

SPECIFICATION

SafeSite™ Advanced Filtration System

1.0 GENERAL DESCRIPTION AND STANDARDS

- 1.1** Furnish and install a factory assembled and tested system capable of continuously filtering and de-watering stored Ultra Low Sulphur Diesel (ULSD) and ULSD blended biodiesel fuel. Coalesce and remove both free-standing water and saturated/emulsified water from the fuel. The factory filter must be SAE J1488 ver. 2010 certified to effectively remove emulsified water to at least 95% efficiency with ULSD and ULSD blended to a minimum of B15 (an IFT or Interfacial tension of 15Nm/m).
- 1.2** Manufacturer: Subject to compliance requirements, provide integrated filtration and controls system by the following: Core Engineered Solutions, Inc.

2.0 DESIGN AND CONSTRUCTION

- 2.1** The systems shall filter and treat the entire contents of one main tank by circulating the complete volume every 8-10 hours of system operating time. Oily water removed from the fuel shall be able to be drained off, filtered to less than 10ppm and stored in a corrosion proof container until disposal can be arranged.
- 2.2** The fuel quality monitoring control and management system shall be integrated with each main fuel oil transfer pump control system contained in separate NEMA 3R cabinet. The control system cabinet shall contain (as a minimum) the following devices:
- 2.2.1** A Programmable Logic Controller (PLC) or programmable relay to control and manage system functions as described herein to monitor the performance and integrity of the fuel maintenance system and to alert operating personnel to drain excessive water in filter canister, a fuel leak in the unit, motor overload, or to notify a required filter change.
- 2.3** The following alarm points shall send an alarm notice and illuminate an alarm indicating light which shall remain lit until the alarm is acknowledged and cleared:
- 2.3.1** Failure during Flow Test.
- 2.3.2** Excess Water in Fuel Canister.
- 2.3.3** 'Filter Dirty 'Alarm.
- 2.3.4** Leakage into System Drip Tray Alarm.
- 2.3.5** Motor overload.
- 2.4** Anti-siphon solenoid valve control - When the lowest piping inside the filtration cabinet is below the top of the fuel tank, anti-siphon solenoid valves must be installed on both the supply and the return lines to the filtration unit.
- 2.5** Water detection sensor -The presence of water in the tank can be used as a trigger to run a filtration cycle.

- 2.6** All of the components shall be factory mounted on a structural steel backing panel with integral 2.5 inch high steel containment lip, seam welded to form a leak-tight drip tray. Base shall extend beyond any fitting, valve, pump or strainer to assure that a fuel leak from any component, fitting, or packing in the system shall be contained within the pan. The same steel base and containment tray shall be used to support the fuel transfer pumping and straining system described elsewhere in this Specification.
- 2.7** The suction fuel lines from the fuel filtration system shall extend to the lowest point of the diesel tank so that any water accumulating from leakage, contaminated fuel delivery, or condensation will be drawn into the filter and dewatering system. The fuel pick up line should be within 2 inches of the bottom of the tank, cut on a 45-degree angle, and should not make contact with the tank bottom. This fuel pick up line should be located as close to one end of the tank as possible. The fuel pick up line should be a solid material that meets local code and a minimum of half inch (0.5") or metric equivalent ID.
- 2.8** The fuel return line from the fuel filtration system must be installed at the opposite end of the tank to where the fuel pick up line is located. The return line must just barely penetrate far enough into the tank so as to minimize fuel siphoning back into the fuel filtration system. The fuel return line should be a solid material that meets local code and a minimum of half inch (0.5") or metric equivalent ID.
- 2.9** The fuel filtration canister shall be a pressure vessel fabricated out of solid stainless steel and be capable of obtaining an ASME "U" stamp. Vessel must be built in a certified shop in accordance to code and be capable of certification, if required. No component of the fuel filtration system shall be constructed of plastic, polycarbonate or any other material that will not withstand regulated or specified heat and fire ratings.
- 2.9.1** The stainless steel filter canister shall have a removable, gasketed VITON "O" ring top, and be fitted with an integral water containment sump with a certified intrinsically safe electronic water detector. The electronic water sensor in the fuel canister must be CE certified to be intrinsically safe.
- 2.9.2** The stainless steel fuel canister shall be a pressure vessel manufactured in a U-stamp ASME certified shop. It shall be engineered and tested to hold replaceable SAE J1488 ver. 2010 certified coalescing fuel filters. These filters must have a greater than 95 percent efficiency rating from SAE for removing emulsified and saturated water from ULSD and ULSD blended with biodiesel to an interfacial tension (IFT) of 15 mN/m.

3.0 OPERATIONS

- 3.1** The replaceable SAE J1488 ver. 2010 filter must also filter particulate to a 0.2 sub-micron level.
- 3.2** A two year service contract to include the cost of the filters will be supplied at start-up at no additional cost to the owner.

For drawings or more information contact Core Engineered Solutions at www.core-es.com
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