

Report Number:	1500914	ATTN:	Customer Name
Received Date:	7/7/2015	Company:	Company
Report Date:	7/10/2015		Address
Lubricants:	Quincy Quinsyn Plus Aeon 9000 SP Sullair Sullube 32		
Analyst:	Monika Malcolm		

### Summary of Findings:

The Quincy Quinsyn Plus/Aeon 9000 SP mixture did not show signs of incompatibility as defined by requested testing. The Sullube 32/Aeon 9000 SP mixture also did not show signs of incompatibility as defined by requested testing. Although the observation of the Sullube 32/Quinsyn Plus mixture immediately after heating did not show signs of incompatibility (as defined by requested testing), the observation of this sample separating into two fluid phases at room temperature both before and after heating would be a concern and should be considered when deciding whether to mix these two products.

### Background:

In order to consolidate plant lubricants, it was desired to determine if screw compressor lubricants currently in use are compatible. The three lubricants currently in use are Quincy Quinsyn Plus, Aeon 9000 SP, and Sullair Sullube 32. The requested testing was defined as preparing 50:50 mixtures of the three lubricants, heating the mixtures to 160 F for one hour, and then observing the mixtures for visible indications of incompatibility such as cloudiness, separation, or formation of deposits or sediment immediately following the heating period.

### Analysis:

Quincy Quinsyn Plus/Aeon 9000 SP Mixture:

A 50:50 mixture of Quincy Quinsyn Plus and Aeon 9000 SP was prepared. The mixture was initially observed to be clear and absolutely bright, with no sediment. The mixture was heated to 160 F (71 C) while being stirred. The mixture was then held at temperature with stirring for one hour. At the end of the heating period the mixture was again observed to be clear and absolutely bright, with no sediment.

Sample mixture	Quinsyn Plus/Aeon 9000 SP			
Time at which sample reaches temperature	12:30 pm			
Time at which test is ended	1:30 pm			
Observations: clear and bright, no sediment both after mixing and after heating.				
Sediment rating after heating:				
0 No Sediment	1 Very Slight Sediment	2 Slight Sediment	3 Heavy Sediment	4 Appreciably More Sediment than 3
Clarity rating after heating:				
0 Absolutely Bright	1 Bright	2 Very Slight Cloud	2.5 Medium Moderate Cloud	
3 Moderate Cloud	4 Heavy Cloud	5 Detectable Floc	6 Heavy Floc	

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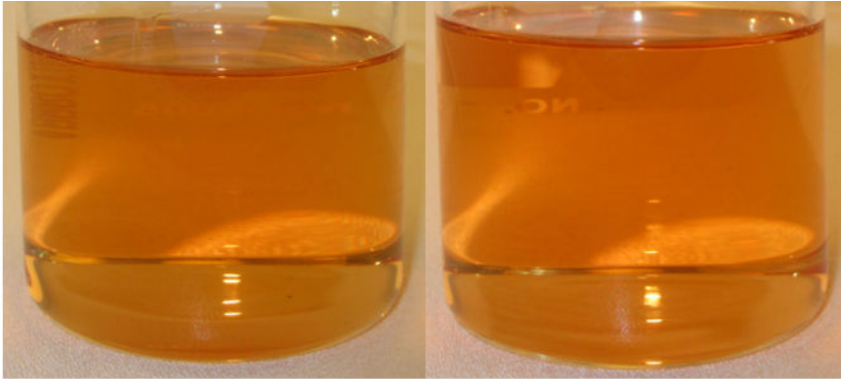


Figure 1 Quinsyn Plus/Aeon 9000 SP before heating; Quinsyn Plus/Aeon 9000 SP after heating.

## Sullair Sullube 32/Aeon 9000 SP Mixture:

A 50:50 mixture of Sullair Sullube and Aeon 9000 SP was prepared. The mixture was initially observed to be clear and bright, with no sediment. The mixture was heated to 160 F (71 C) while being stirred. The mixture was then held at temperature with stirring for one hour. At the end of the heating period the mixture was again observed to be clear and bright, with no sediment.

Sample mixture	Sullube 32/Aeon 9000 SP			
Time at which sample reaches temperature	1:53 pm			
Time at which test is ended	2:53 pm			
Observations: clear and bright, no sediment both after mixing and after heating.				
Sediment rating after heating:				
0 No Sediment	1 Very Slight Sediment	2 Slight Sediment	3 Heavy Sediment	4 Appreciably More Sediment than 3
Clarity rating after heating:				
0 Absolutely Bright	1 Bright	2 Very Slight Cloud	2.5 Medium Moderate Cloud	
3 Moderate Cloud	4 Heavy Cloud	5 Detectable Floc	6 Heavy Floc	

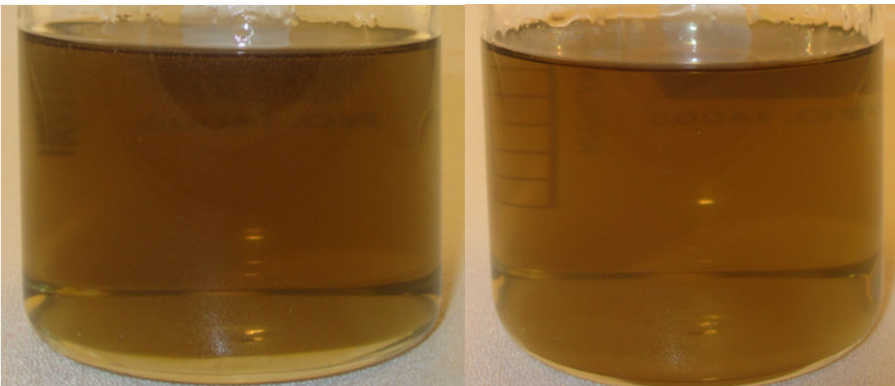


Figure 2 Sullube 32/Aeon 9000 SP before heating; Sullube 32/Aeon 9000 SP after heating.

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## Sullube 32/Quinsyn Plus Mixture:

A 50:50 mixture of Sullair Sullube 32 and Quincy Quinsyn Plus was prepared. The mixture was observed to be cloudy immediately after mixing. The mixture sat at room temperature for approximately one hour before heating. During that time, the mixture was observed to separate into two fluid layers. The mixture was heated to 160 F (71 C) while being stirred. The mixture was then held at temperature with stirring for one hour. At the end of the heating period the mixture was observed to be clear and bright, with no sediment and no fluid separation. This sample was allowed to cool for one hour at room temperature, to see if separation would re-occur. Separation was not observed after one hour; however sample did appear to develop cloudiness. This sample was allowed to sit overnight, and was then observed to have separated into two fluid phases once again.

Sample mixture	Sullube 32/Quinsyn Plus			
Time at which sample reaches temperature	3:36 pm			
Time at which test is ended	4:36 pm			
Observations: sample immediately after preparing mixture (before heating) was observed to be medium/moderate cloudy. After ~1 hour settling period the sample separated into two fluid layers. Upon heating with stirring, the two fluid layers mixed. At the end of the heating period the sample was observed to be clear (bright) with no separation. After one hour of sitting at room temperature, the sample was observed to be cloudy. After sitting overnight the sample was observed to have separated into two fluid phases again.				
Sediment rating after heating:				
0 No Sediment	1 Very Slight Sediment	2 Slight Sediment	3 Heavy Sediment	4 Appreciably More Sediment than 3
Clarity rating after heating:				
0 Absolutely Bright	1 Bright	2 Very Slight Cloud	2.5 Medium Moderate Cloud	
3 Moderate Cloud	4 Heavy Cloud	5 Detectable Floc	6 Heavy Floc	

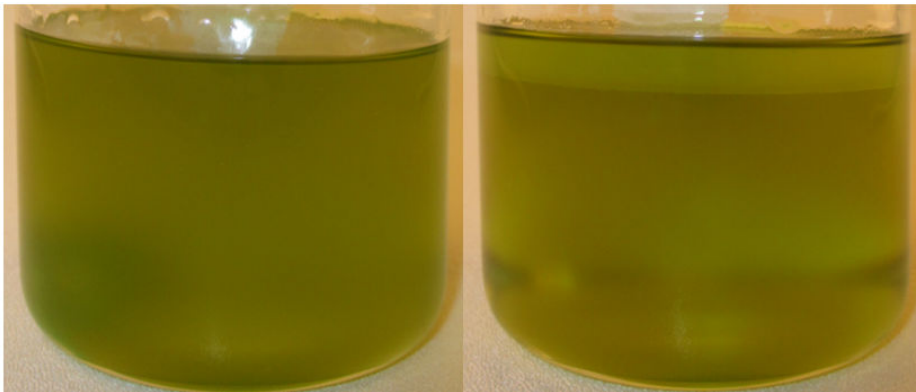


Figure 3 Sullube 32/ Quinsyn Plus before heating (cloudy) and before heating (fluid separation).

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*Figure 4 Sullube 32/Quinsyn Plus after heating, after one hour cool down, and after overnight at room temperature.*

**Questions:**

Analysis completed by Monika Malcolm. For questions please e-mail [mmalcolm@testoil.com](mailto:mmalcolm@testoil.com).

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