

Athletic Polymer Systems, Inc.
by Jack Rouff
Sustainability Leadership Program
University of California, Irvine
5/3/10

All-weather running tracks have been in existence since the late 1950's. Their creation stemmed from a desire to find a consistent surface that equalized competition among athletes and that removed bad weather as a factor impacting event outcomes. The first tracks used a combination of rubber and asphalt. In the 1960's, the 3M company retained a group of researchers at MCP Industries, Inc. to develop polyurethane athletic surfacing. This product, originally intended for use at horse tracks, eventually became known as the Tartan® surface. Over the years, Tartan® became an improper generic trademark for any all-weather running track. The product is manufactured by Athletic Polymer Systems (APS), Inc., a subsidiary of MCP Industries.¹

In the years since the original track was developed, many companies, both those using polyurethane and those using other materials, have entered the “all-weather track industry.” APS, Inc. has emerged from this group as the only manufacturer of athletic surfaces that has achieved Cradle to Cradle certification. APS was certified in 2005 at the Silver level.^{2,3} Prior to that time, mercury was used as a curing agent in track installations. It made tracks easier to install, while also saving money. The process was a good example of what McDonough and Braungart describe in their book, “Cradle to Cradle: Remaking the Way We Make Things”, as the application of chemical brute force to accomplish the goal of getting a product to customers quickly and cheaply.⁴ In the ensuing years, scientific research increased our understanding of the risks associated with mercury exposure. In response to this and the added focus it prompted from the EPA, a team of chemists at APS, headed by Dr. Thomas Garrett, developed a means of removing all Mercury, while retaining the resilience of Tartan® and increasing its physical strength.⁵ The removal of the Mercury appears to have been the most significant factor in taking Tartan® from a linear, cradle to grave product, to one that when other ingredients are added to it, can be used over several product life cycles.⁶ The move to a more sustainable product has created other advantages too. As product liability litigation related to mercury exposures increases, athletic administrators favor mercury-free surfaces over those that contain mercury. Tartan® has other advantages related to long-term maintenance. When the existing surface requires refurbishing, the new surface is merely poured over the existing one without having to tear anything out. This reuse results in upcycling of Tartan® as each additional layer enhances the performance characteristics of the product. In the language of Cradle to Cradle, Tartan® is “designed for disassembly” – its maintenance requirements are low relative to its counterparts (because it is unaffected by hot or cold temperatures and does not retain water) and it utilizes a continuous flow of water in its manufacture rather than being drained off and periodically replenished.^{5,6} These unique design characteristics are further evidence of Tartan's superiority to

other surfaces as a sustainable product. The product's sustainability advantage is also borne out by APS's experience with its clients who, according to Dr. Garrett, favor the product for two reasons – the “Piece of Mind Service” that is a cornerstone of the company's marketing efforts and for its Cradle to Cradle Silver Certification.

Another example of Tartan®'s sustainability advantage over its counterparts is found in the *Natural Capitalism* approach advocated by Lovins, Lovins, and Hunter.⁷ First, it has increased the productivity of natural resources. In addition to utilizing a continuous flow of water where other processes do not, it is made from soy-based polyols. In contrast to other polyurethane formulations, this means it is coming from a renewable source. Second, the product moves closer to waste elimination than petroleum-based polyols by reducing non-renewable energy use (burning fossil fuels) and total energy demand.⁸ Tartan® also reflects a solutions-based model rather than a goods-based one. Their promotional and other materials were, in my opinion, indicative of this. While they do talk about their product, there is a great deal of focus on meeting customer needs and doing so in a variety of settings and circumstances – for athletes and coaches, they focus on performance payoff; for administrators, they focus on costs and longevity; and for groundstaff, they are sensitive to maintenance issues. Their “Piece of Mind” philosophy is centered more on individual customer comfort from the outset as opposed to emphasizing the attributes of Tartan®. Lastly, Tartan® is a recyclable product. Once removed, its materials do not have to be taken to a landfill, but can instead be used to create a new track at the same site, a track at another site, or be used in certain other products that require the use of polyurethanes.

Tartan® has been in existence for over 40 years. Its origins, though, date from the late 1930's when polyurethane was discovered and patented by Otto Bayer in Germany. The Germans coveted the product due to their inability to access natural rubber from Southeast Asia. Following the war, polyurethane was brought to the U.S. through a technology transfer program. ABS's parent company, MCP Industries, Inc., began using polyurethane as a sealant for use with its clay pipe, valued for its elasticity, strength, and other characteristics. Given its experience with polyurethane and as a leader in rubber products, MCP Industries was retained by the 3M Company to develop polyurethane as an athletic surface, initially for use at horse tracks. The first uses of the Tartan surface as a running track appeared in the late 1960's in California and in Mexico City in 1968 at the Summer Olympics. Approximately 10-15 years ago, the EPA identified concerns about mercury toxicity. This led Dr. Garrett and his team of chemists to develop the means for removing Mercury from Tartan® cited earlier. The choice was also a good fit with the company's skill set and lengthy history in the pipe industry.^{1,5} The results of these efforts were a product that is not only Mercury-free, but that retains its resilience, while increasing its strength and yielding faster running times, a factor that has often favored its use over other products.

Bibliography

1. **The History Behind Tartan® Surfaces**
<http://www.tartan-aps.com/history.php> p.1
2. **Cradle to Cradle™ Certified Silver**
http://www.mbdc.com/cert_tartan.html
3. Bolus, Jay (Vice-President, Technical Operations, MBDC). "Re: APS C 2 C Certification Date " to Jack Rouff, 20 April 2010
4. McDonough, W., Braungart, M. (2002). Cradle to Cradle: Remaking the Way We Make Things. New York: North Point Press; Location 410.
5. Garrett, Thomas M. (President, Athletic Polymer Systems, Inc.), phone call, 15 April 2010
6. **New Developments in Urethanes for Track Surfaces Yield Record Times and Reduce the Risk of Training Injuries While Removing Mercury Toxicity**
http://www.tartan-apps.com/new_development.php p.4
7. Lovins, Amory B. et al. (1999). A Road Map for Natural Capitalism. Harvard Business Review, pp. 146-47.
8. HB-150, Honey Bee™ Polyol, Technical Data Sheet
<http://www.honeybee.cc>