AIR LIQUIDE

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TEST REPORT N° 2002/OL 149
June 6th, 2002

Pressure regulator manufactured by Apeks Type NP0527 Nitrox 4 Port 1st Stage Dry "A" Clamp Ignition tests with oxygen according to Pr EN 13949

Test Order n° O0837

Applicant : Apeks

Technical Manager : Jean-Paul Schaaff

Assistant (s) : Olivier Longuet

Distribution : Apeks M. Davis

Head of Center
Daniel ROY

SUMMARY

At the request of Apeks, we have carried out ignition tests (Adiabatic compression) of the standard Pr EN 13949 (Respiratory equipment, pressure regulators for use with compressed Nitrox and oxygen – Requirements, testing, marking), on oxygen pressure regulator, type NP0527 Nitrox 4 Port 1st Stage Dry "A" Clamp, manufactured by Apeks.

This pressure regulator withstands to ignition test of the Pr EN 13949 (§ 5.2) of June 2001, for a working pressure of 300 bars.

N.B. : This report concerns only the samples that have been submitted to tests

CONTENTS

1. INTRODUCTION

At the request of Apeks, we have carried out ignition tests (Adiabatic compression) of the standard Pr EN 13949 (Respiratory equipment, pressure regulators for use with compressed Nitrox and oxygen – Requirements, testing, marking), on oxygen pressure regulator, type NP0527 Nitrox 4 Port 1st Stage Dry "A" Clamp, manufactured by Apeks.

The working pressure of the pressure regulator is 300 bars.

The samples were received the April 18th, 2002.

2. DESCRIPTION OF EQUIPMENT TESTED

The picture hereafter shows the pressure regulator

Picture hereafter shows the pressure regulator dismantled

Drawing and parts list are reproduced in appendix 1.

3. IGNITION TESTS

3.1. DESCRIPTION OF THE TEST

Tests have been carried out according to Pr EN 13949 (§ 5.2) of June 2001. It's checked wether the pressure regulator safely withstands an oxygen pressure surge.

- The pressure test is 360 bars of oxygen at 60°C.
- The number of cycles compression / decompression is 20.

- The connection tube measures 1 m in length and has an internal diameter of 5 mm.

Static pressure uncertainty ± 2.5 bars.
Dynamic pressure uncertainty ± 3 bars.
Time increase uncertainty ± 0.2 ms.
Oxygen temperature uncertainty ± 0.5°C.

Three samples must be submitted to 20 cycles of compression / decompression (see data sheet 2382 in appendix 2) following the configuration :

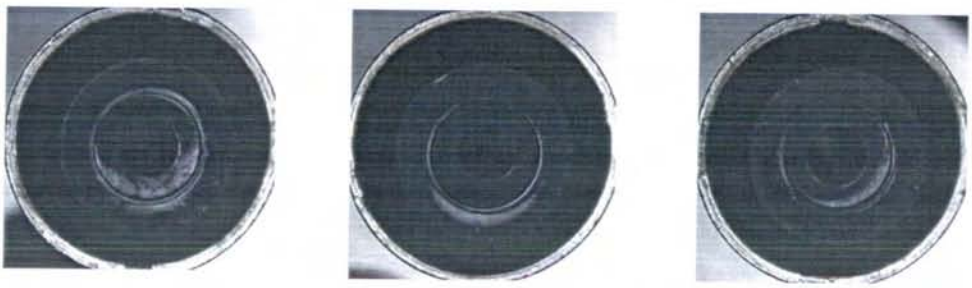
① By inlet

3.2. TEST CARRIED OUT

The samples have been tested as received without degreasing.

After the tests, the three samples have been dismantled. We have not observed any ignition (see pictures hereafter).

High pressure valves (n°12 on drawing) after tests



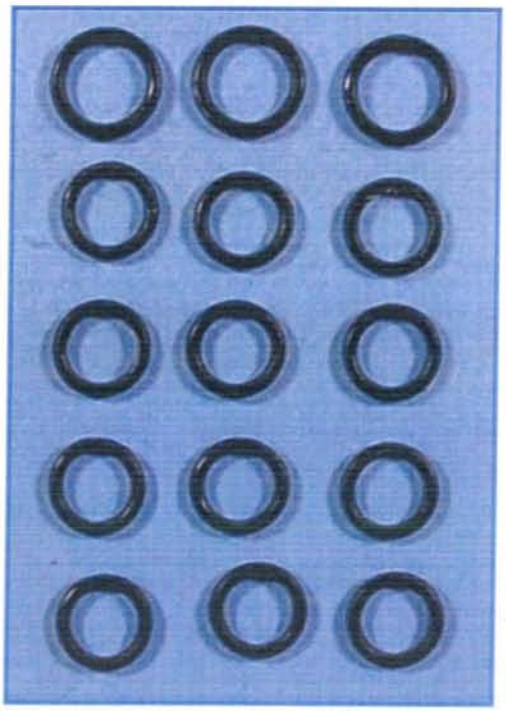
O-rings (n°16 on drawing NP0527) after tests

O-rings (n°15 on drawing NP0527) after tests

O-rings (n°19 on drawing NP0527) after tests

O-rings (n°14 on drawing NP0527) after tests

O-rings (n°21 et 12 on drawing NP0527) after tests



Diaphragms (n°9 on drawing NP0527) after tests

Conical filters (n°28 on drawing NP0527) after tests

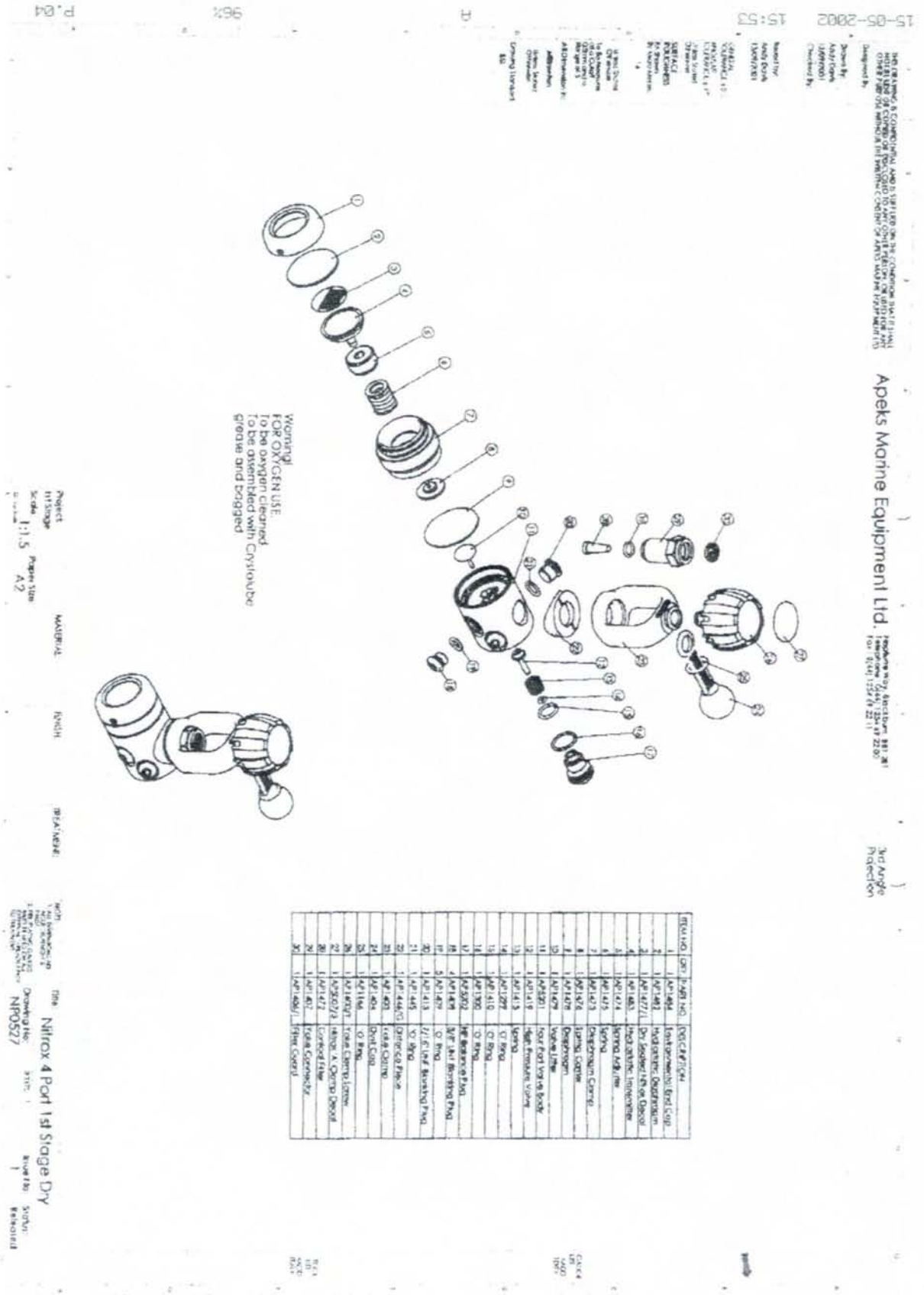
4. CONCLUSION

The pressure regulator type NP0527 Nitrox 4 Port 1st Stage Dry "A" Clamp, manufactured by Apeks, for using with oxygen, withstands to ignition tests of the Pr EN 13949 (§ 5.2), for a working pressure of 300 bars.

Technical Manager
Jean-Paul Schaaff

Author
Olivier Longuet

APPENDIX 1


Apeks Marine Equipment Ltd.
Warning!
FOR OXYGEN USE
To be oxygen cleaned
To be assembled with Crystolube
grease and bagged
Nitrox 4 Port 1st Stage Dry
NP0527

APPENDIX 2

IGNITION TEST (pressure surge)
According to standard : Pr EN 13949

Data sheet #	2382
Test date :	25-avr-02
Request #	00837

Request by :	Apeks / M . Davis
Country :	England

Device tested :	Pressure regulator
Type :	NP0527 Nitrox 4 Port 1st Stage Dry "A" Clamp
Manufacturer :	Apeks

Working conditions

temperature	Room
pressure	300 bars

Test conditions

standard applied :	Pr EN 13949
gas :	O2
pressure :	360 bars
gas temperature :	60°C
connection tube :	Diameter = 5 mm ; L = 1 m
number of cycles :	20

Test sequence 1 :	By inlet.
Test sequence 2 :	
Test sequence 3 :	
Test sequence 4 :	

RESULTS

Sample # 1	
test seq.1	After 20 cycles, no ignition.
test seq.2	
test seq.3	
test seq.4	
Sample # 2	
test seq.1	After 20 cycles, no ignition.
test seq.2	
test seq.3	
test seq.4	
Sample # 3	
test seq.1	After 20 cycles, no ignition
test seq.2	
test seq.3	
test seq.4	

CONCLUSIONS

Good behaviour of the three tested samples.

Operator
O . Longuet

Authorized Manager
JP Schaaff