VESTA™ - Frequently Asked Questions

What is VESTA™?
VESTA™ is a NOx Mitigant additive used to decrease emissions of biodiesel blends with diesel (up to 20%) in order to meet the California Air Resources Board's (CARB) January 1, 2018 Alternate Diesel Fuel (ADF) Regulation.

Why should VESTA™ be used?
Where there is a need to blend biodiesel into diesel fuel above the seasonal allowances, VESTA™ is a CARB approved method to blend up to B20 in low and high saturation biodiesels.

Will VESTA™'s performance vary in different biodiesel and diesel blends?
VESTA™'s approval was granted by CARB in response to the successful completion of a strict regimen of required testing. As a result, VESTA™ has been approved for use in all diesels and biodiesels up to and including 20% biodiesel.

What are typical treat rates for VESTA™?
Where VESTA™ is added to diesel fuel and biodiesel blends at treat rates which vary according to the percentage of biodiesel present. Treat-rates for B20 are as follows:

VESTA™1000 Concentrations for Biodiesel Blends B20 and Below

Biodiesel Saturation Level[2]	**Biodiesel Blend Level**	**Volume percent, minimum**
Low Saturation	>B5 to <B10	0.150
	B10 to <B15	0.225
	B15 to B20	0.300
High Saturation	B10 to <B15	0.075
	B15 to B20	0.150

[2] Low saturation refers to biodiesel Cetane Number of below 56; High saturation refers to biodiesel with Cetane Number of 56 and above by the test methods specified in the Alternative Diesel Fuels Regulation.

Where **VESTA™** is added to B99/B100, treat-rates are as follows:

VESTA™ 1000 Concentrations for Biodiesel Blendstock B100 or B99

Biodiesel Saturation Level	**Biodiesel Blendstock**	**Volume percent, minimum**
Low Saturation	B100 or B99	1.50
High Saturation	B100 or B99	0.75

Can VESTA™ be mixed with other diesel additives that may be present in a diesel or biodiesel?
VESTA™ is fully compatible with all commonly used diesel and/or biodiesel fuel additives including antioxidants, detergents, cold flow improvers, lubricity and conductivity improvers as well as additive packages that may contain mixtures thereof.

How should VESTA™ be handled?
Handling must take account of the thermal stability of the product in order to operate with an acceptable margin of safety. It is essential to ensure that the product is handled in a manner that does not permit an increase in temperature above 130°F. It has a low vapour pressure and is easily accommodated within zone and temperature classifications for electrical and instrumentation equipment. For additional information, consult California Fueling's VESTA™ 1000 Safety & Handling Guide which can be found at www.californiafueling.com

Why is VESTA™ potentially hazardous?
VESTA™ contains organic nitrates, and the over-riding limitation on how the product is handled is based on its thermal properties. VESTA™ undergoes a self-sustaining exothermic decomposition at temperatures above 200°F. This can result in the rapid evolution of gases, fire and rupturing or explosion in confined spaces such as tanks, pump casings and pipelines. Handling VESTA™ at all times to avoid over-heating is an essential requirement.

How should VESTA™ be stored?

VESTA™ is combustible, but fire from adjacently located products is a greater threat. Vertical storage tanks should be used and fitted with a fixed cooling water system connected to a remote manual or automatically actuated valve. A cooling water flow rate minimum of 0.25 gpm per square foot of storage tank surface will prevent VESTA™ in the tank from reaching a temperature capable of causing tank rupture. Pressure relief valves on the tank will not prevent tank rupture once the temperature reaches 212°F (100°C). In the event of insufficient volume of water available for cooling, thermal insulation of the vertical sides should be considered. Tanks should be surrounded by a containment wall with a capacity of 110% of the largest tank capacity.

How should VESTA™ be pumped?
Pneumatically powered diaphragm pumps provide an inherently safe and cost-effective means of unloading into storage tanks. If centrifugal pumps are to be used, they must be fitted with one, and preferably both of the following controls:

1. Temperature trip set to shut down the pump at a product temperature of 130°F (55°C)
2. A low flow switch

When offloading or injecting into headers, positive displacement pumps such as gear, vane, or piston, closed circuit pumping must be avoided. This could happen, for instance, through relief valves when the discharge is closed or blockages occur. Relief valves for these pumps must be external and be designed to discharge to the storage tank, not to the pump suction pipework. Pump trip instrumentation as above must be fitted. Pumped transfers should be done under controlled conditions and all transfer valves must be open before pumps are started.

How should VESTA™ be transferred from portable tank to tank?
Outside the controlled conditions of a fixed storage and handling installation, for instance in emergency transfer involving tank trucks, it is necessary to operate in a manner which recognises the thermal properties of VESTA™. A separate detailed operating procedure to cover instances when there is an operational necessity to transfer from tank to tank is available. The preferred means of transfer is by gravity, but where this is not possible, the use of an air driven pump, or the use of pressure using nitrogen are the methods described.

Are there any occupational health concerns with VESTA™?
The Safety Data Sheet (SDS) for VESTA™ stipulates that VESTA™ vapor should not be breathed, and that contact with skin and eyes should be avoided through the use of appropriate Personal Protective Equipment. Contact with VESTA™ can result in headache and dizziness. Full details are included in the SDS which can be found at www.californiafueling.com

Are there any precautions to be taken for splash blending of VESTA™?
Splash blending of VESTA™ into diesel fuel, biodiesel or vice versa is a very effective way of mixing the two components. Normal procedures for handling combined with recommended good working practice for the handling and storage of VESTA™, to provide an acceptable working procedure for splash blending, is sufficient.

How do you clean up a spill of VESTA™?
VESTA™ contains organic nitrates, and is therefore subject to the effluent consent levels in operation at the location of the spill. A spill of VESTA™ needs to be contained and not allowed to reach the water effluent system. If the quantity is small, it should be absorbed in a suitable medium for clean-up of spillages, and then treated as hazardous waste for subsequent disposal of the medium. If the spill is large, it should be contained and pumped by an approved pumping system or removed by bucket (with appropriate PPE) and placed in a storage drum or tank. It can then be filtered to remove foreign bodies and restored, or added to diesel fuel or kerosene for blending away in fuel to be used.

What special instructions need to be provided for VESTA™ to tank truck drivers and bulk consignment carriers?
Drivers of trucks delivering VESTA™ need to be trained to appreciate the nature of the product being carried, and to understand the supporting paperwork that accompanies the delivery. In the event of an emergency, drivers must assist the emergency services to understand the need for information support in advance of dealing with any situation that involves a potential VESTA™ related hazard. If the truck is fitted with an off-loading pump it must only be used for off-loading VESTA™ if it has been approved as being suitable for such. The carrier must clarify any doubt on this, so that an alternative means of loading and off-loading will be carried out using suitable pumps alongside the truck tank.

How is VESTA™ 1000 classified in relation to Proposition 65?
In 1986, California voters approved an initiative to address their growing concerns about exposure to toxic chemicals. That initiative became the Safe Drinking Water and Toxic Enforcement Act of 1986, better known by its original name of Proposition 65. VESTA™ is not a Prop 65 listed product (see VESTA™ 1000 SDS for further information).

Does VESTA impact the oxidation stability of biodiesel?
Limited testing has indicated there may be a small to negligible impact on the Rancimat results of B100 samples additized with 1.5 vol% VESTA™. B100 should be tested and certified prior to the addition of VESTA™ 1000.

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