



pure:flo<sup>®</sup>  
bleaching earths



Mineral sample from Ochlocknee, Georgia

# BLEACHING EARTHS

## For Edible Oils

Pure-Flo® products offer edible oil refiners processing aids to produce clean, clear, quality oils. Pure-Flo is classified in three product families; Natural™, Supreme™, and Perform®. Our product families provide refiners with a range of performance options depending on oil type and process.

Pure-Flo products originate from a unique mineral deposit located near Ochlocknee, Georgia. The clay in this region features a large, highly active surface area well suited for the removal of color bodies and impurities from edible oils.

# PROVEN & RELIABLE PERFORMANCE

- Efficient removal of chlorophyll and color bodies
- Fast filtration with long filtration cycles and less pressure build-up at cycle end
- Reduce free fatty acid rise and the associated risk of damaged oil





# natural<sup>TM</sup>

bleaching earths



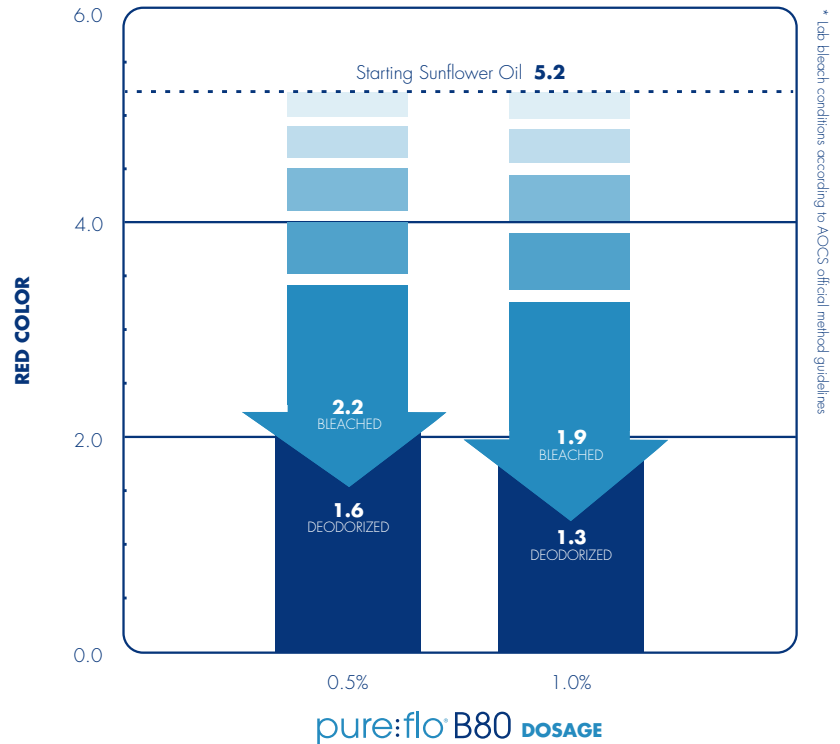
## PRODUCTS

pure:flo<sup>®</sup> B80

Pure-Flo Natural products use our clay's inherent properties to remove impurities in oil without the use of chemical additives. Because these products are naturally active there is no danger of mineral acid carryover in finished oils.

# A NATURAL APPROACH

This chart illustrates how the introduction of a typical dosage (between 0.5% and 1.0%) of Pure-Flo B-80 during the bleaching and deodorizing process can help achieve a significant reduction in red color in sunflower oil.







# supreme<sup>TM</sup>

bleaching earths

## PRODUCTS

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supreme:B81

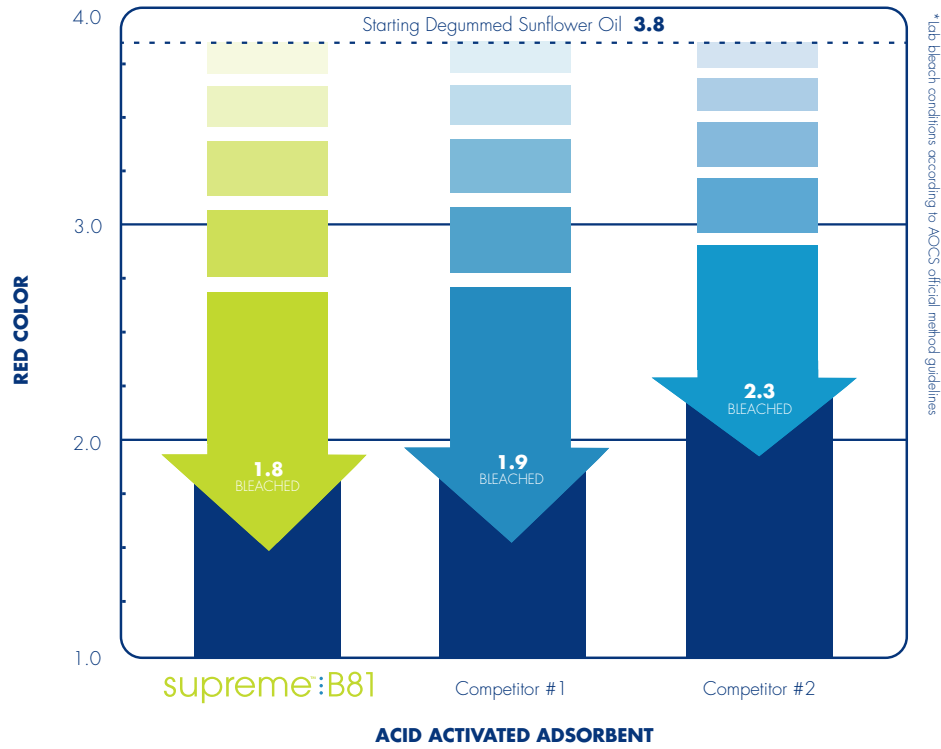
supreme:55

pro:active

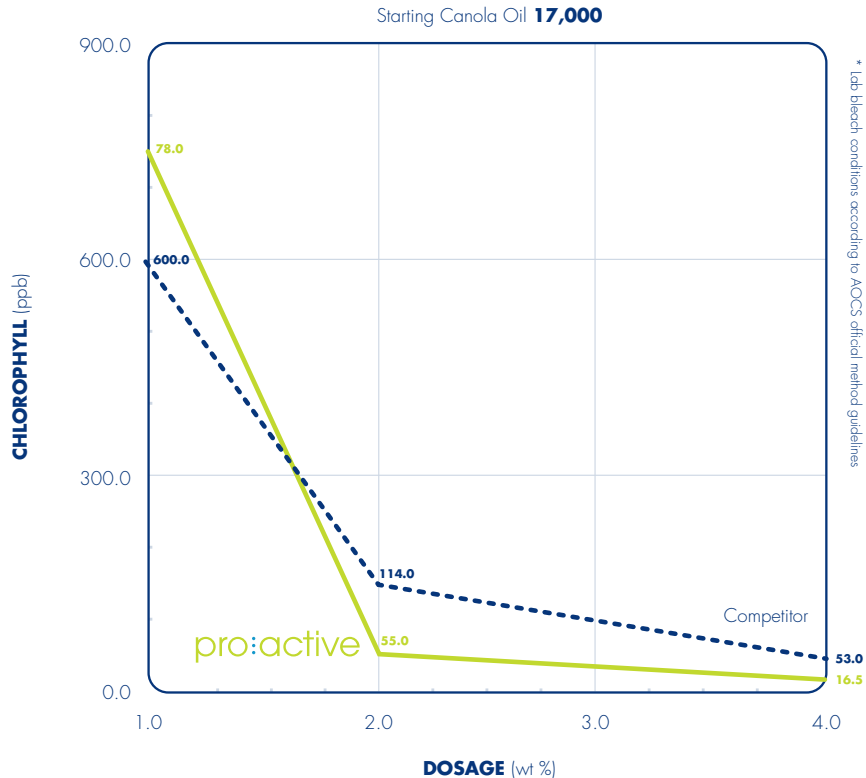
Pure-Flo Supreme products are surface activated to optimize clarification of difficult to bleach oils with high levels of chlorophyll and problematic color bodies.

# BLEACHING POTENTIAL

This is an example of Supreme B-81's ability to remove red color from sunflower oil. In this instance, a typical dosage of 0.5% was used in the bleaching process.



# CHLOROPHYLL REMOVAL



This chart compares Pro-Active's chlorophyll adsorption to a competitor at a variety of dosages.







## PRODUCTS

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perform:4000

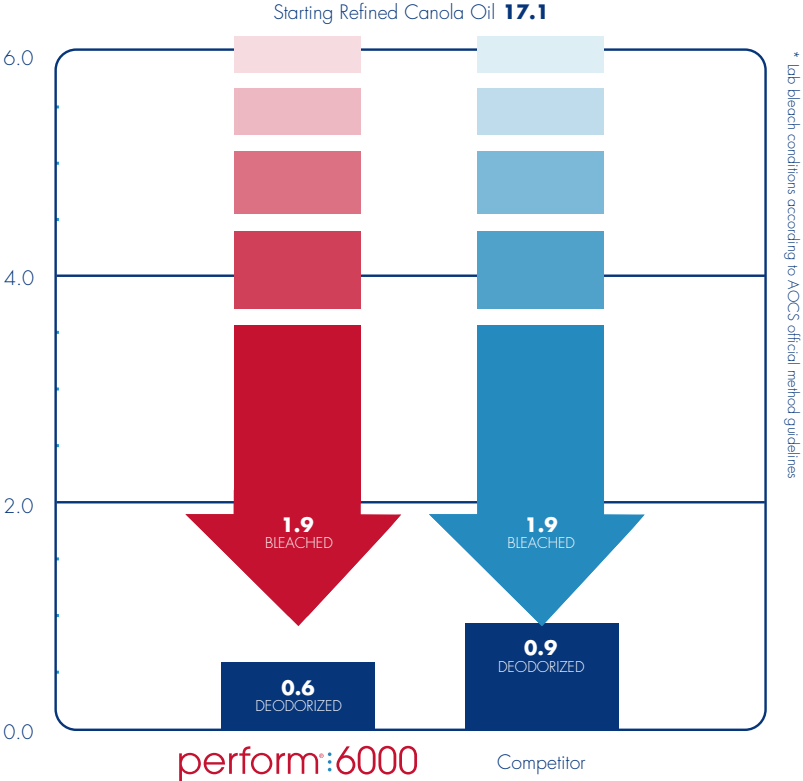
perform:5000

perform:6000

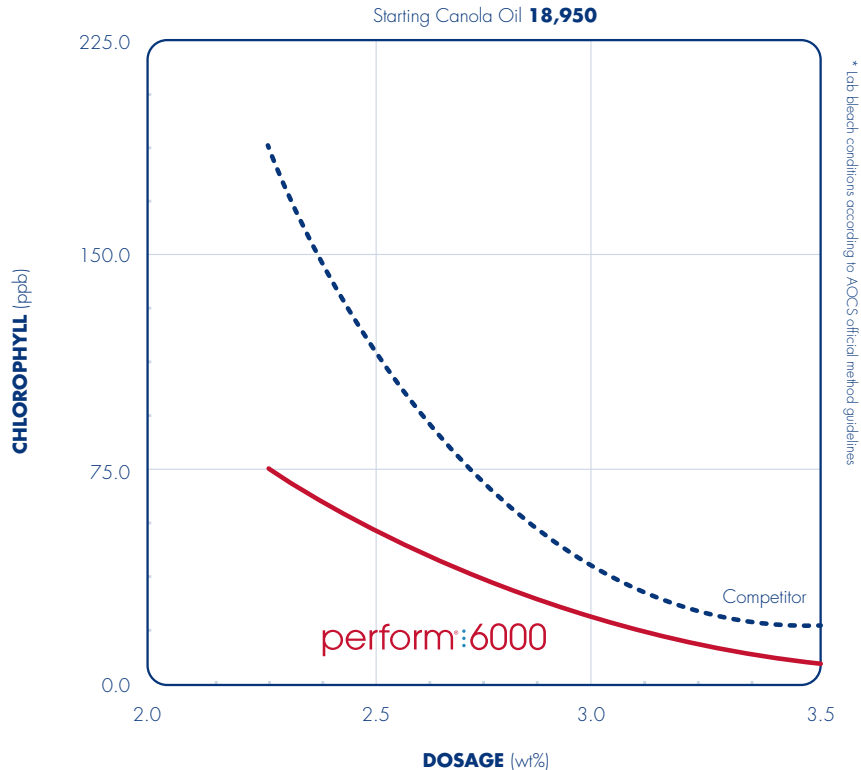
Our Perform products are highly activated to purify extremely difficult to bleach oils with the most challenging levels of chlorophyll and color bodies.

# IMPROVED REDUCTION IN RED COLOR

In this lab test, Perform 6000 outperformed its competitor at 2.75% dosage while the competitive product was applied at 3.50%.



# GREATER CHLOROPHYLL REMOVAL



This chart compares Perform 6000's chlorophyll adsorption to a competitor at a variety of dosages.

# OIL COLOR VALUES



This chart provides a guideline for selecting Pure-Flo products based on oil type and their respective level of problematic colors requiring removal. Your sales representative can help you determine the best solution for your specific needs.

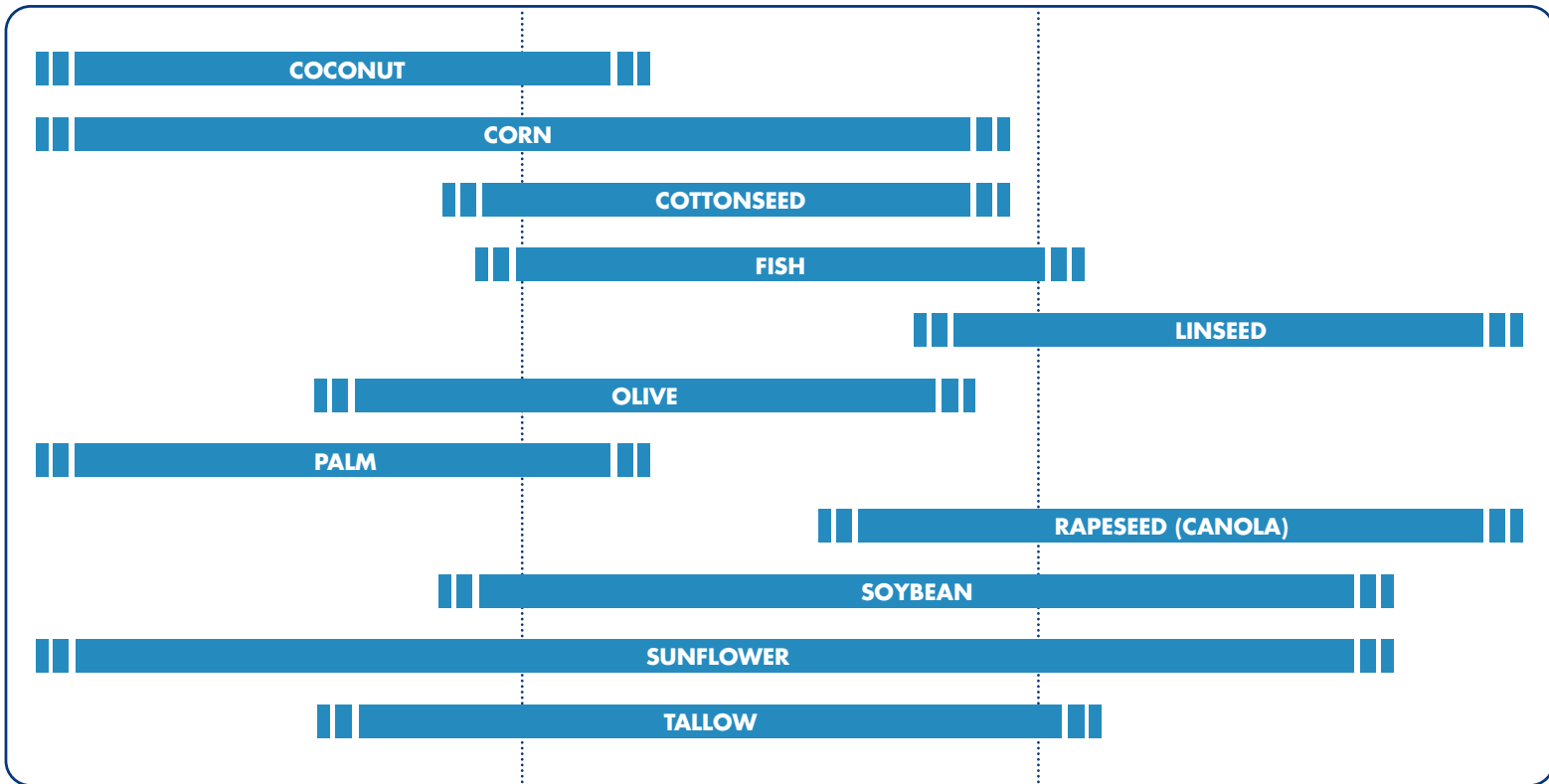




natural™

supreme™

perform®



Bleachability of Oil

# PRODUCT OPTIONS

## Typical Properties

This chart represents an overview of the Pure-Flo product line. Finished product characteristics may vary. Contact us if you require more detailed information.

<b>B80</b> NATURAL	<b>B81</b> SUPREME	<b>55</b> SUPREME
15.50	15.50	15.50
7.2	4.4	3.0
43.0 lbs./ft <sup>3</sup> 688.0 g/l	43.0 lbs./ft <sup>3</sup> 688.0 g/l	46.0 lbs./ft <sup>3</sup> 736.0 g/l
83.00%	77.00%	46.00%

Product				
PROACTIVE SUPREME	4000 PERFORM	5000 PERFORM	6000 PERFORM	
15.50	10.50	10.50	10.50	Free Moisture wt. % @ 105°C
3.0	2.9	2.7	2.5	pH (5% solids in D.I.H <sub>2</sub> O)
43.0 lbs./ft <sup>3</sup> 688.0 g/l	41.0 lbs./ft <sup>3</sup> 656.0 g/l	43.0 lbs./ft <sup>3</sup> 688.0 g/l	40.0 lbs./ft <sup>3</sup> 640.0 g/l	Tamped Density
77.00%	77.00%	70.00%	70.00%	Particle Size U.S. Standard Sieve: Through 325 Mesh (Less than 45 Microns) wt.%

# QUALITY STANDARDS & CERTIFICATIONS



HACCP  
Registered

Our manufacturing process includes modern hygiene controls at every stage in the production of Pure-Flo products. Our controls follow the HACCP approach consistent with EU Regulations. The HACCP system used in our production process is certified by NSF,

an independent certification organization. Pure-Flo products are also certified both Kosher and Hallal for use in food processing.





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bleaching earths



# THE TRUSTED SOLUTION

Customers around the world count on Pure-Flo's  
adsorbent properties to keep their products  
meeting specifications.



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select<sup>®</sup>  
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<sup>®</sup>:edible oil

## PRODUCTS

select<sup>®</sup>:350

select<sup>®</sup>: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.



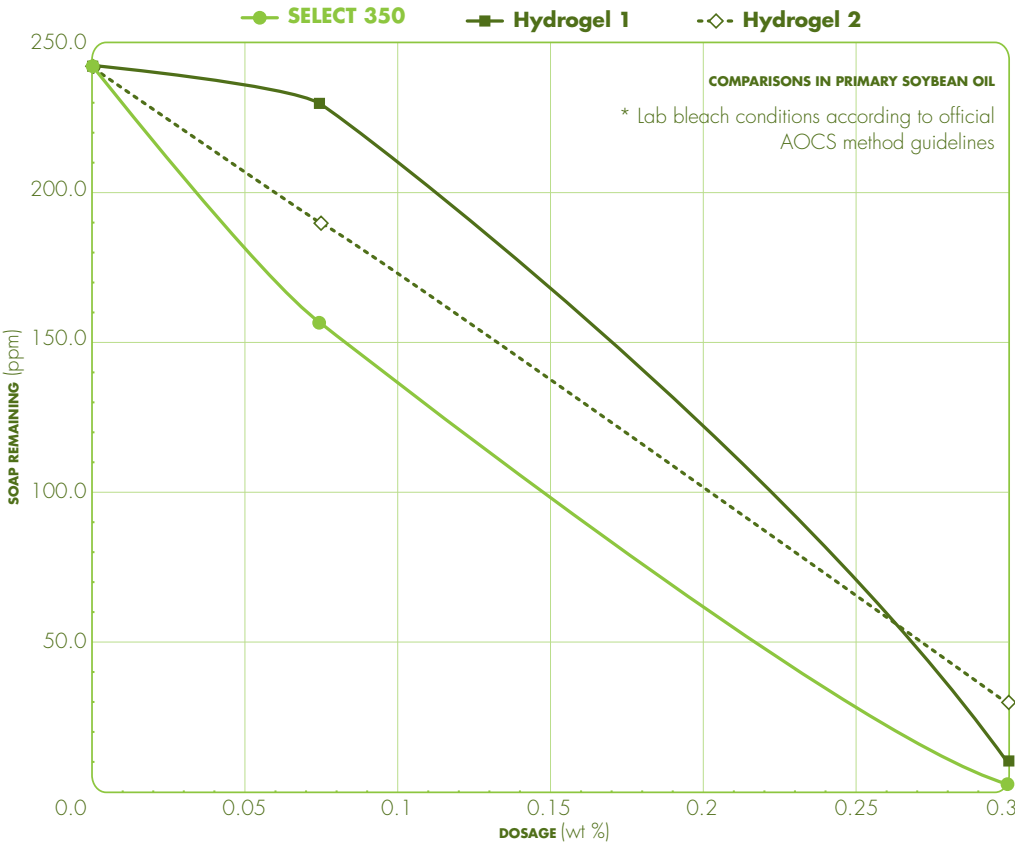


# PURIFICATION OF CANOLA OIL

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

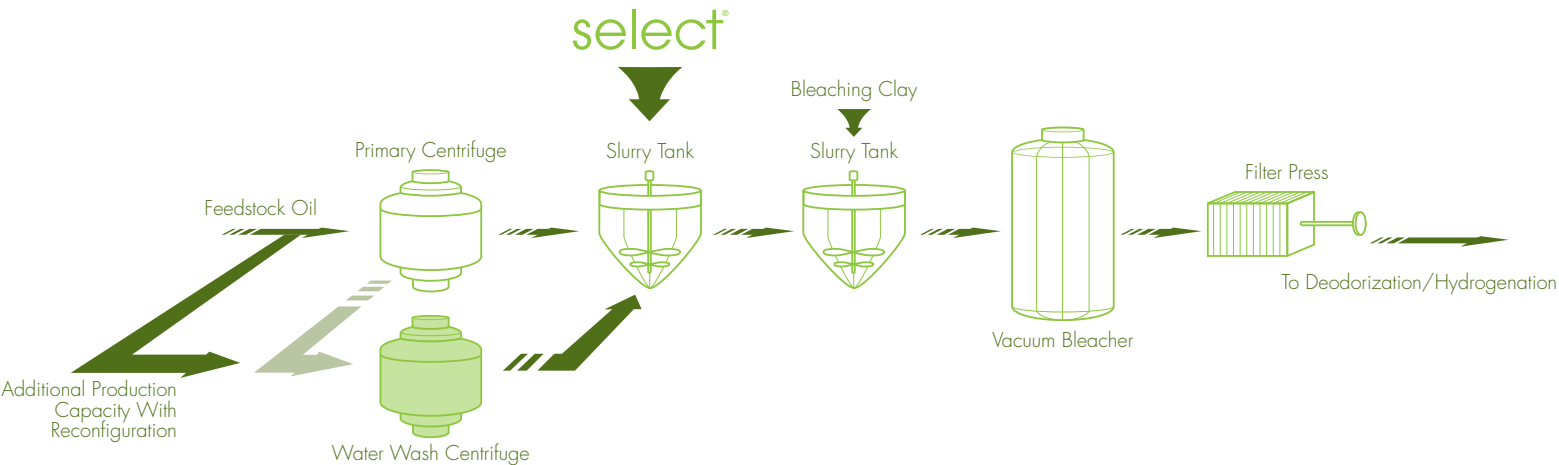
Select offers flexibility to customize and simplify your edible oil production process. By treating with Select, the water wash centrifuge can be eliminated or reconfigured as a second primary centrifuge, allowing for increased production.

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.

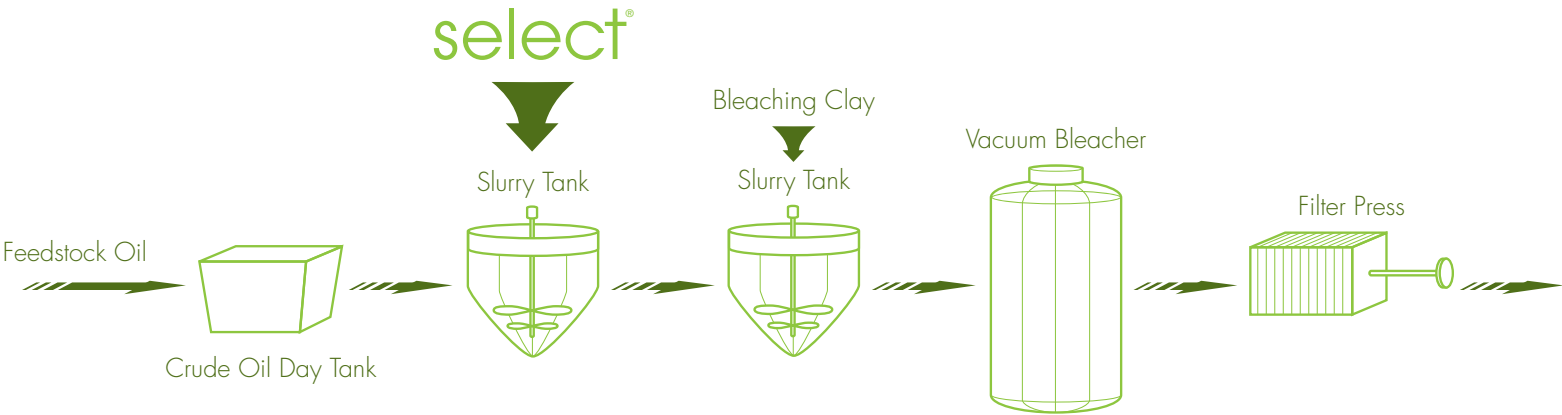
# BENEFITS & OPTIMUM CONDITIONS

- 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<sup>®</sup>:biodiesel

## PRODUCTS

select<sup>®</sup>:350

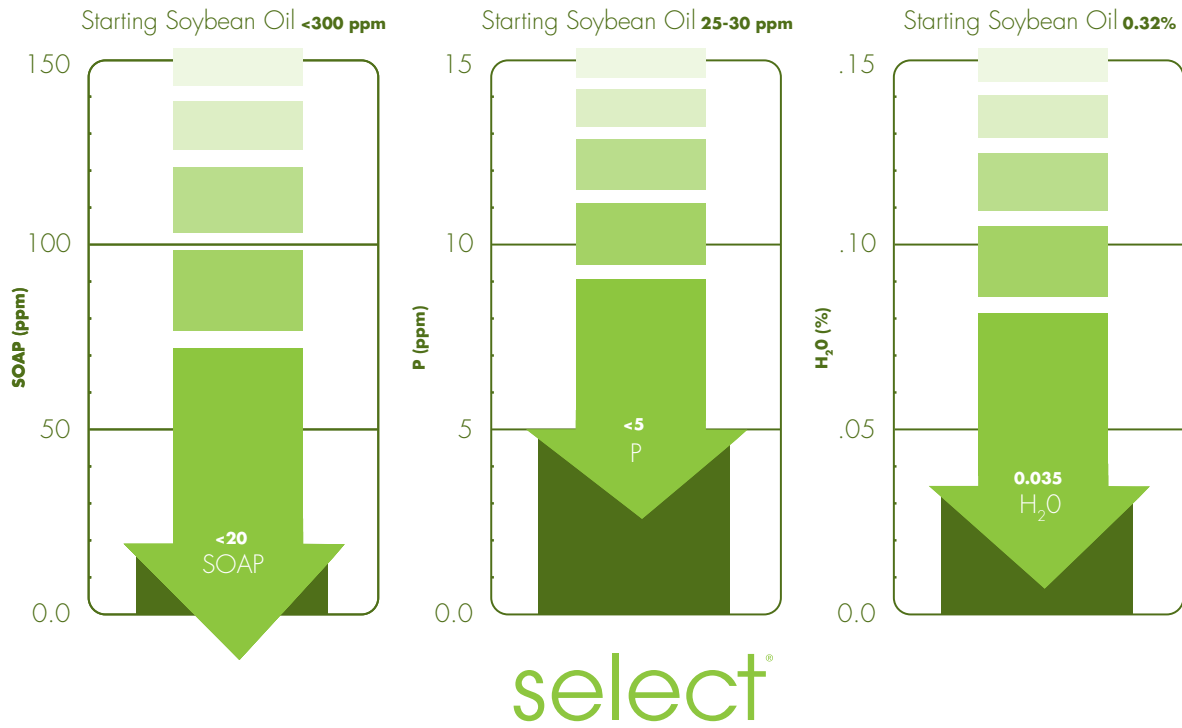
select<sup>®</sup>:450

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



# 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%.

<b>350 SELECT</b>	<b>ADSORBENT</b>
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)

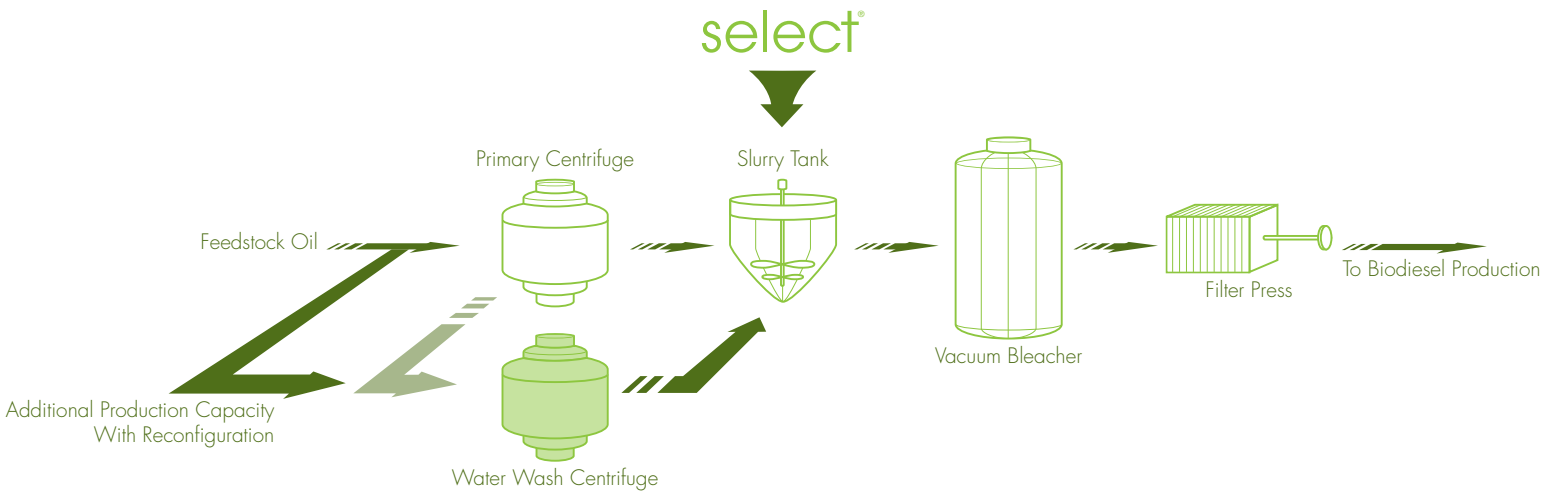


# PROCESSING BIODIESEL

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.%





## THE TRUSTED SOLUTION

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



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