

Dufferin Concrete Technical Bulletin

Rapid Surface Evaporation of Fresh Concrete

What is rapid surface evaporation?

Environmental conditions can accelerate the surface evaporation moisture loss beyond the replenishing capacity of the fresh concrete bleeding rate, leading to a wide range of finishability and surface deficiencies that will have an impact on the durability and aesthetics of the concrete.

What causes rapid surface evaporation?

Typically, the **wind, low relative humidity, direct sun exposure, high ambient & concrete temperatures** are the main factors that increase the surface evaporation rate while the presence of entrained air and cool subgrade temperatures are often involved reducing bleeding rate.

Surface evaporation is **prevalent during the spring** & fall months when the humidity is low and the winds are high in combination with low ambient and subgrade temperatures.

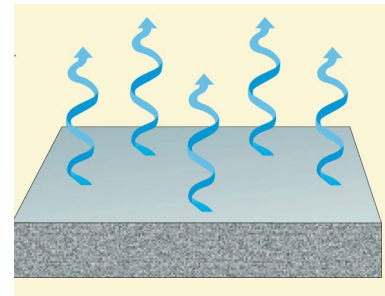
What are the symptoms of rapid surface evaporation?

Light to moderate rapid evaporation might induce “**tearing**” and “**sponginess**” on the fresh concrete surface and could make the surface appear ready to be troweled while the underlying concrete is still bleeding or still plastic. If the evaporation rate is too rapid, **plastic shrinkage cracks** may develop.

How to Minimize the Effects of Rapid Surface Evaporation?

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

- Plan to have indoor slabs poured after all walls and roofs are built
- Fogging, sunshades and windbreaks
- Liquid-applied **evaporation reducers/retardants**
- Wet burlap, cotton mats and synthetic covers
- Wet sand, straw and hay



Additionally, **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 and finishing process.

Bibliography & references:

PCA- Concrete Slab Surface Defects: Causes, Prevention, Repair NRMCA—CIP5—Plastic Shrinkage cracking

Concrete Ontario -Concrete Construction Troubleshooting Tips CSA A23.1-14