

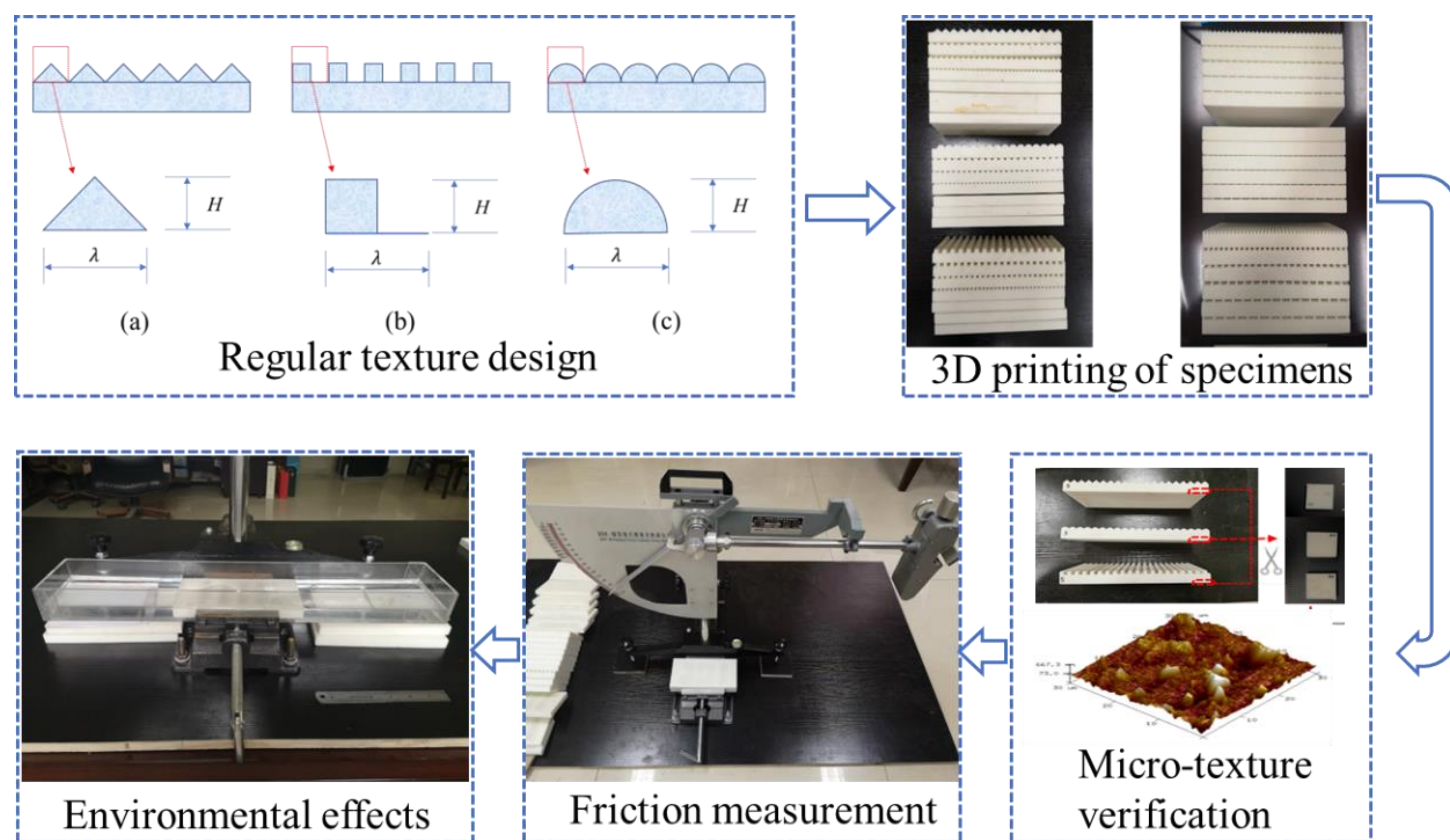
Introduction

- Tire-pavement friction, a key performance associated with driving safety, is tightly related to the pavement texture.
- Conventional gradation-based pavement design makes the constructed pavement surface too complex to quantify the contribution of texture on the tire-pavement friction accurately.
- 3D printing technology can be introduced to perform friction experiments on a pavement with the predefined texture of interest.

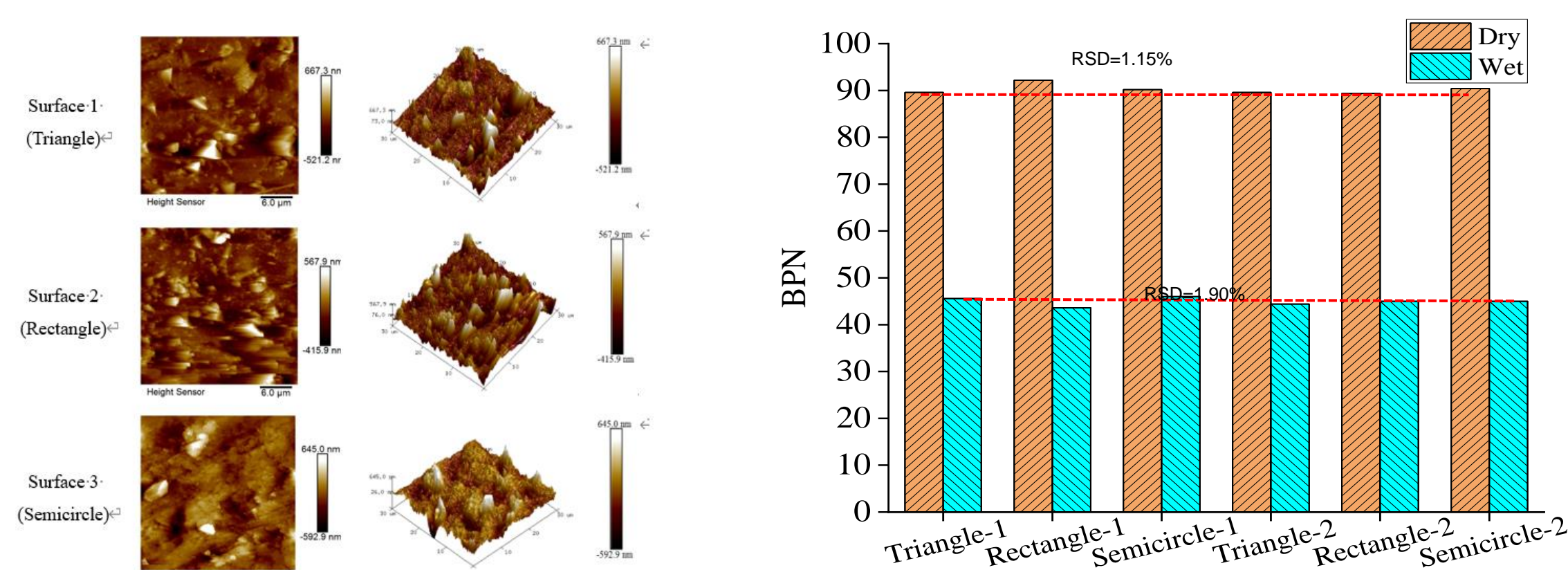
Objectives

The objective of this study is to investigate the influence of regular macro-texture characteristics and environmental factors on friction using 3D printing technology.

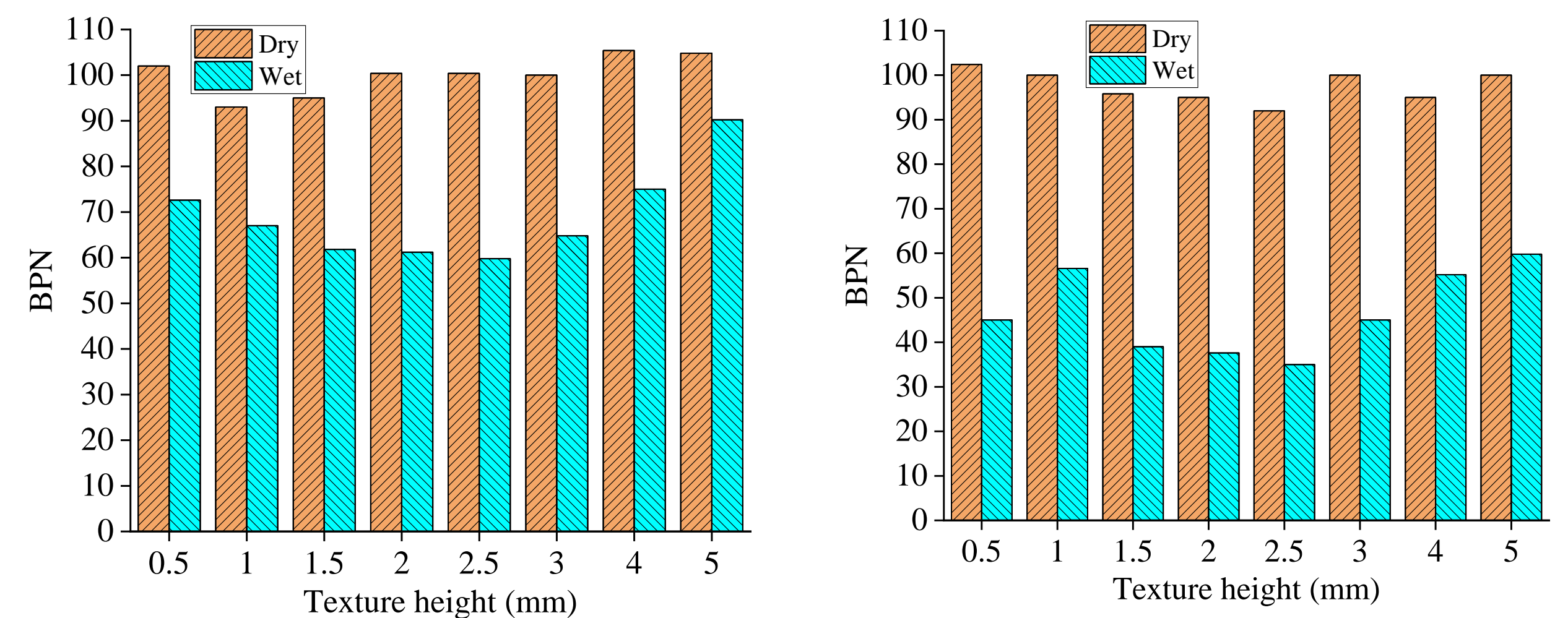
Methodology



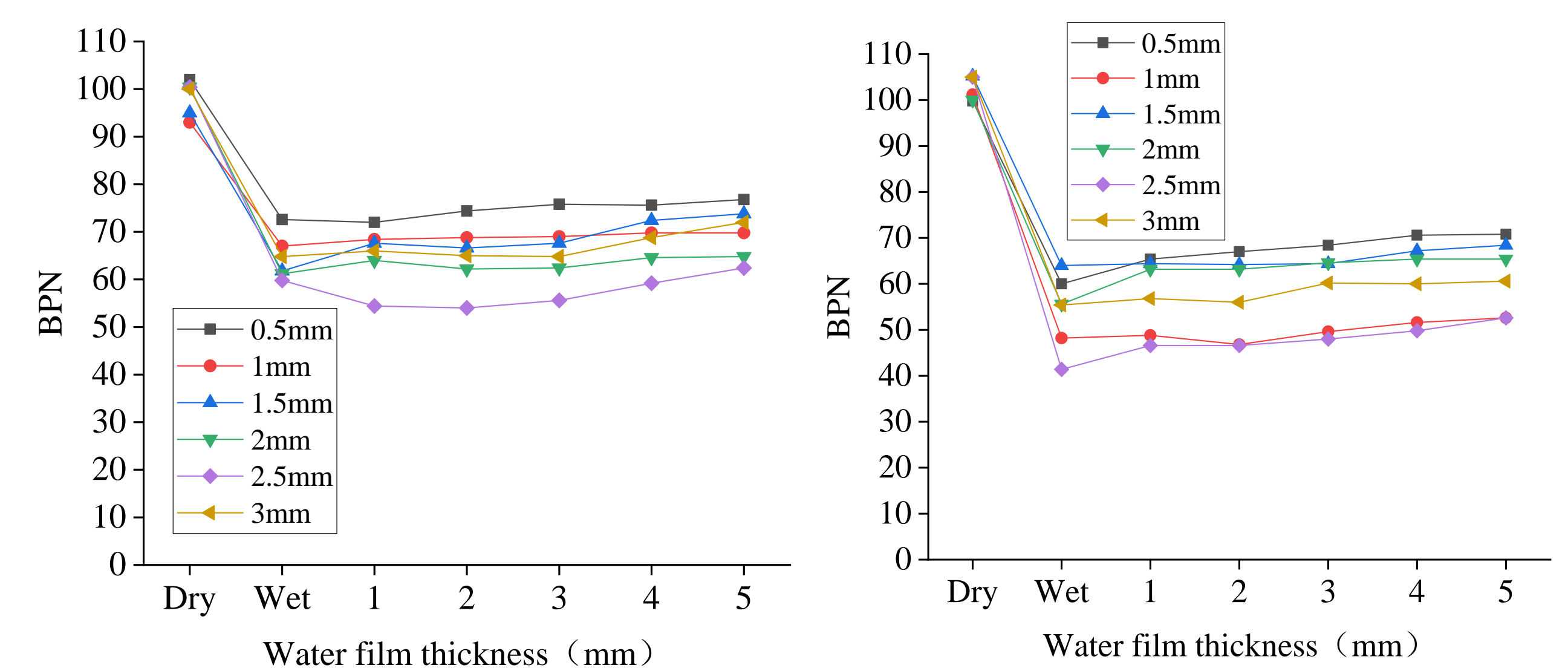
Results



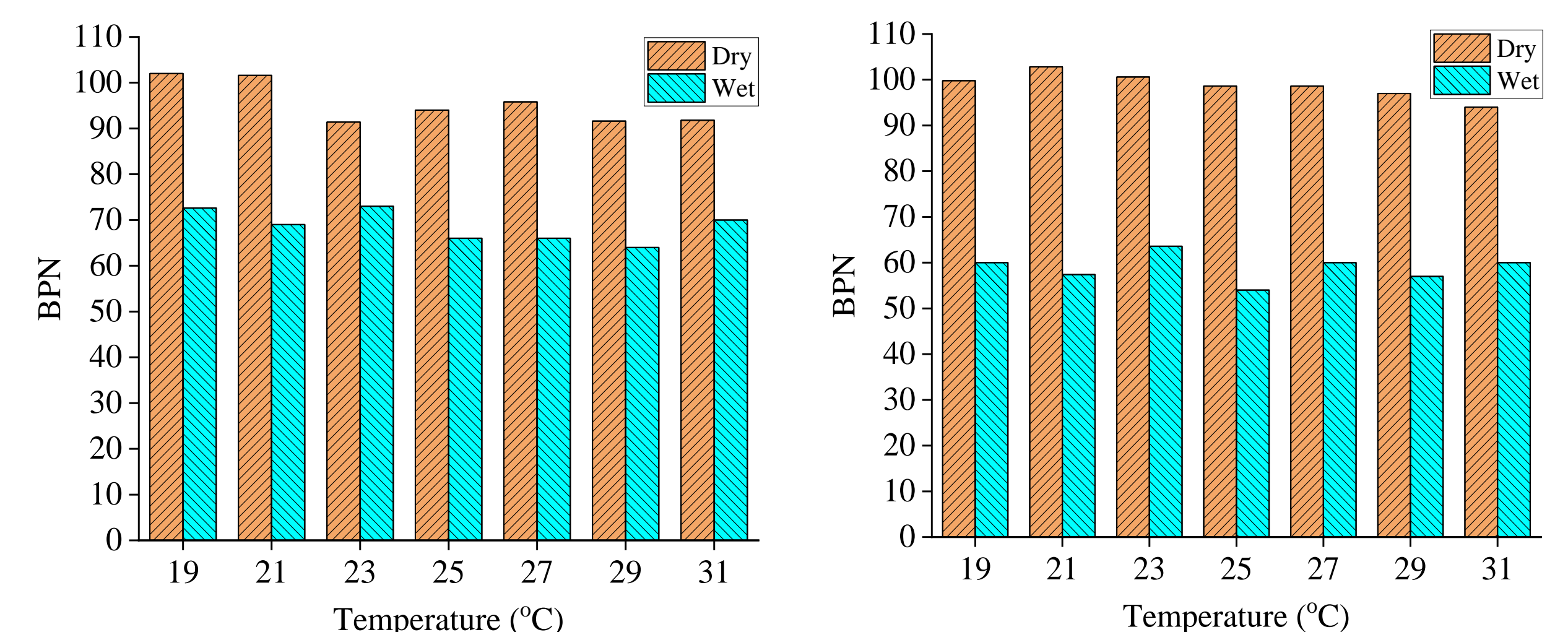
Micro-texture measurement and friction verification



Effect of regular macro-texture on friction



Effect of water film thickness on friction



Effect of temperature on friction

Conclusions

- Specimens with different macrotexture shapes, heights, and gaps can contribute large dry friction.
- Friction sharply decreases under wet conditions, especially for the semicircle texture.
- Friction is slightly linearly increased with the water film thickness.
- Friction is slightly decreases with pavement temperature.