Duke Power
A Duke Energy Company

Duke Power Company
A Duke Energy Company
Energy Center
P.O. Box 1006
Charlotte, NC 28201-1006

May 1, 2003

U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001
ATTENTION: Document Control Desk

Subject: Duke Energy Corporation
Oconee Nuclear Station, Units 1, 2, and 3
Docket Nos. 50-269, 50-270, 50-287
McGuire Nuclear Station, Units 1 and 2
Docket Nos. 50-369, 50-370
Catawba Nuclear Station, Units 1 and 2
Docket Nos. 50-413, 50-414
Response to Request for Additional Information Concerning
Request for Exemption from 10CFR20.1703 and 10CFR20 Appendix A
Use of French Designed Respiratory Protection Equipment

By letter dated March 4, 2003, Duke Energy Corporation (Duke) submitted a request for exemption from the requirements of 10CFR20.1703 and 10CFR20 Appendix A for use of French designed respiratory protection equipment. On April 1 and April 14, 2003, the NRC requested additional information concerning the subject exemption.

Duke's response to the Request for Additional Information is provided as an attachment to this letter.

Duke has identified the following as commitments associated with this exemption request.

1. The Mururoa V4 F1 and V4 MTH2 suits will be integrated into Duke's respiratory program using the information provided by the manufacturer.
2. New lesson plans will be developed to train workers on Mururoa's features, donning, use and removal, cautions and use of mouth strip and tear off strips for routine and emergency egress.
3. Radiation Protection personnel will be provided additional training for selection, approval, issue, equipment set-up, operation and maintenance instructions for the Mururoa suit.
4. Radiological and non-radiological environments will be assessed for each job to determine the need for a rescue person
5. Radiation Protection Manager's approval will be required for all jobs where a rescue person is not provided.
6. Duke procedures will clearly explain when and how the exception of 10CFR20.1703(f) for use of standby rescue persons will be used.

A001

If you have any questions, please contact M. T. Cash at 704 382-5826 or L. B. Jones at 704 382-4753.

Very truly yours,

W. R. McCollum
Senior Vice President
Nuclear Support

Attachment

xc:

L. A. Reyes, Regional Administrator
U. S. Nuclear Regulatory Commission, Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, GA 30303-8931

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NRC Senior Project Manager (Oconee)
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Washington, DC 20555-0001

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S. M. Shaeffer
NRC Senior Resident Inspector
McGuire Nuclear Station

M. C. Shannon
NRC Senior Resident Inspector
Oconee Nuclear Station

E. F. Guthrie
NRC Senior Resident Inspector
Catawba Nuclear Station

bxc:

L. E. Nicholson – ON03RC
G. D. Gilbert – CN01RC
C. J. Thomas – MG01RC
L. E. Haynes – EC07F
T. J. Venkat – EC07F
L. B. Jones – EC05O
J. W. Foster – CN02RP
J. A. Twiggs – ON01R2
L. E. Loucks – MG01RP
G. T. Hamrick – EC07F
NCMPA-1
SREC
PMPA
NCEMC
ONS Master File – ON03DM (File OS 801.01)
MNS Master File – MG01DM
CNS Master File – CN01DM
ELL

DUKE ENERGY CORPORATION
REQUEST TO REQUEST FOR ADDITIONAL INFORMATION
DATED APRIL 1 and APRIL 14, 2003

1. Based on a review of the attachments provided in the licensee's submittal, the manufacturer states (and the European Certification Authority assumes) that both models of the suits are authorized for single-use only. Please confirm that the suit will be discarded after one use.

   RESPONSE: *Duke confirms that the suit will be discarded after one use.*

2. Relative to the required supply air pressure to the suit, the submittal uses "should" (section 2.3.1, third paragraph, first sentence), and "shall" (section 2.3.2, first paragraph, 7th line) when describing needed air supply pressure. Please clarify to assure that the required air supply shall be provided during use, consistent with the manufacturer's recommendations/ECEC certification.

   RESPONSE: *Duke agrees that the first sentence of the third paragraph of section 2.3.1 should read:*

   'Air hoses of any length can be used, but air shall be supplied to the Mururoa suit (model V4 F1) at 85 psig measured at the inlet."

3. While the licensee has established a useful communication with the vendor for suit improvements and lessons learned from other users, it is vital that the vendor establish and alert each product user (licensee) to any significant problems or deficiencies with the suit. This vendor-user alert system must provide timely, similar warnings to users, as NIOSH and the USA respirator manufacturers provide for in the United States. Does the suit manufacturer (or European Certification Authority) provide such a service to the licensee?

   RESPONSE: *Duke asked the vendor how problems with their products reported by customers were handled by them and by French authorities. We are informed by the vendor that the Mururoa suits have the highest classification, Class 3, for Personal Protective Equipment. The IPSN Notified Body checks that the product meets European Standards and has no risk of injury to user. A second organization called ASQUAL performs annual inspections of the factory to certify that the product manufactured is of the same quality approved by IPSN Notified Body. Several destructive/non-destructive tests are performed by the manufacturer for each order received from clients. Any defects reported by clients, investigations and corrective actions taken are documented. Customers are notified of any problems and products are recalled if necessary. This information is made available to ASQUAL for their annual inspections.*

   Duke plans to communicate any problems with the Mururoa suit to the vendor for a satisfactory resolution. Duke will also post the details on the INPO/WANO nuclear network.

4. The licensee's wording, "....request...authorization to use an APF of <u>at least</u> 1000..." (emphasis added) could be confusing. Given the test data provided, the NRC staff plans to

grant an Assigned Protection Factor (APF) of 1000 for both suits. Assuming the authorization is granted, as defined and used in 10 CFR Part 20, the licensee may not assume a higher APF (without permission from the NRC in accordance with 20.1705). Is an APF of 1000 for the suits adequate for your projected needs?

RESPONSE: *Duke requests that an APF of 2000 be approved for the Mururoa suits. Duke confirms that this would meet our projected needs at our nuclear sites.*

5. Describe the plant plan in place to assist a suit user (e.g., while decontaminating the reactor cavity, using a hydro-laser) upon receipt of a containment evacuation alarm due to high particulate airborne activity.

   RESPONSE: *Currently our procedures require rescue personnel for bubble-hood users. The rescue person is required to be in line of sight or in constant communication with the user. The rescue person and bubble-hood user carry blunt-tip scissors for cutting open the hood in case of loss of supplied breathing air. When the containment alarm sounds, the bubble-hood user will stop the work safely, and go to the rescue person. The rescue person will cut a large opening in the bubble-hood, disconnect the airline from the hood and then escort the user safely outside the containment.*

   The Mururoa suit has an advantage over the bubble-hood in that the mouth strip can be easily removed by the user and the opening enlarged, without waiting for help from a rescue person. The user can disconnect the airline and walk out of containment. If a rescue person is provided, he will ensure the worker is able to breathe ambient air and then escort the worker out.

   Radiation Protection technicians assigned to cover work inside the containment are also responsible for ensuring all personnel have exited after any containment evacuation alarm.

6. While the licensee committed to use the manufacturer's information in developing implementing procedures (and training lesson plans) for using the suits, please identify any of the manufacturer's "instructions for donning and removal", "instructions for use" and "emergency features" technical information/directions provided, that will not be required by procedures. For each instruction identified, explain the rationale for not including it in the program's procedures/training (and any other compensatory actions).

   RESPONSE: *Paragraph 2 of 'Cautions' in Attachment 2.5.5 - 'Instructions for Donning and Removal (of) The Mururoa V4 Fully Enclosed Suit -' specifies the use of a buddy system with 'either both persons wearing the suit or the second person nearby in view with a particulate respirator ready'. The Vendor informed us that Paragraph 2 was specifically added in 1991 in response to a request from Duke which was evaluating an earlier version of the Mururoa suit. Attachment 2.5.8 - 'Donning and Removal Instructions for Mururoa V4 MTH2' which forms part of the approval by the Institute of Nuclear Safety does not require use of a buddy system. Instead, it requires the user to leave the work zone immediately if the suit deflates, if the helmet fogs or if the person has a feeling of excessive warmth.*

   'Buddy System' was used by Duke in the early 1990's before the introduction of advanced audio/video communication technology in our power plants. For radiological work with high

airborne activity and presence of discrete radioactive particles, such as Steam Generator platform work, Steam Generator Bowl entry or Cavity decontamination, Duke has, for the past several years, used headsets for communication coupled with video surveillance. Duke will continue the use of audio/video monitoring for these jobs, in lieu of the buddy system, when Mururoa suits are used.

However, there could be non-radiological and safety concerns such as fire hazard, noise or heat stress where the audio/video system use may not be adequate and a dedicated rescue person would be required to monitor worker's safety. Therefore, Duke will assess radiological and non-radiological environments for each job to determine the need for a rescue person. Duke will require the Radiation Protection Manager's approval for all jobs where a rescue person is not provided.

If an exception is granted from use of standby rescue persons referred to in 10 CFR 20.1703 (f), Duke procedures will clearly explain when and how the exception will be used. Training will cover situations where rescue persons are provided, and not provided, and explain individual responsibilities for each situation. Users and Radiation Protection technicians will be trained on situations that would require use of rescue person when the Mururoa suit is used. Mock-up training and pre-job briefings will identify if rescue persons are provided and the responsibilities of the rescue person.

7. Relative to the "inward leakage factor-- fit factor" testing in accordance with ECEC 97/0028 (page 7/12), the testing for the suits was conducted at the minimum flow rate allowed for use. By using the minimum flow rate for leak testing a suit, the certification agency assumes this configuration provides the user with the minimum protection (maximum in-leakage potential). However, for some suits used by Department of Energy work sites, the testing by (Los Alamos National Laboratory (LANL) showed that the maximum in-leakage occurred at flow rates greater than the allowed minimum (suspected exhaust valve "chattering"). Please provide the manufacturer's basis/justification for using the minimum flow rate for certification testing to establish the "fit factor" issued by the certification agency.

   RESPONSE *On April 16, 2003, Duke talked with Mr. Sam Ozil, Director, Delta-Protection of France and was informed that the suits were tested at the minimum flow rate to determine the minimum Fit Factor. Delta Protection determined Fit Factors for the Mururoa suit in May 1991 using flow rates from 250 Liters/min to 1000 Liters/min. Three workers performed 8 exercises and the Overall Fit Factor was determined using PortaCount Model 8010 with NaCl as the test medium. The Mururoa model used had the same magnetic exhaust valve as the current model, but the exhaust valve of the old model was enclosed in a thick metal box. The enclosure was made thin and flat and therefore was re-certified by Institute of Nuclear Safety in 1996.*

The Overall Fit Factors at different flow rates were as follows:

Flow Rate (Liters/min)	Overall Fit Factor Worker 1	Overall Fit Factor Worker 2	Overall Fit Factor Worker 3
250	37552	59415	152733
275	36948	66915	107138
300	55935	47603	118088
325	89716	63225	96626
350	57278	66043	125877
375	N/A	166344	183104
400	68132	92676	181830
425	71078	138019	83681
450	72239	101267	144619
475	63280	94324	167189
500	61748	114786	106584
750	56593	56946	61905
1000	72416	59497	50600

Copies of the fit test reports showing detailed fit factors for individual exercises are enclosed for your review. From attachment 2.5.8 - Donning and Removal Instructions for Mururoa V4 MTH2, Duke notes that the flow rate shall be kept between 500 Liters/min and 1100 Liters/min for the Mururoa suit.

Mr. Ozil also confirmed that they had not provided any Mururoa suits for evaluation by the Department of Energy or Los Alamos National Laboratory. Duke is the first organization in U.S.A. to receive the Mururoa models V4 F1 and MTH2 for evaluation. He had no comments on the findings at LANL. No instances of exhaust valve 'chattering' had been reported to them by any of their customers so far. Mr. Ozil also had no comments on why the Institute of Nuclear Safety tested the Mururoa suits at the minimum flow rates, instead of at the maximum flow rates.

APPENDIX A

EXPERIMENTAL DATA
(42 pages)

LIST of EXERCISES
and
ABREVIATIONS

(a) Standing still with the arms against the sides and breathing normally (SS).
(b) Bending forwards and touching the toes (BT).
(c) Running on the spot (RS).
(d) Lifting the arms above the head and looking upwards (LA).
(e) Bending the knees and crouching down (BC)
(f) Walking on all fours (W4).
(g) Standing with the arms crossed and turning the torso to one side and then the other (XT).
(h) Standing still with the rms against the sides and breathing normally (SS).

Name: VANDEN EEDE
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-17-1991
Test time: 2:30:45 pm
Test subject last name: VANDEN EEDE
Test subject first name: PIERRE
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: NaCl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 4
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 250 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	260000	0.550	473000	PASS
BT	260500	6.840	38100	PASS
RS	242500	4.740	51300	PASS
LA	259000	3.540	73300	PASS
BC	258500	21.600	11900	PASS
W4	171600	4.780	35900	PASS
XT	172100	5.130	33500	PASS
SS	249500	2.440	102000	PASS

OVERALL FIT FACTOR = 37552 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject _____ Date 03 JUIN 1991

Name: VANDEN EEDE
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-17-1991
Test time: 2:49:31 pm
Test subject last name: VANDEN EEDE
Test subject first name: PIERRE
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: NaCl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 4
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 275 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	262500	1.090	241000	PASS
BT	249500	18.700	13300	PASS
RS	246000	4.260	57700	PASS
LA	240500	4.620	52100	PASS
BC	236000	7.130	33100	PASS
W4	240000	5.170	46400	PASS
XT	232000	6.640	34900	PASS
SS	218500	4.430	49400	PASS

OVERALL FIT FACTOR = 36948 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject Vanden Eede Date 03 JUIN 1991

Name: VANDEN EEDE
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-17-1991
Test time: 3:26:05 pm
Test subject last name: VANDEN EEDE
Test subject first name: PIERRE
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: NaCl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 4
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 300 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	334000	1.340	249000	PASS
BT	323000	16.300	19700	PASS
RS	315500	5.380	58700	PASS
LA	316500	4.440	71400	PASS
BC	309500	6.230	49700	PASS
W4	317500	5.850	54200	PASS
XT	328500	4.390	74800	PASS
SS	314000	1.650	190000	PASS

OVERALL FIT FACTOR = 55935 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject Vanden Eede Date 03 JUIN 1991

Name: VANDEN EEDE
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-17-1991
Test time: 3:46:11 pm
Test subject last name: VANDEN EEDE
Test subject first name: PIERRE
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: NaCl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 4
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 325 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	288000	0.970	297000	PASS
BT	291500	4.140	70400	PASS
RS	308000	3.080	100000	PASS
LA	300000	4.340	69200	PASS
BC	268500	4.140	64800	PASS
W4	278000	4.510	61600	PASS
XT	292000	3.150	92700	PASS
SS	267000	1.250	213000	PASS

OVERALL FIT FACTOR = 89716 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject Vanden Eede Date 03 JUIN 1991

Name: VANDEN EEDE
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-22-1991
Test time: 11:27:31 am
Test subject last name: VANDEN EEDE
Test subject first name: PIERRE
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 4
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 350 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	404000	0.970	417000	PASS
BT	358000	10.000	35700	PASS
RS	348500	3.130	111000	PASS
LA	361500	6.300	57400	PASS
BC	342000	3.580	95700	PASS
W4	346000	2.990	115000	PASS
XT	360000	3.780	95300	PASS
SS	356000	18.800	18800	PASS

OVERALL FIT FACTOR = 57278 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject Vanden Eede Date 03 JUIN 1991

Name: VANDEN EEDE
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-22-1991
Test time: 1:12:06 pm
Test subject last name: VANDEN EEDE
Test subject first name: PIERRE
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 4
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 400 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	319000	0.770	414000	PASS
BT	294500	12.300	23800	PASS
RS	288500	2.980	96900	PASS
LA	289000	4.320	67000	PASS
BC	278500	4.390	63500	PASS
W4	271500	4.630	58600	PASS
XT	280500	2.900	96700	PASS
SS	257500	1.180	218000	PASS

OVERALL FIT FACTOR = 68132 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject Vanden Eede Date 03 JUIN 1991

ISSeP
- R&D et démonstration
- Centre de transposition industrielle et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: VANDEN EEDE
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-22-1991
Test time: 1:30:28 pm
Test subject last name: VANDEN EEDE
Test subject first name: PIERRE
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 4
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 425 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	304000	0.990	307000	PASS
BT	287500	7.800	36900	PASS
RS	280000	4.740	59100	PASS
LA	281500	3.650	77200	PASS
BC	278500	6.220	44800	PASS
W4	290000	3.810	76200	PASS
XT	294500	2.800	105000	PASS
SS	278500	2.050	136000	PASS

OVERALL FIT FACTOR = 71078 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject Vanden Eede Date 03 JUIN 1991

VSSeP
- R&D et démonstration
- Centre de transposition industrielle et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: VANDEN EEDE
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-22-1991
Test time: 1:45:13 pm
Test subject last name: VANDEN EEDE
Test subject first name: PIERRE
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 4
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 450 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	266500	0.810	329000	PASS
BT	243000	6.760	36000	PASS
RS	245000	3.690	66500	PASS
LA	270000	3.000	90000	PASS
BC	252000	5.520	45700	PASS
W4	257500	3.410	75700	PASS
XT	283000	3.420	82900	PASS
SS	279000	1.840	151000	PASS

OVERALL FIT FACTOR = 72239 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject Vanden Eede Date 03 JUIN 1991

Name: VANDEN EEDE
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-22-1991
Test time: 2:02:21 pm
Test subject last name: VANDEN EEDE
Test subject first name: PIERRE
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 4
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 475 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	256000	1.040	246000	PASS
BT	237500	4.940	48200	PASS
RS	240000	4.300	55900	PASS
LA	246500	4.040	61000	PASS
BC	241500	5.640	42800	PASS
W4	254000	6.330	40200	PASS
XT	271000	2.900	93600	PASS
SS	246000	2.060	119000	PASS

OVERALL FIT FACTOR = 63280 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 0 3 JUIN 1991

Test Subject Vanden Eede Date 0 3 JUIN 1991

Name: VANDEN EEDE
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-22-1991
Test time: 2:20:18 pm
Test subject last name: VANDEN EEDE
Test subject first name: PIERRE
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 4
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 500 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	240500	1.300	185000	PASS
BT	224000	4.580	49000	PASS
RS	213500	3.460	61800	PASS
LA	217500	2.710	80400	PASS
BC	210000	4.320	48600	PASS
W4	211000	7.870	26800	PASS
XT	230000	3.110	74200	PASS
SS	229000	0.860	266000	PASS

OVERALL FIT FACTOR = 61748 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject Vanden Eede Date 03 JUIN 1991

Name: VANDEN EEDE
Next test due:

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-31-1991
Test time: 11:58:58 am
Test subject last name: VANDEN EEDE
Test subject first name: Pierre
ID number: -
Operator name: DEBOUTEZ
Next fit test due:
Test agent: NaCl aerosol
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 4
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 250 l/min
Additional notes: TRACTION

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
T1	270500	1.590	170000	PASS
T2	284000	1.490	190000	PASS
T3	283000	1.070	264000	PASS

OVERALL FIT FACTOR = 200892 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject Vanden Eede Date 03 JUIN 1991

Name: VANDEN EEDE
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-24-1991
Test time: 11:50:19 am
Test subject last name: VANDEN EEDE
Test subject first name: PIERRE
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 4
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 750 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	358500	17.500	20400	PASS
BT	333500	6.910	48300	PASS
RS	334000	3.040	110000	PASS
LA	322500	3.540	91300	PASS
BC	308000	3.430	89900	PASS
W4	296500	3.170	93600	PASS
XT	298000	3.080	96800	PASS
SS	309000	6.010	51400	PASS

OVERALL FIT FACTOR = 56593 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject Vanden Eede Date 03 JUIN 1991

Name: VANDEN EEDE
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-24-1991
Test time: 12:10:26 pm
Test subject last name: VANDEN EEDE
Test subject first name: PIERRE
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 4
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 1000 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	338500	4.340	78100	PASS
BT	262000	3.700	71000	PASS
RS	249500	4.640	53900	PASS
LA	260500	3.620	72100	PASS
BC	268000	4.410	60800	PASS
W4	279000	3.440	81100	PASS
XT	302500	4.000	75700	PASS
SS	297500	2.720	109000	PASS

OVERALL FIT FACTOR = 72416 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject Vanden Eede Date 03 JUIN 1991

VSSeR
- R&D et démonstration
- Centre de transposition industrielle et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: NOEL
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-29-1991
Test time: 1:28:53 pm
Test subject last name: NOEL
Test subject first name: ALAIN
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 1
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 250 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	270500	0.220	1230000	PASS
BT	295000	22.100	13300	PASS
RS	302000	4.070	74300	PASS
LA	285000	3.610	79100	PASS
BC	268500	2.330	115000	PASS
W4	297500	1.520	196000	PASS
XT	318500	4.790	66600	PASS
SS	303500	1.130	268000	PASS

OVERALL FIT FACTOR = 59415 PASS
(Calculated per ANSI Z88.2-1980)

Operator_____ Date 03 JUIN 1991

Test Subject_____ Date 03 JUIN 1991

Name: NOEL
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-29-1991
Test time: 1:58:06 pm
Test subject last name: NOEL
Test subject first name: ALAIN
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 1
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 275 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	295500	0.450	657000	PASS
BT	282000	14.200	19800	PASS
RS	292000	4.750	61600	PASS
LA	256500	5.320	48300	PASS
BC	216000	1.970	109000	PASS
W4	238500	2.170	110000	PASS
XT	268000	2.530	106000	PASS
SS	248500	0.720	346000	PASS

OVERALL FIT FACTOR = 66915 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject _____ Date 03 JUIN 1991

VSSeR
· R&D et démonstration
· Centre de transposition industrielle
et de transfert technologique
· Laboratoire d'essais, d'expertises et d'analyses

Name: NOEL
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-29-1991
Test time: 2:13:43 pm
Test subject last name: NOEL
Test subject first name: ALAIN
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 1
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 300 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	288500	0.610	473000	PASS
BT	261000	23.400	11100	PASS
RS	246500	5.650	43700	PASS
LA	223000	3.860	57700	PASS
BC	244500	3.100	78800	PASS
W4	265500	2.740	97000	PASS
XT	260000	2.600	100000	PASS
SS	242500	0.640	379000	PASS

OVERALL FIT FACTOR = 47603 PASS
(Calculated per ANSI Z88.2-1980)

Operator [signature] Date 03 JUIN 1991

Test Subject [signature] Date 03 JUIN 1991

ISSeP
- R&D et démonstration
- Centre de transposition industrielle et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: NOEL
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-29-1991
Test time: 2:30:32 pm
Test subject last name: NOEL
Test subject first name: ALAIN
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 1
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 325 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	259000	0.410	632000	PASS
BT	249000	16.600	15000	PASS
RS	241500	2.390	101000	PASS
LA	240500	2.320	103000	PASS
BC	249500	1.980	126000	PASS
W4	254000	3.380	75300	PASS
XT	236000	3.540	66800	PASS
SS	205000	0.510	402000	PASS

OVERALL FIT FACTOR = 63225 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject _____ Date 03 JUIN 1991

ISSeP
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et de transfert technologique
Laboratoire d'essais, d'expertises et d'analyses

Name: NOEL
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-29-1991
Test time: 2:47:31 pm
Test subject last name: NOEL
Test subject first name: ALAIN
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 1
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 350 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	305000	0.370	826000	PASS
BT	299000	26.300	11300	PASS
RS	301500	2.070	145000	PASS
LA	271000	1.740	155000	PASS
BC	233000	1.330	175000	PASS
W4	276000	1.400	197000	PASS
XT	315000	1.580	199000	PASS
SS	274000	0.620	442000	PASS

OVERALL FIT FACTOR = 66043 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject _____ Date 03 JUIN 1991

ISSeP
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Centre de transposition industrielle
et de transfert technologique
Laboratoire d'essais d'expertises et d'analyses

Name: NOEL
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-30-1991
Test time: 9:38:56 am
Test subject last name: NOEL
Test subject first name: ALAIN
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 1
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 375 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	342500	0.390	880000	PASS
BT	308000	4.030	76500	PASS
RS	306000	2.340	130000	PASS
LA	279500	2.300	121000	PASS
BC	299000	2.160	138000	PASS
W4	329000	1.880	175000	PASS
XT	310000	1.210	257000	PASS
SS	334000	0.360	929000	PASS

OVERALL FIT FACTOR = 166344 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject _____ Date 03 JUIN 1991

ISSeP
- R&D et démonstration
- Centre de transposition industrielle
et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: NOEL
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-30-1991
Test time: 9:53:40 am
Test subject last name: NOEL
Test subject first name: ALAIN
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 1
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 400 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	383000	0.300	1270000	PASS
BT	313500	11.600	27000	PASS
RS	294500	2.070	142000	PASS
LA	279000	2.110	132000	PASS
BC	302500	1.750	173000	PASS
W4	312000	7.810	40000	PASS
XT	300500	0.610	493000	PASS
SS	307500	0.330	934000	PASS

OVERALL FIT FACTOR = 92676 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject _____ Date 03 JUIN 1991

ISSeR
· R&D et démonstration
· Centre de transposition industrielle
et de transfert technologique
· Laboratoire d'accès, d'exposition et d'analyses

Name: NOEL
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-30-1991
Test time: 11:25:35 am
Test subject last name: NOEL
Test subject first name: ALAIN
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 1
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 425 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	306000	0.200	1530000	PASS
BT	290500	4.720	61600	PASS
RS	278500	3.670	75900	PASS
LA	267500	1.480	181000	PASS
BC	255500	3.010	85100	PASS
W4	267000	1.930	138000	PASS
XT	279500	0.660	423000	PASS
SS	266000	0.270	986000	PASS

OVERALL FIT FACTOR = 138019 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject _____ Date 03 JUIN 1991

Name: NOEL
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-30-1991
Test time: 11:39:38 am
Test subject last name: NOEL
Test subject first name: ALAIN
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 1
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 450 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	271500	0.200	1360000	PASS
BT	268500	9.610	28000	PASS
RS	253500	2.230	113000	PASS
LA	249000	1.730	144000	PASS
BC	241000	2.700	89400	PASS
W4	237500	2.730	87100	PASS
XT	239000	0.810	295000	PASS
SS	244000	0.170	1430000	PASS

OVERALL FIT FACTOR = 101267 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject _____ Date 03 JUIN 1991

VSSeR

R&D et demonstration
Centre de transposition industrielle
et de transfert technologique
Laboratoire d'essais, d'expertises et d'analyses

Name: NOEL
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-30-1991
Test time: 11:52:32 am
Test subject last name: NOEL
Test subject first name: ALAIN
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 1
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 475 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	246000	0.270	914000	PASS
BT	241500	7.240	33400	PASS
RS	239500	2.170	110000	PASS
LA	244000	1.840	132000	PASS
BC	249500	3.240	77100	PASS
W4	259500	2.450	106000	PASS
XT	255500	1.900	134000	PASS
SS	242500	1.760	138000	PASS

OVERALL FIT FACTOR = 94324 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject _____ Date 03 JUIN 1991

VSSeP
- R&D et démonstration
- Centre de transposition industrielle et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: NOEL
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-30-1991
Test time: 1:56:08 pm
Test subject last name: NOEL
Test subject first name: ALAIN
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 1
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 500 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	337500	0.330	1020000	PASS
BT	328500	13.700	23900	PASS
RS	306000	1.680	182000	PASS
LA	288500	2.310	125000	PASS
BC	282000	1.410	200000	PASS
W4	298500	1.380	216000	PASS
XT	313500	1.010	310000	PASS
SS	305500	0.160	1910000	PASS

OVERALL FIT FACTOR = 114786 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 0 3 JUIN 1991

Test Subject _____ Date 0 3 JUIN 1991

Name: NOEL
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-30-1991
Test time: 2:11:29 pm
Test subject last name: NOEL
Test subject first name: ALAIN
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 1
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 750 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	294000	1.170	251000	PASS
BT	286500	24.500	11600	PASS
RS	267500	2.310	116000	PASS
LA	245500	2.630	93600	PASS
BC	234500	3.610	65100	PASS
W4	243000	1.810	134000	PASS
XT	253000	1.190	212000	PASS
SS	252000	0.870	290000	PASS

OVERALL FIT FACTOR = 56946 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject _____ Date 03 JUIN 1991

VSSeR
- R&D et démonstration
- Centre de transposition industrielle et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: NOEL
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-30-1991
Test time: 2:30:13 pm
Test subject last name: NOEL
Test subject first name: ALAIN
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 1
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 1000 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	263000	2.700	97500	PASS
BT	251000	10.600	23500	PASS
RS	239000	3.980	60000	PASS
LA	228000	2.890	79000	PASS
BC	216000	3.230	67000	PASS
W4	208500	3.190	65400	PASS
XT	216500	2.800	77300	PASS
SS	225000	2.050	109000	PASS

OVERALL FIT FACTOR = 59497 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject _____ Date 03 JUIN 1991

VSSeP
- R&D et démonstration
- Centre de transposition industrielle et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: NOEL
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-30-1991
Test time: 2:40:08 pm
Test subject last name: NOEL
Test subject first name: ALAIN
ID number: -
Operator name: HOUZIAUX
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 1
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 250 l/min
Additional notes: TRACTION

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
T1	280500	1.420	198000	PASS
T2	259500	2.810	92600	PASS
T3	257500	2.720	94800	PASS

OVERALL FIT FACTOR = 113644 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject _____ Date 03 JUIN 1991

VSSeR
- R&D et démonstration
- Centre de transposition industrielle et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: HOUZIAUX
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-24-1991
Test time: 2:37:04 pm
Test subject last name: HOUZIAUX
Test subject first name: BERNARD
ID number: -
Operator name: VANDEN EEDE
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 3
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 250 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	388000	1.070	362000	PASS
BT	346000	4.330	79900	PASS
RS	319000	3.520	90700	PASS
LA	312000	1.740	179000	PASS
BC	305000	3.110	98100	PASS
W4	348500	2.060	169000	PASS
XT	395000	1.140	346000	PASS
SS	356000	0.530	672000	PASS

OVERALL FIT FACTOR = 152733 PASS
(Calculated per ANSI Z88.2-1980)

Operator Vanden Eede Date 03 JUIN 1991

Test Subject [signature] Date 03 JUIN 1991

VSSeR
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- Centre de transposition industrielle et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: HOUZIAUX
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-24-1991
Test time: 2:53:09 pm
Test subject last name: HOUZIAUX
Test subject first name: BERNARD
ID number: -
Operator name: VANDEN EEDE
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 3
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 275 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	329000	0.610	540000	PASS
BT	283500	5.140	55200	PASS
RS	297500	3.570	83500	PASS
LA	300500	1.960	153000	PASS
BC	282500	6.340	44500	PASS
W4	320000	2.840	112000	PASS
XT	321000	1.170	274000	PASS
SS	280500	0.320	877000	PASS

OVERALL FIT FACTOR = 107138 PASS
(Calculated per ANSI Z88.2-1980)

Operator Vanden Eede Date 03 JUIN 1991

Test Subject Date 03 JUIN 1991

- R&D et démonstration
- Centre de transposition industrielle
et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: HOUZIAUX
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-24-1991
Test time: 3:09:14 pm
Test subject last name: HOUZIAUX
Test subject first name: BERNARD
ID number: -
Operator name: VANDEN EEDE
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 3
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 300 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	299500	0.670	447000	PASS
BT	289000	3.210	90100	PASS
RS	290500	2.940	98900	PASS
LA	288500	1.460	197000	PASS
BC	271500	5.820	46600	PASS
W4	276000	2.850	96900	PASS
XT	286000	1.480	193000	PASS
SS	278500	0.630	442000	PASS

OVERALL FIT FACTOR = 118088 PASS
(Calculated per ANSI Z88.2-1980)

erator Vanden Eede Date 03 JUIN 1991

st Subject Date 03 JUIN 1991

VSSeR
- R&D et démonstration
- Centre de transposition industrielle
et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: HOUZIAUX
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-24-1991
Test time: 3:22:38 pm
Test subject last name: HOUZIAUX
Test subject first name: BERNARD
ID number: -
Operator name: VANDEN EEDE
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 3
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 325 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	277500	0.920	302000	PASS
BT	283500	4.550	62300	PASS
RS	277500	2.890	96100	PASS
LA	255000	1.610	158000	PASS
BC	236500	6.020	39300	PASS
W4	250500	2.650	94800	PASS
XT	265000	1.290	206000	PASS
SS	246500	1.440	171000	PASS

OVERALL FIT FACTOR = 96626 PASS
(Calculated per ANSI Z88.2-1980)

Operator Vanden Eede Date 03 JUIN 1991

Test Subject Date 03 JUIN 1991

VSSeR
- R&D et démonstration
- Centre de transposition industrielle et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: HOUZIAUX
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-29-1991
Test time: 9:04:25 am
Test subject last name: HOUZIAUX
Test subject first name: BERNARD
ID number: -
Operator name: VANDEN EEDE
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 3
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 350 l/min
Additional notes:

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	433500	0.330	1310000	PASS
BT	385000	4.330	89000	PASS
RS	367500	2.800	131000	PASS
LA	381000	1.130	337000	PASS
BC	424000	12.600	33500	PASS
W4	422500	2.650	159000	PASS
XT	357000	0.890	401000	PASS
SS	310500	0.720	431000	PASS

OVERALL FIT FACTOR = 125877 PASS
(Calculated per ANSI Z88.2-1980)

Operator Vanden Eede Date 03 JUIN 1991

Test Subject Date 03 JUIN 1991

VSSeR
- R&D et demonstration
- Centre de transposition industrielle
et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: HOUZIAUX
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-29-1991
Test time: 9:21:50 am
Test subject last name: HOUZIAUX
Test subject first name: BERNARD
ID number: -
Operator name: VANDEN EEDE
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 3
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 375 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	387500	0.200	1940000	PASS
BT	340500	4.150	82200	PASS
RS	330500	2.520	131000	PASS
LA	327500	1.450	225000	PASS
BC	326000	3.870	84200	PASS
W4	350000	1.410	248000	PASS
XT	340500	0.590	577000	PASS
SS	325500	0.420	775000	PASS

OVERALL FIT FACTOR = 183104 PASS
(Calculated per ANSI Z88.2-1980)

Operator Vanden Eede Date 03 JUIN 1991

Test Subject Date 03 JUIN 1991

Name: HOUZIAUX
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-29-1991
Test time: 9:36:35 am
Test subject last name: HOUZIAUX
Test subject first name: BERNARD
ID number: -
Operator name: VANDEN EEDE
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 3
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 400 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	337500	0.510	662000	PASS
BT	306500	2.830	108000	PASS
RS	332500	1.390	239000	PASS
LA	326500	1.110	294000	PASS
BC	285500	4.580	62400	PASS
W4	295500	1.260	234000	PASS
XT	293500	0.800	367000	PASS
SS	278500	0.730	382000	PASS

OVERALL FIT FACTOR = 181830 PASS
(Calculated per ANSI Z88.2-1980)

Operator Vanden Eede Date 03 JUIN 1991

Test Subject Date 03 JUIN 1991

VSSeP
- R&D et démonstration
- Centre de transposition industrielle et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: HOUZIAUX
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-29-1991
Test time: 9:53:54 am
Test subject last name: HOUZIAUX
Test subject first name: BERNARD
ID number: -
Operator name: VANDEN EEDE
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 3
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 425 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	313000	0.400	783000	PASS
BT	278000	2.030	137000	PASS
RS	286500	1.520	188000	PASS
LA	282000	0.830	340000	PASS
BC	239000	16.100	14800	PASS
W4	261500	1.200	218000	PASS
XT	272000	0.850	320000	PASS
SS	227000	0.790	287000	PASS

OVERALL FIT FACTOR = 83681 PASS
(Calculated per ANSI Z88.2-1980)

Operator Vanden Eede Date 03 JUIN 1991

Test Subject Date 03 JUIN 1991

Name: HOUZIAUX
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-29-1991
Test time: 11:21:40 am
Test subject last name: HOUZIAUX
Test subject first name: BERNARD
ID number: -
Operator name: VANDEN EEDE
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 3
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 450 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	344000	0.480	717000	PASS
BT	327000	3.030	107000	PASS
RS	339000	1.870	181000	PASS
LA	342500	1.470	233000	PASS
BC	313500	8.090	38800	PASS
W4	319000	2.210	144000	PASS
XT	329500	0.420	785000	PASS
SS	286000	0.220	1300000	PASS

OVERALL FIT FACTOR = 144619 PASS
(Calculated per ANSI Z88.2-1980)

Operator Vanden Eede Date 03 JUIN 1991

Test Subject Date 03 JUIN 1991

Name: HOUZIAUX
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-29-1991
Test time: 11:37:45 am
Test subject last name: HOUZIAUX
Test subject first name: BERNARD
ID number: -
Operator name: VANDEN EEDE
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 3
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 475 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	314500	0.490	642000	PASS
BT	301000	2.460	122000	PASS
RS	269500	1.570	172000	PASS
LA	279500	0.720	388000	PASS
BC	282500	6.910	40900	PASS
W4	290000	0.810	358000	PASS
XT	279000	0.390	715000	PASS
SS	244500	0.260	941000	PASS

OVERALL FIT FACTOR = 167189 PASS
(Calculated per ANSI Z88.2-1980)

Operator Vanden Eede Date 03 JUIN 1991

Test Subject Date 03 JUIN 1991

- R&D et démonstration
- Centre de transposition industrielle
et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: HOUZIAUX
Next test due: -

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-29-1991
Test time: 11:53:38 am
Test subject last name: HOUZIAUX
Test subject first name: BERNARD
ID number: -
Operator name: VANDEN EEDE
Next fit test due: -
Test agent: Nacl AEROSOL
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 3
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 500 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	302500	0.270	1120000	PASS
BT	273500	1.610	170000	PASS
RS	248000	1.390	178000	PASS
LA	257000	0.540	476000	PASS
BC	257000	12.500	20500	PASS
W4	264000	0.860	307000	PASS
XT	266500	1.670	159000	PASS
SS	236500	0.530	447000	PASS

OVERALL FIT FACTOR = 106584 PASS
(Calculated per ANSI Z88.2-1980)

Operator Vanden Eede Date 03 JUIN 1991

Test Subject Date 03 JUIN 1991

Name: HOUZIAUX
Next test due:

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-31-1991
Test time: 9:36:03 am
Test subject last name: HOUZIAUX
Test subject first name: Bernard
ID number: -
Operator name: DEBOUTEZ
Next fit test due:
Test agent: NaCl aerosol
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 3
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 750 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	234500	1.390	169000	PASS
BT	231000	3.140	73700	PASS
RS	224500	1.370	164000	PASS
LA	217500	1.160	187000	PASS
BC	221500	17.600	12500	PASS
W4	222000	1.940	114000	PASS
XT	211500	1.030	206000	PASS
SS	200500	0.940	214000	PASS

OVERALL FIT FACTOR = 61905 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject _____ Date 03 JUIN 1991

VSSeR
- R&D et démonstration
- Centre de transposition industrielle
et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: HOUZIAUX
Next test due:

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-31-1991
Test time: 9:52:08 am
Test subject last name: HOUZIAUX
Test subject first name: Bernard
ID number: -
Operator name: DEBOUTEZ
Next fit test due:
Test agent: NaCl aerosol
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 3
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 1000 l/min
Additional notes: -

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
SS	225000	6.710	33500	PASS
BT	218500	4.970	44000	PASS
RS	209500	3.740	56100	PASS
LA	193000	3.260	59200	PASS
BC	202000	7.030	28800	PASS
W4	211500	2.700	78600	PASS
XT	201000	2.500	80500	PASS
SS	192500	2.110	91400	PASS

OVERALL FIT FACTOR = 50600 PASS
(Calculated per ANSI Z88.2-1980)

Operator _____ Date 03 JUIN 1991

Test Subject _____ Date 03 JUIN 1991

VSSeR
- R&D et démonstration
- Centre de transposition industrielle et de transfert technologique
- Laboratoire d'essais, d'expertises et d'analyses

Name: HOUZIAUX
Next test due:

TSI MODEL 8015 PORTACOUNT FIT-TESTING SOFTWARE
Version 2.0 S/N 333
VANDEPUTTE N.V.S.A.

FIT TEST REPORT

Test date: 05-31-1991
Test time: 10:04:46 am
Test subject last name: HOUZIAUX
Test subject first name: Bernard
ID number: -
Operator name: DEBOUTEZ
Next fit test due:
Test agent: NaCl aerosol
Test device: TSI MODEL 8010 PORTACOUNT

RESPIRATOR ID
Size: 3
Model: MURUROA
Manufacturer: DELTA PROTECTION
Approval number: -

Additional notes: 250 l/min
Additional notes: TRACTION

TEST DATA

Pass/Fail level: 10000
Test cycles....: 1

Ex.	Ambient (Part/cc)	Mask (Part/cc)	Fit Factor	Pass/Fail
T1	245500	0.880	279000	PASS
T2	248500	1.020	244000	PASS
T3	272500	0.860	317000	PASS

OVERALL FIT FACTOR = 276825 PASS
(Calculated per ANSI Z88.2-1980)

Operator_____ Date 03 JUIN 1991

Test Subject_____ Date 03 JUIN 1991