

# Unique Binder System and Effective Penetration

**Overview:** Midwest's Semi-Permanent Gravel Runway system is unique from all other dust control products currently on the market. This is due to the exceptional chemistry and binder systems present in EnviroKleen and EK35. Most dust palliatives work by penetrating and coating individual soil particles. The cohesive properties of the fluid will cause them to initially agglomerate. While this can be an effective short-term way to reduce dust, these types of products can be easily displaced by rain and migrate away from the surface. This however is not the case with EnviroKleen and EK35.

**EnviroKleen:** EnviroKleen is formulated with a polymeric binder dissolved in a synthetic base fluid. The base fluid acts as a carrier for the binder, rapidly penetrating beneath the surface to distribute it evenly into the runway. As the product cures, the base fluid penetrates more rapidly than the binder. This causes the binder to increase in concentration near the surface over time, improving strength and performance of the runway. The key to the binder system in EnviroKleen is that the binder is engineered with a very high molecular weight and it contains a high degree of branching on each molecule. The high molecular weight imparts a very large cohesive force in the binder, making it very viscous. The high viscosity ensures that the binder stays locked in place once the product is applied. As the binder migrates into the soil, its branches become entangled between aggregate particles, binding them together with mechanical adhesive forces. The numerous branches on each molecule become lodged into microscopic pores on the surface of the soil particles. This causes the binder to be extremely tacky, ensuring that the runway surface adheres tightly and achieves a high degree of compaction.

**EK35:** EK35 is formulated with a natural resin binder dissolved in a synthetic base fluid. The base fluid draws the binder beneath the surface and distributes it evenly into the runway. The performance of the binder system in EK 35 results from a unique mechanism of action. The resin binder has similar properties to the polymeric binder used in EnviroKleen, but it relies on slightly different adhesive properties for its performance.

The branches on our polymeric binder physically adhere to soil particles through a process similar to Velcro sticking together. The resin binder in EK35 actually forms chemical bonds with the soil. This chemical adhesion is permanent and irreversible. This reaction causes the binder to become waxy solids, ensuring that the runway surface compacts tightly and performs at a high level over time.