Western Medical Gas Services, Inc.
2913 Middleboro Place
Modesto, California 95355
(209) 577-4989
(800) AIR-TEST

CERTIFIED TEST REPORT FOR THE COMPRESSED AIR SYSTEM

REQUESTER:	Mr. Herman Geerling Sales Manager
FACILITY:	Osterbauer Compressor Service
ADDRESS:	5041 South Santa Fe Avenue Los Angeles, California 90058
TESTING DATES:	July 6, 1987
SUBJECT:	Operatonal Tests and Verification of Purity of the Compressed Air System on the facilities of La Man Corporation.
BACKGROUND:	Western Medical Gas Services, Inc. performed various operatonal and purity tests on the Compressed Air System.
CERTIFICATION:	Western Medical Gas Services, Inc. certifies that, as per our testing, the Compressed Air System meets Grade D Air Quality, as established by various standards of the National Fire Protection Agency and Joint Commission on Accreditation of Hospitals. The attached sheets will verify our findings and give more detail to our procedures. They should be read by all parties concerned.

Richard E. Mattern, President
Western Medical Gas Services, Inc.

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Osterbauer Compressor Service
Los Angeles, California
July 6, 1987

This Survey of the Compressed Air System was performed for operational pressure, temperature, and purity, by Western Medical Gas Services, Inc.

TEST PROCEDURES

TEST #1 - DRAEGER

The Carbon Dioxide level was determined using a National Draeger Areotest Breathing Air Tester #4054001 with Draeger Detector Tubes #6728521.

The Carbon Monoxide Level was determined using a National Draeger Aerotest breathing Air Tester #4054001 with Draeger Detector Tubes #6728511.

The Oil Vapor level was determined using a National Draeger Aerotest Breathing Air Tester #4054001 with Draeger Detector Tubes #6728371. **

This test kit measures the oil, carbon monoxide and carbon dioxide content of the compressed air by passing a known volume of air through a test tube containing an absorbent that changes color proportional to the amount of contaminants present. Sixty (60) liters of air were passed through the test tube and the resulting color change was visually compared to the color chart supplied with the test kit.

** Test results may be effected by excessive moisture in the medical air system. There must be $0^{o}F$ reading in the water vapor content testing, as per our dewpoint readings.

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Los Angeles, California
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TEST #2 - BALSTON

Western Medical Gas Services, Inc. obtained a sample. The technician inserted a specially treated slide into the slide holder and opened the valve to impinge a jet of air onto the slide for approximately 35 seconds (exact time depends upon airline pressure). The exposed slide is then placed in the viewing box, adjacent to a standard slide.

Under Ultra-Violet Light in the viewing box, the oil appeared as a dark circle on the treated slide. The size of the circle was directly related to the liquid oil concentration in the compressed air sample. The oil concentration was determined quanitatively by comparing the size of the oil circle to the circles on the standard slide, which was calibrated in parts per million (ppm) by the weight of oil in the air.

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TEST #3 - MIRAN

Air Samples were collected for measurement of gaseous and condensed hydrocarbons and particulate matter.

The sampling lines were purged for at least ten (10) minutes prior to the start of each test.

A grab sample of compressed air was then collected in a Stainless Steel Tank with a Calibrated Instruments, Inc. Multi-Layer Gas Sampling Bag. The tank had passed a test for freedom from hydrocarbon contamination and was fully evacuated prior to sampling. Methane and other gaseous hydrocarbons were measured from the Multi-Layer Gas Sampling Bag sample using a Miran Infrared Gas Analyzer.

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TEST #4 - BECKMAN

ANALYTICAL PROCEDURES

A Western Medical Gas Services, Inc. 2002 Gas Chromatograph System consisting of a Sybron Taylor 0A244 High Accuracy Analyzer was used to determine the purity of Oxygen and Grade D Air. A Western Medical Gas Services, Inc. Infrared Nitrous Oxide Gas Analyzer AR200 was used to determine the purity of the Nitrous Oxide with a 99% accuracy. A Beckman Industrial Hydrocarbon analyzer Model 400A was used to measure Hydrocarbon compounds and Haloginated Hydrocarbon Compounds. Miran Gas Analyzer 1A was used to measure Methane and also Carbon Monoxide concentrations. General Easterner Dewpoint Hydrometer 1100DP, the Alnor Dewpointer 7200UF and a National Draeger Water Vapor Tube 6728531 was used to measure moisture content.

Sample bottles were used to collect samples from patient room outlets. The samples were then passed by way of a teflon connecting line into a sample loop on the gas chromatograph system. Reference gas standards containing 40% Hydrogen, 60% Nitrogen, (THC<0.5ppm) and Air Ultra Zero containing THC <0.1 ppm, CO2 <1ppm, and Dew Point < -99 F were used to make direct comparisons to observed levels from the source gases passing through each delivery.

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Los Angeles, California
July 6, 1987

MEDICAL AIR SYSTEM
AIR SAMPLE RESULTS

1.	Test Date:	July 6, 1987
2.	Testing Equipment:	National Draeger Aerotest Breathing Air Tester #4054001 Dew Point Hygrometer - System 1100DP Alnor Dew Point Meter Balston Oilcheck Kit Miran 1A Beckman 400 TC Analyzer
3.	Test Location:	TEST #3 - SHOP AIR
4.	Air Purity:	21% Oxygen - Analyzer with Sybron Taylor High Purity Oxygen Analyzer
5.	Air Line Pressure:	75 - 50 PSIG
6.	Air Flowrate:	.02 / 2 LPM
7.	Air Line Temperature:	$72^{O}F$
8.	Ambient Temperature:	$83^{O}F$
9.	Relative Humidity:	48%

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COMPRESSED/MEDICAL AIR SYSTEM
TABLE OF MEASURED CONTAMINANTS

PROCEDURE/ CONTAMINANTS	GRADE D AIR MAX. ALLOWABLE	TEST LOCATIONS #1	#2	#3	#4
Carbon Monoxide	20 ppm	2 ppm	< 1 ppm	2 ppm	
Carbon Dioxide	1000 ppm	400 ppm	< 1 ppm	600 ppm	
Water Vapor/Dewpoint	*	10.4°F	6.9°F	7.5°F	
Oil - Draeger	5 mg/m^3	< 3 mg/m^3	< .05 mg/m^3	< 3 mg/m^3	
Oil - Balston	3 ppm	< 1 ppm	< 1 ppm	2 ppm	
Gaseous H C (Miran)	25 ppm**	< .05 ppm	< .05 ppm	< .05 pp	
Beckman Industrial Hydrocarbon Analyzer		00.1 ppm	00.0 ppm	0.2 ppm	

* The water content of compressed air required for any particular grade may vary with the intended use from saturated to very dry. If a specific water limit is required, it should be specified as a limiting dewpoint or concentration is ppm (v/v). Dewpoint is expressed in temperature °F at one atmosphere absolute pressure.

** Grade D Air

Test Location: #1 - PORT AIR COMPRESSOR
#2 - LA MAN UNIT
#3 - SHOP AIR