



select[®]
adsorbent technology



ADSORBENT TECHNOLOGY

For Edible Oils & Biodiesel

Select® is a specially modified, natural silicate for the removal of soaps, metals and phospholipids to help in the production of clean, quality edible oils and biodiesel feedstock that meet the most demanding specifications.

Our Select products originate from a unique mineral deposit located near Ochlocknee, Georgia. The minerals in this region feature a large, highly active surface area well suited for the removal of impurities from oil streams.



PROVEN & RELIABLE PERFORMANCE

- Strong affinity for adsorbing soaps, phospholipids, and trace metals
- Potential reduction in bleaching clay use
- Effective on a variety of feedstock oils
- Promotes higher flash point, lower cloud point, and glycerin removal in biodiesel

select[®]:edible oil

PRODUCTS

select[®]:350

select[®]:450

Our edible oil technology maximizes the adsorption of impurities that negatively impact oil quality. Using Select may also allow for the reduction of bleaching earth used in your process.

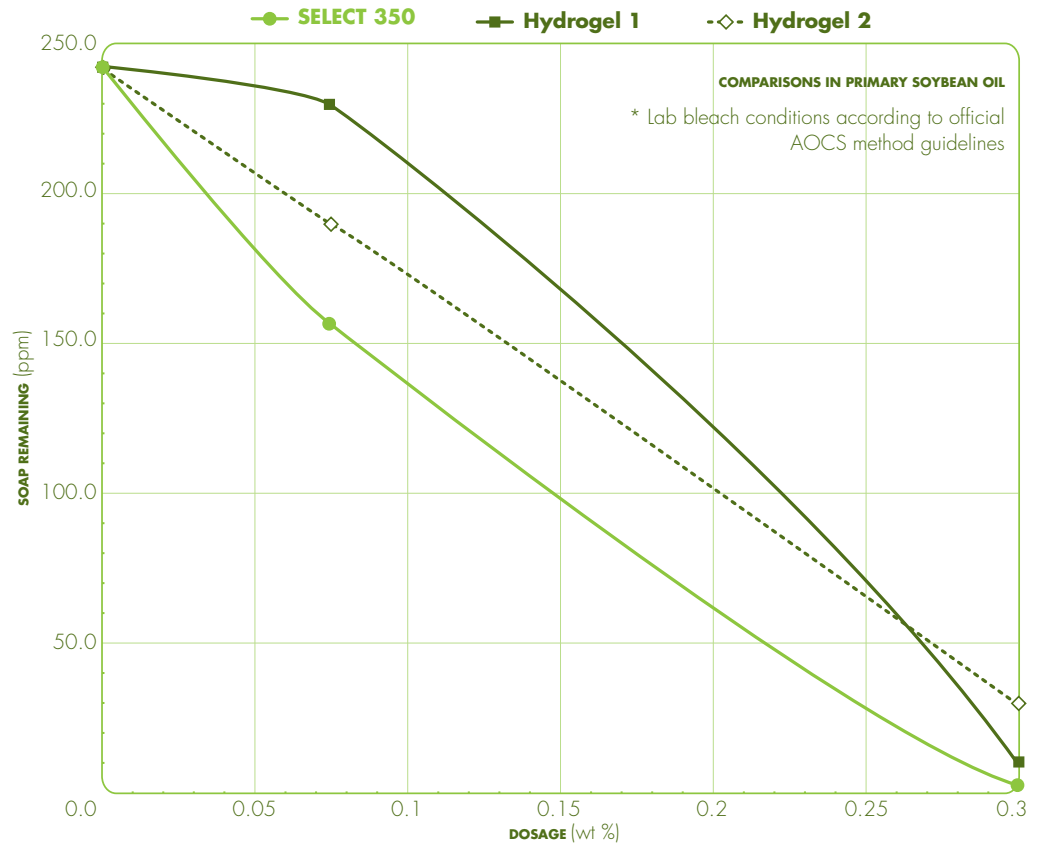


PURIFICATION OF CANOLA OIL

Adsorption of Phosphorus, Trace Metals & Soaps

Canola ORIGINAL	350 SELECT	Hydrogel 1	Hydrogel 2	Pretreat ADSORBENT
8.7	0.0	0.0	2.4	P (ppm)
3.0	0.3	0.4	1.1	Mg (ppm)
15.9	0.1	0.7	6.1	Ca (ppm)
0.0	0.0	0.0	0.0	Fe (ppm)

SOAP REDUCTION VS. DOSAGE





PROCESSING OPTIONS

For Edible Oils

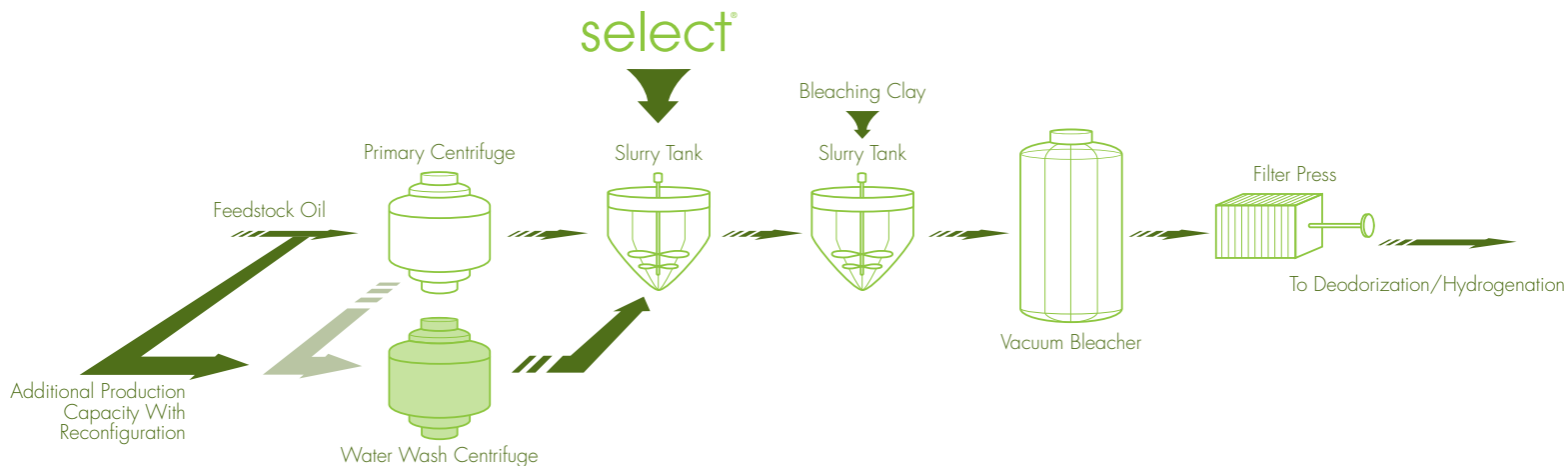
Select offers flexibility to customize and simplify your edible oil production process. By treating with Select, the water wash centrifuge can be eliminated or reconfigured as a second primary centrifuge, allowing for increased production.

Select adsorbents are also well suited to physical refining processes where free fatty acids are removed by distillation in the deodorization stage.

The following pages illustrate how Select fits into refining processes and details the optimum conditions and process benefits for each refining method.

CENTRIFUGE RECONFIGURATION

Process Diagram for Elimination of Waste Water



- 1** A pretreat of phosphoric or citric acid is recommended for maximum removal of Phosphorous, Calcium, and Magnesium.
- 2** The recommended dosage of Select can either be added continuously or in a batch process (adequate agitation is necessary to keep the slurry mixture in suspension).
- 3** Material may be filtered in a single filtration system (with bleaching clay) or filtered in a dual filtration system prior to bleaching clay addition.

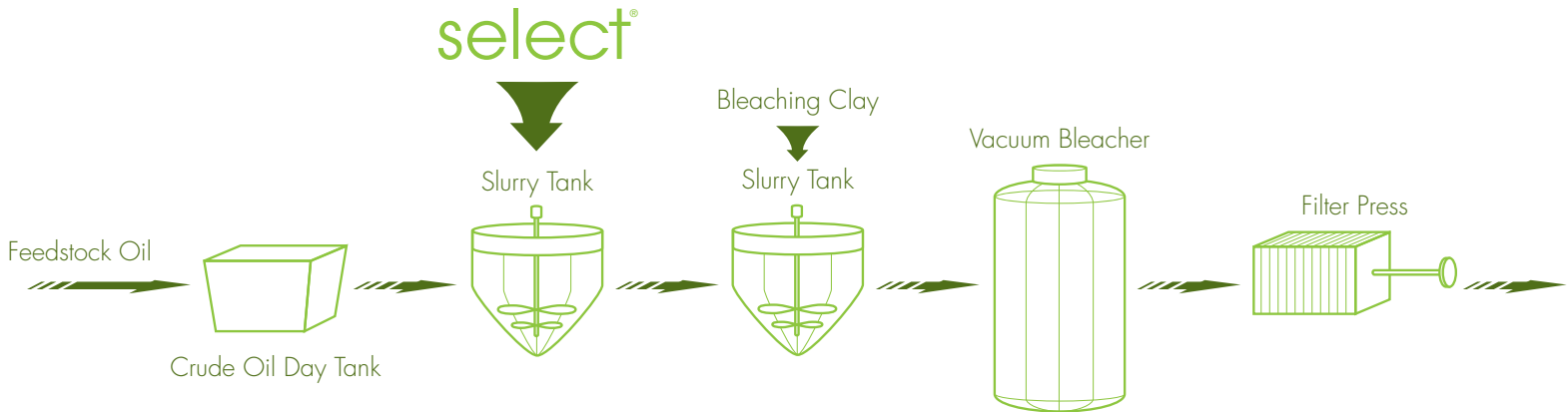
BENEFITS & OPTIMUM CONDITIONS

- Reduction of operating and disposal costs
- Improved finished oil quality
- Potential to increase production capacity

350 SELECT	450 SELECT	ADSORBENT
0.05% - 0.15%	0.05% - 0.15%	Dosage (Wt./Wt. /Oil)
160° F - 180° F 70° C - 80° C	160° F - 180° F 70° C - 80° C	Oil Temperature (at Addition) (Degrees)
20 - 30	20 - 30	Slurry Tank Residence Time (Minutes)
0.15% - 0.30%	0.15% - 0.30%	Oil Moisture (Wt./Wt. Oil)
100 - 500	100 - 500	Recommended Soap Level of Oil (post Primary Centrifuge, prior to Select Addition) (ppm)

PHYSICAL REFINING

Process Diagram



- 1** Oil pretreated with 500-1000 ppm citric acid or phosphoric acid.
- 2** For continuous processes, add Select at the recommended dosage, upstream from the bleaching clay addition system. *
- 3** For a batch processes, add Select at the recommended dosage, followed by bleaching clay addition after 20 minutes. *

** Both processes require adequate agitation to keep the slurry mixture in suspension.*

BENEFITS & OPTIMUM CONDITIONS

Physical refining is a recommended method for use in the production of palm oil.

350 SELECT	450 SELECT	ADSORBENT
0.1% - 0.5%	0.1% - 0.5%	Dosage (Wt./Wt. /Oil)
167° F - 185° F 75° C - 85° C	167° F - 185° F 75° C - 85° C	Oil Temperature (at Addition) (Degrees)
20 - 30	20 - 30	Slurry Tank Residence Time (Minutes)
0.15% - 0.30%	0.15% - 0.30%	Oil Moisture (Wt./Wt. Oil)

select[®]:biodiesel

PRODUCTS

select[®]:350

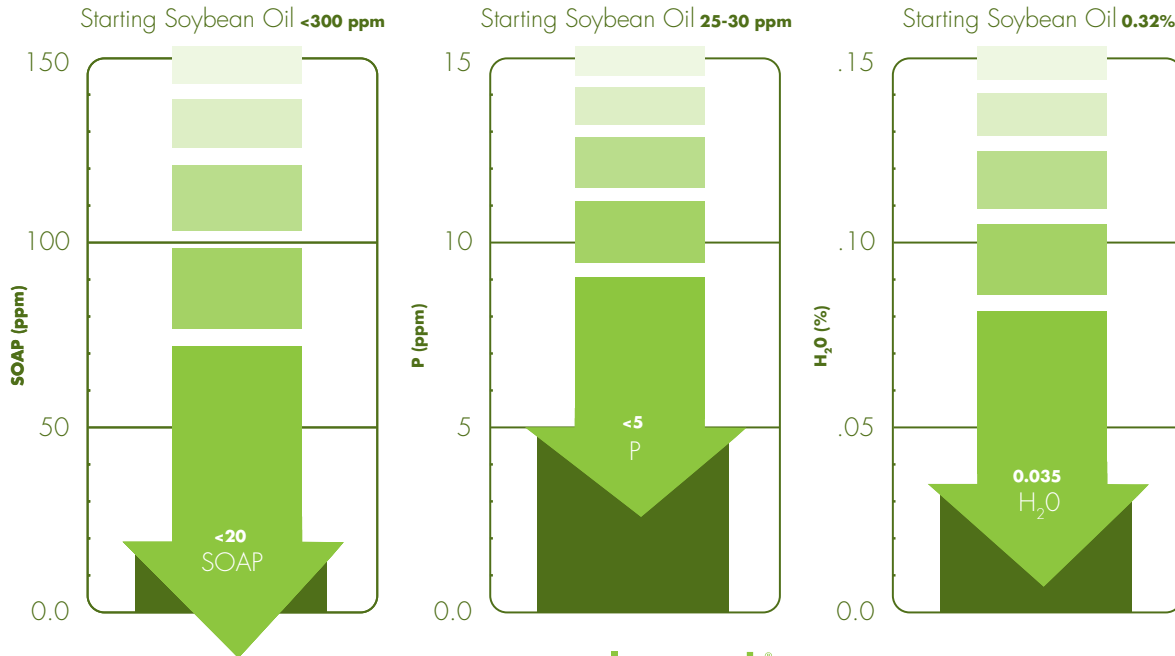
select[®]:450

Our selective adsorbent is a natural silicate designed to attract and bind unwanted compounds helping your fuel to pass industry specifications.

Select removes unwanted soaps, metals and other impurities from feedstock oils with or without the use of a water wash centrifuge.



EFFECTIVE AT A LOW DOSAGE



select®

OPTIMUM CONDITIONS

Select effectively removes problematic soaps from feedstock oil streams at a low dosage. For optimal efficiency, soaps off the primary centrifuge in the refinery should be in a working range of 100 to 500 ppm. Soap levels in oil dictate sorbent dosage, working ranges of 0.1% to 0.3%.

350
SELECT

ADSORBENT

0.15%

Dosage
(Wt./Wt. /Oil)

175° F
79.4° C

Oil Temperature
(Degrees)

30

Slurry Tank Residence Time
(Minutes)

210° F

Vacuum Dried & Filtered
(Degrees)

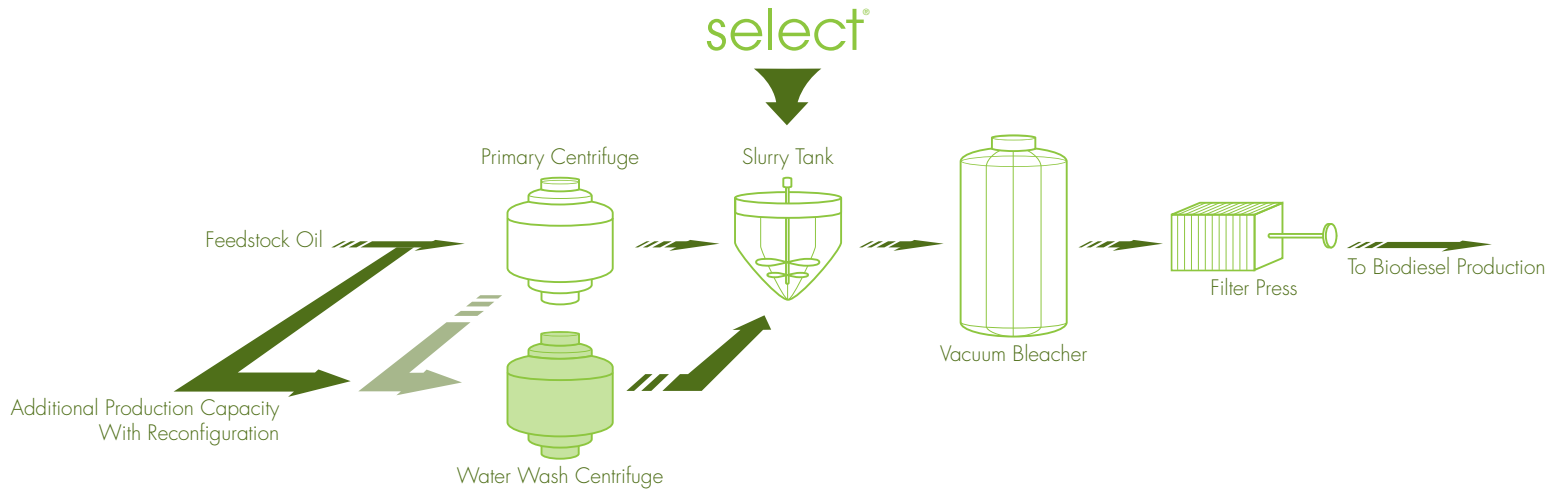


PROCESSING BIODIESEL

Select's role in biodiesel production is to purify feedstocks and allow for efficient conversion into biodiesel fuel. The diagram on the following page illustrates the options for using Select to purify feedstocks.

REFINING FOR BIODIESEL

Process Diagram & Optimum Conditions



OPTIMUM CONDITIONS

For optimal efficiency, before bleaching, caustic refine oil in order to reduce free fatty acids (FFAs).

350
SELECT

100 - 500

Control Soaps (Off Primary Centrifuge)
(ppm)

165° F - 185° F
73.89° C - 85° C

Oil Temperature
(Degrees)

0.1 - 0.3
**INTRODUCING
SORBENT**

Oil Moisture
(%)

0.025

Dosage Range (per 100 ppm Soap)
(wt.%)

20 - 30

Contact Time
(Minutes)

0.05 - 0.10
**DURING
FILTERING**

Oil Moisture
(%)



PRODUCT OPTIONS & SPECIFICATIONS

Typical Properties

This chart represents an overview of the Select product line. Finished product characteristics may vary. Contact us if you require more detailed information on our products.

350 SELECT	450 SELECT	Product
<5.0	10.50	Free Moisture Wt. % @ 105°C
3.6	3.2	pH (5% Suspension)
20.00	20.00	Particle Size (> 75 Microns) Wt.%

select[®]
adsorbent technology



THE TRUSTED SOLUTION

Customers around the world count on
Select's adsorbent properties to help meet
product specifications.



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