

Take water out of the equation... *Dry Wash™* your biodiesel!



## **MAGNESOL® D-SOL** eliminates the need for water wash and...

- **SAVES TIME...**Purify biodiesel in minutes, not hours and with no messy emulsions.
- **SAVES ENERGY...** No drying required.
- **SAVES CAPITAL...**No expensive centrifuges, no large settling tank farms.
- **SAVES DISPOSAL COSTS...**No water waste.

For more about the benefits of MAGNESOL, contact us today!

**DALLAS**  
SPECIALTY ADSORBENTS

# Purification of Biodiesel with Magnesium Silicate Adsorbent Treatment

## Dry Wash™ your biodiesel!

Adsorbent purification (*Dry Wash™*) of mono-alkyl esters with MAGNESOL®, a synthetic magnesium silicate from The Dallas Group, was compared to the traditional water wash purification method followed by drying. Purification with MAGNESOL® proved very competitive to the troublesome water wash method. Methyl esters were derived from feedstocks of degummed soybean, yellow grease and rapeseed using methanol. The methyl esters were then separated from the glycerin and the excess methanol removed. One portion of each ester was water washed and dried, while another portion was treated and filtered with MAGNESOL®. The resulting biodiesel from both the water wash and adsorbent treatment methods were evaluated for the parameters outlined by ASTM D6751 and EN 14214.

### Rapeseed Methyl Esters

Parameter	Specification	Rapeseed Methyl Esters		
		Unwashed, Untreated	1.5% MAGNESOL® R60 Treated	Washed And Dried
<b>ASTM 6751</b>				
Free Glycerin, %	0.020 max	0.134	0.005	0.000
Total Glycerin, %	0.240 max	0.297	0.162	0.162
Carbon Residue, %	0.050 max	0.02	<0.010	<0.010
Sulfated Ash, mass %	0.020 max	0.033	0.000	0.002
<b>EN 14214</b>				
Oxidation stability at 110°C, hours	6.0 min	0.61	2.25	0.49
Metals I Na + K, mg/kg	5.0 max	161.0	4.0	3.0
Metals II Mg + Ca, mg/kg	5.0 max	6.0	0.0	5.0
Soap, mg/kg	None	1593	12	30

### Soybean Methyl Ester

Parameter	Specification	Soybean Methyl Ester		
		Unwashed, Untreated	1% MAGNESOL® (77°C/20 min.)	Washed And Dried
<b>ASTM 6751</b>				
Free Glycerin, %	0.020 max	0.033	0.005	0.002
Total Glycerin, %	0.240 max	0.209	0.191	0.196
Flash Point, °C	130 min	>190	200	163
Water and Sediment, vol. %	0.050 max	0.10	0.04	0.00
Carbon Residue, %	0.050 max	<0.010	<0.010	0.050
Sulfated Ash, mass %	0.020 max	0.000	0.000	0.005
Kinematic Viscosity, cSt@40°C	1.9 - 6.0	4.127	4.097	4.207
Total Sulfur, mass %	0.05 max	0.00006	0.00002	0.00007
Cetane Number	47 min	51.0	51.3	55.9
Cloud Point, °C	Report	0.0	0.0	0.0
Copper Corrosion	No. 3 max	1a	1a	1a
Acid Number, mg KOH/gram	0.80 max	0.32	0.27	0.31
Phosphorus, mass %	0.001 max	0.0007	0.0005	0.0006
<b>EN 14214</b>				
Viscosity at 40°C, mm2/sec	3.5 min - 5.0 max	4.1	4.1	4.2
Oxidation stability at 110°C, hours	6.0 min	0.5	3.7	0.2
Methanol content, %	0.2 max	0.113	0.011	<0.001
Metals I Na + K, mg/kg	5.0 max	3	<1	5
Metals II Ca + Mg, mg/kg	5.0 max	0	0	0
Phosphorus content, mg/kg	10.0 max	<1	<1	<1
Soap, mg/kg	None	651	4	13

### Yellow Grease Methyl Ester

Parameter	Specification	Yellow Grease Methyl Ester		
		Unwashed, Untreated	2% MAGNESOL® (77°C/20 min.)	Washed And Dried
Free Glycerin, %	0.020 max	0.063	0.004	0.037
Total Glycerin, %	0.240 max	0.220	0.147	0.185
Flash Point, °C	130 min	>190	200	163
Water and Sediment, vol. %	0.050 max	0.10	0.04	0.00
Carbon Residue, %	0.050 max	<0.010	<0.010	0.050
Sulfated Ash, mass %	0.020 max	0.000	0.000	0.005
Kinematic Viscosity, cSt@40°C	1.9 - 6.0	4.127	4.097	4.207
Total Sulfur, mass %	0.05 max	0.00006	0.00002	0.00007
Cetane Number	47 min	51.0	51.3	55.9
Cloud Point, °C	Report	0.0	0.0	0.0
Copper Corrosion	No. 3 max	1a	1a	1a
Acid Number, mg KOH/gram	0.80 max	0.32	0.27	0.31
Phosphorus, mass %	0.001 max	0.0007	0.0005	0.0006
<b>EN 14214</b>				
Viscosity at 40°C, mm2/sec	3.5 min - 5.0 max	4.1	4.1	4.2
Oxidation stability at 110°C, hours	6.0 min	0.5	3.7	0.2
Methanol content, %	0.2 max	0.113	0.011	<0.001
Metals I Na + K, mg/kg	5.0 max	3	<1	5
Metals II Ca + Mg, mg/kg	5.0 max	0	0	0
Phosphorus content, mg/kg	10.0 max	<1	<1	<1
Soap, mg/kg	None	651	4	13

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