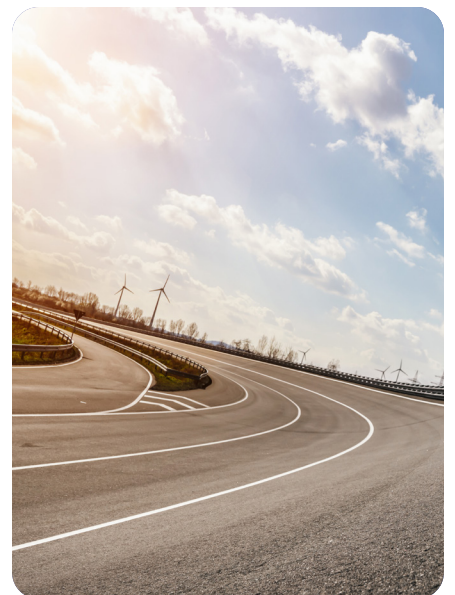




# MEETING F1 SPEED AND SAFETY REQUIREMENTS WITH SOLSTICE TITAN™ POLYMER

CASE STUDY



When Formula One (F1) Group decided to return to Las Vegas after 31 years, it envisioned a spectacle that would enthrall American and global audiences alike and establish the race as a fixture in its annual calendar. What better way to do that than to orchestrate the Grand Prix at night, against the glimmering backdrop of the Las Vegas Strip? To develop the all-important track surface, F1 Group brought in polymer-modified asphalt specialist Southwest Liquid Asphalt. By adding Solstice Titan polymer to its binder, the company was able to meet F1 Group's challenging specifications. The result is a state-of-the-art circuit designed to withstand the blistering performance and punishing stresses of the world's fastest race cars, plus extreme desert temperatures.

## BACKGROUND

On November 18, 2023, 20 drivers from 10 F1 teams waited anxiously for the five-light sequence to signal the start of the inaugural Las Vegas Grand Prix – the first in the city since 1982 and the third on F1's United States calendar. Launching off the grid, the cars lapped the 3.8-mile circuit 50 times, racing 192 miles from start to finish.

Weaving through some of Las Vegas' most famous hotels and casinos, F1's newest circuit features three long straights – including one along the iconic Las Vegas Boulevard – and relatively few corners, making it an extremely fast track in F1 terms, with cars able to reach speeds of 212 mph. To support such high levels of performance in such a high-density track setting, F1 Group meticulously designed the circuit's layout and the specification of its asphalt surface, down to the aggregate and binder used. Then it selected North Las Vegas-based Southwest Liquid Asphalt, a polymer modified products supplier, to develop and produce the binder.



F1 Group's plan called for the existing street surfaces to be dug up and replaced with three layers of asphalt: a base layer in standard PG 76-22 specification; a levelling course in modified PG 76-22 specification; and a driving layer in PG 82-22 specification that could withstand 8G of lateral force, deliver exceptional grip and endure temperatures ranging from searing summers to chilly winters and everything in between. For the levelling and driving layers, F1 Group specified multiple stress creep recovery (MSCR) rates of 70% and 95% respectively – far beyond the Nevada Department of Transportation (NDOT) norm of 40% MSCR.

"We had experience formulating binder to forty MSCR, but not to seventy let alone ninety-five" says Gene Chrisenbery, Operations Manager for Southwest Liquid Asphalt. "After trialing multiple polymer and wax products over a six-month period with our polymer supplier and two laboratories and not getting the result we wanted, we knew we needed to take a different approach."



## SOLUTION

During a discussion with one of Southwest Liquid Asphalt's additives supplier, Chrisenbery learned about Solstice Titan, a family of low-molecular weight polyolefin-based products that can be blended with asphalt binders to build durable and sustainable pavements at lower overall costs, and with less energy consumption. Encouraged by what he heard, Chrisenbery immediately ordered a sample of Solstice Titan 7686 for a plant trial. In consideration of several demanding industrial regulations and specifications, Solstice Titan in 7686 form was well-matched to Southwest Liquid Asphalt's requirements. Over the course of eight trials, Solstice Titan was mixed with different quantities of poly (styrene-butadiene-styrene), or SBS, to create a suitable binder. After two months, there was a breakthrough.

*"It was an exciting moment," says Chrisenbery. "Titan gave us the creep recovery we were looking for, increasing the stiffness of the binder without increasing its viscosity. We could deliver an exceptionally rigid pavement capable of accommodating 8G of horizontal stress as race cars rounded corners."*

Additionally, the result was achieved without Southwest Liquid Asphalt having to invest in any additional equipment or modify its plant processes this contributing to lower overall costs.

## OUTCOME

In addition to helping Southwest Liquid Asphalt meet F1 Group's specifications, the properties of Solstice Titan facilitated the quicker, easier compaction of the asphalt as it was laid down by F1's contractors. During the technically complex undertaking, the 60-foot-wide track surface – designed to be free of longitudinal joints – was implemented using three pavers simultaneously.

*"The paving crew were delighted with ease of compaction and paving performance of the mixture," says Chrisenbery. "Not long thereafter, the F1 engineers who inspected the circuit rated the surface as 'excellent' and felt it would last up to eight years."*

Throughout the project, Solstice technical specialists worked with Chrisenbery and his team to keep the project on track. "Solstice were by our side with expert advice whenever we needed it," he recounts. Looking ahead, Chrisenbery sees plenty of scope for Solstice Titan in the business opportunities Southwest Liquid Asphalt is considering. One example is new road surfaces being considered by U.S. states, such as Utah, that last longer and support a wider range of temperatures. Other potential applications include airport runways, bus lanes, bridge decks, and truck weigh stations. In such applications, Solstice Titan improves the adhesion of the asphalt binder to the aggregates, delivering benefits such as improved pavement durability; increased resistance to rutting, fuel and water damage; and easier compaction for faster, more energy-efficient paving. In Chrisenbery's view, such benefits position Solstice Titan strongly to help meet emerging industry regulations ranging from emissions and recycling to mixing and compaction temperatures.

*"Binder makes up a small proportion of asphalt but has a significant impact on the quality of the end product," Chrisenbery says. "The better the binder, the more it's going to withstand and the longer it's going to last. That's a message that resonates with our customers and prospects."*

He concludes: "With Titan added to our toolbelt, we're able to pursue a wider variety of business opportunities with confidence."



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