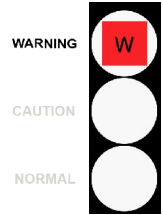


C Code : 21007  
 U Name :  
 T  
 O Address : 4/2, I-8 Road, T.Map Ta Phut,  
 M A. Muang, Rayong 21150  
 E Thailand  
 R Site :  
 Location :  
 Test code : 892

Unit ID : 06 301  
 Unit Type : Hyd Syst Industrial  
 Unit Make : VOGEL  
 Unit Model : ZR80 90 BN50 V2  
 Oil type/  
 I Viscosity : SHELL TELLUS ISO 68  
 L  
 Oil System Capacity : 45 Liters



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

Note abnormal wear metals.  
 All oil conditions and oil tests appear in normal working range.  
 Particle count indicates that oil cleanliness level is in unacceptable range.  
 Recommend check to determine how dirt is entering the system and correct the problem to prevent further dirt entry.  
 Recommend resample in 500 hours from the time this sample was taken, to monitor.

Patcharee K. / Wasan C.

			Current Sample			Previous Sample			Baseline and Alarm Limit														
Condition History			Wear	Oil	Cont.	Wear	Oil	Cont.	Wear	Oil	Cont.	Alarm Limit											
												Alarm Limit Matrix -Set Name (Equipment type / oil type)											
												Hyd Syst General SH Tellus 68											
			RDE fine		RFS coarse		RDE fine		RFS coarse		RDE fine		RFS coarse		RDE fine		RFS coarse						
			U-Caution	U-Warning	U-Caution	U-Warning	U-Caution	U-Warning	U-Caution	U-Warning	U-Caution	U-Warning	U-Caution	U-Warning	U-Caution	U-Warning	U-Caution	U-Warning					
Lab ID	Test Method	Result	222323			216374			210500			0		>10		>17		>10		>18			
Bottle ID			1014340			1008131			1008233			0		>1		>2		>1		>2			
Date Sampled			10-Jul-13			13-May-13			11-Mar-13			0		>5		>9		>6		>10			
Oil Hours (Kms)			Not Given			Not Given			Not Given			0		>43		>75		>30		>55			
Unit Hours (Kms)			Not Given			Not Given			Not Given			0		>2		>3		>3		>6			
Oil Added (Liters)			Not Given			Not Given			Not Given			0		>2		>3		>2		>4			
Filters Hours (Kms)	Not Given			Not Given			Not Given			0		>1		>2		>2		>3					
<b>Wear Condition</b>												Reference Oil (RO)											
Wear Element	Method	Unit	RDE fine	RFS coarse	RDE fine	RFS coarse	RDE fine	RFS coarse	RDE fine	RFS coarse	RO	L-Warning		L-Caution		U-Caution		U-Warning					
Iron	D-6595	PPM	2.6	10.9 C	2.1	8.1	1.8	26.4 W	0	0	68.0	<61.2	<64.6	>71.4	>74.8								
Chromium	D-6595	PPM	0.0	0.0	0.1	0.0	0.1	0.1	0	0	2.5			>3.8		>5							
Lead	D-6595	PPM	0.0	0.0	0.0	0.0	0.0	0.5	0	0	2.8			>4.2		>5.6							
Copper	D-6595	PPM	5.0	0.6	4.5	1.7	3.3	3.0	0	0	0.15			>0.65		>1.15							
Tin	D-6595	PPM	1.0	0.0	0.8	0.0	0.8	0.3	0	0													
Aluminum	D-6595	PPM	0.0	2.2 C	0.0	2.7 C	0.0	0.0	0	0													
Nickel	D-6595	PPM	0.0	0.0	0.1	0.0	0.0	0.0	0	0													
Silver	D-6595	PPM	0.0	0.0	0.0	0.0	0.0	0.1	0	0													
Molybdenum	D-6595	PPM	0.0	0.9	0.0	1.3	0.0	0.0	0	0													
Titanium	D-6595	PPM	0.0	1.2	0.1	2.4	0.0	1.2	0	0													
<b>Oil Condition</b>												RO	L-Warning		L-Caution		U-Caution		U-Warning				
Viscosity @ 40°C	D-445	cSt	68.3			68.3			68.3			68.0		<61.2		<64.6		>71.4		>74.8			
Viscosity @ 100°C	D-445	cSt										2.5				>3.8		>5					
Oxidation	FTIR	Abs	2.2			1.7			3.1			2.8				>4.2		>5.6					
Nitration	FTIR	Abs	1.2			1.2			1.5			0.15				>0.65		>1.15					
TAN	D-974	mg KOH/g.										0				>0.03		>0.05					
TBN	D-4739	mg KOH/g.										0				>15		>27		>10		>18	
<b>Contamination</b>												RO			U-Caution		U-Warning						
Water	T-H2O CheckTM	% (Wt.)	0.018			0.012			0.013			0.010				>0.03		>0.05					
Sodium	D-6595	PPM	1			1			0			0				>15		>27		>10		>18	
Silicon	D-6595	PPM	2.1			3.4			2.3			4.3			0.0			6.2					
<b>Additive Element</b>												RO											
Boron	D-6595	PPM	0			0			0			0											
Magnesium	D-6595	PPM	7			8			7			10											
Calcium	D-6595	PPM	27			26			29			30											
Barium	D-6595	PPM	0			0			0			0											
Phosphorus	D-6595	PPM	195			227			164			200											
Zinc	D-6595	PPM	268			36			320			121			287			42					
<b>Additional Test</b>												RO	L-Caution		L-Warning		U-Caution		U-Warning				
Flash Point	D-3828	°C																					
Viscosity Index	D-2270																						

Note: Alarm Limits are variable and dependent upon dataset size and to be used as general guideline.  
 No Sign or : NORMAL, C or : CAUTION (first level warning limit), W or : Warning (second level warning limit)  
 U-Caution : Upper CAUTION Level L-Caution : Lower CAUTION Level First Level Alarm\_Alert Limit in Upper Level and/or Lower Level  
 U-Warning : Upper WARNING Level L-Warning : Lower WARNING required Level Second Level Alarm\_Alert Limit in Upper Level and/or Lower Level  
 Baseline will be data of either "The new oil" or "Reference oil" or "Oil specification". TNO = The new oil, RO = Reference oil, OS = Oil Specification  
 Accuracy of interpretation and recommendation are based on representatives sample and information supplied. No warranty is expressed or implied for this report.

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 R Thailand  
 Site :  
 Location :  
 Test code : 892

Unit ID : 06 301  
 Unit Type : Hyd Syst Industrial  
 Unit Make : VOGEL  
 Unit Model : ZR80 90 BN50 V2  
 Oil type / Viscosity : SHELL TELLUS ISO 68  
 Oil System Capacity : 45 Liters

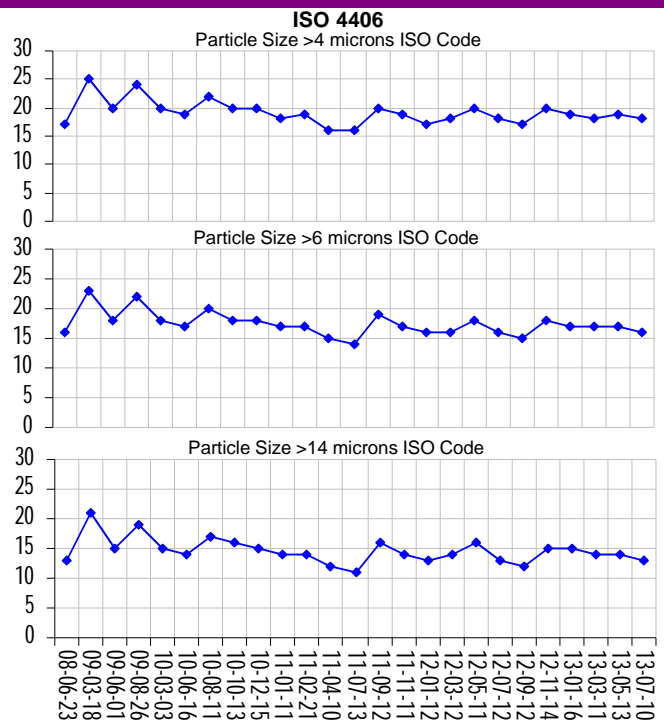
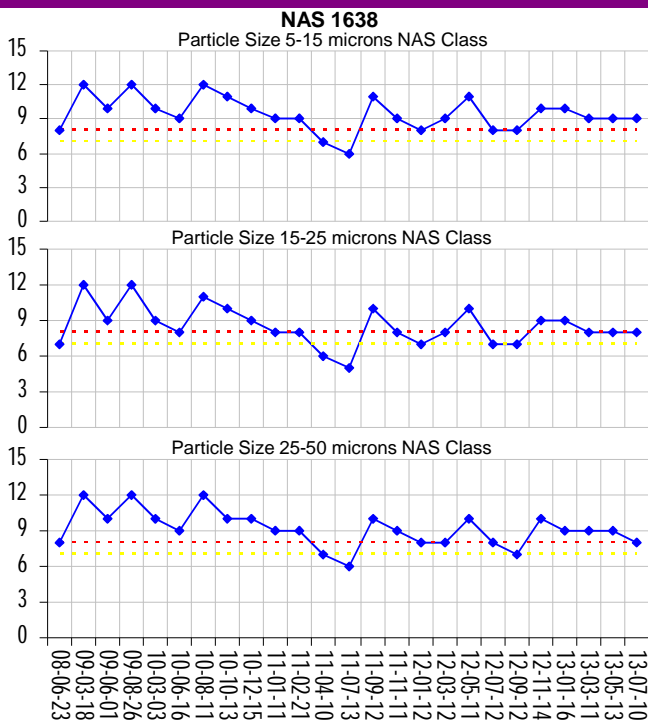
**Notes (Finding, Evaluation, Interpretation, Suggestion and Recommendation)**

Particle count indicates that oil cleanliness level is in unacceptable range.

Lab ID Bottle ID Date Sampled Oil Hours (Kms) Unit Hours (Kms) Oil Added (Liters) Filters Hours (Kms)	Current Sample	Previous Sample		Particle Count
		222323 1014340 10-Jul-13 Not Given Not Given	216374 1008131 13-May-13 Not Given Not Given	210500 1008233 11-Mar-13 Not Given Not Given
				BASELINE
				Alarm Limit
				Hyd Syst General SH Tellus 68

Contamination							U-Caution				U-Warning	
Particle Count NAS 1638 System Standard												
Particle Size Range	No. of Particles / 100ml.	Class	No. of Particles / 100ml.	Class	No. of Particles / 100ml.	Class	Class	No. of Particles / 100ml.	Class	No. of Particles / 100ml.	Class	
Particle Size 5-15 microns	66,400	9 W	97,500	9 W	81,100	9 W		>16000	7	>32000	8	
Particle Size 15-25 microns	6,000	8 W	8,900	8 W	7,400	8 W		>2850	7	>5700	8	
Particle Size 25-50 microns	1,800	8 W	2,500	9 W	2,100	9 W		>506	7	>1012	8	
Particle Size 50-100 microns	100	7	200	8	200	8						
Particle Size >100 microns	<100	6	<100	6	<100	6						

Particle Count ISO 4406:1999 System Standard											
Particle Size Range	No. of Particles / ml.	Class	No. of Particles / ml.	Class	No. of Particles / ml.	Class	Class	No. of Particles / ml.	Class	No. of Particles / ml.	Class
Particle Size > 4 microns	1,991	18	2,923	19	2,433	18					
Particle Size > 6 microns	557	16	818	17	681	17					
Particle Size > 14 microns	78	13	114	14	96	14					
ISO 4406 Class Rating	18 / 16 / 13		19 / 17 / 14		18 / 17 / 14						



C	Code	: 21007	E	Unit ID	: 06 301
U	Name	:	O		
S			U		
T			I		
O	Address	: 4/2, I-8 Road, T.Map Ta Phut, A. Muang, Rayong 21150	P	Unit Type	: Hyd Syst Industrial
M			M	Unit Make	: VOGEL
E			E	Unit Model	: ZR80 90 BN50 V2
R	Site	:	N		
	Location	:	T		
	Test code	: 892		Oil type/ I Viscosity	: SHELL TELLUS ISO 68
			L		
				Oil System Capacity	: 45 Liters

Lab ID : 222323 Date sampled : 10-Jul-13 Hours on Oil : Not Given Hours on Unit : Not Given Bottle ID : 1014340

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

สังเกต-อนุภาคเศษโลหะสึกหรอที่ผิดปกติ  
คุณสมบัติของน้ำมันและผลทดสอบน้ำมันทั้งหมด พบว่าอยู่ในช่วงปกติ  
ผลการตรวจนับอนุภาคสิ่งสกปรกชี้ว่าระดับความสะอาดของน้ำมันยอมรับไม่ได้แล้ว  
แนะนำให้ตรวจสอบว่าที่มาของสิ่งสกปรกเข้าสู่ระบบได้อย่างไร และแก้ไขเพื่อป้องกันสิ่งสกปรกไม่ให้เข้าสู่ระบบอีกต่อไป  
แนะนำให้เก็บตัวอย่างซ้ำอีกครั้งภายใน 500 ชั่วโมง หลังจากเก็บตัวอย่างครั้งนี้ เพื่อเฝ้าติดตาม

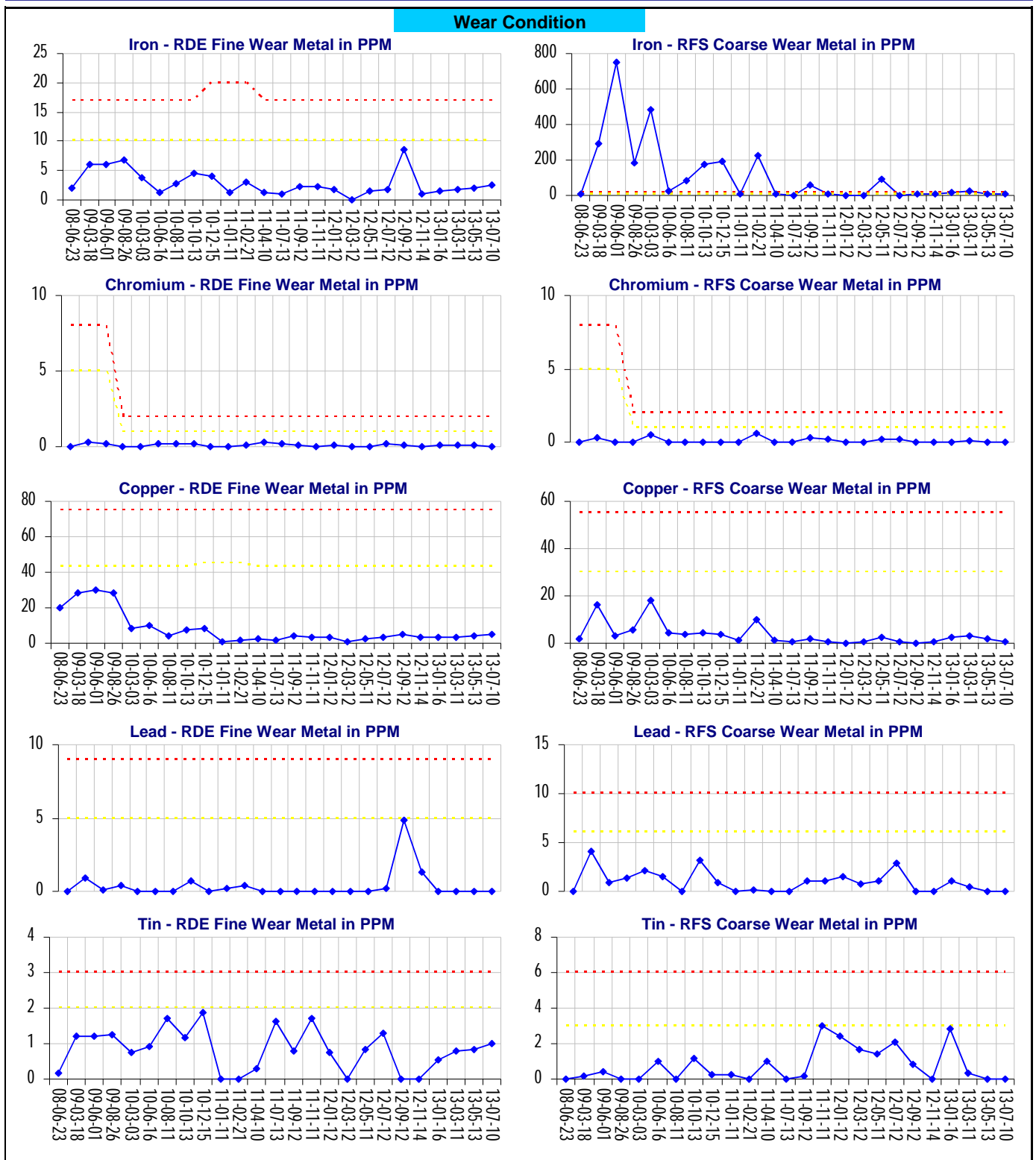
**ส่วนที่ 2 : หน้าของ Particle Count**[Section 2 : Particle Count](#)

ผลการตรวจนับอนุภาคสิ่งสกปรกชี้ว่าระดับความสะอาดของน้ำมันยอมรับไม่ได้แล้ว

**ส่วนที่ 3 : หน้าของ Ferrographic Analysis**[Section 3 : Ferrographic Analysis](#)**ส่วนที่ 4 : หน้าของ Varnish and Sludge Potential**[Section 4 : Varnish and Sludge Potential](#)**ส่วนที่ 5 : หน้าของ Gravimetric Analysis**[Section 5 : Gravimetric Analysis](#)

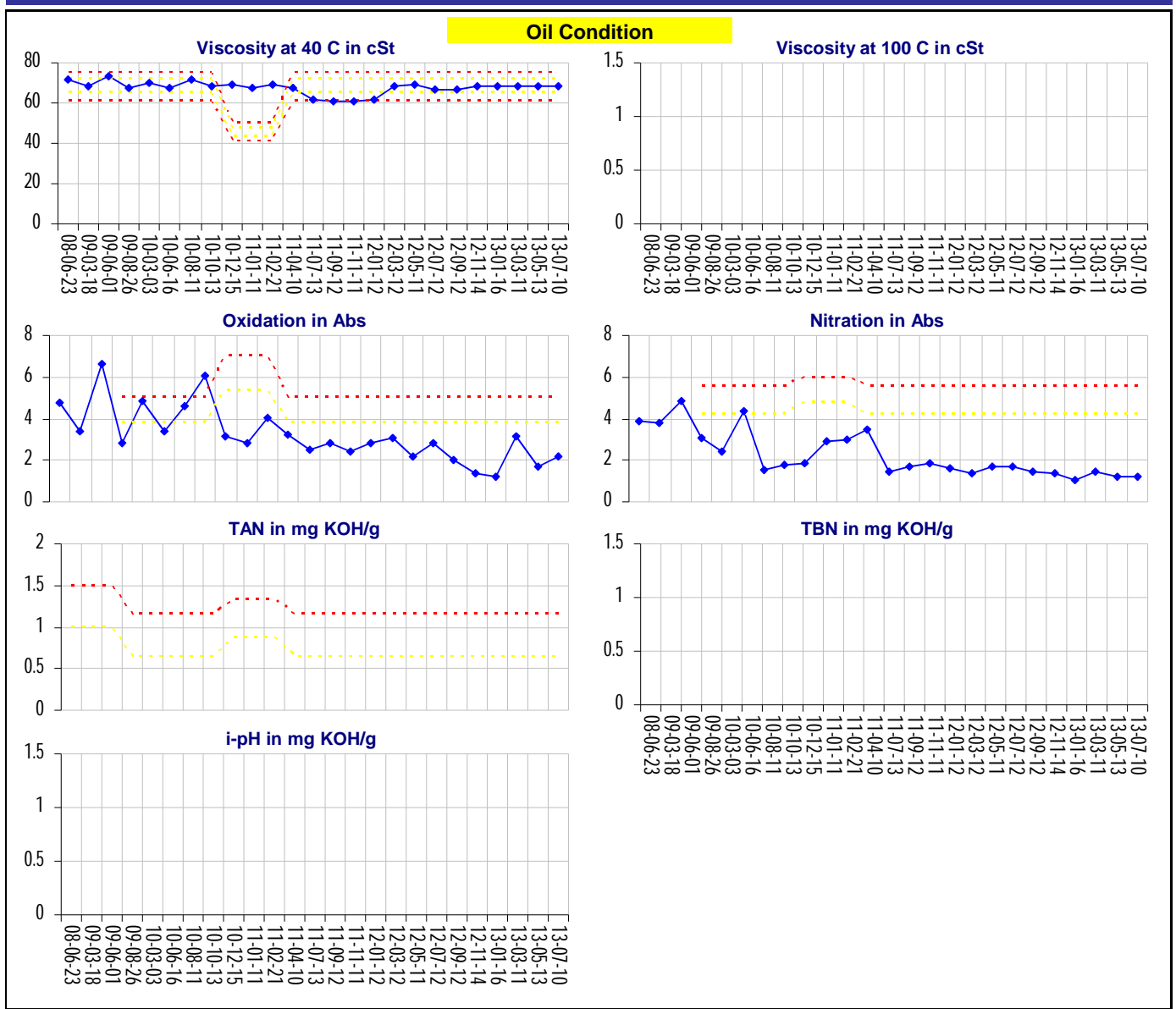
C Code : **21007**  
 U Name :  
 S Address : 4/2, I-8 Road, T.Map Ta Phut,  
 T A. Muang, Rayong 21150  
 M Thailand  
 E Site :  
 R Location :  
 Test code : 892

E Unit ID : **06 301**  
 O Unit Type : Hyd Syst Industrial  
 U Unit Make : VOGEL  
 N Unit Model : ZR80 90 BN50 V2  
 T Oil type / Viscosity : SHELL TELLUS ISO 68  
 L Oil System Capacity : 45 Liters



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