

## Product Information Bulletin

### Gen III 100% Renewable Base Oil—ReGen III - 5 cSt

ReGen III - 5 cSt 100% renewable Group III base oil is derived from very high-quality recycled oil sources and processed using advanced technology to yield Group III high VI product meeting all API licensing and certification requirements for state-of-the-art engine oils. ReGen base oil can be used to produce API SN/GF-5 lubricants and will meet GF-6 which will become available in 2020. GF-6 oils will meet the requirements of modern GDI and turbocharged engines operating on up to E85 gasoline when blended with approved additive systems.

### Specifications

			<b>ReGen III- 5 cSt</b>
<b>Parameter</b>	<b>Unit</b>	<b>Test Method</b>	<b>Group III</b>
Colour ASTM		ISO 2049	0.5
Density 15°C	kg/m <sup>3</sup>	EN ISO 12185	855
Viscosity 40°C	mm <sup>2</sup> /s	EN ISO 3104	31.4
Viscosity 100°C	mm <sup>2</sup> /s	EN ISO 3104	5.7
Viscosity Index		ISO 2909	123
Neutralization Number	mg KOH/g	DIN 51 558-1	
Flashpoint COC	°C	ISO 2592	207
Pour Point	°C	ISO 3016	-13
Noack Evaporation Loss	wt.%	DIN 51 581	11.7
Sulfur	wt.%	EN ISO 14596	<0.03
Copper Corrosion	3h/100°C	EN ISO 2160	
CA	%	DIN 51 378-K	

### Applications

ReGen base oils are intended for formulating automotive engine oils meeting the latest API and ILSAC specifications including GF-5 and SN. These base oils will also meet future engine oils requirements that will be introduced in 2020. ReGen base oils can also be used to formulate diesel engine oils such as API FA-4 and CK-4. All API Base Oil Interchange guidelines for Group III base oils apply to this product. Additional applications include industrial oils, tractor hydraulic fluids, transmissions fluids, process oils and greases.

## Certification for ILSAC GF-5/API SN Plus

### Gen III Oil Final Formulations

			ILSAC GF-5 / API SN PLUS	
			LBR-021594-A-01	
			5W-30	
Components	kV100, cSt *	lbs/gal	% wt.	% vol.
Gen III (5.35 cSt Group III) Base Oil	5.35	7.136	83.5	82.6
DI Package with PPD	--	8.1	8.5	9.5
Non-Dispersant Viscosity Modifier	--	7.12	8	7.9
	100	0	100	100

### Base Oil Blend Properties

### Results

B.O., Kinematic Viscosity @ 100°C, cSt (calc., for Seq. IX)			5.35
B.O. Viscosity Index (calc.)			122
B.O. Sats (calc)			98.2
B.O. Sulfur (Calc.)			0.015

### Physical and Chemical Tests

### Limits / Targets

Kinematic Viscosity @ 100°C, cSt	9.3 -- 12.5	D445	10.99
Kinematic Viscosity @ 40°C, cSt		D445	
Viscosity Index		D2270	
CCS, cP @ -30°C	6600 max	D5293	5984
Pumping, cP @ -35°C	60,000 max	D4684	21,300
HTHS @ 150°C, cP	(2.9 min)	D4683	3.22
Noack Volatility, evaporation loss, 1 hr. @ 250°C, %	15 max.	D5800	9.0
Simulated Distillation Volatility @ 371°C, %	10 max.	D6417	

## Elemental Analysis

## Limits / Targets

Phosphorus, wt. %	0.077	D4951	0.0769 (0.08 max)
Sulfur, wt. %	0.5 max	D6622 / D4951	0.3
Zinc, wt. %	0.085	D4951 / D5185	0.085
TBN, mg KOH/g	7.3	D2896	7.3

## Bench Tests

CCS @(°C), cP	Report	D5293	14,000 (-30)
Pumping @(°C), cP	60,000 max.	D4684	25,000 (-30)
Yield Stress, Pa Shear Stability	< 35	D4684	<35
Kin. Viscosity after 30 Pass Shearing, cSt		D6278	(8.5 min)
		D6278	
Sulfated Ash, wt. %	0.92	D874	
TEOST MHT, Total Deposits, mg	(By Result)	D7097	25.8 (BOI)
TEOST 33, Total Deposits, mg	(By Result)	D6335	27.6 (BOI)
IR Spectra			yes