

TERRA PRIME



TERRA PRIMETM Non-Petroleum-Based Prime Coat

ROADWAYS – PARKING LOTS – AIRFIELDS

Environment-Friendly and Cost-Effective Prime Coat

TERRA PRIMETM is an environmentally friendly alternative to asphalt prime coats. **Invented at the University of Texas at Austin (UT Austin), Terra PrimeTM offers the most cost-effective and risk-free way to improve highways without sacrificing road durability, quality, or stability.** Terra PrimeTM is an easy-to-use polymer-based emulsion, and it requires no special equipment or handling procedures. **In a series of tests, Terra PrimeTM outperforms the most widely used alternatives, such as MC-30 and AEP** — both of which emit volatile organic compounds (VOCs) and are at least partially prohibited for use in Ozone Nonattainment Areas, like crowded cities and metropolitan areas.



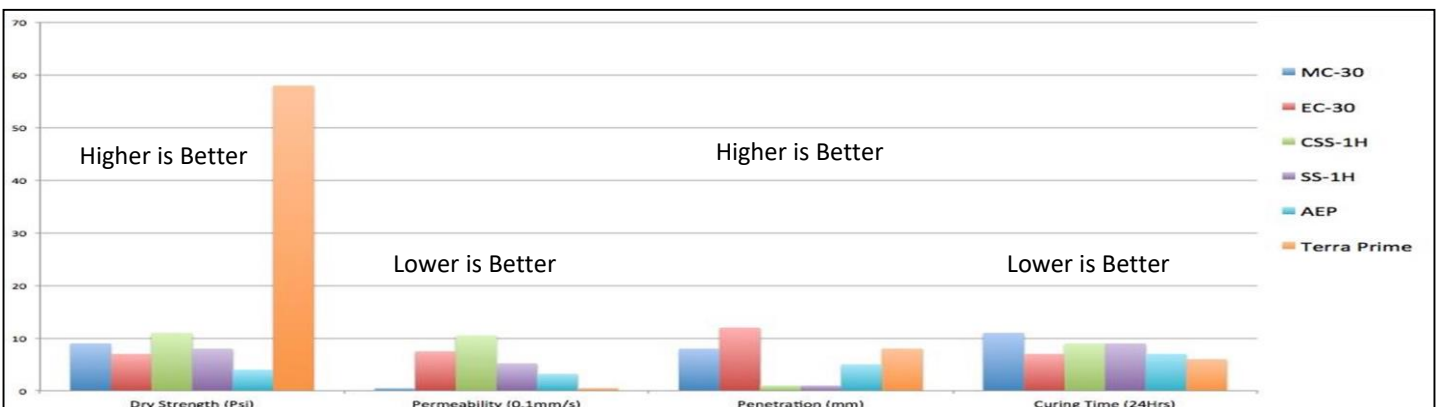
Terra PrimeTM application in Florence, Texas

TERRA PRIMETM IS TEST-PROVEN. In extensive trials coordinated by UT Austin and the Texas Department of Transportation (TxDot), Terra PrimeTM prominently outperformed all known competitor products as a replacement for MC-30, an asphalt primer used worldwide. MC-30 is classified as a cutback asphalt substance and is heavily laden with kerosene, which is environmentally toxic. The Environmental Protection Agency (EPA) classifies cutback asphalt as a volatile organic compound (VOC), placing in a category of substances regulated by environmental agencies worldwide.

The leaching of kerosene into the ground and its evaporation atmosphere have polluted the environment for years. **In addition to environmental concerns, MC-30 poses serious health risks to workers who are exposed directly to its vapors and potential flammability.** Inhalation of asphalt fumes can cause dizziness, headaches, intoxication, and vomiting. These fumes also contain known carcinogens.

Extensive research has revealed that several other products, mostly asphalt emulsion-based, are suitable replacements for MC-30. However, none have proven to be as effective as MC-30—until the arrival of Terra PrimeTM.

TERRA PRIMETM IS THE BEST REPLACEMENT FOR MC-30. As shown by the following table, Terra PrimeTM outperforms competitor products as a replacement for MC-30, and Terra PrimeTM is much stronger than MC-30 and other alternatives.

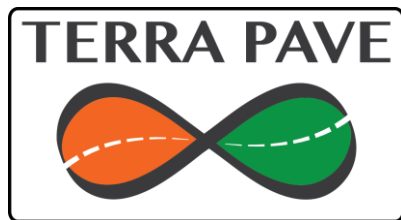


TERRA PRIMETM VS. COMPETITORS/MC-30

The Future of Better Roads

TERRA PRIME™ IS A SAFE, COST-EFFECTIVE REPLACEMENT FOR MC-30. Texas University research shows that TERRA PRIME™ has the best strength and curing time of all other prime coats materials.

Terra Prime™ also outperforms competitor products in permeability reduction, providing a permeability coefficient similar to that of MC-30. Additionally, Terra Prime™ achieves the same level of penetration as M-30 while being much more cost-effective than MC-30, as MC-30 is kerosene-based and priced according to crude oil fluctuations.



As a non-petroleum-based prime coat TP™ provides an environmentally-friendly solution to the growing need everywhere for cost-effective roads.

TERRA PRIME™ IS THE FUTURE OF BUILDING BETTER ROADS. In today's world, the need to improve transportation infrastructure is felt around the globe. With the current climate of shrinking economies and growing environmental concerns, the pursuit of cost-effective methods for building and improving roads is a high priority for private owners, contractors, municipalities, counties, states, and nations. **Terra Prime™ is the right product for the environment with unmatched performance.**



AEP Prime coat in Florence, Texas: Less than 1 inch penetration



Terra Prime™ in Florence, Texas – More than 4 inches penetration

ORDERING AND RECEIVING TERRA PRIME™. Terra Prime™ is manufactured in Central Texas, USA. For most applications, the product is calculated at a rate ranging from 0.04 to 0.1 gal/sq. yd. Terra Prime™ can be ordered in any quantity and can be shipped worldwide. Please contact Terra Pave International for more information.

For More Information on Products and Business Opportunities, Contact:

EMAIL: info@terrapavetech.com

WEB: www.terrapavetech.com

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TERRA PRIME IS SAFE & EASY TO USE. It is non-petroleum-based and requires no special equipment or handling procedures. Dilute one part product with five parts water in a holding tank, and then evenly distribute it over the asphalt in two passes. **The process is fast and simple compared to asphalt emulsions that require heating and adherence to strict, time-consuming application procedures.** To ensure that Terra Prime™ is distributed into the road base efficiently, using a distributor or pressurized spraying system for the application is highly recommended.

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**LOW COST
PAVEMENT
PRESERVATION**

**DOWEL BAR
RETROFITS**

Investigation of Curing Time and Strength Development of Prime Coat Materials

By Juan Du

The University of Texas-Austin initiated a series of research studies to investigate prime coat properties. The first study aims at capturing the effect of weather conditions, application method and type of prime coat on curing time, and also to look into prime coat's other properties such as penetration, permeability and strength.

The second research study focuses on how long it takes for prime coat materials to achieve maximum strength, investigating the relationship between weight loss and strength growth. There is a relationship between weight loss and strength gain, and an experiment was conducted at a TxDOT laboratory to discover the actual relationship. This article summarizes the results of the second experimental study.

To make the results comparable to the first study, the researcher kept the prime coat materials, base material, application method and application rate, etc. the same as the first experiment. Prime coat materials used were MC-30, CSS-1h, SS-1h, AEP, EC-30 and TSB. The base material chosen was limestone, which is most commonly used in Texas. Two application methods, spray on and mixed-in, were used to prepare the specimens.

The test was conducted during the summer of 2011, when average temperature ranged from 73.6 to 101.5 deg F, and average relative humidity was 55.5 percent. The sample was not left outside to cure during rainfall.

The strength and weight of samples was tested every 24 hours. Unconfined compressive strength of primed base samples was tested using a

pocket penetrometer. The measurement is done by inserting the shaft to a 1/4-in. depth with a smooth constant force into the soil sample. Once the penetrometer is 1/4-in. deep, a reading is taken from the top of the indicator ring. One interval on the

scale represents 1 kg per sq. cm. (14.2 psi). For each type of prime coat and each application method, three samples were prepared to reduce the random effect that may influence the accuracy of the results.

The curing of prime coat is assumed to end when the reduction in weight drops below 0.1 gram, or when the strength reaches its maximum value, whatever occurs later.

This testing brings the following conclusions:

- TSB has the highest strength among all the prime coat materials
- TSB cures the fastest among all the prime coat materials
- AEP has the lowest strength among all the prime coat materials
- MC-30 cures the slowest, up to 240 hours
- Application methods (spray-on or mix in) have no significant impact on curing time, and
- Application methods have significant impact on unconfined compressive strength; mixed-in type applications have higher strength than sprayed-on type applications.

The curing time and unconfined compressive strength for all prime coat materials are summarized in Fig. 1. For more information on this study please visit www.utexas.edu/research/tppc/news/newsletter_issue_23.pdf.

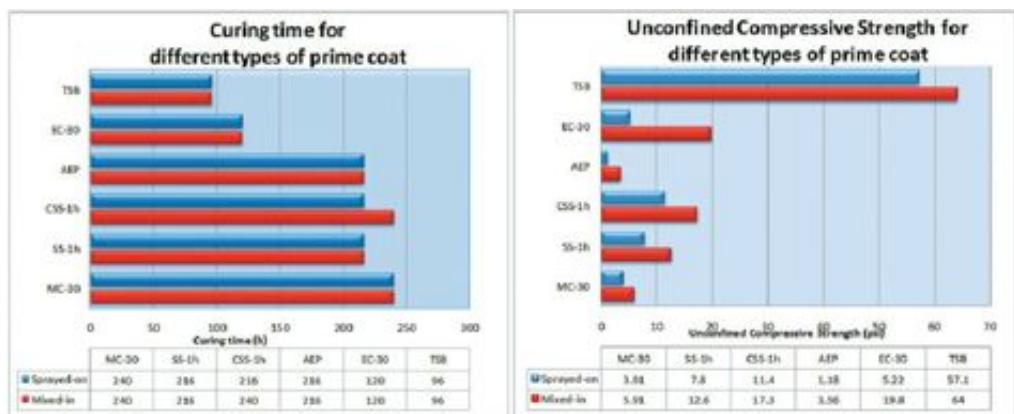


Fig. 1: Curing time and strength comparison between prime coats

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