F (38°C)	1-2/3
90°F (32°C)	2-2/3
80°F (27°C)	4
70°F (21°C)	6
60°F (16°C)	8
50°F (10°C)	11
40°F (4°C)	14
30°F (-1°C)	19
20°F (-7°C)	Set will not occur

Table 1
Setting Time of Concrete at Various Temperatures

Temperature Effect on Setting Time of Concrete

Temperature can have a detrimental effect to concrete strength development. However, proper cold weather concrete curing will enhance concrete strength development. Hot weather is defined as any combination is high ambient temperature, high concrete temperature, low relative humidity, and wind velocity. Cold weather period, as defined by ACI Committee 306, is when one of the following conditions occurs for three consecutive days:

- Average daily air temperature is less than 40^{o}F
- The air temperature is not greater than 50^{o}F for more than one-half of any 24 hour period.