



## 9 Reasons Why Porous (Polyurethane or Water-Based) Surfaces Are Inferior to Sealed or Non-Porous (Polyurethane) Running Track Surface Systems

First let us begin by defining porous versus non-porous running track surfaces.

**Porous Running Track Surface** – A surface comprised of rubber granules and (polyurethane, water based latex or poly-resin) binder or glue that is open graded and allows water, air, contaminants, etc. to flow within and through its profile. It is also referred to as vented system and can “breathe”. These are **entry level** running track surface systems and are at the lower cost range for surfaces. Their expected longevity is at the low end of the potential life cycle range.

**Non-Porous Running Track Surface** - A surface comprised of rubber granules and polyurethane binder or glue, that is sealed, encapsulated and does not allow penetration of moisture, air or contaminants to move through its profile. It is non-vented and cannot “breathe”. This type surface also creates an “umbrella” effect for the pavement surface below, and precludes the possibility of moisture, air and contaminants to weather or erode the pavement surface. These are advanced running track surface systems and are at the mid to high range of cost for surfaces. Their expected longevity is at the mid to high range of the potential life cycle range.

1. By far the most overlooked reason and of immeasurable importance is, that porous systems do not protect the asphalt sub-surface. Any designer worth his weight knows that **moisture is any pavement's (concrete or asphalt) worst enemy!** If you can protect the pavement from below with proper drainage design, protect it from above with some type of encapsulation or sealing, and reach optimal densities, your pavement will reach maximum longevity.

Regardless of how responsibly you have installed your drainage, constructed your pavement (true to slope, smoothness and density) your pavement will have some level of porosity on the surface. Porous systems will allow moisture to move through and lay on the pavement surface and the pavement surface will slowly begin to break down and deteriorate, especially during freeze/thaw cycles, thus compromising the surface that the track surface needs to adhere to. Obviously this will eventually compromise or destroy the bond that was originally created. Why install a running track surface you hope will last 20+ years (with proper maintenance) if you are creating a condition where the asphalt pavement will not perform for the same period of time?

2. Porous systems will eventually fill with fine dirt (silt), debris, etc. This will harden the surface and **eventually contribute to abrasion and degradation.**

3. Temperatures will cause noticeable differences in the feel of the surface. The colder the temperature the harder the surface will become, and the warmer the temperature the softer the surface will become **thus creating different feels for users and competitors.** Porous systems tend to fluctuate in feel more than their counter parts. Some of the non-porous full-pour polyurethane systems do not change their performance characteristics or feel within a 120 degree variation.

4. In the case of water-based systems, 100% encapsulation of the rubber granules with binder or glue **is impossible to achieve** because of the methodology of installation (not subject to change). Penetration of the binder (glue) coating cannot envelope all of the granules, especially where the flat side (or some percentage thereof) of a dry granule is lying tight to the flat side of a previously coated granule. In addition, no matter how careful a contractor is, some minor clumping of rubber or "heavy spots" of the rubber granules will occur. Both of these conditions will result in compromised binding and a compromised surface system. Polyurethane systems are all pre-mixed and blended, prior to installation, so that all granules are entirely encapsulated.

5. In the case of water-based systems, no installation can occur when rain or moisture is imminent. In addition, higher humidity slows the curing process leaving smaller windows for installation. If the system is applied and moisture affects the curing, the damage may not be evident for an extended period of time but longevity will be compromised. **The high sensitivity for moisture can extend projects considerably.**

6. Water based systems are labor intensive. Some systems, properly installed, have a minimum of 10 or 11 steps to be performed over 10-11 days. If moist weather, fog, etc., rolls in, the installation can be delayed for significant periods of time. In addition, because of this high percentage of labor, relative to the overall cost of the system, **a much lower percentage of materials** or surface, compared to non-porous systems, **is left for the benefit of the owner and user.**

7. Porous polyurethane systems **have joints in the base layer that will not be sealed or encapsulated.** With or without proper maintenance, these joints will eventually split and affect the performance and longevity of the surface.

**\*Porous polyurethane systems can however, be upgraded to a sealed system when budgets allow and if done in a timely fashion. Water based systems cannot!**

8. Recoating or resurfacing of water-based systems is simply tricky! I once had a plastics engineer turned running track consultant/expert, (Mr. Albert Brennan of Brooks Consulting), tell me that, "Although the track world views polyurethane systems as the most sophisticated and difficult to install, I believe water-based systems are much more difficult to get right". He explained that, "Because of the many layers (sometimes 11) of rubber and sprayed on binder, the importance of the binder percentages to rubber granules and the damage that weather, moisture and lack of curing can cause, all the procedures for installation must be very exacting. He believed there was very little room for error to get the optimal installation.

Because of these sensitivities and polyurethane being less sensitive to moisture, he believed polyurethane systems were simply harder to screw up. In addition, he pointed out that with re-coating or resurfacing, all things must be even more controlled. Too much binder could cause "lock up" and bubbling of the re-surface or re-coat. Too little binder will cause dry spots that will delaminate and deteriorate quickly, leaving holes and "chunk outs". **There is little room for error!**

9. It is always an owner's intention to maintain their facilities in a timely manner, however due to unforeseen issues, economic slumps, or simply budget cuts, this does not always occur. Porous systems must be resurfaced in close proximity to when they are due and if this does not occur, irreversible damage may occur. Non-porous systems do not have this same level of urgency. Of course it is preferred that maintenance cycles are met for all surfaces, but due to every inch of non-porous surfaces being sealed and isolated from exterior conditions, extended but reasonable delays with the maintenance cycle will not destroy the performance and longevity of the surface. **Obviously, this is a huge advantage when budgets fall short.**

**So when does one buy a porous polyurethane or water based running track surface?**

## **Only when budget does not permit otherwise!**

The author of this opinion document, Bill Narozanick is the owner of American Athletic, Vincentown, NJ and Florida Track and Turf, Haines City, FL. He is a member of the American Sports Builder's Association (ASBA) since 1986 and is a Certified Track Builder as awarded by the ASBA since 2000. He is published with the ASBA as well as other publications and served on various committees for the ASBA including meeting with the NCAA for modifications to their requirements. In addition, Bill has been involved with the sports construction industry for approximately 45 years and his own business since its inception in 1982. Bill has been involved with track construction and surfacing of all surface systems during that entire period of time and is very familiar with the nuances of the various systems as well performing and setting the highest standards for laser controlled asphalt pavements relating to the sports facility industry. In addition, Bill was a competitor at the Division I Collegiate Level for track and field while at Florida State University, and has experienced some of the finest facilities in the Southeast. That experience honed his joy and passion for the running track industry and he brings that same joy, passion and extensive experience to help owners, taxpayers, fundraiser, kids and competitors decide the appropriate surface for their programs.