



Mask Performances and Specifications

PENETRATION TIME OF WARFARE CHEMICALS

Mustard Gas Resistance

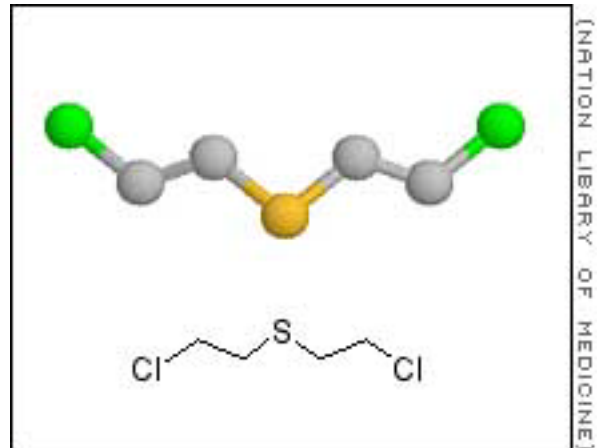
Mustard gas penetration on the SGE masks, and in particular on the butyl rubber face-seal of the SGE 150 and SGE 400/3 BB masks and the visor coating on the SGE 400 - SGE 400/3 - SGE 400/3 BB masks, had the following results:

Test made by:

Gruppe fuer Ruestungsdienste Laboratory - AC

R&D Management

Polymers and protective raw materials



Customer FA 36 individual protection

Subject: masks SGE 1000

Materials quality: different

Supplier: S.G.E.

Sample #: sample

Charge: IS-89-200

Packing slip: 4.4.1989

Prescription testing rules: material identifications

Test made by: Liechti, Hans Hulrich

Receipt note: 04.20.1989

Internal receipt #: 89-256

Distributor: IS, P+SW

Mustard gas resistance L000282

Sample shape: round, diam. 44 mm

Test conditions: 30 C, mustard gas, chlorobenzene = 80:20

VISOR

(#1), 2.30mm thickness-go through as gas ⇒50 h

(#1), 2.30mm thickness-go through as gas ⇒50 h

Face seal

(#3), 2.68mm thickness-go through as gas ⇒50 h

(#3), 2.68mm thickness-go through as gas ⇒50 h

(#3), 2.68mm thickness-go through as gas ⇒50 h

The SGE masks are fully resistant to all used means of decontamination, including boiling water.

CARBON DIOXIDE CONTENT

Inhaled air: 0,44%

Anhang 2

Gruppe fuer Buestungsdienste
AC-Laboratorium
Fachsektion Technik
Polymer- und Schutzwerkstoffe

Spiez, 26.05.1989

PRUEFERESULTATE

Auftraggeber: FA36, Individualschutz
Gegenstand: ABC-Schutzmaske SGE 1000
Materialqualitaet: Diverse
Lieferant: Societa Generale Elastomeri SPA Italien
Losnummer: Muster
Eingangnummer Auftrag: IS-89-200
Lieferschein: vom 4.4.89 STHE
Masse:
Pruefung nach Vorschrift : Materialidentifikation
geprueft durch: Liechti, Hans-Ulrich
Eingangsdatum: 24.04.1989
interne Auftragsnummer ..: 89- 256

VERTEILER : IS, P+SW

I. YPERIT-RESISTENZZEIT L000282

PROBEFORM : Runden Durchmesser = 44 mm
PRUEFEBEDINGUNGEN : 30 Grad C, Yperit : Chlorbenzol = 80 : 20

Gesichtstueck (Nr. 1), 2.30 mm dick. Durchbruch gasfoermig n. > 50 h
do (Nr. 1), 2.30 mm " " " " n. > 50 h

Dichtraemen (Nr. 3), 2.68 mm dick. Durchbruch gasfoermig n. > 50 h
do (Nr. 3), 2.43 mm " " " " n. > 50 h
do (Nr. 3), 2.10 mm " " " " n. > 50 h

FIELD AND QUALITY OF VISION

The full transparent body allows a much wider field of vision. The quality of vision is not impaired in cold environment. The SGE masks are supplied with an easily removable corrective lens system using standard lenses.

FIELD OF VISION (Eye area only)

Total (red + pink + yellow): 87%

Stereo field (pink): 80%

FOGGING UP OF VISOR

(Tested up to -30° C)

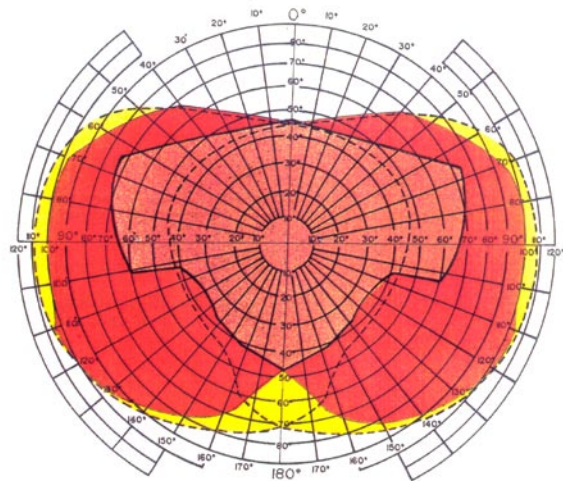
- Starting cold: no fogging up
- Starting warm: no fogging up

LIGHT TRANSMITTANCE: 92%

CAMPO VISIVO
(zona ottica)

- Totale
- Sovrapposto

87%
80%



COMMUNICATION

Microphone, earphones and hearing protection devices can be easily fitted to the mask. Due to the position and type of speech membrane, loud speaker use is easy and efficient.




PROTECTION AGAINST CONVENTIONAL WEAPONS

The visor protects not only the eyes, but the whole face against fragments, stones, splinters caused by explosions. It can stand with no damage (break or perforation) to the impact of a steel sphere 6.35 mm caliber bullet hitting the mask at any point at the speed of more than 150 m/sec. Blast effects do not impair the protection performances as all the membranes are able to stand significant pressure. The speech diaphragm in particular is the open type and does not use the old rigid metal membrane.



Resistance to Impact:

<p>ANNEX 10 Page 1</p> <p>Ruggedness (ballistic protection) of the eyeglasses of the SGE 1000 NBC respirator</p> <p>Introduction</p> <p>At the request of Mr Stradella (SGE, Sant'Oicese ITALY) the ballistic protection for the eyes as offered by the SGE 1000 NBC respirator was determined.</p> <p>Method</p> <p>The tests were performed according to STANAG 4296 4th preliminary draft. The fragment used had a weight of 325 mg. In view of the large area of the eye glass part of the face piece it was found that several shots could be fired on a single mask. The V_{50} value was determined twice. The results are shown in Table 2</p> <p>Table 2 Results of the ballistic protection test (ruggedness) on the SGE 1000 NBC respirator</p> <table border="1"> <thead> <tr> <th>Mask number 180297 Shot number (-)</th> <th>Speed (m/s)</th> <th>Penetration (yes/no)</th> </tr> </thead> <tbody> <tr><td>1</td><td>167</td><td>no</td></tr> <tr><td>2</td><td>187</td><td>no</td></tr> <tr><td>3</td><td>281</td><td>yes</td></tr> <tr><td>4</td><td>244</td><td>yes</td></tr> <tr><td>5</td><td>259</td><td>yes</td></tr> <tr><td>6</td><td>256</td><td>yes</td></tr> <tr><td>7</td><td>229</td><td>no</td></tr> <tr><td>8</td><td>223</td><td>no</td></tr> <tr><td>9</td><td>237</td><td>no</td></tr> </tbody> </table>	Mask number 180297 Shot number (-)	Speed (m/s)	Penetration (yes/no)	1	167	no	2	187	no	3	281	yes	4	244	yes	5	259	yes	6	256	yes	7	229	no	8	223	no	9	237	no	<p>ANNEX 10 Page 2</p> <p>For mask number 180297 the V_{50}-value was determined from shots numbers 4,5,6,7,8 and 9 and is calculated to be 260 m/s. For mask number 180309 the V_{50}-value was determined from shots numbers 1,2,3,4,5, and 6 and is calculated to be 261 m/s.</p> <p>Author: Dr. H. Jäger </p> <p>Date : September 25, 1992</p>
Mask number 180297 Shot number (-)	Speed (m/s)	Penetration (yes/no)																													
1	167	no																													
2	187	no																													
3	281	yes																													
4	244	yes																													
5	259	yes																													
6	256	yes																													
7	229	no																													
8	223	no																													
9	237	no																													

HEAT RESISTANCE


The masks in all their parts are flame resistant and heat-radiation resistant. It does not melt or catch fire when tested accordingly with the EN 136 specification and the German Fire-Brigade radiation test. (800°C flame for 5 sec., 200°C for 6 minutes.)

DRINKING FACILITIES


The SGE 400, 400/3, & 400/3 BB may be supplied with a drinking system (see mask accessories).

WEARING AND USE

The SGE masks have been developed to provide 5 days of continuous wearing. Thanks to the new concept of rigid body, it has been possible to adopt an exceptionally comfortable face-Seal.



Università degli Studi di Genova
via Balbi, 5 - 16126 Genova
tel. +39 01020991 fax +39 0102099227 P.IVA 00754150100



- **DISM - University of Genova**

- Genova September 22, 1992

- **Test Certification**

- **Purpose:** To test the ability of wearing the mask for a long time; specifically measuring mechanical tolerance and psychological reaction during different environmental conditions.

- **Test Procedure:**
 - The participants wore the mask w/out removing it for 5 consecutive days at a temperature ranging from 20-45 degrees C. Eating during this period was accomplished through liquid food.

- **Test Evaluation:**
 - The test have been evaluated on the following: wearing the mask during the day and night; the comfort, level; the visual field, and breathing effort and heart rate results in calm and stressful conditions.

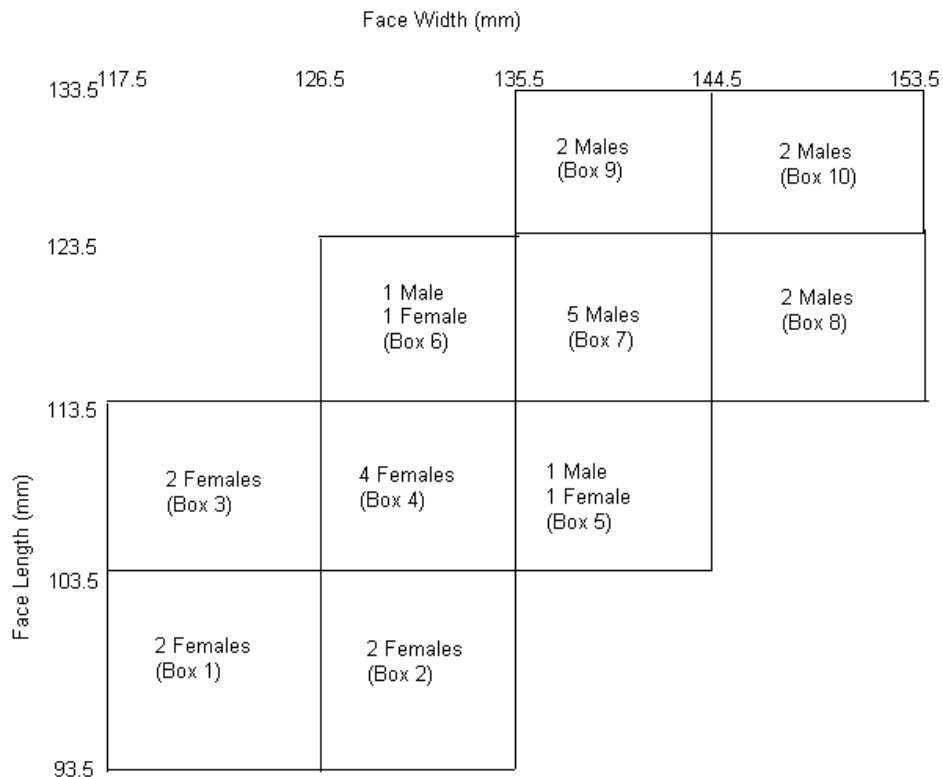
- **Test Results:**
 - In general, the psychological and physical reactions of the participants were excellent. There were no skin reactions found. The ability to function physically was not affected by the environmental conditions.

- **Conclusion:**
 - From these test we may conclude that your mask NBC type 1000 is well tolerated by young people and in healthy conditions

- Lab Manager: Prof Vito Burasco,
- Breathing Physiopathologic associated professor

LEAKAGE TEST/SIZES

The protection factor allowed by the SGE mask have been proved by several certification laboratories worldwide. The most recent survey has been made by SBCCOM at Aberdeen Proving Ground (MD) on November 22nd 2003 in according with the new CBRN norms. The Procedure is the N° RCT- CBRN -STP-001. In accordance with the Los Alamos Scientific Laboratory, 25 member (male and female) Panel for testing of full face masks. LARGE of SGE 400/3 BB's have been submitted to a complete test of leakage.



Twenty-five participants performed eleven standard exercises, 1 minute long (each), using a routine devised to stress the face seal of the respiratory face-piece. During the test, each test subject is asked to perform normal breathing; deep breathing; turning head side to side; moving head up and down; reciting the rainbow passage; sighting the rifle; reaching for the floor and ceiling; getting on hands and knees; grimacing exercises; and climbing the stairs at regular pace.

The maximum PF is 100000.

The minimum, acceptable PF is 500 on 95% of samples.

The following table shows:

- The date of the test
- The time of the test
- The mask number
- The subject number
- The head size in accordance with the Los Alamos table
- The trial n°
- The average fit
- The results for each of the 11 tests

Mask Performance & Specifications

SBCOM Table

DATE	TIME	MASK	SUBJECT	head size	CONCEPT	TRIAL	AVEFIT	EXRCS1	EXRCS2	EXRCS3	EXRCS4	EXRCS5	EXRCS6	EXRCS7	EXRCS8	EXRCS9	EXRCS10	EXRCS11
11/19/2003	14:37:05	A1	1	9	1	1	74994.5	100000.0	100000.0	100000.0	100000.0	21423.7	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0
11/19/2003	14:55:59	A1	1	9	1	2	82395.0	100000.0	100000.0	100000.0	100000.0	90044.2	67118.3	36365.7	100000.0	100000.0	100000.0	100000.0
11/22/2003	10:41:25	A4	11	4***	1	1	6064.9	15732.7	9608.4	19698.6	5009.1	12634.5	14974.8	12198.5	13343.0	3394.6	1967.9	3447.6
11/22/2003	11:06:35	A4	11	4***	1	2	852.6	5001.7	3256.8	6422.1	4424.7	3815.7	14875.0	1690.9	6951.6	3669.1	101.8	1166.5
11/22/2003	11:30:36	A4	11	4	1	3	97133.8	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	75495.3	100000.0	100000.0	100000.0	100000.0
11/22/2003	10:41:26	A11	12	5	1	1	2623.7	752.1	5547.0	1290.5	3589.0	10528.1	2246.2	3208.9	6493.7	5114.6	4809.1	4546.7
11/22/2003	11:06:36	A11	12	5	1	2	2453.3	2928.2	2591.3	1278.2	4809.0	7649.6	1290.4	1921.2	2082.0	3807.6	2926.2	3917.9
11/22/2003	10:41:28	A3	13	6**	1	1	666.3	771.6	707.2	770.0	731.2	581.3	639.2	557.5	603.3	705.9	579.1	797.9
11/22/2003	11:06:37	A3	13	6	1	2	9041.7	9181.7	9554.3	11556.6	13430.6	8501.4	8841.7	6934.4	7683.2	12089.7	6959.0	9048.4
11/22/2003	11:30:45	A1	14	5****	1	1	5847.2	3530.4	3343.3	3570.8	3923.4	3779.8	4882.7	15838.8	20152.0	15838.1	17567.6	16186.9
11/22/2003	11:55:55	A1	14	5****	1	2	1413.3	1079.1	1321.7	1152.8	1192.2	1183.2	1230.0	2206.8	1918.7	1790.6	1702.6	1624.5
11/22/2003	11:30:38	A8	14	5	1	3	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0
11/22/2003	11:52:59	A1	14	5	1	4	96781.1	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	73214.5	100000.0	100000.0	100000.0
11/22/2003	11:30:46	A8	15	6	1	1	4535.7	4689.7	4281.3	4433.8	14829.8	20086.3	8618.4	5333.1	3521.2	3555.8	2609.5	2606.5
11/22/2003	11:55:57	A8	15	6	1	2	5537.0	100000.0	100000.0	100000.0	100000.0	100000.0	5025.2	2005.6	3091.0	3558.9	3050.8	3259.9
11/22/2003	11:30:48	A7	16	7	1	1	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0
11/22/2003	11:55:58	A7	16	7	1	2	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0
11/22/2003	11:30:49	A10	17	7*	1	1	17.8	16.7	20.3	19.6	17.3	27.0	16.0	15.7	16.1	17.2	16.6	17.8
11/22/2003	11:55:59	A10	17	7*	1	2	256.5	198.9	293.0	255.0	216.7	518.5	281.0	245.9	217.6	215.4	299.8	264.1
11/22/2003	11:53:00	A10	17	7	1	3	18735.2	22538.5	20032.4	21600.1	29351.0	17451.7	27068.6	16293.0	14514.2	17908.5	14496.8	15838.2
11/22/2003	10:32:04	A9	18	8	1	1	48494.1	63549.7	76810.1	97063.8	58334.4	33335.6	100000.0	37936.8	30934.4	50726.3	34449.8	43091.6
11/22/2003	10:55:43	A9	18	8	1	2	36982.2	100000.0	73604.3	18816.2	34315.2	40455.5	62416.7	31129.9	29793.2	39894.1	27399.6	42417.0
11/22/2003	10:32:05	A6	19	8	1	1	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0
11/22/2003	10:55:44	A6	19	8	1	2	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0
11/19/2003	15:42:28	A2	2	5	1	1	72692.1	100000.0	100000.0	100000.0	100000.0	100000.0	20506.0	79637.0	100000.0	100000.0	100000.0	100000.0
11/19/2003	16:05:07	A2	2	5	1	2	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0
11/22/2003	10:32:07	A12	20	9	1	1	26747.3	29455.0	26905.7	25412.4	26178.1	26077.4	28804.0	25018.4	24618.5	27056.0	27765.5	27811.1
11/22/2003	10:55:45	A12	20	9	1	2	22294.0	30860.4	20115.8	25513.5	23952.6	24391.5	24517.3	21506.8	19056.1	22374.4	20128.0	18112.3
11/22/2003	10:32:08	A2	21	10	1	1	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0
11/22/2003	10:55:46	A2	21	10	1	2	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0
11/19/2003	16:38:43	A3	3	3	1	1	530.1	560.1	477.7	463.9	624.9	654.1	517.9	491.6	479.4	530.2	501.3	603.8
11/19/2003	16:58:02	A3	3	3	1	2	756.6	801.2	707.6	650.4	850.3	871.5	646.8	660.2	723.1	864.0	795.9	863.1
11/19/2003	16:38:44	A4	4	7	1	1	64753.1	100000.0	22799.5	100000.0	64191.0	32854.9	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0

Mask Performance & Specifications

11/19/2003	16:58:04	A4	4	7	1	2	83286.5	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	64506.9	37633.7	100000.0	100000.0	100000.0	
11/19/2003	16:58:05	A5	5	5	1	1	29308.4	52430.5	56220.5	30006.3	31597.0	53437.2	35237.1	15599.5	17179.1	43718.2	17337.4	42509.6	
11/19/2003	17:59:27	A8	5	4	1	1	99794.7	100000.0	100000.0	100000.0	100000.0	97787.1	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	
11/19/2003	17:37:49	A5	5	5	1	2	35009.2	64920.6	87471.0	30300.9	24671.1	29258.3	31711.9	21270.9	22219.6	62955.5	52581.2	47171.5	
11/19/2003	17:37:50	A6	6	10	1	1	73917.8	100000.0	100000.0	100000.0	100000.0	100000.0	62299.7	51326.2	100000.0	100000.0	100000.0	30048.8	
11/19/2003	17:59:28	A6	6	10	1	2	93925.4	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	58431.2	100000.0	100000.0	100000.0	100000.0	
11/19/2003	17:37:52	A7	7	4	1	1	13895.4	100000.0	100000.0	26216.9	68005.7	88143.0	2296.8	27019.3	100000.0	31111.2	5467.7	100000.0	
11/19/2003	17:59:29	A7	7	4	1	2	180.5	640.1	256.5	788.6	480.5	195.9	146.3	298.5	1810.3	508.5	45.4	81.2	
11/19/2003	18:21:11	A7	7	4	1	3	88972.1	100000.0	100000.0	100000.0	100000.0	42311.5	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	
11/19/2003	18:21:09	A8	8	4	1	2	34334.9	29633.3	22904.3	33483.9	45008.6	9310.3	29871.8	100000.0	100000.0	100000.0	100000.0	100000.0	
11/19/2003	18:21:10	A9	9	2	1	1	17.1	92.6	98.9	62.7	11.2	50.5	57.3	5.9	7.5	18.5	10.8	33.6	
11/19/2003	18:40:23	A9	9	2	1	2	184.4	53.1	78.6	139.1	132.3	190.1	213.6	1044.3	3615.3	929.8	2117.7	1619.9	
11/22/2003	11:30:39	A7	16	7	2	1	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0
11/22/2003	11:53:01	A7	16	7	2	2	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0
11/22/2003	12:19:59	A9	18	8	2	1	32213.7	100000.0	100000.0	23446.4	39253.3	30771.8	29552.2	17605.7	20634.2	39099.9	34769.9	36485.2	
11/22/2003	12:42:21	A9	18	8	2	2	36160.1	45673.2	63029.1	19671.2	34881.6	39372.8	100000.0	28757.1	33862.5	47773.2	27518.6	33373.5	
11/22/2003	12:20:00	A6	19	9	2	1	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0
11/22/2003	12:42:22	A6	19	8	2	2	48786.0	7969.7	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0
11/22/2003	12:20:01	A12	20	9	2	1	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0
11/22/2003	12:42:23	A12	20	9	2	2	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0
11/22/2003	12:20:02	A2	21	10	2	1	98975.5	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	89778.1
11/22/2003	12:42:24	A2	21	10	2	2	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0	100000.0

*after the first two trials on Subject 17 using Mask A10, a large piece of material was removed from a side port plug

**after the first trial on Subject 13, the sampling line was replaced; the higher fit on the second trial MAY have been the result of a bad sampling line

(it can be argued that the failed data point was also due to fit failure, and redonning of the mask caused the passing second data point)

***after the first two trials on Subject 11 using Mask A4, loose canister was tightened, and a visibly damaged sample line was replaced

****after the first two trials on Subject 14 using Mask A1, an unseated gasket was detected in the side port; Subject 14 was then tested once in Mask A8 and then in a repaired Mask A1

Mask fit failure

Data not used due to failed RDECOM Equipment

Manufacturer QC problem caused mask failure