



Biofuel Systems Group Limited
Beech Croft
51 Ruff Lane, ORMSKIRK
Lancashire, ENGLAND
L39 4UL

www.biofuelsystems.com

Wintron Synergy

Broad spectrum cold flow additive for biodiesel

Cold filter plugging point (CFPP) depressant for biodiesel produced from Rapeseed oil and Canola. Excellent results are generally seen with biodiesel produced from used cooking oil (UCO), however as the composition of UCO is highly variable it is not possible to predict effectiveness or treat rate.

Wintron Synergy can also work synergistically with Wintron X series additives (Wintron XC30 and XC40) Using both types of additive can reduce the pour point of some types of biodiesel to lower levels than can be achieved using either additive alone.

Wintron Synergy is fully compatible with Baynox and Baynox Plus biodiesel additives.

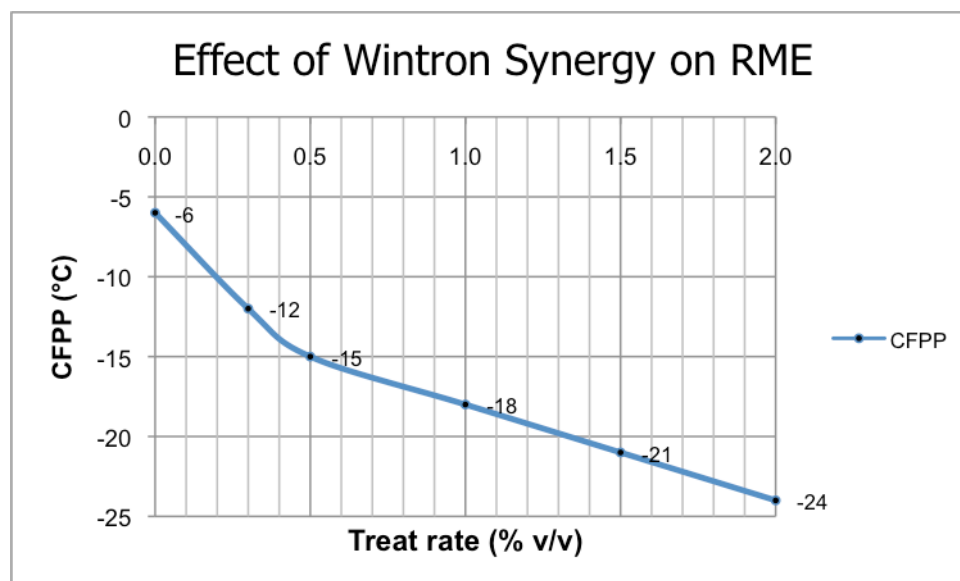
General

Wintron Synergy is a pour point depressant formulated specifically for biodiesel. Wintron Synergy contains polymethacrylate compounds in a mineral oil base. It is a viscosity modifier that reduces the tendency of viscosity to increase as the fuel is cooled. This alters the low temperature crystallization process - lowering the temperature at which biodiesel is able to flow and lowering the temperature at which wax crystals become large enough to block the pores of the fuel filter.

Treat rate

(1) Used as stand-alone additive to reduce CFPP

Wintron Synergy is recommended for use as a stand alone CFPP depressant for biodiesel produced from Rapeseed Oil or biodiesel produced from the closely related oil seed – Canola. Only a very modest effect is seen in reducing the CFPP of biodiesel produced from highly saturated feedstock oils such as Palm Oil or tallow. As the exact composition of biodiesel can vary, so can the optimum treat rate. Users must determine the required treat rate and this information should be used as a guide only.



RME – Rapeseed methyl ester – biodiesel produced from rapeseed oil (EN 14214)
CFPP – cold filter plugging point (EN 116, ASTM D 6371, IP309)



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Treatment with Wintron Synergy for biodiesel produced from types of oil

Oil used to produce biodiesel	Untreated CFPP °C	Treat rate	Treated CFPP °C
Rapeseed	-6	0.3%	-12
Canola	-10	0.3%	-15
Soy	0	0.3%	-4
Tallow	+10	0.6%	+8
Palm	+11	0.6%	+7

(2) Used synergistically with Wintron XC30 or Wintron XC40

Wintron Synergy can be used in conjunction with Wintron X series additives to further reduce the pour point of some types of biodiesel. The combined use of these two types of additives has not been shown to further improve CFPP, and this approach is only used in conjunction with additional cold-filtration to produce arctic grades of biodiesel fuel. Users must determine experimentally whether this type of treatment is effective and determine treat rates specific to type of biodiesel used. The additives should be blended separately i.e. ensure the first additive is thoroughly mixed with the fuel before mixing with the second additive.

Example results, with EN 14214 RME :

PP of untreated RME: -12°C
 PP with 0.5% Wintron XC30: -35°C
 PP with 0.5% Wintron Synergy: -28°C
 PP with 0.5% of both additives: -45°C

(PP – pour point – lowest temperature at which liquid can be freely poured - ASTM D 97, IP 15, ISO 3016)

Cold flow characteristics after filtration to 1 micron at -40°C: Cloud point -42°C, CFPP -47°C
 (meets class 4 arctic climate limit as specified by EN 14214)

(CP – cloud point – temperature at which haziness is observed - ASTM D 2500)

Use

Wintron Synergy is mixed with finished biodiesel. The biodiesel should be warm, and must be at least 5°C above the cloud point of the fuel (i.e. it should appear clear). If using more than one additive, mix thoroughly with the first additive before mixing with additional additive(s).

Cold filtration

The cold flow characteristics can be further improved by cold filtration of the fuel after it has been mixed with Wintron additive(s). This method will reduce the CP and further reduce CFPP.

- (1) Optimum treat rate with Wintron additive(s) is determined to maximally reduce pour point of biodiesel
- (2) Warm biodiesel is mixed with Wintron additive(s)
- (3) The mixture is allowed to cool to below the cloud point – the fuel must still be able to flow
- (4) Filtration to 1 micron