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### **SOR to implement ISO Base Oil Viscosity System**

Effective from the 1<sup>st</sup> of July 2006, Southern Oil Refineries has renamed its base oil products in line with the ISO Standard (ASTM D6074-99). We have chosen the name “SORBO” for Southern Oil Refineries Base Oil for our base oil product codes, and our products will now be presented as: SORBO XX where XX represents the ISO standard viscosity for the base oil.

Until now we have used the Saybolt Seconds base oil naming system. This system uses the kinematic viscosity measured at 100 degrees Fahrenheit in Saybolt Universal Seconds (SUS) to define the base oil grade. Thus SN 150 would be a solvent neutral base oil with a kinematic viscosity of 150 SUS at 100 °F (approximately 40 degrees Celsius).

In SI units kinematic viscosities are measured in centistokes (cSt), and the ISO Standard uses the kinematic viscosity measured at 40 degrees Celsius expressed in centistokes to define a base oil. Thus ISO 32 base oil has a kinematic viscosity of 32 cSt at 40 °C. The acceptable tolerance for each product is plus or minus ten percent of the noted viscosity.

### **SORBO 32 and SORBO 52**

SOR currently produces two grades of base oil being SN150 and SN 300 for which our future ISO standard names will be:

- SORBO 32, an ISO 32 base oil (equivalent to SN 150); and
- SORBO 52, an ISO 52 base oil (equivalent to SN 300).

### **Very Heavy Base Oil – SORBO 110**

The SOR refinery at Bomen near Wagga Wagga is currently undergoing a major upgrade (the Refinery Development Project). Part of the scope of this project is to increase recovery of distillates from the used oil including a much heavier grade lube distillate. This heavier lube distillate will be recovered separately from the other distillate products. It will subsequently undergo solvent treatment to produce a new base oil product. Computer modelling has indicated that this product will be in the range ISO 100 to 120 grade (ie SORBO 110, equivalent to SN 500). This product is expected to be tested and market ready by the second quarter of 2007.

### **Very Light Base Oil – SORBO 12**

Currently our refinery produces a high-grade light distillate product currently sold into the fuel oil market (‘gas oil’). Initial trials indicate we are able to further process this distillate to produce an ISO 12 base oil, ie SORBO 12, equivalent to SN 70. We still have some

process and specification development work to do to ensure quality and production consistency before we formally release this product to our customers, however with the updates occurring as part of the Refinery Development Project, we expect to formally release SORBO 12 in the course of the next six months.

## SORBO Specifications

The main product specifications for our proposed base oil portfolio including our current and development products is as follows although full scope product specifications are available on request from SOR for these products.

Southern Oil Refineries Base Oil Specifications						
Property	Units	Method	SORBO 12	SORBO 32	SORBO 52	SORBO 110
Specification Status			Draft	Final	Final	Draft
Colour	-	ASTM D1500	1.0 max	2.0 max	3.0 max	4.0 max
Appearance	-	ASTM D4176	Clear & Bright	Clear & Bright	Clear & Bright	Clear & Bright
Kinematic Viscosity	CSt @ 40°C	ASTM D445	11 - 13	28 - 35	47 - 57	100 - 120
Kinematic Viscosity	CSt @ 100°C	ASTM D445	2.7 - 3.3	4.5 - 5.5	6.3 - 7.7	10.0-12.0
Viscosity Index (VI)	-	ASTM D2270	99 min	99 min	99 min	99 min
VI (typical)	-	ASTM D2270	102	106	106	110
Flash Point, PMCC	°C	ASTM D93	150 min	200 min	200 min	220 min
Total Acid Number	mg(KOH)g <sup>-1</sup>	ASTM D974	0.03 max	0.03 max	0.03 max	0.03 max
Saturates (typical)	%W/W	ASTM D2007	85	83	81	79
Ash	%W/W	ASTM D482	0.01 max	0.01 max	0.01 max	0.02 max

Note: These specifications are subject to revision from time to time

## SORBO Market Development

We anticipate contacting all of our current customers in current weeks to discuss these changes and welcome feedback on any aspect of this Technical Bulletin

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