Innovations in Tennis Court Surfaces Offer Improved Durability and Safer Play.

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Generally thought of as an indoor product, polyurethane floor systems have been used in gymnasium athletic floors for over forty years, and during that time polyurethanes have been developed and refined. Polyurethane athletic systems are now commonly used as performance outdoor track and basketball surfaces.

While polyurethanes have been available for use as tennis court surfaces for many years, several drawbacks delayed their acceptance. Their installation involved a complicated spray process, causing over-spray problems that added to the installation costs in both equipment and labor making it hard to justify. Older generation polyurethane systems utilized high VOC solvents, requiring respirators for safe installation which deterred acceptance by facilities and installation contractors.

Polyurethane Tennis Court Surfaces

The latest polyurethanes have overcome these obstacles. They are squeegee installed—the preferred installation method—versus the older spray applications previously used. Innovations by the industry have improved many types of polyurethane by reducing harmful solvents and eliminating heavy metals from their products. Some manufacturers have pushed innovation even further, eliminating solvents completely, and have developed performance urethane waterborne products that meet or exceed state and federal air quality standards and meet LEED VOC emission requirements. Always check with the manufacturer or distributor to confirm the product meets current EPA VOC requirements, and is free of heavy metals.

The new polyurethane tennis coatings now deliver the same tactile surface that players have become accustomed to across the tennis community. Many are certified and some have even achieved Category 4 certification from the International Tennis Federation (ITF). Check with the manufacturer or distributor for their products' certified rating. The new polyurethane tennis surface coatings are at home indoors or outdoors and offer a completely seamless court. Polyurethane surfaces deliver a consistent rate of play while offering facilities surface lifecycles that exceed that of current industry surface coatings.

Polyurethanes are structurally more elastic so they resist crazing, are very durable, and do not show racket strike marks. Polyurethane coatings exhibit excellent flexibility and hold-up well in freeze thaw regions as well as hot sunny geographical region, having a proven track record from the Middle East's plus 100 degree temperatures to the frigid 30 degree below zero cold of Sweden. This superior flexibility allows polyurethanes to expand and contract with the environment, greatly reducing the potential crazing or chipping that occurs with more brittle court surfacing materials. The elastic properties of the polyurethane surface keep the court playing at its best longer and increased crack and chip resistance maintains the court will play true longer. The latest polyurethane surface looks like current hard court surfaces that players are used to competing on and are color fast (UV resistant) keeping courts looking better longer.

Concrete or asphalt base requirements for polyurethane court systems are basically the same as acrylic coatings for new court installations and re-top coating of existing courts. Manufacturers offer systems that can be as simple as a tennis urethane surface applied directly to the concrete or asphalt. For an

intermediate system, 1mm to 2mm of seamless polyurethane is pour-applied (new or existing surface) followed by the textured polyurethane court coating. This system provides some athletic cushioning for the players while providing an extremely uniform surface.

New courts or existing courts can also be upgraded to a seamless cushioned system that can deliver force reduction to tennis courts with true point elastic characteristics per EN 14804 or DIN 18032-2 with force reduction levels from 15% to 30%. This is great news for tennis players as these seamless cushioned systems bring technology transfer from the track and indoor performance polyurethane athletic floor system market to tennis courts. Some of the polyurethane products that have the higher shock absorption have been ITF tested and certified providing players with a surface that can offer Force Reduction in excess of 30 percent depending on the system configuration selected – a player health and comfort solution that is not available from simple surface- applied paints. The advantage is players can practice more with reduced joint impact, allowing players of all skill levels to enjoy playing the game with less fatigue, joint aches and pains. The cushioned surface provides excellent shock absorption reducing the potential for leg and lower back injuries.

Hard Courts versus Synthetic Courts

A range of tennis surfaces exist today-- clay, grass, and most common in the US, hard courts (concrete or asphalt). Hard courts cost less to construct and maintain versus their clay or grass court counterparts. Grass and clay court surfaces are easier on the player's body, while hard court surfaces are notorious for taking a toll on the player's body. The coated concrete or asphalt provides no cushioning (force reduction) and are recognized for contributing to high impact on joints, making hard courts unappealing to players concerned with long term joint health and well-being, and senior players.

For some time, players, trainers, and coaches have voiced concerns about the detrimental effects of long hours of practice and playing on hard courts have on all players. Performance polyurethane systems offer the potential to reduce the pounding a player's body takes on a hard court by providing force reduction.

High performance seamless cushioned polyurethane systems consist of a granular recycled rubber base layer mat (generally 4mm to 9mm thick); this layer is glued to the base surface (asphalt or concrete). The mat is consistent in density, ensuring consistent ball reaction and providing a proportion of the cushioning force reduction characteristics. This is followed by a 1.5mm structural layer of polyurethane that provides a strong elastic monolithic surface. The polyurethane structural layer is poured and is self-leveling; when cured it delivers an extremely flat and uniform surface. The polyurethane layer is very strong and protects the base mat layer as well delivering exceptional elasticity, elongation properties, and tensile strength. The surface polyurethane layer contains the sand texture. This layer is UV fade resistant, elastic, and results in a surface that players are aesthetically familiar with and expect when walking out onto the court.

The system is more expensive than simple acrylic paint on concrete or asphalt, but because of its flexibility, it is resistant to chipping and cracks reducing repair costs. It is durable, UV resistant and doesn't show racket marks-- all helping to control court maintenance costs. Most importantly, high performance padded polyurethane tennis surfaces provide the option of engineering a surface that takes the players well-being into consideration by providing a court with exceptional impact force reduction ability. A more forgiving court will allow players to play longer and more often.

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