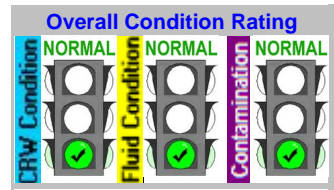


C Code : 14032  
 U S Name :  
 T O M E R Address : 12th Floor, 1910  
 New Petchburi Road, Bangkapi, Huakwang, Bangkok 10320  
 Site :  
 Location :  
 Test code : 812 911.2

Unit ID : Thermal Oil Boiler  
 Unit Type : HOT OIL  
 Unit Make : GETABEC  
 Unit Model : TOH 08140 SN 0253  
 Oil type/ Viscosity : BP TRANSCAL N  
 Oil System Capacity : 1500 Liters



**Notes (Finding, Evaluation, Interpretation, Suggestion and Recommendation)**

Note increase in flash point levels since last sample was analyzed.  
 TAN appear in normal working range.  
 Contamination levels are improving.  
 No oil change recommended at this time, oil appears suitable for further use.  
 Recommend resample in 3 months from the time this sample was taken, to monitor.

Wasan C / Andy Sitton

		Current Sample			Previous Sample			Baseline and Alarm Limit									
Condition History		Wear	Oil	Cont.	Wear	Oil	Cont.	Wear	Oil	Cont.	Alarm Limit						
		(N)	(N)	(N)	(N)	(C)	(C)	(N)	(C)	(C)	Alarm Limit Matrix - Set Name (Equipment type / oil type) Heat Transfer Oil General BP Transcal N						
Lab ID	Test Method Result	150867			142526			137179									
Bottle ID		none			none			none									
Date Sampled		23-Dec-10			23-Aug-10			07-Jun-10									
Oil Hours (Kms)		25 days			Not Given			Not Given									
Unit Hours (Kms)		Approx 7 years			Not Given			Not Given									
Oil Added (Liters)					Not Given			Not Given									
Filters Hours (Kms)																	
<b>Corrosion, Rust and/or Wear Condition (CRW Condition)</b>												Reference Oil (RO)	RDE fine		RFS coarse		
Wear Element	Method	Unit	RDE fine	RFS coarse	RDE fine	RFS coarse	RDE fine	RFS coarse	RDE fine	RFS coarse	U-Caution	U-Warning	U-Caution	U-Warning			
Iron	D-6595	PPM	4.6	38.7	1.5	62.9	0.7	12.4	0		>50	>100	>50	>100			
Chromium	D-6595	PPM	0.4	0.2	0.0	0.9	0.0	0.4	0		>20	>40	>20	>40			
Lead	D-6595	PPM	0.0	0.0	0.0	0.5	0.0	1.9	0		>30	>60	>30	>60			
Copper	D-6595	PPM	0.6	0.1	0.0	0.2	0.0	0.1	0		>40	>75	>40	>75			
Tin	D-6595	PPM	0.7	0.0	0.0	0.0	0.0	0.8	0		>10	>40	>10	>40			
Aluminum	D-6595	PPM	0.3	0.8	0.0	2.3	0.0	0.3	0		>20	>40	>20	>40			
Nickel	D-6595	PPM	0.0	0.0	0.0	0.5	0.0	0.0	0								
Silver	D-6595	PPM	0.0	0.0	0.0	0.1	0.0	0.0	0		>10	>40	>10	>40			
Molybdenum	D-6595	PPM	0.2	0.6	0.0	0.8	0.0	0.7	0								
Titanium	D-6595	PPM	0.0	0.2	0.0	0.5	0.0	0.0	0								
<b>Fluid Condition and Safety in Use</b>												RO	L-Warning	L-Caution	U-Caution	U-Warning	
Viscosity @ 40°C	D-445	cSt	31.6	C	30.2		32.0	C	29.4		<26.5	<27.9	>30.9	>32.3			
Viscosity @ 100°C	D-445	cSt															
Oxidation	FTIR	Abs	6.4		7.1	C	6.7	C	2.6				>6.5	>7.8			
Nitration	FTIR	Abs	5.1		5.3		5.3		3.6				>7.2	>9			
TAN	D-974	mg KOH/g	0.26		0.31		0.21		0.01				>1	>2			
<b>Safety in Use</b>												RO	L-Warning	L-Caution			
Flash Point, closed cup	D-3828	°C	187	C	138	W	188	C	210		<140	<190					
Flash Point, open cup	D-92	°C	214														
Fire Point, open cup	D-92	°C	242														
<b>Contamination</b>												RO			U-Caution	U-Warning	
Water	T-H2O Check™	%(Wt.)	0.018		0.042		0.015		0.020				>0.05	>0.08			
												RDE fine		RFS coarse			
												U-Caution	U-Warning	U-Caution	U-Warning		
Sodium	D-6595	PPM	0		0		0		0				>10	>20			
Silicon	D-6595	PPM	0.0	3.4	0.0	8.6	0.0	5.0	0				>10	>20			
<b>Additional Test</b>												RO	L-Warning	L-Caution	U-Caution	U-Warning	

Note: Alarm Limits are variable and dependent upon dataset size and to be used as general guideline.

No Sign or (N) : NORMAL, (C) or (C) : CAUTION (first level warning limit), (W) or (W) : Warning (second level warning limit)

U-Caution : Upper CAUTION Level, L-Caution : Lower CAUTION Level  
 U-Warning : Upper WARNING Level, L-Warning : Lower WARNING required Level

Baseline will be data of either "The new oil" or "Reference oil" or "Oil specification".

Accuracy of interpretation and recommendation are based on representatives sample and information supplied.



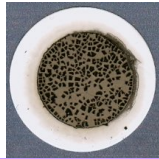

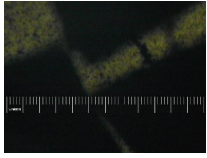
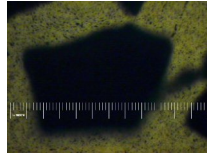
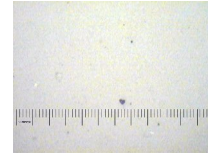
First Level Alarm: Alert Limit in Upper Level and/or Lower Level  
 Second Level Alarm: Alert Limit in Upper Level and/or Lower Level  
 TNO = The new oil, RO = Reference oil, OS = Oil Specification  
 No warranty is expressed or implied for this report.

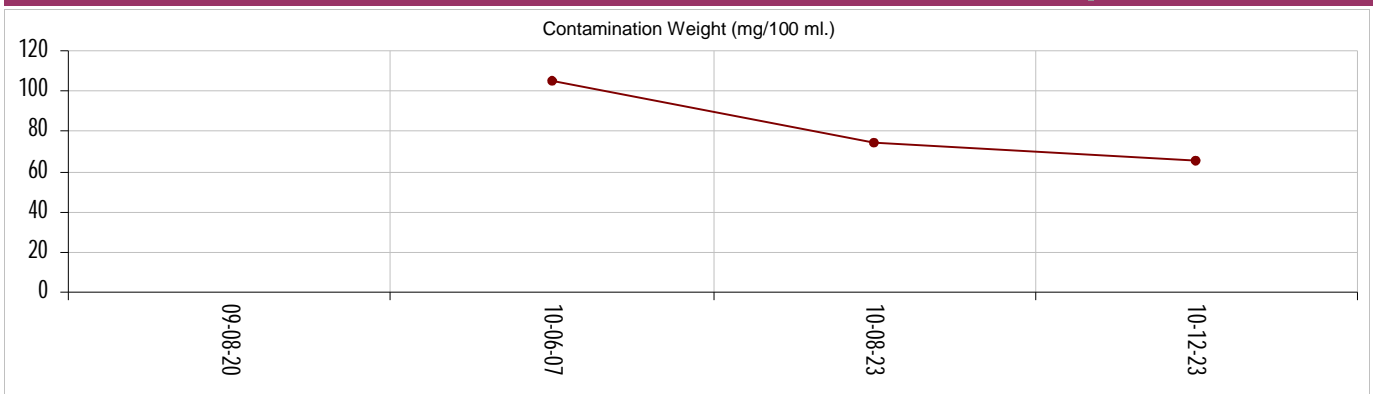
C Code : **14032**  
 U S Name :  
 T O M Address : 12th Floor, 1910  
 E R New Petchburi Road, Bangkapi, Huakwang, Bangkok 10320  
 Site :  
 Location :  
 Test code : 812 911.2

**Unit ID : Thermal Oil Boiler**  
 Unit Type : HOT OIL  
 Unit Make : GETABEC  
 Unit Model : TOH 08140 SN 0253  
 Oil type / Viscosity : BP TRANSCAL N  
 Oil System Capacity : 1500 Liters

**Notes (Finding, Evaluation, Interpretation, Suggestion and Recommendation)**

Contamination levels are improving.  
 Gravimetric analysis (photos shown) indicate the oil is moderately contaminated with sludge, dirt, rust, coking and other debris.

	Current Sample		Previous Sample		
<b>Lab ID</b>	150867		142526		 (Mod. ASTM D-4898)
<b>Bottle ID</b>	none		none		
<b>Date Sampled</b>	23-Dec-10		23-Aug-10		
<b>Oil Hours (Kms)</b>	25 days		Not Given		
<b>Unit Hours (Kms)</b>	Approx 7 years		Not Given		
<b>Oil Added (Liters)</b>					
<b>Filters Hours (Kms)</b>					
<b>Contamination</b>					
<b>Gravimetric Analysis : Test Method for Insoluble Contamination of Fluid</b>					<b>The New Oil (TNO)</b>
Fluid Volume	10	ml	10	ml	10
Filter Type	0.8	micron	0.8	micron	0.80
Photo of Insoluble Contamination Retained on Filter Membrane Disc					
Photo of Insoluble Contamination Retained on Filter Membrane Disc					
Photo of Insoluble Contamination Retained on Filter Membrane Disc - Magnification 100x					
Photo of Insoluble Contamination Retained on Filter Membrane Disc Magnification 100x					
<b>Contaminant Retain on Filter Disk</b>	<b>% Visual Rating</b>		<b>% Visual Rating</b>		<b>% Visual Rating</b>
Grey & Black Metal	20		20		
Copper Base Metal					
Bright & White Metal					
Rust & Corrosion	10		10		
Dirt & Dust	10		10		100
Fibers / Filters / Seals					
Sludge & Varnish					
Coking	60		60		
<b>Contamination Weight (mg/100 ml)</b>	65	mg/100 ml	73.9	mg/100 ml	104.9
					TNO 2    Caution >80    Warning >100



**Gravimetric Analysis:**  
 - determines total solid and soft compound contamination level by weight  
 - identifies particle contamination in oils by microscopic analysis  
 - determines oil contamination level by colorimetric (color density)  
 In brief, will analyze oil cleanliness and source(s) of contamination.

C Code : 14032	Unit ID : Thermal Oil Boiler
U Name :	
S Name :	
T Name :	Unit Type : HOT OIL
O Name :	Unit Make : GETABEC
M Address : 12th Floor, 1910 New Petchburi Road, Bangkapi, Huakwang, Bangkok 10320	Unit Model : TOH 08140 SN 0253
E Site :	Oil type / Viscosity : BP TRANSCAL N
R Location :	
Test code : 812 911.2	Oil System Capacity : 1500 Liters

Lab ID : 150867 Date sampled : 23-Dec-10 Hours on Oil : 25 days Hours on Unit : Approx 7 years Bottle ID : none

**ส่วนที่ 1 : หน้าหลัก**[Section 1 : Main Page](#)

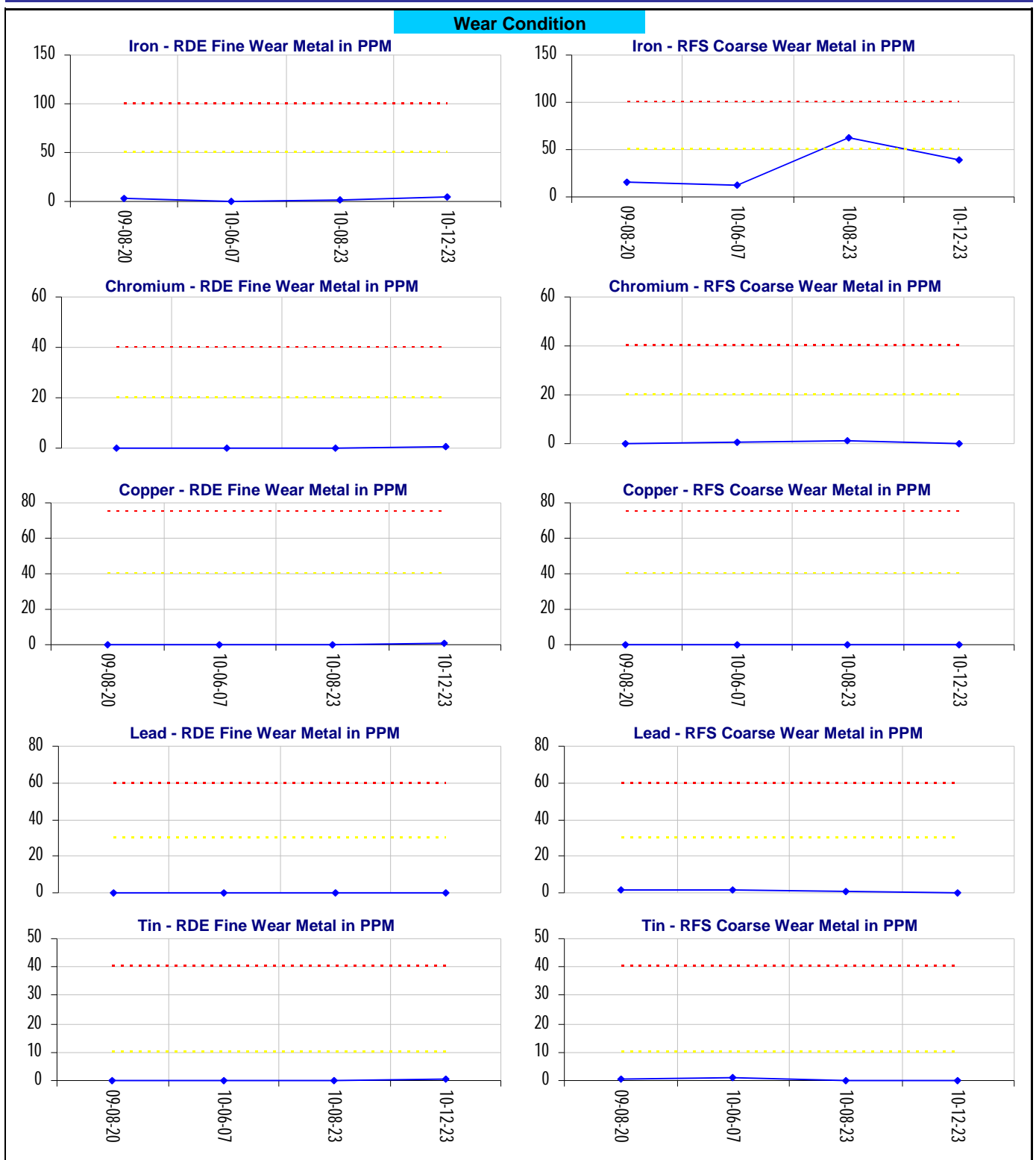
จุดความไฟ เพิ่มสูงขึ้น เมื่อเปรียบเทียบกับผลทดสอบของตัวอย่างครั้งก่อนนี้  
สภาพความเป็นกรดของน้ำมัน ยังอยู่ในช่วงปกติ  
ระดับความสกปรกกำลังได้รับการปรับปรุงให้ดีขึ้น  
แนะนำว่าไม่จำเป็นต้องเปลี่ยนถ่ายน้ำมันในขณะนี้ น้ำมันยังมีสภาพเหมาะสมที่จะใช้งานต่อได้  
แนะนำให้เก็บตัวอย่างซ้ำอีกครั้งภายใน 3 เดือน หลังจากเก็บตัวอย่างครั้งนี้ เพื่อเฝ้าติดตาม

**ส่วนที่ 2 : หน้าที่สอง**[Section 2 : Second Page](#)**ส่วนที่ 3 : หน้าของ Analytical Ferrography**[Section 3 : Analytical Ferrography Page](#)**ส่วนที่ 4 : หน้าของ Gravimetric Page**[Section 4 : Gravimetric Page](#)

ระดับความสกปรกกำลังได้รับการปรับปรุงให้ดีขึ้น  
ผลวิเคราะห์จากการกรองผ่านกระดาษกรอง (แสดงดังภาพ) พบว่าน้ำมันมีการปนเปื้อนปริมาณปานกลางของ ตะกอน ฟันละออง เศษโลหะกัดกร่อน เถ้าคาร์บอน และเศษสิ่งสกปรกอื่นๆ

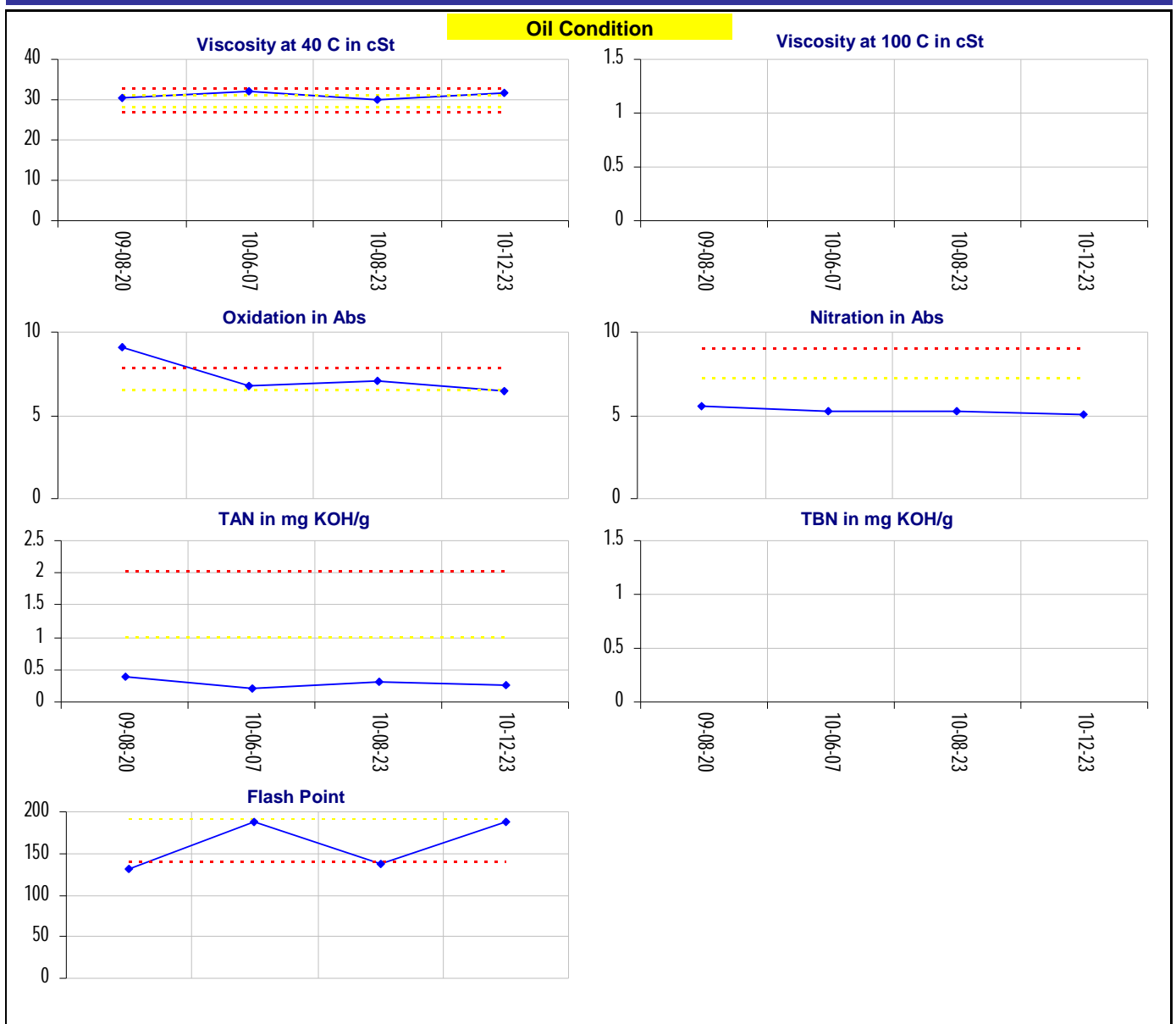
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 U Name :  
 S Address : 12th Floor, 1910  
 T New Petchburi Road, Bangkapi, Huakwang, Bangkok 10320  
 O M  
 E R Site :  
 Location :  
 Test code : 812 911.2

E Unit ID : **Thermal Oil Boiler**  
 O Unit Type : HOT OIL  
 I Unit Make : GETABEC  
 P Unit Model : TOH 08140 SN 0253  
 M  
 E  
 N  
 T Oil type / Viscosity : BP TRANSCAL N  
 L Oil System Capacity : 1500 Liters



C Code : 14032  
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