

ALSTOM Power Systems GmbH, Boveristrasse 22, D-68309 Mannheim

Von/From	APG-TTTMC	Datum/Date	29.01.2010
Name	Jutta Angelmahr	Seite/Page	1 von 4
Telefon/Phone	+49 621 329 3836		
Fax	+49 621 329 4196	Lab-Nr.	09158
e-Mail	jutta.angelmahr@power.alstom.com	Order-Nr.	0533728
Kunde/Customer:	ALSTOM		
Anlage/Project:			
Anl. Schlüssel/Key:	Oelfreigaben		
Gegenstand/Subject:	Evaluation of a Lubrication Engineering Turbine Oil with the Product Name 6462 MONOLEC®		
Deskri./Keywords:	approval test, turbine oil, MONOLEC 6462, HTGD 90117		
An/To	Name	An/To	Name
Ba-TPSNRS	Phil Peel	BA-GSPEMC	Rolf Ruetschi

1 Subject Data

A turbine oil sample of Lubrication Engineers with the product name 6462 MONOLEC® should have been tested with respect to its conformity with the ALSTOM specification HTGD 90117 – Lubricating and Control Oils for Turbines – Specification and Supervision.

2 Designation of the Sample

Sample description: 6462 MONOLEC® Turbine Oil

Lab.No.: 09158

3 Test Performed, Results

See table on page 2 and IR-spectra on page 3.

4 Conclusion

The FT-IR-spectra show that the turbine oil MONOLEC 6462 is based on mineral oil with an aromatic content of 4,4%. The determined oxidation stabilities according to ASTM D 2272 (RPVOT) and according to ISO 4263-1 (TOST) are good. The RPVOT value with 946 minutes is typical for turbine oils with amines oxidation inhibitors. The turbine oil contains EP additives.

All measured test results meet the requirements of the ALSTOM specification HTGD 90117.

The load carrying capacity of the FZG-test (ASTM D 5182) with fail stage 8 as written in the technical data bulletin of 6462 MONOLEC® fulfills the ALSTOM requirement.

Therefore the turbine oil 6462 MONOLEC® is recommended for inclusion in the table "ALSTOM tested lube and control oil " of the HTGD 90117 .

TTTMC



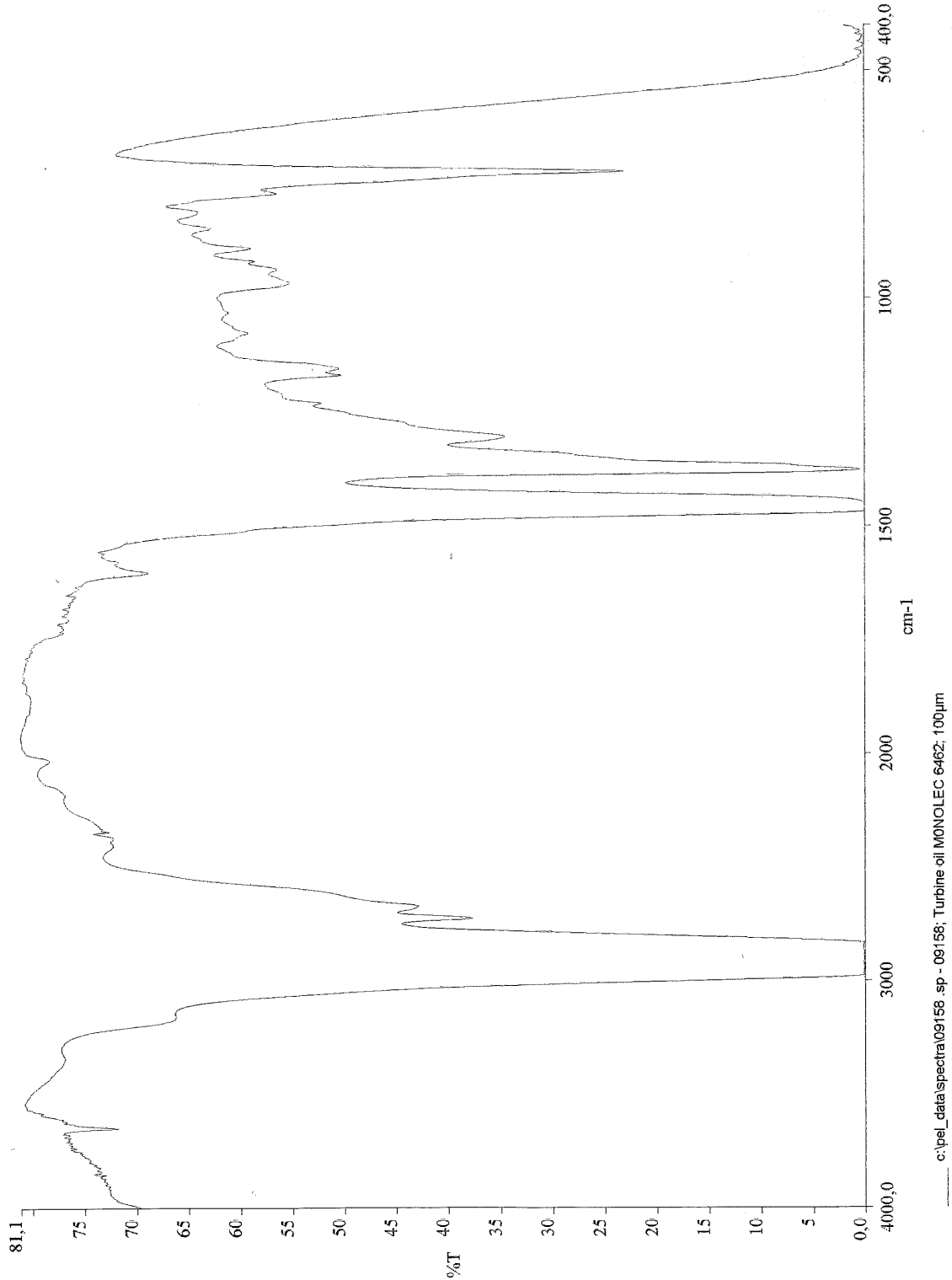

L:\TDL\ANLAGEN\1-Berichte\201297AR-Oelfreigaben.doc

Analysis Results

Turbine oil sample 6462 MONOLEC[®], Lab. No. 09158

Property	Test method	Unit	Measured Value	Requirements
Appearance	visual		clear	-
ASTM-Color	ASTM D1500	-	L 1,0	-
Density at 15°C	EN ISO 12185	kg/m ³	866	≤ 880
Flashpoint (Cleveland- open cup)	ISO 2592	°C	216	≥ 200
Pourpoint	ISO 3016	°C	-27	≤ -9
Zinc content	AAS	mg/kg	< 1	≤ 5
Kin. Viscosity at 40°C	DIN 51562	mm ² /s	46,0	46 ± 10%
Viscosity index	ISO 2909	-	102	> 90
Acid number	ISO 6618	mgKOH/g	0,12	≤ 0,3
Air release at 50°C	ISO 9120	Minutes	4	≤ 4
Demulsibility after steam treatment	DIN 51589-1	Seconds	172	≤ 300
Foaming characteristics	ISO 6247			
Seq. I at 24°C				
- Foam volume/ Foam volume after 5-min		ml/ml	20/0	≤ 300/0
Seq. II at 93,5°C				
- Foam volume/ Foam volume after 5-min		ml/ml	10/0	≤ 50/0
Seq. III at 24°C				
- Foam volume/ Foam volume after 5-min		ml/ml	30/0	≤ 300/0
Copper corrosion (100°C/3h)	ISO 2160	-	1b	Max. 2
Rust preventing characteristics	ISO 7120	-	Pass B	Pass B
FT-IR-Spectrum	-		Mineral oil	Mineral oil
- Aromatics content	IEC 590	%	4,4	
Oxidation stability (TOST)	ISO 4263-1			
- Neutralisation number after 1000h		mgKOH/g	0,05	-
- After 2000 h				
- Neutralisation		mgKOH/g	0,06	increase <1
- Sludge		mass%	0,02	
- IR aging band at 1710cm ⁻¹ (d=0,1mm)			none	
- Remaining antioxidants	RULER	%	51	
Oxidation stability (RPVOT)	ASTM D 2272	Minutes	946	> 300
Filterability	ISO 13357-2			
- Stage I		%	99,6	min. 93
- Stage II		%	96,0	min. 85

FT-IR spectra of turbine oil 6462 MONOLEC[®] as delivered



FT-IR spectra of turbine oil 6462 MONOLEC[®] after 2000h TOST

