



U.S. Department of Transportation
Federal Highway Administration

PRODUCT BRIEF

LTPPBind: A New Tool for Selecting Cost-Effective Superpave Asphalt Binder Performance Grades

Introduction

A limited amount of pavement temperature data was available when the Strategic Highway Research Program (SHRP) developed its Superpave system. As such, specifications for SHRP's Superpave Performance Grade (PG) asphalt binders were based on the lowest and highest temperatures expected at a site.

Recently, the Long Term Pavement Performance (LTPP) program used data from its Seasonal Monitoring Program to quantify the relationship between air and pavement temperatures. This evaluation resulted in the development of improved low and high pavement temperature models for selecting Superpave PG asphalt binders. Now these improved models are available in a new software program called LTPPBind.

What is LTPPBind?

LTPPBind is a new software tool developed by LTPP to help highway agencies select the most suitable and cost-effective Superpave PG for a particular site. Based on the original binder selection software—SHRPBind—LTPPBind features a database of high and low air temperatures (minimum, mean, maximum, standard deviation, and number of years) for 7,835 U.S. and Canadian weather stations, along with several modifications to the

initial SHRP methodology that provide users with the ability to:

- ▶ Select PGs based on actual temperature conditions at their site and the level of risk designated by their highway agency.
- ▶ Use either the original SHRP models or LTPP's revised temperature models for determining a site's binder PG.
- ▶ Adjust the PG selection for different levels of traffic loading and speed.

Who Can Benefit From LTPPBind?

All State and Provincial highway agencies implementing Superpave will benefit from LTPPBind. This new software tool provides pavement engineers with the ability to select binder grades that are less restrictive, more cost-effective, and meet Superpave PG concepts.

LTPPBind Tools/Features

In addition to the database of high and low air temperatures, LTPPBind provides users with a set of reports to examine and work with this data. After starting the program, users can select either a specific site or a group of weather stations. A specific site is selected by placing the cursor and clicking on the site on the main menu's

map of North America. A cross-hair marker is then shown at the selected location and the closest weather station to that location is displayed on the bottom of the screen. Once a weather station is marked, the user can access the:

- ▶ PG Binder Selection report, which provides all the parameters needed to select a PG for a given site. LTPPBind calculates PGs for any set of input temperature data and adjusts the resulting PG for traffic loading and speed.
- ▶ Three Closest Weather Stations report, which contains a summary of temperature data and PG binder calculations for the three closest weather stations to the selected site.

When a group of weather stations are selected, the user can access the:

- ▶ Detailed report for the selected weather station, which includes location and identification data, temperature data, and the calculated PGs for the selected weather station. In addition, this report provides PG Chart and PG Distribution options. The PG Chart option shows all possible PGs for different reliability levels and layer depths. The PG Distribution option shows the distribution

- of high- and low-temperature PGs for the selected weather station.
- ▶ Tabular report for the selected weather station, which consists of a single summary table that includes all of the parameters in the LTPPBind database with a summary of the associated PG binder calculations.

Other key features of the LTPPBind program include the

ability to save displayed maps, set user-defined map colors, zoom the map, show different map layers, and display color-coded maps of weather stations by different attributes.

LTPPBind System Requirements

To install and run LTPPBind, the following minimum hardware and software requirements are necessary:

- ▶ IBM-compatible PC with a 486 or faster microprocessor.
- ▶ Microsoft Windows™ 95 or Windows NT 3.51 or higher.
- ▶ At least 10 megabytes of free hard-disk space.
- ▶ Display resolution of 800 by 600 dpi.

Contact Information

LTPPBind can be previewed and downloaded from FHWA's LTPP website: <http://www.tfhr.gov>.

Research, Development & Technology

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