

Consultant's Corner: Alternative Fuel Generators

consultants corner



Considerations for alternate fuel types

Natural gas, propane or sour gas from sewage digesters, landfills or manufacturing processes can be viable fuels for gen sets. Natural gas or propane fuels burn cleanly and can be used to meet clean air standards in many areas. Byproduct fuels, when managed correctly, can power gen sets economically.

Spark-ignited (SI) engines have proven to be the best choice for use with these alternative medium-Btu fuels. SI engines are diesel units outfitted with appropriate components to allow use of gaseous fuels. They offer built-in strength and durability not found in most other SI engines.

High or low compression engines?

SI engines can be equipped to burn fuels under high or low compression ratios. Each configuration has its own advantages. High-compression ratio units can burn fuels completely and economically, but can use only dry natural gas, sewage gas (methane), landfill gas or "clean" fuels with high anti-knock qualities.

Low-compression ratio engines are less efficient but can burn unprocessed fuels such as wellhead gas or byproducts of petroleum production.

Fuels must be evaluated for their low heat value, which impacts fuel economy. Unprocessed fuels must be tested for contaminants that can be very caustic to engine components. In extreme cases, filtration equipment may be needed to protect engine components.

Specific engine needs

Turbocharged engines require a minimum of 140 kPa (20 psi) pressure to the gas regulator; and even higher for large engines. Naturally aspirated engines need a minimum of 14 kPa (2 psi) regulator pressure.

Engine knock can be a problem with fuels used in SI engines. Fuels that contain a significant percentage of hydrocarbons (propane, butane, pentane, etc.) should be used only in low-compression engines to avoid serious detonation.

The likelihood of detonation increases with higher fuel-air temperatures, so aftercooler temperatures must be controlled. Cat turbocharged high-compression engines require aftercooler water temperatures no higher than 32 C (90 F); low-compression turbocharged SI engines should have aftercooler water temperature no higher than 54 C (130 F). Consider how ambient temperature affects aftercooler water temperature; an engine that successfully operates on a fuel during the winter may encounter combustion problems during the summer.

Maintenance considerations

Unprocessed fuels such as landfill gas can contain high levels of sulfur and other contaminants that produce caustic acids during combustion. These acids are corrosive to engine components, so timely oil changes and acting on results from Scheduled Oil Sampling (S.O.S.) can minimize maintenance and repair problems.

In addition to supplying the equipment for alternative fuel electrical power generation, we can offer you expert advice in fuel testing and component selection. We can also identify and implement the proper maintenance programs alternative fuel gen sets demand.