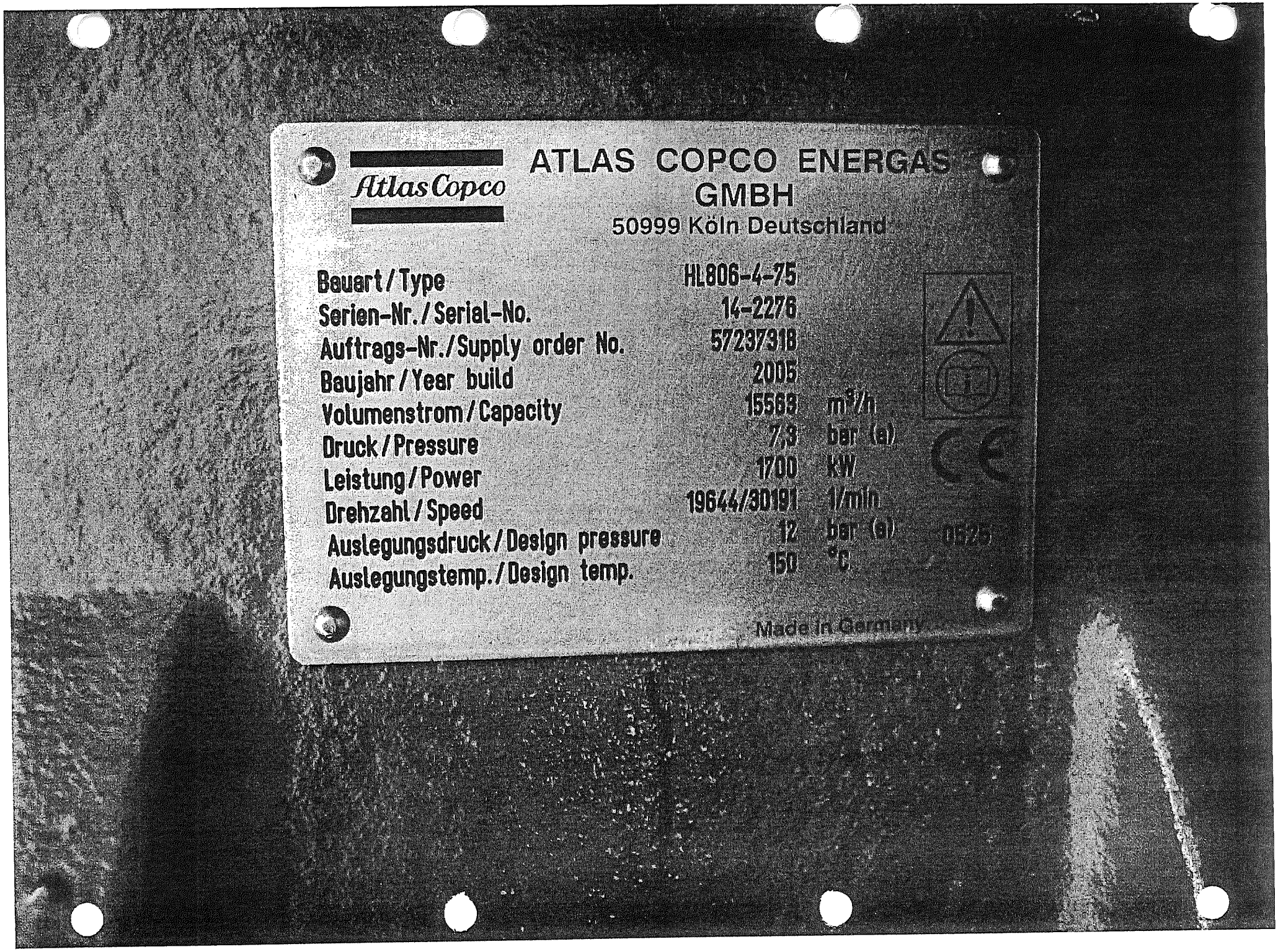

Atlas Copco
ATLAS COPCO ENERGAS GMBH
50999 Köln Deutschland
Bauart / Type HL806-4-75
Serien-Nr. / Serial-No. 14-2276
Auftrags-Nr. / Supply order No. 57237318
Baujahr / Year build 2005
Volumenstrom / Capacity 15563 m³/h
Druck / Pressure 7,3 bar (a)
Leistung / Power 1700 kW
Drehzahl / Speed 19644/30191 1/min
Auslegungsdruck / Design pressure 12 bar (a)
Auslegungstemp. / Design temp. 150 °C
0525
Made in Germany

Note Hinweis	Modified from Beschreibung der Änderung (Kurztext)	Date Datum	Intr. Name	Note Hinweis	Modified from Beschreibung der Änderung (Kurztext)	Date Datum	Intr. Name
0	–	-	-				

Für Maschinen innerhalb der EG und nach DGRL ab der Kategorie II

ATLAS COPCO ENERGAS GMBH
50999 Köln Deutschland

Bauart / Type	HL806-4-75	
Serien.Nr. / Serial-No.	14-2275	
Auftrags-Nr. / Sypply order No.	57237318	
Baujahr / Year build	2005	
Volumenstrom / Capacity	15563	m^3/h
Druck / Pressure	7,3	bar(a)
Leistung / Power	1700	kW
Drehzahl / Speed	19644/30191	1/min
Auslegungsdruck / Design pressure	12	bar(a)
Auslegungstemp. / Design temp.	150	°C

CE 0525

Made in Germany

weitere Maschinen-Nr.: 14-2276

Zeichnung darf nur mit dem CAD-System geändert werden !

Tolerances, if not indicated, according to: Toleranzen, falls nicht angegeben, gemäß: ATLAS COPCO STANDARD/Klasse/Class II	Machined surface Oberflächenbearbeitung 1350K/			Secrecy class Sicherheitsklasse 1102 K/

Name / Benennung: TYPENSCHILD (DGRL ab Kat. II) Deutsch/Englisch
Material / Werkstoff: CRNI
Material-class / Materialklasse: 56900
CAD

Atlas Copco Energas GmbH Köln/Cologne

Transferred fr Erhalten von	Scale / Maßstab 1:1.0	6970308953 1 20-05-05 0 RSchmidt	Compare / Entstanden aus	Org Owner / Zchg Eigent. ENG
	Drawn / Gezeichnet PT4 RSchmidt	Blank No. / Rohteil Nr. 1231875792	Replaces / Ersatz für	
	Std. chd. / Normgeprüft	Blank wt. / Rohgewicht 6970308953 1 23-05-05 0 kg	Finished wt. / Fertiggewicht kg	Designation/Zeichnungs-Nr. 6970308953
	Design chd. / Ausf.gepr. .	Prod. chd. / Produkt gepr. GRAJDANEK	Approved / Genehmigt 13K000760	Date / Datum 20-MAY-2005

Blatt/Sheet ( ) 1/1

ATLAS COPCO ENERGAS GMBH KÖLN GILT :
Freimaßtoleranzen nach Werknorm 010.50.0 ff.
Oberflächenangaben nach Werknorm 033.00.0 ff.

QUALITÄTSKONTROLLE
Bescheinigung
Certificate

EN 10204 -2.1 [ ] -3.1 [X]
-2.2 [ ] -3.2 [ ]

Atlas Copco

Werksbescheinigung über durchgeführte Prüfungen
Certificate for inspections carried out

AC-Auftr.-Nr.**57237318** **AC Supply Order No.**		Kennwort: **Asu Kosice** **Code word:**	Maschinen-Nr.**14-2276** **Machine No.**
Menge **Quantity**	Benennung **Designation**	Teile-Nr. **Part No.**	
1	**Turboverdichter** **Turbocompressor**	**6970301490**	

Diese(s) Teil(e) wurde(n) in unserem Werk folgenden Prüfungen unterzogen:
Above part(s) was/were submitted to following tests at our factory:

[ ] Allgemeine Sichtkontrolle
Generell visual inspection

[ ] Sauberkeit Sichtkontrolle
Cleanliness visual inspection

[ ] Sauberkeit Wischprobe
Cleanliness white glove test

[ ] Öl- und Fettfrei
Oil- and grease free

[ ] Anstrich (Sichtkontrolle)
Painting (Visual inspection)

[ ] Anstrich Farbnummer _____
Painting colour code _____

[ ] Maßkontrolle (Haupt- und Anschlußmaße)
Dimensional check (Main-/connection dimens.)

[ ] Prüfung nach P+I-Schema
Check according to P+I drawing

[ ] Elektrischer Funktionstest
Electrical function check

[ ] Mechanischer Funktionstest
Mechanical function check

[X] Vollständigkeit und Versandkontrolle der Lieferung
Completeness and readiness for dispatch

[ ] Lagersichtkontrolle nach dem Probelauf
Bearing inspection after test run

[ ] **Verpackung**
Packing

[ ] Dokumentationskontrolle
Documentation review

[ ] Farbanstrich ist entsprechend unserer Werknorm WN 033.20.1/033.20.2/033.20.3 ausgeführt.
Painting has been carried out according to Works Standard WN 033.20.1/033.20.2/033.20.3

Bemerkung: **Remarks:**	

Prüfergebnis: Keine Beanstandungen
Test result: **No objections**

Ort/**Place:** **D-50999 Köln (Sürth)**

ATLAS COPCO ENERGAS GMBH

Datum/**Date:** 19.07.05

Atlas Copco Energas GmbH Quality Control

Prüfer **Examiner**	Abnahmebeauftragter **Purchasers's Inspector**	Werkssachverständiger **Works Surveyor**

TEST PROCEDURE FOR TURBOCOMPRESSOR LUBE-OIL-SYSTEM
TESTBESCHREIBUNG TURBOVERDICHTER-SCHMIERÖLSYSTEM

-CLEANING PROCEDURE / FUNCTIONAL TEST / PRESERVATION-
-REINIGUNGSPROZEDUR / FUNKTIONSTEST / KONSERVIERUNG-

ACE ORDER NO.	**572 3 7318**
ACE CODE	**ASU Kosice**
ACE MACHINE TYPE	**HL8-4-75**
ACE MACHINE NO.	**14- 2276**
QUANTITY	**1**
CUSTOMER	**Air Liquide AGS GmbH**
CUSTOMER ORDER NO.	**Z13/4500024048**

Remarks: Bemerk.:					
00	23.11.04	Beckers			
REVISION	DATE	ORIG		Forwarded on / Received CONTRACT COORDINATOR	CLIENT APPROVAL

Freigabe WET
13. Juli 2005
Name:

Content / Inhalt

1. General / Allgemeines

This document describes the test procedure for proving the correct function of the lubrication oil system that is in the scope of supply together with the Atlas Copco Turbocompressor of above mentioned order. Furthermore the test includes the cleaning procedure prior to testing and the preservation of all inner parts that get in contact with the oil during testing. The tests are carried out in Atlas Copco work shop, they are generally internal. A customer-witnessed test is as an option possible.

Das vorliegende Dokument beschreibt die Testprozeduren zum Nachweiß der ordnungsgemäßen Funktion des Schmierölsystems, das im Lieferumfang des Turboverdichters o. g. Auftrages enthalten ist. Die Tests beinhalten ebenfalls die Reinigungsprozeduren vor Testbeginn, sowie die Konservierung aller mit Öl benetzten Teile des Systems. Die Tests werden im Atlas Copco Werk durchgeführt, und sind generell intern. Eine Abnahme durch Kundenvertreter ist optional möglich.

2. Mechanical preparations / Vorbereitung mechanisch

ACTIVITY TÄTIGKEIT			Date/ Datum	Done by/ Erledigt von
Setup includes job main motor Aufbau inklusive original Hauptmotor	**Yes**/Ja X	**No**/Nein	12.07.05	Drd
Visual check of job oil filter system, filter cartridge OK Visuelle Kontrolle Auftragsölfiltereinheit, Filtereinsatz OK ?	**Yes**/Ja X	**No**/Nein	11.07.05	Ler2
Oil filling up to MIN sign (Test bed oil) **Type**/Typ: Öl Einfüllen bis Marke MIN (Prüffeldöl)	**VG 32**	**VG 46** X	120705	Drd
Installation of instrument air as additional seal gas (if necessary) Anschluss Prüffeldinstrumentenluft als Fremdsperrgas (falls erforderlich)			/	
Visual check of mounting direction of non-return valves (if accessible from outside) Visuelle Kontrolle der Einbaurichtung der Rückschlagklappen (wenn von außen zugängig)			11.07.05	Ler2
Check of order related P & I diagram Kontrolle des auftragsbezogenen P & I Diagramms (Soll-Ist)			12.07.05	Drd

Cleaning of oil piping downstream of filter(s) by / Reinigung der Ölleitung nach Filter durch:

Installation of additional filter sieve (50µm) at the gearbox inlet flange Montage Zusatzsieb (50µm) am Getriebeeintrittsflansch **OR** / ODER	11.07.05	Ler2
Installation of flexible pipe from gearbox inlet flange back to oil tank Montage Rücklaufschlauch von Getriebeeintrittsflansch zurück zum Öltank **OR** / ODER	/	/
Removal of piping, flushing and cleaning by hand Demontage der Ölleitung, Spülen und Reinigen von Hand	/	/

3. Electrical preparations / Vorbereitung elektrisch

ACTIVITY TÄTIGKEIT			Date/ Datum	Done by/ Erledigt von
Connection of oil heater to test bed power line Anschluss Ölheizung, elektrisch an Prüffeldnetz			11.7	
Functional test of oil heater regarding warming up, short circuit, etc. Funktionsprüfung Ölheizung auf Erwärmung, Kurzschluss, etc.			11.7	
Connection of oil demister to test bed power line Anschluss Öldemistor, elektrisch an Prüffeldnetz			11.7	
Functional test of oil demistor regarding turning direction, short circuit, etc. Funktionsprüfung Öldemistor auf Drehrichtung, Kurzschluss, etc.			11.7	
Connection of auxiliary oil pump to test bed power line Anschluss Hilfsölpumpe, elektrisch an Prüffeldnetz			11.7	
Connection of oil inlet temperature measurement: **Job probe ?** Anschluss Ölvorlauftemperaturmessung: Originalfühler ?	**Yes**/Ja	**No**/Nein X	11.7	
Connection of oil inlet pressure measurement: **Job probe ?** Anschluss Ölvorlauf-Druckmessung: Originalgerät ?	**Yes**/Ja	**No**/Nein X	11.7	

4. Oil system operation tests / Ölsystem Betriebstests

ACTIVITY TÄTIGKEIT	Date/ Datum	Done by/ Erledigt von
Start up of auxiliary oil pump Einschalten Hilfsölpumpe 9 15	12.07.05	
Visual tightness and leakage check of oil pipes, filter(s), cooler(s) Visuelle Leckagekontrolle, Rohrleitungen, Ölkühler, Auftragsölfiltereinheit	12.07.05	
Adjustment oil inlet pressure to nominal pressure approx. 2.0 barg Einstellung Ölvorlaufdruck auf Nenndruck ca. 2.0 barg	12.07.05	
Flushing time, minimum 2 hours Spülvorgang, mind. 2 Stunden Start 9 15 Stop 11 45	12.07.05	
Stop of auxiliary oil pump, removing of additional filter sieve or flexible pipe (assembly of "filter downstream" piping respectively) Abschalten Hilfsölpumpe und Demontage Zusatzsieb oder Rücklaufschlauch (bzw. Montage der „nach-Filter" Ölleitung)	12.07.05	
Start up of auxiliary oil pump (with gearbox connected) Einschalten Hilfsölpumpe (Getriebe angeschlossen)	12.07.05	

Adjustment oil inlet pressure to maximum by closing of relieve valve, recording of pressure Einstellung Ölvorlaufdruck auf Maximaldruck (Überdruck Bypass schließen) und Druck notieren	**Max. pressure** Maxmaldruck [barg]	4,1	12.07.05	Drell
Visual tightness and leakage check of oil pipes, filter(s), cooler(s) Visuelle Leckagekontrolle, Rohrleitungen, Ölkühler, Auftragsölfiltereinheit			12.07.05	Drell
Recording of oil inlet temperature Ölvorlauftemperatur notieren	**Oil temperature** Öltemperatur [°C]	32,8°C	12.07.05	Drell
Adjustment oil inlet pressure to nominal pressure approx. 2.0 barg, recording of pressure Einstellung Ölvorlaufdruck auf Nenndruck 2.0 barg und Druck notieren	**Oil pressure** Öldruck [barg]	2,05	12.07.05	Drell
Switch of oil filters in case of double filter unit Umschalten der Doppelölfiltereinheit (falls vorhanden)			12.07.05	Drell
Switch of oil coolers in case of double cooler unit Umschalten der Doppelölkühlereinheit (falls vorhanden)			/	/
Visual check of oil flow to gear box over inspection covers (oil feeding) Kontrolle Ölfluss zum Getriebe über Revisionsdeckel (Ölduschen, wenn Deckel-vorhanden)			12.07.05	Drell

5. Standstill-tests after operation / Stillstandstests nach Betrieb

ACTIVITY TÄTIGKEIT	Date/ Datum	Done by/ Erledigt von
Visual check of job oil filter system, open and cleaning of filter cartridge Visuelle Kontrolle Auftragsölfiltereinheit, Filtereinsatz herausnehmen und reinigen (wenn möglich)	11.07.05	Gnz
Check of oil filling in suction pipe of main oil pump (e.g. open flange) Kontrolle Ölfüllstand in Saugleitung Hauptölpumpe (z.B. Flansch öffnen)	12.07.05	Gnz
Remove oil out of the pipes with pressurized air Ausblasen der Rohrleitungen mit Druckluft	12.07.05	Gnz
Remove oil out of the tank Abpumpen des Öls, zurück in Prüffeldtank	11.07.05	Gnz
Disconnection of all electric components Abklemmen aller elektrischen Komponenten	12.7.05	

6. Remarks / Bemerkungen:

-

-

-

-

-

-

7. On site activities / Baustellentätigkeiten

Since the tests are carried out without the main motor and the turbocompressor respectively running, the following additional on site activities are necessary during the commissioning:
Da während der Tests der Hauptmotor bzw. somit auch der Turbocompressor nicht in Betrieb sind, werden im Rahmen der Erstinbetriebnahme auf der Baustelle folgende Tätigkeiten notwendig:

ACTIVITY TÄTIGKEIT	**Date/** Datum	**Done by/** Erledigt von
Check of pressure take-over of the main oil pump during very first start up of the compressor at the auxiliary oil pump shut down. Kontrolle der Förderdruck-Übernahme durch die Hauptölpumpe bei erstem Anfahren des Kompressors und Abschaltung der Hilfsölpumpe		**ACE Service dept.**
Adjustment oil inlet pressure to nominal pressure (normal approx. 2.5barg) Einstellung Ölvorlaufdruck auf Nenndruck (normalerweise ca. 2.5 barg)		**ACE Service dept.**
Check of temperature control valve function (TCV), when oil temperature has reached nominal value (normal 40-48°C) after first start up Funktionskontrolle des Temperaturregelventil TCV, wenn Ölvorlauftemperatur den Nennwert (normalerweise 40-48°C) nach erstem Anfahren erreicht		**ACE Service dept.**
Check of oil cooler function: water flow, approach temperature, water leakages) Funktionskontrolle des Ölkühlers im Bezug auf: Wasserdurchfluss, Rückkühltemperatur, Wasserleckagen		**ACE Service dept.**

118949

5723738
6970301469
45217950

Atlas Copco

ACC Sales Order Number ..... L8-41198 K
Serial Number TBI0541198
Customer ..... AC Energas / Air Liquide

Atlas Copco Comptec Inc.

Atlas Copco Comptec Inc.
46 School Road
Voorheesville, NY 12186
USA

Phone: (518) 765-3344

Fax: (518) 765-3357
(518) 765-4889 (svce)
(518) 765-4220 (mfg)
(518) 765-4528 (eng)
(518) 765-2048 (acct)

Gearing

Rough Casting Certification Report

Elyria Foundry
120 Filbert St.
Elyria Oh. 44036

Cert Number: 31742
Date: 04/12/2005
Revision Date:

Customer: ATLAS COPCO COMPRESSORS INC	Metal Specification: WI-0303 REV 4
Pattern Number: 1320701560 REV 13 Rev: 13	Cast Date: 04/07/2005 Cast Qty: 1
P.O. Number: 501180-001	Heat Treat Date(s): 04/13/05 1.00 0.00

Physical Properties		Chemical Properties	
Tensile (PSI):	47,300	C:	3.239
Yield (PSI):		Si:	2.042
Elongation 2" Meth:		P:	0.013
Test Bar BHN:	228	S:	0.024
s/n040705-1		Mn:	0.787

We hereby certify that the material has been manufactured, tested and inspected in accordance witht he specification referenced herein, and had been found to meet all requirements.

Remarks:

Rick Lewis
Quality Engineer

Rough Casting Certification Report

Elyria Foundry
120 Filbert St.
Elyria Oh. 44036

Cert Number: 31078
Date: 12/28/2004
Revision Date:

Customer: ATLAS COPCO COMPRESSORS INC	Metal Specification: WI-0303 REV 4
Pattern Number: 1320701564 REV 8 Rev: 8	Cast Date: 12/22/2004 Cast Qty: 2
P.O. Number: 411159-002	Heat Treat Date(s): 12/27/2004 2.00 0.00
Physical Properties Tensile (PSI): 44,500 Yield (PSI): Elongation 2" Meth: Test Bar BHN: 217 411159-002 s/n122204-1 411114-002 s/n122204-2	Chemical Properties C: 3.250 Si: 2.152 P: 0.032 S: 0.029 Mn: 0.760

We hereby certify that the material has been manufactured, tested and inspected in accordance witht he specification referenced herein, and had been found to meet all requirements.

Remarks:

Rick Lewis
Quality Engineer

Rough Casting Certification Report

Elyria Foundry
120 Filbert St.
Elyria Oh. 44036

Cert Number: 31630
Date: 03/23/2005
Revision Date:

Customer: ATLAS COPCO COMPRESSORS INC	Metal Specification: WI-0260 REV 4
Pattern Number: 1320701619 REV 11 Rev: 11	Cast Date: 03/19/2005 Cast Qty: 1
P.O. Number: 500469-003	Heat Treat Date(s): 03/31/2005 1.00 0.00

Physical Properties		Chemical Properties	
Tensile (PSI):	64,100	C:	3.526
Yield (PSI):	44,800	Si:	2.655
Elongation 2" Meth:	21.80	P:	0.020
Test Bar BHN:	163	S:	0.006
S/N 031905-1		Mn:	0.313
		Mg:	0.060

We hereby certify that the material has been manufactured, tested and inspected in accordance witht he specification referenced herein, and had been found to meet all requirements.

Remarks:

Rick Lewis
Quality Engineer

Atlas Copco Comptec Inc.
46 School Road
Voorheesville, N.Y. 12186

LEAK TEST REPORT

S.O./Rel.: L8-41198-A Stage: 1 PCS: 1

ITEM:	1ST ST HSG	CATL#:	1320701741	DWG#:	1320701741	REV.:	17	SERIAL #: 031905-1
ITEM:	SHROUD	CATL#:	1320100047	DWG#:	1320100047	REV.:	3	SERIAL #: 032105-1
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:

Max. Allowable Working Pressure _____ PSI _____ F _____ minutes
Gas & Bubble Test at _____ PSI for _____ minutes
Hydrostatic Test at SEE BELOW PSI for 10 minutes
Part Accepted: X Rejected: __

SPECIAL REQUIREMENTS:

	Gauge Nbr.:	Pressures:
1st Stage:	1103	65 PSI
2nd Stage:		
3rd Stage:		
4th Stage:		

NO VISIBLE LEAKS

REMARKS:

WI-0104

We certify the above listed pressure vessel has been leak tested in accordance with ATLAS COPCO COMPTEC INC. Q.A. procedure number WI-0104 per QSI Rev.

Test by: JED MERWIN Witness by: GORDON LAMB

Date: 5/11/2005 Date: 5/11/2005

Title: HYDRO WORKER Title: HYDRO WORKER

Rough Casting Certification Report

Elyria Foundry
120 Filbert St.
Elyria Oh. 44036

Cert Number: 31629
Date: 03/23/2005
Revision Date:

Customer: ATLAS COPCO COMPRESSORS INC	Metal Specification: WI-0260 REV 4
Pattern Number: 1320701620 REV 5 Rev: 5	Cast Date: 03/19/2005 Cast Qty: 1
P.O. Number: 500469-012	Heat Treat Date(s): 04/07/05 1.00 0.00

Physical Properties		Chemical Properties	
Tensile (PSI):	64,100	C:	3.526
Yield (PSI):	44,800	Si:	2.655
Elongation 2" Meth:	21.80	P:	0.020
Test Bar BHN:	163	S:	0.006
s/n031905-1		Mn:	0.313
		Mg:	0.060

We hereby certify that the material has been manufactured, tested and inspected in accordance witht he specification referenced herein, and had been found to meet all requirements.

Remarks:

Rick Lewis
Quality Engineer

Atlas Copco Comptec Inc.
46 School Road
Voorheesville, N.Y. 12186

LEAK TEST REPORT

S.O./Rel.: L8-41198-A **Stage:** 2 PCS: 1

ITEM:	2ND ST HSG	CATL#:	1320713049	DWG#:	1320713049	REV.:	6	SERIAL #: 031905-1
ITEM:	SHROUD	CATL#:	1320713364	DWG#:	1320713364	REV.:	1	SERIAL #: 022405-2
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:

Max. Allowable Working Pressure _____ PSI _____ F _____ minutes
Gas & Bubble Test at _____ PSI for _____ minutes
Hydrostatic Test at SEE BELOW PSI for 10 minutes
Part Accepted: X Rejected: ___

SPECIAL REQUIREMENTS:

	Gauge Nbr.:	Pressures:
1st Stage:		
2nd Stage:	M2381	150 PSI
3rd Stage:		
4th Stage:		

NO VISIBLE LEAKS

REMARKS:

WI-0104

We certify the above listed pressure vessel has been leak tested in accordance with ATLAS COPCO COMPTEC INC. Q.A. procedure number WI-0104 per QSI Rev.

Test by: JED MERWIN **Witness by:** GORDON LAMB

Date: 5/11/2005 **Date:** 5/11/2005

Title: HYDRO WORKER **Title:** HYDRO WORKER

Rough Casting Certification Report

Elyria Foundry
120 Filbert St.
Elyria Oh. 44036

Cert Number: 31500
Date: 03/03/2005
Revision Date:

Customer: ATLAS COPCO COMPRESSORS INC	Metal Specification: WI-0260 REV 4
Pattern Number: 1320701621 REV 9 Rev: 9	Cast Date: 02/28/2005 Cast Qty: 2
P.O. Number: 500469-005	Heat Treat Date(s): 03/10/05 2.00 0.00

Physical Properties		Chemical Properties	
Tensile (PSI):	67,800	C:	3.489
Yield (PSI):	44,800	Si:	2.655
Elongation 2" Meth:	18.25	P:	0.029
Test Bar BHN:	163	S:	0.014
		Mn:	0.320
		Mg:	0.059

500469-005 s/n022805-1
500469-013 s/n022805-3

We hereby certify that the material has been manufactured, tested and inspected in accordance witht he specification referenced herein, and had been found to meet all requirements.

Remarks:

Rick Lewis
Quality Engineer

Atlas Copco Comptec Inc.
46 School Road
Voorheesville, N.Y. 12186

LEAK TEST REPORT

S.O./Rel.: L8-41198-A **Stage:** 3 PCS: 1

ITEM:	3RD ST HSG	CATL#:	1320713053	DWG#:	1320713053	REV.:	1	SERIAL #: 022805-3
ITEM:	SHROUD	CATL#:	1320100234	DWG#:	1320100234	REV.:	0	SERIAL #: 022805-2
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:

Max. Allowable Working Pressure _____ PSI _____ F _____ minutes
Gas & Bubble Test at _____ PSI for _____ minutes
Hydrostatic Test at SEE BELOW PSI for 10 minutes
Part Accepted: X Rejected: ___

SPECIAL REQUIREMENTS:

	Gauge Nbr.:	Pressures:
1st Stage:		
2nd Stage:		
3rd Stage:	M604	425 PSI
4th Stage:		

NO VISIBLE LEAKS

REMARKS:

WI-0104

We certify the above listed pressure vessel has been leak tested in accordance with ATLAS COPCO COMPTEC INC. Q.A. procedure number WI-0104 per QSI Rev.

Jed Merwin

Test by: _____ **Witness by:** Dom Caruso

JED MERWIN DOM CARUSO

Date: 5/12/2005 **Date:** 5/12/2005

Title: HYDRO WORKER **Title:** HYDRO WORKER

Rough Casting Certification Report

Elyria Foundry
120 Filbert St.
Elyria Oh. 44036

Cert Number: 31647
Date: 03/24/2005
Revision Date:

Customer: ATLAS COPCO COMPRESSORS INC	Metal Specification: WI-0260 REV 4
Pattern Number: 1320100095 REV 1 Rev: 1	Cast Date: 03/21/2005 Cast Qty: 2
P.O. Number: 501256-006	Heat Treat Date(s): 04/07/05 2.00 0.00

Physical Properties		Chemical Properties	
Tensile (PSI):	65,600	C:	3.431
Yield (PSI):	48,000	Si:	2.616
Elongation 2" Meth:	21.50	P:	0.019
Test Bar BHN:	170	S:	0.010
501256-006 s/n032105-1 501180-006 s/n032105-2		Mn:	0.313
		Mg:	0.042

We hereby certify that the material has been manufactured, tested and inspected in accordance witht he specification referenced herein, and had been found to meet all requirements.

Remarks:

Rick Lewis
Quality Engineer

Atlas Copco Comptec Inc.
46 School Road
Voorheesville, N.Y. 12186

LEAK TEST REPORT

S.O./Rel.: L8-41198-A **Stage:** 1 PCS: 1

ITEM:	1ST ST HSG	CATL#:	1320701741	DWG#:	1320701741	REV.:	17	SERIAL #: 031905-1
ITEM:	SHROUD	CATL#:	1320100047	DWG#:	1320100047	REV.:	3	SERIAL #: 032105-1
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:

Max. Allowable Working Pressure _____ PSI _____ F _____ minutes
Gas & Bubble Test at _____ PSI for _____ minutes
Hydrostatic Test at SEE BELOW PSI for 10 minutes
Part Accepted: X Rejected: __

SPECIAL REQUIREMENTS:

	Gauge Nbr.:	Pressures:
1st Stage:	1103	65 PSI
2nd Stage:		
3rd Stage:		
4th Stage:		

NO VISIBLE LEAKS

REMARKS:

WI-0104

We certify the above listed pressure vessel has been leak tested in accordance with ATLAS COPCO COMPTEC INC. Q.A. procedure number WI-0104 per QSI Rev.

Test by: _____ Witness by: _____

JED MERWIN GORDON LAMB

Date: 5/11/2005 **Date:** 5/11/2005

Title: HYDRO WORKER **Title:** HYDRO WORKER

Rough Casting Certification Report

Elyria Foundry
120 Filbert St.
Elyria Oh. 44036

Cert Number: 31485
Date: 03/02/2005
Revision Date:

Customer: ATLAS COPCO COMPRESSORS INC	Metal Specification: WI-0260 REV 4
Pattern Number: 1320701684 REV 6 Rev: 6	Cast Date: 02/24/2005 Cast Qty: 3
P.O. Number: 500469-007	Heat Treat Date(s): 03/06/05 3.00 0.00

Physical Properties		Chemical Properties	
Tensile (PSI):	60,700	C:	3.532
Yield (PSI):	44,900	Si:	2.643
Elongation 2" Meth:	18.95	P:	0.029
Test Bar BHN:	163	S:	0.010
		Mn:	0.293
		Mg:	0.041

500469-007 s/n022405-1
500469-015 s/n022405-2
500381-008 s/n022405-3

We hereby certify that the material has been manufactured, tested and inspected in accordance witht he specification referenced herein, and had been found to meet all requirements.

Remarks:

Rick Lewis
Quality Engineer

Atlas Copco Comptec Inc.
46 School Road
Voorheesville, N.Y. 12186

LEAK TEST REPORT

S.O./Rel.: L8-41198-A **Stage:** 2 PCS: 1

ITEM:	2ND ST HSG	CATL#:	1320713049	DWG#:	1320713049	REV.:	6	SERIAL #: 031905-1
ITEM:	SHROUD	CATL#:	1320713364	DWG#:	1320713364	REV.:	1	SERIAL #: 022405-2
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:

Max. Allowable Working Pressure _____ PSI _____ F _____ minutes
Gas & Bubble Test at _____ PSI for _____ minutes
Hydrostatic Test at SEE BELOW PSI for 10 minutes
Part Accepted: X Rejected: ___

SPECIAL REQUIREMENTS:

	Gauge Nbr.:	Pressures:
1st Stage:		
2nd Stage:	M2381	150 PSI
3rd Stage:		
4th Stage:		

NO VISIBLE LEAKS

REMARKS:

WI-0104

We certify the above listed pressure vessel has been leak tested in accordance with ATLAS COPCO COMPTEC INC. Q.A. procedure number WI-0104 per QSI Rev.

Test by: JED MERWIN Witness by: GORDON LAMB

Date: 5/11/2005 Date: 5/11/2005

Title: HYDRO WORKER Title: HYDRO WORKER

Rough Casting Certification Report

Elyria Foundry
120 Filbert St.
Elyria Oh. 44036

Cert Number: 31498
Date: 03/03/2005
Revision Date:

Customer: ATLAS COPCO COMPRESSORS INC	Metal Specification: WI-0260 REV 4
Pattern Number: 1320701686 REV 6 Rev: 6	Cast Date: 02/28/2005 Cast Qty: 3
P.O. Number: 500469-008	Heat Treat Date(s): 03/06/05 3.00 0.00

Physical Properties		Chemical Properties	
Tensile (PSI):	67,600	C:	3.571
Yield (PSI):	46,000	Si:	2.531
Elongation 2" Meth:	20.15	P:	0.020
Test Bar BHN:	170	S:	0.006
		Mn:	0.362
		Mg:	0.044

500469-008 s/n022805-1
500469-016 s/n022805-2
500381-009 s/n022805-3

We hereby certify that the material has been manufactured, tested and inspected in accordance witht he specification referenced herein, and had been found to meet all requirements.

Remarks:

Rick Lewis
Quality Engineer

Atlas Copco Comptec Inc.
46 School Road
Voorheesville, N.Y. 12186

LEAK TEST REPORT

S.O./Rel.: L8-41198-A **Stage:** 3 PCS: 1

ITEM:	3RD ST HSG	CATL#:	1320713053	DWG#:	1320713053	REV.:	1	SERIAL #:	022805-3
ITEM:	SHROUD	CATL#:	1320100234	DWG#:	1320100234	REV.:	0	SERIAL #:	022805-2
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:	
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:	
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:	
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:	
ITEM:		CATL#:		DWG #:		REV.:		SERIAL #:	

Max. Allowable Working Pressure _____ PSI _____ F _____ minutes
Gas & Bubble Test at _____ PSI for _____ minutes
Hydrostatic Test at SEE BELOW PSI for 10 minutes
Part Accepted: X Rejected: ___

SPECIAL REQUIREMENTS:

	Gauge Nbr.:	Pressures:
1st Stage:		
2nd Stage:		
3rd Stage:	M604	425 PSI
4th Stage:		

NO VISIBLE LEAKS

REMARKS:

WI-0104

We certify the above listed pressure vessel has been leak tested in accordance with ATLAS COPCO COMPTEC INC. Q.A. procedure number WI-0104 per QSI Rev.

Jed Merwin

Test by: _____ **Witness by:** Dom Caruso

JED MERWIN DOM CARUSO

Date: 5/12/2005 **Date:** 5/12/2005

Title: HYDRO WORKER **Title:** HYDRO WORKER

ProcessCertL (2): 8/97

PROCESS CERTIFICATION

PCC PART NO.	SO NO.	METAL LOT NO.	Quantity Accepted by Final Inspection And Released For Shipment.	
12477	63007		P/S NO. 686925	QTY. 1
CUSTOMER PART NO. 1320703200 / Rev.5				
PURCHASE ORDER NO. 0412239		158016		

PCC Structurals, Inc. hereby certifies that the material (product) described above has been completely processed per all purchase order, supplement and blueprint instructions and is acceptable to all applicable specification requirements.

SPECIAL REQUIREMENTS

1. Material: 17–4PH Per WI–0296
2. HIP: 2125°F +/– 25°F at 15+/– 0.5ksi for 4 hrs min.
3. Heat Treat per WI–0296:
   - A. Solution Anneal: 1900°F+/– 25°F for 4 hrs.
   - B. Sub Zero: –100°F for 3 hrs.
   - C. Age: 1100°F+/– 10°F for 6 hrs min.
4. Inspection and acceptance per WI–0138:
   - A. Visual
   - B. Penetrant

SERIAL NUMBERS

Welded
00077-01

ATTACHMENTS

1. Material Cert
2. Test Material (1 Tensile, 1 Charpy)
3. Weld Map (if applicable)

PCC Structurals, Inc.
4600 S.E. HARNEY DRIVE PORTLAND, OREGON 97206
TELEPHONE (503)777–3881

Authorized Signature Wendy K. Christensen

Date February 26, 2005

Bodycote
MATERIALS TESTING PORTLAND
4949 S.E. JOHNSON CREEK BLVD.
PORTLAND, OR 97222-4122
503/771-5977 • FAX 503/777-7453

for PCC Structurals, Inc.

MATERIAL CERTIFICATE

February 24, 2005

LIMS ID 01	PART NO.	HIP/HT NO.	CUSTOMER
N124770202042050	12477	02-02-042-05	ATLAS COPCO
ALLOY TYPE	LOT NO.	METAL LOT NO.	SPECIFICATION
17-4		58016	WI-0296 Rev. 10
HEAT VENDOR	SERIAL NO.	RELEASED TO	
CANNON-MUSKEGON		5015L Rev. B	Part per Heat Treat Load

MASTER HEAT CHEMISTRY WEIGHT %

Element	C	Mn	Si	P	S	Cr	Ni	Cb+Ta	Fe	Cu
Test	0.04	0.44	0.88	0.009	<0.001	16.14	3.96	0.18	Bal.	2.96

Element	N
Test	0.027

Method : C,P,S-OES;Majors-XRF;GASES-IGF

ROOM TEMP TENSILE

Ultimate (KSI)	Yield @ .2% (KSI)	Elong. 4D%	Red. of Area %	HARDNESS (HRC)	Tested per
146.4	138.6	18.2	57.1	32	ASTM E 8 and E 18

Charpy V-Notch

Temp (F)	Ft. lbs (Test #1)	Ft. lbs (Test #2)	Ft. lbs (Test #3)	Ft. lbs (Avg)	Tested per
ROOM	21	22	18	20	ASTM E 23

HEAT TREATMENT

HIP : 2125 +/- 25 F @ 15ksi for 4 hrs minimum
ANNEAL : 1900 +/- 25 F for 4 hrs minimum
SUBZERO : -100 F for 3 hrs minimum
AGE : 1100F +/-15F for 6 hrs. minimum
NOTE: : Thermal treatments by PCC Structurals.

MATERIAL TO SHIP : 1 TENSILE, 1 CHARPY

SHIPPING USE ONLY
P/S 686925
"TEST MATERIALS ARE INCLUDED WITH THIS SHIPMENT"
WELDED
00077-01 2-26-05 1pc.

Material conforms to applicable specification requirements.

G. Thrush ME 2/24/05
LABORATORY MANAGER DATE

This certifies that materials, parts, or components of assemblies have been inspected to the specifications involved, and results of tests required are as shown. All analyses are performed by approved laboratories.

Atlas Copco

Impeller Acceptance Certificate

Atlas Copco Compressors Inc. hereby certifies that Compressor wheel part # 1320707592 has been tested to the following speed(s).

Operator: Richard Loucks Date: 4/12/2005

S.O.# L8-41198-A Stage: 1st H ☒ SC ☐. AV ☐.

Serial No. 00077-01

Before overspeed .5 hour - ● MPI ○ FPI

Indications and type: none

● Accept
○ Reject

Inspector: Richard Loucks Date: 04/11/2005

Speed & Time:	22,590 rpm for 5 minutes	Date:	04/12/2005

Performed By: Joel Leromain

After overspeed .5 hour - ● MPI ○ FPI

Indications and type: none

● Accept
○ Reject

Inspector: Richard Loucks Date: 04/12/2005

E505/P20B.02

****

ATLAS COPCO COMPTEC
VOORHEESVILLE, NY

****

operator : DICK 04.11.05 11:06 PM

rotor data

setup:

file name : H8 1ST STAGE WHEEL

a: 1.750 in	b: 5.250 in	c: 2.625 in
r1: 1.400 in	readout : pl1/pl2	r2: 6.500 in
m1: polar		m2: polar
tol1: 0.280 gin	bal. speed: 851. rpm	tol2: 0.280 gin

plane 1

156. mg
at 269 deg
in tol

rotor: 1320707592

run 14

plane 2

83.0 mg
at 279 deg
1.9 * tol

AT E2

W/O L8-41198-A 0029 ATLAS COPCO ENERGAS
HLH8-4 1ST STG IMPELLER SERIAL NO.00077-01
1320707592

ProcessCertL (2): 8/97

PROCESS CERTIFICATION

PCC PART NO.	SO NO.	METAL LOT NO.	Quantity Accepted by Final Inspection And Released For Shipment.	
12458	63007	58016	P/S NO. 687235	QTY. 1
CUSTOMER PART NO. 1320703206 / Rev. D				
PURCHASE ORDER NO. 412239				

PCC Structurals, Inc. hereby certifies that the material (product) described above has been completely processed per all purchase order, supplement and blueprint instructions and is acceptable to all applicable specification requirements.

SPECIAL REQUIREMENTS

1. Material: 17–4PH Per WI–0296
2. HIP: 2050°F +/– 25°F at 15+/– 0.5ksi for 4 hrs min.
3. Heat Treat per WI–0296:
   - A. Solution Anneal: 1900°F+/– 25°F for 4 hrs.
   - B. Sub Zero: –100°F for 3 hrs.
   - C. Age: 1100°F+/– 10°F for 4 hrs min.
4. Inspection and acceptance per WI–0138:
   - A. Visual
   - B. Penetrant

SERIAL NUMBERS

NONWELDED 00046-01

ATTACHMENTS

1. Material Cert
2. Test Material (1 Tensile, 1 Charpy)
3. Weld Map (if applicable)

PCC Structurals, Inc.
4600 S.E. HARNEY DRIVE
PORTLAND, OREGON 97206
TELEPHONE (503)777–3881

Authorized Signature PAM BURGESS Pam Burgess

Date 3/1/2005

Bodycote
MATERIALS TESTING PORTLAND
4949 S.E. JOHNSON CREEK BLVD.
PORTLAND, OR 97222-4122
503/771-5977 • FAX 503/777-7453

for PCC Structurals, Inc.

MATERIAL CERTIFICATE

February 24, 2005

LIMS ID 01 N12458020204205	PART NO. 12458	HIP/HT NO. 02-02-042-05	CUSTOMER ATLAS COPCO
ALLOY TYPE 17-4	LOT NO.	METAL LOT NO. 58016	SPECIFICATION WI-0296 Rev. 10
HEAT VENDOR CANNON-MUSKEGON	SERIAL NO.	RELEASED TO 5015L Rev. B	Part per Heat Treat Load

MASTER HEAT CHEMISTRY WEIGHT %

Element	C	Mn	Si	P	S	Cr	Ni	Cb+Ta	Fe	Cu
Test	0.04	0.44	0.88	0.009	<0.001	16.14	3.96	0.18	Bal.	2.96

Element	N
Test	0.027

Method : C,P,S-OES;Majors-XRF;GASES-IGF

ROOM TEMP TENSILE

Ultimate (KSI)	Yield @ .2% (KSI)	Elong. 4D %	Red. of Area %	HARDNESS (HRC)	Tested per
146.8	138.0	18.8	53.8	34	ASTM E 8 and E 18

Charpy V-Notch

Temp (F)	Ft. lbs (Test #1)	Ft. lbs (Test #2)	Ft. lbs (Test #3)	Ft. lbs (Avg)	Tested per
ROOM	21	21	14	19	ASTM E 23

HEAT TREATMENT

HIP : 2125 +/- 25 F @ 15ksi for 4 hrs minimum
ANNEAL : 1900 +/- 25 F for 4 hrs minimum
SUBZERO : -100 F for 3 hrs minimum
AGE : 1100F +/-15F for 6 hrs. minimum
NOTE: : Thermal treatments by PCC Structurals.

MATERIAL TO SHIP : 1 TENSILE, 1 CHARPY

SHIPPING USE ONLY S/N NONWELDED 00046-01 1 PC.
P/S 687235
"TEST MATERIALS ARE INCLUDED WITH THIS SHIPMENT"

Material conforms to applicable specification requirements.

G. Tracy ME — 2/24/05
LABORATORY MANAGER — DATE

This certifies that materials, parts, or components of assemblies have been inspected to the specifications involved, and results of tests required are as shown. All analyses are performed by approved laboratories.

Atlas Copco

Impeller Acceptance Certificate

Atlas Copco Compressors Inc. hereby certifies that Compressor wheel part # 1320707185 has been tested to the following speed(s).

Operator: Joel LeRomain Date: 4/12/2005

S.O.# L8-41198-A Stage: 2nd H ☒ SC ☐. AV ☐.

Serial No. 00046-01

Before overspeed .5 hour - ● MPI ○ FPI

Indications and type: None

● Accept
○ Reject

Inspector: Joel Leromain Date: 04/12/2005

Speed & Time:	22590 for 5 minutes	Date:	04/12/2005

Performed By: Richard Loucks

After overspeed .5 hour - ● MPI ○ FPI

Indications and type: none

● Accept
○ Reject

Inspector: Richard Loucks Date: 04/12/2005

E505/P20B.02

****

ATLAS COPCO COMPTEC
VOORHEESVILLE, NY

****

operator : DICK 04.12.05 03:38 PM

rotor data

setup:

file name : H8 2ND STAGE WHEEL

a: 1.750 in	b: 3.625 in	c: 2.500 in
r1: 1.000 in	readout : pl1/pl2	r2: 5.300 in
m1: polar		m2: polar
tol1: 0.220 gin	bal. speed: 884. rpm	tol2: 0.220 gin

plane 1

179. mg
at 60 deg
in tol

rotor: 1320707185

run 12

plane 2

72.3 mg
at 276 deg
1.7 * tol

AT E2

W/O L8-41198-A 0030 ATLAS COPCO ENERGAS GMBH
HL8-4 2ND STG IMPELLER SERIAL NO.00046-01
1320707185

ProcessCertL (2): 8/97

PROCESS CERTIFICATION

PCC PART NO.	SO NO.	METAL LOT NO.	Quantity Accepted by Final Inspection And Released For Shipment.	
12536	63005	58016	P/S NO. 686911	QTY. 4pc's
CUSTOMER PART NO. **1320703212 / Rev. 08**				
PURCHASE ORDER NO. 412210				

PCC Structurals, Inc. hereby certifies that the material (product) described above has been completely processed per all purchase order, supplement and blueprint instructions and is acceptable to all applicable specification requirements.

SPECIAL REQUIREMENTS

1. Material: 17–4PH Per WI–0296
2. HIP: 2050°F +/– 25°F at 15+/– 0.5ksi for 4 hrs min.
3. Heat Treat per WI–0296:
   - A. Solution Anneal: 1900°F+/– 25°F for 4 hrs.
   - B. Sub Zero: –100°F for 3 hrs.
   - C. Age: 1100°F+/– 10°F for 4 hrs min.
4. Inspection and acceptance per WI–0138:
   - A. Visual
   - B. Penetrant

SERIAL NUMBERS

00100-01,02

Welded - 00102-01,02

ATTACHMENTS

1. Material Cert
2. Test Material (1 Tensile, 1 Charpy)
3. Weld Map (if applicable)

PCC Structurals, Inc.
4600 S.E. HARNEY DRIVE
PORTLAND, OREGON 97206
TELEPHONE (503)777–3881

Authorized Signature Wendy Tate

Date 2-28-05

Bodycote
MATERIALS TESTING PORTLAND
4949 S.E. JOHNSON CREEK BLVD.
PORTLAND, OR 97222-4122
503/771-5977 • FAX 503/777-7453

for PCC Structurals, Inc.

MATERIAL CERTIFICATE

February 24, 2005

LIMS ID 01	PART NO.	HIP/HT NO.	CUSTOMER
N12536020204205	12536	02-02-042-05	ATLAS COPCO
ALLOY TYPE	**LOT NO.**	**METAL LOT NO.**	**SPECIFICATION**
17-4		58016	WI-0296 Rev. 10
HEAT VENDOR	**SERIAL NO.**	**RELEASED TO**	
CANNON-MUSKEGON		5015L Rev. B	Part per Heat Treat Load

MASTER HEAT CHEMISTRY WEIGHT %

Element	C	Mn	Si	P	S	Cr	Ni	Cb+Ta	Fe	Cu
Test	0.04	0.44	0.88	0.009	<0.001	16.14	3.96	0.18	Bal.	2.96

Element	N
Test	0.027

Method : C,P,S-OES;Majors-XRF;GASES-IGF

ROOM TEMP TENSILE

Ultimate (KSI)	Yield @ .2% (KSI)	Elong. 4D%	Red. of Area %	HARDNESS (HRC)	Tested per
146.6	138.7	17.4	57.5	33	ASTM E 8 and E 18

Charpy V-Notch

Temp (F)	Ft. lbs (Test #1)	Ft. lbs (Test #2)	Ft. lbs (Test #3)	Ft. lbs (Avg)	Tested per
ROOM	24	16	25	22	ASTM E 23

HEAT TREATMENT

HIP : 2125 +/- 25 F @ 15ksi for 4 hrs minimum
ANNEAL : 1900 +/- 25 F for 4 hrs minimum
SUBZERO : -100 F for 3 hrs minimum
AGE : 1100F +/-15F for 4 hrs. minimum
NOTE: : Thermal treatments by PCC Structurals.

MATERIAL TO SHIP : 1 TENSILE, 1 CHARPY

SHIPPING USE ONLY
P/S 686911 00100-01,02
"TEST MATERIALS ARE INCLUDED WITH THIS SHIPMENT"
4pc's Welded 00102-01,02

Material conforms to applicable specification requirements.

G. Thuss HE — 2/24/05
LABORATORY MANAGER — DATE

This certifies that materials, parts, or components of assemblies have been inspected to the specifications involved, and results of tests required are as shown. All analyses are performed by approved laboratories.

Atlas Copco

Impeller Acceptance Certificate

Atlas Copco Compressors Inc. hereby certifies that Compressor wheel part # 1320706710 has been tested to the following speed(s).

Operator: Joel LeRomain **Date:** 4/14/2005

S.O.# L8-41198-A **Stage:** 3rd H ☒ SC ☐. AV ☐.

Serial No. 00102-01

Before overspeed .5 hour - ● MPI
○ FPI

Indications and type: None
● Accept
○ Reject
Inspector: Joel Leromain **Date:** 04/14/2005

Speed & Time:	37,100 rpm for 5 minutes	Date:	04/14/2005

Performed By: Joel Leromain

After overspeed .5 hour - ● MPI
○ FPI

Indications and type: None
● Accept
○ Reject
Inspector: Joel Leromain **Date:** 04/14/2005

E505/P20B.02

****

ATLAS COPCO COMPTEC
VOORHEESVILLE, NY

****

operator : JOEL

04.14.05 09:20 AM

rotor data

file name :

setup:

a: 6.600 in	b: 2.850 in	c: 4.125 in
r1: 3.312 in	readout : p11/p12	r2: 0.689 in
m1: polar		m2: polar
tol1: 0.056 gin	bal. speed: 1024. rpm	tol2: 0.056 gin

plane 1

69.2 mg
at 183 deg
4.1 * tol

rotor: 1320706710

run 5

plane 2

356. mg
at 73 deg
4.4 * tol

AT E2

W/O L8-41198-A 0032 ATLAS COPCO ENERGAS
HL8-3RD.STG.IMPELLER SERIAL NO.00102-01
1320706710

	M. C. WATTEEUW n.v. Kampveldstraat 51 B - 8020 OOSTKAMP Tel. +32.50.82.69.07 Fax. +32.50.82.69.74 *FORMULIER*	F 11.01.01N datum uitgifte : 31/05/00 revisie : 02	Pagina ..... / .....

KEURINGSRAPPORT
INSPECTION CERTIFICATE
CERTIFICAT DE RECEPTION

EN 10204 - 3.1B

Klant :
Customer / Client

ATLAS COPCO COMPTEC

Ordernummer :
Purchase order nr. / No. de commande 407587

Tekeningnummer :
Drawing number / No. de plan 1320702628

Editie :
Issue / Edition 7

Stuknaam :
Part name / Dénomation PINION

Hoeveelheid :
Quantity / Quantité 3

Identificatie :
Identification / Identification 17991 → 17993

Opmerkingen :
Remarks / Remarques

Verklaard wordt, dat het geheel der hierboven genoemde afleveringen in alle opzichten in overeenstemming zijn met de gestelde eisen, de tekeningen en de betreffende kontrakten en dat de afleveringen werden geverifieerd en gekeurd overeenkomstig de kontrakteisen, behoudens hogervermelde uitzonderingen .

It is certified that the whole of supplies outlined above are in all respects conform to the specifications, the drawings and the contracts in question and that the supplies have been verified and inspected in accordance with the contract requirements, exept for above mentioned exeptions .

Il est certifié que la totalité des fournitures nommées ci-dessus sont totalement conformes aux spécifications, plan et contrats qui s'y rapportent et que les fournitures ont été verifiées et contrôlées, conformément aux exigences du contrat, hormis les exeptions mentionnées ci-dessus .

Datum :
Date / Date 04 NOV. 2004

Naam en functie :
Name and function / Nom et fonction

WAT 250

MECHANISCHE CONSTRUCTIE
WATTEEUW N. V.
Kampveldstraat 51
B-8020 Oostkamp
FORMULIER

Instructieblad - turbo controle **38 a**

Klant :**A.C.Comptec** Pinion Gecementeerd

Plan samenstelling :	1320702628		**Rev :7**		**PO nr:**			
			ID nr:599836					
Volgnummer :	**17991-17993**							
	Pinion	**x**	**pinion**		**Ring 1**	**X**	**Ring 2**	
	shaft		**shaft**		**gear**		**gearmop**	
Lot serial :	**B04070507**				**B04051203**			
Materiaal item nr :	**1011760080c2**				**1013460100**			
Ovenlading :	**A8827**							

Procedure voor algemene controle :

a) Uit te voeren controles :

* Dimensioneel :

☒	100 % controle op de Höfler
☒	100 % controle Ø en slag nauwkeurige boring + WK , rest steekproef , F 09.03.14
☒	100 % controle electrical runout
☒	100 % visueel (polieren)
☒	Nummeren

* Magnaflux : ☒ 100 % magnaflux en demagnetiseren

b) Mee te leveren documenten : volledig pakket wordt ingescand en doorgemaild

Ingescand ☐ Samengesteld door ☐

c) Documenten hier te bewaren : (originelen)

☐	Keuringsrapport EN 10204-3.1.B , formulier 11.01.01 N
☒	Voorblad F 09.03.10
☒	Materiaal certificaat 3.1.B
☒	Hardheidscertificaat formulier
☒	Gear data certification F 09.03.17
☐	
☒	100 % grafieken evolvente , richting , steek en rondloop
☒	100 % meetrapport Höfler
☒	Steekproef controle , formulier F 09.03.13
☒	Procescontrolebladen van de machine of van onderaannemer

Opmerkingen : NCR nr:	**Rebut sn :**	
	Herwerking sn :	
Revisie : 4	Datum :	29/09/2003

(*) schrappen wat niet past

Stempel ter goedkeuring : 3170

Edelstahlwerke Buderus AG, Buderusstraße 25, 35576 Wetzlar	Abnahmeprüfzeugnis (EN 10 204 - 3.1.B)	Buderus EDELSTAHL
	Attest-Nr./Certificate-no.	**091220021330**
	Werksauftrag-Nr./our reference no.	
	Pos-Los	

Position	**UPos**	**Anzahl** Quantity	**Chargen-Nr.** Heat-no.	**Chargen-Kurzz.** Heat code-no.	**Gewicht** Weight
			439860		kg

Erschmelzungsart Melting process: Elektrostahl / electric steel

Kd Wst Bez Mat. qual.: 18 CrNiMo 7 - 6

Werkstoff Nr. Steel gr. no.: 6587

Lieferschein-Nr. / Datum Deliver no.:

B04070507
10117600806
4,3 m

Materialbezeichnung: Stabstahl / bar steel
Material

Position	:
Ausführung Finish	: Gewalzt, Gerichtet, BG-Geglüht,US-Geprüft hot rolled, straightened, BG- annealed, us-tested
Kundenbestellnummer Purchase order-no.	:
Liefervorschrift Specification	: ZF1 A, SEP 1921;3 D/d
Abmessung Dimension	: Rund 80 x

06 JULI 2004

VAT 51

Signatur/signature

Edelstahlwerke Buderus AG, Buderusstraße 25, 35576 Wetzlar

Abnahmeprüfzeugnis
(EN 10 204 - 3.1.B)

Buderus EDELSTAHL

Attest-Nr./Certificate-no. 091220021330

Werksauftrag-Nr./our reference no.

Pos-Los

Chemische Zusammensetzung % **Chargenanalyse** **Schmelzen-Nr. 439860**
Chemical composition Heat analysis Heat-no.

C	Si	Mn	P	S	Cr	Ni	Mo	V	Cu
0,17	0,15	0,54	0,007	0,031	1,68	1,49	0,32		0,10
Sn	Al	H_2	Ti	Ca	B	N_2	W	Nb	
0,009	0,024		<0,002	0,0017		0,0093		<0,003	

Bemerkungen/remarks: bei ZF vorgestellt am 23.10.02

Stirnabschreckversuch
Jominy-test

1,5	3	5	7	9	11	13	15	20	25	30	40	50	MM
44	43	43	43	42	42	42	42	39	37	35	34	33	HRC

MI-Reinheitsgrad gem. DIN 50602
Micro-cleanliness acc. DIN 50602

K4= 0 Oxide

MI-Reinheitsgrad gem. ISO 4967
Micro-cleanliness acc. ISO 4967

A:Dünn	Dick	B:Dünn	Dick	C:Dünn	Dick	D:Dünn	Dick	
Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy	
1,5	1,5	0,0	0,0	0,0	0,0	0,0	0,0	54503
1,5	1,0	0,0	0,0	0,0	0,0	0,0	0,0	54502
1,5	1,5	0,0	0,0	0,0	0,0	0,5	0,0	54501
1,5	1,5	0,0	0,0	0,0	0,0	0,0	0,0	54500
1,5	1,5	0,0	0,0	0,0	0,0	0,0	0,0	54499
1,5	1,0	0,0	0,0	0,0	0,0	0,5	0,0	54498

06 JUL 2004

WAT 151

Signatur/signature

Edelstahlwerke Buderus AG, Buderusstraße 25, 35576 Wetzlar	Abnahmeprüfzeugnis (EN 10 204 - 3.1.B)	Buderus EDELSTAHL
	Attest-Nr./Certificate-no.	**091220021330**
	Werksauftrag-Nr./our reference no.	
	Pos-Los	

Abschreckkorngröße
Austenitic grain size — **6 und feiner / 6 and finer**

Härteprüfung
Hardness test

Prüf-Nr.	HB 30
Test-no.	
54504	168 HB

Zugversuch Tensile test — **Referenzerprobung** Reference-test

Prüf-Nr. / Test-no. 1
Probenform / Test-piece-type **10 mm rd.**
Richtung / Direction **längs**
Lage / Position

Prüf-Temp. Test-temp.	[°C]	+23					
$Rp_{0,2}$	[N/mm²]	812					
Rm	[N/mm²]	1139					
A5	[%]	12,1					
Z	[%]	51					

Kerbschlagversuch Notch impact test — **Referenzerprobung** Reference-test

Prüf-Nr. / Test-no. 1
Probenform / Test-piece-type **Charpy-V**
Richtung / Direction **längs**
Lage / Position

Prüf-Temp. Test-temp.	[°C]	+23					
Av-Einzelwert Notch impact energy	[J]	72					
Av-Einzelwert Notch impact energy	[J]	73					
Av-Einzelwert Notch impact energy	[J]	74					

Referenzzustand: 63 R, 860°C/Oel + 180°C 120 min Luft

Bemerkungen/remarks:
Verformungsgrad/forging ratio: > 6 - fach/fold
Ultraschallprüfung gem. SEP 1921 3 D/d.

Edelstahlwerke Buderus AG
Qualitätskontrolle/Q.C. Department
Wetzlar, 09.12.2002
Fr. Mann
Werkssachverständige/work inspector

Bei Rückfragen bitte unsere Werksauftrags-Nr. angeben.
If there are any questions, please refer to our reference no.

Attest ist per EDV erstellt und ohne Unterschrift gültig gemäß EN 10204.
Es wird hiermit bestätigt, daß die Lieferung den Vereinbarungen bei der Bestellung entspricht.
Certificate is prepared by EDP-system and has validity without signature acc. to EN 10204.
we herewith certify, that above mentioned material is in accordance with terms of order.

Signatur/signature

SIDENOR

Reinosa Plant

MILL TEST CERTIFICATE

Wattenw 184490

ISO 9001/2000 ER-0039/1994 ISO-TS 16949 (2002) RA02-0071/2001

CUSTOMER:THYSSEN BELGE, S.A.		WORKS REFERENCE:1083638
REFERENCE:4500187002	SALES ORDER:122630-1	HEAT NUMBER:88328
PRODUCT NR:	VERSION:37204	ROLLED:17.02.2004

REQUIRED PRODUCT

B04051203
10134601OOC2

34CrNiMo6 ROUND BARS AS ROLLED QUENCHING+TEMPER 110 -1,5/+1,5 mm DIN 1013 (2) 5.900/7.400 mm RANDOM

EXPEDITION | DELIVERY:80062393 WEIGHT (KG):7.060 BUNDLES:3 UNITS:14

7,25 m

MADE ACCORDING TO

EN 10221 - 01.11.1995 ; DIN 01013 P1 - .11.1976 ; EN 10083-1:91+A1-96 - 01.02.1991
THYSSEN BELGE CERTIFICATS - . . .; THYSSEN BELGE GS05.03.07E 06 31.08.2002
EN 10204:91/A1 - 01.06.1995 3.1B

CHEMICAL ANALYSIS OF HEAT U:% HEAT NUMBER:88328

	C	Mn	Si	P	S	Cr	Ni	Mo
Min.	0,300	0,500				1,300	1,300	0,150
Max.	0,380	0,800	0,400	0,035	0,035	1,700	1,700	0,300
Cer.	0,332	0,780	0,260	0,013	0,017	1,560	1,430	0,134

INCLUSIONS (MICROINCLUSIONS)

Standard(1) (DIN 50602- .09.1985) ; Standard(2) (ISO 4967:98-01.10.1998) ; Type/method (A) ; K(O):15
A(t):2 ; A(h):1,5 ; B(t):1 ; B(h):0,5 ; C(t):0 ; C(h):0; D(t):1,5 ; D(h):1

MECHANICAL PROPERTIES AS SUPPLIED (CONDITIONS)

Specimen Test location:At 12,5 mm from the surface

MECHANICAL PROPERTIES AS SUPPLIED (TEST)

Tensile test specimen diraction (Longitudinal):Longitudinal ; Rm (900/1.100 N/mm2):990 N/mm2
Re ((0,2%) >= 700 N/mm2):(0,2%) 870 N/mm2 ; A ((5d) >= 12 %):(5d) 19,3 % ; Z (>= 55 %):61,4 %
Notch impact sample direction (Longitudinal):Longitudinal ; Notch Impact sample type (KV):KV
Notch Impact test Temperature (20 °C):20 °C ; K(1):88 J ; K(2):87 J ; K(3):83 J
K (average) (>= 45 J):86 J ; K (single) (>= 31,5 J):83 J ; Hardness:295 HB

ADDITIONAL TESTS

Standard (ASTM E112-96- . .1996) ; Grain size:6 ; radiactivity:Exento

NON DESTRUCTIVE TESTS

Internal defects standard (STAHL EISEN SEP1921-01.12.1984) ; Internal defects type/method (AVG scale)
ULTRASONIC CONTROL 100%: OK. SEP1921 Group .2 Class D/d

ADDITIONAL INFORMATION

Minimum reduction ratio:16,2 ; MANUFACTURING PROCESS: ELECTRIC FURNACE AND VACUUM DEGASSED.
INGOT CASTING: 207.000 mm2
ULTRASONIC CONTROL 100%: OK. AS PER POINT 8 . , OF GS 05.03.07E AVG
WATER QUENCHED 850°C - 110M. TEMPERED 620°C - 220M. AIR.

ThyssenKrupp
Materials Belgium N.V./S.A.
04 MAI 2004
Division Lokeren

13 MEI 2004

MAT 451

TECHNOLOGY & QUALITY CERTIFIES THAT THE PRODUCT FULL FILLS THE ORDER'S SPECIFICATION

APPROVED BY:VICENTE GONZALEZ MERINO SIGN:

DATE:27.02.2004

SIDENOR REINOSA

REF.:6000228860000

Watteeuw

Documentcode	BF824_004
Type document	Locaal formulier
Uitgiftedatum	02.01.2004
Revisie	0
Pagina	1/1
Referentie document	P823_005N

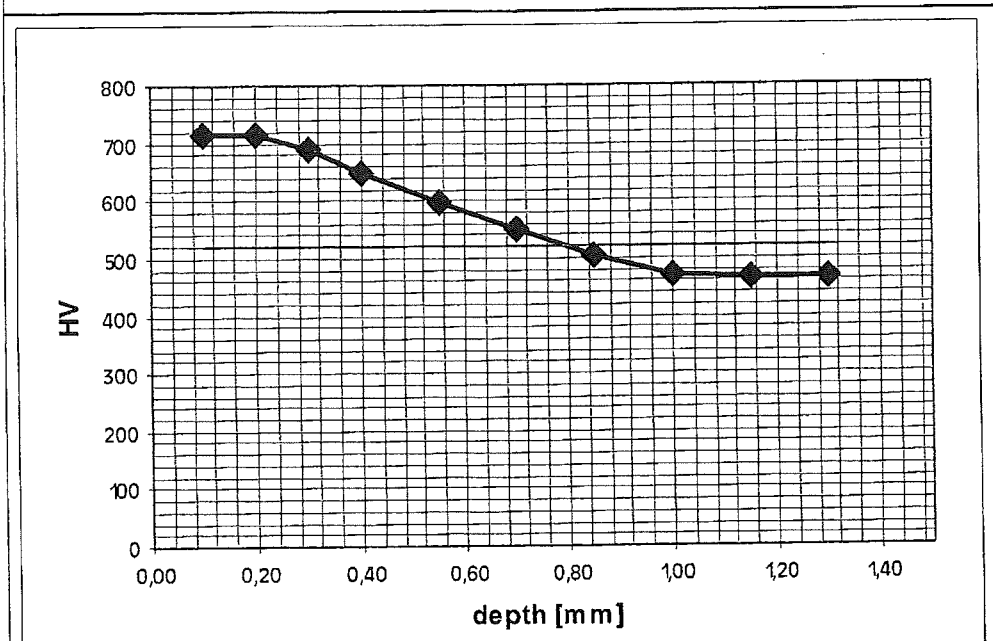
HEAT TREATMENT PROCESS INSPECTION

MCW ☑ | EURAIR ☐ | BMTR_G ☐ | BMTR_AS ☐ | BMTR_C ☐ | BMTC ☐ | CARATRON ☐ | AMTECH ☐

Heat treat lot A8827 — **proefblok d30** 17 Cr Ni Mo 6

customer	itemnr	serial nr	id nr	qty	material	Lot/Serial nr
AC COMPTEC	1320702628B		582995	3	17 Cr Ni Mo 6	

Results of the analyses and checks



Metalographic structure

Residual Austenite (500:1)	Carbide precipitation (500 : 1)
Intergranular oxidation (500:1)	Decarburization (500:1)
Surface structure (500:1)	Core structure (500:1)

effective case dept ISO 2639
effective case depth GH = 520 HV

			Hardness					
			Surface			Core		
loc zone	final	draw spec	hardness	specified	FOUND	hardnesstest	specified	FOUND
Sample	0,64	0,38 - 0,63	HRC	59 - 64	59,5	HRC	0 - 0	43,4

Remarks Lab :

date : 23/09/2004 **issued by :** Rammelaere Johan

Watteeuw Group	Datum: 29/10/2004	Klant: A.C.Comptec
Kampveldstraat 51	benaming: Pinion	Plan nr: **1320702628**
B 8020 Oostkamp	ID: 599836	Rev: **7**

Kontrolerapport Pinion

4. Gear Data Certification

		set nr;					
	requirements	17991	17992	17993			
Runout	0,0005	0,00008	0,00020	0,00011			
Tooth to tooth space	0,0002	0,00004	0,00004	0,00006			
Finisch on tooth contact surface	32	o.k.	o.k.	o.k.			
Finisch on fillet area	64	o.k.	o.k.	o.k.			
Chordal tooth thickness	,1379 - ,1339	0,1377	0,1365	0,1366			

Lead and profile; See Chart

5. Magnetic Particle Inspection

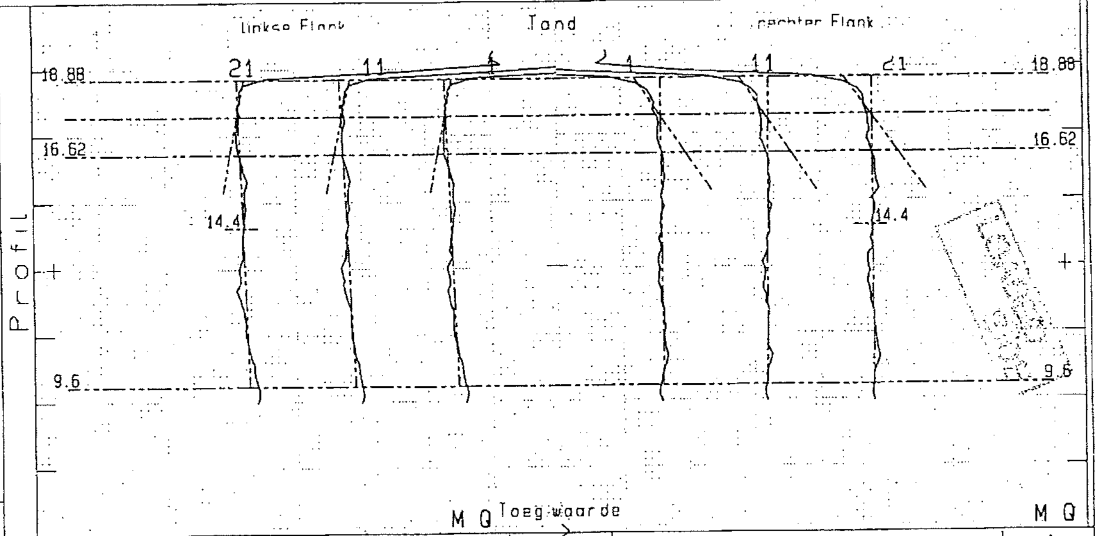
All parts have been inspected and are conform to the specifications.

6. balance record

parts are not balanced

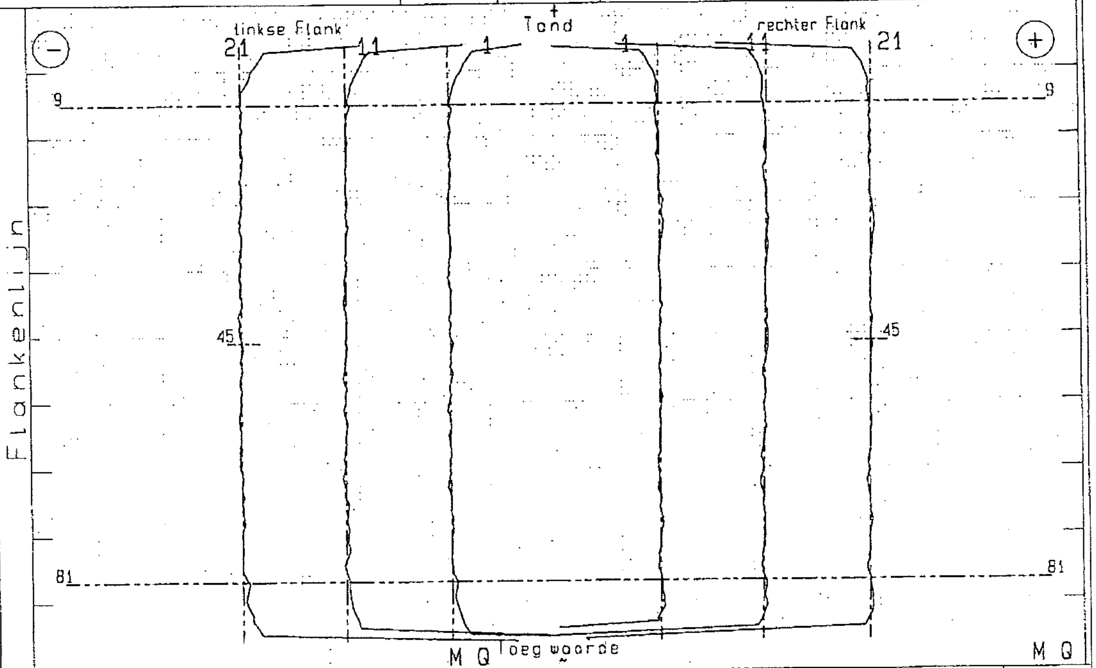
WATTEEUW	Meetblad Flanklijn		
Tekeningnr. 1320702628/T/7/S		m_n 2.1166 mm	b 90 mm
Benaming: ATLAS COPCO COMPTEC		z 29 R/R	L_β 80/80/100 %
BEMERKING: Mach450-SN17991	LOPEND NR 1	α_n 25°0'0" | X0	d_b 58.213/58.213 mm
WOODRUFF ONDER		β 18°57'58"/18°57'58"	vP 2 / vL 6
		β_b 17°7'51"/17°7'51"	TASTERSTIFT: Ø 1 mm
Kwaliteit	Toeg Pr: 5 / Fl: 5 Gemet Pr: 5 / Fl: 1	Toeg Pr: 5 / Fl: 5 Gemet Pr: 4 / Fl: 3	

Kop 5 : 1, 2 mm, 500 : 1, 20 µm, Voet



Toeg waarde				M | Q	Toeg waarde				M | Q
F_α 0/7	6.5	6	6	6 | 5	0/7	3	3	3.5	3 | 3
$f_{f\alpha}$ 0/6	5.5	4.5	4.5	5 | 5	0/6	3	3	3.5	3 | 4
$f_{H\alpha}$ +-4.5	3	4	3.5	3.5 | 5	+-4.5	0	1	.5	.5 | 1
K.5/13	2	3	2.5	2.5	5/13	8	9	8.5	8.5

Onder, BOVEN, 1 : 1, 10 mm, 500 : 1, 20 µm, ONDER, Boven



Toeg waarde				M | Q	Toeg waarde				M | Q
F_β 0/10	2	3.5	2.5	2.5 | 1	0/10	3	3.5	3.5	3.5 | 1
$f_{f\beta}$ 0/7	2.5	2.5	2.5	2.5 | 1	0/7	2.5	2.5	2.5	2.5 | 1
$f_{H\beta}$ +-7	-1	-1.5	-1	-1 | 1	+-7	-1.5	-3.5	-2.5	-2.5 | 3

Datum 15.10.2004 18:49

Keurder 230

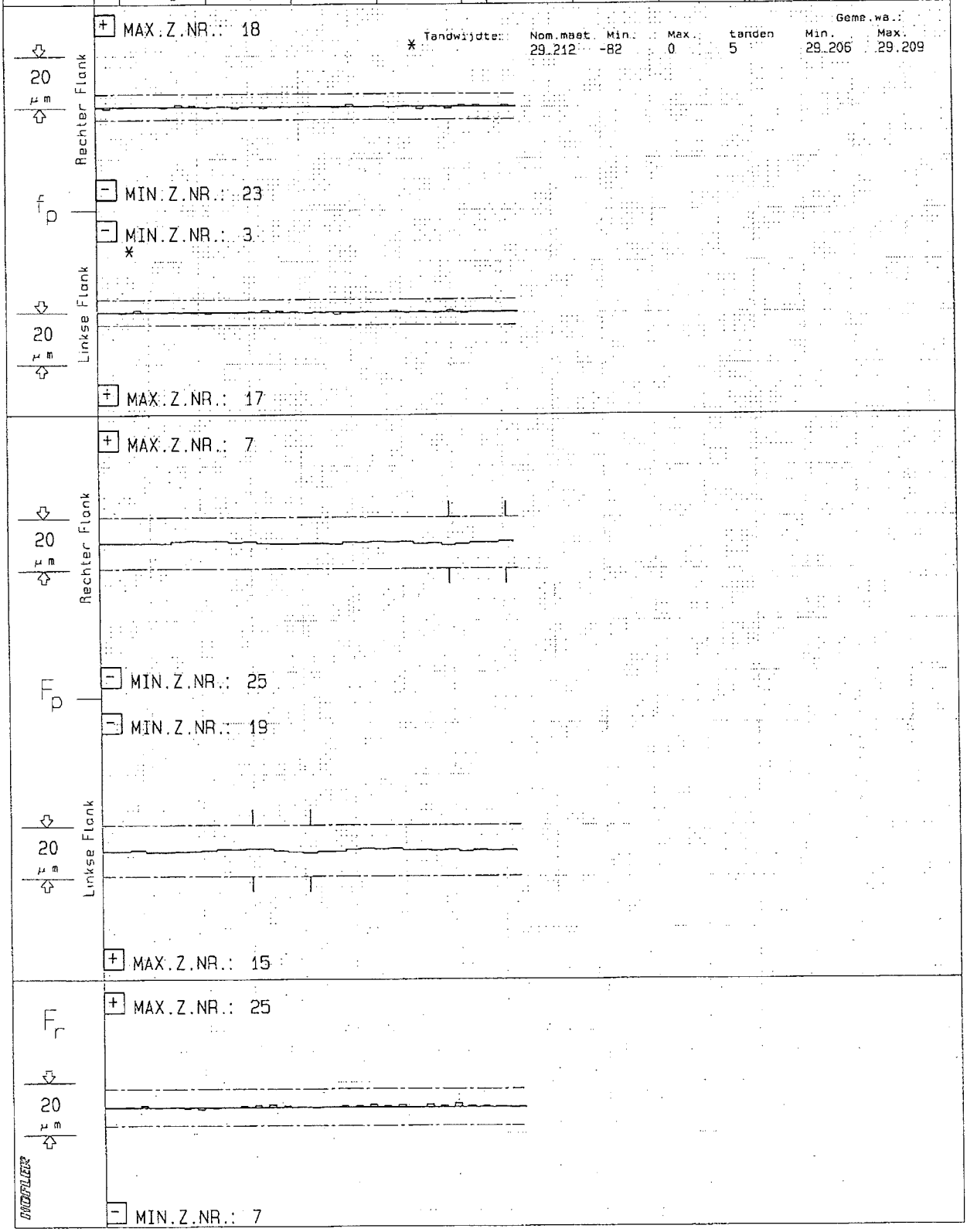
ZP 350 V5.14 DIN

HÖFLER

Teken.Nr.. 1320702628/T/7/S BEMERKING: Mach450-SN17991 LOPEND NR 1 UUR: 18: 49

z = 29 | m = 2.117 mm | β = 18 °57'58" R | d = 64.905 mm | Dat./Keurd 15.10.2004/230

DIN		f_{pt}	f_{u}*	F_p	$F_{pz}/8$		f_{pt}	f_{u}*	F_p	$F_{pz}/8$	F_r	
Toeg.Kwal.	Linkse FL	5	5	5	5	Rechter FL	5	5	5	5	5	Waarde in µm
Toeg.waarde		5	6	20	12		5	6	20	12	14	
Gemewaarde		1	1	1.5	1.5		1	1	2	1.5	2	
Gemi.Kwal.		1	1	1	1		1	1	1	1	1	



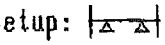
****

ATLAS COPCO COMPTEC
VOORHEESVILLE, NY

****

operator : CR 05.03.05 02:13 PM

rotor data

setup: 

file name :

a: 4.250 in	b: 16.87 in	c: 4.375 in
r1: 5.300 in	readout : p1/p12	r2: 6.500 in
m1: polar		m2: polar
tol1: 0.367 gin	bal. speed: 1086. rpm	tol2: 0.735 gin

plane 1

19.8 mg
at 58 deg
in tol

rotor: 1320102149

run 4

plane 2

14.8 mg
at 124 deg
in tol

AT E2

W/O L8-41198-A 0014 ATLAS COPCO ENERGAS
HL8 1ST & 2NDSTG ROTOR
PINION S/N 17748 1ST WHEEL S/N 00077-01 2ND WHEEL S/N 00046-01

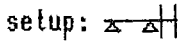
****

ATLAS COPCO COMPTEC
VOORHEESVILLE, NY

****

operator : CR 05.03.05 01:54 PM

rotor data

setup: 

file name :

a: 12.60 in	b: 5.500 in	c: 9.800 in
r1: 6.500 in	readout : pl1/pl2	r2: 1.375 in
m1: polar		m2: polar
tol1: 0.730 gin	bal. speed: 1087. rpm	tol2: 0.735 gin

plane 1

14.0 mg
at 85 deg
in tol

rotor: 1320102149

run 4

plane 2

39.6 mg
at 97 deg
in tol

AT E2

W/O L8-41198-A 0014 ATLAS COPCO ENERGAS
HL8 1ST STG ROTOR
PINION S/N 17748 WHEEL S/N 00077-01

****

ATLAS COPCO COMPTEC
VOORHEESVILLE, NY

****

operator : CR 05.03.05 12:32 PM

rotor data

setup:

file name :

a: 12.50 in	b: 4.000 in	c: 8.250 in
r1: 5.300 in	readout : pl1/pl2	r2: 1.000 in
m1: polar		m2: polar
tol1: 0.367 gin	bal. speed: 1186. rpm	tol2: 0.367 gin

plane 1

19.1 mg
at 196 deg
in tol

rotor: 1320102149

run 3

plane 2

48.3 mg
at 23 deg
in tol

AT E2

W/O L8-41198-A 0014 ATLAS COPCO ENERGAS
HL8 2ND STG ROTOR
PINION S/N 17748 WHEEL S/N 00046-01

ATLAS COPCO COMPTEC
VOORHEESVILLE, NY

operator : CR 05.03.05 10:20 AM

rotor data

setup:

file name :

a: 2.625 in	b: 2.800 in	c: 2.800 in
r1: 1.800 in	readout : pl1/pl2	r2: 2.400 in
m1: polar		m2: polar
tol1: 0.084 gin	bal. speed: 1202. rpm	tol2: 0.084 gin

plane 1

17.4 mg
at 257 deg
in tol

rotor: 1320705573

run 16

plane 2

19.2 mg
at 50 deg
in tol

AT E2

W/O L8-41198-A 0014 ATLAS COPCO ENERGAS
HL8 1ST& 2ND STG PINION
PINION S/N 17748

Atlas Copco Plant Air Rotor Assembly

Sales Order # L8-4/198-A **Compressor Model:** HL8
Pinion Part # 1320705573 **Pinion Serial #:** 17748
Rotor Assy Part # 1320102149 **Stage** 1 **Wheel S/N** 00077-01
Stage 2 **Wheel S/N** 00046-01

Pinion Runout Measurements

	Stage 1	Stage 2
Mech. Runout	.00005	.00005
Elec. Runout	.00006	.00007
Total Runout	.00011	.00012

Performed By: CR Date: 5/3/05
Witnessed By: _____ Date: _____

	Stretch Instruction #	Spacer	Nut
1st Stage	1320707989	1320708520	1320708020
2nd Stage	1320707988	1320708521	1320707834
3rd Stage			
4th Stage			

Pressure On Gauge (PSIG)

Stage	Dim.	Pre Stretch	Required	Actual
1	P1	9,857	8,973	9,000
2	P2	10,732	10,232	10,250
3	P3			
4	P4			

Tie-Bolt Stretch

Stage	Dim.	Required	Actual	Start Dim.	Final Dim.
1	B1	.022 - .024	.022	1.866	1.888
2	B2	.020 - .022	.021	1.604	1.625
3	B3				
4	B4				

Rotor Assembly Runouts

	Stage 1	Stage 2
Circular Runout (Wheel)	.002	.003
Circular Runout (Nut)	.005	.003
Seal Diameter	2.9075	2.548

Completed By: CR

	M. C. WATTEEUW n.v. Kampveldstraat 51 B - 8020 OOSTKAMP Tel. +32.50.82.69.07 Fax. +32.50.82.69.74 *FORMULIER*	F 11.01.01N datum uitgifte : 31/05/00 revisie : 02	Pagina ..... / .....

KEURINGSRAPPORT
INSPECTION CERTIFICATE
CERTIFICAT DE RECEPTION

EN 10204 - 3.1B

Klant : ATLAS COPCO COMPTEC
Customer / Client

Ordernummer : 310525
Purchase order nr. / No. de commande

Tekeningnummer : 1320702618 Editie : 3
Drawing number / No. de plan *Issue / Edition*

Stuknaam : Helical Gear Pinion
Part name / Dénomation

Hoeveelheid : 4
Quantity / Quantité

Identificatie : 17747 => 17750
Identification / Identification

Opmerkingen :
Remarks / Remarques

Verklaard wordt, dat het geheel der hierboven genoemde afleveringen in alle opzichten in overeenstemming zijn met de gestelde eisen, de tekeningen en de betreffende kontrakten en dat de afleveringen werden geverifieerd en gekeurd overeenkomstig de kontraktеisen, behoudens hogervermelde uitzonderingen .

It is certified that the whole of supplies outlined above are in all respects conform to the specifications, the drawings and the contracts in question and that the supplies have been verified and inspected in accordance with the contract requirements, exept for above mentioned exeptions .

Il est certifié que la totalité des fournitures nommées ci-dessus sont totalement conformes aux spécifications, plan et contrats qui s'y rapportent et que les fournitures ont été verifiées et contrôlées, conformément aux exigences du contrat, hormis les exeptions mentionnées ci-dessus .

Datum : 11 MAART 2004
Date / Date

Naam en functie :
Name and function / Nom et fonction

MECHANISCHE CONSTRUCTIE
WATTEEUW N. V.
Kampveldstraat 51
B-8020 Oostkamp
FORMULIER

F 09.03.10
pagina 1 / 1
datum uitgifte : 28/02/01
revisie: 01

Instructieblad - turbo controle **38 a**

Klant : **AC Comptec** Pinion Gecementeerd (*)

Plan samenst: 1320702612			**Rev: 3**					**PO nr:**	
Plannummer gear:		Rev:	**Idnr: 492873**						
Plannummer shaft:		Rev:							
Volgnummer: 17747 – 17752									
	Pinion shaft	X	**Pinion shaft**		**Ring 1 gear**		**Ring 2 gearmop**		
Lot serial:	**B04011307**								
Materiaal item nr:	1011760130c2								
Ovenlading:	A8612								

Procedure voor ~~proefstuk~~ / algemene controle (*) :

a) Uit te voeren controles :

* Dimensioneel :	X	100% controle op de Hofler
	X	100% controle ∅ en slag nauwkeurige boring + WK, rest steekproef, F 09.03.13
	X	100% controle electrical runout
	X	100% visueel (polieren)
	X	nummeren
* Magnaflux :	X	100% magnaflux en demagnetiseren

b) Mee te leveren documenten : volledig pakket wordt ingescand en doorgemaild

Ingescand: ☐ Samengesteld door: ☐

c) Documenten hier te bewaren : (originelen)

	Keuringsrapport EN 10204-3.1B, F11.01.01N
X	Voorblad F09.03.10
X	Materiaal certificaat 3.1.B
X	Hardheidscertificaat formulier (draft)
X	Gear data certification F 09.03.17
X	100% grafieken evolvente, richting, steek en rondloop
X	100% meetrapport Hofler
X	Steekproef controle, formulier 09.03.13
	Procescontrolebladen van de machine of van onderaannemer

Opmerkingen: NCR nr:	**Rebut sn:**	
	Herwerking sn:	
Revisie: 4	Datum:	29/09/2003

(*) schrappen wat niet past

Stempel ter goedkeuring : 3 Ts

Edelstahlwerke Buderus AG, Buderusstraße 25, 35576 Wetzlar

Abnahmeprüfzeugnis
(EN 10 204 - 3.1.B)

Buderus
EDELSTAHL

Attest-Nr./Certificate-no. 271120031120

Werksauftrag-Nr./our reference no.

Pos-Los

Position	UPos	Anzahl Quantity	Chargen-Nr. Heat-no.	Chargen-Kurzz. Heat code-no.	Gewicht Weight
			A 4189		kg

Erschmelzungsart Melting process: Elektrostahl / electric steel

Kd. Wst. Bez. Mat. qual.: 18 CrNiMo 7 6

Werkstoff Nr. Steel gr. no.: 6587

Versandanzeige-Nr. / Datum Shipment no.:

Materialbezeichnung: Stabstahl gewalzt
Material

Position	:
Ausführung Finish	: Gewalzt, BG-Geglüht, UT-geprüft nach SEP 1921 D/d
Kundenbestellnummer Purchase order-no.	:
Liefervorschrift Specification	: TLV QP-Q 01-001 REV.05
Abmessung Dimension	: RM RD: 130 X HSTLG.

Chemische Zusammensetzung % Chemical composition — **Chargenanalyse** Heat analysis — **Schmelzen-Nr.** A 4189 Heat-no.

C	Si	Mn	P	S	Cr	Ni	Mo	Cu	Al
0,17	0,29	0,54	0,009	0,021	1,58	1,47	0,30	0,11	0,029
Sn	Ti	H_2	Sb	Ca	B	O_2	W	Nb	
0,009	0,002	1,17	0,002	19 ppm		9 ppm			

Bemerkungen/remarks: H2 in ppm

Stirnabschreckversuch
Jominy-test

1,5	3	5	7	9	10	11	13	15	20	25	30	40	50	MM
46	45	45	45	43	43	42	42	42	39	37	36	34	33	HRC

MI-Reinheitsgrad gem. DIN 50602
Micro-cleanliness acc. DIN 50602

K4 = 0

MI-Reinheitsgrad gem. ISO 4967
Micro-cleanliness acc. ISO 4967

A:Dünn Thin	A:Dick Heavy	B:Dünn Thin	B:Dick Heavy	C:Dünn Thin	C:Dick Heavy	D:Dünn Thin	D:Dick Heavy
0,5	0,5	1,0	0,5	0,0	0,0	1,0	0,5

EURAM 255

13 -01- 2004

Edelstahlwerke Buderus AG, Buderusstraße 23, 35576 Wetzlar

Abnahmeprüfzeugnis
(EN 10 204 - 3.1.B)

Buderus
EDELSTAHL

Attest-Nr./Certificate-no. 271120031120

Werksauftrag-Nr./our reference no.

Pos-Los

Abschreckkorngröße
Austenitic grain size 7-8

Härteprüfung
Hardness test

Prüf-Nr. HB 30
Test-no. 187 HB

Zugversuch — Blindhärteerprobung
Tensile test — Blank hardness-test

Prüf-Nr. / Test-no.
Probenform / Test-piece-type
Richtung / Direction: LÄNGS

Prüf-Temp. Test-temp.	[°C]	+ 20					
$Rp_{0,2}$	[N/mm²]	1157					
Rm	[N/mm²]	1280					
A5	[%]	11,0					
Z	[%]	49,0					

Kerbschlagversuch — Blindhärteerprobung
Notch impact test — Blank hardness-test

Prüf-Nr. / Test-no.
Probenform / Test-piece-type
Richtung / Direction: LÄNGS
Lage / Position

Prüf-Temp. Test-temp.	[°C]	+ 20	+ 20	+ 20			
Av-Einzelwert Notch impact energy	[J]	65	83	67			

Dynamische Schlagarbeit
57 KN

Bemerkungen/remarks:
ULTRASCHALLPRÜFUNG GEMÄSS SEP 1921 D/d .
VERFORMUNGSGRAD: 19,99 - FACH
"Wir bestätigen, dass die Angaben der oben aufgeführten Lieferung denen des Ursprungszeugnisses nach EN 10204 entsprechen."
"We confirm, that the Data of above mentioned delivery are in conformity to the Root-Certificate according to EN 10204"

Edelstahlwerke Buderus AG
Qualitätskontrolle/Q.C. Department
Wetzlar, 27.11.2003
Er. Mann
Werkssachverständige/work inspector

Bei Rückfragen bitte unsere Werksauftrags-Nr. angeben.
If there are any questions, please refer to our reference no.

Attest ist per EDV erstellt und ohne Unterschrift gültig gemäß EN 10204.
Es wird hiermit bestätigt, daß die Lieferung den Vereinbarungen bei der Bestellung entspricht.
Certificate is prepared by EDP-system and has validity without signature acc. to EN 10204.
We herewith certify, that above mentioned material is in accordance with terms of order.

EURAS 258

13 -01- 2004

Documentcode	BF824_004
Type document	Locaal formulier
Uitgiftedatum	02.01.2004
Revisie	0
Pagina	1/1
Referentie document	P823_005N

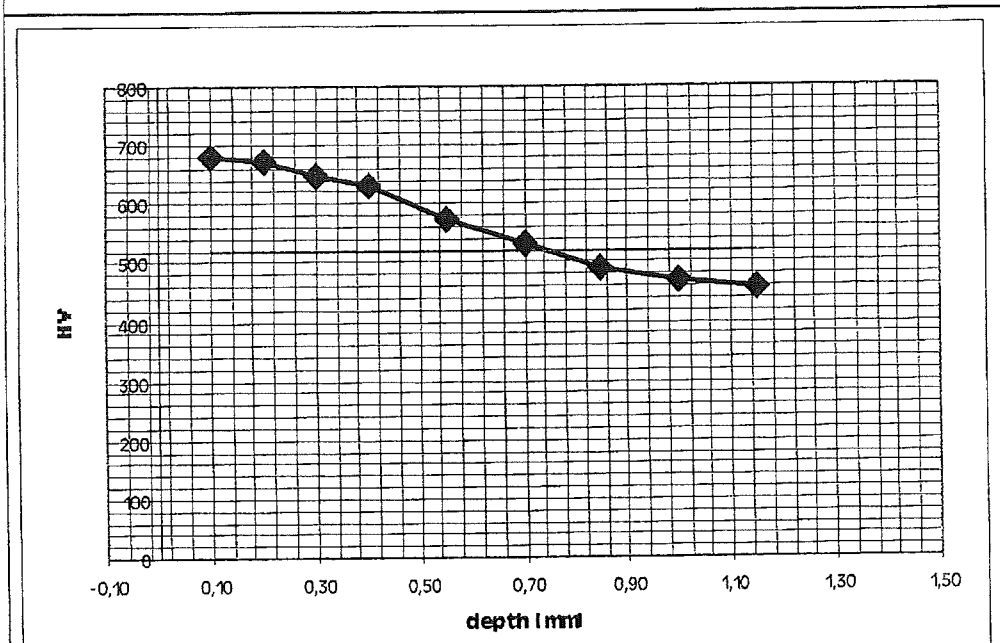
HEAT TREATMENT PROCESS INSPECTION

MCW ☑ | EURAIR ☐ | BMTR_G ☐ | BMTR_AS ☐ | BMTR_C ☐ | BMTC ☐ | CARATRON ☐ | AMTECH ☐

Heat treat lot A8612 — **proefblok d30 17 Cr Ni Mo 6**

customer	itemnr	serial nr	id nr	qty	material	Lot/Serial nr
AC COMPTEC	1320702612		492873	6	17 Cr Ni Mo 6	

Results of the analyses and checks



Metalographic structure

Residual Austenite (500:1)	Carbide precipitation (500 : 1)
Intergranular oxidation (500:1)	Decarburization (500:1)
Surface structure (500:1)	Core structure (500:1)

effective case dept ISO 2639
effective case depth GH = 520 HV

loc zone	spec HT	FOUND	grindstock	final	draw spec	Hardness Surface hardness	specified	FOUND	Core hardnesstest	specified	FOUND
Sample	0,60 - 0,80	0,74	0,17	0,57	0,38 - 0,63	HRC	59 - 64	60	HRC	0 - 0	42,4

Remarks Lab :

date : 5/02/2004 **issued by :** De Buysser Henk

Watteeuw Group Kampveldstraat 51 B 8020 Oostkamp	Datum: 9/03/2004 benaming: Pinion ID: 492873	Klant: A.C.Comptec Plan nr: **1320702612** Rev: **3**

Kontrolerapport Pinion

4. Gear Data Certification

		set nr;					
	requirements	17747	17748	17749	17750	17751	17752
Runout	0,0005	0,00037	0,00021	0,00025	0,00031	0,00025	0,00031
Tooth to tooth space	0,0002	0,00008	0,00006	0,00008	0,00010	0,00006	0,00008
Finisch on tooth contact surface	32	ok	ok	ok	ok	ok	ok
Finisch on fillet area	64	ok	ok	ok	ok	ok	ok
Chordal tooth thickness	,1376 - ,1335	0,1360	0,1349	0,1349	0,1376	0,1365	0,1360

Lead and profile; See Chart

5. Magnetic Particle Inspection

All parts have been inspected and are conform to the specifications.

6. balance record

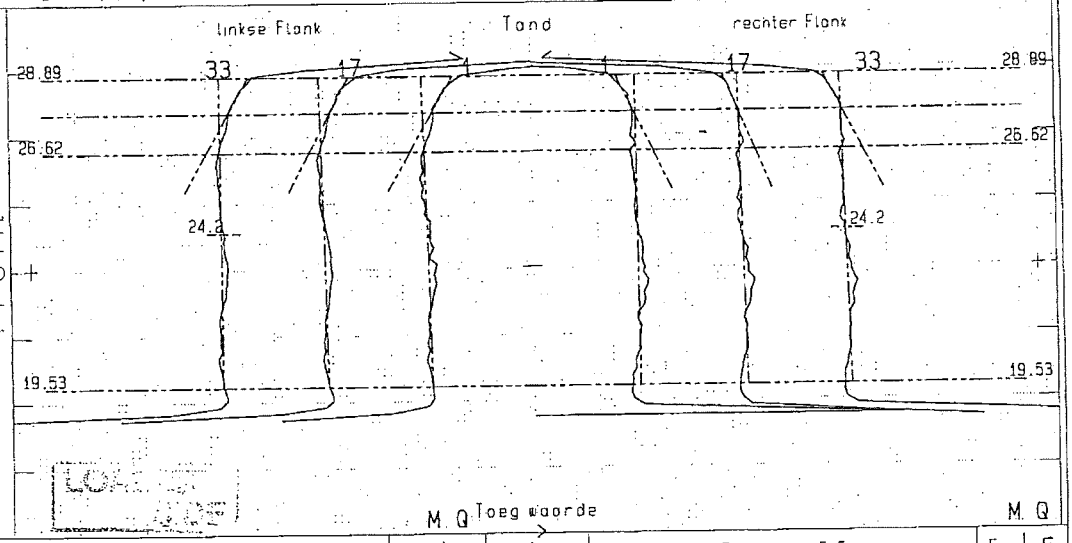
parts are not balanced

WATTEEUW — Meetblad Flanklijn

Tekeningnr:	1320702612/T/3/S	m_n 2.116667	mm	b 67.3	mm
Benaming:	TURBONETIC	z 49 R/R		L_β 80/80/100 %	
BEMERKING:	Mach450-Sn17748 LOPEND NR 5	α_n 25°0'0" | XO		d_b 98.363/98.363	mm
WOODRUFF BOVEN	MET POTJE	β 18°57'58"/18°57'58"		vP 3 / vL 7	
OMGEKEERD GEKONTR.		β_b 17°7'51"/17°7'51"		TASTERSTIFT: Ø 1	mm
Kwaliteit	Toeg. Pr: 5 / Fl: 5 Gemet. Pr: 4 / Fl: 4	Toeg. Pr: 5 / Fl: 5		Gemet Pr: 5 / Fl: 3	

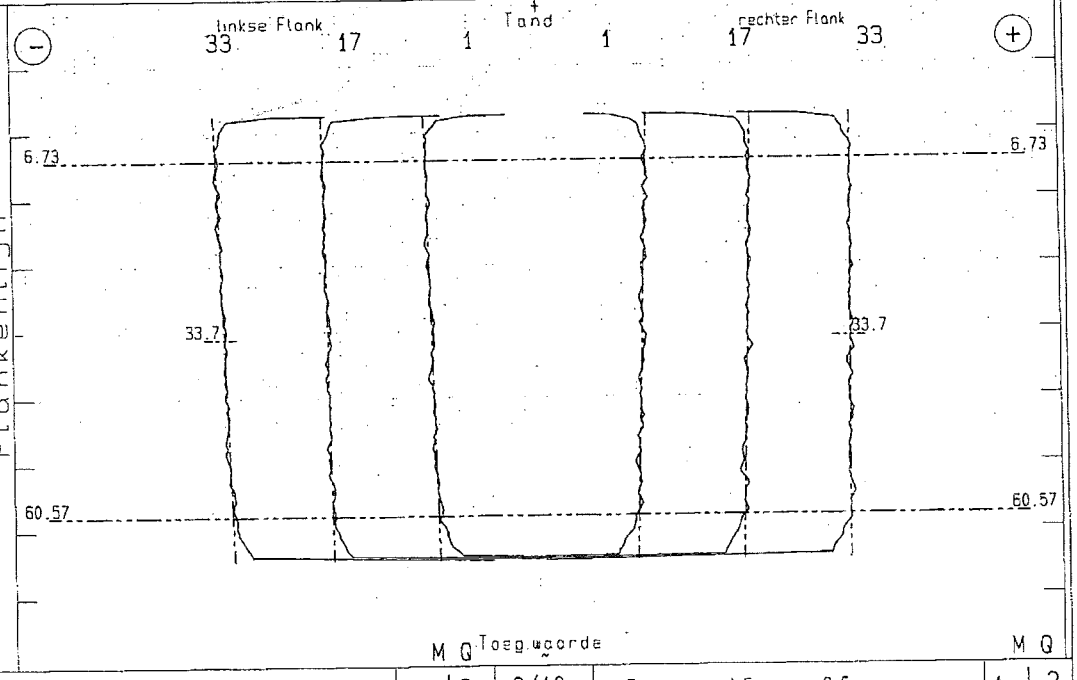
Datum 27.02.2004 12:55 — Keurder: 367 — ZP 350 V5.14 DIN

Kop
5 : 1
2 mm
500 : 1
20 µm
Voet



Toegwaarde				M	Q	Toegwaarde				M	Q
F_α 0/7	3.5	4.5	5	4.5	4	0/7	5	5	5.5	5	5
$f_{f\alpha}$0/6	3.5	3.5	4	3.5	4	0/6	5.5	5.5	5	5.5	5
$f_{H\alpha}$+-4.5	.5	2	2.5	1.5	4	+-4.5	-.5	-2	-2.5	-1.5	4
K.5/13	9	9	9.5	9		5/13	6	4.5	5	5	

Onder
BOVEN
1 : 1
10 mm
500 : 1
20 µm
ONDER
Boven



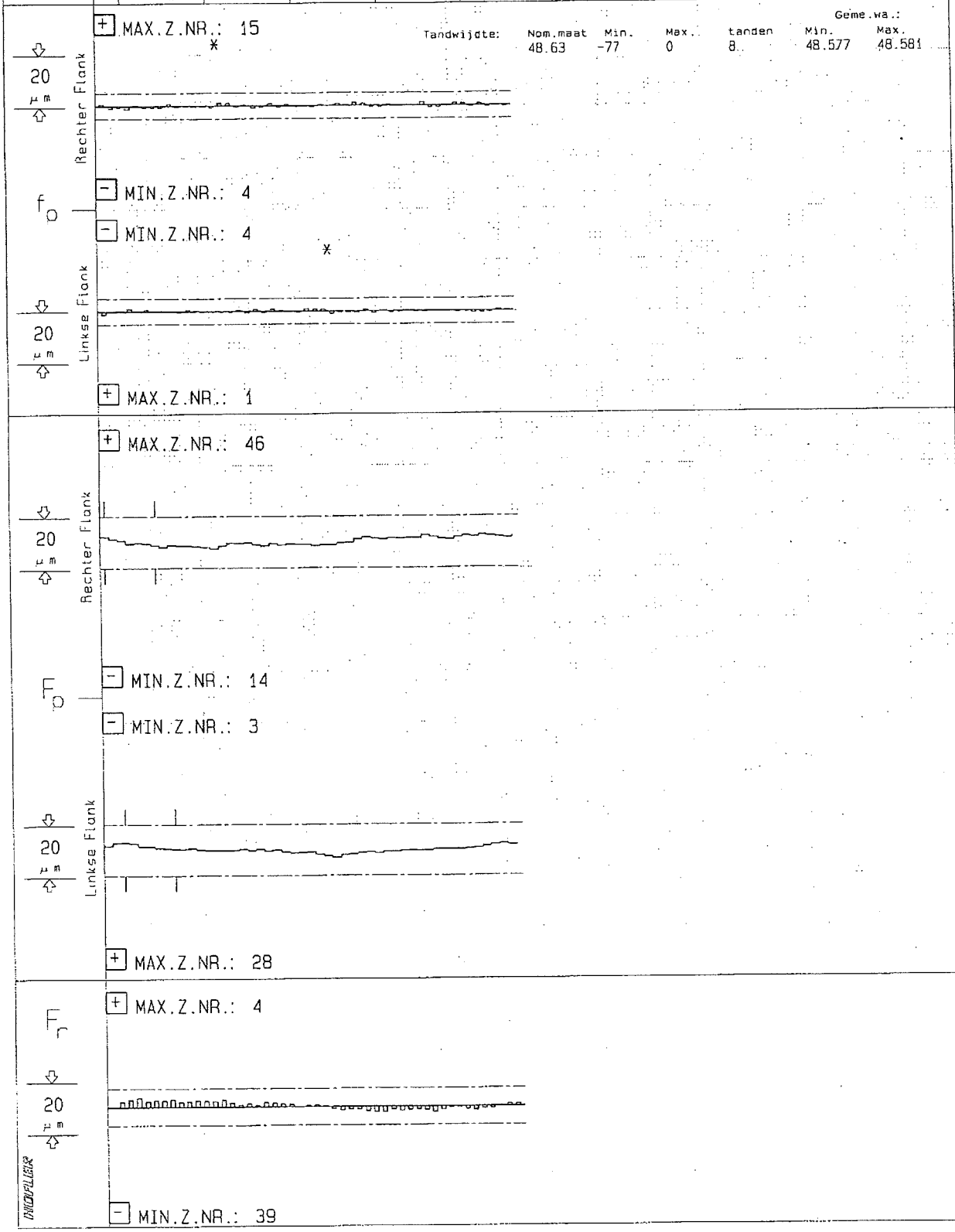
Toegwaarde				M	Q	Toegwaarde				M	Q
f_β 0/10	5.5	3.5	4.5	4.5	3	0/10	5	4.5	2.5	4	2
$f_{f\beta}$0/7	2.5	2.5	3	2.5	1	0/7	2.5	3.5	2.5	3	2
$f_{H\beta}$+-7	5	2.5	3.5	3.5	4	+-7	-4	-3.5	-1	3	3

HILDEFILLER

Teken Nr 1320702612/T/3/S BEMERKING: Mach450-Sn17748 LOPEND NR 5 UUR: 12:55

z = 49 | m = 2.117 mm | β = 18° 57' 58" R | d = 109.671 mm | Dat/Keurd 27.02.2004/367

DIN	Linkse FL	f_{pt}	f_{u}*	F_p	$F_{pz}/8$	Rechter FL	f_{pt}	f_{u}*	F_p	$F_{pz}/8$	F_r	Waarde in µm
Toeg.Kwal		5	5	5	5		5	5	5	5	5	
Toeg.waarde		5	6	20	12		5	6	20	12	14	
Geme.waarde		1	1.5	6	2.5		1	2	5	3.5	5.5	
Geme.Kwal		1	1	2	1		1	1	1	2	3	



ATLAS COPCO COMPTEC M857
VOORHEESVILLE, NY

operator : TH 05.09.05 06:53 PM

rotor data

setup:

file name :

a: 12.00 in	b: 2.875 in	c: 6.625 in
r1: 3.250 in	readout : pl1/pl2	r2: 0.687 in
m1: polar		m2: polar
tol1: 0.056 gin	bal. speed: 1582. rpm	tol2: 0.056 gin

plane 1

8.12 mg
at 84 deg
in tol

rotor: 1320707070

run 3

plane 2

25.7 mg
at 155 deg
in tol

AT E2

W/O L8-41198-A 0015 AC ENERGAS GMBH
PINION S/N 17991 WHEEL S/N 00102-01
3RD STG HL8 ROTOR

ATLAS COPCO COMPTEC M857
VOORHEESVILLE, NY

operator : TH 05.09.05 05:02 PM

rotor data

file name :

setup:

a: 2.187 in	b: 4.375 in	c: 1.687 in
r1: 1.100 in	readout : pl1/pl2	r2: 1.600 in
m1: polar		m2: polar
tol1: 0.056 gin	bal. speed: 1501. O/mh	tol2: 0.056 gin

plane 1

18.5 mg
at 340 deg
in tol

rotor: 1320702628 REV 7

run 1

plane 2

8.04 mg
at 279 deg
in tol

AT E2

W/O L8-41198-A 0015 AC ENERGAS GMBH
PINION S/N 17991
HL8 3RD STG

Plant Air Rotor Assembly

Sales Order L8-41198-A **Compressor Model:** HL8
Pinion Part 1320702628Rev7 **Pinion Serial #:** 17991
Rotor Assy Part # 1320707070 **Stage** 3 **Wheel S/N** 00102-01
Stage _____ **Wheel S/N** _____

Pinion Runout Measurements

	Stage 3	Outboard
Mech. Runout	.00005	.00005
Elec. Runout	.00009	.00019
Total Runout	.00014	.00024

Performed By: CR Date: 5/6/05
Witnessed By: _____ Date: _____

	Stretch Instruction #	Spacer	Nut
1st Stage			
2nd Stage			
3rd Stage	1320707994	1320708002	1320707836
4th Stage			

Pressure On Gauge (PSIG)

Stage	Dim.	Pre Stretch	Required	Actual
1	P1			
2	P2			
3	P3	10,732	10,232	10,250
4	P4			

Tie-Bolt Stretch

Stage	Dim.	Required	Actual	Start Dim.	Final Dim.
1	B1				
2	B2				
3	B3	.018 - .022	.0185	2.764	2.7825
4	B4				

Rotor Assembly Runouts

	Stage 3	
Circular Runout (Wheel)	.001	
Circular Runout (Nut)	.004	
Seal Diameter	1.9068	

Completed By: TH

	M. C. WATTEEUW n.v. Kampveldstraat 51 B - 8020 OOSTKAMP Tel. +32.50.82.69.07 Fax. +32.50.82.69.74 *FORMULIER*	F 11.01.01N datum uitgifte : 31/05/00 revisie : 02	Pagina ..... / .....

KEURINGSRAPPORT
INSPECTION CERTIFICATE
CERTIFICAT DE RECEPTION

EN 10204 - 3.1B

Klant :
Customer / Client
Atlas Copco Compressors Inc

Ordernummer :
Purchase order nr. / No. de commande
411214

Tekeningnummer :
Drawing number / No. de plan
1320702241

Editie : **A**
Issue / Edition

Stuknaam :
Part name / Dénomation
Gear Assy Drive + Pump

Hoeveelheid :
Quantity / Quantité
5

Identificatie :
Identification / Identification
18061 - 18065

Opmerkingen :
Remarks / Remarques

Verklaard wordt, dat het geheel der hierboven genoemde afleveringen in alle opzichten in overeenstemming zijn met de gestelde eisen, de tekeningen en de betreffende kontrakten en dat de afleveringen werden geverifieerd en gekeurd overeenkomstig de kontrakteisen, behoudens hogervermelde uitzonderingen .

It is certified that the whole of supplies outlined above are in all respects conform to the specifications, the drawings and the contracts in question and that the supplies have been verified and inspected in accordance with the contract requirements, exept for above mentioned exeptions .

Il est certifié que la totalité des fournitures nommées ci-dessus sont totalement conformes aux spécifications, plan et contrats qui s'y rapportent et que les fournitures ont été verifiées et contrôlées, conformément aux exigences du contrat, hormis les exeptions mentionnées ci-dessus .

Datum :dinsdag 8 februari 2005Naam en functie :
Date / Date
Name and function / Nom et fonction

MECHANISCHE CONSTRUCTIE
WATTEEUW N. V.
Kampveldstraat 51
B-8020 Oostkamp
FORMULIER

F 09.03.10
pagina 1 / 1
datum uitgifte : 28/02/01
revisie: 01

Instructieblad - turbo controle **38 a**

Klant :**A.C.Comptec** Bullgear Niet gecementeerd

Plan samenstelling : 1320701557 R1			**Rev : 9**		**PO nr:**		
			ID nr 609908sp				
Volgnummer : 18061							
					gear	**x**	
Lot serial :	**I04112301**						
Materiaal item nr :	**108176800077C2**						
Ovenlading :	----------						

Procedure voor algemene controle :

a) Uit te voeren controles :

* Dimensioneel :

X	100 % controle Ø en slag nauwkeurige boring + WK , rest steekproef , F 09.03.14
	~~100 % controle electrical runout~~
	~~100 % visueel (polieren)~~
X	Nummeren

* Magnaflux :

X	100 % magnaflux en demagnetiseren

b) Mee te leveren documenten : volledig pakket wordt ingescand en doorgemaild

Ingescand [ ] Samengesteld door [256]

c) Documenten hier te bewaren : (originelen)

	Keuringsrapport EN 10204-3.1.B , formulier 11.01.01 N
X	Voorblad F 09.03.10
X	Materiaal certificaat 3.1.B
X	Gear data certification F 09.03.17
	Uitbalanceerrapport
X	100 % grafieken evolventie , richting , steek en rondloop
X	Steekproef controle , formulier F 09.03.13
X	Procescontrolebladen van de machine of van onderaannemer

Opmerkingen : NCR nr:	**Rebut sn :**	
deze bullgear monteren met shaft n°609909/1	**Herwerking sn :**	
Revisie : 4	Datum :	29/09/2003

(*) schrappen wat niet past

Stempel ter goedkeuring :

	MECHANISCHE CONSTRUCTIE WATTEEUW N. V. Kampveldstraat 51 B-8020 Oostkamp *FORMULIER*	F 09.03.10 pagina 1 / 1 datum uitgifte : 28/02/01 revisie: 01

Instructieblad - turbo controle **38 a**

Klant :**A.C.Comptec** Shaft Niet gecementeerd

Plan samenstelling : 1320701557 R2		**Rev : 9**	**PO nr:**	
		ID nr: 609909		
Volgnummer : 609909/1 → 609909/5				
	shaft x			
Lot serial :	**B04111705**			
Materiaal item nr :	**1013460180C2**			
Ovenlading :	----------			

Procedure voor algemene controle :

a) Uit te voeren controles :

* Dimensioneel :	X	100 % controle op de Höfler
	X	steekproef , F 09.03.14
	X	100 % visueel (polieren)
	X	Nummeren
* Magnaflux :	X	100 % magnaflux en demagnetiseren

b) Mee te leveren documenten : volledig pakket wordt ingescand en doorgemaild

Ingescand ☐ Samengesteld door 256

c) Documenten hier te bewaren : (originelen)

	Keuringsrapport EN 10204-3.1.B , formulier 11.01.01 N
X	Voorblad F 09.03.10
X	Materiaal certificaat 3.1.B
X	100 % meetrapport Höfler
X	Steekproef controle , formulier F 09.03.13
X	Procescontrolebladen van de machine of van onderaannemer

Opmerkingen : NCR nr:	**Rebut sn :**	
S/N 1 monteren met aangepaste bulgear. S/N 18061	**Herwerking sn :**	
Revisie : 4	Datum :	29/09/2003

276

(*) schrappen wat niet past

Stempel ter goedkeuring :

	MECHANISCHE CONSTRUCTIE **WATTEEUW N. V.** Kampveldstraat 51 B-8020 Oostkamp *FORMULIER*	F 09.03.10 pagina 1 / 1 datum uitgifte : 28/02/01 revisie: 01

Instructieblad - turbo controle **38 a**

Klant :**A.C.Comptec** Spur gear Niet-gecementeerd

Plan samenstelling : 1320701637			**Rev : 4**		**PO nr:**			
			ID nr: 609910					
Volgnummer :	**609910/1 – 609910/5**							
	Pinion		**pinion**		**Ring 1**		**Ring 2**	
	shaft		**shaft**		**gear**		**gearmop**	X
Lot serial :							**B03022804**	
Materiaal item nr :							**1013460140c2**	
Ovenlading :								

Procedure voor algemene controle :

a) Uit te voeren controles :

* Dimensioneel :	X	100 % controle op de Höfler
	X	100 % controle Ø en slag nauwkeurige boring + WK , rest steekproef , F 09.03.14
	V	Nummeren
* Magnaflux :	X	100 % magnaflux en demagnetiseren

b) Mee te leveren documenten : volledig pakket wordt ingescand en doorgemaild

Ingescand ☐ Samengesteld door ☐

c) Documenten hier te bewaren : (originelen)

	Keuringsrapport EN 10204-3.1.B , formulier 11.01.01 N
X	Voorblad F 09.03.10
X	Materiaal certificaat 3.1.B
X	~~Hardheidscertificaat formu~~lier
X	Gear data certification F 09.03.17
X	100 % grafieken evolvente , richting , steek en rondloop
X	100 % meetrapport Höfler
X	Steekproef controle , formulier F 09.03.13
	Procescontrolebladen van de machine of van onderaannemer

Opmerkingen : NCR nr:	**Rebut sn :**	
	Herwerking sn :	
Revisie : 4	Datum :	29/09/2003

(*) schrappen wat niet past

Stempel ter goedkeuring :

	MECHANISCHE CONSTRUCTIE WATTEEUW N. V. Kampveldstraat 51 B-8020 Oostkamp *FORMULIER*	F 09.03.10 pagina 1 / 1 datum uitgifte : 28/02/01 revisie: 01

Instructieblad - turbo controle **38 a**

Klant :**A.C.Comptec** ~~Bullgear~~ Spur gear. Niet-gecementeerd

Plan samenstelling : 1320701637			**Rev :4**		**PO nr:**			
			ID nr:595199					
Volgnummer : 595199/1 – 595199/5								
	Pinion		**pinion**		**Ring 1**		**Ring 2**	
	shaft		**shaft**		**gear**	X	**gearmop**	
Lot serial :					**B03022804**			
Materiaal item nr :					**1013460140C2**			
Ovenlading :					----------			

Procedure voor algemene controle :

a) Uit te voeren controles :

* Dimensioneel :		100 % controle op de Höfler
		100 % controle Ø en slag nauwkeurige boring + WK , rest steekproef , F 09.03.14
		100 % controle electrical runout
		100 % visueel (polieren)
		Nummeren
* Magnaflux :		100 % magnaflux en demagnetiseren

b) Mee te leveren documenten : volledig pakket wordt ingescand en doorgemaild

Ingescand ☐ Samengesteld door 439

c) Documenten hier te bewaren : (originelen)

	Keuringsrapport EN 10204-3.1.B , formulier 11.01.01 N
X	Voorblad F 09.03.10
X	Materiaal certificaat 3.1.B
-	Hardheidscertificaat formulier
X	Gear data certification F 09.03.17
X	grafieken evolvente , richting , steek en rondloop
X	Steekproef controle , formulier F 09.03.13

Opmerkingen : NCR nr:	**Rebut sn :**	
	Herwerking sn :	
Revisie : 4	Datum :	29/09/2003

(*) schrappen wat niet past

Stempel ter goedkeuring :

Edelstahlwerke Buderus AG

STAHLLAGER WETZLAR

BUDERUSSTR. 25

D 35576 WETZLAR

Abnahmeprüfzeugnis EN 10 204-3.1.B

Attest Nr. 202891

Werksauftrag-Nr. 1-27577-3

Pos-Los 1-09

Herstellerzeichen Supplier's Mark Marque D'Usine

Position	UPos	Anzahl	Chargen Nr.		Gewicht [Kg]
0001	0	2	53877		35560,000

I04112301
10317680007 7C e
5X

Erschmelzungsart Elektrostahl

Kd Wst Bez 18 CRNiMO 7-6 ISO-B **Werkstoff** 6587

Versandanzeige-Nr. / Datum 5000197748 26.03.2003

Materialbezeichnung	: Stabstahl geschmiedet
Position	: ARTIKEL-NR.: 75004698
Ausführung	: DIN 7527/6 - 02/75, FESTIGKEIT MIN 180,0, FESTIGKEIT MAX 210,0 HB, UNBEARBEITET, BEIDE ENDEN GESÄGT, UT-GEPRÜFT, VORVERGÜTET, VERFORMUNGSGRAD MIN 4,0 VAKUUMENTGAST, 100 % TITANFREI
Kundenbestellnummer	: .
Liefervorschrift	: EN 10084 + DIN 17210-ANHANG AUSGABE 10/84 ZF 1A REV.10/01
Abmessung	: RM RD. 800,0 X

Chemische Zusammensetzung % Chargenanalyse

C	SI	MN	P	S	CR	NI	MO	V	W
0,17	0,33	0,55	0,008	0,002	1,69	1,57	0,30	——	——
CU	SN	TI	AL	H2	CA	SB	O2		
0,19	0,0100	0,0010	0,026	——	0,0010	0,0015	0,0012		

NB=0,002 N2=0,0090

Stirnabschreckversuch Charge

1,5	3	5	7	9	10	13	15	20	25	30	40	50	MM
44	44	44	43	43	43	43	42	40	39	36	35	34	HRC

Dynamische Schlagkraft in [KN]

63

MI-Reinheit DIN 50602 Charge

K4 0,0

MI-Reinheit nach ASTM E 45/97 PL. Charge

A Dünn	Dick	B Dünn	Dick	C Dünn	Dick	D Dünn	Dick
0,5	0,5	0,0	0,0	0,0	0,0	1,0	0,5

ISO 4967: TYP DS= 1,0

23 NOV. 2004

Charge

Abschreck Korngröße : 6-7

WAT 451

Prüf Nr. **Härteprüfung**

Edelstahlwerke **Buderus AG**	Qualitätssicherung Wetzlar, den 13.08.2004	Hr. C. Moosberger Werkssachverständiger	Seite 1 von 2

Bellegarde

Edelstahlwerke Buderus AG	Abnahmeprüfzeugnis EN 10 204-3.1.B	Herstellerzeichen Supplier's Mark Marque D'Usine
STAHLLAGER WETZLAR BUDERUSSTR. 25 **D 35576** WETZLAR	Attest Nr. 202891 Werksauftrag-Nr. 1-27577-3 Pos-Los 1-09	

V 0624 HB 30 190

Zugversuch

Zugversuch **Blindhärteerprobung**

Prüf Nr.	Proben - Form Richtung Lage	Temp: [°C]			Werte
S 0624	Q B 10 X 50 STIRNS./FRONT-FACE	+ 20	RP	0,2 [MPa]	1083
				RM [MPa]	1232
			A	5 [%]	10,4
				Z [%]	51,0

Kerbschlagversuch

Kerbschlagversuch **Blindhärteerprobung**

Prüf Nr.	Proben - Form Richtung Lage	Temp: [°C]	Testart	Werte		
S 0624	Q ISO-V STIRNS./FRONT-FACE	+ 20	AV/Einzelwerte [J]	46	51	45

VERFORMUNGSGRAD: > 4 - FACH
DIE US-PRÜFUNG GEMÄSS QSV 1090 REV.1 ERGAB KEINE BEANSTANDUNG.

Attest ist per EDV erstellt und ohne Unterschrift gültig gemäss EN 10204.

Es wird hiermit bestätigt, daß die Lieferung den Vereinbarungen bei der Bestellung entspricht.

23 NOV. 2004

WAT 451

Edelstahlwerke Buderus AG	Qualitätssicherung Wetzlar, den 13.08.2004	Hr. C. Moosberger Werkssachverständiger	Seite 2 von 2 Anlagen

B04111705
1013460180C2
Watteeuw 5,57 m
633069

EDELSTAHL WITTEN-KREFELD GMBH

Auestraße
D-58452 Witten
Telefon: (02302)29-0
Telefax: (02302)29-40 00
Postanschrift: D-58449 Witten
http://www.edelstahl-witten-krefeld.de

Datum/Date: 28.07.04

Seite/Page: 1/2

Zertifiziert nach:	ISO 9001 VDA 6. Teil 1	Werkstofflieferant gemäß Druckgeräte-richtlinie 97/23 EG
	AD2000 W 0 TRD 100	

Abnahmeprüfzeugnis nach
Inspection Certificate acc.to/Certificat de réception selon **DIN EN 10204 3.1B**

Zeugnis-Nr./Certificate No./No.de Certificat 805387/655269/bit

Edelstahl Witten - Krefeld GmbH, D-58449 Witten
ThyssenKrupp Materials Belgium (BE)
N.V/S.A.
Zoning Industriel Rue de Wallonie
BE-4460 Grace-Hollogne

Herstellerzeichen/Supplier's Mark/Marque d'usine	WK
Prüfstempel/Inspector's stamp/Poinçon de l'expert	QA

Warenempfänger
N.V. ThyssenKrupp Materials Belgium
Weverslaan, 16

BE-9160 Lokeren

Ihre Auftr.-Nr. vom / Your order No. date / No.de votre commande du	
4500213796 / 07.05.04	
Unsere Auftr.-Nr. / Our order No. / No.de notre Commande	Unsere Material-Nr. / Our material No. / No.de notre matériel
228191 / 10	2215852
Unsere Abteilung / Our department / Notre département	Telefon/Telephone/Téléphone
VBR4	02302/294990

Produkt/Product/Produit

STAEBE AUS EDELBAUSTAHL
THYROFORT 34 CRNIMO 6, WST.-NR. 1.6582
GEWALZT, VERGUETET,
GERICHTET,
GEMAESS EN 10083-1 +QT
RM = 800-950 N/MM2
TOLERANZ DIN 1013
GEMAESS SPEC. 05.03.07 E V. 08.02

ENGINEERING STEEL BARS
THYROFORT 34 CRNIMO 6, MAT.-NO. 1.6582
HOT ROLLED, HARDENED AND TEMPERED,
STRAIGHTENED,
ACC. TO EN 10083-1 +QT
RM = 800-950 N/MM2
TOLERANCE DIN 1013
ACC. TO SPEC. 05.03.07 E V. 08.02

BARRES EN ACIER FIN DE CONSTRUCTION
THYROFORT 34 CRNIMO 6, NO. MAT. 1.6582
LAMINE, TREMPE ET REVENU.
DRESSE,
SELON EN 10083-1 +QT
RM = 800-950 N/MM2
TOLERANCE DIN 1013
SELON SPEC. 05.03.07 E V. 08.02

BARRAS DE ACERO DE CONSTRUCCION
THYROFORT 34 CRNIMO 6, MAT. NO. 1.6582
LAMINADO, BONIFICADO,
ENDEREZADO,
SEGUN EN 10083-1 +QT
RM = 800-950 N/MM2
TOLERANCIA DIN 1013
SEGUN SPEC. 05.03.07 E V. 08.02

Fertigungsauftr.-Nr./Production lot-No./Lot de fabrication No.	: 23140
Lieferschein-Nr./Delivery note/No. de l'avis de livraison	:
Schmelzen-Nr./Heat No./No.de coulée	: 503360
Stückzahl/Piece No./Nombre des pièces	:
Gewicht/Weight/Masse	:
Zeichnungs-Nr./Drawing No./No.du dessin	:
Format/Shape/Profil	: rund / round / rond
Durchm./Breite/Diameter/width/Diamètre/largeur	: 190.000 [mm] +2.500/-2.500 [mm]
Dicke/Thickness/Epaisseur	:
Länge/Length/Longueur	: 5000 - 6500 [mm] + UL

Stückzahl und Gewicht siehe Rechnung. / Quantity and weight see delivery bill/invoice.
Nombre des pièces et masse voir facture.

ThyssenKrupp
Materials Belgium N.V./S.A.
- 3 AOUT 2004
Division Liège

Lieferzustand/Condition as supplied/Etat de livraison: 840 °C Wasser/Water/L'Eau + 620 °C 2 H Luft/Air/L'air

Die Prüfergebnisse zu Ihrer Lieferung finden Sie auf der Rückseite bzw. den nächsten Seiten
As for test results of your delivery see overleaf. / Vous trouverez les resultats d'essais de votre livraison aux pages suivantes.

shaft

18 NOV. 2004

WAT 451

EDELSTAHL WITTEN-KREFELD GMBH
Abnahmetechnik/Inspection department/Département de Réception

Der Werkssachverständige
Werks' inspector/L'Agent Réceptionnaire de l'usine

Auestraße 4
D-58452 Witten
Telefon: (02302)29-0
Telefax: (02302)29-40 00
Postanschrift: D-58449 Witten
http://www.edelstahl-witten-krefeld.de

EDELSTAHL WITTEN-KREFELD GMBH

Datum/Date: 28.07.04

Seite/Page: 2 / 2

Zeugnis-Nr. Certificate No./No.de Certificat	Unsere Auftr.-Nr. Our order No./No.de notre Commande	Ihre Auftr.-Nr. vom Your order No. date /No.de votre commande du	Fertigungsauftr.-Nr. Production lot-No./Lot de fabrication No.
505387/655269/bit	228197 / 10	4500213796	23140

Schmelzen-Nr. Heat No./No.de coulée	Erschmelzungsart Steelmaking process/Procédé d'élaboration	Gießverfahren Casting process/Procédé de coulée
505360	E	VSG

Chemische Zusammensetzung/ Chemical Composition/ Composition chimique

	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	Sn	V	Al	
Ist/Actual/Actuel	0.35	0.31	0.62	0.010	0.026	1.50	0.20	1.51	0.06	0.014	< 0.01	0.027	[%]

Zugversuch/ Tensile test/ Essai de traction

Lieferzustand/Condition as supplied/Etat de livraison

Pr... nahm./Specimen dimension/Dimension d'éprouvette	Probenrichtung/Specimen direction/Sens de Prélèvement	Prüftemp./Test temperature/Température d'essai
Zugprobe; 10 mm rd	längs/longitudinal/longueur	23 [°C]

Proben-Nr./Specimen-No./No.d'éprouvette	Rp0.2 [MPa (N/mm²)]	Rm [MPa (N/mm²)]	A5 [%]	Z [%]
47191	748	867	20.0	66
Soll/Required/Demandé	>= 600	800 - 950	>= 13	>= 55

...chlagbiegeversuch/ Impact test/ Essai de résilience

...eferzustand/Condition as supplied/Etat de livraison

Probenform/Type of specimen/Type d'éprouvette	Probenrichtung/Specimen direction/Sens de Prélèvement	Prüftemp./Test temperature/Température d'essai
[CHARPY V]	längs/longitudinal/longueur	23 [°C]

Proben-Nr./Specimen-No./No.d'éprouvette	1.Prfl./Spec./Eprouvette	2.Prfl./Spec./Eprouvette	3.Prfl./Spec./Eprouvette
47191	89 [J]	91 [J]	90 [J]
Soll/Required/Demandé	>45 [J]		

...orngröße/ Grain size/ Grosseur de grain

...ferenzzustand/Reference condition/Etat de référence

...röße/Size/Grosseur
... und feiner/and smaller/et plus fin

...kroskopischer Reinheitsgrad/ Microscopic cleanliness/ Degré de propreté micrographique

...(e) DIN 50602 entspr. Spec. GS 05.02.07 E gewährleistet/guaranteed/garanti/garantizado

...S-Prüfung/ Ultrasonic testing/ Contrôle par ultrasons

...e L...erung wurde US-geprüft nach/Delivery US-checked acc. to/Livraison contrôlé par ultrasons selon: EN 10228-3 Typ 1a, Tab.5, Kl.3

...CH / ALSO / AUSSI / TAMBIEN SEP 1921 D/d GEWAEHRLEISTET / GUARANTEED / GARANTI / GARANTIZADO

...Lieferung wurde auf Identität geprüft (Spectro.) /Identity has been checked (Spectro.) /Identification (Spectro.) a été effectué
...kontrolle wurde durchgeführt./Testing for surface cracks has been performed./Contrôle de fissures à la surface a été effectué.
...Lieferung wurde besichtigt und auf Maß kontrolliert/Visual inspection and control of dimensional accuracy have been performed/
...trôle visuel et inspection dimensionnelle ont été effectué
...formgrad/Hot forming ratio/Ratio de déformation: > 5 fach/fold/fois

...läuterung/ Explanations/ Explications

...rschmelzungsart/ Steelmaking process / Procédé d'élaboration /
... = Elektrostahl / Electric-arc-furnace steel / Acier électrique
...ießverfahren/Casting process/Procédé de coulée:
...SG = Vorblock-Strangguß / Continuous casting bloom / Bloom de coulée continue

...wird bestätigt, daß die Lieferung geprüft wurde und den Vereinbarungen bei der Bestellungsannahme entspricht.
...hereby certify that the material described above has been tested and complies with the terms of the order.
...us certifions que la livraison été vérifiée et est conforme aux stipulations de l'acception de la commande.

Schaft

18 NOV. 2004

WAT 451

ASCOMETAL

Usine des Dunes
Boîte postale 41
59941 Dunkerque cedex 2

GROUPE LUCCHINI

CERTIFICAT DE RECEPTION 3-1-B/EN 10204

N°CERTIFICAT 1/72813	CLIENT	CDE CLIENT DAB 100819
CDE USINE 216/8320 /02-01	MCB RUE JL DEFRENE 107 B4340 AWANS BELGIQUE	N° COULEE B6850
DESIGNATION DIMENSIONS ET POIDS	8 rd 140 x 6,000/ 6,100 m = 5,860 T	
NUANCE	34CRNIMO6	

COMPOSITION CHIMIQUE 10-3%

C	Mn	Si	S	P	Ni	Cr	Mo	H2	Cu			
356	692	211	20	12	1540	1620	239	ppm 1,05	163			

CARACTERISTIQUES MECANIQUES

* TC PR	TRAITEMENT	* L T	LIM.EL RE N/mm2	RESIST RM N/mm2	A %	Z %	* L T	RESILIENCE KV JOULES	DURETE HB
PR	Traité	L	849	969	17,8	64,0	L	+ 20 95.0- 99.8-100.3	269/ 277

* SIGNIFIE TC : TEMOINS COULEE PR : PRODUIT ETAT LIV. L : LONG T : TRANSVERS

AUTRES RESULTATS

Elaboration electrique, metal degaze sous vide
Controle def.de surface et internes satisfaisant
Inclusions: K4=.0

EURAIR 258

03-03-2003

Acier exempt de radioactivité anormale - Steel free from abnormal radioactivity - Stahl Frei von anormaler Radioaktivität

NOUS CERTIFIONS QUE LES PRODUITS CI-DESSUS SONT CONFORMES AUX PRESCRIPTIONS DE LA COMMANDE	DATE 21/11/01	VISA DU CHEF DU SERVICE G. GIROUD GG

MG / 095

Edelstahlwerke Buderus AG

STAHLLAGER WETZLAR

BUDERUSSTR. 25
D 35576 WETZLAR

Abnahmeprüfzeugnis EN 10 204-3.1.B
Attest Nr. 202891
Werksauftrag-Nr. 1-27577-3
Pos-Los 1-09

Herstellerzeichen Suppliers Mark Marque D'Usine

Position	UPos	Anzahl	Chargen Nr.		Gewicht [Kg]
0001	0	2	53877		35560,000

I04112301
1081768000774 e
5X

Erschmelzungsart Elektrostahl
Kd Wst Bez 18 CRNIMO 7-6 ISO-B **Werkstoff** 6587
Versandanzeige-Nr. / Datum 5000197748 26.03.2003

Materialbezeichnung : Stabstahl geschmiedet
Position : ARTIKEL-NR.: 75004698
Ausführung : DIN 7527/6 - 02/76, FESTIGKEIT MIN 180,0, FESTIGKEIT MAX 210,0 HB, UNBEARBEITET, BEIDE ENDEN GESÄGT, UT-GEPRÜFT, VORVERGÜTET, VERFORMUNGSGRAD MIN 4,0 VAKUUMENTGAST, 100 % TITANFREI
Kundenbestellnummer : .
Liefervorschrift : EN 10084 + DIN 17210-ANHANG AUSGABE 10/84 ZF 1A REV.10/01
Abmessung : RM RD. 800,0 X

Chemische Zusammensetzung % Chargenanalyse

C	SI	MN	P	S	CR	NI	MO	V	W
0,17	0,33	0,55	0,008	0,002	1,69	1,57	0,30	—	—
CU	SN	TI	AL	H2	CA	SB	O2		
0,19	0,0100	0,0010	0,026	—	0,0010	0,0015	0,0012		

NB=0,002 N2=0,0090

Stirnabschreckversuch Charge

1,5	3	5	7	9	10	13	15	20	25	30	40	50	MM
44	44	44	43	43	43	43	42	40	39	36	35	34	HRC

Dynamische Schlagkraft in [KN]

63

MI-Reinheit DIN 50602 Charge

K4 0,0

MI-Reinheit nach ASTM E 45/97 PL. Charge

A Dünn	Dick	B Dünn	Dick	C Dünn	Dick	D Dünn	Dick
0,5	0,5	0,0	0,0	0,0	0,0	1,0	0,5

ISO 4967: TYP DS= 1,0

23 NOV. 2004

Charge

Abschreck Korngröße : 6-7

WAT 451

Prüf Nr. **Härteprüfung**

Edelstahlwerke Buderus AG	Qualitätssicherung Wetzlar, den 13.08.2004	Hr. C. Moosberger Werkssachverständiger	Seite 1 von 2

Edelstahlwerke Buderus AG	Abnahmeprüfzeugnis EN 10 204-3.1.B	Hersteilerzeichen Suppliers Mark Marque D'Usine
STAHLLAGER WETZLAR	Attest Nr. 202891	
BUDERUSSTR. 25	Werksauftrag-Nr. 1-27577-3	
D 35576 WETZLAR	Pos-Los 1-09	

V 0624 HB 30 190

Zugversuch

Zugversuch **Blindhärteerprobung**

Prüf Nr.	Proben - Form Richtung Lage	Temp: [°C]			Werte
S 0624	Q 8 10 X 50 STIRNS./FRONT-FACE	+ 20	RP	0,2 [MPa]	1083
				RM [MPa]	1232
			A	5 [%]	10,4
				Z [%]	51,0

Kerbschlagversuch

Kerbschlagversuch **Blindhärteerprobung**

Prüf Nr.	Proben - Form Richtung Lage	Temp: [°C]	Testart	Werte		
S 0624	Q ISO-V STIRNS./FRONT-FACE	+ 20	AV/Einzelwerte [J]	48	51	45

VERFORMUNGSGRAD: > 4 - FACH
DIE US-PRÜFUNG GEMÄSS QSV 1090 REV.1 ERGAB KEINE BEANSTANDUNG.

Attest ist per EDV erstellt und ohne Unterschrift gültig gemäss EN 10204.

Es wird hiermit bestätigt, daß die Lieferung den Vereinbarungen bei der Bestellung entspricht.

23 NOV. 2004

WAT 451

Edelstahlwerke Buderus AG	Qualitätssicherung Wetzlar, den 13.08.2004	Hr. C. Moosberger Werkssachverständiger	Seite 2 von 2 Anlagen

ASCOMETAL

Usine des Dunes
Boîte postale 41
59941 Dunkerque cedex 2

GROUPE LUCCHINI

CERTIFICAT DE RECEPTION 3-1-B/EN 10204

N°CERTIFICAT 1/72813	CLIENT	CDE CLIENT DAB 100819
CDE USINE 216/8320 /02-01	MCB RUE JL DEFRENE 107 B4340 AWANS BELGIQUE	N° COULEE B6850
DESIGNATION DIMENSIONS ET POIDS	8 rd 140 x 6,000/ 6,100 m = 5,860 T	
NUANCE	34CRNIMO6	

COMPOSITION CHIMIQUE 10-3%

C	Mn	Si	S	P	Ni	Cr	Mo	H2	Cu			
356	692	211	20	12	1540	1620	239	ppm 1,05	163			

CARACTERISTIQUES MECANIQUES

* IC PR	TRAITEMENT	* L T	LIM.EL RE N/mm2	RESIST RM	A %	Z %	* L T	RESILIENCE KV JOULES	DURETE HB
PR	Traité	L	849	969	17,8	64,0	L	+ 20 95.0- 99.8-100.3	269/ 277

* SIGNIFIE TC : TEMOINS COULEE PR : PRODUIT ETAT LIV. L : LONG T : TRANSVERS

AUTRES RESULTATS

Elaboration electrique, metal degaze sous vide
Controle def.de surface et internes satisfaisant
Inclusions: K4=.0

EURAIR 258

03-03-2003

Acier exempt de radioactivité anormale - Steel free from abnormal radioactivity - Stahl Frei von anormaler Radioaktivität

NOUS CERTIFIONS QUE LES PRODUITS CI-DESSUS SONT CONFORMES AUX PRESCRIPTIONS DE LA COMMANDE	DATE 21/11/01	VISA DU CHEF DU SERVICE G. GIROUD GG

MG / 095

Watteeuw Group Kampveldstraat 51 B 8020 Oostkamp	Datum: 17/01/2005 benaming: gear ID: 609908sp	Klant: A.C.Comptec Plan nr: **1320701557** Rev: **9**

Kontrolerapport gear

4. Gear Data Certification

	requirements	set nr; 18061					
Runout	0,0008	0,000274					
Tooth to tooth space	0,0002	0,000098					
Finisch on tooth contact surface	32	O.K.					
Finisch on fillet area	63	O.K.					
Chordal tooth thickness	,1069 -,1035	0,1061					

Lead and profile; See Chart

5. Magnetic Particle Inspection

All parts have been inspected and are conform to the specifications.

6. balance record

All parts are balanced

Watteeuw Group	Datum: 3/01/2005	Klant: A.C. Comptec
Kampveldstraat 51	benaming: Gear spur	Plan nr: 1320701637
B 8020 Oostkamp	ID: 609910	Rev: 4

Kontrolerapport pinion

S/N.....609910/1 - 609910/5.....

5, MAGNETIC PARTICLE INSPECTION

Parts have been inspected on a simpling base to MIL-STD 105 E and comply to the specification

6, BALANCE RECORD

parts are not balanced

Watteeuw Group	Datum: 6/12/2004	Klant: A.C. Comptec
Kampveldstraat 51	benaming: Gear	Plan nr: 1320701637
B 8020 Oostkamp	ID: 595199	Rev: 4

Kontrolerapport pinion

S/N..... 595199/1 - 595199/5

5. MAGNETIC PARTICLE INSPECTION

Parts have been inspected on a simpling base to MIL-STD 105 E and comply to the specification

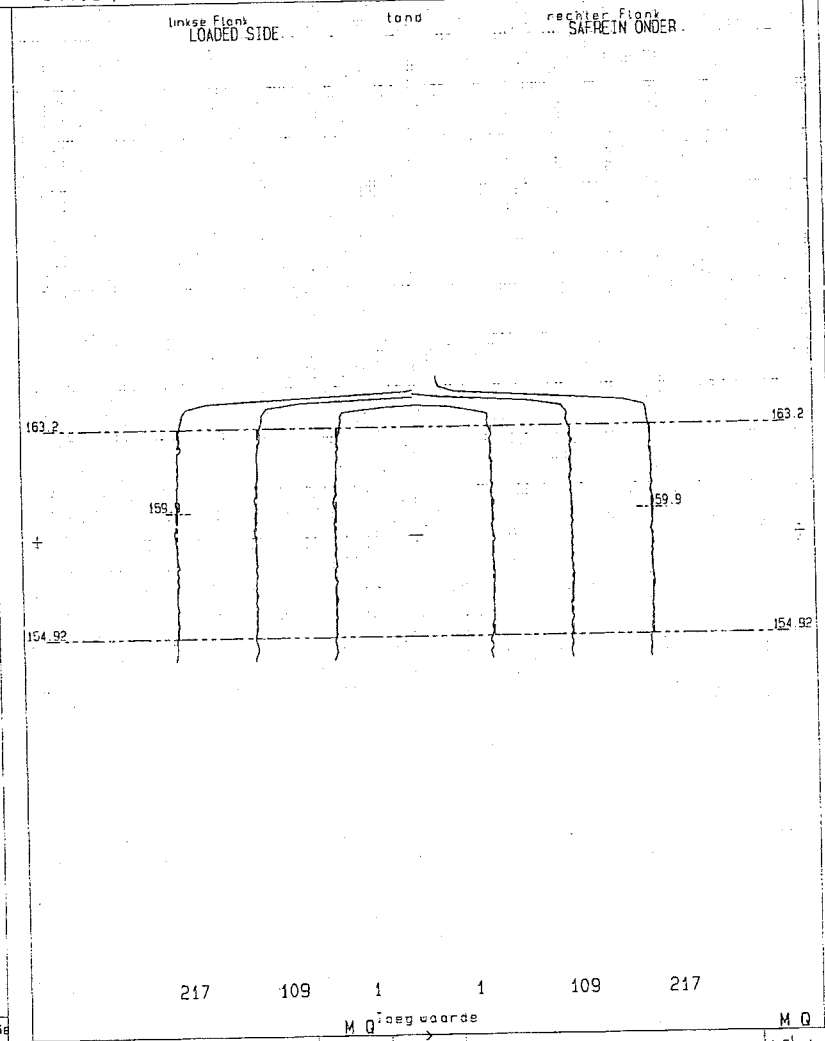
6. BALANCE RECORD

parts are not balanced

met proces 595 199/2

WATTEEUW — PROFIL

Tekeningnr	1320701557/LOS/T/9/S	m_n 2.1167 mm	b 64 mm
Benaming	TURBONETICS	z 323 L/L	L_β 80/80/100 %
BEMERKING:	Mach480-Sn18061 LOPEND NR 1	α_n 25°0'0" I X0	d_b 648.405/648.405 mm
WOODRUFF BOVEN	SAFREIN ONDER	β 18°57'58"/18°57'58"	vP 1.5 / vl. 7
		D_b 17°7'51"/17°7'51"	TASTERSTIFT: Ø 1 mm
Kwaliteit	Toeg Pr: 5 / Fl: 5 Gemet Pr: 3 / Fl: 5	Toeg Pr: 5 / Fl: 5 Gemet Pr: 2 / Fl: 4	

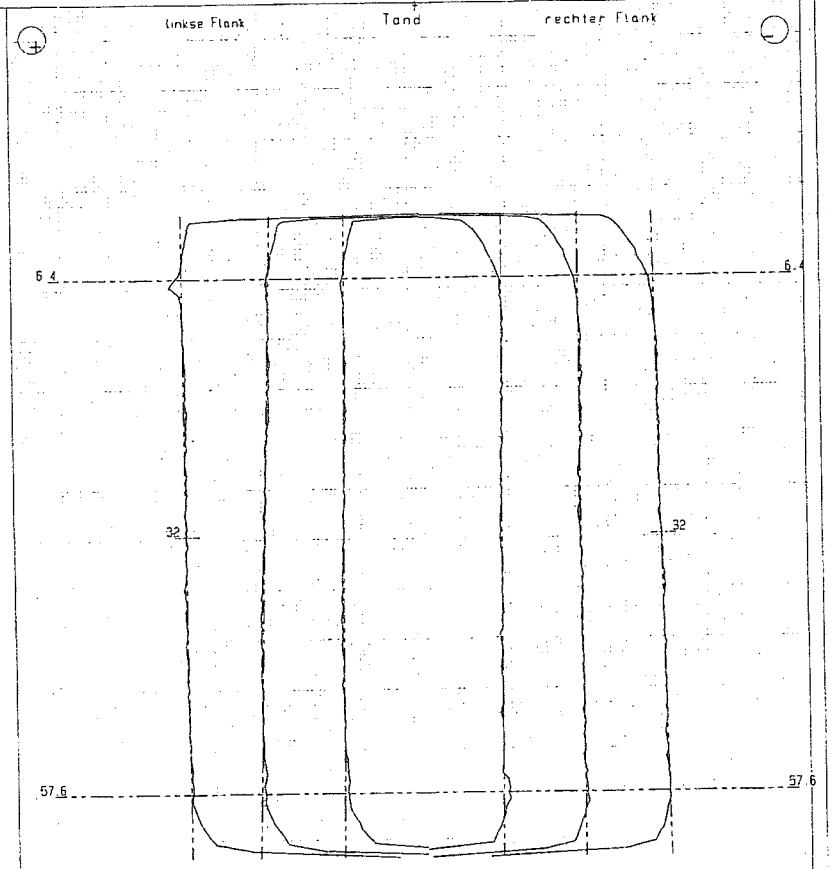


EMZ 2602 V5.14 DIN Keurder 367 Datum 13.01.2005 13:40

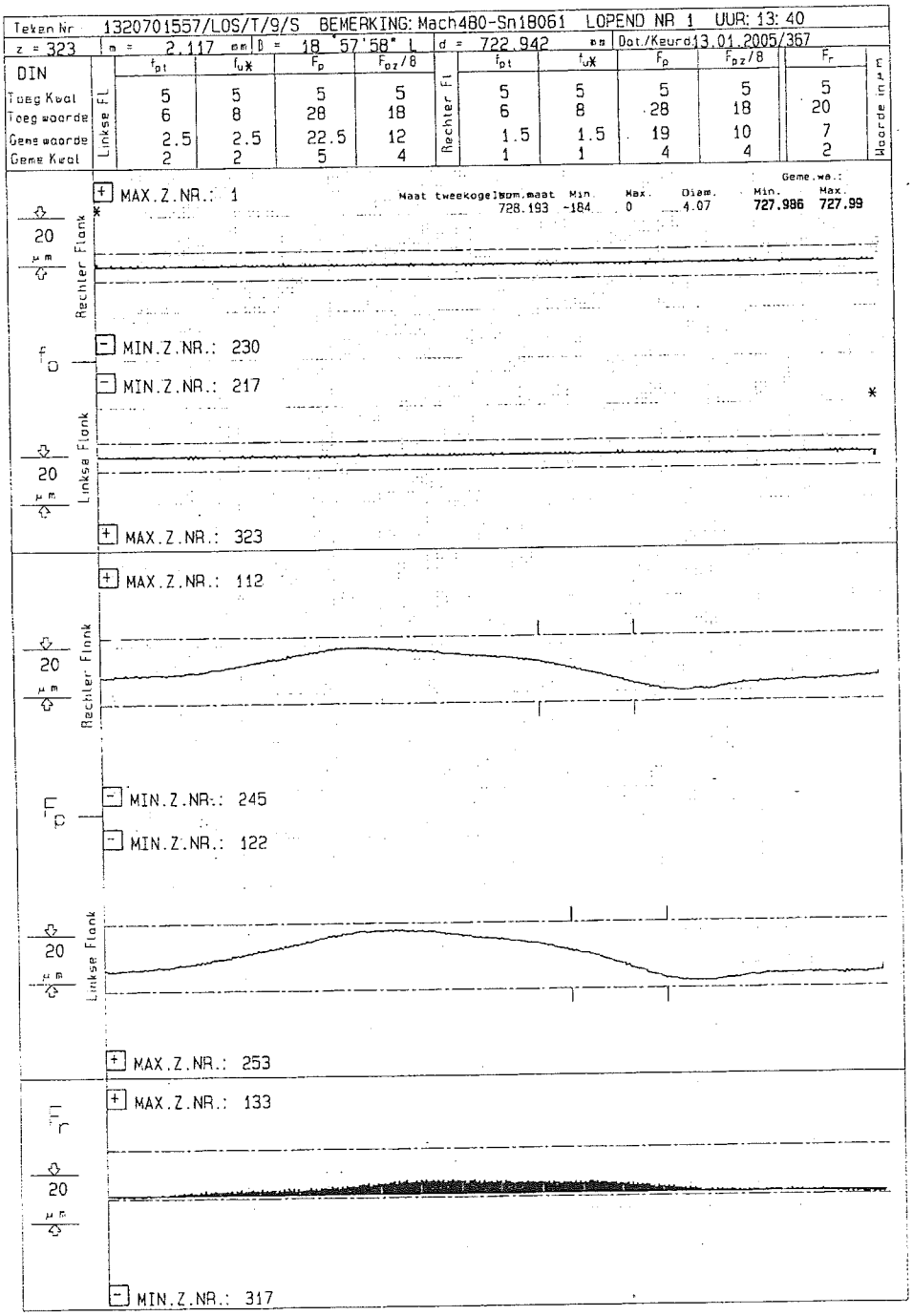
Toegwaarde				M	Q	Toegwaarde				M	Q
F_α 0/7	3	3	3	3	2	0/7	2	1.5	1.5	1.5	1
$f_{f\alpha}$ 0/6	2.5	2	2.5	2.5	3	0/6	2	2	2	2	2
$f_{H\alpha}$ +-4.5	-1	-1.5	-1.5	-1.5	2	+-4.5	0	0	0	0	1

Sn 18061

FLANKLIJN



					217	109	1	1	109	217
Toegwaarde							Toegwaarde			
$F_{f\beta}$	0/10	7	5	3.5	5.14	0/10	3.5	3.5	6.5	4.94
$f_{f\beta}$	0/7	6.5	3	3.5	4.95	0/7	4.5	3	3	3.83
$f_{H\beta}$	+-7	-1.5	6.5	3	2.95	+-7	2	0	-5	-1.14


Teken Nr 1320701557/LOS/T/9/S BEMERKING: Mach480-Sn18061 LOPEND NR 1 UUR: 13:40
z = 323 m = 2.117 mm β = 18° 57' 58" L d = 722.942 mm Dat./Keurd 13.01.2005/367
DIN
Toeg Kwal
Toeg waarde
Gem waarde
Gem Kwal
Linkse Fl
Rechter Fl
Waarde in µm
MAX.Z.NR.: 1
Maat tweekogel
MIN.Z.NR.: 230
MIN.Z.NR.: 217
MAX.Z.NR.: 323
MAX.Z.NR.: 112
MIN.Z.NR.: 245
MIN.Z.NR.: 122
MAX.Z.NR.: 253
MAX.Z.NR.: 133
MIN.Z.NR.: 317
Rechter Flank
Linkse Flank
20 µm

operator : 730

25.01.05 13:09

file name : I520702241

rotor data

setup:

a: 76.00 mm	b: 51.00 mm	c: 77.00 mm
r1: 254.0 mm	readout : g*i/g*i2	r2: 254.0 mm
m1: poler		m2: poler
tol1: 345.0 gmm	bal. speed: 486 U/min	tol2: 345.0 gmm

plane 1

385. mg

at 25 deg

plane 2

584. mg

at 30 deg

rotor: 1000

rpm 2

AT E2 M1

[illegible]

[illegible]

B -8020 Oostkamp

operator : 733 — 25.01.05 13:08

rotor data	setup 1	1320/02241
a: 76.00 mm	b: 51.00 mm	c: 77.00 mm
r1: 254.0 mm	2-plane	r2: 254.0 mm
m1: -polar		m2: -polar
tol1: 345.0 gmm		tol2: 345.0 gmm
machine : 1	set speed : 450. rpm	
readout	rotor: 13061	25.01.05 13:0[illegible]
run 2	act speed : 436. rpm	

pl 1:	283. mg	pl 2:	587. mg
	125. deg		70. deg
	in tol		in tol

correction in tol. units :
77.65 gmm — 198.3 gmm

Atlas Copco Comptec

Final Inspection of Centrifugal Compressors

Customer: AC Energas / Air Liquid Unit: HL8-4-75 Sales Order: L8-41197

No.	Description	Verified By/ Date
	Pre Test	
1.	Orientation of Flow Direction Sensitive Items Verified	AP 6/2/05
2.	Loctite has been Applied to the IGV Control Rod End Bolt	AP 6/2/05
3.	Piping, Tubing & Conduit are Properly Secured	AP 6/2/05
4.	Bolting is Installed Properly on Required Flanges 6.	AP 6/2/05
5.	Unit Checked for Replacement of Plastic Plugs w/ Metal Ones	AP 6/2/05
	Post Test	
6.	Post Test Bearing and Seal Inspection if Required	AP 6/2/05
7.	Shop Test Punchlist Findings Resolved	AP 6/2/05
8.	Unit assembly checklist is completed	AP 6/2/05
9.	Painting Accomplished as Required	AP 6/2/05
10.	Tagging is Completed, & is Verified as Correct	AP 6/2/05
	Administrative	
12.	Dim Check is Completed and Dispositioned	AP 6/2/05
13.	All NCR's against this job have been Cleared	AP 6/2/05
14.	Requirements of Quality Plan Performed	AP 6/2/05

Atlas Copco Comptec

15. Control Drawing in Electrical Box & Electrical Boxes Secured — AF 6/2/05
16. Certification of Compressor Package, Signed & Attached — AF 6/2/05
17. Record Serial Numbers — AF 6/2/05

	Shell	Bundle
1st Stg Cooler	N/A	N/A
2nd Stg Cooler		
3rd Stg Cooler		
Aftercooler		
Oil Cooler		

Shipping Preparation

18. Preservation Techniques Applied as Required (Includes Gearing) — AF 6/2/05
19. Coupling Blocked & Wrapped for Shipment — AF 6/2/05
20. Protective Covers Installed on External Openings — AF 6/2/05
21. Insulation has been installed if required. — N/A
22. Necessary Hardware for Ship Loose Items Included/ Packaged — AF 6/2/05

Comments:_____

Unit Released for Shipment Q.C:_____ Date: 6/2/05

Customer Release if Required:_____ Date_____

Atlas Copco

Certificate of Test

This certifies that the centrifugal compressor identified as serial number TBI0541198 was mechanically and performance tested on 26-May-05 for a minimum of two hours and has been found acceptable according to the terms of the order. The testing was executed using atmospheric air. The compressor was driven through an intermediate gear using a shop test motor. Compressor input speed was 3010 RPM.

Jude Fusco Digitally signed by Jude Fusco DN: CN = Jude Fusco, C = US Date: 2005.06.02 10:01:52 -04'00'

Quality Assurance
Atlas Copco Comptec Inc

Roger Nyquist

Senior Aero Engineer
Atlas Copco Comptec Inc.

Atlas Copco Comptec Inc.

Atlas Copco Comptec Inc.
46 School Road
Voorheesville, NY 12186 USA
Phone: (518) 765-3344

Atlas Copco

Compressor Test
Sign-off Sheet

Model: HL8-4-75

Unit Number: L8-41198

Customer: ACE/Air Liquide

Test Location: ACC Test Cell T13

The referenced unit has successfully completed test as defined by the Test Spec. and meets contract requirements, mechanical and aero.

By: ✓ Jeff Sheely Digitally signed by Jeff Sheely DN: cn=Jeff Sheely, c=US Date: 2005.06.03 11:21:31 -04'00'

Atlas Copco – Project Engineer

By: _____

Customer – if witnessed

Comments: _____

_____

_____

Accepted and issued by: Jeffrey W. Smith Digitally signed by Jeffrey W. Smith DN: cn=Jeffrey W. Smith, o=Atlas Copco Comptec Inc., ou=Test, c=US Date: 2005.05.27 09:51:11 -04'00'

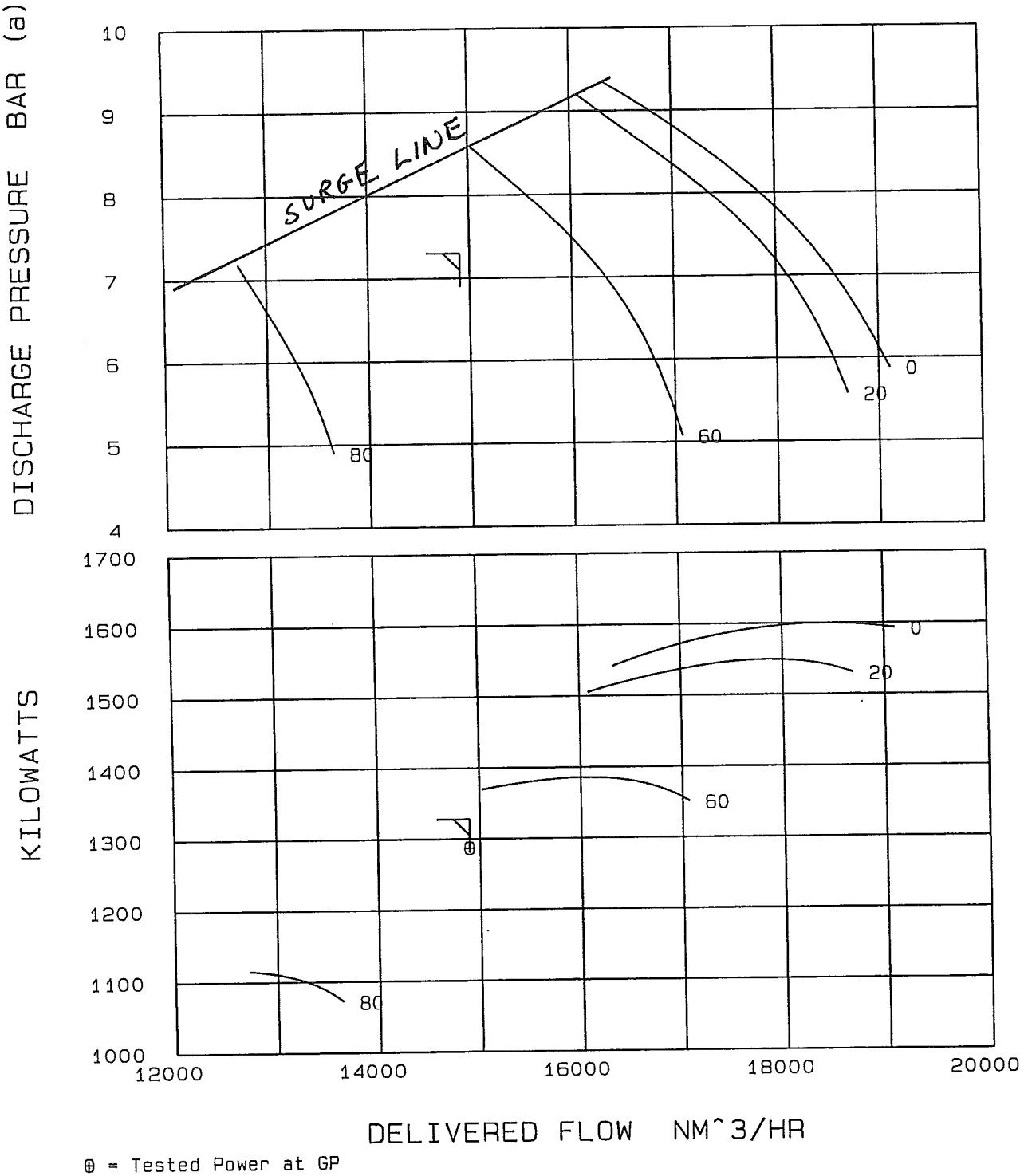
Test Engineer **Date**

ATLAS COPCO ACT COMPRESSOR PERFORMANCE MAP

ORDER # : L8-41198
CUSTOMER: ACE/AIR LIQUIDE
MODEL: HL8-4-75
TEST DATE: 5-26-05

REF. PRES. : 15.16 psia
MEDIUM : NITROGEN
MOLEWEIGHT : 28.01 kg/kMol
ISEN. EXP. : 1.4
REL. HUM. : 0%

T1 IN : 71.6 deg F
T2 IN : 70 deg F
T3 IN : 69.8 deg F



⊕ = Tested Power at GP

CUSTOMER: ACE/AIR LIQUIDE TEST DATE: 5-26-05

INPUT DATA

NUMBER OF STAGES = 3 NUMBER OF IGV ANGLES = 4
BAROMETRIC PRESSURE = 14.70 REFERENCE PRESSURE = 15.16
AFTERCOOLER DP = 1.52 MECHANICAL POWER LOSS = 67.0
STAGE 1 INLET TEMP = 71.6 STAGE 1 GAS CONSTANT: 55.15
STAGE 2 INLET TEMP = 70.0 STAGE 2 GAS CONSTANT: 55.15
STAGE 3 INLET TEMP = 69.8 STAGE 3 GAS CONSTANT: 55.15
STAGE 1 - 2 DP, FLOW = 0.96 @ 9912.0
STAGE 2 - 3 DP, FLOW = 0.88 @ 9912.0

SEAL LEAKAGE + CONDENSATE KNOCKOUT
MASS FLOW RATIO m2/m1 = 1.000
MASS FLOW RATIO m3/m1 = 0.999

INTERSTAGE MASS INJECTION OR REMOVAL
MASS FLOW RATIO m2/m1 = 1.000
MASS FLOW RATIO m3/m2 = 1.000

DISCHARGE TO INLET FLOW RATIO = .998

IGV ANGLE = 0				IGV ANGLE = 20				IGV ANGLE = 60			
Q1	PR1	HP1	EF1	Q1	PR1	HP1	EF1	Q1	PR1	HP1	EF1
9989	2.719	909.3	.8414	9886	2.673	882.1	.8419	9226	2.495	771.7	.8266
10426	2.675	938.9	.8348	10152	2.637	897.2	.8366	9842	2.370	787.7	.8089
10886	2.608	962.5	.8253	10705	2.547	920.6	.8246	10461	2.204	797.1	.7699
11350	2.530	981.3	.8136	11152	2.476	936.6	.8154				
11697	2.479	996.5	.8049	11455	2.414	945.4	.8033				

IGV ANGLE = 80			
Q1	PR1	HP1	EF1
7858	2.08	587.7	.7223
8351	1.84	581.7	.6325

STAGE 2				STAGE 3			
Q	PR	HP	EF	Q	PR	HP	EF
3782	1.96	226.1	.8184	1959	1.76	95.7	.8311
3787	1.97	219.6	.8533	1968	1.75	96.7	.8210
3798	1.96	223.4	.8356	1973	1.76	96.6	.8277
3871	1.96	223.5	.8473	2011	1.75	97.9	.8284
3960	1.94	228.4	.8355	2079	1.75	100.4	.8310
4018	1.92	232.5	.8230	2135	1.74	101.8	.8356
4321	1.88	237.6	.8300	2350	1.69	107.6	.8228
4324	1.87	242.0	.8073	2376	1.69	108.0	.8196
4360	1.86	239.4	.8216	2388	1.69	108.5	.8207
4681	1.79	250.3	.7828	2688	1.60	114.4	.7766
4707	1.80	247.3	.8041	2690	1.59	114.9	.7697
4710	1.80	249.1	.7996	2698	1.58	113.8	.7701
4968	1.72	254.8	.7570	2986	1.36	116.5	.5438
4985	1.72	252.9	.7668	2991	1.35	116.4	.5329
4993	1.72	251.5	.7738	2992	1.34	115.7	.5164

CUSTOMER: ACE/AIR LIQUIDE TEST DATE: 5-26-05

ACCURACY OF POLYNOMIAL CURVE FIT

IGV ANGLE = 0

Q1	ëPR	ëHP	ëEF
9989	-0.01	-0.01	-0.00
10426	0.02	0.02	0.01
10886	-0.04	-0.03	-0.02
11350	0.03	0.03	0.01
11697	-0.01	-0.01	-0.00

IGV ANGLE = 20

Q1	ëPR	ëHP	ëEF
9886	0.04	0.02	0.04
10152	-0.09	-0.04	-0.08
10705	0.12	0.04	0.10
11152	-0.11	-0.04	-0.09
11455	0.04	0.01	0.03

IGV ANGLE = 60

Q1	ëPR	ëHP	ëEF
9226	0.00	0.00	0.00
9842	0.00	0.00	0.00
10461	0.00	0.00	0.00

IGV ANGLE = 80

Q1	ëPR	ëHP	ëEF
7858	0.00	0.00	0.00
8351	0.00	0.00	0.00

STAGE 2

Q	ëPR	ëHP	ëEF
3782	0.44	-1.57	2.37
3787	-0.29	1.43	-1.83
3798	0.05	-0.13	0.22
3871	-0.27	0.91	-1.35
3960	-0.11	0.04	-0.23
4018	0.12	-0.92	1.09
4321	-0.22	0.86	-1.22
4324	0.33	-0.93	1.54
4360	0.04	0.55	-0.45
4681	0.52	-0.74	1.73
4707	-0.30	0.68	-1.24
4710	-0.41	-0.03	-0.71
4968	0.36	-0.76	1.49
4985	-0.01	0.05	-0.07
4993	-0.23	0.64	-1.09

STAGE 3

Q	ëPR	ëHP	ëEF
1959	0.13	0.49	0.02
1968	0.35	-0.26	1.12
1973	0.09	0.04	0.22
2011	-0.08	-0.03	-0.29
2079	-0.49	-0.38	-0.97
2135	-0.64	-0.09	-1.54
2350	0.26	0.05	0.61
2376	0.51	0.28	0.98
2388	0.34	0.09	0.82
2688	-0.39	-0.15	-0.76
2690	-0.24	-0.55	-0.00
2698	0.03	0.50	-0.53
2986	-0.44	-0.24	-1.40
2991	-0.20	-0.16	-0.55
2992	0.81	0.44	2.48

ALL ë VALUES ARE GIVEN AS PERCENT DIFFERENCE OF CALCULATED TO INPUT VALUE.

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 0

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
10094	3804	1960	15.2	2.711	40.1	1.961	77.7	1.763
10184	3851	1992	15.2	2.703	40.0	1.954	77.2	1.756
10274	3901	2027	15.2	2.694	39.8	1.946	76.5	1.750
10364	3952	2063	15.2	2.683	39.6	1.937	75.8	1.743
10453	4006	2101	15.2	2.672	39.4	1.929	75.1	1.737
10543	4061	2142	15.2	2.660	39.2	1.919	74.3	1.731
10633	4119	2184	15.2	2.647	39.0	1.909	73.5	1.725
10723	4177	2228	15.2	2.633	38.8	1.899	72.6	1.719
10813	4238	2274	15.2	2.619	38.6	1.888	71.8	1.712
10903	4300	2323	15.2	2.604	38.3	1.877	70.9	1.704
10993	4363	2373	15.2	2.590	38.1	1.865	69.9	1.695
11083	4427	2425	15.2	2.575	37.8	1.852	69.0	1.684
11173	4492	2480	15.2	2.560	37.6	1.839	68.0	1.670
11263	4558	2537	15.2	2.545	37.3	1.825	67.0	1.653
11353	4624	2595	15.2	2.530	37.1	1.811	66.0	1.632
11443	4691	2656	15.2	2.516	36.9	1.796	65.0	1.605
11533	4758	2719	15.2	2.502	36.6	1.780	64.0	1.572
11623	4824	2784	15.2	2.489	36.4	1.764	63.0	1.532
11713	4889	2850	15.2	2.476	36.2	1.747	62.0	1.482
11803	4954	2918	15.2	2.465	36.0	1.730	61.0	1.423

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
16339	9.34	8.33	1542.4
16485	9.24	8.22	1550.0
16630	9.12	8.11	1557.0
16776	9.01	7.99	1563.5
16922	8.89	7.87	1569.5
17067	8.76	7.75	1574.9
17213	8.64	7.62	1579.9
17358	8.50	7.49	1584.2
17504	8.37	7.35	1588.1
17650	8.22	7.21	1591.5
17795	8.07	7.05	1594.3
17941	7.90	6.89	1596.5
18086	7.72	6.71	1598.2
18232	7.53	6.52	1599.3
18378	7.32	6.31	1599.8
18523	7.09	6.08	1599.7
18669	6.83	5.82	1599.0
18814	6.55	5.54	1597.6
18960	6.23	5.22	1595.6
19106	5.88	4.87	1593.0

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 20

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
9936	3805	1960	15.2	2.667	39.5	1.961	76.5	1.763
10020	3857	1996	15.2	2.654	39.3	1.953	75.8	1.755
10105	3910	2033	15.2	2.642	39.1	1.944	75.0	1.748
10190	3964	2071	15.2	2.629	38.8	1.935	74.3	1.742
10275	4019	2110	15.2	2.617	38.6	1.926	73.5	1.736
10359	4074	2151	15.2	2.604	38.4	1.917	72.7	1.730
10444	4130	2192	15.2	2.591	38.2	1.907	71.9	1.724
10529	4187	2235	15.2	2.578	38.0	1.897	71.1	1.718
10614	4246	2280	15.2	2.565	37.8	1.887	70.3	1.711
10699	4305	2326	15.2	2.551	37.6	1.876	69.4	1.704
10783	4365	2374	15.2	2.538	37.3	1.864	68.6	1.695
10868	4427	2424	15.2	2.523	37.1	1.852	67.7	1.684
10953	4490	2477	15.2	2.509	36.9	1.839	66.7	1.671
11038	4555	2533	15.2	2.494	36.6	1.826	65.8	1.654
11123	4621	2592	15.2	2.479	36.4	1.811	64.8	1.633
11207	4690	2654	15.2	2.463	36.1	1.796	63.7	1.606
11292	4760	2720	15.2	2.447	35.9	1.780	62.7	1.572
11377	4832	2791	15.2	2.431	35.6	1.762	61.5	1.527
11462	4907	2867	15.2	2.413	35.3	1.743	60.4	1.469
11547	4984	2948	15.2	2.396	35.0	1.722	59.1	1.393

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
16083	9.19	8.18	1505.6
16220	9.06	8.05	1511.2
16358	8.94	7.92	1516.5
16495	8.81	7.80	1521.5
16632	8.69	7.68	1526.2
16770	8.57	7.55	1530.5
16907	8.44	7.43	1534.5
17044	8.32	7.30	1538.1
17181	8.19	7.17	1541.3
17319	8.05	7.04	1544.1
17456	7.91	6.89	1546.3
17593	7.75	6.74	1548.0
17730	7.58	6.57	1549.1
17868	7.40	6.38	1549.5
18005	7.19	6.17	1549.1
18142	6.95	5.94	1547.9
18279	6.68	5.67	1545.6
18417	6.37	5.36	1542.1
18554	6.01	4.99	1537.3
18691	5.57	4.56	1530.8

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 60

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
9281	3808	1960	15.2	2.485	36.8	1.961	71.5	1.763
9348	3855	1993	15.2	2.473	36.6	1.953	70.8	1.756
9414	3904	2027	15.2	2.461	36.4	1.945	70.1	1.749
9481	3955	2063	15.2	2.448	36.2	1.937	69.4	1.743
9547	4006	2099	15.2	2.434	36.0	1.928	68.6	1.738
9614	4059	2138	15.2	2.421	35.8	1.920	67.9	1.732
9680	4114	2178	15.2	2.406	35.6	1.910	67.1	1.726
9747	4169	2219	15.2	2.392	35.3	1.900	66.3	1.720
9813	4227	2263	15.2	2.376	35.1	1.890	65.5	1.714
9880	4286	2309	15.2	2.361	34.8	1.879	64.6	1.707
9946	4347	2357	15.2	2.345	34.6	1.868	63.7	1.698
10012	4410	2407	15.2	2.328	34.3	1.856	62.8	1.688
10079	4475	2461	15.2	2.311	34.0	1.843	61.8	1.675
10145	4541	2518	15.2	2.293	33.8	1.829	60.8	1.659
10212	4610	2578	15.2	2.276	33.5	1.814	59.8	1.638
10278	4681	2642	15.2	2.257	33.2	1.798	58.7	1.612
10345	4754	2711	15.2	2.238	32.9	1.781	57.6	1.577
10411	4830	2784	15.2	2.219	32.6	1.762	56.4	1.531
10478	4908	2864	15.2	2.199	32.3	1.742	55.2	1.471
10544	4989	2949	15.2	2.178	31.9	1.721	54.0	1.392

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
15024	8.58	7.57	1369.7
15132	8.46	7.45	1372.5
15239	8.35	7.34	1375.0
15347	8.23	7.22	1377.4
15455	8.12	7.10	1379.5
15562	8.00	6.99	1381.3
15670	7.88	6.87	1382.9
15777	7.76	6.74	1384.2
15885	7.63	6.62	1385.1
15993	7.49	6.48	1385.6
16100	7.35	6.34	1385.6
16208	7.20	6.19	1385.1
16315	7.03	6.02	1384.1
16423	6.85	5.84	1382.4
16531	6.65	5.64	1379.9
16638	6.42	5.41	1376.5
16746	6.16	5.14	1372.1
16853	5.85	4.84	1366.5
16961	5.50	4.48	1359.6
17069	5.07	4.06	1351.0

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 80

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
7858	3834	1975	15.2	2.083	31.0	1.956	60.0	1.759
7888	3876	2004	15.2	2.069	30.8	1.950	59.4	1.754
7918	3918	2033	15.2	2.055	30.5	1.943	58.8	1.749
7948	3960	2063	15.2	2.041	30.3	1.936	58.2	1.743
7978	4004	2094	15.2	2.027	30.1	1.929	57.5	1.739
8008	4049	2126	15.2	2.013	29.9	1.921	56.9	1.734
8038	4094	2159	15.2	1.999	29.7	1.914	56.2	1.729
8068	4141	2193	15.2	1.984	29.4	1.905	55.5	1.724
8098	4188	2229	15.2	1.970	29.2	1.897	54.8	1.719
8127	4237	2265	15.2	1.955	29.0	1.888	54.1	1.713
8157	4287	2304	15.2	1.940	28.8	1.879	53.4	1.707
8187	4338	2344	15.2	1.925	28.5	1.870	52.7	1.700
8217	4390	2385	15.2	1.910	28.3	1.860	52.0	1.692
8247	4443	2428	15.2	1.894	28.1	1.849	51.3	1.683
8277	4498	2474	15.2	1.879	27.8	1.838	50.5	1.672
8307	4553	2521	15.2	1.863	27.6	1.826	49.7	1.658
8337	4611	2571	15.2	1.847	27.3	1.814	48.9	1.641
8367	4669	2623	15.2	1.832	27.1	1.801	48.1	1.620
8397	4729	2678	15.2	1.815	26.8	1.787	47.3	1.594
8427	4791	2737	15.2	1.799	26.6	1.772	46.5	1.562

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
12721	7.18	6.17	1115.6
12769	7.08	6.07	1115.0
12817	6.98	5.97	1114.3
12866	6.89	5.87	1113.5
12914	6.79	5.78	1112.5
12963	6.69	5.68	1111.5
13011	6.59	5.58	1110.3
13060	6.49	5.48	1109.0
13108	6.39	5.38	1107.5
13156	6.29	5.28	1105.8
13205	6.19	5.17	1103.9
13253	6.08	5.06	1101.7
13302	5.96	4.95	1099.4
13350	5.84	4.83	1096.7
13398	5.72	4.70	1093.7
13447	5.58	4.57	1090.4
13495	5.43	4.42	1086.6
13544	5.27	4.26	1082.4
13592	5.10	4.08	1077.8
13641	4.90	3.89	1072.5

***** Power Evaluation (Inlet Guide Vanes) *****'

Model : HL8-4-75
Order No : L8-41198
Test Date : 5-26-05

Guaranteed Conditions:		POINT #	1	
(QG)	Flow	14900.00	DEL. NM^3/HR	
(DPG)	Disc Press		7.30	BAR(a)
(HPG)	Coupling Power		1328.00	KW
(HPM)	Mechanical loss		49.96	KW
(APD)	Aftercooler dp		0.11	BAR

Igv Angle 1 (deg)		60	
Flow 1	16100.19	DEL. NM^3/HR	
Disc P 1	7.35	BAR(a)	
Power 1	1385.60	KW	
Flow 2	16207.80	DEL. NM^3/HR	
Disc P 2	7.20	BAR(a)	
Power 2	1385.13	KW	
Igv Angle 2 (deg)		80	
Flow 1	99999.00	DEL. NM^3/HR	
Disc P 1	99998.89	BAR(a)	
Power 1	99999.00	KW	
Flow 2	12720.54	DEL. NM^3/HR	
Disc P 2	7.18	BAR(a)	
Power 2	1115.60	KW	

Calc Values at Des P:

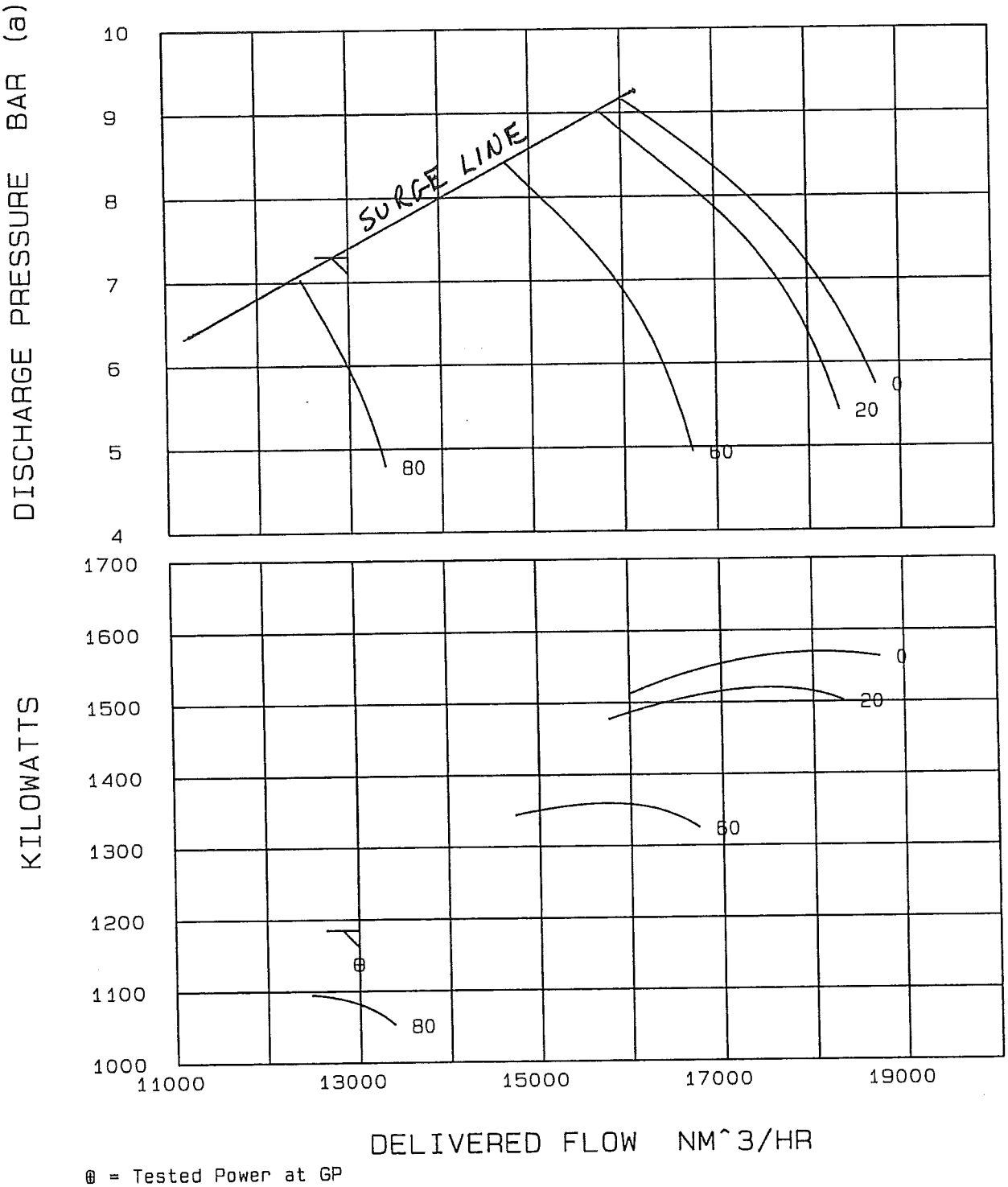
IGV 1 Flow	16137.04	DEL. NM^3/HR	
IGV 1 Power	1385.44	KW	
IGV 2 Flow	12720.64	DEL. NM^3/HR	
IGV 2 Power	1115.72	KW	
Des Pt IGV angle (deg)		67.24	
Des Pt Power	1287.78	KW	
(Calc/Guar) Power(%)		-3.03	

ATLAS COPCO ACT COMPRESSOR PERFORMANCE MAP

ORDER # : L8-41198
CUSTOMER: ACE/AIR LIQUIDE
MODEL: CASE A MIN
TEST DATE: 5-26-05

REF. PRES. : 14.87 psia
MEDIUM : NITROGEN
MOLEWEIGHT : 28.01 kg/kMol
ISEN. EXP. : 1.4
REL. HUM. : 0%

T1 IN : 71.6 deg F
T2 IN : 70 deg F
T3 IN : 69.8 deg F



⊕ = Tested Power at GP

CUSTOMER: ACE/AIR LIQUIDE TEST DATE: 5-26-05

INPUT DATA

NUMBER OF STAGES = 3
NUMBER OF IGV ANGLES = 4
BAROMETRIC PRESSURE = 14.70
REFERENCE PRESSURE = 14.87
AFTERCOOLER DP = 1.52
MECHANICAL POWER LOSS = 67.0
STAGE 1 INLET TEMP = 71.6
STAGE 1 GAS CONSTANT: 55.15
STAGE 2 INLET TEMP = 70.0
STAGE 2 GAS CONSTANT: 55.15
STAGE 3 INLET TEMP = 69.8
STAGE 3 GAS CONSTANT: 55.15
STAGE 1 - 2 DP, FLOW = 0.96 @ 9912.0
STAGE 2 - 3 DP, FLOW = 0.88 @ 9912.0

SEAL LEAKAGE + CONDENSATE KNOCKOUT

MASS FLOW RATIO m2/m1 = 1.000
MASS FLOW RATIO m3/m1 = 0.999

INTERSTAGE MASS INJECTION OR REMOVAL

MASS FLOW RATIO m2/m1 = 1.000
MASS FLOW RATIO m3/m2 = 1.000

DISCHARGE TO INLET FLOW RATIO = .998

IGV ANGLE = 0

Q1	PR1	HP1	EF1
9989	2.719	891.9	.8414
10426	2.675	920.9	.8348
10886	2.608	944.1	.8253
11350	2.530	962.5	.8136
11697	2.479	977.4	.8049

IGV ANGLE = 20

Q1	PR1	HP1	EF1
9886	2.673	865.2	.8419
10152	2.637	880.1	.8366
10705	2.547	903.0	.8246
11152	2.476	918.7	.8154
11455	2.414	927.3	.8033

IGV ANGLE = 60

Q1	PR1	HP1	EF1
9226	2.495	756.9	.8266
9842	2.370	772.6	.8089
10461	2.204	781.8	.7699

IGV ANGLE = 80

Q1	PR1	HP1	EF1
7858	2.08	576.5	.7223
8351	1.84	570.6	.6325

STAGE 2

Q	PR	HP	EF
3782	1.96	221.8	.8184
3787	1.97	215.4	.8533
3798	1.96	219.1	.8356
3871	1.96	219.2	.8473
3960	1.94	224.1	.8355
4018	1.92	228.0	.8230
4321	1.88	233.1	.8300
4324	1.87	237.4	.8073
4360	1.86	234.9	.8216
4681	1.79	245.5	.7828
4707	1.80	242.5	.8041
4710	1.80	244.3	.7996
4968	1.72	250.0	.7570
4985	1.72	248.1	.7668
4993	1.72	246.7	.7738

STAGE 3

Q	PR	HP	EF
1959	1.76	93.9	.8311
1968	1.75	94.9	.8210
1973	1.76	94.7	.8277
2011	1.75	96.0	.8284
2079	1.75	98.5	.8310
2135	1.74	99.9	.8356
2350	1.69	105.5	.8228
2376	1.69	106.0	.8196
2388	1.69	106.4	.8207
2688	1.60	112.3	.7766
2690	1.59	112.7	.7697
2698	1.58	111.6	.7701
2986	1.36	114.3	.5438
2991	1.35	114.2	.5329
2992	1.34	113.5	.5164

CUSTOMER: ACE/AIR LIQUIDE TEST DATE: 5-26-05

ACCURACY OF POLYNOMIAL CURVE FIT

IGV ANGLE = 0

Q1	ëPR	ëHP	ëEF
9989	-0.01	-0.01	-0.00
10426	0.02	0.02	0.01
10886	-0.04	-0.04	-0.02
11350	0.03	0.03	0.01
11697	-0.01	-0.01	-0.00

IGV ANGLE = 20

Q1	ëPR	ëHP	ëEF
9886	0.04	0.02	0.04
10152	-0.09	-0.04	-0.08
10705	0.12	0.05	0.10
11152	-0.11	-0.04	-0.09
11455	0.04	0.01	0.03

IGV ANGLE = 60

Q1	ëPR	ëHP	ëEF
9226	0.00	0.00	0.00
9842	0.00	0.00	0.00
10461	0.00	0.00	0.00

IGV ANGLE = 80

Q1	ëPR	ëHP	ëEF
7858	0.00	0.00	0.00
8351	0.00	0.00	0.00

STAGE 2

Q	ëPR	ëHP	ëEF
3782	0.44	-1.58	2.37
3787	-0.29	1.43	-1.83
3798	0.05	-0.12	0.22
3871	-0.27	0.93	-1.35
3960	-0.11	0.02	-0.23
4018	0.12	-0.88	1.09
4321	-0.22	0.85	-1.22
4324	0.33	-0.94	1.54
4360	0.04	0.53	-0.45
4681	0.52	-0.74	1.73
4707	-0.30	0.70	-1.24
4710	-0.41	-0.02	-0.71
4968	0.36	-0.78	1.49
4985	-0.01	0.05	-0.07
4993	-0.23	0.65	-1.09

STAGE 3

Q	ëPR	ëHP	ëEF
1959	0.13	0.46	0.02
1968	0.35	-0.31	1.12
1973	0.09	0.10	0.22
2011	-0.08	0.00	-0.29
2079	-0.49	-0.39	-0.97
2135	-0.64	-0.13	-1.54
2350	0.26	0.10	0.61
2376	0.51	0.23	0.98
2388	0.34	0.12	0.82
2688	-0.39	-0.21	-0.76
2690	-0.24	-0.54	-0.00
2698	0.03	0.54	-0.53
2986	-0.44	-0.25	-1.40
2991	-0.20	-0.16	-0.55
2992	0.81	0.45	2.48

ALL ë VALUES ARE GIVEN AS PERCENT DIFFERENCE OF CALCULATED TO INPUT VALUE.

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 0

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
10089	3803	1960	14.9	2.711	39.3	1.961	76.2	1.763
10179	3851	1992	14.9	2.703	39.2	1.954	75.6	1.756
10269	3900	2027	14.9	2.694	39.0	1.946	75.0	1.750
10359	3952	2063	14.9	2.684	38.9	1.937	74.3	1.743
10450	4006	2102	14.9	2.672	38.7	1.929	73.6	1.737
10540	4061	2142	14.9	2.660	38.5	1.919	72.8	1.731
10630	4119	2185	14.9	2.647	38.3	1.909	72.0	1.725
10720	4178	2229	14.9	2.634	38.0	1.899	71.2	1.719
10810	4238	2275	14.9	2.619	37.8	1.888	70.3	1.712
10901	4301	2324	14.9	2.605	37.6	1.877	69.4	1.704
10991	4364	2374	14.9	2.590	37.3	1.865	68.5	1.695
11081	4428	2427	14.9	2.575	37.1	1.852	67.6	1.683
11171	4494	2482	14.9	2.560	36.9	1.839	66.6	1.669
11261	4560	2539	14.9	2.545	36.6	1.825	65.7	1.652
11352	4627	2598	14.9	2.531	36.4	1.810	64.7	1.630
11442	4693	2659	14.9	2.516	36.1	1.795	63.7	1.604
11532	4760	2722	14.9	2.502	35.9	1.779	62.7	1.570
11622	4827	2788	14.9	2.489	35.7	1.763	61.7	1.529
11712	4893	2855	14.9	2.477	35.5	1.746	60.7	1.479
11803	4958	2923	14.9	2.465	35.3	1.729	59.8	1.418

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
16019	9.16	8.14	1513.2
16162	9.05	8.04	1520.7
16305	8.94	7.93	1527.7
16448	8.83	7.82	1534.1
16592	8.71	7.70	1540.0
16735	8.59	7.58	1545.4
16878	8.46	7.45	1550.2
17021	8.33	7.32	1554.6
17165	8.20	7.18	1558.4
17308	8.05	7.04	1561.6
17451	7.90	6.89	1564.4
17594	7.74	6.73	1566.6
17738	7.56	6.55	1568.2
17881	7.37	6.36	1569.2
18024	7.17	6.15	1569.7
18167	6.94	5.92	1569.5
18311	6.68	5.67	1568.8
18454	6.40	5.39	1567.4
18597	6.09	5.07	1565.4
18740	5.74	4.72	1562.8

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 20

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
9931	3803	1959	14.9	2.668	38.7	1.961	75.0	1.763
10016	3856	1996	14.9	2.655	38.5	1.953	74.3	1.755
10101	3910	2033	14.9	2.643	38.3	1.944	73.6	1.748
10186	3964	2071	14.9	2.630	38.1	1.936	72.8	1.742
10271	4018	2111	14.9	2.617	37.9	1.926	72.0	1.736
10356	4074	2151	14.9	2.605	37.7	1.917	71.3	1.730
10441	4130	2193	14.9	2.592	37.5	1.907	70.5	1.724
10526	4188	2236	14.9	2.579	37.3	1.897	69.7	1.718
10611	4246	2281	14.9	2.565	37.0	1.887	68.9	1.711
10696	4305	2327	14.9	2.552	36.8	1.876	68.1	1.703
10781	4366	2375	14.9	2.538	36.6	1.864	67.2	1.694
10866	4428	2426	14.9	2.524	36.4	1.852	66.3	1.684
10951	4492	2479	14.9	2.509	36.1	1.839	65.4	1.670
11036	4557	2535	14.9	2.494	35.9	1.825	64.4	1.653
11121	4623	2594	14.9	2.479	35.7	1.811	63.5	1.632
11206	4692	2657	14.9	2.464	35.4	1.795	62.4	1.605
11291	4762	2723	14.9	2.447	35.2	1.779	61.4	1.570
11376	4835	2795	14.9	2.431	34.9	1.761	60.3	1.524
11461	4910	2871	14.9	2.413	34.6	1.742	59.1	1.465
11547	4987	2953	14.9	2.396	34.3	1.721	57.9	1.388

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
15768	9.01	8.00	1477.3
15903	8.89	7.87	1482.8
16038	8.76	7.75	1488.1
16173	8.64	7.63	1493.0
16308	8.52	7.50	1497.6
16443	8.40	7.38	1501.9
16578	8.27	7.26	1505.9
16713	8.15	7.14	1509.4
16848	8.02	7.01	1512.5
16983	7.89	6.87	1515.2
17118	7.74	6.73	1517.4
17253	7.59	6.58	1519.0
17388	7.43	6.41	1520.1
17523	7.24	6.23	1520.4
17658	7.04	6.02	1520.0
17793	6.80	5.79	1518.7
17928	6.54	5.52	1516.4
18063	6.23	5.21	1513.0
18198	5.86	4.85	1508.2
18334	5.43	4.42	1501.8

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 60

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
9277	3806	1960	14.9	2.486	36.1	1.961	70.1	1.763
9343	3854	1993	14.9	2.474	35.9	1.953	69.4	1.756
9410	3903	2027	14.9	2.462	35.7	1.945	68.7	1.750
9477	3954	2062	14.9	2.449	35.5	1.937	68.0	1.744
9544	4005	2099	14.9	2.435	35.3	1.929	67.3	1.738
9610	4058	2138	14.9	2.421	35.1	1.920	66.6	1.732
9677	4113	2178	14.9	2.407	34.9	1.910	65.8	1.726
9744	4169	2219	14.9	2.392	34.6	1.901	65.0	1.720
9810	4227	2263	14.9	2.377	34.4	1.890	64.2	1.714
9877	4286	2309	14.9	2.361	34.2	1.879	63.3	1.706
9944	4347	2358	14.9	2.345	33.9	1.868	62.4	1.698
10011	4410	2409	14.9	2.329	33.6	1.855	61.5	1.687
10077	4475	2462	14.9	2.311	33.4	1.842	60.6	1.675
10144	4542	2519	14.9	2.294	33.1	1.828	59.6	1.658
10211	4611	2580	14.9	2.276	32.8	1.814	58.6	1.638
10277	4683	2644	14.9	2.257	32.5	1.798	57.5	1.611
10344	4756	2713	14.9	2.238	32.2	1.780	56.4	1.575
10411	4833	2788	14.9	2.219	31.9	1.762	55.3	1.529
10478	4911	2867	14.9	2.199	31.6	1.742	54.1	1.468
10544	4993	2954	14.9	2.178	31.3	1.720	52.8	1.387

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
14729	8.41	7.40	1344.1
14835	8.30	7.29	1346.9
14941	8.19	7.17	1349.4
15047	8.07	7.06	1351.7
15153	7.96	6.95	1353.8
15259	7.84	6.83	1355.7
15365	7.72	6.71	1357.2
15471	7.60	6.59	1358.4
15577	7.48	6.46	1359.3
15683	7.34	6.33	1359.8
15789	7.20	6.19	1359.8
15895	7.05	6.04	1359.3
16001	6.89	5.88	1358.3
16107	6.71	5.70	1356.6
16212	6.51	5.50	1354.1
16318	6.28	5.27	1350.8
16424	6.02	5.01	1346.4
16530	5.72	4.71	1340.9
16636	5.37	4.36	1334.0
16742	4.95	3.93	1325.5

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 80

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
7858	3836	1977	14.9	2.083	30.4	1.956	58.9	1.759
7888	3877	2005	14.9	2.069	30.2	1.950	58.2	1.754
7918	3919	2034	14.9	2.055	30.0	1.943	57.6	1.748
7948	3962	2064	14.9	2.041	29.7	1.936	57.0	1.743
7978	4006	2095	14.9	2.027	29.5	1.929	56.4	1.738
8008	4050	2127	14.9	2.013	29.3	1.921	55.7	1.733
8038	4096	2160	14.9	1.999	29.1	1.913	55.1	1.729
8068	4143	2195	14.9	1.984	28.9	1.905	54.4	1.724
8098	4190	2230	14.9	1.970	28.6	1.897	53.7	1.719
8127	4239	2267	14.9	1.955	28.4	1.888	53.1	1.713
8157	4289	2306	14.9	1.940	28.2	1.879	52.4	1.707
8187	4340	2346	14.9	1.925	28.0	1.869	51.7	1.700
8217	4392	2387	14.9	1.910	27.7	1.859	51.0	1.692
8247	4445	2431	14.9	1.894	27.5	1.849	50.2	1.682
8277	4500	2476	14.9	1.879	27.3	1.837	49.5	1.671
8307	4556	2524	14.9	1.863	27.0	1.826	48.7	1.657
8337	4613	2573	14.9	1.847	26.8	1.813	48.0	1.640
8367	4671	2626	14.9	1.832	26.6	1.800	47.2	1.619
8397	4731	2681	14.9	1.815	26.3	1.786	46.4	1.593
8427	4793	2740	14.9	1.799	26.1	1.772	45.5	1.560

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
12477	7.03	6.02	1095.2
12525	6.94	5.92	1094.5
12572	6.84	5.83	1093.8
12620	6.75	5.73	1093.0
12667	6.65	5.64	1092.1
12715	6.56	5.54	1091.0
12762	6.46	5.45	1089.8
12810	6.36	5.35	1088.5
12857	6.26	5.25	1087.0
12905	6.16	5.15	1085.4
12952	6.06	5.05	1083.5
13000	5.95	4.94	1081.4
13047	5.84	4.83	1079.0
13095	5.72	4.71	1076.4
13142	5.60	4.58	1073.5
13190	5.46	4.45	1070.2
13237	5.32	4.30	1066.6
13285	5.16	4.15	1062.5
13332	4.99	3.97	1057.9
13380	4.79	3.78	1052.8

***** Power Evaluation (Inlet Guide Vanes) *****'

Model : CASE A MIN
Order No : L8-41198
Test Date : 5-26-05

Guaranteed Conditions: POINT # 1

(QG)	Flow	13000.00	DEL. NM^3/HR	
(DPG)	Disc Press		7.30	BAR(a)
(HPG)	Coupling Power		1185.00	KW
(HPM)	Mechanical loss		49.96	KW
(APD)	Aftercooler dp		0.11	BAR

Igv Angle 1 (deg)	60	
Flow 1	15682.80	DEL. NM^3/HR
Disc P 1	7.34	BAR(a)
Power 1	1359.80	KW
Flow 2	15788.74	DEL. NM^3/HR
Disc P 2	7.20	BAR(a)
Power 2	1359.83	KW

Igv Angle 2 (deg)	80	
Flow 1	99999.00	DEL. NM^3/HR
Disc P 1	99998.89	BAR(a)
Power 1	99999.00	KW
Flow 2	12477.20	DEL. NM^3/HR
Disc P 2	7.03	BAR(a)
Power 2	1095.16	KW

Calc Values at Des P:

IGV 1 Flow	15716.62	DEL. NM^3/HR
IGV 1 Power	1359.81	KW
IGV 2 Flow	12477.44	DEL. NM^3/HR
IGV 2 Power	1095.42	KW
Des Pt IGV angle (deg)	76.77	
Des Pt Power	1138.07	KW

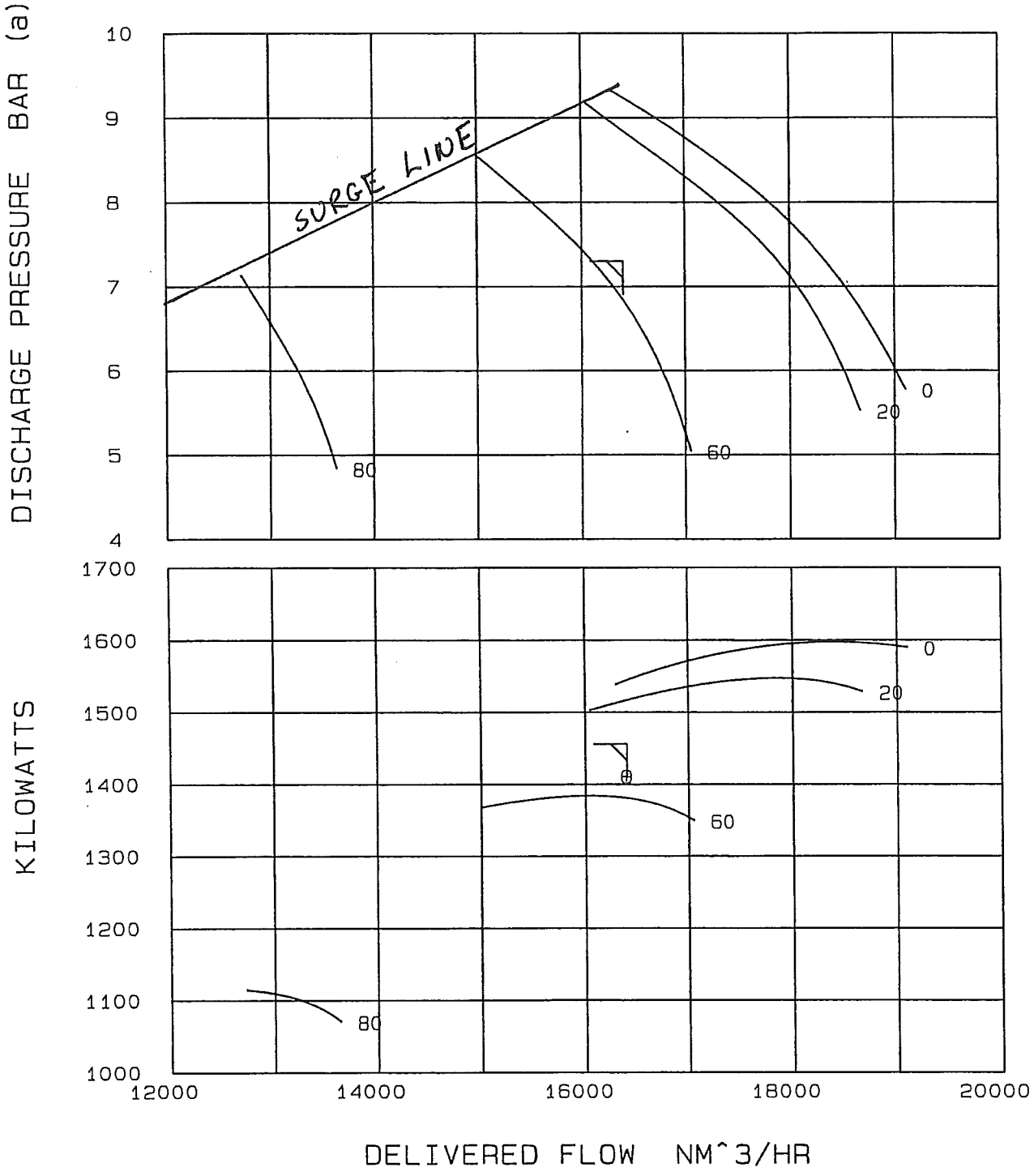
(Calc/Guar) Power(%) -3.96

ATLAS COPCO ACT COMPRESSOR PERFORMANCE MAP

ORDER # : L8-41198
CUSTOMER: ACE/AIR LIQUIDE
MODEL: CASE A MAX
TEST DATE: 5-26-05

REF. PRES. : 15.16 psia
MEDIUM : NITROGEN
MOLEWEIGHT : 28.01 kg/kMol
ISEN. EXP. : 1.4
REL. HUM. : 0%

T1 IN : 71.6 deg F
T2 IN : 71.6 deg F
T3 IN : 71.4 deg F



⊕ = Tested Power at GP

CUSTOMER: ACE/AIR LIQUIDE TEST DATE: 5-26-05

INPUT DATA

NUMBER OF STAGES	= 3	NUMBER OF IGV ANGLES	= 4
BAROMETRIC PRESSURE	= 14.70	REFERENCE PRESSURE	= 15.16
AFTERCOOLER DP	= 1.52	MECHANICAL POWER LOSS	= 67.0
STAGE 1 INLET TEMP	= 71.6	STAGE 1 GAS CONSTANT:	55.15
STAGE 2 INLET TEMP	= 71.6	STAGE 2 GAS CONSTANT:	55.15
STAGE 3 INLET TEMP	= 71.4	STAGE 3 GAS CONSTANT:	55.15
STAGE 1 - 2 DP, FLOW	= 0.96 @ 9912.0		
STAGE 2 - 3 DP, FLOW	= 0.88 @ 9912.0		

SEAL LEAKAGE + CONDENSATE KNOCKOUT	INTERSTAGE MASS INJECTION OR REMOVAL
MASS FLOW RATIO m2/m1 = 1.000	MASS FLOW RATIO m2/m1 = 1.000
MASS FLOW RATIO m3/m1 = 0.999	MASS FLOW RATIO m3/m2 = 1.000

DISCHARGE TO INLET FLOW RATIO = .998

IGV ANGLE = 0				IGV ANGLE = 20				IGV ANGLE = 60			
Q1	PR1	HP1	EF1	Q1	PR1	HP1	EF1	Q1	PR1	HP1	EF1
9989	2.719	909.3	.8414	9886	2.673	882.1	.8419	9226	2.495	771.7	.8266
10426	2.675	938.9	.8348	10152	2.637	897.2	.8366	9842	2.370	787.7	.8089
10886	2.608	962.5	.8253	10705	2.547	920.6	.8246	10461	2.204	797.1	.7699
11350	2.530	981.3	.8136	11152	2.476	936.6	.8154				
11697	2.479	996.5	.8049	11455	2.414	945.4	.8033				

IGV ANGLE = 80			
Q1	PR1	HP1	EF1
7858	2.08	587.7	.7223
8351	1.84	581.7	.6325

STAGE 2				STAGE 3			
Q	PR	HP	EF	Q	PR	HP	EF
3782	1.95	225.4	.8184	1959	1.76	95.5	.8311
3787	1.97	219.0	.8533	1968	1.75	96.4	.8210
3798	1.96	222.7	.8356	1973	1.76	96.3	.8277
3871	1.95	222.8	.8473	2011	1.75	97.6	.8284
3960	1.93	227.8	.8355	2079	1.75	100.1	.8310
4018	1.92	231.8	.8230	2135	1.74	101.5	.8356
4321	1.87	236.9	.8300	2350	1.69	107.3	.8228
4324	1.86	241.3	.8073	2376	1.68	107.7	.8196
4360	1.86	238.7	.8216	2388	1.68	108.2	.8207
4681	1.79	249.5	.7828	2688	1.59	114.1	.7766
4707	1.79	246.5	.8041	2690	1.59	114.6	.7697
4710	1.80	248.3	.7996	2698	1.58	113.5	.7701
4968	1.72	254.1	.7570	2986	1.36	116.2	.5438
4985	1.72	252.2	.7668	2991	1.35	116.1	.5329
4993	1.72	250.7	.7738	2992	1.33	115.4	.5164

CUSTOMER: ACE/AIR LIQUIDE TEST DATE: 5-26-05

ACCURACY OF POLYNOMIAL CURVE FIT

IGV ANGLE = 0				IGV ANGLE = 20				IGV ANGLE = 60			
Q1	ëPR	ëHP	ëEF	Q1	ëPR	ëHP	ëEF	Q1	ëPR	ëHP	ëEF
9989	-0.01	-0.01	-0.00	9886	0.04	0.02	0.04	9226	0.00	0.00	0.00
10426	0.02	0.02	0.01	10152	-0.09	-0.04	-0.08	9842	0.00	0.00	0.00
10886	-0.04	-0.03	-0.02	10705	0.12	0.04	0.10	10461	0.00	0.00	0.00
11350	0.03	0.03	0.01	11152	-0.11	-0.04	-0.09				
11697	-0.01	-0.01	-0.00	11455	0.04	0.01	0.03				

IGV ANGLE = 80			
Q1	ëPR	ëHP	ëEF
7858	0.00	0.00	0.00
8351	0.00	0.00	0.00

STAGE 2				STAGE 3			
Q	ëPR	ëHP	ëEF	Q	ëPR	ëHP	ëEF
3782	0.44	-1.56	2.37	1959	0.13	0.41	0.02
3787	-0.28	1.40	-1.83	1968	0.35	-0.24	1.12
3798	0.05	-0.11	0.22	1973	0.09	0.06	0.22
3871	-0.27	0.94	-1.35	2011	-0.08	-0.01	-0.29
3960	-0.11	0.02	-0.23	2079	-0.49	-0.37	-0.97
4018	0.12	-0.90	1.09	2135	-0.65	-0.08	-1.54
4321	-0.22	0.86	-1.22	2350	0.26	0.04	0.61
4324	0.33	-0.94	1.54	2376	0.50	0.27	0.98
4360	0.04	0.55	-0.45	2388	0.33	0.08	0.82
4681	0.52	-0.73	1.73	2688	-0.39	-0.14	-0.76
4707	-0.31	0.69	-1.24	2690	-0.23	-0.55	-0.00
4710	-0.41	-0.02	-0.71	2698	0.03	0.51	-0.53
4968	0.36	-0.78	1.49	2986	-0.45	-0.24	-1.40
4985	-0.01	0.04	-0.07	2991	-0.20	-0.16	-0.55
4993	-0.23	0.67	-1.09	2992	0.81	0.44	2.48

ALL ë VALUES ARE GIVEN AS PERCENT DIFFERENCE OF CALCULATED TO INPUT VALUE.

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 0

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
10064	3800	1961	15.2	2.713	40.1	1.958	77.7	1.760
10155	3848	1993	15.2	2.706	40.0	1.951	77.1	1.753
10247	3897	2028	15.2	2.697	39.9	1.943	76.5	1.747
10338	3949	2065	15.2	2.686	39.7	1.934	75.8	1.740
10430	4004	2104	15.2	2.675	39.5	1.925	75.1	1.734
10521	4060	2144	15.2	2.663	39.3	1.916	74.3	1.728
10613	4118	2187	15.2	2.650	39.1	1.906	73.5	1.722
10704	4178	2232	15.2	2.636	38.8	1.896	72.6	1.716
10796	4239	2279	15.2	2.622	38.6	1.885	71.7	1.709
10887	4302	2328	15.2	2.607	38.4	1.873	70.8	1.701
10979	4366	2379	15.2	2.592	38.1	1.861	69.9	1.691
11070	4431	2433	15.2	2.577	37.9	1.848	68.9	1.680
11162	4498	2489	15.2	2.562	37.6	1.835	67.9	1.665
11254	4565	2546	15.2	2.547	37.4	1.821	66.9	1.647
11345	4633	2607	15.2	2.532	37.1	1.806	65.9	1.625
11437	4700	2669	15.2	2.517	36.9	1.791	64.9	1.597
11528	4768	2733	15.2	2.503	36.7	1.775	63.8	1.562
11620	4836	2800	15.2	2.489	36.4	1.758	62.8	1.519
11711	4903	2868	15.2	2.477	36.2	1.741	61.8	1.466
11803	4969	2938	15.2	2.465	36.0	1.724	60.8	1.402

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
16291	9.32	8.31	1538.5
16439	9.22	8.20	1546.4
16587	9.11	8.09	1553.8
16735	8.99	7.98	1560.5
16883	8.87	7.86	1566.7
17032	8.75	7.73	1572.4
17180	8.62	7.60	1577.4
17328	8.48	7.47	1582.0
17476	8.34	7.33	1585.9
17624	8.20	7.18	1589.3
17772	8.04	7.03	1592.2
17920	7.87	6.86	1594.5
18069	7.69	6.68	1596.1
18217	7.49	6.48	1597.2
18365	7.28	6.26	1597.6
18513	7.04	6.02	1597.4
18661	6.77	5.76	1596.5
18809	6.47	5.46	1595.0
18958	6.14	5.13	1592.7
19106	5.77	4.76	1589.9

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 20

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
9911	3801	1961	15.2	2.671	39.5	1.958	76.5	1.760
9996	3854	1997	15.2	2.658	39.3	1.950	75.8	1.752
10082	3908	2035	15.2	2.645	39.1	1.941	75.0	1.746
10167	3962	2073	15.2	2.633	38.9	1.932	74.2	1.739
10253	4017	2113	15.2	2.620	38.7	1.923	73.5	1.733
10338	4073	2153	15.2	2.607	38.5	1.914	72.7	1.727
10424	4129	2195	15.2	2.594	38.3	1.904	71.9	1.721
10509	4187	2238	15.2	2.581	38.1	1.894	71.1	1.715
10595	4245	2283	15.2	2.568	37.8	1.884	70.3	1.708
10680	4305	2330	15.2	2.554	37.6	1.873	69.4	1.700
10766	4366	2378	15.2	2.540	37.4	1.861	68.5	1.691
10851	4428	2429	15.2	2.526	37.2	1.849	67.6	1.680
10937	4491	2482	15.2	2.512	36.9	1.836	66.7	1.667
11022	4557	2538	15.2	2.497	36.7	1.822	65.7	1.650
11108	4623	2598	15.2	2.482	36.4	1.808	64.7	1.628
11193	4692	2660	15.2	2.466	36.2	1.793	63.7	1.601
11279	4763	2727	15.2	2.450	35.9	1.776	62.6	1.566
11364	4836	2798	15.2	2.433	35.6	1.758	61.5	1.520
11450	4911	2875	15.2	2.416	35.3	1.739	60.3	1.460
11535	4988	2957	15.2	2.398	35.1	1.718	59.0	1.382

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
16043	9.18	8.17	1502.8
16182	9.05	8.04	1508.5
16320	8.92	7.91	1513.9
16458	8.80	7.78	1519.0
16597	8.67	7.66	1523.7
16735	8.55	7.54	1528.2
16874	8.43	7.41	1532.2
17012	8.30	7.29	1535.9
17150	8.17	7.16	1539.2
17289	8.03	7.02	1542.0
17427	7.89	6.87	1544.3
17565	7.73	6.72	1546.0
17704	7.56	6.55	1547.1
17842	7.37	6.36	1547.5
17981	7.16	6.15	1547.1
18119	6.93	5.91	1545.9
18257	6.65	5.64	1543.6
18396	6.34	5.32	1540.1
18534	5.96	4.95	1535.2
18673	5.52	4.51	1528.6

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 60

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
9258	3803	1961	15.2	2.490	36.9	1.958	71.5	1.760
9325	3851	1994	15.2	2.478	36.7	1.950	70.8	1.753
9392	3900	2028	15.2	2.465	36.5	1.942	70.1	1.747
9460	3950	2063	15.2	2.452	36.3	1.934	69.4	1.741
9527	4002	2100	15.2	2.439	36.1	1.926	68.7	1.735
9594	4055	2139	15.2	2.425	35.9	1.917	67.9	1.729
9661	4110	2179	15.2	2.411	35.6	1.907	67.1	1.723
9728	4166	2221	15.2	2.396	35.4	1.898	66.3	1.717
9795	4224	2265	15.2	2.381	35.2	1.887	65.5	1.711
9862	4284	2311	15.2	2.365	34.9	1.876	64.6	1.704
9930	4345	2359	15.2	2.349	34.6	1.865	63.7	1.695
9997	4408	2410	15.2	2.332	34.4	1.853	62.8	1.685
10064	4473	2464	15.2	2.315	34.1	1.840	61.8	1.672
10131	4540	2521	15.2	2.297	33.8	1.826	60.8	1.656
10198	4609	2581	15.2	2.279	33.5	1.811	59.8	1.635
10265	4681	2646	15.2	2.261	33.2	1.795	58.7	1.608
10332	4755	2715	15.2	2.242	32.9	1.778	57.6	1.572
10400	4831	2789	15.2	2.222	32.6	1.759	56.4	1.526
10467	4910	2869	15.2	2.202	32.3	1.739	55.2	1.465
10534	4991	2956	15.2	2.182	32.0	1.718	54.0	1.384

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
14987	8.57	7.56	1367.7
15095	8.45	7.44	1370.5
15204	8.34	7.33	1373.1
15313	8.23	7.21	1375.5
15422	8.11	7.10	1377.7
15530	7.99	6.98	1379.6
15639	7.87	6.86	1381.3
15748	7.75	6.73	1382.6
15856	7.62	6.61	1383.5
15965	7.49	6.47	1384.1
16074	7.34	6.33	1384.2
16182	7.19	6.18	1383.7
16291	7.02	6.01	1382.7
16400	6.84	5.83	1381.0
16508	6.64	5.62	1378.5
16617	6.41	5.39	1375.2
16726	6.14	5.13	1370.8
16834	5.83	4.82	1365.2
16943	5.47	4.46	1358.2
17052	5.04	4.03	1349.6

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 80

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
7858	3846	1987	15.2	2.083	31.0	1.951	59.9	1.754
7888	3887	2015	15.2	2.069	30.8	1.944	59.3	1.749
7918	3929	2045	15.2	2.055	30.5	1.938	58.6	1.744
7948	3972	2075	15.2	2.041	30.3	1.931	58.0	1.739
7978	4016	2106	15.2	2.027	30.1	1.923	57.3	1.734
8008	4061	2138	15.2	2.013	29.9	1.916	56.7	1.729
8038	4107	2172	15.2	1.999	29.7	1.908	56.0	1.724
8068	4153	2206	15.2	1.984	29.4	1.900	55.4	1.720
8098	4201	2242	15.2	1.970	29.2	1.891	54.7	1.714
8127	4250	2279	15.2	1.955	29.0	1.883	54.0	1.709
8157	4300	2318	15.2	1.940	28.8	1.873	53.3	1.702
8187	4351	2358	15.2	1.925	28.5	1.864	52.6	1.695
8217	4403	2400	15.2	1.910	28.3	1.854	51.8	1.687
8247	4456	2443	15.2	1.894	28.1	1.843	51.1	1.677
8277	4511	2489	15.2	1.879	27.8	1.832	50.3	1.665
8307	4567	2537	15.2	1.863	27.6	1.820	49.6	1.650
8337	4624	2587	15.2	1.847	27.3	1.808	48.8	1.632
8367	4683	2640	15.2	1.832	27.1	1.795	48.0	1.610
8397	4743	2696	15.2	1.815	26.8	1.781	47.2	1.583
8427	4805	2755	15.2	1.799	26.6	1.766	46.3	1.549

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
12721	7.14	6.12	1114.7
12769	7.04	6.03	1114.1
12817	6.94	5.93	1113.3
12866	6.85	5.83	1112.5
12914	6.75	5.74	1111.6
12963	6.65	5.64	1110.5
13011	6.56	5.54	1109.3
13060	6.46	5.44	1107.9
13108	6.36	5.34	1106.4
13156	6.26	5.24	1104.7
13205	6.15	5.14	1102.7
13253	6.04	5.03	1100.5
13302	5.92	4.91	1098.1
13350	5.80	4.79	1095.4
13398	5.67	4.66	1092.3
13447	5.54	4.52	1088.9
13495	5.39	4.37	1085.1
13544	5.22	4.21	1080.8
13592	5.04	4.03	1076.0
13641	4.84	3.83	1070.6

***** Power Evaluation (Inlet Guide Vanes) *****'

Model : CASE A MAX
Order No : L8-41198
Test Date : 5-26-05
Guaranteed Conditions: POINT # 1

(QG)	Flow	16400.00	DEL. NM^3/HR	
(DPG)	Disc Press		7.30	BAR(a)
(HPG)	Coupling Power		1456.00	KW
(HPM)	Mechanical loss		49.96	KW
(APD)	Aftercooler dp		0.11	BAR

Igv Angle 1 (deg)	20	
Flow 1	17842.22	DEL. NM^3/HR
Disc P 1	7.37	BAR(a)
Power 1	1547.51	KW
Flow 2	17980.61	DEL. NM^3/HR
Disc P 2	7.16	BAR(a)
Power 2	1547.14	KW

Igv Angle 2 (deg)	60	
Flow 1	16073.59	DEL. NM^3/HR
Disc P 1	7.34	BAR(a)
Power 1	1384.16	KW
Flow 2	16182.28	DEL. NM^3/HR
Disc P 2	7.19	BAR(a)
Power 2	1383.72	KW

Calc Values at Des P:

IGV 1 Flow	17890.61	DEL. NM^3/HR
IGV 1 Power	1547.38	KW
IGV 2 Flow	16103.93	DEL. NM^3/HR
IGV 2 Power	1384.04	KW
Des Pt IGV angle (deg)	53.37	
Des Pt Power	1411.10	KW

(Calc/Guar) Power(%) -3.08

ATLAS COPCO COMPTEC INC. TEST DATA REDUCTION PROGRAM

IGV=0 DATA AQUI MAY 26,2005 2:29 PM REV 2.1NT
MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5
SUPERVISING ENGINEER : JWS

RAW TEST DATA:C:\AERO\41198AA1.A00

1	FLOW P	PSI	0.63	0.67	0.71	0.77	0.79
2	FLOW DP	PSI	0.81	0.86	0.92	0.97	1.02
3	INLET P	PSI	2.29	2.40	2.58	2.78	2.90
4	DISC. P	PSI	18.79	17.82	16.59	15.17	14.33
7	FLOW T	F	103.21	104.37	102.26	100.53	99.28
8	INLET T	F	97.19	100.25	99.77	98.73	97.78
9	DISC. T	F	315.01	315.70	311.50	305.63	301.83
11	VAPOR P	PSI	0.13	0.13	0.13	0.13	0.13
15	FLOW P	PSI	0.63	0.66	0.71	0.76	0.79
17	FLOW P	PSI	0.63	0.67	0.71	0.77	0.80
23	FLOW DP	PSI	0.80	0.86	0.92	0.97	1.02
25	FLOW DP	PSI	0.81	0.86	0.92	0.97	1.02
31	INLET P	PSI	2.29	2.40	2.58	2.78	2.91
33	INLET P	PSI	2.29	2.40	2.58	2.78	2.90
39	DISC. P	PSI	18.87	17.92	16.68	15.28	14.43
41	DISC. P	PSI	18.70	17.73	16.50	15.06	14.23
52	FLOW T	F	103.37	104.46	102.37	100.67	99.41
53	FLOW T	F	103.05	104.28	102.15	100.40	99.15
56	INLET T	F	97.35	100.44	99.99	98.94	98.02
57	INLET T	F	97.03	100.06	99.54	98.52	97.54
60	DISC. T	F	315.19	315.72	311.37	305.45	301.67
61	DISC. T	F	314.84	315.68	311.62	305.80	301.98
65	SPEED	RPM	3011.00	3011.00	3012.00	3011.00	3012.00
69	R.H.	%	15.60	13.90	13.70	14.50	14.60
74	BAROMETR	PSI	14.39	14.39	14.39	14.39	14.39
81	RH T	F	96.40	99.80	99.70	98.70	97.70
82	RH P	PSI	12.09	11.99	11.81	11.60	11.48

NOTE : BE SURE BAROMETRIC PRESSURE GIVEN IS FOR THE LOCAL ELEVATION,
PRESSURE GIVEN BY THE WEATHER SERVICE IS CORRECTED TO SEA LEVEL,
AND SO MUST BE RECORRECTED BACK TO THE LOCAL PRESSURE.

ECHO KEY FILE:C:\AERO\41198A.KYA

15.160	71.60	2980.0	1.4000	55.150	1	2		
67.00	16.2500	0.9950	6.59184	0.0000110	0.0			
3	3	3	3	6	6	3	81	82
0	0	0	2	0	0	0	0	
1	0	0	0	10.69	0.00	14.31	0.00	
15.0000	11.9380	0.6000	0.0000	1.0000	0.0000	0.0000110	0.0000187	

IGV=0 DATA AQUI MAY 26,2005 2:29 PM REV 2.1NT

MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

VARIATION FROM AVERAGE

1	FLOW P	PSI	0.00	0.00	0.00	0.00	0.00
2	FLOW DP	PSI	0.01	0.00	0.00	0.00	0.00
3	INLET P	PSI	0.00	0.00	0.00	0.00	0.00
4	DISC. P	PSI	0.09	0.10	0.09	0.11	0.10
7	FLOW T	F	0.16	0.09	0.11	0.14	0.13
8	INLET T	F	0.16	0.19	0.22	0.21	0.24
9	DISC. T	F	0.18	0.02	0.13	0.18	0.16

INSTRUMENT TEMPERATURE ASSUMED TO BE 68 DEGREES

REF,INLET,INSTR.,FLOW DEVICE,OR DRY BULB TEMP SHOULD BE USED FOR R.H. LINE

ABSOLUTE PRESSURES AND TEMPERATURES

1	FLOW P	PSI	13.76	13.72	13.68	13.62	13.59
2	FLOW DP	PSI	0.81	0.86	0.92	0.97	1.02
3	INLET P	PSI	12.10	11.99	11.81	11.60	11.48
4	DISC. P	PSI	33.17	32.21	30.98	29.56	28.72
7	FLOW T	R	562.88	564.04	561.93	560.21	558.95
8	INLET T	R	556.86	559.92	559.44	558.40	557.45
9	DISC. T	R	774.69	775.37	771.17	765.30	761.50
72	GAS CONS		53.5728	53.5719	53.5714	53.5815	53.5785
73	HT RATIO		1.3957	1.3956	1.3957	1.3958	1.3959
74	BAROMETR	PSI	14.3870	14.3880	14.3880	14.3860	14.3880

PRIMARY FLOW DEVICE

CALCULATION FOR AN ORIFICE D+1/2D

PIPE DIA = 14.3120 DEVICE DIA = 10.6870 B = 0.7467 F = 1.0000

	FLOW COEFF	REYNOLDS NUMBER	FLOW #/SEC	VELOCITY FT/SEC	DYNAMIC TEMP	DYNAMIC PRESS	%	STAG PRESS	STATIC FLOW
1	0.6100	1126327.	9.918	138.05	1.57	0.12	0.57	12.22	10164.4
2	0.6099	1158393.	10.215	144.18	1.71	0.13	0.64	12.12	10616.1
3	0.6098	1196683.	10.526	150.69	1.87	0.14	0.73	11.95	11095.4
4	0.6098	1231699.	10.811	157.18	2.03	0.15	0.84	11.75	11573.0
5	0.6097	1262067.	11.060	162.14	2.16	0.16	0.92	11.64	11938.9

	DISCHARGE VELOCITY	VELOCITY TEMP	VELOCITY PRESS	VELOCITY %	STAG PRESS	STATIC FLOW	STAG FLOW	INLET STAG FLOW
1	110.71	1.01	0.15	0.72	33.33	5163.4	5146.5	10092.7
2	117.52	1.14	0.17	0.82	32.38	5480.8	5460.6	10534.8
3	125.20	1.29	0.18	0.95	31.16	5839.0	5814.5	11002.6
4	133.72	1.47	0.20	1.11	29.76	6236.6	6206.5	11467.6
5	140.08	1.61	0.22	1.24	28.93	6533.0	6498.2	11823.0

RATIOS OF DISCHARGE TO INLET

	PRESSURE STATIC	PRESSURE STAG	TEMPERTURE STATIC	TEMPERTURE STAG	F L O W STATIC	F L O W STAG
1	2.7427	2.7282	1.3933	1.3912	0.5080	0.5099
2	2.6866	2.6716	1.3870	1.3848	0.5163	0.5183
3	2.6238	2.6084	1.3808	1.3785	0.5263	0.5285
4	2.5476	2.5323	1.3729	1.3705	0.5389	0.5412
5	2.5008	2.4854	1.3684	1.3660	0.5472	0.5496

IGV=0 DATA AQUI MAY 26,2005 2:29 PM REV 2.1NT

MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

	ITROPIC WORK	I.W. COEFF	PTROPIC COEFF	PTROPIC WORK	P.W. COEFF	POWER TORQUE	POWER KWATTS	MOTOR EFF
1	34635.	0.5626	1.4902	35475.	0.5763	0.0	0.0	0.0000
2	33991.	0.5522	1.4954	34840.	0.5660	0.0	0.0	0.0000
3	33018.	0.5360	1.5033	33881.	0.5500	0.0	0.0	0.0000
4	31805.	0.5167	1.5134	32679.	0.5309	0.0	0.0	0.0000
5	31026.	0.5037	1.5211	31910.	0.5180	0.0	0.0	0.0000

	MACH NUMBER	REYNOLDS NUMBER	TEMP EFF	GAS HORSEPOWER AERO	GAS HORSEPOWER TORQUE	EFFICIENCY (FROM AERO) SHAFT	EFFICIENCY (FROM AERO) ITROPIC	EFFICIENCY (FROM AERO) PTROPIC
1	1.2159	550579.	0.8414	742.3	0.0	0.7701	0.8414	0.8618
2	1.2126	541217.	0.8348	756.2	0.0	0.7652	0.8348	0.8557
3	1.2135	534453.	0.8253	765.6	0.0	0.7573	0.8253	0.8469
4	1.2141	527164.	0.8136	768.4	0.0	0.7467	0.8136	0.8359
5	1.2155	523903.	0.8049	775.1	0.0	0.7393	0.8049	0.8279

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE = 15.16 GAS CONSTANT = 55.15 WHEEL DIA = 16.250
TEMPERATURE = 71.60 HEAT RATIO = 1.400 TIP WIDTH = 0.995
MOTOR SPEED = 2980. VISCOSITY =0.0000110 MECH HP = 67.0
MACHINE MACH = 1.2124 REYNOLDS # = 782245. WHEEL SPEED = 19644.
NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8618	0.5763	9988.8	34748.7	2.7188	1.3932	909.3	976.3
2	0.8557	0.5660	10426.3	34126.6	2.6748	1.3889	938.9	1005.9
3	0.8469	0.5500	10885.7	33164.6	2.6083	1.3819	962.5	1029.5
4	0.8359	0.5309	11349.5	32009.4	2.5302	1.3734	981.3	1048.3
5	0.8279	0.5180	11697.4	31235.9	2.4788	1.3679	996.5	1063.5

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE = 14.87 GAS CONSTANT = 55.15 WHEEL DIA = 16.250
TEMPERATURE = 71.60 HEAT RATIO = 1.400 TIP WIDTH = 0.995
MOTOR SPEED = 2980. VISCOSITY =0.0000110 MECH HP = 67.0
MACHINE MACH = 1.2124 REYNOLDS # = 767282. WHEEL SPEED = 19644.
NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8618	0.5763	9988.8	34748.7	2.7188	1.3932	891.9	958.9
2	0.8557	0.5660	10426.3	34126.6	2.6748	1.3889	920.9	987.9
3	0.8469	0.5500	10885.7	33164.6	2.6083	1.3819	944.1	1011.1
4	0.8359	0.5309	11349.5	32009.4	2.5302	1.3734	962.5	1029.5
5	0.8279	0.5180	11697.4	31235.9	2.4788	1.3679	977.4	1044.4

IGV=0 DATA AQUI MAY 26,2005 2:29 PM REV 2.1NT
MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE	= 15.16	GAS CONSTANT	= 55.15	WHEEL DIA	= 16.250
TEMPERATURE	= 71.60	HEAT RATIO	= 1.400	TIP WIDTH	= 0.995
MOTOR SPEED	= 2980.	VISCOSITY	=0.0000110	MECH HP	= 67.0
MACHINE MACH	= 1.2124	REYNOLDS #	= 782245.	WHEEL SPEED	= 19644.

NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8618	0.5763	9988.8	34748.7	2.7188	1.3932	909.3	976.3
2	0.8557	0.5660	10426.3	34126.6	2.6748	1.3889	938.9	1005.9
3	0.8469	0.5500	10885.7	33164.6	2.6083	1.3819	962.5	1029.5
4	0.8359	0.5309	11349.5	32009.4	2.5302	1.3734	981.3	1048.3
5	0.8279	0.5180	11697.4	31235.9	2.4788	1.3679	996.5	1063.5

ATLAS COPCO COMPTEC INC. TEST DATA REDUCTION PROGRAM

IGV=0 DATA AQUI MAY 26,2005 2:29 PM REV 2.1NT

MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

SUPERVISING ENGINEER : JWS

RAW TEST DATA:C:\AERO\41198AA1.B00

1	FLOW P	PSI	0.63	0.67	0.71	0.77	0.79
2	FLOW DP	PSI	0.81	0.86	0.92	0.97	1.02
3	INLET P	PSI	17.90	16.87	15.53	14.00	13.05
4	DISC. P	PSI	49.07	45.73	41.41	36.34	32.69
7	FLOW T	R	103.21	104.37	102.26	100.53	99.28
8	INLET T	R	100.23	99.03	99.41	99.53	101.68
9	DISC. T	R	238.96	237.44	233.39	227.47	224.50
11	VAPOR P	PSI	0.13	0.13	0.13	0.13	0.13
15	FLOW P	PSI	0.63	0.66	0.71	0.76	0.79
17	FLOW P	PSI	0.63	0.67	0.71	0.77	0.80
23	FLOW DP	PSI	0.80	0.86	0.92	0.97	1.02
25	FLOW DP	PSI	0.81	0.86	0.92	0.97	1.02
31	INLET P	PSI	17.94	16.92	15.60	14.06	13.11
33	INLET P	PSI	17.85	16.82	15.45	13.94	12.99
39	DISC. P	PSI	49.10	45.75	41.45	36.38	32.74
41	DISC. P	PSI	49.05	45.70	41.36	36.30	32.64
52	FLOW T	F	103.37	104.46	102.37	100.67	99.41
53	FLOW T	F	103.05	104.28	102.15	100.40	99.15
56	INLET T	F	100.62	100.23	100.69	99.80	101.98
57	INLET T	F	99.85	97.83	98.13	99.27	101.37
60	DISC. T	F	239.40	238.02	233.98	228.05	225.12
61	DISC. T	F	238.52	236.87	232.80	226.89	223.87
65	SPEED	RPM	3011.00	3011.00	3012.00	3011.00	3012.00
69	R.H.	%	15.60	13.90	13.70	14.50	14.60
74	BAROMETR	PSI	14.39	14.39	14.39	14.39	14.39
81	RH T	F	96.40	99.80	99.70	98.70	97.70
82	RH P	PSI	12.09	11.99	11.81	11.60	11.48

NOTE : BE SURE BAROMETRIC PRESSURE GIVEN IS FOR THE LOCAL ELEVATION,
PRESSURE GIVEN BY THE WEATHER SERVICE IS CORRECTED TO SEA LEVEL,
AND SO MUST BE RECORRECTED BACK TO THE LOCAL PRESSURE.

ECHO KEY FILE:C:\AERO\41198A.KYB

15.160	70.00	2980.0	1.4000	55.150	1	2		
67.00	12.8200	0.7410	6.59184	0.0000110	0.0			
3	3	3	3	6	6	3	81	82
0	0	2	2	0	0	0	0	
1	0	0	0	10.69	0.00	14.31	0.00	
11.9380	10.0200	0.6000	0.0000	1.0000	0.0000	0.0000110	0.0000187	

IGV=0 DATA AQUI MAY 26,2005 2:29 PM REV 2.1NT
MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

VARIATION FROM AVERAGE

1	FLOW P	PSI	0.00	0.00	0.00	0.00	0.00
2	FLOW DP	PSI	0.01	0.00	0.00	0.00	0.00
3	INLET P	PSI	0.05	0.05	0.07	0.06	0.06
4	DISC. P	PSI	0.02	0.02	0.05	0.04	0.05
7	FLOW T	R	0.16	0.09	0.11	0.14	0.13
8	INLET T	R	0.39	1.20	1.28	0.27	0.31
9	DISC. T	R	0.44	0.58	0.59	0.58	0.63

INSTRUMENT TEMPERATURE ASSUMED TO BE 68 DEGREES
REF,INLET,INSTR.,FLOW DEVICE,OR DRY BULB TEMP SHOULD BE USED FOR R.H. LINE

ABSOLUTE PRESSURES AND TEMPERATURES

1	FLOW P	PSI	13.76	13.72	13.68	13.62	13.59
2	FLOW DP	PSI	0.81	0.86	0.92	0.97	1.02
3	INLET P	PSI	32.28	31.26	29.92	28.39	27.44
4	DISC. P	PSI	63.46	60.12	55.79	50.73	47.08
7	FLOW T	R	562.88	564.04	561.93	560.21	558.95
8	INLET T	R	559.91	558.70	559.08	559.21	561.35
9	DISC. T	R	698.63	697.12	693.06	687.14	684.17
72	GAS CONS		53.5728	53.5719	53.5714	53.5815	53.5785
73	HT RATIO		1.3972	1.3972	1.3973	1.3973	1.3974
74	BAROMETR	PSI	14.3870	14.3880	14.3880	14.3860	14.3880

PRIMARY FLOW DEVICE
CALCULATION FOR AN ORIFICE D+1/2D
PIPE DIA = 14.3120 DEVICE DIA = 10.6870 B = 0.7467 F = 1.0000

	FLOW COEFF	REYNOLDS NUMBER	FLOW #/SEC	VELOCITY FT/SEC	DYNAMIC TEMP	DYNAMIC PRESS	%	STAG PRESS	STATIC FLOW
1	0.6100	1126354.	9.918	82.25	0.56	0.11	0.36	32.40	3836.1
2	0.6099	1158425.	10.215	87.29	0.63	0.12	0.43	31.38	4071.1
3	0.6098	1196718.	10.526	94.03	0.73	0.14	0.53	30.05	4385.2
4	0.6098	1231736.	10.811	101.79	0.85	0.15	0.69	28.54	4747.4
5	0.6097	1262105.	11.060	108.13	0.96	0.17	0.85	27.60	5043.1

	DISCHARGE VELOCITY	TEMP	VELOCITY PRESS	%	STAG PRESS	STATIC FLOW	STAG FLOW	INLET STAG FLOW
1	74.14	0.45	0.15	0.46	63.60	2435.8	2431.8	3826.5
2	80.42	0.53	0.16	0.56	60.28	2642.2	2637.1	4059.6
3	88.74	0.65	0.18	0.71	55.98	2915.8	2908.9	4370.9
4	99.39	0.81	0.21	0.95	50.94	3265.6	3255.9	4729.2
5	109.06	0.98	0.24	1.21	47.32	3583.2	3570.3	5021.4

RATIOS OF DISCHARGE TO INLET

	PRESSURE STATIC	PRESSURE STAG	TEMPERTURE STATIC	TEMPERTURE STAG	FLOW STATIC	FLOW STAG
1	1.9658	1.9634	1.2482	1.2478	0.6350	0.6355
2	1.9232	1.9208	1.2482	1.2477	0.6490	0.6496
3	1.8651	1.8627	1.2401	1.2396	0.6649	0.6655
4	1.7870	1.7848	1.2292	1.2288	0.6879	0.6885
5	1.7159	1.7142	1.2191	1.2188	0.7105	0.7110

IGV=0 DATA AQUI MAY 26,2005 2:29 PM REV 2.1NT
MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

	ITROPIC WORK	I.W. COEFF	PTROPIC COEFF	PTROPIC WORK	P.W. COEFF	POWER TORQUE	POWER KWATTS	MOTOR EFF
1	22308.	0.5822	1.4883	22651.	0.5912	0.0	0.0	0.0000
2	21467.	0.5603	1.5131	21868.	0.5708	0.0	0.0	0.0000
3	20378.	0.5315	1.5276	20782.	0.5421	0.0	0.0	0.0000
4	18870.	0.4925	1.5519	19275.	0.5031	0.0	0.0	0.0000
5	17517.	0.4569	1.5801	17924.	0.4675	0.0	0.0	0.0000

	MACH NUMBER	REYNOLDS NUMBER	TEMP EFF	GAS HORSEPOWER AERO	GAS HORSEPOWER TORQUE	EFFICIENCY (FROM AERO) SHAFT	EFFICIENCY (FROM AERO) ITROPIC	EFFICIENCY (FROM AERO) PTROPIC
1	0.9561	850031.	0.8533	471.5	0.0	0.7447	0.8533	0.8664
2	0.9572	826438.	0.8230	484.5	0.0	0.7207	0.8230	0.8384
3	0.9571	790805.	0.8073	483.1	0.0	0.7066	0.8073	0.8232
4	0.9566	750315.	0.7828	473.9	0.0	0.6836	0.7828	0.7996
5	0.9551	721305.	0.7570	465.3	0.0	0.6595	0.7570	0.7746

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE = 15.16 GAS CONSTANT = 55.15 WHEEL DIA = 12.820
TEMPERATURE = 70.00 HEAT RATIO = 1.400 TIP WIDTH = 0.741
MOTOR SPEED = 2980. VISCOSITY =0.0000110 MECH HP = 67.0
MACHINE MACH = 0.9579 REYNOLDS # = 460981. WHEEL SPEED = 19644.
NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8664	0.5912	3787.1	22187.4	1.9696	1.2505	219.6	286.6
2	0.8384	0.5708	4017.8	21419.6	1.9242	1.2499	232.5	299.5
3	0.8232	0.5421	4324.4	20342.7	1.8659	1.2417	242.0	309.0
4	0.7996	0.5031	4680.5	18880.6	1.7888	1.2310	250.3	317.3
5	0.7746	0.4675	4968.0	17544.7	1.7203	1.2215	254.8	321.8

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE = 14.87 GAS CONSTANT = 55.15 WHEEL DIA = 12.820
TEMPERATURE = 70.00 HEAT RATIO = 1.400 TIP WIDTH = 0.741
MOTOR SPEED = 2980. VISCOSITY =0.0000110 MECH HP = 67.0
MACHINE MACH = 0.9579 REYNOLDS # = 452162. WHEEL SPEED = 19644.
NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8664	0.5912	3787.1	22187.4	1.9696	1.2505	215.4	282.4
2	0.8384	0.5708	4017.8	21419.6	1.9242	1.2499	228.0	295.0
3	0.8232	0.5421	4324.4	20342.7	1.8659	1.2417	237.4	304.4
4	0.7996	0.5031	4680.5	18880.6	1.7888	1.2310	245.5	312.5
5	0.7746	0.4675	4968.0	17544.7	1.7203	1.2215	250.0	317.0

IGV=0 DATA AQUI MAY 26,2005 2:29 PM REV 2.1NT

MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE	= 15.16	GAS CONSTANT	= 55.15	WHEEL DIA	= 12.820
TEMPERATURE	= 71.60	HEAT RATIO	= 1.400	TIP WIDTH	= 0.741
MOTOR SPEED	= 2980.	VISCOSITY	=0.0000110	MECH HP	= 67.0
MACHINE MACH	= 0.9565	REYNOLDS #	= 459592.	WHEEL SPEED	= 19644.

NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8664	0.5912	3787.1	22187.4	1.9660	1.2497	219.0	286.0
2	0.8384	0.5708	4017.8	21419.6	1.9208	1.2491	231.8	298.8
3	0.8232	0.5421	4324.4	20342.7	1.8627	1.2410	241.3	308.3
4	0.7996	0.5031	4680.5	18880.6	1.7859	1.2303	249.5	316.5
5	0.7746	0.4675	4968.0	17544.7	1.7178	1.2209	254.1	321.1

ATLAS COPCO COMPTEC INC. TEST DATA REDUCTION PROGRAM

IGV=0 DATA AQUI MAY 26,2005 2:29 PM REV 2.1NT

MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

SUPERVISING ENGINEER : JWS

RAW TEST DATA:C:\AERO\41198AA1.C00

1	FLOW P	PSI	0.63	0.67	0.71	0.77	0.79
2	FLOW DP	PSI	0.81	0.86	0.92	0.97	1.02
3	INLET P	PSI	48.16	44.74	40.30	35.01	31.14
4	DISC. P	PSI	94.97	87.89	76.97	62.90	45.29
7	FLOW T	R	103.21	104.37	102.26	100.53	99.28
8	INLET T	R	100.56	100.89	100.87	100.29	100.31
9	DISC. T	R	217.50	215.06	209.74	201.22	193.00
11	VAPOR P	PSI	0.13	0.13	0.13	0.13	0.13
15	FLOW P	PSI	0.63	0.66	0.71	0.76	0.79
17	FLOW P	PSI	0.63	0.67	0.71	0.77	0.80
23	FLOW DP	PSI	0.80	0.86	0.92	0.97	1.02
25	FLOW DP	PSI	0.81	0.86	0.92	0.97	1.02
31	INLET P	PSI	48.24	44.82	40.38	35.11	31.23
33	INLET P	PSI	48.07	44.65	40.21	34.91	31.05
39	DISC. P	PSI	94.97	87.95	76.97	62.87	45.10
41	DISC. P	PSI	94.97	87.83	76.97	62.93	45.47
52	FLOW T	F	103.37	104.46	102.37	100.67	99.41
53	FLOW T	F	103.05	104.28	102.15	100.40	99.15
56	INLET T	F	100.54	100.88	100.85	100.29	100.31
57	INLET T	F	100.57	100.90	100.89	100.29	100.31
60	DISC. T	F	217.84	215.30	210.05	201.88	193.96
61	DISC. T	F	217.16	214.81	209.43	200.57	192.05
65	SPEED	RPM	3011.00	3011.00	3012.00	3011.00	3012.00
69	R.H.	%	15.60	13.90	13.70	14.50	14.60
74	BAROMETR	PSI	14.39	14.39	14.39	14.39	14.39
81	RH T	F	96.40	99.80	99.70	98.70	97.70
82	RH P	PSI	12.09	11.99	11.81	11.60	11.48

NOTE : BE SURE BAROMETRIC PRESSURE GIVEN IS FOR THE LOCAL ELEVATION, PRESSURE GIVEN BY THE WEATHER SERVICE IS CORRECTED TO SEA LEVEL, AND SO MUST BE RECORRECTED BACK TO THE LOCAL PRESSURE.

ECHO KEY FILE:C:\AERO\41198A.KYC

15.160	69.80	2980.0	1.4000	55.150	1	2		
67.00	7.1000	0.622011.13793		0.0000110	0.0			
3	3	3	3	6	6	3	81	82
0	0	2	2	0	0	0	0	
1	0	0	0	10.69	0.00	14.31	0.00	
10.0200	6.0650	0.6000	0.0000	1.0000	0.0000	0.0000110	0.0000187	

IGV=0 DATA AQUI MAY 26,2005 2:29 PM REV 2.1NT

MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

VARIATION FROM AVERAGE

1	FLOW P	PSI	0.00	0.00	0.00	0.00	0.00
2	FLOW DP	PSI	0.01	0.00	0.00	0.00	0.00
3	INLET P	PSI	0.09	0.09	0.09	0.10	0.09
4	DISC. P	PSI	0.00	0.06	0.00	0.03	0.18
7	FLOW T	R	0.16	0.09	0.11	0.14	0.13
8	INLET T	R	0.02	0.01	0.02	0.00	0.00
9	DISC. T	R	0.34	0.25	0.31	0.66	0.96

INSTRUMENT TEMPERATURE ASSUMED TO BE 68 DEGREES

REF,INLET,INSTR.,FLOW DEVICE,OR DRY BULB TEMP SHOULD BE USED FOR R.H. LINE

ABSOLUTE PRESSURES AND TEMPERATURES

1	FLOW P	PSI	13.76	13.72	13.68	13.62	13.59
2	FLOW DP	PSI	0.81	0.86	0.92	0.97	1.02
3	INLET P	PSI	62.54	59.13	54.68	49.40	45.53
4	DISC. P	PSI	109.36	102.28	91.35	77.28	59.68
7	FLOW T	R	562.88	564.04	561.93	560.21	558.95
8	INLET T	R	560.23	560.56	560.54	559.96	559.98
9	DISC. T	R	677.17	674.73	669.41	660.90	652.68
72	GAS CONS		53.5728	53.5719	53.5714	53.5815	53.5785
73	HT RATIO		1.3975	1.3976	1.3977	1.3978	1.3979
74	BAROMETR	PSI	14.3870	14.3880	14.3880	14.3860	14.3880

PRIMARY FLOW DEVICE

CALCULATION FOR AN ORIFICE D+1/2D

PIPE DIA = 14.3120 DEVICE DIA = 10.6870 B = 0.7467 F = 1.0000

	FLOW COEFF	REYNOLDS NUMBER	FLOW #/SEC	VELOCITY FT/SEC	DYNAMIC TEMP	DYNAMIC PRESS	%	STAG PRESS	STATIC FLOW
1	0.6100	1126360.	9.919	60.33	0.30	0.12	0.25	62.66	1982.1
2	0.6099	1158432.	10.215	65.76	0.36	0.13	0.31	59.26	2160.5
3	0.6098	1196726.	10.526	73.24	0.44	0.15	0.42	54.84	2406.5
4	0.6098	1231746.	10.811	83.19	0.57	0.18	0.64	49.57	2733.4
5	0.6097	1262118.	11.061	92.32	0.70	0.20	1.44	45.73	3033.2

	DISCHARGE VELOCITY	VELOCITY TEMP	VELOCITY PRESS	VELOCITY %	STAG PRESS	STATIC FLOW	STAG FLOW	INLET STAG FLOW
1	113.71	1.07	0.61	1.28	109.96	1368.8	1363.4	1979.4
2	124.73	1.28	0.69	1.57	102.96	1501.4	1494.2	2157.0
3	142.67	1.68	0.81	2.16	92.16	1717.4	1706.6	2401.7
4	170.84	2.41	0.99	3.46	78.28	2056.5	2037.9	2726.4
5	222.93	4.10	1.33	8.68	61.00	2683.6	2641.9	3023.6

RATIOS OF DISCHARGE TO INLET

	PRESSURE STATIC	PRESSURE STAG	TEMPERTURE STATIC	TEMPERTURE STAG	FLOW STATIC	FLOW STAG
1	1.7485	1.7549	1.2075	1.2087	0.6906	0.6888
2	1.7298	1.7375	1.2021	1.2037	0.6949	0.6927
3	1.6706	1.6807	1.1922	1.1942	0.7136	0.7106
4	1.5646	1.5790	1.1772	1.1803	0.7524	0.7475
5	1.3107	1.3340	1.1597	1.1655	0.8847	0.8737

IGV=0 DATA AQUI MAY 26,2005 2:29 PM REV 2.1NT

MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

	ITROPIC WORK	I.W. COEFF	PTROPIC COEFF	PTROPIC WORK	P.W. COEFF	POWER TORQUE	POWER KWATTS	MOTOR EFF
1	18305.	0.5456	1.5085	18586.	0.5540	0.0	0.0	0.0000
2	17966.	0.5355	1.5050	18228.	0.5433	0.0	0.0	0.0000
3	16801.	0.5005	1.5194	17060.	0.5082	0.0	0.0	0.0000
4	14636.	0.4363	1.5694	14907.	0.4443	0.0	0.0	0.0000
5	9010.	0.2684	2.1348	9343.	0.2783	0.0	0.0	0.0000

	MACH NUMBER	REYNOLDS NUMBER	TEMP EFF	GAS HORSEPOWER AERO	GAS HORSEPOWER TORQUE	EFFICIENCY (FROM AERO) SHAFT	EFFICIENCY (FROM AERO) ITROPIC	EFFICIENCY (FROM AERO) PTROPIC
1	0.8944	1290235.	0.8311	397.2	0.0	0.7085	0.8311	0.8439
2	0.8941	1218964.	0.8356	399.3	0.0	0.7129	0.8356	0.8479
3	0.8944	1128427.	0.8196	392.3	0.0	0.6973	0.8196	0.8323
4	0.8944	1021381.	0.7701	373.6	0.0	0.6504	0.7701	0.7844
5	0.8947	942510.	0.5164	350.9	0.0	0.4317	0.5164	0.5355

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE = 15.16 GAS CONSTANT = 55.15 WHEEL DIA = 7.100
TEMPERATURE = 69.80 HEAT RATIO = 1.400 TIP WIDTH = 0.622
MOTOR SPEED = 2980. VISCOSITY =0.0000110 MECH HP = 67.0
MACHINE MACH = 0.8966 REYNOLDS # = 362232. WHEEL SPEED = 33191.
NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8439	0.5540	1959.1	18205.0	1.7606	1.2111	95.7	162.7
2	0.8479	0.5433	2134.8	17854.6	1.7436	1.2061	101.8	168.8
3	0.8323	0.5082	2376.2	16699.7	1.6857	1.1963	108.0	175.0
4	0.7844	0.4443	2698.3	14601.3	1.5831	1.1821	113.8	180.8
5	0.5355	0.2783	2991.5	9145.5	1.3359	1.1671	115.7	182.7

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE = 14.87 GAS CONSTANT = 55.15 WHEEL DIA = 7.100
TEMPERATURE = 69.80 HEAT RATIO = 1.400 TIP WIDTH = 0.622
MOTOR SPEED = 2980. VISCOSITY =0.0000110 MECH HP = 67.0
MACHINE MACH = 0.8966 REYNOLDS # = 355303. WHEEL SPEED = 33191.
NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8439	0.5540	1959.1	18205.0	1.7606	1.2111	93.9	160.9
2	0.8479	0.5433	2134.8	17854.6	1.7436	1.2061	99.9	166.9
3	0.8323	0.5082	2376.2	16699.7	1.6857	1.1963	106.0	173.0
4	0.7844	0.4443	2698.3	14601.3	1.5831	1.1821	111.6	178.6
5	0.5355	0.2783	2991.5	9145.5	1.3359	1.1671	113.5	180.5

IGV=0 DATA AQUI MAY 26,2005 2:29 PM REV 2.1NT

MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE	= 15.16	GAS CONSTANT	= 55.15	WHEEL DIA	= 7.100
TEMPERATURE	= 71.40	HEAT RATIO	= 1.400	TIP WIDTH	= 0.622
MOTOR SPEED	= 2980.	VISCOSITY	=0.0000110	MECH HP	= 67.0
MACHINE MACH	= 0.8952	REYNOLDS #	= 361141.	WHEEL SPEED	= 33191.

NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8439	0.5540	1959.1	18205.0	1.7579	1.2105	95.5	162.5
2	0.8479	0.5433	2134.8	17854.6	1.7410	1.2054	101.5	168.5
3	0.8323	0.5082	2376.2	16699.7	1.6833	1.1957	107.7	174.7
4	0.7844	0.4443	2698.3	14601.3	1.5811	1.1816	113.5	180.5
5	0.5355	0.2783	2991.5	9145.5	1.3348	1.1666	115.4	182.4

Atlas Copco

MECHANICAL DATA SHEET

10. Title ACE/Air Liquide 11. Date 5-26-05

12. Model HL806-04 13. S/N CB-411198

TEST POINT	1	2	3	4	5	6	7	8	9
IGV ANGLE	0	0	0	0	0	20	20	20	20
TIME	9:36	9:50	10:08	10:26	10:41	10:56	11:12	11:27	11:43
OIL PRESS. PSIG	31,	30,	30	30	30	30	30.	30	30
OIL TEMP. °F	113	114	114	114	114	114	114	114	114
OIL FLOW {GPM}	29,5	29,5	29,5	29,5	29,5	29,5	29,5	29,5	29,5
VIBRATION 1X mils	.27	.27	.25	.28	.28	.27	.27	.27	.27
2X ↓	.30	.29	.27	.30	.31	.29	.29	.29	.29
3X ↓	.20	.18	.15	.19	.18	.15	.16	.15	.18
OPP.3X	.20	.18	.15	.20	.19	.16	.17	.17	.18
AXIAL 1 mils	+2,	+2	+2,	+2,5	+2,5	+2,	+2,	+2,	+2,5
AXIAL 2 mils	-7,	-7,	-7,	-7,	-6,5	-7,	-7,	-7,	-7,
RPM	3011	3011	3011	3011	3011	3012	3011	3012	3012
KW	1349	1360	1366	1352	1331	1329	1336	1332	1317
IGV {MA}	17,7	→	→	→	→	15,2	→	→	→

DATA TAKEN BY: [signature]

REVIEWED BY [signature]

RTD/MECHANICAL DATA SHEET

Atlas Copco

10. Title ACE/AIR Cryojet 11. Date 5-26-05
12. Model AC806-04 13. S/N CA41198

TEST POINT	1	2	3	4	5	6	7	8	9
IGV ANGLE	0	0	0	0	0	20	20	20	20
TIME	9:36	9:50	10:08	10:26	10:41	10:56	11:12	11:27	11:43
RTD 1 °F °C	186	186	186	186	186	184	185	185	185
RTD 2 °F °C	166	167	167	168	168	166	166	167	167
RTD 3 °F °C	137	140	141	141	141	141	141	141	140
RTD 4 °F °C	137	140	141	141	141	141	141	141	140
RTD 5 °F °C	176	176	174	171	168	177	176	173	170
RTD 6 °F °C	169	170	168	166	163	170	170	168	165
RTD 7 °F °C	176	178	178	178	177	177	177	177	177
RTD 8 °F °C	170	172	172	172	172	171	171	171	171
RTD 9 °F °C	X								
RTD 10 °F °C									
RTD 11 °F °C									
RTD 12 °F °C									
RTD 13 °F °C									
RTD 14 °F °C									
RTD 15 °F °C	173	174	175	175	174	175	174	174	175
RTD 16 °F °C	186	187	186	185	185	188	188	187	185
RTD 17 °F °C	141	141	141	140	139	142	141	140	140
RTD 18 °F °C	137	138	138	137	137	138	138	138	137
RTD 19 °F °C	134	136	137	138	138	136	137	137	137
RTD 20 °F °C	133	136	137	137	137	136	136	137	137
RTD 21 °F °C	168	171	171	171	169	170	170	170	170
RTD 22 °F °C	185	185	185	184	184	185	185	185	184
RTD 23 °F °C	X								
RTD 24 °F °C									

DATA TAKEN BY: [signature] REVIEWED BY: [signature]

Atlas Copco

MECHANICAL DATA SHEET

10. Title ACE/Air Liquide 11. Date 5-26-05

12. Model HL806-04 13. S/N CB-41198

TEST POINT	10	11	12	13	14	15			
IGV ANGLE	20	60	60	60	80	80			
TIME	11:58	12:12	1227	12:42	12:55	12:59			
OIL PRESS. PSIG	30	30	30	30	30	30			
OIL TEMP. °F	114	114	114	114	114	114			
OIL FLOW{GPM}	29.5	29.5	29.5	29.5	29.5	29.5			
VIBRATION 1X mil	.24	.29	.30	.24	.29	.30			
2X	.28	.30	.31	.30	.31	.35			
3X	.15	.18	.17	.15	.15	.16			
OPP.3X	.16	.18	.18	.16	.16	.17			
AXIAL 1 m/s	+2.5	+2.	+2.5	+2.5	+2.	+2.5			
AXIAL 2 m/s	-6.5	-7.	-7.	-6.5	-7.	-7			
RPM	3012	3013	3013	3013	3014	3015			
KW	1295	1240	1225	1161	1155	1004			
IGV{MA}	15.2	9.5	→	→	6.1	→			

DATA TAKEN BY: [signature]

REVIEWED BY [signature]

RTD/MECHANICAL DATA SHEET

Atlas Copco

10. Title ACE/Air Liquide 11., Date 5-26-05
12. Model HL806-84 13. S/N CB-40198

TEST POINT	10	11	12	13	14	15			
IGV ANGLE	20	60	60	60	80	80			
TIME	11:58	12:12	12:27	12:42	12:55	12:59			
RTD 1 °F °C	185	181	182	181	175	174			
RTD 2 °F °C	167	164	165	165	160	160			
RTD 3 °F °C	140	140	140	140	139	138			
RTD 4 °F °C	140	140	140	140	139	139			
RTD 5 °F °C	167	175	171	165	171	168			
RTD 6 °F °C	167	169	166	161	166	163			
RTD 7 °F °C	176	175	174	174	170	169			
RTD 8 °F °C	171	169	169	168	164	163			
RTD 9 °F °C									
RTD 10 °F °C									
RTD 11 °F °C									
RTD 12 °F °C									
RTD 13 °F °C									
RTD 14 °F °C									
RTD 15 °F °C	175	173	174	174	172	171			
RTD 16 °F °C	185	187	186	184	182	182			
RTD 17 °F °C	139	141	140	139	140	139			
RTD 18 °F °C	137	138	137	137	137	137			
RTD 19 °F °C	138	136	137	137	136	136			
RTD 20 °F °C	137	136	136	137	135	136			
RTD 21 °F °C	169	168	169	168	166	166			
RTD 22 °F °C	184	184	184	183	182	182			
RTD 23 °F °C									
RTD 24 °F °C									

DATA TAKEN BY: [signature]

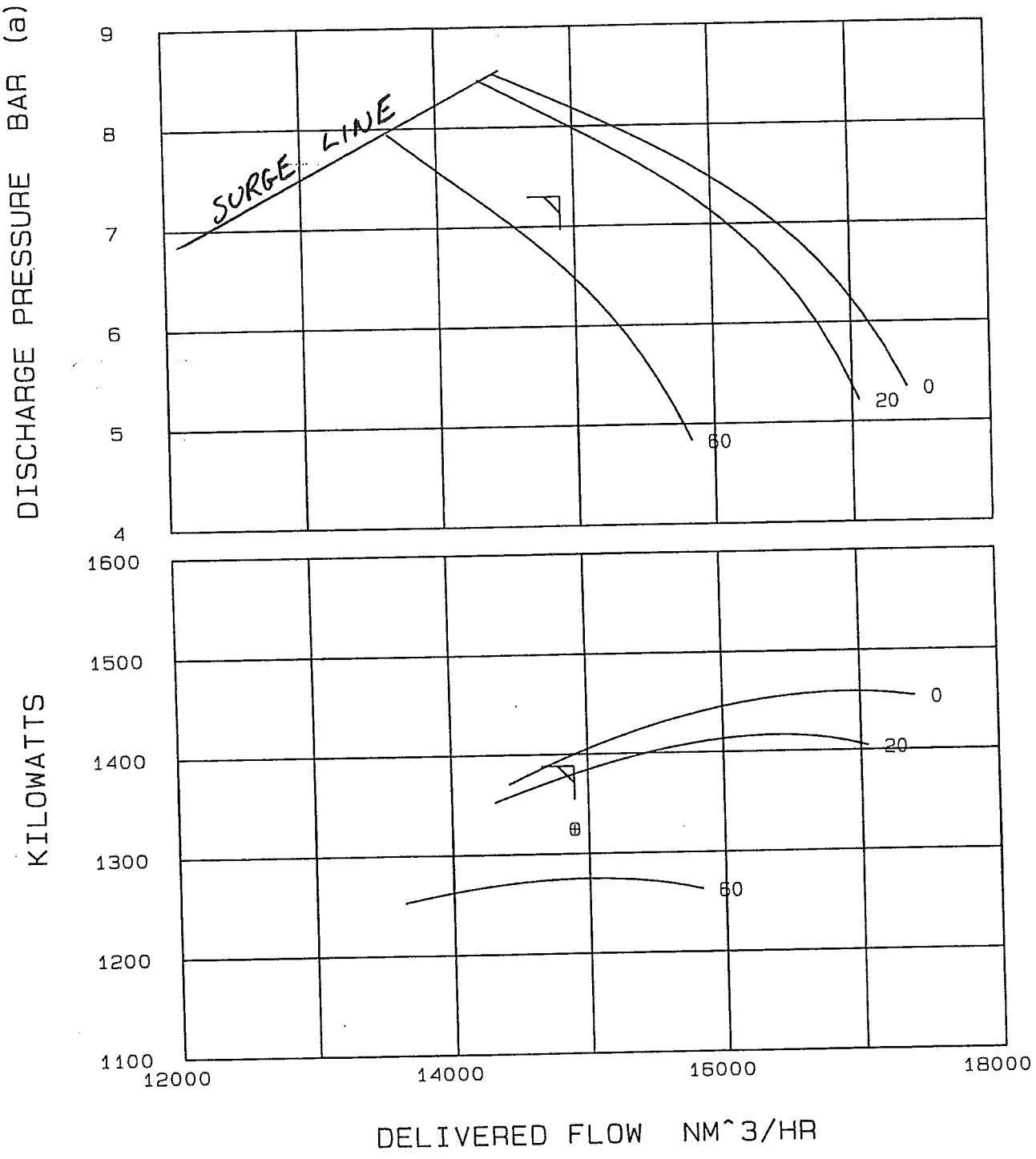
REVIEWED BY: [signature]

ATLAS COPCO ACT COMPRESSOR PERFORMANCE MAP

ORDER # : L8-41198
CUSTOMER: ACE/AIR LIQUIDE
MODEL: HL8-4-75
TEST DATE: 5-26-05

REF. PRES. : 15.16 psia
MEDIUM : NITROGEN
MOLEWEIGHT : 28.01 kg/kMol
ISEN. EXP. : 1.4
REL. HUM. : 0%

T1 IN : 96.8 deg F
T2 IN : 108 deg F
T3 IN : 108 deg F



⊕ = Tested Power at GP

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

INPUT DATA

NUMBER OF STAGES	= 3	NUMBER OF IGV ANGLES	= 3
BAROMETRIC PRESSURE	= 14.70	REFERENCE PRESSURE	= 15.16
AFTERCOOLER DP	= 1.52	MECHANICAL POWER LOSS	= 67.0
STAGE 1 INLET TEMP	= 96.8	STAGE 1 GAS CONSTANT:	55.15
STAGE 2 INLET TEMP	= 108.0	STAGE 2 GAS CONSTANT:	55.15
STAGE 3 INLET TEMP	= 108.0	STAGE 3 GAS CONSTANT:	55.15
STAGE 1 - 2 DP, FLOW	= 0.96 @ 9912.0		
STAGE 2 - 3 DP, FLOW	= 0.88 @ 9912.0		

SEAL LEAKAGE + CONDENSATE KNOCKOUT

MASS FLOW RATIO m2/m1 = 1.000

MASS FLOW RATIO m3/m1 = 0.999

INTERSTAGE MASS INJECTION OR REMOVAL

MASS FLOW RATIO m2/m1 = 1.000

MASS FLOW RATIO m3/m2 = 1.000

DISCHARGE TO INLET FLOW RATIO = .998

IGV ANGLE = 0				IGV ANGLE = 20				IGV ANGLE = 60			
Q1	PR1	HP1	EF1	Q1	PR1	HP1	EF1	Q1	PR1	HP1	EF1
9275	2.646	820.7	.8388	9197	2.630	804.8	.8422	8828	2.474	721.7	.8369
9793	2.616	858.3	.8354	9762	2.573	833.2	.8413	9479	2.348	738.7	.8207
10159	2.579	879.4	.8314	10245	2.520	857.7	.8359	10171	2.217	756.4	.7951
10672	2.521	903.8	.8266	10709	2.439	871.1	.8258				
11160	2.449	923.2	.8164	10979	2.394	880.1	.8181				

STAGE 2				STAGE 3			
Q	PR	HP	EF	Q	PR	HP	EF
3659	1.90	199.2	.8532	1959	1.70	88.1	.8423
3665	1.90	198.4	.8579	1962	1.70	88.5	.8392
3737	1.89	202.5	.8518	2009	1.70	90.2	.8414
3937	1.86	208.2	.8473	2149	1.68	93.9	.8438
3980	1.85	209.7	.8461	2187	1.67	95.0	.8379
4149	1.82	214.4	.8385	2319	1.64	98.0	.8280
4282	1.80	217.6	.8341	2428	1.62	100.8	.8209
4295	1.81	219.1	.8358	2430	1.61	100.4	.8211
4480	1.77	222.5	.8247	2586	1.57	103.4	.7971
4665	1.73	226.3	.8092	2770	1.49	105.6	.7382
4858	1.69	229.1	.7900	2967	1.34	106.7	.5593
4892	1.68	231.7	.7859	2998	1.33	107.5	.5438
4892	1.67	230.0	.7812	3012	1.27	106.0	.4638

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

ACCURACY OF POLYNOMIAL CURVE FIT

IGV ANGLE = 0				IGV ANGLE = 20				IGV ANGLE = 60			
Q1	ëPR	ëHP	ëEF	Q1	ëPR	ëHP	ëEF	Q1	ëPR	ëHP	ëEF
9275	0.01	0.00	0.01	9197	-0.02	-0.02	-0.00	8828	0.00	0.00	0.00
9793	-0.05	-0.01	-0.06	9762	0.09	0.10	0.01	9479	0.00	0.00	0.00
10159	0.07	0.01	0.08	10245	-0.16	-0.19	-0.01	10171	0.00	0.00	0.00
10672	-0.04	-0.00	-0.05	10709	0.16	0.18	0.01				
11160	0.01	0.00	0.01	10979	-0.07	-0.07	-0.01				

STAGE 2				STAGE 3			
Q	ëPR	ëHP	ëEF	Q	ëPR	ëHP	ëEF
3659	0.07	-0.15	0.26	1959	0.24	0.33	0.39
3665	0.02	0.36	-0.31	1962	0.24	-0.04	0.71
3737	-0.14	-0.35	0.11	2009	-0.27	-0.34	-0.33
3937	0.05	0.14	-0.07	2149	-0.54	0.00	-1.53
3980	-0.02	0.05	-0.08	2187	-0.25	-0.07	-0.85
4149	0.15	0.09	0.19	2319	0.32	0.20	0.42
4282	0.15	0.18	0.10	2428	0.15	-0.25	0.88
4295	-0.30	-0.36	-0.18	2430	0.32	0.21	0.83
4480	-0.01	0.01	-0.05	2586	0.20	-0.02	0.87
4665	0.04	-0.01	0.09	2770	-0.47	0.04	-1.61
4858	0.08	0.35	-0.18	2967	-0.14	-0.00	-1.04
4892	-0.36	-0.52	-0.23	2998	-1.55	-0.72	-5.08
4892	0.28	0.22	0.36	3012	1.82	0.68	7.41

ALL ë VALUES ARE GIVEN AS PERCENT DIFFERENCE OF CALCULATED TO INPUT VALUE.

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 0

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
9331	3678	1960	15.2	2.644	39.2	1.895	73.6	1.703
9432	3727	1994	15.2	2.639	39.1	1.888	73.1	1.696
9534	3778	2029	15.2	2.633	39.0	1.881	72.6	1.689
9636	3830	2066	15.2	2.626	38.9	1.873	72.1	1.682
9737	3883	2104	15.2	2.619	38.8	1.866	71.5	1.676
9839	3938	2144	15.2	2.611	38.6	1.858	70.9	1.669
9940	3995	2185	15.2	2.602	38.5	1.849	70.3	1.663
10042	4053	2228	15.2	2.592	38.3	1.841	69.6	1.656
10143	4113	2274	15.2	2.582	38.1	1.831	68.9	1.649
10245	4174	2321	15.2	2.571	38.0	1.822	68.2	1.641
10346	4237	2370	15.2	2.560	37.8	1.811	67.4	1.632
10448	4302	2422	15.2	2.548	37.6	1.800	66.6	1.621
10549	4368	2477	15.2	2.535	37.4	1.789	65.8	1.608
10651	4436	2534	15.2	2.522	37.1	1.776	64.9	1.591
10753	4506	2594	15.2	2.509	36.9	1.763	64.0	1.571
10854	4577	2659	15.2	2.495	36.7	1.749	63.1	1.545
10956	4651	2727	15.2	2.480	36.4	1.734	62.1	1.512
11057	4726	2799	15.2	2.465	36.2	1.717	61.0	1.469
11159	4804	2876	15.2	2.450	35.9	1.700	59.9	1.415
11260	4883	2959	15.2	2.434	35.7	1.681	58.8	1.344

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
14420	8.53	7.52	1370.4
14577	8.44	7.43	1380.6
14734	8.35	7.33	1390.2
14891	8.25	7.24	1399.2
15048	8.16	7.14	1407.6
15205	8.06	7.04	1415.4
15362	7.95	6.94	1422.6
15519	7.84	6.83	1429.2
15676	7.73	6.72	1435.2
15833	7.61	6.60	1440.6
15990	7.48	6.47	1445.3
16147	7.34	6.33	1449.4
16304	7.19	6.18	1452.7
16461	7.02	6.01	1455.4
16618	6.83	5.82	1457.4
16775	6.61	5.60	1458.5
16931	6.37	5.35	1458.8
17088	6.08	5.06	1458.2
17245	5.74	4.73	1456.6
17402	5.35	4.33	1453.8

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 20

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
9261	3678	1959	15.2	2.624	38.9	1.895	73.0	1.703
9354	3728	1994	15.2	2.616	38.8	1.888	72.5	1.696
9448	3779	2030	15.2	2.607	38.7	1.881	71.9	1.689
9541	3832	2067	15.2	2.599	38.5	1.873	71.3	1.682
9634	3885	2105	15.2	2.589	38.3	1.866	70.7	1.676
9728	3940	2145	15.2	2.579	38.2	1.858	70.1	1.669
9821	3996	2186	15.2	2.569	38.0	1.849	69.4	1.663
9914	4053	2228	15.2	2.558	37.8	1.841	68.7	1.656
10007	4112	2273	15.2	2.547	37.6	1.832	68.0	1.649
10101	4172	2319	15.2	2.535	37.4	1.822	67.3	1.641
10194	4234	2368	15.2	2.523	37.2	1.812	66.5	1.632
10287	4298	2419	15.2	2.510	37.0	1.801	65.7	1.622
10381	4364	2472	15.2	2.496	36.8	1.790	64.9	1.609
10474	4431	2529	15.2	2.482	36.6	1.777	64.0	1.593
10567	4501	2590	15.2	2.467	36.3	1.764	63.0	1.573
10660	4573	2654	15.2	2.451	36.1	1.750	62.1	1.547
10754	4648	2723	15.2	2.435	35.8	1.734	61.0	1.514
10847	4725	2796	15.2	2.418	35.5	1.718	59.9	1.471
10940	4805	2876	15.2	2.400	35.2	1.700	58.8	1.415
11034	4888	2962	15.2	2.381	34.9	1.680	57.5	1.341

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
14313	8.47	7.46	1352.4
14457	8.37	7.36	1359.7
14601	8.27	7.25	1366.7
14745	8.17	7.15	1373.4
14889	8.06	7.05	1379.8
15034	7.96	6.95	1385.7
15178	7.85	6.84	1391.3
15322	7.75	6.73	1396.4
15466	7.63	6.62	1401.0
15610	7.51	6.50	1405.2
15754	7.38	6.37	1408.7
15899	7.24	6.23	1411.7
16043	7.09	6.08	1414.0
16187	6.92	5.91	1415.5
16331	6.73	5.72	1416.3
16475	6.51	5.50	1416.1
16619	6.26	5.25	1415.0
16764	5.97	4.96	1412.8
16908	5.63	4.61	1409.3
17052	5.22	4.20	1404.3

CUSTOMER: ACE/AIR LIQUIDE TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 60

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
8828	3715	1984	15.2	2.474	36.8	1.890	68.8	1.698
8902	3770	2022	15.2	2.460	36.5	1.882	68.0	1.690
8977	3826	2061	15.2	2.446	36.3	1.874	67.3	1.683
9051	3882	2101	15.2	2.431	36.1	1.866	66.5	1.676
9126	3939	2143	15.2	2.417	35.8	1.858	65.8	1.670
9200	3998	2185	15.2	2.402	35.6	1.849	65.0	1.663
9275	4056	2229	15.2	2.388	35.4	1.840	64.3	1.656
9349	4116	2274	15.2	2.373	35.1	1.831	63.5	1.649
9423	4176	2320	15.2	2.359	34.9	1.821	62.8	1.641
9498	4238	2368	15.2	2.344	34.7	1.811	62.0	1.632
9572	4299	2417	15.2	2.330	34.4	1.801	61.2	1.622
9647	4362	2469	15.2	2.316	34.2	1.790	60.4	1.610
9721	4426	2522	15.2	2.302	34.0	1.778	59.6	1.595
9796	4490	2577	15.2	2.287	33.7	1.766	58.7	1.577
9870	4555	2634	15.2	2.273	33.5	1.754	57.9	1.555
9944	4621	2694	15.2	2.259	33.3	1.740	57.0	1.528
10019	4687	2757	15.2	2.245	33.1	1.726	56.2	1.495
10093	4755	2822	15.2	2.231	32.8	1.711	55.3	1.454
10168	4823	2890	15.2	2.217	32.6	1.695	54.4	1.404
10242	4892	2962	15.2	2.203	32.4	1.679	53.4	1.341

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
13643	7.94	6.93	1252.9
13758	7.82	6.81	1256.3
13873	7.70	6.69	1259.4
13988	7.59	6.57	1262.3
14103	7.47	6.46	1264.9
14218	7.35	6.34	1267.2
14333	7.24	6.22	1269.3
14448	7.12	6.10	1271.0
14563	7.00	5.98	1272.5
14678	6.87	5.86	1273.6
14793	6.74	5.72	1274.5
14909	6.60	5.58	1274.9
15024	6.44	5.43	1275.0
15139	6.28	5.27	1274.7
15254	6.10	5.09	1274.0
15369	5.90	4.89	1272.9
15484	5.68	4.67	1271.2
15599	5.44	4.42	1269.0
15714	5.15	4.14	1266.3
15829	4.83	3.82	1262.8

***** Power Evaluation (Inlet Guide Vanes) *****'

Model : HL8-4-75
Order No : L8-41198
Test Date : 5-26-05

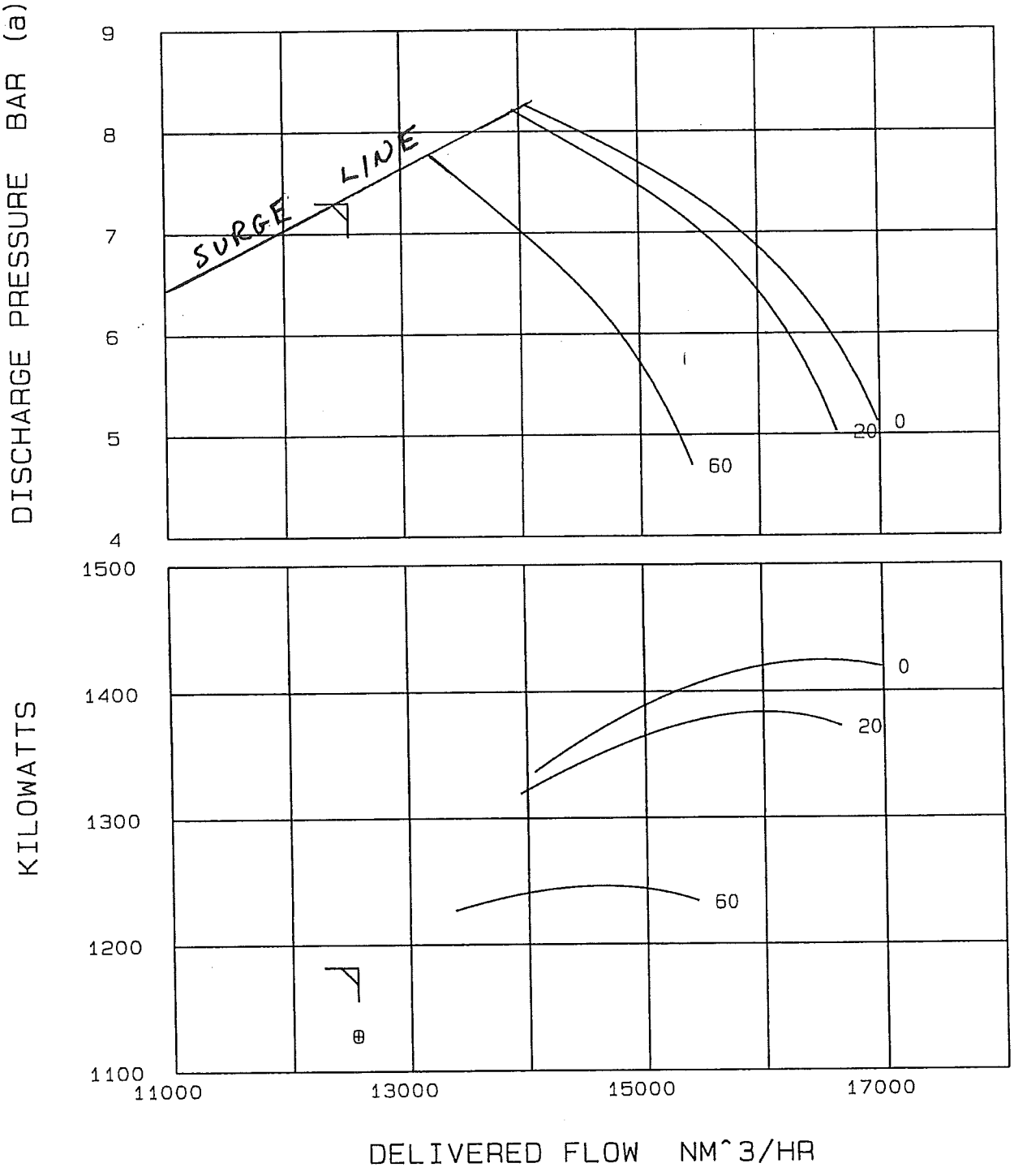
Guaranteed Conditions:		POINT # 1	
(QG) Flow	14900.00	DEL. NM^3/HR	
(DPG) Disc Press		7.30	BAR(a)
(HPG) Coupling Power		1388.00	KW
(HPM) Mechanical loss		49.96	KW
(APD) Aftercooler dp		0.11	BAR
Igv Angle 1 (deg)		20	
Flow 1	15754.39	DEL. NM^3/HR	
Disc P 1	7.38	BAR(a)	
Power 1	1408.73	KW	
Flow 2	15898.56	DEL. NM^3/HR	
Disc P 2	7.24	BAR(a)	
Power 2	1411.68	KW	
Igv Angle 2 (deg)		60	
Flow 1	14218.30	DEL. NM^3/HR	
Disc P 1	7.35	BAR(a)	
Power 1	1267.22	KW	
Flow 2	14333.34	DEL. NM^3/HR	
Disc P 2	7.24	BAR(a)	
Power 2	1269.27	KW	
Calc Values at Des P:			
IGV 1 Flow	15838.97	DEL. NM^3/HR	
IGV 1 Power	1410.46	KW	
IGV 2 Flow	14270.97	DEL. NM^3/HR	
IGV 2 Power	1268.16	KW	
Des Pt IGV angle (deg)		43.95	
Des Pt Power	1325.25	KW	
(Calc/Guar) Power(%)		-4.52	

ATLAS COPCO ACT COMPRESSOR PERFORMANCE MAP

ORDER # : L8-41198
CUSTOMER: ACE/AIR LIQUIDE
MODEL: CASE 8 MIN
TEST DATE: 5-26-05

REF. PRES. : 14.87 psia
MEDIUM : NITROGEN
MOLEWEIGHT : 28.01 kg/kMol
ISEN. EXP. : 1.4
REL. HUM. : 0%

T1 IN : 96.8 deg F
T2 IN : 113.7 deg F
T3 IN : 113.7 deg F



⊕ = Tested Power at GP

CUSTOMER: ACE/AIR LIQUIDE TEST DATE: 5-26-05

INPUT DATA

NUMBER OF STAGES	= 3	NUMBER OF IGV ANGLES	= 3
BAROMETRIC PRESSURE	= 14.70	REFERENCE PRESSURE	= 14.87
AFTERCOOLER DP	= 1.52	MECHANICAL POWER LOSS	= 67.0
STAGE 1 INLET TEMP	= 96.8	STAGE 1 GAS CONSTANT:	55.15
STAGE 2 INLET TEMP	= 113.7	STAGE 2 GAS CONSTANT:	55.15
STAGE 3 INLET TEMP	= 113.7	STAGE 3 GAS CONSTANT:	55.15
STAGE 1 - 2 DP, FLOW	= 0.96 @ 9912.0		
STAGE 2 - 3 DP, FLOW	= 0.88 @ 9912.0		

SEAL LEAKAGE + CONDENSATE KNOCKOUT	INTERSTAGE MASS INJECTION OR REMOVAL
MASS FLOW RATIO m2/m1 = 1.000	MASS FLOW RATIO m2/m1 = 1.000
MASS FLOW RATIO m3/m1 = 0.999	MASS FLOW RATIO m3/m2 = 1.000

DISCHARGE TO INLET FLOW RATIO = .998

IGV ANGLE = 0				IGV ANGLE = 20				IGV ANGLE = 60			
Q1	PR1	HP1	EF1	Q1	PR1	HP1	EF1	Q1	PR1	HP1	EF1
9275	2.646	805.0	.8388	9197	2.630	789.4	.8422	8828	2.474	707.9	.8369
9793	2.616	841.9	.8354	9762	2.573	817.2	.8413	9479	2.348	724.6	.8207
10159	2.579	862.6	.8314	10245	2.520	841.2	.8359	10171	2.217	741.9	.7951
10672	2.521	886.5	.8266	10709	2.439	854.4	.8258				
11160	2.449	905.5	.8164	10979	2.394	863.3	.8181				

STAGE 2				STAGE 3			
Q	PR	HP	EF	Q	PR	HP	EF
3659	1.89	193.4	.8532	1959	1.69	85.6	.8423
3665	1.89	192.7	.8579	1962	1.69	85.9	.8392
3737	1.88	196.6	.8518	2009	1.69	87.6	.8414
3937	1.85	202.1	.8473	2149	1.67	91.2	.8438
3980	1.84	203.7	.8461	2187	1.66	92.3	.8379
4149	1.81	208.2	.8385	2319	1.63	95.1	.8280
4282	1.79	211.4	.8341	2428	1.61	97.9	.8209
4295	1.80	212.8	.8358	2430	1.61	97.5	.8211
4480	1.76	216.1	.8247	2586	1.56	100.4	.7971
4665	1.72	219.8	.8092	2770	1.49	102.6	.7382
4858	1.68	222.5	.7900	2967	1.33	103.6	.5593
4892	1.68	225.0	.7859	2998	1.32	104.4	.5438
4892	1.67	223.3	.7812	3012	1.27	102.9	.4638

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

ACCURACY OF POLYNOMIAL CURVE FIT

IGV ANGLE = 0				IGV ANGLE = 20				IGV ANGLE = 60			
Q1	ëPR	ëHP	ëEF	Q1	ëPR	ëHP	ëEF	Q1	ëPR	ëHP	ëEF
9275	0.01	0.00	0.01	9197	-0.02	-0.02	-0.00	8828	0.00	0.00	0.00
9793	-0.05	-0.01	-0.06	9762	0.09	0.10	0.01	9479	0.00	0.00	0.00
10159	0.07	0.01	0.08	10245	-0.16	-0.19	-0.01	10171	0.00	0.00	0.00
10672	-0.04	-0.00	-0.05	10709	0.16	0.18	0.01				
11160	0.01	0.00	0.01	10979	-0.07	-0.07	-0.01				

STAGE 2				STAGE 3			
Q	ëPR	ëHP	ëEF	Q	ëPR	ëHP	ëEF
3659	0.07	-0.13	0.26	1959	0.24	0.29	0.39
3665	0.02	0.33	-0.31	1962	0.23	0.02	0.71
3737	-0.14	-0.34	0.11	2009	-0.27	-0.34	-0.33
3937	0.05	0.17	-0.07	2149	-0.53	-0.02	-1.53
3980	-0.02	0.02	-0.08	2187	-0.25	-0.13	-0.85
4149	0.15	0.10	0.19	2319	0.31	0.26	0.42
4282	0.15	0.16	0.10	2428	0.15	-0.26	0.88
4295	-0.30	-0.36	-0.18	2430	0.32	0.21	0.83
4480	-0.01	0.02	-0.05	2586	0.20	0.00	0.87
4665	0.05	-0.00	0.09	2770	-0.47	0.00	-1.61
4858	0.08	0.33	-0.18	2967	-0.14	0.01	-1.04
4892	-0.36	-0.53	-0.23	2998	-1.53	-0.74	-5.08
4892	0.28	0.24	0.36	3012	1.81	0.70	7.41

ALL ë VALUES ARE GIVEN AS PERCENT DIFFERENCE OF CALCULATED TO INPUT VALUE.

CUSTOMER: ACE/AIR LIQUIDE TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 0

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
9275	3690	1980	14.9	2.646	38.5	1.882	71.7	1.691
9377	3739	2014	14.9	2.642	38.4	1.876	71.3	1.684
9478	3789	2049	14.9	2.636	38.3	1.869	70.8	1.677
9580	3841	2086	14.9	2.630	38.2	1.861	70.3	1.671
9681	3894	2124	14.9	2.623	38.1	1.854	69.8	1.665
9783	3949	2164	14.9	2.615	38.0	1.846	69.2	1.659
9884	4006	2205	14.9	2.607	37.8	1.838	68.6	1.652
9986	4063	2249	14.9	2.597	37.7	1.829	68.0	1.646
10088	4123	2294	14.9	2.588	37.5	1.820	67.3	1.638
10189	4184	2341	14.9	2.577	37.3	1.810	66.6	1.630
10291	4247	2391	14.9	2.566	37.1	1.800	65.9	1.620
10392	4311	2443	14.9	2.555	36.9	1.789	65.1	1.609
10494	4377	2498	14.9	2.542	36.7	1.778	64.3	1.595
10595	4445	2555	14.9	2.530	36.5	1.766	63.5	1.578
10697	4515	2616	14.9	2.516	36.3	1.752	62.6	1.556
10798	4586	2680	14.9	2.502	36.1	1.738	61.7	1.529
10900	4660	2749	14.9	2.488	35.8	1.723	60.7	1.494
11001	4735	2821	14.9	2.473	35.6	1.707	59.7	1.449
11103	4812	2899	14.9	2.458	35.4	1.690	58.6	1.392
11205	4891	2982	14.9	2.443	35.1	1.671	57.5	1.319

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
14060	8.26	7.24	1336.4
14214	8.17	7.16	1346.5
14368	8.08	7.07	1356.0
14522	7.99	6.98	1365.0
14676	7.90	6.89	1373.3
14830	7.81	6.79	1381.1
14984	7.71	6.70	1388.3
15138	7.61	6.59	1394.9
15292	7.50	6.48	1400.9
15446	7.38	6.37	1406.2
15599	7.26	6.24	1411.0
15753	7.12	6.10	1415.0
15907	6.97	5.95	1418.4
16061	6.80	5.79	1421.1
16215	6.61	5.60	1423.0
16369	6.39	5.38	1424.2
16523	6.15	5.13	1424.4
16677	5.86	4.85	1423.8
16831	5.52	4.51	1422.1
16985	5.13	4.11	1419.2

CUSTOMER: ACE/AIR LIQUIDE TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 20

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
9197	3681	1974	14.9	2.629	38.3	1.883	71.3	1.692
9291	3732	2009	14.9	2.622	38.1	1.876	70.8	1.685
9384	3784	2045	14.9	2.613	38.0	1.869	70.2	1.678
9478	3836	2082	14.9	2.605	37.9	1.862	69.7	1.672
9572	3890	2120	14.9	2.596	37.7	1.854	69.1	1.665
9666	3945	2160	14.9	2.586	37.5	1.847	68.5	1.659
9760	4001	2201	14.9	2.576	37.4	1.838	67.9	1.653
9853	4058	2244	14.9	2.565	37.2	1.830	67.2	1.646
9947	4117	2289	14.9	2.554	37.0	1.821	66.5	1.639
10041	4177	2336	14.9	2.543	36.8	1.811	65.8	1.631
10135	4239	2384	14.9	2.531	36.6	1.801	65.1	1.622
10228	4303	2436	14.9	2.518	36.4	1.791	64.3	1.611
10322	4368	2489	14.9	2.505	36.2	1.779	63.5	1.597
10416	4436	2546	14.9	2.491	36.0	1.767	62.6	1.581
10510	4505	2607	14.9	2.476	35.7	1.754	61.7	1.560
10604	4577	2671	14.9	2.461	35.5	1.740	60.8	1.533
10697	4651	2740	14.9	2.445	35.2	1.725	59.8	1.499
10791	4728	2814	14.9	2.428	35.0	1.709	58.7	1.454
10885	4808	2893	14.9	2.410	34.7	1.691	57.6	1.397
10979	4890	2980	14.9	2.392	34.4	1.671	56.4	1.321

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
13941	8.22	7.20	1319.4
14084	8.12	7.11	1326.5
14226	8.02	7.01	1333.5
14368	7.93	6.91	1340.1
14510	7.83	6.81	1346.4
14652	7.73	6.72	1352.3
14794	7.63	6.61	1357.8
14937	7.52	6.51	1363.0
15079	7.41	6.40	1367.6
15221	7.30	6.28	1371.8
15363	7.17	6.16	1375.4
15505	7.03	6.02	1378.5
15647	6.88	5.87	1380.9
15789	6.72	5.70	1382.6
15932	6.53	5.52	1383.5
16074	6.32	5.30	1383.5
16216	6.07	5.06	1382.5
16358	5.78	4.77	1380.5
16500	5.44	4.43	1377.1
16642	5.03	4.02	1372.4

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 60

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
8828	3753	2022	14.9	2.474	36.0	1.874	66.8	1.682
8899	3807	2060	14.9	2.461	35.8	1.866	66.1	1.675
8970	3861	2098	14.9	2.447	35.6	1.859	65.4	1.669
9042	3915	2137	14.9	2.433	35.4	1.851	64.7	1.663
9113	3971	2178	14.9	2.419	35.2	1.843	64.1	1.656
9184	4027	2219	14.9	2.405	34.9	1.835	63.3	1.650
9255	4084	2262	14.9	2.391	34.7	1.826	62.6	1.643
9326	4141	2306	14.9	2.378	34.5	1.817	61.9	1.636
9398	4199	2351	14.9	2.364	34.3	1.808	61.2	1.628
9469	4258	2397	14.9	2.350	34.1	1.798	60.5	1.619
9540	4318	2445	14.9	2.336	33.9	1.788	59.7	1.608
9611	4378	2495	14.9	2.323	33.6	1.778	59.0	1.596
9683	4439	2547	14.9	2.309	33.4	1.767	58.2	1.581
9754	4501	2600	14.9	2.295	33.2	1.755	57.4	1.562
9825	4563	2656	14.9	2.282	33.0	1.743	56.6	1.540
9896	4626	2713	14.9	2.268	32.8	1.730	55.8	1.513
9967	4690	2774	14.9	2.255	32.6	1.717	55.0	1.480
10039	4755	2837	14.9	2.241	32.3	1.703	54.2	1.439
10110	4820	2902	14.9	2.228	32.1	1.688	53.3	1.390
10181	4886	2971	14.9	2.215	31.9	1.672	52.4	1.329

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
13382	7.64	6.63	1226.8
13490	7.53	6.52	1229.8
13598	7.43	6.41	1232.6
13706	7.32	6.30	1235.1
13814	7.21	6.20	1237.4
13922	7.10	6.09	1239.5
14030	6.99	5.98	1241.3
14138	6.88	5.87	1242.8
14246	6.76	5.75	1244.1
14354	6.64	5.63	1245.1
14462	6.52	5.50	1245.8
14570	6.38	5.37	1246.1
14678	6.24	5.22	1246.1
14786	6.08	5.07	1245.7
14894	5.91	4.89	1245.0
15002	5.72	4.70	1243.8
15110	5.51	4.49	1242.2
15218	5.27	4.26	1240.0
15326	5.00	3.99	1237.4
15434	4.70	3.69	1234.1

***** Power Evaluation (Inlet Guide Vanes) *****'

Model : CASE B MIN
Order No : L8-41198
Test Date : 5-26-05

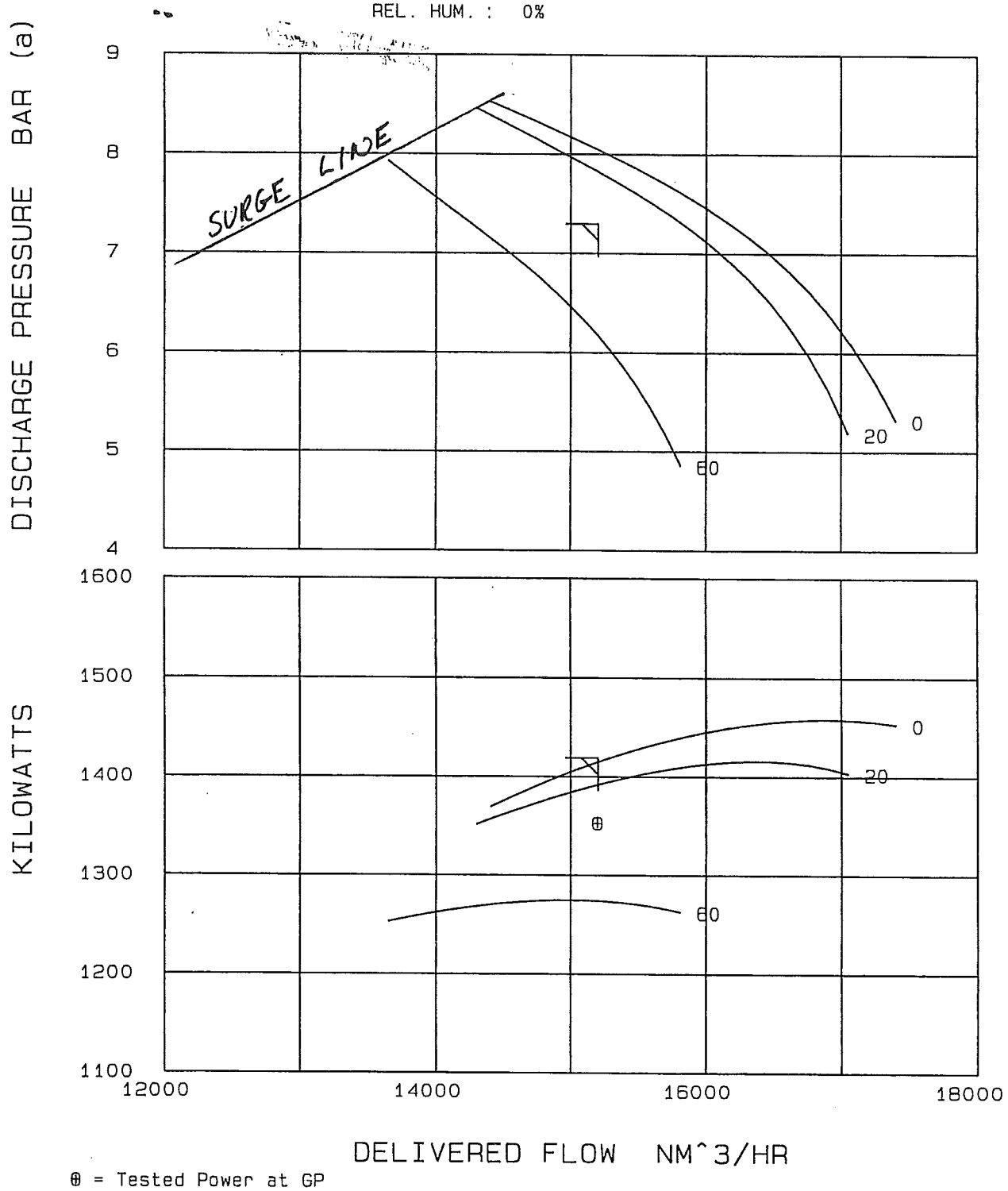
Guaranteed Conditions:		POINT # 1	
(QG) Flow	12550.00	DEL. NM^3/HR	
(DPG) Disc Press		7.30	BAR(a)
(HPG) Coupling Power		1182.00	KW
(HPM) Mechanical loss		49.96	KW
(APD) Aftercooler dp		0.11	BAR
Igv Angle 1 (deg)		60	
Flow 1	13706.03	DEL. NM^3/HR	
Disc P 1	7.32	BAR(a)	
Power 1	1235.12	KW	
Flow 2	13814.00	DEL. NM^3/HR	
Disc P 2	7.21	BAR(a)	
Power 2	1237.43	KW	
Igv Angle 2 (deg)		20	
Flow 1	15078.67	DEL. NM^3/HR	
Disc P 1	7.41	BAR(a)	
Power 1	1367.63	KW	
Flow 2	15220.83	DEL. NM^3/HR	
Disc P 2	7.30	BAR(a)	
Power 2	1371.80	KW	
Calc Values at Des P:			
IGV 1 Flow	13723.59	DEL. NM^3/HR	
IGV 1 Power	1235.50	KW	
IGV 2 Flow	15214.87	DEL. NM^3/HR	
IGV 2 Power	1371.62	KW	
Des Pt IGV angle (deg)		91.48	
Des Pt Power	1128.37	KW	
(Calc/Guar) Power(%)		-4.54	

ATLAS COPCO ACT COMPRESSOR PERFORMANCE MAP

ORDER # : L8-41198
CUSTOMER: ACE/AIR LIQUIDE
MODEL: CASE B MAX
TEST DATE: 5-26-05

REF. PRES. : 15.16 psia
MEDIUM : NITROGEN
MOLEWEIGHT : 28.01 kg/kMol
ISEN. EXP. : 1.4
REL. HUM. : 0%

T1 IN : 96.8 deg F
T2 IN : 108.5 deg F
T3 IN : 108.5 deg F



⊕ = Tested Power at GP

CUSTOMER: ACE/AIR LIQUIDE TEST DATE: 5-26-05

INPUT DATA

NUMBER OF STAGES	= 3	NUMBER OF IGV ANGLES	= 3
BAROMETRIC PRESSURE	= 14.70	REFERENCE PRESSURE	= 15.16
AFTERCOOLER DP	= 1.52	MECHANICAL POWER LOSS	= 67.0
STAGE 1 INLET TEMP	= 96.8	STAGE 1 GAS CONSTANT:	55.15
STAGE 2 INLET TEMP	= 108.5	STAGE 2 GAS CONSTANT:	55.15
STAGE 3 INLET TEMP	= 108.5	STAGE 3 GAS CONSTANT:	55.15
STAGE 1 - 2 DP, FLOW	= 0.96 @ 9912.0		
STAGE 2 - 3 DP, FLOW	= 0.88 @ 9912.0		

SEAL LEAKAGE + CONDENSATE KNOCKOUT	INTERSTAGE MASS INJECTION OR REMOVAL
MASS FLOW RATIO m2/m1 = 1.000	MASS FLOW RATIO m2/m1 = 1.000
MASS FLOW RATIO m3/m1 = 0.999	MASS FLOW RATIO m3/m2 = 1.000

DISCHARGE TO INLET FLOW RATIO = .998

IGV ANGLE = 0				IGV ANGLE = 20				IGV ANGLE = 60			
Q1	PR1	HP1	EF1	Q1	PR1	HP1	EF1	Q1	PR1	HP1	EF1
9275	2.646	820.7	.8388	9197	2.630	804.8	.8422	8828	2.474	721.7	.8369
9793	2.616	858.3	.8354	9762	2.573	833.2	.8413	9479	2.348	738.7	.8207
10159	2.579	879.4	.8314	10245	2.520	857.7	.8359	10171	2.217	756.4	.7951
10672	2.521	903.8	.8266	10709	2.439	871.1	.8258				
11160	2.449	923.2	.8164	10979	2.394	880.1	.8181				

STAGE 2				STAGE 3			
Q	PR	HP	EF	Q	PR	HP	EF
3659	1.89	199.0	.8532	1959	1.70	88.0	.8423
3665	1.90	198.2	.8579	1962	1.70	88.4	.8392
3737	1.89	202.3	.8518	2009	1.70	90.2	.8414
3937	1.86	208.0	.8473	2149	1.68	93.9	.8438
3980	1.85	209.5	.8461	2187	1.67	94.9	.8379
4149	1.82	214.2	.8385	2319	1.64	97.9	.8280
4282	1.80	217.4	.8341	2428	1.62	100.7	.8209
4295	1.81	218.9	.8358	2430	1.61	100.4	.8211
4480	1.77	222.3	.8247	2586	1.57	103.3	.7971
4665	1.73	226.1	.8092	2770	1.49	105.6	.7382
4858	1.68	228.9	.7900	2967	1.34	106.6	.5593
4892	1.68	231.5	.7859	2998	1.33	107.4	.5438
4892	1.67	229.8	.7812	3012	1.27	105.9	.4638

CUSTOMER: ACE/AIR LIQUIDE TEST DATE: 5-26-05

ACCURACY OF POLYNOMIAL CURVE FIT

IGV ANGLE = 0				IGV ANGLE = 20				IGV ANGLE = 60			
Q1	ëPR	ëHP	ëEF	Q1	ëPR	ëHP	ëEF	Q1	ëPR	ëHP	ëEF
9275	0.01	0.00	0.01	9197	-0.02	-0.02	-0.00	8828	0.00	0.00	0.00
9793	-0.05	-0.01	-0.06	9762	0.09	0.10	0.01	9479	0.00	0.00	0.00
10159	0.07	0.01	0.08	10245	-0.16	-0.19	-0.01	10171	0.00	0.00	0.00
10672	-0.04	-0.00	-0.05	10709	0.16	0.18	0.01				
11160	0.01	0.00	0.01	10979	-0.07	-0.07	-0.01				

STAGE 2				STAGE 3			
Q	ëPR	ëHP	ëEF	Q	ëPR	ëHP	ëEF
3659	0.07	-0.15	0.26	1959	0.24	0.36	0.39
3665	0.02	0.36	-0.31	1962	0.23	-0.00	0.71
3737	-0.14	-0.35	0.11	2009	-0.27	-0.42	-0.33
3937	0.05	0.14	-0.07	2149	-0.54	-0.07	-1.53
3980	-0.02	0.05	-0.08	2187	-0.25	-0.04	-0.85
4149	0.15	0.09	0.19	2319	0.32	0.24	0.42
4282	0.15	0.18	0.10	2428	0.15	-0.21	0.88
4295	-0.30	-0.36	-0.18	2430	0.32	0.15	0.83
4480	-0.01	0.01	-0.05	2586	0.20	0.03	0.87
4665	0.05	-0.01	0.09	2770	-0.47	-0.02	-1.61
4858	0.08	0.35	-0.18	2967	-0.14	0.01	-1.04
4892	-0.36	-0.52	-0.23	2998	-1.55	-0.72	-5.08
4892	0.28	0.22	0.36	3012	1.83	0.69	7.41

ALL ë VALUES ARE GIVEN AS PERCENT DIFFERENCE OF CALCULATED TO INPUT VALUE.

CUSTOMER: ACE/AIR LIQUIDE TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 0

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
9322	3677	1960	15.2	2.644	39.2	1.894	73.5	1.703
9424	3726	1994	15.2	2.639	39.1	1.887	73.1	1.695
9526	3777	2030	15.2	2.633	39.0	1.880	72.6	1.688
9628	3829	2066	15.2	2.627	38.9	1.873	72.0	1.682
9730	3883	2105	15.2	2.619	38.8	1.865	71.5	1.675
9832	3938	2145	15.2	2.611	38.6	1.857	70.9	1.669
9934	3995	2186	15.2	2.602	38.5	1.849	70.3	1.662
10036	4053	2230	15.2	2.593	38.3	1.840	69.6	1.655
10138	4113	2275	15.2	2.583	38.2	1.830	68.9	1.648
10240	4175	2322	15.2	2.572	38.0	1.821	68.2	1.640
10342	4238	2372	15.2	2.560	37.8	1.810	67.4	1.631
10444	4303	2424	15.2	2.548	37.6	1.799	66.6	1.620
10546	4369	2479	15.2	2.536	37.4	1.788	65.8	1.606
10648	4438	2537	15.2	2.523	37.1	1.775	64.9	1.590
10750	4508	2598	15.2	2.509	36.9	1.762	64.0	1.569
10852	4580	2662	15.2	2.495	36.7	1.748	63.0	1.543
10954	4654	2731	15.2	2.480	36.4	1.732	62.0	1.509
11056	4730	2803	15.2	2.465	36.2	1.716	61.0	1.466
11158	4808	2881	15.2	2.450	35.9	1.698	59.9	1.410
11260	4888	2964	15.2	2.434	35.7	1.679	58.7	1.339

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
14406	8.53	7.51	1369.2
14564	8.44	7.42	1379.5
14721	8.34	7.33	1389.2
14879	8.25	7.23	1398.2
15037	8.15	7.14	1406.7
15195	8.05	7.04	1414.6
15352	7.95	6.93	1421.9
15510	7.84	6.83	1428.5
15668	7.73	6.71	1434.6
15825	7.61	6.59	1440.0
15983	7.48	6.46	1444.7
16141	7.34	6.32	1448.8
16298	7.18	6.17	1452.2
16456	7.01	6.00	1454.9
16614	6.82	5.80	1456.9
16772	6.60	5.59	1458.0
16929	6.35	5.34	1458.3
17087	6.06	5.05	1457.6
17245	5.72	4.71	1455.9
17402	5.32	4.30	1453.1

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 20

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
9252	3676	1959	15.2	2.625	39.0	1.894	73.0	1.703
9346	3727	1994	15.2	2.617	38.8	1.887	72.5	1.695
9440	3778	2030	15.2	2.608	38.7	1.880	71.9	1.688
9533	3831	2067	15.2	2.599	38.5	1.872	71.3	1.681
9627	3884	2106	15.2	2.590	38.4	1.865	70.7	1.675
9721	3939	2145	15.2	2.580	38.2	1.857	70.1	1.669
9815	3996	2186	15.2	2.570	38.0	1.848	69.4	1.662
9908	4053	2229	15.2	2.559	37.8	1.840	68.7	1.655
10002	4112	2274	15.2	2.548	37.6	1.831	68.0	1.648
10096	4173	2320	15.2	2.536	37.5	1.821	67.3	1.640
10190	4235	2369	15.2	2.523	37.2	1.811	66.5	1.631
10283	4299	2421	15.2	2.510	37.0	1.800	65.7	1.621
10377	4365	2475	15.2	2.497	36.8	1.788	64.8	1.608
10471	4433	2532	15.2	2.482	36.6	1.776	64.0	1.591
10565	4503	2593	15.2	2.467	36.3	1.763	63.0	1.571
10659	4576	2657	15.2	2.451	36.1	1.749	62.0	1.545
10752	4651	2726	15.2	2.435	35.8	1.733	61.0	1.511
10846	4728	2801	15.2	2.418	35.5	1.716	59.9	1.468
10940	4809	2881	15.2	2.400	35.2	1.698	58.7	1.411
11034	4892	2968	15.2	2.381	34.9	1.678	57.5	1.335

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
14298	8.47	7.45	1351.4
14443	8.36	7.35	1358.8
14588	8.26	7.25	1365.8
14733	8.16	7.15	1372.6
14878	8.06	7.05	1379.0
15023	7.96	6.94	1385.0
15168	7.85	6.84	1390.6
15313	7.74	6.73	1395.8
15458	7.63	6.61	1400.4
15603	7.50	6.49	1404.6
15748	7.38	6.36	1408.2
15893	7.24	6.22	1411.2
16037	7.08	6.07	1413.5
16182	6.91	5.90	1415.1
16327	6.72	5.71	1415.8
16472	6.50	5.49	1415.7
16617	6.25	5.24	1414.5
16762	5.95	4.94	1412.2
16907	5.61	4.59	1408.6
17052	5.19	4.17	1403.5

CUSTOMER: ACE/AIR LIQUIDE

TEST DATE: 5-26-05

STAGE MATCHING CALCULATIONS

INLET GUIDE VANE ANGLE = 60

Q1 ICFM	Q2 ICFM	Q3 ICFM	PI1	PR1	PI2	PR2	PI3	PR3
8828	3718	1987	15.2	2.474	36.8	1.888	68.7	1.697
8902	3773	2025	15.2	2.460	36.5	1.881	68.0	1.689
8976	3828	2064	15.2	2.446	36.3	1.873	67.2	1.682
9050	3884	2104	15.2	2.431	36.1	1.865	66.5	1.675
9124	3941	2145	15.2	2.417	35.8	1.856	65.8	1.669
9197	3999	2187	15.2	2.403	35.6	1.848	65.0	1.662
9271	4057	2231	15.2	2.388	35.4	1.839	64.3	1.655
9345	4117	2275	15.2	2.374	35.1	1.830	63.5	1.648
9419	4177	2321	15.2	2.360	34.9	1.820	62.7	1.640
9493	4237	2369	15.2	2.345	34.7	1.810	62.0	1.632
9567	4299	2418	15.2	2.331	34.4	1.800	61.2	1.621
9641	4361	2469	15.2	2.317	34.2	1.789	60.4	1.609
9715	4424	2521	15.2	2.303	34.0	1.778	59.6	1.595
9789	4488	2576	15.2	2.289	33.8	1.766	58.8	1.577
9863	4552	2633	15.2	2.275	33.5	1.753	57.9	1.555
9936	4618	2692	15.2	2.261	33.3	1.740	57.1	1.529
10010	4684	2754	15.2	2.247	33.1	1.726	56.2	1.496
10084	4750	2819	15.2	2.233	32.9	1.711	55.3	1.456
10158	4818	2887	15.2	2.219	32.6	1.696	54.4	1.406
10232	4886	2958	15.2	2.205	32.4	1.679	53.5	1.345

PERFORMANCE SUMMARY

FLOW DEL. NM^3/HR	DIS P. BAR(a)	DIS P. BAR(e)	SHAFT KW
13643	7.93	6.92	1252.7
13757	7.81	6.80	1256.0
13872	7.69	6.68	1259.1
13986	7.58	6.56	1261.9
14100	7.46	6.45	1264.5
14214	7.35	6.33	1266.8
14328	7.23	6.22	1268.9
14443	7.11	6.10	1270.6
14557	6.99	5.98	1272.1
14671	6.87	5.85	1273.2
14785	6.73	5.72	1274.1
14899	6.59	5.58	1274.5
15014	6.44	5.43	1274.7
15128	6.28	5.27	1274.4
15242	6.11	5.09	1273.7
15356	5.91	4.90	1272.6
15470	5.69	4.68	1270.9
15585	5.45	4.43	1268.8
15699	5.17	4.16	1266.0
15813	4.85	3.84	1262.7

***** Power Evaluation (Inlet Guide Vanes) *****'
Model : CASE B MAX
Order No : L8-41198
Test Date : 5-26-05
Guaranteed Conditions: POINT # 1

(QG)	Flow	15200.00	DEL. NM^3/HR	
(DPG)	Disc Press		7.30	BAR(a)
(HPG)	Coupling Power		1419.00	KW
(HPM)	Mechanical loss		49.96	KW
(APD)	Aftercooler dp		0.11	BAR

Igv Angle 1 (deg)	20	
Flow 1	15747.66	DEL. NM^3/HR
Disc P 1	7.38	BAR(a)
Power 1	1408.21	KW
Flow 2	15892.57	DEL. NM^3/HR
Disc P 2	7.24	BAR(a)
Power 2	1411.20	KW
Igv Angle 2 (deg)	60	
Flow 1	14214.16	DEL. NM^3/HR
Disc P 1	7.35	BAR(a)
Power 1	1266.83	KW
Flow 2	14328.37	DEL. NM^3/HR
Disc P 2	7.23	BAR(a)
Power 2	1268.88	KW

Calc Values at Des P:

IGV 1 Flow	15825.73	DEL. NM^3/HR
IGV 1 Power	1409.82	KW
IGV 2 Flow	14259.80	DEL. NM^3/HR
IGV 2 Power	1267.65	KW
Des Pt IGV angle (deg)	35.98	
Des Pt Power	1353.01	KW
(Calc/Guar) Power(%)	-4.65	

ATLAS COPCO COMPTEC INC. TEST DATA REDUCTION PROGRAM

IGV=0 DATA AQUI MAY 27,2005 7:32 AM REV 2.1NT
MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5
SUPERVISING ENGINEER : JWS

RAW TEST DATA:C:\AERO\41198BA1.A00

1	FLOW P	PSI	0.55	0.59	0.63	0.67	0.72
2	FLOW DP	PSI	0.70	0.75	0.79	0.86	0.92
3	INLET P	PSI	1.94	2.12	2.26	2.43	2.62
4	DISC. P	PSI	18.77	17.88	17.09	16.03	14.70
7	FLOW T	F	136.36	131.59	128.33	127.28	127.52
8	INLET T	F	124.17	125.62	124.78	124.12	124.14
9	DISC. T	F	345.45	344.92	341.45	336.38	331.59
11	VAPOR P	PSI	0.16	0.15	0.14	0.14	0.13
15	FLOW P	PSI	0.55	0.59	0.63	0.67	0.72
17	FLOW P	PSI	0.55	0.59	0.63	0.67	0.73
23	FLOW DP	PSI	0.69	0.75	0.79	0.86	0.92
25	FLOW DP	PSI	0.70	0.75	0.80	0.86	0.92
31	INLET P	PSI	1.94	2.12	2.26	2.42	2.62
33	INLET P	PSI	1.94	2.12	2.26	2.43	2.62
39	DISC. P	PSI	18.87	17.97	17.19	16.11	14.79
41	DISC. P	PSI	18.68	17.80	16.99	15.94	14.60
52	FLOW T	F	136.27	131.62	128.47	127.32	127.46
53	FLOW T	F	136.44	131.55	128.20	127.23	127.58
56	INLET T	F	124.32	125.90	125.05	124.39	124.38
57	INLET T	F	124.03	125.34	124.51	123.84	123.90
60	DISC. T	F	345.66	345.01	341.45	336.27	331.45
61	DISC. T	F	345.23	344.83	341.45	336.50	331.72
65	SPEED	RPM	3012.00	3012.00	3012.00	3014.00	3014.00
69	R.H.	%	9.40	7.60	7.40	7.60	7.20
74	BAROMETR	PSI	14.39	14.39	14.38	14.38	14.38
81	RH T	F	120.90	124.70	124.20	123.70	123.50
82	RH P	PSI	12.45	12.27	12.12	11.95	11.76

NOTE : BE SURE BAROMETRIC PRESSURE GIVEN IS FOR THE LOCAL ELEVATION,
PRESSURE GIVEN BY THE WEATHER SERVICE IS CORRECTED TO SEA LEVEL,
AND SO MUST BE RECORRECTED BACK TO THE LOCAL PRESSURE.

ECHO KEY FILE:C:\AERO\41198B.KYA

15.160	96.80	2980.0	1.4000	55.150	1	2		
67.00	16.2500	0.9950	6.59184	0.0000120	0.0			
3	3	3	3	6	6	3	81	82
0	0	0	2	0	0	0	0	
1	0	0	0	10.69	0.00	14.31	0.00	
15.0000	11.9380	0.6000	0.0000	1.0000	0.0000	0.0000110	0.0000187	

IGV=0 DATA AQUI MAY 27,2005 7:32 AM REV 2.1NT

MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

VARIATION FROM AVERAGE

1	FLOW P	PSI	0.00	0.00	0.00	0.00	0.00
2	FLOW DP	PSI	0.00	0.00	0.00	0.00	0.00
3	INLET P	PSI	0.00	0.00	0.00	0.00	0.00
4	DISC. P	PSI	0.10	0.09	0.10	0.09	0.10
7	FLOW T	F	0.09	0.03	0.14	0.05	0.06
8	INLET T	F	0.14	0.28	0.27	0.28	0.24
9	DISC. T	F	0.22	0.09	0.00	0.12	0.14

INSTRUMENT TEMPERATURE ASSUMED TO BE 68 DEGREES

REF,INLET,INSTR.,FLOW DEVICE,OR DRY BULB TEMP SHOULD BE USED FOR R.H. LINE

ABSOLUTE PRESSURES AND TEMPERATURES

1	FLOW P	PSI	13.84	13.79	13.76	13.71	13.66
2	FLOW DP	PSI	0.70	0.75	0.79	0.86	0.92
3	INLET P	PSI	12.45	12.27	12.12	11.96	11.77
4	DISC. P	PSI	33.16	32.27	31.48	30.41	29.08
7	FLOW T	R	596.03	591.26	588.01	586.95	587.19
8	INLET T	R	583.85	585.29	584.45	583.79	583.81
9	DISC. T	R	805.12	804.59	801.12	796.06	791.26
72	GAS CONS		53.6160	53.5921	53.5854	53.5919	53.5816
73	HT RATIO		1.3945	1.3946	1.3947	1.3948	1.3950
74	BAROMETR	PSI	14.3870	14.3860	14.3850	14.3850	14.3840

PRIMARY FLOW DEVICE

CALCULATION FOR AN ORIFICE D+1/2D

PIPE DIA = 14.3120 DEVICE DIA = 10.6870 B = 0.7467 F = 1.0000

	FLOW COEFF	REYNOLDS NUMBER	FLOW #/SEC	VELOCITY FT/SEC	DYNAMIC TEMP	DYNAMIC PRESS	%	STAG PRESS	STATIC FLOW
1	0.6103	984258.	9.019	128.06	1.35	0.10	0.49	12.55	9429.5
2	0.6102	1029046.	9.376	135.30	1.50	0.11	0.56	12.38	9962.3
3	0.6101	1061228.	9.632	140.43	1.62	0.12	0.62	12.24	10340.2
4	0.6100	1104013.	10.008	147.73	1.79	0.13	0.71	12.09	10877.5
5	0.6100	1137018.	10.310	154.60	1.96	0.14	0.82	11.91	11383.3

	DISCHARGE VELOCITY	VELOCITY TEMP	VELOCITY PRESS	VELOCITY %	STAG PRESS	STATIC FLOW	STAG FLOW	INLET STAG FLOW
1	104.77	0.90	0.13	0.63	33.29	4886.1	4872.3	9374.8
2	111.79	1.03	0.15	0.73	32.42	5213.6	5196.9	9897.9
3	117.20	1.13	0.16	0.81	31.63	5466.1	5446.7	10268.2
4	125.22	1.29	0.17	0.94	30.59	5840.1	5816.3	10793.6
5	134.03	1.48	0.19	1.10	29.27	6251.1	6221.7	11287.2

RATIOS OF DISCHARGE TO INLET

	PRESSURE STATIC	PRESSURE STAG	TEMPERTURE STATIC	TEMPERTURE STAG	F L O W STATIC	F L O W STAG
1	2.6644	2.6533	1.3806	1.3790	0.5182	0.5197
2	2.6302	2.6182	1.3765	1.3747	0.5233	0.5250
3	2.5965	2.5841	1.3726	1.3707	0.5286	0.5304
4	2.5435	2.5305	1.3656	1.3636	0.5369	0.5389
5	2.4718	2.4588	1.3574	1.3553	0.5491	0.5512

IGV=0 DATA AQUI MAY 27,2005 7:32 AM REV 2.1NT

MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

	ITROPIC WORK	I.W. COEFF	PTROPIC COEFF	PTROPIC WORK	P.W. COEFF	POWER TORQUE	POWER KWATTS	MOTOR EFF
1	35179.	0.5711	1.4910	36025.	0.5848	0.0	0.0	0.0000
2	34701.	0.5633	1.4939	35547.	0.5771	0.0	0.0	0.0000
3	34110.	0.5537	1.4974	34955.	0.5675	0.0	0.0	0.0000
4	33221.	0.5386	1.5016	34055.	0.5521	0.0	0.0	0.0000
5	32052.	0.5196	1.5105	32890.	0.5332	0.0	0.0	0.0000

	MACH NUMBER	REYNOLDS NUMBER	TEMP EFF	GAS HORSEPOWER AERO	GAS HORSEPOWER TORQUE	EFFICIENCY (FROM AERO) SHAFT	EFFICIENCY (FROM AERO) ITROPIC	EFFICIENCY (FROM AERO) PTROPIC
1	1.1879	521803.	0.8388	687.7	0.0	0.7625	0.8388	0.8590
2	1.1867	512931.	0.8354	708.1	0.0	0.7614	0.8354	0.8558
3	1.1875	508448.	0.8314	718.5	0.0	0.7588	0.8314	0.8520
4	1.1889	503298.	0.8266	731.3	0.0	0.7554	0.8266	0.8474
5	1.1889	495806.	0.8164	735.9	0.0	0.7465	0.8164	0.8378

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE	= 15.16	GAS CONSTANT	= 55.15	WHEEL DIA	= 16.250
TEMPERATURE	= 96.80	HEAT RATIO	= 1.400	TIP WIDTH	= 0.995
MOTOR SPEED	= 2980.	VISCOSITY	=0.0000120	MECH HP	= 67.0
MACHINE MACH	= 1.1846	REYNOLDS #	= 684586.	WHEEL SPEED	= 19644.

NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8590	0.5848	9275.2	35263.6	2.6462	1.3822	820.7	887.7
2	0.8558	0.5771	9792.8	34795.7	2.6157	1.3785	858.3	925.3
3	0.8520	0.5675	10159.1	34215.8	2.5785	1.3739	879.4	946.4
4	0.8474	0.5521	10671.8	33291.3	2.5206	1.3658	903.8	970.8
5	0.8378	0.5332	11159.9	32151.9	2.4492	1.3573	923.2	990.2

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE	= 14.87	GAS CONSTANT	= 55.15	WHEEL DIA	= 16.250
TEMPERATURE	= 96.80	HEAT RATIO	= 1.400	TIP WIDTH	= 0.995
MOTOR SPEED	= 2980.	VISCOSITY	=0.0000120	MECH HP	= 67.0
MACHINE MACH	= 1.1846	REYNOLDS #	= 671490.	WHEEL SPEED	= 19644.

NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8590	0.5848	9275.2	35263.6	2.6462	1.3822	805.0	872.0
2	0.8558	0.5771	9792.8	34795.7	2.6157	1.3785	841.9	908.9
3	0.8520	0.5675	10159.1	34215.8	2.5785	1.3739	862.6	929.6
4	0.8474	0.5521	10671.8	33291.3	2.5206	1.3658	886.5	953.5
5	0.8378	0.5332	11159.9	32151.9	2.4492	1.3573	905.5	972.5

IGV=0 DATA AQUI MAY 27,2005 7:32 AM REV 2.1NT
MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE	= 15.16	GAS CONSTANT	= 55.15	WHEEL DIA	= 16.250
TEMPERATURE	= 96.80	HEAT RATIO	= 1.400	TIP WIDTH	= 0.995
MOTOR SPEED	= 2980.	VISCOSITY	=0.0000120	MECH HP	= 67.0
MACHINE MACH	= 1.1846	REYNOLDS #	= 684586.	WHEEL SPEED	= 19644.

NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8590	0.5848	9275.2	35263.6	2.6462	1.3822	820.7	887.7
2	0.8558	0.5771	9792.8	34795.7	2.6157	1.3785	858.3	925.3
3	0.8520	0.5675	10159.1	34215.8	2.5785	1.3739	879.4	946.4
4	0.8474	0.5521	10671.8	33291.3	2.5206	1.3658	903.8	970.8
5	0.8378	0.5332	11159.9	32151.9	2.4492	1.3573	923.2	990.2

ATLAS COPCO COMPTEC INC. TEST DATA REDUCTION PROGRAM

IGV=0 DATA AQUI MAY 27,2005 7:32 AM REV 2.1NT

MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

SUPERVISING ENGINEER : JWS

RAW TEST DATA:C:\AERO\41198BA1.B00

1	FLOW P	PSI	0.55	0.59	0.63	0.67	0.72
2	FLOW DP	PSI	0.70	0.75	0.79	0.86	0.92
3	INLET P	PSI	18.02	17.04	16.17	14.98	13.54
4	DISC. P	PSI	47.08	43.92	41.33	37.59	32.68
7	FLOW T	R	136.36	131.59	128.33	127.28	127.52
8	INLET T	R	137.88	139.69	138.54	138.45	139.56
9	DISC. T	R	276.35	275.00	270.85	265.76	260.50
11	VAPOR P	PSI	0.16	0.15	0.14	0.14	0.13
15	FLOW P	PSI	0.55	0.59	0.63	0.67	0.72
17	FLOW P	PSI	0.55	0.59	0.63	0.67	0.73
23	FLOW DP	PSI	0.69	0.75	0.79	0.86	0.92
25	FLOW DP	PSI	0.70	0.75	0.80	0.86	0.92
31	INLET P	PSI	18.07	17.09	16.21	15.04	13.60
33	INLET P	PSI	17.97	16.99	16.14	14.92	13.48
39	DISC. P	PSI	47.14	43.97	41.38	37.65	32.72
41	DISC. P	PSI	47.02	43.87	41.28	37.52	32.64
52	FLOW T	F	136.27	131.62	128.47	127.32	127.46
53	FLOW T	F	136.44	131.55	128.20	127.23	127.58
56	INLET T	F	138.03	139.86	138.70	138.64	139.74
57	INLET T	F	137.74	139.53	138.39	138.27	139.37
60	DISC. T	F	276.69	275.51	271.43	266.40	261.18
61	DISC. T	F	276.01	274.49	270.26	265.13	259.82
65	SPEED	RPM	3012.00	3012.00	3012.00	3014.00	3014.00
69	R.H.	%	9.40	7.60	7.40	7.60	7.20
74	BAROMETR	PSI	14.39	14.39	14.38	14.38	14.38
81	RH T	F	120.90	124.70	124.20	123.70	123.50
82	RH P	PSI	12.45	12.27	12.12	11.95	11.76

NOTE : BE SURE BAROMETRIC PRESSURE GIVEN IS FOR THE LOCAL ELEVATION, PRESSURE GIVEN BY THE WEATHER SERVICE IS CORRECTED TO SEA LEVEL, AND SO MUST BE RECORRECTED BACK TO THE LOCAL PRESSURE.

ECHO KEY FILE:C:\AERO\41198B.KYB

15.160	108.00	2980.0	1.4000	55.150	1	2		
67.00	12.8200	0.7410	6.59184	0.0000120	0.0			
3	3	3	3	6	6	3	81	82
0	0	2	2	0	0	0	0	
1	0	0	0	10.69	0.00	14.31	0.00	
11.9380	10.0200	0.6000	0.0000	1.0000	0.0000	0.0000110	0.0000187	

IGV=0 DATA AQUI MAY 27,2005 7:32 AM REV 2.1NT
MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

VARIATION FROM AVERAGE

1	FLOW P	PSI	0.00	0.00	0.00	0.00	0.00
2	FLOW DP	PSI	0.00	0.00	0.00	0.00	0.00
3	INLET P	PSI	0.05	0.05	0.04	0.06	0.06
4	DISC. P	PSI	0.06	0.05	0.05	0.06	0.04
7	FLOW T	R	0.09	0.03	0.14	0.05	0.06
8	INLET T	R	0.15	0.17	0.16	0.19	0.19
9	DISC. T	R	0.34	0.51	0.59	0.63	0.68

INSTRUMENT TEMPERATURE ASSUMED TO BE 68 DEGREES
REF,INLET,INSTR.,FLOW DEVICE,OR DRY BULB TEMP SHOULD BE USED FOR R.H. LINE

ABSOLUTE PRESSURES AND TEMPERATURES

1	FLOW P	PSI	13.84	13.79	13.76	13.71	13.66
2	FLOW DP	PSI	0.70	0.75	0.79	0.86	0.92
3	INLET P	PSI	32.40	31.43	30.56	29.36	27.92
4	DISC. P	PSI	61.47	58.31	55.72	51.97	47.06
7	FLOW T	R	596.03	591.26	588.01	586.95	587.19
8	INLET T	R	597.56	599.37	598.22	598.13	599.23
9	DISC. T	R	736.02	734.67	730.52	725.44	720.17
72	GAS CONS		53.6160	53.5921	53.5854	53.5919	53.5816
73	HT RATIO		1.3959	1.3960	1.3961	1.3962	1.3963
74	BAROMETR	PSI	14.3870	14.3860	14.3850	14.3850	14.3840

PRIMARY FLOW DEVICE
CALCULATION FOR AN ORIFICE D+1/2D
PIPE DIA = 14.3120 DEVICE DIA = 10.6870 B = 0.7467 F = 1.0000

	FLOW COEFF	REYNOLDS NUMBER	FLOW #/SEC	VELOCITY FT/SEC	DYNAMIC TEMP	DYNAMIC PRESS	%	STAG PRESS	STATIC FLOW
1	0.6103	984277.	9.019	79.59	0.52	0.10	0.34	32.50	3712.1
2	0.6102	1029067.	9.376	85.53	0.60	0.11	0.42	31.54	3989.1
3	0.6101	1061251.	9.632	90.17	0.67	0.12	0.48	30.68	4205.3
4	0.6100	1104039.	10.008	97.48	0.78	0.14	0.60	29.50	4546.4
5	0.6100	1137046.	10.310	105.76	0.92	0.15	0.80	28.07	4932.4

	DISCHARGE VELOCITY	VELOCITY TEMP	VELOCITY PRESS	VELOCITY %	STAG PRESS	STATIC FLOW	STAG FLOW	INLET STAG FLOW
1	73.38	0.44	0.13	0.45	61.60	2411.0	2407.3	3704.0
2	80.24	0.53	0.15	0.55	58.46	2636.2	2631.4	3979.0
3	85.75	0.61	0.16	0.65	55.88	2817.4	2811.5	4193.4
4	94.85	0.74	0.19	0.83	52.16	3116.3	3108.3	4531.4
5	107.07	0.94	0.22	1.13	47.28	3517.8	3506.2	4913.3

RATIOS OF DISCHARGE TO INLET

	PRESSURE STATIC	PRESSURE STAG	TEMPERTURE STATIC	TEMPERTURE STAG	F L O W STATIC	F L O W STAG
1	1.8970	1.8952	1.2321	1.2317	0.6495	0.6499
2	1.8553	1.8535	1.2261	1.2257	0.6609	0.6613
3	1.8233	1.8214	1.2215	1.2212	0.6700	0.6704
4	1.7699	1.7681	1.2132	1.2128	0.6855	0.6860
5	1.6855	1.6842	1.2021	1.2018	0.7132	0.7136

IGV=0 DATA AQUI MAY 27,2005 7:32 AM REV 2.1NT
MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

	ITROPIC WORK	I.W. COEFF	PTROPIC COEFF	PTROPIC WORK	P.W. COEFF	POWER TORQUE	POWER KWATTS	MOTOR EFF
1	22457.	0.5857	1.4837	22773.	0.5940	0.0	0.0	0.0000
2	21661.	0.5650	1.4923	21982.	0.5734	0.0	0.0	0.0000
3	20953.	0.5465	1.4997	21276.	0.5549	0.0	0.0	0.0000
4	19829.	0.5165	1.5119	20150.	0.5249	0.0	0.0	0.0000
5	18038.	0.4699	1.5449	18374.	0.4786	0.0	0.0	0.0000

	MACH NUMBER	REYNOLDS NUMBER	TEMP EFF	GAS HORSEPOWER AERO	GAS HORSEPOWER TORQUE	EFFICIENCY (FROM AERO) SHAFT	EFFICIENCY (FROM AERO) ITROPIC	EFFICIENCY (FROM AERO) PTROPIC
1	0.9259	763470.	0.8579	429.2	0.0	0.7393	0.8579	0.8700
2	0.9247	737310.	0.8473	435.8	0.0	0.7318	0.8473	0.8599
3	0.9256	719683.	0.8385	437.6	0.0	0.7246	0.8385	0.8515
4	0.9262	692517.	0.8247	437.5	0.0	0.7124	0.8247	0.8381
5	0.9254	657131.	0.7900	428.0	0.0	0.6804	0.7900	0.8047

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE = 15.16 GAS CONSTANT = 55.15 WHEEL DIA = 12.820
TEMPERATURE = 108.00 HEAT RATIO = 1.400 TIP WIDTH = 0.741
MOTOR SPEED = 2980. VISCOSITY =0.0000120 MECH HP = 67.0
MACHINE MACH = 0.9253 REYNOLDS # = 394279. WHEEL SPEED = 19644.
NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8700	0.5940	3664.6	22291.7	1.8962	1.2338	198.4	265.4
2	0.8599	0.5734	3936.7	21517.6	1.8572	1.2284	208.2	275.2
3	0.8515	0.5549	4148.9	20825.9	1.8229	1.2232	214.4	281.4
4	0.8381	0.5249	4480.3	19698.3	1.7683	1.2145	222.5	289.5
5	0.8047	0.4786	4857.9	17961.6	1.6857	1.2037	229.1	296.1

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE = 14.87 GAS CONSTANT = 55.15 WHEEL DIA = 12.820
TEMPERATURE = 113.70 HEAT RATIO = 1.400 TIP WIDTH = 0.741
MOTOR SPEED = 2980. VISCOSITY =0.0000120 MECH HP = 67.0
MACHINE MACH = 0.9207 REYNOLDS # = 382892. WHEEL SPEED = 19644.
NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8700	0.5940	3664.6	22291.7	1.8853	1.2315	192.7	259.7
2	0.8599	0.5734	3936.7	21517.6	1.8468	1.2261	202.1	269.1
3	0.8515	0.5549	4148.9	20825.9	1.8131	1.2210	208.2	275.2
4	0.8381	0.5249	4480.3	19698.3	1.7592	1.2124	216.1	283.1
5	0.8047	0.4786	4857.9	17961.6	1.6777	1.2017	222.5	289.5

IGV=0 DATA AQUI MAY 27,2005 7:32 AM REV 2.1NT
MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE	= 15.16	GAS CONSTANT	= 55.15	WHEEL DIA	= 12.820
TEMPERATURE	= 108.50	HEAT RATIO	= 1.400	TIP WIDTH	= 0.741
MOTOR SPEED	= 2980.	VISCOSITY	=0.0000120	MECH HP	= 67.0
MACHINE MACH	= 0.9249	REYNOLDS #	= 393932.	WHEEL SPEED	= 19644.

NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8700	0.5940	3664.6	22291.7	1.8952	1.2336	198.2	265.2
2	0.8599	0.5734	3936.7	21517.6	1.8562	1.2282	208.0	275.0
3	0.8515	0.5549	4148.9	20825.9	1.8221	1.2230	214.2	281.2
4	0.8381	0.5249	4480.3	19698.3	1.7675	1.2143	222.3	289.3
5	0.8047	0.4786	4857.9	17961.6	1.6850	1.2035	228.9	295.9

ATLAS COPCO COMPTEC INC. TEST DATA REDUCTION PROGRAM

IGV=0 DATA AQUI MAY 27,2005 7:32 AM REV 2.1NT

MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

SUPERVISING ENGINEER : JWS

RAW TEST DATA:C:\AERO\41198BA1.C00

1	FLOW P	PSI	0.55	0.59	0.63	0.67	0.72
2	FLOW DP	PSI	0.70	0.75	0.79	0.86	0.92
3	INLET P	PSI	46.28	43.05	40.32	36.38	31.21
4	DISC. P	PSI	88.29	81.54	74.58	64.82	45.72
7	FLOW T	R	136.36	131.59	128.33	127.28	127.52
8	INLET T	R	137.63	137.42	137.94	136.29	137.21
9	DISC. T	R	252.74	249.41	246.18	238.91	229.52
11	VAPOR P	PSI	0.16	0.15	0.14	0.14	0.13
15	FLOW P	PSI	0.55	0.59	0.63	0.67	0.72
17	FLOW P	PSI	0.55	0.59	0.63	0.67	0.73
23	FLOW DP	PSI	0.69	0.75	0.79	0.86	0.92
25	FLOW DP	PSI	0.70	0.75	0.80	0.86	0.92
31	INLET P	PSI	46.36	43.09	40.38	36.45	31.30
33	INLET P	PSI	46.19	43.02	40.26	36.30	31.13
39	DISC. P	PSI	88.26	81.67	74.58	64.82	45.72
41	DISC. P	PSI	88.32	81.42	74.58	64.82	45.72
52	FLOW T	F	136.27	131.62	128.47	127.32	127.46
53	FLOW T	F	136.44	131.55	128.20	127.23	127.58
56	INLET T	F	137.62	137.42	137.93	136.29	137.21
57	INLET T	F	137.65	137.42	137.95	136.29	137.21
60	DISC. T	F	252.97	249.61	246.43	239.37	230.54
61	DISC. T	F	252.50	249.21	245.92	238.44	228.50
65	SPEED	RPM	3012.00	3012.00	3012.00	3014.00	3014.00
69	R.H.	%	9.40	7.60	7.40	7.60	7.20
74	BAROMETR	PSI	14.39	14.39	14.38	14.38	14.38
81	RH T	F	120.90	124.70	124.20	123.70	123.50
82	RH P	PSI	12.45	12.27	12.12	11.95	11.76

NOTE : BE SURE BAROMETRIC PRESSURE GIVEN IS FOR THE LOCAL ELEVATION,
PRESSURE GIVEN BY THE WEATHER SERVICE IS CORRECTED TO SEA LEVEL,
AND SO MUST BE RECORRECTED BACK TO THE LOCAL PRESSURE.

ECHO KEY FILE:C:\AERO\41198B.KYC

15.160	108.00	2980.0	1.4000	55.150		1	2		
67.00	7.1000	0.622011.13793		0.0000120	0.0				
3	3	3	3	6	6	3	81	82	
0	0	2	2	0	0	0	0		
1	0	0	0	10.69	0.00	14.31	0.00		
10.0200	6.0650	0.6000	0.0000	1.0000	0.0000	0.0000110	0.0000187		

IGV=0 DATA AQUI MAY 27,2005 7:32 AM REV 2.1NT
MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

VARIATION FROM AVERAGE

1	FLOW P	PSI	0.00	0.00	0.00	0.00	0.00
2	FLOW DP	PSI	0.00	0.00	0.00	0.00	0.00
3	INLET P	PSI	0.09	0.04	0.06	0.07	0.09
4	DISC. P	PSI	0.03	0.12	0.00	0.00	0.00
7	FLOW T	R	0.09	0.03	0.14	0.05	0.06
8	INLET T	R	0.02	0.00	0.01	0.00	0.00
9	DISC. T	R	0.24	0.20	0.26	0.47	1.02

INSTRUMENT TEMPERATURE ASSUMED TO BE 68 DEGREES
REF,INLET,INSTR.,FLOW DEVICE,OR DRY BULB TEMP SHOULD BE USED FOR R.H. LINE

ABSOLUTE PRESSURES AND TEMPERATURES

1	FLOW P	PSI	13.84	13.79	13.76	13.71	13.66
2	FLOW DP	PSI	0.70	0.75	0.79	0.86	0.92
3	INLET P	PSI	60.66	57.44	54.70	50.76	45.60
4	DISC. P	PSI	102.67	95.93	88.97	79.20	60.10
7	FLOW T	R	596.03	591.26	588.01	586.95	587.19
8	INLET T	R	597.31	597.09	597.61	595.96	596.88
9	DISC. T	R	712.41	709.08	705.85	698.58	689.19
72	GAS CONS		53.6160	53.5921	53.5854	53.5919	53.5816
73	HT RATIO		1.3963	1.3965	1.3966	1.3967	1.3969
74	BAROMETR	PSI	14.3870	14.3860	14.3850	14.3850	14.3840

PRIMARY FLOW DEVICE
CALCULATION FOR AN ORIFICE D+1/2D
PIPE DIA = 14.3120 DEVICE DIA = 10.6870 B = 0.7467 F = 1.0000

	FLOW COEFF	REYNOLDS NUMBER	FLOW #/SEC	VELOCITY FT/SEC	DYNAMIC TEMP	DYNAMIC PRESS	%	STAG PRESS	STATIC FLOW
1	0.6103	984283.	9.019	60.35	0.30	0.11	0.26	60.77	1982.8
2	0.6102	1029075.	9.376	66.20	0.36	0.12	0.32	57.56	2175.1
3	0.6101	1061259.	9.632	71.46	0.42	0.14	0.40	54.84	2347.8
4	0.6100	1104049.	10.008	79.79	0.52	0.16	0.56	50.92	2621.5
5	0.6100	1137059.	10.310	91.60	0.69	0.19	1.30	45.78	3009.7

	DISCHARGE VELOCITY	TEMP	PRESS	%	STAG PRESS	STATIC FLOW	STAG FLOW	INLET STAG FLOW
1	115.95	1.11	0.56	1.32	103.24	1395.8	1390.4	1980.3
2	128.32	1.36	0.65	1.66	96.58	1544.7	1537.3	2171.8
3	141.41	1.65	0.73	2.10	89.70	1702.3	1692.3	2343.6
4	163.23	2.19	0.88	3.01	80.08	1964.9	1949.5	2615.7
5	218.04	3.92	1.21	7.79	61.31	2624.7	2587.6	3001.0

RATIOS OF DISCHARGE TO INLET

	PRESSURE STATIC	PRESSURE STAG	TEMPERTURE STATIC	TEMPERTURE STAG	FLOW STATIC	FLOW STAG
1	1.6925	1.6988	1.1914	1.1927	0.7039	0.7021
2	1.6701	1.6778	1.1860	1.1876	0.7102	0.7078
3	1.6264	1.6357	1.1792	1.1811	0.7250	0.7221
4	1.5603	1.5727	1.1695	1.1722	0.7496	0.7453
5	1.3180	1.3391	1.1494	1.1547	0.8721	0.8623

IGV=0 DATA AQUI MAY 27,2005 7:32 AM REV 2.1NT

MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

	ITROPIC WORK	I.W. COEFF	PTROPIC COEFF	PTROPIC WORK	P.W. COEFF	POWER TORQUE	POWER KWATTS	MOTOR EFF
1	18313.	0.5455	1.4982	18558.	0.5528	0.0	0.0	0.0000
2	17836.	0.5313	1.4975	18067.	0.5381	0.0	0.0	0.0000
3	16912.	0.5037	1.5112	17145.	0.5107	0.0	0.0	0.0000
4	15434.	0.4591	1.5405	15674.	0.4663	0.0	0.0	0.0000
5	9737.	0.2896	1.9704	10043.	0.2988	0.0	0.0	0.0000

	MACH NUMBER	REYNOLDS NUMBER	TEMP EFF	GAS HORSEPOWER AERO	GAS HORSEPOWER TORQUE	EFFICIENCY (FROM AERO) SHAFT	EFFICIENCY (FROM AERO) ITROPIC	EFFICIENCY (FROM AERO) PTROPIC
1	0.8665	1122011.	0.8423	356.5	0.0	0.7060	0.8423	0.8536
2	0.8668	1063907.	0.8438	360.4	0.0	0.7085	0.8438	0.8547
3	0.8664	1012221.	0.8280	357.7	0.0	0.6944	0.8280	0.8394
4	0.8681	944787.	0.7971	352.3	0.0	0.6667	0.7971	0.8096
5	0.8674	847433.	0.5593	326.3	0.0	0.4618	0.5593	0.5769

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE = 15.16 GAS CONSTANT = 55.15 WHEEL DIA = 7.100
TEMPERATURE = 108.00 HEAT RATIO = 1.400 TIP WIDTH = 0.622
MOTOR SPEED = 2980. VISCOSITY =0.0000120 MECH HP = 67.0
MACHINE MACH = 0.8659 REYNOLDS # = 309702. WHEEL SPEED = 33191.
NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8536	0.5528	1959.3	18165.6	1.6994	1.1942	88.1	155.1
2	0.8547	0.5381	2148.7	17684.7	1.6777	1.1888	93.9	160.9
3	0.8394	0.5107	2318.7	16782.6	1.6362	1.1825	98.0	165.0
4	0.8096	0.4663	2586.2	15322.9	1.5706	1.1727	103.4	170.4
5	0.5769	0.2988	2967.1	9817.7	1.3384	1.1553	106.7	173.7

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE = 14.87 GAS CONSTANT = 55.15 WHEEL DIA = 7.100
TEMPERATURE = 113.70 HEAT RATIO = 1.400 TIP WIDTH = 0.622
MOTOR SPEED = 2980. VISCOSITY =0.0000120 MECH HP = 67.0
MACHINE MACH = 0.8616 REYNOLDS # = 300758. WHEEL SPEED = 33191.
NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8536	0.5528	1959.3	18165.6	1.6912	1.1923	85.6	152.6
2	0.8547	0.5381	2148.7	17684.7	1.6698	1.1870	91.2	158.2
3	0.8394	0.5107	2318.7	16782.6	1.6289	1.1806	95.1	162.1
4	0.8096	0.4663	2586.2	15322.9	1.5641	1.1710	100.4	167.4
5	0.5769	0.2988	2967.1	9817.7	1.3348	1.1538	103.6	170.6

IGV=0 DATA AQUI MAY 27,2005 7:32 AM REV 2.1NT
MODEL SC- 0 # 0-41198 TEST DATE: MAY 26, 5

TEST RESULTS CONVERTED TO DESIGN INLET CONDITIONS

PRESSURE	= 15.16	GAS CONSTANT	= 55.15	WHEEL DIA	= 7.100
TEMPERATURE	= 108.50	HEAT RATIO	= 1.400	TIP WIDTH	= 0.622
MOTOR SPEED	= 2980.	VISCOSITY	=0.0000120	MECH HP	= 67.0
MACHINE MACH	= 0.8655	REYNOLDS #	= 309430.	WHEEL SPEED	= 33191.

NO REYNOLDS NUMBER CORRECTION

	PTROPIC EFF	WORK COEFF	VOLUME FLOW	PTROPIC WORK	PRESS RATIO	TEMP RATIO	GAS POWER	SHAFT POWER
1	0.8536	0.5528	1959.3	18165.6	1.6987	1.1941	88.0	155.0
2	0.8547	0.5381	2148.7	17684.7	1.6770	1.1887	93.9	160.9
3	0.8394	0.5107	2318.7	16782.6	1.6356	1.1823	97.9	164.9
4	0.8096	0.4663	2586.2	15322.9	1.5701	1.1726	103.3	170.3
5	0.5769	0.2988	2967.1	9817.7	1.3381	1.1552	106.6	173.6

Atlas Copco

MECHANICAL DATA SHEET

10. Title ACE/Air Liquide 11. Date 5-26-05

12. Model HL806-04 13. S/N 2841198

TEST POINT	1	2	3	4	5	6	7	8	9
IGV ANGLE	0	0	0	0	0	20	20	20	20
TIME	1:17	1:30	1:45	2:01	2:14	2:28	2:41	2:55	3:08
OIL PRESS. PSIG	30	30	30	30	30	30	30	30	30
OIL TEMP. °F	114	114	114	114	114	115	114	114	114
OIL FLOW {GPM}	29,5	29,5	29,5	29,5	29,5	29,5	29,5	29,5	29,5
VIBRATION 1X m/l	.25	.25	.24	.24	.24	.25	.24	.23	.25
2X	.27	.27	.26	.25	.25	.26	.25	.26	.26
3X	.13	.13	.12	.13	.12	.13	.12	.12	.13
OPP.3X	.14	.14	.13	.13	.13	.13	.13	.13	.14
AXIAL 1 m/s	+2,5	+2,5	+2,5	+2,5	+3,	+2,5	+2,5	+2,5	+2,5
AXIAL 2 m/s	-7,5	-7,	-7,	-7,	-6,5	-7,	-7,	-7,	-6,5
RPM	3012	3013	3012	3013	3013	3012	3013	3013	3013
KW	1276	1277	1286	1287	1266	1247	1255	1260	1246
IGV {MA}	17,7	→	→	→	→	16,2	→	→	→

DAS Locked up Here →

DATA TAKEN BY: [signature]

REVIEWED BY [signature]

RTD/MECHANICAL DATA SHEET

Atlas Copco

10. Title ACE/Air Cycle 11. Date 5-26-05
12. Model AC606-04 13. S/N CS-411&8

TEST POINT	1	2	3	4	5	6	7	8	9
IGV ANGLE	0	0	0	0	0	20	20	20	20
TIME	1:17	1:30	1:45	2:01	2:14	2:28	2:41	2:55	3:08
RTD 1 (°F) °C	184	184	184	184	184	182	183	183	183
RTD 2 (°F) °C	166	166	166	167	167	165	165	166	166
RTD 3 (°F) °C	140	141	141	141	141	140	140	140	140
RTD 4 (°F) °C	140	140	141	141	141	140	140	140	140
RTD 5 (°F) °C	172	171	171	168	165	172	170	169	165
RTD 6 (°F) °C	166	165	165	163	160	166	164	163	160
RTD 7 (°F) °C	176	176	176	176	176	175	176	175	175
RTD 8 (°F) °C	170	170	170	170	170	169	169	169	169
RTD 9 °F °C									
RTD 10 °F °C									
RTD 11 °F °C									
RTD 12 °F °C									
RTD 13 °F °C									
RTD 14 °F °C									
RTD 15 (°F) °C	173	174	174	174	174	173	174	173	173
RTD 16 (°F) °C	187	187	186	185	184	187	186	186	184
RTD 17 (°F) °C	141	141	141	140	139	141	140	140	139
RTD 18 (°F) °C	138	138	138	138	137	138	138	137	137
RTD 19 (°F) °C	136	136	137	137	138	136	137	137	137
RTD 20 (°F) °C	135	136	137	137	137	136	136	136	137
RTD 21 (°F) °C	167	168	169	169	168	167	168	168	168
RTD 22 (°F) °C	184	184	184	184	184	184	184	184	184
RTD 23 °F °C									
RTD 24 °F °C									

DATA TAKEN BY: [signature] REVIEWED BY: [signature]

Atlas Copco

MECHANICAL DATA SHEET

10. Title ACE/Air Liquide 11. Date 5-26-05
12. Model HL806-04 13. S/N L8-41198

TEST POINT	10	11	12	13					
IGV ANGLE	20	60	60	60					
TIME	3:20	3:34	3:48	4:02					
OIL PRESS. PSIG	30	30	30	30					
OIL TEMP. °F	114	114	114	114					
OIL FLOW (GPM)	29.5	29.5	29.5	29.5					
VIBRATION 1X mil	.24	.26	.25	.25					
2X	.26	.28	.29	.27					
3X	.13	.12	.13	.12					
OPP.3X	.14	.13	.13	.13					
AXIAL 1 mils	+3.	+2.5	+2.5	+3.					
AXIAL 2 mils	-6.5	-7.	-7.	-6.5					
RPM	3013	3013	3013	3013					
KW	1232	1164	1160	1135					
IGV (MA)	15.2	9.5	→	→					

DATA TAKEN BY: [signature] REVIEWED BY [signature]

RTD/MECHANICAL DATA SHEET

Atlas Copco

10. Title ACE/Air Liquide 11. Date 5-26-05
12. Model HL80604 13. S/N CB-4/1198

TEST POINT	10	11	12	13					
IGV ANGLE	20	60	60	60					
TIME	3:20	3:34	3:48	4:02					
RTD 1 °F °C	183	180	181	180					
RTD 2 °F °C	166	164	164	164					
RTD 3 °F °C	140	140	140	140					
RTD 4 °F °C	140	140	140	140					
RTD 5 °F °C	163	170	167	162					
RTD 6 °F °C	156	164	162	158					
RTD 7 °F °C	175	173	173	172					
RTD 8 °F °C	164	167	167	167					
RTD 9 °F °C	X								
RTD 10 °F °C									
RTD 11 °F °C									
RTD 12 °F °C									
RTD 13 °F °C									
RTD 14 °F °C									
RTD 15 °F °C	173	173	173	173					
RTD 16 °F °C	184	186	185	183					
RTD 17 °F °C	139	141	140	139					
RTD 18 °F °C	137	136	138	137					
RTD 19 °F °C	138	136	137	138					
RTD 20 °F °C	137	136	136	137					
RTD 21 °F °C	167	167	168	167					
RTD 22 °F °C	183	183	184	183					
RTD 23 °F °C	X								
RTD 24 °F °C									

DATA TAKEN BY: _____ REVIEWED BY: _____

Detailed Test Data

Name	ACE\AIR LIQUIDE		
Title			
Model #	HL806-04	Order #	41198
Calibration	STD_TC	Config.	41198
Customer	41198	Date	05/27/05

	Test #	1	2	3	4	5	6
Time		07:14:42	07:14:38	07:14:35	07:14:33	07:14:30	07:13:39
0 ZB-0	DEGF	65.818	65.825	65.900	65.866	65.996	66.173
1 TF-1	DEGF	127.459	127.319	128.467	131.616	136.273	99.406
2 TF-1	DEGF	127.580	127.229	128.199	131.546	136.437	99.150
3 T00-1	DEGF	124.385	124.392	125.050	125.901	124.314	98.024
4 T00-1	DEGF	123.899	123.841	124.513	125.338	124.033	97.536
5 T08-1	DEGF	331.446	336.272	341.451	345.013	345.656	301.669
6 T08-1	DEGF	331.720	336.501	341.446	344.834	345.231	301.978
7 T00-2	DEGF	139.736	138.640	138.703	139.862	138.028	101.975
9 T00-2	DEGF	139.371	138.268	138.394	139.528	137.744	101.372
10 T08-2	DEGF	261.178	266.400	271.432	275.513	276.689	225.123
11 T08-2	DEGF	259.815	265.133	270.258	274.494	276.011	223.869
13 T00-3	DEGF	137.208	136.285	137.927	137.416	137.624	100.308
14 T00-3	DEGF	137.208	136.292	137.946	137.422	137.650	100.308
15 T08-3	DEGF	230.538	239.366	246.429	249.611	252.968	193.960
16 T08-3	DEGF	228.497	238.436	245.915	249.213	252.496	192.050
17 TOIL-0	DEGF	146.369	146.450	146.075	146.325	145.963	145.769
57 PBAR-0	PSIA	14.384	14.385	14.385	14.386	14.387	14.388
58 RH-1	%	7.201	7.586	7.411	7.556	9.444	14.600
59 TRH-1	DEGF	123.547	123.716	124.250	124.672	120.903	97.672
196 RPM-0	RPM	3013.940	3013.600	3011.650	3012.410	3011.780	3012.030
200 DPF-1	PSID	0.920	0.859	0.791	0.750	0.693	1.021
201 DPF-1	PSID	0.923	0.864	0.796	0.754	0.701	1.021
202 PF-1	PSID	-0.720	-0.671	-0.627	-0.591	-0.552	-0.789
203 PF-1	PSID	-0.728	-0.674	-0.632	-0.593	-0.547	-0.798
208 P0-1	PSIG	-2.622	-2.424	-2.263	-2.117	-1.941	-2.908
209 P0-1	PSIG	-2.615	-2.432	-2.263	-2.117	-1.941	-2.900
210 PRH-1	PSIG	-2.622	-2.439	-2.263	-2.117	-1.941	-2.908
212 PIGV-1	PSIG	-0.015	-0.007	-0.015	-0.015	-0.015	-0.007
224 P8-1	PSIG	14.795	16.113	17.188	17.969	18.872	14.429
225 P8-1	PSIG	14.600	15.942	16.992	17.798	18.677	14.233
226 P0-2	PSIG	13.599	15.039	16.211	17.090	18.066	13.110
227 P0-2	PSIG	13.477	14.917	16.138	16.992	17.969	12.988
229 P8-2	PSIG	32.642	37.524	41.284	43.872	47.022	32.642
230 P0-3	PSIG	31.299	36.450	40.381	43.091	46.362	31.226
231 P0-3	PSIG	31.128	36.304	40.259	43.018	46.191	31.055
240 P8-3	PSIG	45.715	64.819	74.585	81.665	88.257	45.105
241 P8-3	PSIG	45.715	64.819	74.585	81.421	88.318	45.471
300 IGV-0	DEG	0.000	0.000	0.000	0.000	0.000	0.000

Detailed Test Data

Name	ACE\AIR LIQUIDE		
Title			
Model #	HL806-04	Order #	41198
Calibration	STD_TC	Config.	41198
Customer	41198	Date	05/27/05

	Test #	7	8	9	10	11	12
Time		07:13:36	07:13:33	07:13:31	07:13:27	07:15:00	07:14:57
0 ZB-0	DEGF	66.009	65.941	65.961	66.139	66.406	66.290
1 TF-1	DEGF	100.669	102.369	104.459	103.372	127.248	127.064
2 TF-1	DEGF	100.399	102.146	104.276	103.051	127.248	127.057
3 T00-1	DEGF	98.939	99.985	100.439	97.351	124.270	124.020
4 T00-1	DEGF	98.518	99.538	100.058	97.034	123.732	123.546
5 T08-1	DEGF	305.449	311.373	315.715	315.188	324.760	327.550
6 T08-1	DEGF	305.802	311.621	315.676	314.836	325.170	327.823
7 T00-2	DEGF	99.801	100.689	100.229	100.616	139.289	138.867
9 T00-2	DEGF	99.268	98.129	97.832	99.847	138.754	138.369
10 T08-2	DEGF	228.051	233.978	238.017	239.395	260.098	263.503
11 T08-2	DEGF	226.892	232.802	236.868	238.522	258.893	262.403
13 T00-3	DEGF	100.288	100.846	100.879	100.538	137.870	138.514
14 T00-3	DEGF	100.294	100.893	100.899	100.570	137.845	138.495
15 T08-3	DEGF	201.877	210.048	215.298	217.841	229.035	237.144
16 T08-3	DEGF	200.567	209.431	214.806	217.163	227.200	235.527
17 TOIL-0	DEGF	146.013	145.618	145.306	142.986	145.875	146.431
57 PBAR-0	PSIA	14.386	14.388	14.388	14.387	14.378	14.379
58 RH-1	%	14.463	13.730	13.926	15.645	7.232	7.247
59 TRH-1	DEGF	98.656	99.668	99.810	96.406	123.350	123.265
196 RPM-0	RPM	3010.780	3011.780	3010.570	3010.860	3013.330	3012.630
200 DPF-1	PSID	0.972	0.920	0.862	0.801	0.891	0.862
201 DPF-1	PSID	0.974	0.916	0.862	0.811	0.903	0.869
202 PF-1	PSID	-0.762	-0.710	-0.664	-0.627	-0.693	-0.684
203 PF-1	PSID	-0.771	-0.715	-0.671	-0.632	-0.688	-0.691
208 P0-1	PSIG	-2.783	-2.585	-2.402	-2.292	-2.549	-2.454
209 P0-1	PSIG	-2.783	-2.578	-2.395	-2.292	-2.549	-2.446
210 PRH-1	PSIG	-2.783	-2.578	-2.395	-2.292	-2.556	-2.454
212 PIGV-1	PSIG	-0.015	-0.015	-0.015	-0.015	-0.022	-0.015
224 P8-1	PSIG	15.283	16.675	17.920	18.872	14.258	15.064
225 P8-1	PSIG	15.064	16.504	17.725	18.701	14.087	14.868
226 P0-2	PSIG	14.063	15.601	16.919	17.944	13.086	13.940
227 P0-2	PSIG	13.940	15.454	16.821	17.847	12.940	13.794
229 P8-2	PSIG	36.304	41.357	45.703	49.048	31.421	34.473
230 P0-3	PSIG	35.107	40.381	44.824	48.242	30.176	33.350
231 P0-3	PSIG	34.912	40.210	44.653	48.071	30.005	33.154
240 P8-3	PSIG	62.866	76.965	87.952	94.971	40.955	56.030
241 P8-3	PSIG	62.927	76.965	87.830	94.971	41.077	56.030
300 IGV-0	DEG	0.000	0.000	0.000	0.000	20.000	20.000

Detailed Test Data

Name	ACE\AIR LIQUIDE		
Title			
Model #	HL806-04	Order #	41198
Calibration	STD_TC	Config.	41198
Customer	41198	Date	05/27/05

	Test #	13	14	15	16	17	18
Time		07:14:53	07:14:50	07:14:45	07:13:56	07:13:52	07:13:49
0 ZB-0	DEGF	66.098	65.968	65.907	66.645	66.658	66.645
1 TF-1	DEGF	126.757	127.682	130.962	101.595	102.245	100.452
2 TF-1	DEGF	126.738	127.465	130.631	101.365	101.949	100.097
3 T00-1	DEGF	124.103	124.852	126.597	99.308	99.703	98.682
4 T00-1	DEGF	123.655	124.372	126.169	98.900	99.295	98.313
5 T08-1	DEGF	333.614	338.388	345.460	296.477	300.326	304.373
6 T08-1	DEGF	333.718	338.432	345.269	296.975	300.884	304.770
7 T00-2	DEGF	139.497	138.079	139.598	100.846	101.103	100.433
9 T00-2	DEGF	138.987	137.669	139.182	100.176	100.518	99.788
10 T08-2	DEGF	270.438	273.283	279.031	222.625	227.055	232.127
11 T08-2	DEGF	269.478	272.414	278.355	221.264	226.006	231.191
13 T00-3	DEGF	139.151	138.470	139.881	98.465	98.406	99.057
14 T00-3	DEGF	139.163	138.489	139.881	98.471	98.406	99.051
15 T08-3	DEGF	246.007	250.067	255.698	192.647	200.982	208.224
16 T08-3	DEGF	245.276	249.600	255.153	190.693	199.778	207.565
17 TOIL-0	DEGF	145.769	146.481	147.388	146.094	145.500	145.869
57 PBAR-0	PSIA	14.379	14.381	14.381	14.392	14.390	14.388
58 RH-1	%	7.423	7.510	7.260	15.283	14.893	14.941
59 TRH-1	DEGF	123.322	124.138	125.600	98.881	99.219	98.459
196 RPM-0	RPM	3013.470	3012.520	3012.390	3011.990	3012.430	3012.770
200 DPF-1	PSID	0.811	0.745	0.676	0.981	0.947	0.889
201 DPF-1	PSID	0.811	0.750	0.676	0.994	0.955	0.898
202 PF-1	PSID	-0.610	-0.581	-0.542	-0.764	-0.745	-0.696
203 PF-1	PSID	-0.615	-0.586	-0.542	-0.771	-0.750	-0.703
208 P0-1	PSIG	-2.241	-2.095	-1.912	-2.820	-2.695	-2.534
209 P0-1	PSIG	-2.234	-2.087	-1.904	-2.820	-2.695	-2.534
210 PRH-1	PSIG	-2.249	-2.087	-1.912	-2.827	-2.695	-2.542
212 PIGV-1	PSIG	-0.015	-0.015	-0.015	-0.022	-0.015	-0.015
224 P8-1	PSIG	16.577	17.578	18.652	13.818	14.844	16.138
225 P8-1	PSIG	16.382	17.383	18.457	13.599	14.624	15.942
226 P0-2	PSIG	15.576	16.675	17.871	12.500	13.623	15.064
227 P0-2	PSIG	15.454	16.553	17.773	12.402	13.525	14.941
229 P8-2	PSIG	39.600	43.042	46.582	31.690	35.742	40.332
230 P0-3	PSIG	38.672	42.236	45.898	30.347	34.570	39.356
231 P0-3	PSIG	38.501	42.090	45.728	30.176	34.375	39.160
240 P8-3	PSIG	70.618	79.346	87.280	44.800	62.744	75.440
241 P8-3	PSIG	70.679	79.407	87.341	44.861	62.866	75.378
300 IGV-0	DEG	20.000	20.000	20.000	20.000	20.000	20.000

Detailed Test Data

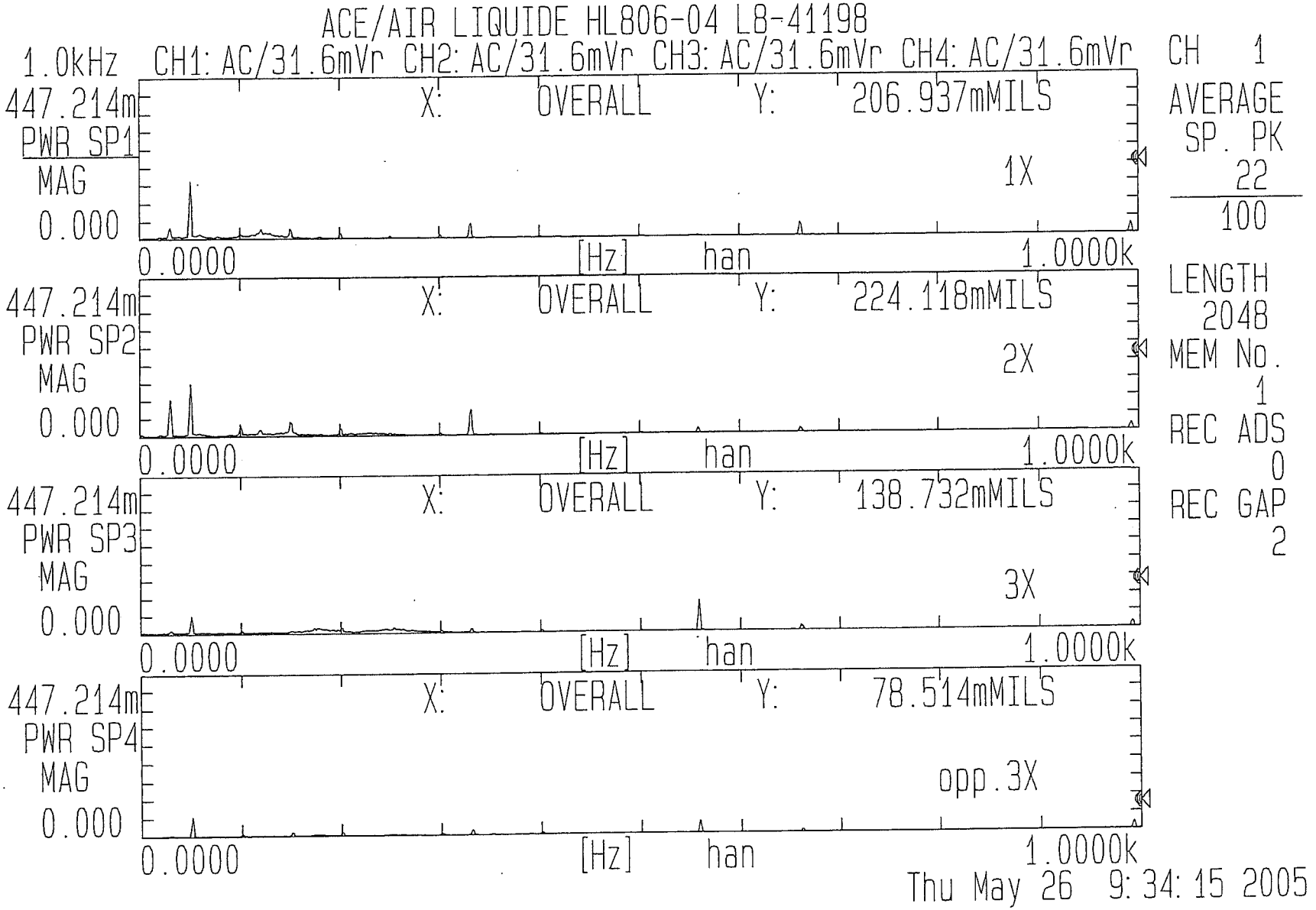
Name	ACE\AIR LIQUIDE		
Title			
Model #	HL806-04	Order #	41198
Calibration	STD_TC	Config.	41198
Customer	41198	Date	05/27/05

	Test #	19	20	21	22	23	24
Time		07:13:46	07:13:43	07:15:10	07:15:06	07:15:03	07:14:05
0 ZB-0	DEGF	66.542	66.406	67.170	66.918	66.549	66.132
1 TF-1	DEGF	102.245	104.701	126.635	127.963	130.459	101.286
2 TF-1	DEGF	102.107	104.505	126.521	127.816	130.275	101.004
3 T00-1	DEGF	100.419	101.647	123.674	124.807	126.195	99.558
4 T00-1	DEGF	100.071	101.306	123.232	124.392	125.856	99.156
5 T08-1	DEGF	311.775	314.951	309.696	319.720	330.851	281.857
6 T08-1	DEGF	311.984	314.990	309.976	319.956	330.928	282.175
7 T00-2	DEGF	99.156	99.709	138.905	141.586	139.516	102.153
9 T00-2	DEGF	98.505	92.868	138.300	141.020	138.987	101.661
10 T08-2	DEGF	237.310	239.648	260.454	271.813	278.249	223.253
11 T08-2	DEGF	236.545	239.039	259.385	270.977	277.779	221.787
13 T00-3	DEGF	98.926	100.169	138.716	140.139	139.044	98.169
14 T00-3	DEGF	98.939	100.169	138.728	140.127	139.056	98.208
15 T08-3	DEGF	214.829	217.601	231.711	246.378	254.461	192.713
16 T08-3	DEGF	214.268	216.976	229.608	245.658	253.922	190.663
17 TOIL-0	DEGF	146.419	146.832	146.544	146.932	147.281	145.531
57 PBAR-0	PSIA	14.388	14.387	14.379	14.378	14.379	14.394
58 RH-1	%	13.750	13.623	7.737	7.553	7.480	15.908
59 TRH-1	DEGF	100.062	100.878	122.759	123.856	125.178	99.359
196 RPM-0	RPM	3011.800	3011.070	3011.650	3012.450	3012.770	3013.390
200 DPF-1	PSID	0.818	0.781	0.798	0.708	0.632	0.862
201 DPF-1	PSID	0.823	0.789	0.803	0.715	0.637	0.862
202 PF-1	PSID	-0.642	-0.625	-0.613	-0.557	-0.500	-0.667
203 PF-1	PSID	-0.640	-0.618	-0.618	-0.562	-0.498	-0.669
208 P0-1	PSIG	-2.322	-2.234	-2.227	-2.000	-1.758	-2.432
209 P0-1	PSIG	-2.322	-2.234	-2.227	-2.000	-1.750	-2.432
210 PRH-1	PSIG	-2.322	-2.234	-2.227	-2.007	-1.758	-2.432
212 PIGV-1	PSIG	-0.015	-0.015	-0.022	-0.022	-0.015	-0.022
224 P8-1	PSIG	17.676	18.262	12.842	14.941	17.090	12.183
225 P8-1	PSIG	17.481	18.066	12.622	14.746	16.895	11.963
226 P0-2	PSIG	16.724	17.334	11.719	13.989	16.309	10.962
227 P0-2	PSIG	16.602	17.236	11.597	13.867	16.187	10.840
229 P8-2	PSIG	45.752	47.705	29.468	36.450	43.433	29.053
230 P0-3	PSIG	44.922	46.875	28.247	35.523	42.725	27.759
231 P0-3	PSIG	44.800	46.777	28.101	35.425	42.578	27.637
240 P8-3	PSIG	88.623	92.468	41.077	65.430	81.970	41.809
241 P8-3	PSIG	88.745	92.590	41.199	65.369	81.970	41.870
300 IGV-0	DEG	20.000	20.000	60.000	60.000	60.000	60.000

Detailed Test Data

Name	ACE\AIR LIQUIDE		
Title			
Model #	HL806-04	Order #	41198
Calibration	STD_TC	Config.	41198
Customer	41198	Date	05/27/05

	Test #	25	26	27	28		
Time		07:14:02	07:13:59	07:14:20	07:14:16		
0 ZB-0	DEGF	66.290	66.447	66.050	66.057		
1 TF-1	DEGF	102.540	102.520	101.418	103.104		
2 TF-1	DEGF	102.297	102.061	101.227	103.025		
3 T00-1	DEGF	100.518	100.143	99.722	100.715		
4 T00-1	DEGF	100.156	99.834	99.459	100.524		
5 T08-1	DEGF	291.987	300.249	266.687	279.880		
6 T08-1	DEGF	292.270	300.503	266.856	279.987		
7 T00-2	DEGF	102.468	99.406	97.430	98.426		
9 T00-2	DEGF	102.021	98.992	96.922	97.878		
10 T08-2	DEGF	234.491	240.382	224.578	236.810		
11 T08-2	DEGF	233.309	239.602	223.207	235.930		
13 T00-3	DEGF	99.663	99.380	97.516	99.038		
14 T00-3	DEGF	99.696	99.380	97.542	99.057		
15 T08-3	DEGF	209.643	217.455	200.585	215.871		
16 T08-3	DEGF	209.054	216.771	199.345	215.315		
17 TOIL-0	DEGF	145.481	146.444	144.667	145.650		
57 PBAR-0	PSIA	14.394	14.392	14.390	14.390		
58 RH-1	%	15.527	15.869	16.797	16.357		
59 TRH-1	DEGF	100.316	99.781	99.641	100.344		
196 RPM-0	RPM	3012.750	3013.140	3014.240	3013.110		
200 DPF-1	PSID	0.781	0.703	0.596	0.535		
201 DPF-1	PSID	0.786	0.706	0.601	0.540		
202 PF-1	PSID	-0.613	-0.557	-0.471	-0.422		
203 PF-1	PSID	-0.615	-0.562	-0.476	-0.425		
208 P0-1	PSIG	-2.197	-1.992	-1.677	-1.509		
209 P0-1	PSIG	-2.197	-1.992	-1.655	-1.509		
210 PRH-1	PSIG	-2.197	-1.992	-1.663	-1.516		
212 PIGV-1	PSIG	-0.015	-0.015	-0.015	-0.015		
224 P8-1	PSIG	14.697	16.748	9.131	12.549		
225 P8-1	PSIG	14.502	16.577	8.936	12.354		
226 P0-2	PSIG	13.672	15.869	8.154	11.743		
227 P0-2	PSIG	13.574	15.796	8.057	11.670		
229 P8-2	PSIG	37.988	44.873	26.123	36.646		
230 P0-3	PSIG	37.061	44.141	25.171	36.084		
231 P0-3	PSIG	36.914	43.994	25.024	35.913		
240 P8-3	PSIG	72.022	87.585	47.913	73.425		
241 P8-3	PSIG	72.022	87.708	47.913	73.608		
300 IGV-0	DEG	60.000	60.000	80.000	80.000		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447.214m
PWR SP1
MAG
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X: OVERALL Y: 206.937mMILS
1X
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447.214m
PWR SP2
MAG
0.000
X: OVERALL Y: 224.118mMILS
2X
0.0000 [Hz] han 1.0000k
447.214m
PWR SP3
MAG
0.000
X: OVERALL Y: 138.732mMILS
3X
0.0000 [Hz] han 1.0000k
447.214m
PWR SP4
MAG
0.000
X: OVERALL Y: 78.514mMILS
opp.3X
0.0000 [Hz] han 1.0000k
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AVERAGE
SP. PK
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LENGTH
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MEM No.
1
REC ADS
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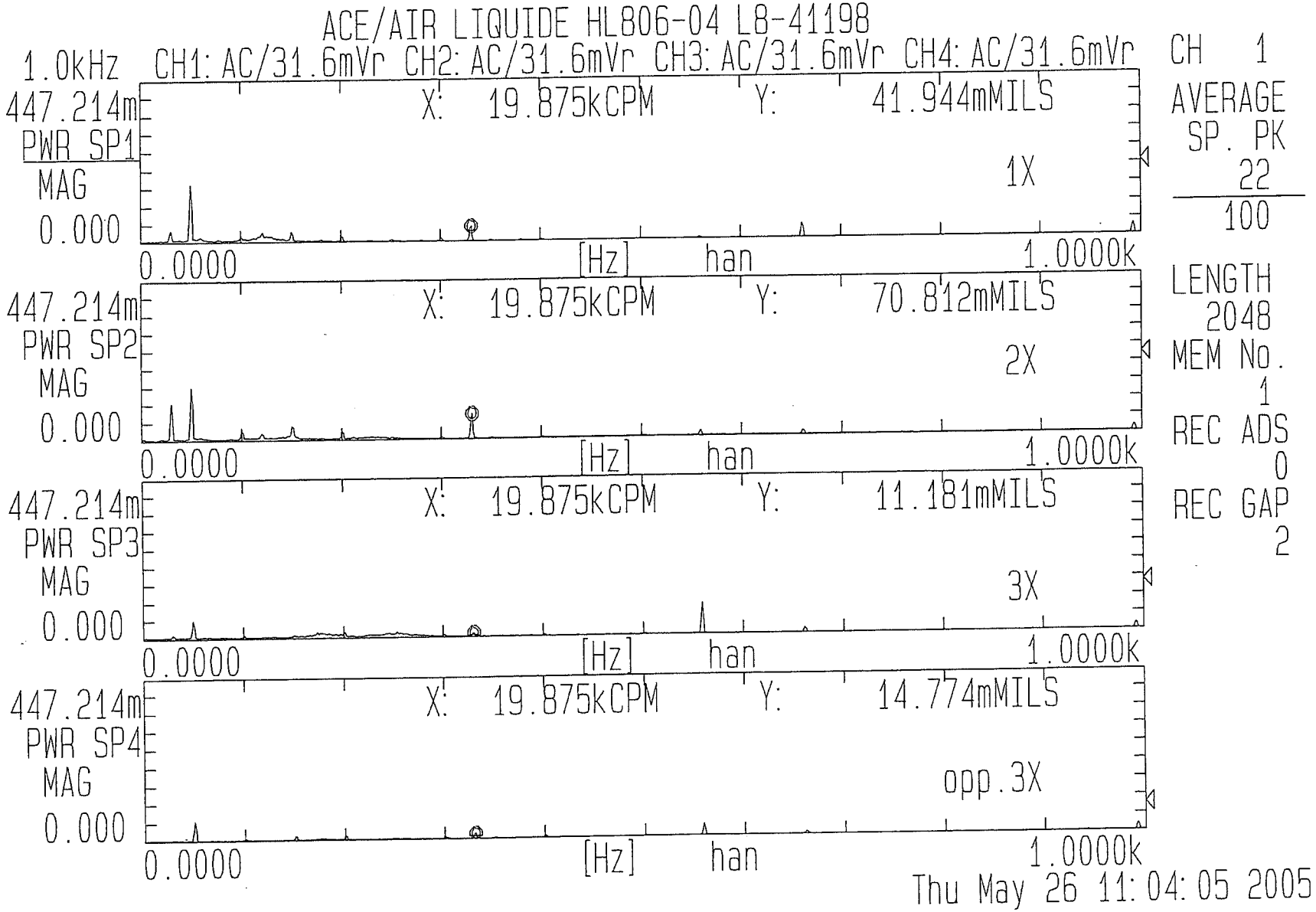
REC GAP
2
Thu May 26 9:34:15 2005


ACE/AIR LIQUIDE HL806-04 L8-41198
1.0kHz CH1: AC/31.6mVr CH2: AC/31.6mVr CH3: AC/31.6mVr CH4: AC/31.6mVr
CH 1
AVERAGE
SP. PK
22
100
LENGTH
2048
MEM No.
1
REC ADS
0
REC GAP
2
447.214m
PWR SP1
MAG
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X: 19.875kCPM
Y: 41.944mMILS
1X
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MAG
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447.214m
PWR SP3
MAG
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MAG
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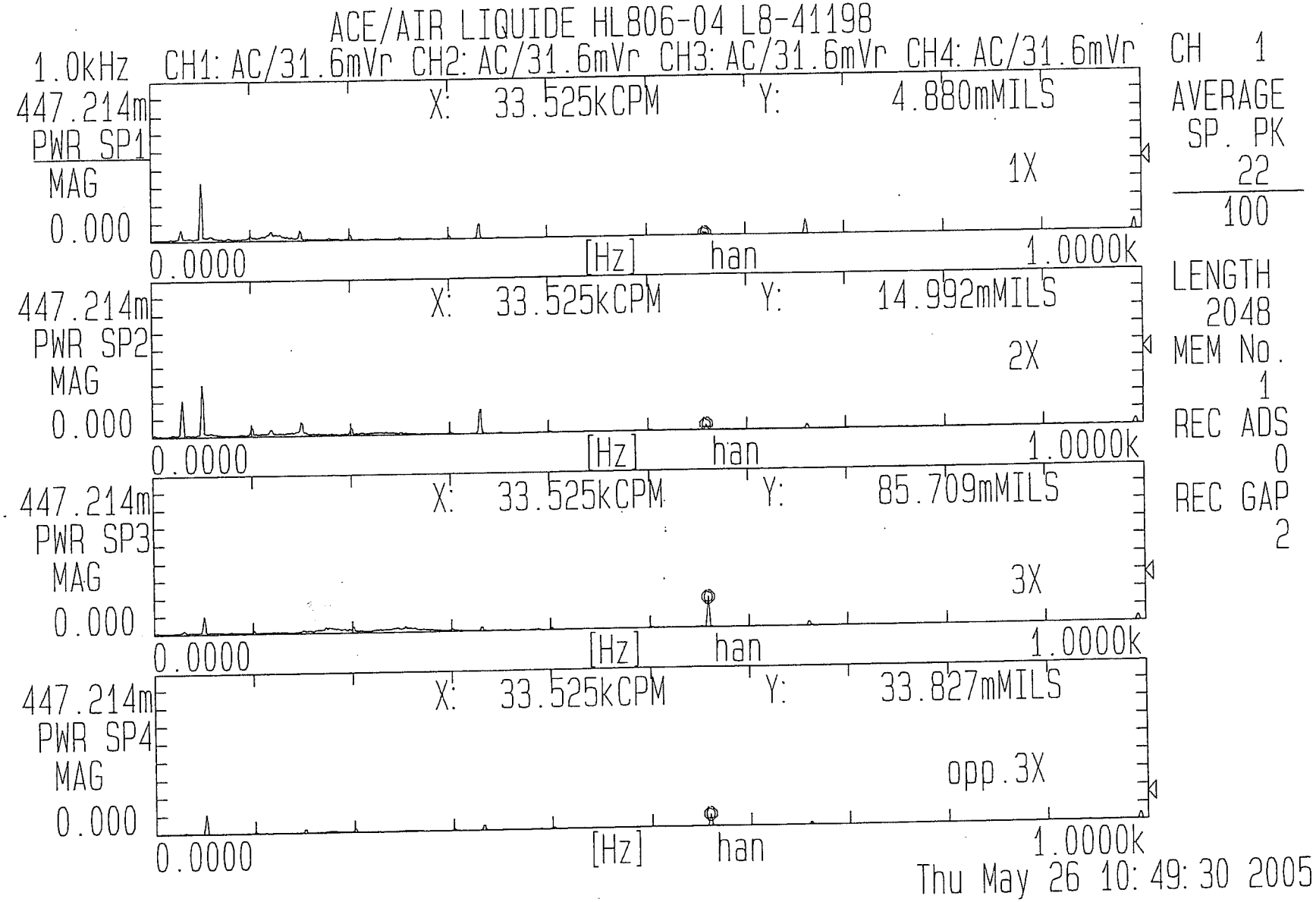
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1.0kHz CH1: AC/31.6mVr CH2: AC/31.6mVr CH3: AC/31.6mVr CH4: AC/31.6mVr
CH 1
AVERAGE
SP. PK
22
100
LENGTH
2048
MEM No.
1
REC ADS
0
REC GAP
2
447.214m
PWR SP1
MAG
0.000
X: 33.525kCPM
Y: 4.880mMILS
1X
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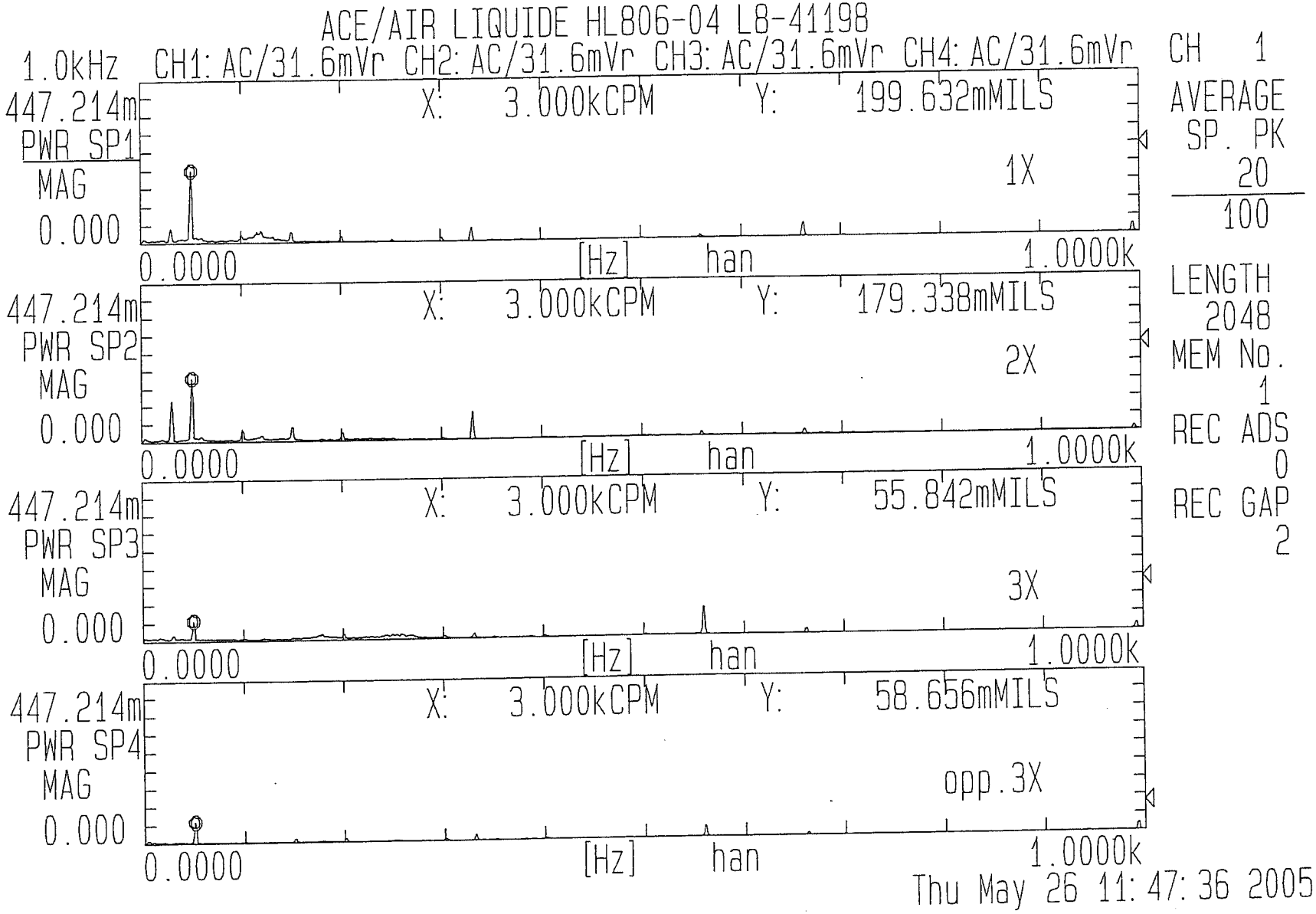
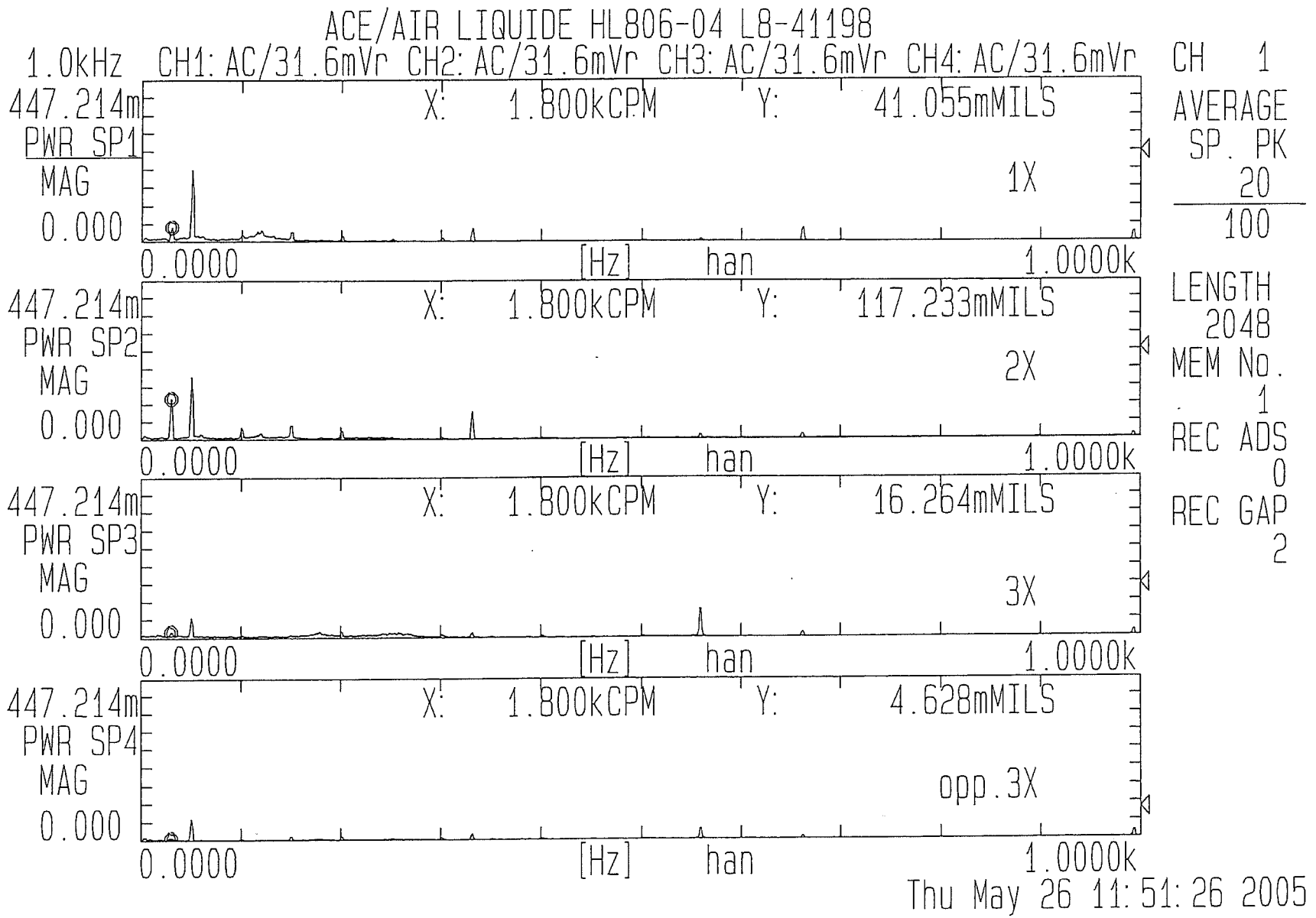
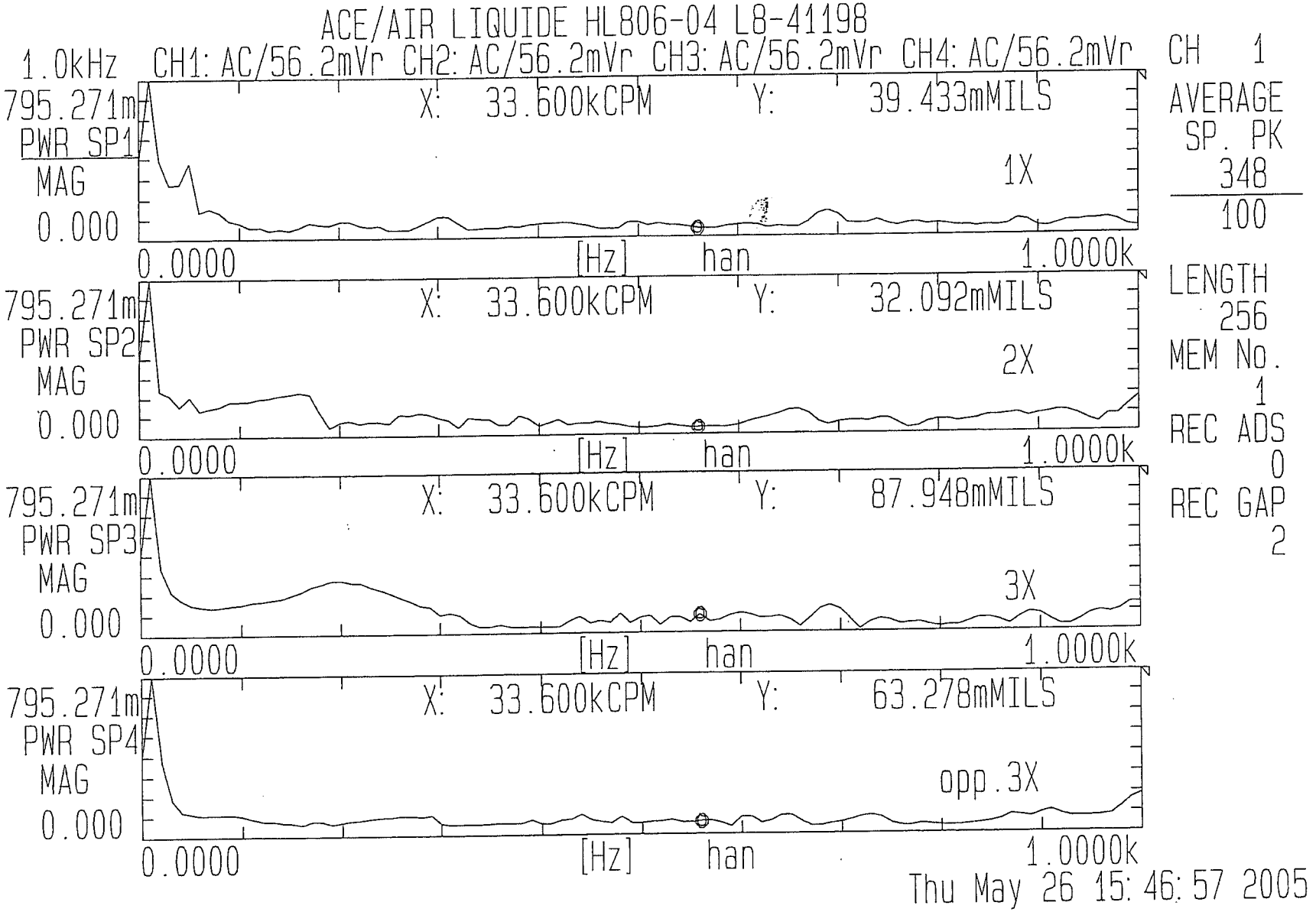
[Hz]
han
1.0000k
447.214m
PWR SP2
MAG
0.000
X: 33.525kCPM
Y: 14.992mMILS
2X
0.0000
[Hz]
han
1.0000k
447.214m
PWR SP3
MAG
0.000
X: 33.525kCPM
Y: 85.709mMILS
3X
0.0000
[Hz]
han
1.0000k
447.214m
PWR SP4
MAG
0.000
X: 33.525kCPM
Y: 33.827mMILS
opp.3X
0.0000
[Hz]
han
1.0000k
Thu May 26 10:49:30 2005


ACE/AIR LIQUIDE HL806-04 L8-41198
1.0kHz CH1: AC/31.6mVr CH2: AC/31.6mVr CH3: AC/31.6mVr CH4: AC/31.6mVr
CH 1
AVERAGE
SP. PK
20
100
LENGTH
2048
MEM No.
1
REC ADS
0
REC GAP
2
447.214m
PWR SP1
MAG
0.000
X: 3.000kCPM Y: 199.632mMILS
1X
0.0000 [Hz] han 1.0000k
447.214m
PWR SP2
MAG
0.000
X: 3.000kCPM Y: 179.338mMILS
2X
0.0000 [Hz] han 1.0000k
447.214m
PWR SP3
MAG
0.000
X: 3.000kCPM Y: 55.842mMILS
3X
0.0000 [Hz] han 1.0000k
447.214m
PWR SP4
MAG
0.000
X: 3.000kCPM Y: 58.656mMILS
opp.3X
0.0000 [Hz] han 1.0000k
Thu May 26 11:47:36 2005


ACE/AIR LIQUIDE HL806-04 L8-41198
1.0kHz CH1: AC/31.6mVr CH2: AC/31.6mVr CH3: AC/31.6mVr CH4: AC/31.6mVr
CH 1
AVERAGE
SP. PK
20
100
LENGTH
2048
MEM No.
1
REC ADS
0
REC GAP
2
447.214m
PWR SP1
MAG
0.000
X: 1.800kCPM Y: 41.055mMILS
1X
0.0000 [Hz] han 1.0000k
447.214m
PWR SP2
MAG
0.000
X: 1.800kCPM Y: 117.233mMILS
2X
0.0000 [Hz] han 1.0000k
447.214m
PWR SP3
MAG
0.000
X: 1.800kCPM Y: 16.264mMILS
3X
0.0000 [Hz] han 1.0000k
447.214m
PWR SP4
MAG
0.000
X: 1.800kCPM Y: 4.628mMILS
opp.3X
0.0000 [Hz] han 1.0000k
Thu May 26 11:51:26 2005


ACE/AIR LIQUIDE HL806-04 L8-41198
1.0kHz CH1: AC/56.2mVr CH2: AC/56.2mVr CH3: AC/56.2mVr CH4: AC/56.2mVr
CH 1
AVERAGE
SP. PK
348
100
LENGTH
256
MEM No.
1
REC ADS
0
REC GAP
2
795.271m
PWR SP1
MAG
0.000
X: 33.600kCPM
Y: 39.433mMILS
1X
0.0000
[Hz]
han
1.0000k
795.271m
PWR SP2
MAG
0.000
X: 33.600kCPM
Y: 32.092mMILS
2X
0.0000
[Hz]
han
1.0000k
795.271m
PWR SP3
MAG
0.000
X: 33.600kCPM
Y: 87.948mMILS
3X
0.0000
[Hz]
han
1.0000k
795.271m
PWR SP4
MAG
0.000
X: 33.600kCPM
Y: 63.278mMILS
opp.3X
0.0000
[Hz]
han
1.0000k
Thu May 26 15:46:57 2005

Atlas Copco

Declaration by the Manufacturer

As defined by EC Machinery Directive 98/37/EC, Annex II B

Herewith, we, ATLAS COPCO COMPTEC INC., 46 School Road, Voorheesville NY 12186, declare in our sole responsibility that the product ("the partial machine")

Machine description: Multi-Stage Centrifugal Compressor
Machine type: HL806-4 50 HZ Serial No. TBI0441198

is intended to be

☐ incorporated into machinery ("complete machine")
☒ assembled with other machinery to constitute machinery ("complete machine")

as defined by the above mentioned EC machinery directive.
Declaration:
In the development and production of the above described partial machine, all direct feasible state-of-the-art measures have been considered to meet the substantive contents of the basic safety and health requirements pertinent to this partial machine as defined in EC machinery directive 98/37/EC with the following supplements: 93/68/EEC. Pertinent documentation will be made available to the competent national authority in charge of the execution of the EC machinery directive on sufficiently justified request within a reasonable period time.

Note:
The manufacturer of the ready-for-use machinery ("complete machine")

☐ into which this partial machine is to be incorporated
☒ with which this partial machine is to be assembled to constitute machinery

is obliged to take any and all further required action in the framework of safety techniques still to be carried out, including warning labels to make sure that the ready-for-use complete machine conforms to the dispositions of the EC machinery directive. The partial machine must not be put into service until the complete machine

☐ into which this partial machine is to be incorporated
☒ with which this partial machine is to be assembled

has been declared to be in conformity with the provisions of the directive in the specified revision

Applied harmonized standards:

EN "compressor safety" (currently in draft form) — N / A

EN 292 Part 1 and 2

Applied national technical standards and specifications:
N / A

Names: Robert J. Wright
Position: Core Operations Manager
Signature:
Date: 2-Jun-05

Atlas Copco

Herstellererklärung
im Sinne der EC-Maschinen-Richtlinie 98/37/EWG, Anhang II B

Wir, die ATLAS COPCO COMPTEC INC., 46 School Road, Voorheesville NY 12186 USA, erklären hiermit in alleiniger Verantwortung, dass das Produkt ("die Teilmaschine")
Machinenbezeichnung: Multi-Stage Centrifugal Compressor

Machinentype: HL806-4 50 HZ Maschinen-Nr: TBI0441198

☐ zum Einbau in eine Maschine ("Gesamtmaschine")
☒ zum Zusammenbau mit anderen Maschinen zu einer Maschine ("Gesamtmaschine")

im Sinne der EG-Maschinen-Richtlinie bestimmt ist.

Erklärung:
In die Entwicklung und den Bau der vorbeschriebenen Teilmaschine sind die nach dem Stand der Technik möglichen unmittelbaren Massnahmen zur Erfüllung des auf diese Teilmaschine zutreffenden materiellen Inhalts der grundlegenden Sicherheits-und Gesundheitsanforderungen gemäss der EG-Maschinen-Richtlinie 98/37/EWG mit den Ergänzungen 93/68/EWG eingeschlossen. Eine entsprechende Dokumentation wird bei ausreichend begründetem Verlangen der fur die Durchführung der EG-Machinen-Richtlinie zuständigen nationalen Behörden in angemessener Zeit verfügbar gemacht.

Hinweis:
Der Hersteller der verwendungsfertigen Maschine ("Gesamtmaschine")

☐ in die diese Teilmaschine eingebaut
☒ mit der diese Teilmaschine zusammengebaut

werden soll, muss im Rahmen der mittelbaren und hinweisenden Sicherheitstechnik die notwendigen weiteren Massniahmen ergreifen, damit die verwendungsfertige Gesamtmaschine den Bestimmungen der EG-Maschinen-Richtlinie entspricht. Die Inbetriebnahme ist solange untersagt, bis festgestellt wurde, dass die Gesamtmaschine.

☐ in die diese Teilmaschine eingebaut
☒ mit der diese Teilmaschine zusammengebaut

werden soll, den Bestimmungen der EG-Maschinen-Richtlinie in der o.g. Fassung entspricht

Angewendete harmonisierte Normen:

EN "Kompressoren-Sicherheit" N / A
(z.Zt.Entwurf)

EN 292 T1 and T2

Angewedete nationale technische Normen und Spezifikationen:

N / A

Name: Robert J. Wright
Position: Core Operations Manager
Unterschrift:
Datum: 2 June, 2005