



Tech Corner

Diamond-Grinding Experiment Begins

Representatives of ACPA and IGGA member companies, Diamond Surface, Inc. and Diamond B, Inc., recently delivered their custom-built grinding head, a key component of the tire-pavement test apparatus (TPTA) to Purdue University.

This unit, pioneered by Terry Kraemer of Diamond Surfaces, is the first grinding attachment used by the TPTA that simulates real world grinding conditions.

Previously, the ACPA, IGGA, and Purdue worked together to develop a comprehensive test plan to test grinding and tining configurations using Purdue's Tire Pavement Test Apparatus. (See Figure 1.)

The key to this plan was the development of a grinding unit that could be attached to and controlled by the TPTA facility.

The initial test series will evaluate the effect of spacer width, blade width, and groove depth on the noise generation characteristics of the resulting texture. Traditionally, grinding experiments have been conducted in the field and this makes it difficult and expensive to change blades or spacers, and the efforts are always subject to the prevailing environmental conditions and traffic control requirements.

Using the Purdue TPTA it becomes more cost effective and efficient to vary the factors controllable by a grinding contractor and to eliminate the traffic and environmental issues.

The new grinding unit, constructed by Steve Garrison, Web Burnett, and Alex Ugalde of Diamond B, is shown in Figure 2. The unit can grind two 8 inch wheelpaths at the same time.



Figure 1 - Tire Pavement test apparatus at Purdue University.





Figure 2 – Grinding unit attached to TPTA with one wheel-track of blades attached. 8-in. grind.



Figure 3 – Close-up of texture resulting from a single 8 inch wheel path grind.



Figure 4 – The grinding unit with dust collection system in place

This allows twelve test sections to be constructed on the TPTA for one series of tests. By limiting a wheel path to only 8 inches, it becomes less expensive to change out blades and spacers.

The blades and spacers can be changed very quickly with this apparatus, allowing more combinations to be evaluated. Figure 3 indicates a close up view of the resulting texture created by a single 8 inch wheel path grind.

The lower portion of the texture (about 1-½ inches) was the very first test grind on the unit so the texture is different for that reason.

Figure 4 depicts the unit in place with the dust collection system attached.

Casting of concrete pavement samples has already begun and the first series of testing is expected to occur late August or early September.

More questions about surface characteristics research initiatives? Contact [Larry Scofield](#), P.E., at 480-775-0908.

Tech Corner is seen in ACPA's "On the Grade" and "Concrete Pavement Progress" newsletters.



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