

**NEXTTEQ**<sup>®</sup>

BETTER TECHNOLOGY. BETTER QUALITY.  
BETTER VALUE.

# VeriFit<sup>®</sup>

*Irritant Smoke Generators  
For Respirator Fit Testing*

PN 50811000-310N



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VeriFit Irritant Smoke Generators are manufactured by Nextteq LLC in the United States of America.

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PN 50811300-340N Rev F 5/09

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**NOTE:**

For your convenience, the Sensitivity Check Protocol (PN 50811340-340N) is available on our website. Please visit [www.nextteq.com](http://www.nextteq.com)

OSHA has reviewed VeriFit Irritant Smoke Generators and determined that they are compliant with OSHA 29 CFR 1910.134.

## I. INTRODUCTION



The VeriFit Irritant Smoke Generators for Respirator Fit Testing (**Part Number 50811000-310N**) include the following:

1. Ten (10) Complete Fit Testing Kits
2. One (1) VeriFit storage box
3. One (1) VeriFit Irritant Smoke Generator Manual (Part Number 50811300-340N)

## II. SPECIFICATIONS

### Weight:

0.15 oz ( $\pm 0.009$ )  
4.3 g ( $\pm 0.25$ )

### Dimensions:

Overall Length 5.35 in ( $\pm 0.05$ ) /  
136 mm ( $\pm 1.3$ )

#### Bellows

Length 1.2 in ( $\pm 0.025$ ) /  
30 mm ( $\pm 0.5$ )

Outside Dimension 0.95 in ( $\pm 0.025$ ) /  
24 mm ( $\pm 0.5$ )

Capacity 8.0 cc ( $\pm 0.1$ )

#### Barrel

Length 1.3 in ( $\pm 0.025$ ) /  
33 mm ( $\pm 0.5$ )

Outside Dimension 0.5 in ( $\pm 0.025$ ) /  
12.5 mm ( $\pm 0.5$ )

Active Ingredient: Stannic Chloride ( $\text{SnCl}_4$ )

Fluid Admitted: Air

Number of Generated Smoke Strokes: 300

*Smoke generating strokes increase by ~10% at 20% relative humidity*

*Smoke generating strokes decrease by ~10% at 80% relative humidity*

Color of Generated Smoke: White

Operating Temperature: 32° F to 104° F / 0°C to 40°C

*As temperature decreases, smoke lasts longer and is less intense*

Operating Relative Humidity: 10% to 95% RH

Storage Temperature: 41°F to 77°F / 5°C to 25°C

Storage Condition: Secure, dry, cool space away  
from direct light

Warranty: 90 days



### III. WARNINGS

1. Before using this product, read, understand, and comply with all labels, warnings, instructions, and other literature accompanying the product including but not limited to this manual, the MSDS in this manual (also available as PN 50811320-340N), and the Sensitivity Check Protocol (PN 50811340-340N - see [www.nextteq.com](http://www.nextteq.com)). Failure to comply with all warnings and instructions could cause property damage, serious injury or death.
2. Operate the product in strict compliance with manufacturer's specifications and instructions. Not using this product in accordance with the manufacturer's specifications and instructions may result in property damage, serious injury, or death.
3. Be thoroughly familiar with this product, the manufacturer's instructions and warnings, and associated equipment before using this product.
4. Inspect this product and associated equipment for damage or defects before using. Do not proceed with Respirator Fit Testing or Sensitivity Check if this product or associated equipment is damaged or defective.
5. Keep all bystanders away from this product during use or testing.
6. Do not remove, alter, or cover any label, instruction, or warning.
7. Use only in well-ventilated areas to prevent the buildup of smoke or fumes. The buildup of smoke or fumes may increase the concentration of the smoke or fumes to dangerous levels, resulting in property damage, serious injury or death.
8. Do not use under a hood or other enclosed area. Do not use in a confined space. Use under a hood, other enclosure, or in a confined space may increase the concentration of fumes or smoke to dangerous levels, resulting in property damage, serious injury or death.

9. Do not breathe the fumes or smoke directly. Avoid prolonged breathing of smoke or fumes. Prolonged breathing of smoke or fumes may result in property damage, serious injury or death.
10. Do not blow smoke or fumes directly into a person's unprotected face. Blowing smoke or fumes directly into a person's unprotected face could result in property damage, serious injury or death.
11. Wear respiratory protection in accordance with OSHA 29 CFR 1910.134 and NIOSH 42 CFR 84 when directly exposed to fumes or smoke.
12. Wear eye protection in accordance with OSHA standards when exposed to fumes or smoke. If contact lenses are worn, they should be worn in strict compliance with applicable NIOSH, OSHA, and ACOEM standards.
13. Do not blow smoke directly into eyes or onto skin. Avoid smoke contacting eyes or skin. Eyes should be tightly closed and remain closed during Respirator Fit Testing and until smoke clears. Blowing smoke into a person's eyes could result in serious injury.
14. Respirator Fit Testing should be performed in strict compliance with OSHA 29 CFR 1910.134 and OSHA 29 CFR 1910.139.
15. Only use the flow rates specified in OSHA 29 CFR 1910.134 and OSHA 29 CFR 1910.139. If the generator is operated at non-specified flow rates, smoke or fume concentrations may increase to dangerous levels, resulting in property damage, serious injury or death.
16. Only operate the smoke generator in strict compliance with the manufacturer's specifications and instructions. If the smoke generator is not operated in accordance with the manufacturer's specifications and instructions, smoke or fume concentrations may increase to dangerous concentrations, resulting in property damage, serious injury or death.
17. Do not operate this product closer to test subjects or test administrator than the specified by OSHA 29 CFR 1910.134, OSHA 29 CFR 1910.139, and the manufacturer. Operating at non-specified distances could increase smoke or fume concentrations to dangerous levels, resulting in property damage, serious injury or death.

18. The smoke generator contains stannic chloride that combines with humidity to liberate a white smoke consisting of hydrogen chloride and tin compounds.
  - A. If inhaled and repeated coughing or trouble breathing occurs, immediately remove test subject to fresh clean air. Restore and support breathing as necessary.
  - B. If coughing or breathing difficulty persists, immediately provide oxygen and immediately contact a physician.
  - C. If smoke contacts eyes, immediately flush eyes with copious amounts of clean running water for fifteen minutes, including under eyelids, and immediately contact a physician.
  - D. If smoke contacts a large area of skin, contacts skin for a prolonged period, or if irritation persists, immediately flush affected area with copious amounts of clean running water for fifteen minutes and immediately contact a physician.
19. Do not use this product for Respirator Fit Testing or Sensitivity Check if any of the following conditions are present:
  - A. The test subject has a pre-existing respiratory, cardiovascular, or bronchial medical condition.
  - B. The test subject is under a physician's care for a respiratory, cardiovascular, or bronchial ailment; sinus, nasal or ear infection; or impaired immune system.
  - C. The test subject is hypersensitive or allergic to stannic chloride, stannic oxide, hydrogen chloride, tin tetrachloride, tin compounds, or metal chloride.
  - D. The test subject has failed the medical evaluation specified by OSHA 29 CFR 1910.134.

Failure to comply with this warning could cause property damage, serious injury or death.

20. Do not remove or adjust respirator during Respirator Fit Testing or in the presence of smoke or fumes. Move to an area of fresh clean air before removing or adjusting respirator.
21. NIOSH-approved HEPA or P100 series filters suitable for stannic chloride or P100 equivalent filters specified by NIOSH should be used in all fit testing.

22. Do not eat, drink, take internally, inhale smoke into mouth, or consume contents of smoke generator as it may result in property damage, serious injury or death.
23. Do not heat or burn the smoke generators or throw smoke generators into a fire. Smoke generators may emit dangerous toxic fumes.
24. After using smoke generator or after being exposed to smoke or fumes, wash face, hands, and any areas exposed to fumes or smoke thoroughly with soap and water before eating, drinking, smoking, applying cosmetics, inserting or removing contact lenses, or touching eyes or mucous membranes.
25. Do not spray smoke or fumes of smoke generator into ventilation ducts unless you have first checked to ensure the smoke will not be blown onto unprotected people.
26. Do not spray smoke in and/or over areas that have the possibility of contaminating food or beverages, surfaces that come in contact with food or beverages, food or beverage containers, and /or food preparation, serving, or holding areas.
27. This product is only for sale to, for use by, and for storage by trained, qualified, technically competent, and professional commercial, industrial or military, or government users.
28. Do not dispose of expired or used smoke generators in domestic or residential waste. Smoke generators must be disposed of properly because they contain chemicals. Dispose of smoke generators in strict accordance with all federal, state, and local statutes, ordinances, and regulations.
29. Smoke generators are primarily composed of plastic, glass, and chemicals. Keep smoke generators out of the reach of children.
30. During the Sensitivity Check, do not place the open end of the smoke generator closer than 36 inches from the test subject's face. Do not point the open end of the smoke generator toward the test subject's face. If the smoke generator is placed too close to the test subject's face or points toward the test subject's face, smoke or fumes concentrations may increase to dangerous levels, resulting in property damage, serious injury or death.

31. Perform the Respirator Fit Test and/or Sensitivity Check strictly in accordance with OSHA 29 CFR 1910.134, this manual, Nextteq's Sensitivity Check Protocol (PN 50811340-340N - see [www.nextteq.com](http://www.nextteq.com)), and other instructions provided by Nextteq LLC.
32. Prior to starting the Respirator Fit Test or the Sensitivity Check:
  - A. Instruct the test subject to immediately step into fresh, clean air in the event of any exposure or response to irritant smoke.
  - B. Give the test subject a complete and accurate description of the following:
    - I. The Respirator Fit Test
    - II. The Sensitivity Check
    - III. The test subject's duties and responsibilities in accordance with this manual, the Sensitivity Check Protocol (PN 50811340-340N - see [www.nextteq.com](http://www.nextteq.com)) and OSHA 29 CFR 1910.134
    - IV. The risk of serious injury or death if the instructions or warnings are not followed
33. Do not start or continue the Respirator Fit Test or the Sensitivity Check if any of the following occurs:
  - A. The test subject does not pass the initial Sensitivity Check, as outlined in OSHA 29 CFR 1910.134.
  - B. The test subject does not pass the User Seal Check, as outlined in OSHA 29 CFR 1910.134.
  - C. There is any hair, clothing, caps, eyeglasses, hearing aids or other objects between the test subject's skin and the respirator face piece seal surface or any object that interferes with valve functions.
  - D. The test subject has not correctly donned, positioned, and adjusted the respirator in accordance with OSHA 29 CFR 1910.134.
  - E. The test subject has not passed a medical evaluation in accordance with OSHA 29 CFR 910.134 prior to this test.

- F. The test subject is in poor health or any of the following conditions are present:
    - I. The test subject has a pre-existing respiratory, cardiovascular, or bronchial medical condition.
    - II. The test subject is under a physician's care for a respiratory, cardiovascular, or bronchial ailment; sinus, nasal or ear infection; or impaired immune system.
    - III. The test subject is hypersensitive or allergic to stannic chloride, stannic oxide, hydrogen chloride, tin tetrachloride, tin compounds, or metal chloride.
  - G. The Respirator Fit Test and/or Sensitivity Check Administrator is not an experienced, trained, qualified, professional Respirator Fit Test and/or Sensitivity Check Administrator able to perform his or her duties in accordance with OSHA 29 CFR 1910.134 including, but not limited to, correctly performing the following:
    - I. Instructing the test subject.
    - II. Demonstrating the techniques for performing the tests.
    - III. Conducting the tests.
    - IV. Preparing test materials.
    - V. Inspecting and testing all the equipment and components and confirming that all equipment and components are in good working order and may be used together.
    - VI. Demonstrating the proper technique to generate a small, weak, dilute stream of irritant smoke with a smoke generating device.
    - VII. Recognizing an invalid test.
34. Do not distribute VeriFit Irritant Smoke Generators without a complete set of Nextteq instructions, warnings, specifications, and MSDS. Distributing VeriFit Irritant Smoke Generators without a complete set of warnings, instructions, specifications, and MSDS may result in misuse and lead to serious injury or death.
35. Do not expose the test subject too frequently to irritant smoke. Do not re-expose the test subject to irritant smoke until the test subject specifically and expressly confirms that all effects from the prior exposure to irritant smoke have ceased.

36. A test subject's sensitivity to irritant smoke varies based upon size, weight, heredity, age, health, and other factors. Some test subjects may respond to a greater degree than others to irritant smoke. During the Sensitivity Check, the administrator shall consider the test subject's sensitivity and be careful to generate a small, weak, dilute stream of smoke that is the absolute minimum concentration of irritant smoke necessary to elicit a response from the test subject.
37. VeriFit Irritant Smoke Generators are only to be used for Respirator Fit Testing and Sensitivity Check in strict compliance with OSHA 29 CFR 1910.134, this manual, Nextteq's Sensitivity Check Protocol (PN 50811340-340N - see [www.nextteq.com](http://www.nextteq.com)), and other instructions provided by Nextteq, LLC.
38. Do not substitute, modify, or omit parts or components. Use exact manufactured replacement parts in configurations specified by the original manufacturer. Substitution of unauthorized parts may result in accidents, serious injury, or death.
39. The VeriFit Irritant Smoke Generator has an internal volume of approximately 8 milliliters. The pump produces a volume of approximately 7 milliliters with each complete and uniform bulb compression.
40. To produce a flow rate of approximately 200 milliliters per minute with the VeriFit Irritant Smoke Generator, uniformly and completely compress the bulb smoothly and continuously every 2 seconds for 1 minute.
41. To produce a small, weak dilute concentration of smoke using the VeriFit Irritant Smoke Generator, slowly and gently compress the bulb at a controlled, uniform, steady rate until a small, weak, diluted stream of smoke is produced that is the absolute minimum necessary to elicit a response from the test subject being tested. Then immediately stop compressing the bulb and release the partially compressed bulb. No additional smoke is to be generated.
42. Do not dispose of irritant smoke generators with turpentine, alcohols, or amines. Exposure to turpentine, alcohols, or amines may result in chemical reaction and fire, resulting in serious injury or death.

43. Wear safety gloves in accordance with OSHA standards and good practice when using VeriFit Irritant Smoke Generators.
44. This product(s) is designed for qualitative respiratory fit testing in ambient atmospheres of 32°F to 104°F, with 10% relative humidity to 95% relative humidity. Do not use this product(s) in atmospheres of less than 40% relative humidity. Use of this product(s) below 40% relative humidity may increase the irritant effect of the smoke.
45. Do not fit test N95, R95, P95, N99, R99, or P99 particulate respirators with VeriFit Irritant Smoke Generators. Fit testing the particulate respirators listed above with VeriFit Irritant Smoke Generators may result in serious personal injury, sickness, and/or death.
46. Ship or transport this product in accordance with all federal, state and local laws and regulations, including federal DOT regulation 49 CFR and OSHA and FAA regulations.
47. Keep this manual and all Nextteq LLC instructions and warnings available for reference and training.
48. Check with your transportation provider before bringing VeriFit Irritant Smoke Generators on an airplane, train, bus, or other method of transportation.
49. Remember the product is only as safe as the product user.
50. If you are confused about the proper use of VeriFit Irritant Smoke Generators for Respirator Fit Testing, any instructions or warnings or labels, specifications, test protocols, or manuals, you should call Nextteq LLC at one of the following telephone numbers: toll free 877-312-2333 or local number 813-249-5888 before using or attempting to use this product.

## **VI. OWNER / USER RESPONSIBILITY**

1. The OWNER and/or USER must have an accurate and complete understanding of the manufacturer's warnings and additionally the manufacturer's operating instructions before using this product. Warning information should be emphasized and understood.
2. If the operator of this product or any person tested by this product is not fluent in English, the manufacturer's warnings and the manufacturer's operating instructions shall be accurately and completely read by the OWNER and/or USER and discussed immediately and fully with the operator of the product in the operator's native language prior to the operator using or attempting to use the product. In addition, it is the responsibility and duty of the OWNER and/or USER to make sure that the operator understands and complies with all of the manufacturer's warnings and all of the manufacturer's operating instructions prior to using or attempting to use this product.
3. If the OWNER and/or USER is confused by or does not understand any of the manufacturer's warnings or the manufacturer's operating instructions, prior to using this product, the OWNER and/or USER should contact the manufacturer at (877)312-2333 (toll free telephone number) or at (813)249-5888 (local telephone number) and/or (877)312-2444 (toll free fax number) or (813)249-0188 (local fax number) as well as review information concerning the product on Nextteq's website at [www.nextteq.com](http://www.nextteq.com).

## V. MSDS

This MSDS is also available at [www.nextteq.com](http://www.nextteq.com) as PN 50811320-340N

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### Part 1 - Material Identification

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**Material Name:** Stannic Chloride Irritant Smoke Generator (PN 50811320-310N)

**Chemical Name:** Stannic Chloride (CAS No. 7646-78-8, UN No. 1827)

**Synonyms:**

- A. Tin tetrachloride, Tin (IV) Chloride
- B. Air Flow Indicator Tube
- C. Irritant Smoke Generator

**Formula:**  $\text{SnCl}_4$

**Chemical Family:** Metal Chloride

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### Part 2 - Ingredients & Hazards

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Stannic chloride reacts with ambient humidity to liberate a white smoke consisting of hydrogen chloride (HCl) and tin compounds. The emitted smoke has a strong irritating odor.

#### Exposure Limits

##### Tin Inorganic Compounds

ACGIH-TLV: TWA 2 mg/m<sup>3</sup>

OSHA PEL: 2 mg/m<sup>3</sup>

##### Hydrogen Chloride

OSHA PEL: Ceiling 5 ppm

ACGIH-TLV: STEL Ceiling 2 ppm

Listed in the 2004 ACGIH-TLV handbook with a carcinogenicity notation of A4, which is defined as "Not classifiable as a human carcinogen".

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### Part 3 - Physical Data

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#### Stannic Chloride

Appearance: Colorless liquid

Boiling Point: 237.2°F

Melting Point: -22.36°F

Volatility: N/A

Specific gravity: 2.23 g/cm<sup>3</sup> (at 68°F)

Solubility: N/A

### Hydrogen Chloride

Appearance: Colorless to slightly yellow gas, irritating odor

Boiling Point: -121°F

Melting Point: N/A

Specific Gravity: N/A

Vapor Pressure: 40.5 atm

Solubility in Water: 37% by weight @ room temperature

Vapor Density: (Air=1)= 1.268

N/A = Not Available

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## **Part 4 - Fire & Explosive Data**

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Flash Point & Method: N/A

Auto Ignition Temp. °F: N/A

Flammability Limits In Air Volume %

Lower: N/A

Upper: N/A

**Extinguishing Media:** Use extinguishing media appropriate for the material that is burning.

**Special Firefighting Procedures:** Firefighters should use SCBA units to protect against possible toxic decomposition products and wear protective clothing. If there is a fire around the area where tubes are stored, move the tubes or cool the tubes by dousing with a large amount of water. Do not put water on tubes that have been crushed or broken.

**Unusual Fire and Explosion Hazards:** Fire encompassing the tubes will emit toxic fumes of chlorides. Violently reacts with water to generate heat. Generates smoke with moisture in air. Mixing with alkali metal may result in an explosion.

N/A = Not Available

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**Part 5 - Health Hazard Information**

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**Exposure Limits Information:**Tin Inorganic CompoundsACGIH-TLV: TWA 2 mg/m<sup>3</sup>OSHA PEL: 2 mg/m<sup>3</sup>Hydrogen Chloride

OSHA PEL: Ceiling 5 ppm

ACGIH-TLV: STEL Ceiling 2 ppm

Listed in the 2004 ACGIH-TLV handbook with a carcinogenicity notation of A4, which is defined as "Not classifiable as a human carcinogen".

**Toxicological Information:**Stannic Chloride

Skin Corrosion: May result in extreme irritation and burns to the skin.

Irritation (Skin, Eyes): Eye contact may result in extreme irritation to the eyes.

Acute Toxicity: When inhaled, irritates nose, throat, and respiratory tract.

Hydrogen Chloride

Acute Toxicity: When inhaled, irritates nose, throat, and respiratory tract.

**Effects of Overexposure:**

Hydrogen chloride gas is corrosive. Prolonged inhalation of gas concentrations moderately above the ACGIH: TLV ceiling of 2 ppm can irritate nasal passages. Inhalation of higher concentrations (above 2 ppm) for short periods of time can cause choking and coughing, and produce severe irritation to the mucous membranes of the upper respiratory tract. The NIOSH-recommended IDLH level is 50 ppm. HCl can cause severe irritation and tissue burns. If deeply inhaled, pulmonary edema may occur.

The emitted tin compound is also an irritant to eyes, skin, and mucous membranes, due to its acidity.

**Emergency & First Aid Procedure:**

**Eyes:** Immediately flush eyes with large amounts of clean running water for at least 15 minutes, occasionally lifting the lower and upper lids to flush the area under the lids. Contact a physician.

**Skin:** Flush the affected areas with large amounts of clean running water and wash with soap for at least 15 minutes. Get medical help in case of a large area of contact or if irritation persists.

**Inhalation:** Remove test subject to fresh air. Restore and/or support breathing as necessary. Provide oxygen therapy for persistent coughing or if breathing is difficult. Keep test subject warm and at rest. Get medical help.

**Swallowed:** If swallowed, get medical help immediately.

**ASSISTANCE:** IF THE USER IS CONFUSED ABOUT THE PROPER USE OF THE SMOKE TUBE / GENERATOR OR ANY INSTRUCTIONS, WARNINGS, LABELS, OR THE MANUAL, THE USER SHOULD CONTACT NEXTTEQ FOR ASSISTANCE PRIOR TO USING THE PRODUCT. NEXTTEQ CAN BE CONTACTED AT ONE OF THE FOLLOWING TELEPHONE NUMBERS: TOLL FREE 877-312-2333 OR LOCAL NUMBER 813-249-5888.

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**Part 6 - Reactivity Information**

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**Stability:**  $\text{SnCl}_4$  decomposes upon exposure to moist air or water. HCl is a stable compound. It does not undergo hazardous polymerization; however, HCl can catalyze polymerization of other compounds.

**Conditions to avoid:** Reacts with turpentine, alcohols, and amines causing a potential fire hazard. Incompatible materials include alkali compounds, amines, metal oxides, hydroxides, copper, brass, zinc, other metals, turpentine, and alcohols. Mixing with alkali metals may result in an explosion.

**Hazardous Decomposition Products:** When heated to decomposition, the smoke tubes will emit chloride fume.

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## Part 7 - Spill, Leak & Disposal Procedures

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**Spill Procedure:** Does not apply. (Refer to below)

**Broken Glass Cleanup:** Broken glass should not be picked up with bare hands.

**Disposal Procedure:** Soak used tubes in large volume of water and neutralize with sodium carbonate or equivalent alkaline substance. Dispose of tubes via landfill. Consult local authorities to assure compliance with all local, state, and federal regulations including but not limited to EPA regulations.

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## Part 8 - Special Protection Information

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**Protective Equipment:** For irritant smoke quantitative fit testing, wear respiratory protection in accordance with OSHA 29 CFR 1910.134, NIOSH 42 CFR Part 84, and good practice. Wear safety goggles to minimize eye contact and keep eyes closed during exposure to irritant smoke. Wear chemical resistant safety gloves with resistance to broken glass in accordance with NIOSH and OSHA standards and good practice.

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## Part 9 - Special Precautions & Comments

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**Dangerous to Life:** Read, understand, and comply with all instructions, warnings, labels, and other literature accompanying this product before attempting to use or using this product. Use this product in accordance with the manufacturer's instructions, specifications, and warnings, and only with the manufacturer's specified parts, components, and accessories.

**Class of Users:** This product is only to be sold to, only for use by, and only for storage by trained, qualified, professional industrial or commercial users.

**Handling & Storage:** Store in the original container in a cool dry place. Protect against light, heat, moisture, and physical damage.

**Shipping Information:** Ship this product according to local, state, and federal laws and regulations, including, but not limited to, federal Department of Transportation regulations in DOT 49 CFR.

**Other Precautions:** Avoid eye and skin contact with smoke. Do not directly breathe the smoke. Avoid the buildup of smoke. Use in a well-ventilated area. Do not use under a hood or in a confined space. Do not blow smoke directly into anyone's unprotected face or eyes. Test only one person at a time. Do not blow smoke between test subjects. Immediately after using the smoke tube or being exposed to the smoke, scrub face, hands, and any area exposed to the smoke with soap and clean running water and always before eating, drinking, smoking, applying cosmetics, or inserting or removing contact lenses.

Do not use this product for respirator fit testing or a "Sensitivity Check" if any of the following conditions is present:

- A. The test subject has pre-existing respiratory, cardiovascular, bronchial, or sinus medical condition.
- B. The test subject is under a physician's care for respiratory, cardioular, bronchial, or sinus problems.
- C. The test subject is being treated for allergies, hypersensitivity, or asthma or has a pre-existing allergic, hypersensitivity, or other condition.
- D. The test subject is allergic to or hypersensitive to hydrogen chloride, stannic chloride, stannic oxide, stannic dioxide, tin tetrachloride, tin compounds, hydrochloric acid or metal chloride.

## V. OPERATING INSTRUCTIONS

### A. *Recommended Usage*

Nextteq recommends the following in regards to use of VeriFit Irritant Smoke Generators:

1. Qualitative Respirator Fit Testing be performed at the following intervals:
  - a. At time of initial respirator selection and fitting
  - b. Annually after the initial fit testing or other successful qualitative fit test
  - c. Whenever the respirator becomes “unacceptable” to the employee and the employee properly notifies the employer of the condition. A respirator may be unacceptable if it causes irritation or pain to the employee or if because of discomfort the employee is unable to wear the respirator for the time required.
2. After being checked by the test administrator, the test subject should wear the respirator for approximately 10 minutes before starting the fit test.
3. The test subject should not be requested to make any head or facial movements until after the following has occurred:
  - a. The smoke generator has been brought within the OSHA 29 CFR 1910.134 specified distance from the test subject.
  - b. The smoke has been delivered.
  - c. No leakage of the respirator has been detected. At the time the test administrator starts to deliver smoke to the test subject and at the time the test subject is requested to commence making head or facial movements, the test administrator should be extremely alert and aware of any slight indication of the test subject’s reaction to the smoke.

### B. *Required Steps before Smoke Generation*

1. Before using this product, read, understand, and comply with all labels, warnings, instructions, and other literature accompanying the product including but not limited to this manual, the MSDS in this manual (also available as PN 50811320-340N), and the Sensitivity Check Protocol (PN 50811340-340N - see [www.nextteq.com](http://www.nextteq.com)).

2. **Keep this manual for reference and training.**
3. Be thoroughly familiar with this product, the manufacturer's instructions and warnings, and associated equipment before using this product.
4. Inspect this product and associated equipment for damage or defects before using. Do not proceed with Respirator Fit Testing or Sensitivity Check if this product or associated equipment is damaged or defective.
5. Do not start or continue the Respirator Fit Test or the Sensitivity Check if any of the conditions described in the Warnings in Section III of this manual (specifically Warning #19 and Warning #33) exist.
6. Use only in well-ventilated areas to prevent the buildup of smoke or fumes. Do not use under a hood or other enclosed area. Do not use in a confined space.
7. Keep all bystanders away from this product and the smoke or fumes during use or testing.
8. Before using or attempting to use this product, users should wear the following:
  - a. Safety gloves in accordance with OSHA standards and good practice.
  - b. Respiratory protection in accordance with OSHA 29 CFR 1910.134 and NIOSH 42 CFR 84.
  - c. Eye protection in accordance with OSHA standards and good practice. Contact lenses should be worn in strict compliance with applicable NIOSH, OSHA, and ACOEM standards.
9. Respirator Fit Testing should be performed in strict compliance with OSHA 29 CFR 1910.134. NIOSH-approved HEPA plus acid gas filters or equivalent filters specified by NIOSH may be used in all fit testing in lieu of HEPA filters.
10. Test subject's eyes should be tightly closed and remain closed during Respirator Fit Testing or Sensitivity Check until smoke clears. Do not remove or adjust respirator during Respirator Fit Testing or in the presence of smoke or fumes. Move to an area of fresh clean air before removing or adjusting respirator.

11. A test subject's sensitivity to irritant smoke varies based upon size, weight, heredity, age, health, and other factors. Some test subjects may respond to a greater degree than others to irritant smoke. During the Sensitivity Check, the administrator shall consider the test subject's sensitivity and be careful to generate a small, dilute, weak stream of smoke that is the absolute minimum concentration of irritant smoke necessary to elicit a response from the test subject.
12. Do not re-expose the test subject to irritant smoke until the test subject specifically and expressly confirms that all effects from the prior exposure to irritant smoke have ceased.
13. During the Sensitivity Check, do not place the open end of the smoke generator closer than 36 inches from the test subject's face.
14. This product(s) is designed for qualitative respiratory fit testing in ambient atmospheres of 40% relative humidity to 90% relative humidity. Do not use this product(s) in atmospheres of less than 40% relative humidity.
15. Test only one test subject at a time.

### ***C. Smoke Generation and Flow Rate***

1. Ensure you are in compliance with all of the previous steps, which are required prior to smoke generation.
2. The VeriFit Irritant Smoke Generator has an internal volume of approximately 8 milliliters. The pump produces a volume of approximately 7 milliliters with each complete and uniform bulb compression.
3. To produce a flow rate of approximately 200 milliliters per minute with the VeriFit Irritant Smoke Generator, uniformly and completely compress the bulb smoothly and continuously every 2 seconds for 1 minute.
4. To produce a small, weak dilute concentration of smoke using the VeriFit Irritant Smoke Generator, slowly and gently compress the bulb at a controlled, uniform, steady rate until a small, weak, diluted stream of smoke is produced that is the absolute minimum necessary to elicit a response from the test subject being tested. Then immediately stop compressing the bulb and release the partially compressed bulb. No additional smoke is to be generated.

5. Bend smoke generator in the middle to break the ampoule as shown in Figure 1 below.



**Figure 1** Break Ampoule

6. Remove black cap as shown in Figure 2 below. Be sure that the tip of the VeriFit Irritant Smoke Generator is pointed away from you and others.



**Figure 2** Remove Black Cap

7. Wait 5 seconds for bellows to expand and air to enter smoke generator (See Figure 3 below).



**Figure 3** Allow Air to Enter Bellows

- NOTE:** Prior to compressing the bellows, ensure the smoke generator is aimed in the correct direction and at the correct distance from test subject.
8. Slowly, gently, and uniformly compress the bellows to generate smoke as shown in Figure 4 below.



**Figure 4** Smoke is Generated

9. When testing is complete, carefully compress the pump bulb. When the pump bulb is compressed, replace the black cap over the end of the smoke generator. Store in a secure, dry, cool space away from direct light and out of the reach of children.

**NOTE:** The VeriFit Irritant Smoke Generator's all-in-one design offers convenience and easy disposal. Due to the corrosive nature of the stannic chloride in the smoke generator, discard the smoke generator within one day of activation.

10. When the VeriFit Irritant Smoke Generator is exhausted, carefully compress the pump bulb. When the pump bulb is compressed, replace the black cap over the end of the smoke generator. Dispose of the VeriFit Irritant Smoke Generator in accordance with all Federal, State, and Local laws and regulations as well as the Warnings in Section III and the MSDS in Section V of this manual.

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