

An Award-Winning Lubricant Solution to the Siloxane Problem in Landfill Gas Applications

Virginia Carrick/Edward Ng/The Lubrizol Corporation

The Siloxane Problem



- Siloxanes are non-toxic, organo-silicon chemicals used in the cosmetics, personal care, plastic and food industries
- Siloxane concentration building up in landfills
- Engines fueled by landfill gas will also burn siloxanes
- Combustion of siloxanes produces crystalline silica (SiO₂) which can agglomerate
- If silica particles grow large enough, they will fall out of the oil and deposit on engine parts
- Silica deposits coat hot engine parts with a thick, hard abrasive layer
- Can cause wear, heat build-up, pre-ignition, high oil consumption and shortened top-end overhaul intervals



Current Industry Approach



- **Remove siloxanes from the gas before reaching the engine** via:
 - Refrigeration
 - Partially reduces siloxanes by 30-50%
 - Significant energy consumption
 - Activated carbon towers
 - \$250,000 for installation
 - \$100,000 per year to operate including costly hazardous waste disposal costs
 - Loss of 20% power
 - Less than 50% uptime

Not financially viable solutions for sites operating with a limited number of engines
- **Mechanically remove the silica deposits from the engine**, also known as combustion chamber de-coking. In an intensely competitive and cost-sensitive market, this practice negatively impacts engine operators since:
 - Time-consuming
 - Frequency of the procedure can be every 400 hours
 - Increases engine downtime
 - Incurs additional maintenance and labour costs

Lubrizol® SG9L60



- Lubrizol® SG9L60 is the first marketed specialty additive package designed to significantly reduce the negative effects of siloxanes in landfill applications
- Lubrizol® SG9L60 controls both the size and dispersion of silica particles in the finished lubricant
- Lubrizol® SG9L60 is formulated with:
 - proprietary technology that breaks up silica particles
 - a novel dispersant system that allows silica particles to stay in solution
- Lubrizol® SG9L60 technology delivers:
 - Caterpillar approval
 - Field trial required no engine decoking
 - Demonstrated a 50% reduction in oil consumption

