

ValvTect Petroleum Products
Guidelines for Treatment of Biodiesel Blends and B100
with Diesel Guard BioDiesel Antigal/Deicer
Winter 2009 - 2010

The cold temperature operability characteristics of biodiesel vary greatly from those of hydrocarbon diesel fuel. These characteristics, along with impurities left from the biodiesel manufacturing process, cause biodiesel to be harder to handle and can lead to plugged filters, fuel gelling, and icing at higher temperatures than diesel fuel. Material in biodiesel can also separate or settle from biodiesel blends.

Due to biodiesel's higher wax content, different type of wax distribution, and higher moisture content than 100% hydrocarbon diesel fuel, it requires a different antigal additive technology and higher level of deicer contained in Diesel Guard BioDiesel Antigal/Deicer H.P.

Following the recommendations below can provide satisfactory storing, handling and use of biodiesel blends and must be followed when using Diesel Guard BioDiesel antigal additives for adequate results.

Biodiesel Blends of more than B5 up to B20

- The biodiesel (B100) must be 100% soy based from a BQ 9000 Certified Biodiesel Producer or Marketer that meets National Biodiesel Board (NBB) specifications and ASTM D6751; unless specifically approved in writing by ValvTect Petroleum. Refer to www.biodiesel.org for list of BQ 9000 producers and marketers.
- The biodiesel (B100) must also meet the following specifications which may exceed BQ9000 and/or ASTM D6751:
 - Cloud Point 35F or less
 - Free glycerin should be less than 0.01%.
 - Total glycerin should be less than 0.12%.
 - Water content should be less than 350ppm
 - Free of other impurities.
 - Visual inspection of B100 at 70F should be clear and bright (no haze, separation or solids).
 - Visual inspection of blends should be without separation after 5 days at +10F.
- The biodiesel (B100) must not exceed 175 seconds in the Cold Soak Filtration Test (ASTM D6217 modified) and should not exceed 100 seconds in biodiesel blends.
- Obtain a current Certificate of Analysis (COA) for each B100 delivery indicating the B100 meets current specifications for ASTM D6751 AND specifications contained herein.
 - Be sure % glycerin, ppm water and Cold Soak Filtration data are indicated.
- Qualify a specific refiner's diesel fuel that has the lowest cloud point and greatest CFPP response to Diesel Guard BioDiesel Antigal/Deicer additives with the specific producer's biodiesel.
 - The diesel fuel should contain a minimal amount of water (less than 100ppm) and be very responsive to Diesel Guard BioDiesel Antigal additives.
- Test the "qualified" blend of biodiesel/diesel fuel with Diesel Guard BioDiesel Antigal/Deicer to determine the specific additive treat rate to achieve the CFPP needed to meet the lowest anticipated or forecasted temperature in your marketing area.
 - Once the CFPP of the "qualified" blend and additive treat rate is determined, no other biodiesel, diesel fuel or additive should be used.
 - The finished biodiesel/diesel fuel blend should not contain more than 200ppm water.
 - Fuels with excess of 200ppm water should be treated with additional amount of deicer.
 - The finished biodiesel/diesel blend must meet the current ASTM D975 specification for No. 2 diesel fuel.
- Continue to test the "qualified" biodiesel/diesel fuel/additive blend to determine any variation from the original "qualified" blend to meet the anticipated or forecasted temperatures.
- Monitor the current and forecasted temperatures. Discontinue marketing biodiesel when the forecasted temperature is lower than 10 F degrees above the CFPP of the "qualified" blend or retested blend.

Biodiesel 100

- Storage of B100:
 - Maintain a temperature of 70F – 80F.
 - Circulate to maintain homogenous and prevent separation.
 - Drain or pump out bottoms as needed.
 - Install a filtration system to filter out glycerin and other impurities.

Note: Storage of B50 (with a qualified hydrocarbon diesel fuel) is preferred versus B100

- Allows lower storage temperatures.
- Less settling than B100 at same storage temps.
- Slower oxidation rate.
- Blends better with antigel additives.
- Maintain a temperature a least 10F degrees above fuel's cloud point.

Additional Recommendations

- Store Diesel Guard BioDiesel Antigel/Deicer additives above 32F.
- Both diesel fuel and biodiesel must be at least 10F degrees above the cloud point of each product when treating with antigel additives.
- Diesel fuel should be loaded first, then biodiesel.
- Biodiesel and blends should be kept as dry as possible during storage; i.e. fills, vents, etc, should be checked to be sure no water enters the fuel.
- Replace paper based pump fuel filters with filters recommended for and compatible with biodiesel".
- BioGuard Micro-biocide (BGULS) and fuel stabilizer (BD100S) should be used if biodiesel is to be stored for more than 3 months.

Diesel Guard BioDiesel Antigel additive technology improves the handling and cold weather operability of biodiesel fuel blends up to B20 when a qualified biodiesel is blended properly with a "qualified" diesel fuel within the temperature range determined by the qualification process described above. However, due to the newness and variability of biodiesels as well as ultra low sulfur diesel fuel, extreme care and diligence must be taken by the fuel marketer as well as storage tank and vehicle maintenance by the end-user to assure adequate additive performance and cold temperature operability.

Preparation of Diesel Fuel Storage Tanks

Equally important to the performance of Diesel Guard BioDiesel Antigel additives is the condition of the customer's bulk diesel fuel tanks. They must be free of water, bacteria, sludge and other contamination that can cause fuel filter plugging. Prior to winter, all water and non-fuel material should be pumped out and tanks should be treated with ValvTect BioGuard Micro-biocide. ValvTect Tank Dri should also be used to "dry out" any excess water. See "*Guidelines for Winterizing Diesel Fuel*" for details.

Vehicle Preparation and Preventive Maintenance

It is very important that fleets prepare their vehicles for winter by changing fuel filters and draining water separators. Good antigel/deicer additives will not prevent problems and down time if vehicles are not properly prepared for winter. See "*Top Ten Winter PM Tips*" for proper vehicle winter PM and also Tank Maintenance Sell Sheet.

ValvTect Field Support

ValvTect personnel are available to provide additional information, technical and field support. Please feel free to contact ValvTect's technical support group at 1-800-728-8258.

NOTE: ValvTect warrants the performance of our biodiesel additive when used in compliance with the above guidelines. Failures caused by biodiesel impurities, such as high glycerin, monoglycerides, particulates, water and phase separation are not additive failures. ValvTect Petroleum cannot be responsible for any claims related to those failures. Please refer to Technical Data Sheets for product descriptions and warrantee.

Acceptance

Customer herein understands and accepts these guidelines and holds ValvTect Petroleum Products harmless from any and all claims should these guidelines herein not be followed in their entirety.