

The Superior Smoke Testing Technique



Presented by **Frank Nichols**
Superior Signal Company, Inc.
1-800-945-TEST

© *Copyright 2000, Superior Signal Company, Inc.*

Not to be reproduced in any way without written permission from Superior Signal Company, Inc.

Outline



⌘ General Introduction

⌘ Inflow Analysis

⌘ Sewer Testing Procedure

⌘ Equipment

☒ Smoke Types

☒ Blowers

⌘ Notes on Toxicity

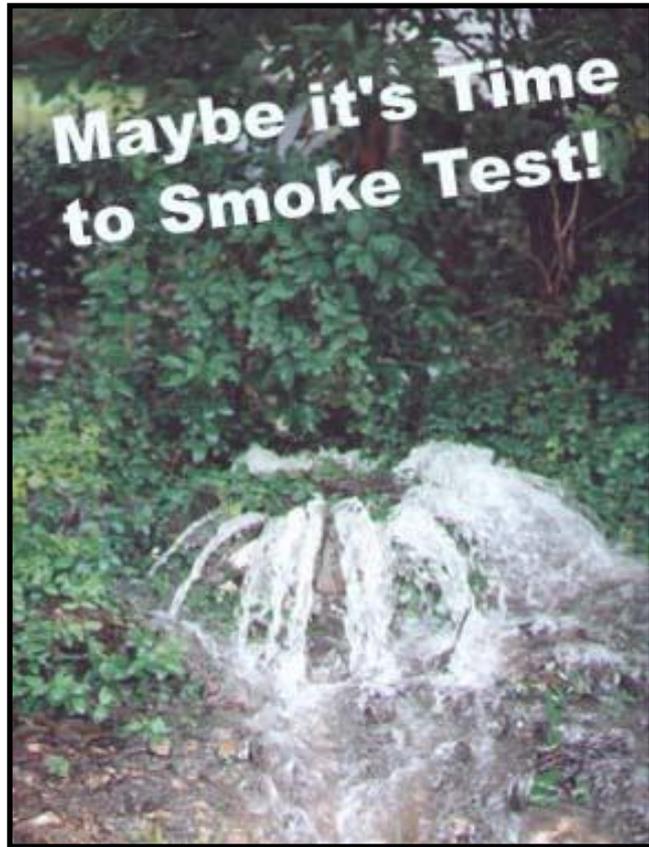
⌘ Leaks and Odors in House Plumbing & Septic

The Superior Smoke Testing Technique

⌘ **Superior Signal**; your partner in Smoke Testing for over 40 years!

- ☑ Developed in 1961 as a way to identify sewer faults at a low cost.
- ☑ Procedure consists of blowing large volumes of air and smoke through sewer lines. The smoke follows the path of the intruding water in a reverse to the surface pattern, revealing the source of the problem within seconds.

Proven to reduce inflow.

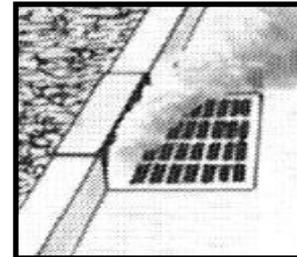
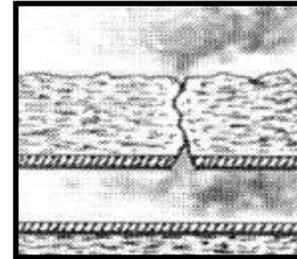


- ⌘ The Superior Smoke testing technique is proven to identify significant sources of excess inflow, thus reducing chances of wet weather overflow.

Inflow Analysis

⌘ Smoke Testing is an easy inexpensive way to quickly identify leaks permitting storm/surface water intrusion.

- ☒ Illegally connected roof & cellar drains.
- ☒ Cross connected storm and sanitary sewers.
- ☒ Leaking manholes.
- ☒ Yard and foundation drains.
- ☒ All connected lines (including abandoned, and supposedly unconnected lines).



Leaks are Visible in Seconds

- ⌘ Smoke Travels the path of least resistance, quickly identifying sources of inflow.



Procedure **(Advance Notice)**



- ⌘ Before conducting any smoke test, proper advance notice is the responsibility of the agency or contractor performing the test. Advance notice program should include...
 - ☒ **Press releases** to the local news media which detail the areas to be tested, as well as the benefits to be derived from the smoke test.
 - ☒ **Notification of local police and fire departments.** Personnel handling phone inquiries should be acquainted with the purposes of the program, and be prepared to advise against the unnecessary exposure to the smoke.

Procedure (Advance Notice)



⌘ **Door to door inquiries** are recommended within 24 hours of the test. This prevents unethical occupants from covering up illegal drains, sump pumps, etc. While giving advance notice discrete neighborhood inquiries can identify persons suffering from heart and/or lung ailments who should never be exposed to any type of smoke.

Procedure (Advance Notice)

Sample Advance Notice Leaflet.

To whom it may concern,

Please be informed that the Sewer Operating Committee will be testing lines in this area on (insert date) by the use of smoke. The smoke should not enter the premises unless a leak is present.

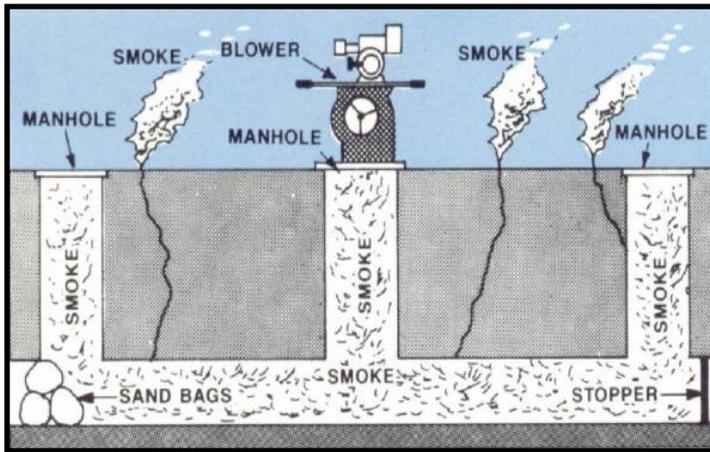
The presence of smoke in your house should be reported immediately to the personnel conducting the tests, or by calling (insert telephone number).

Avoid unnecessary exposure to the smoke. The smoke is relatively harmless but may be irritating to nasal passages. Any smoke irritation will be temporary and should quickly disappear after exposure has ceased. Persons with heart and respiratory ailments should leave the house during the test. House pets will react in a manner similar to a prudent person and leave the smokey area. If an exit is not available, be sure pets are provided with proper ventilation.

To minimize the chance of smoke entering your house, please pour water into all drains including floor drains prior to the date of the test.

Signed _____

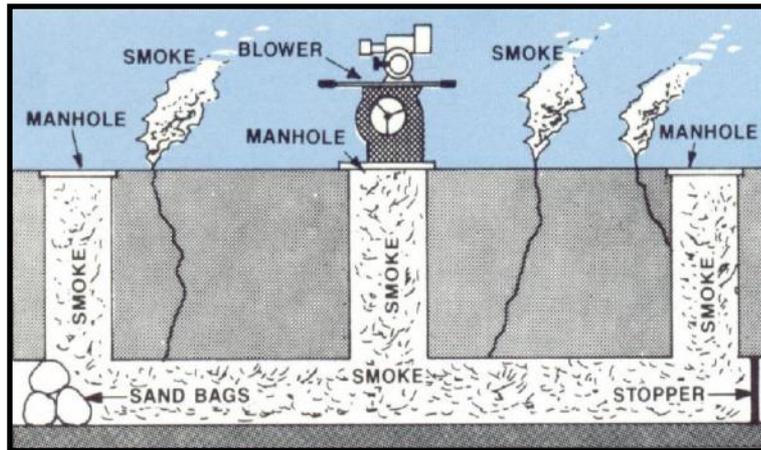
Procedure



⌘ Usually two sections of line (600 - 800ft) are tested simultaneously, with the smoke being introduced through a centrally located manhole.

⌘ Blocking the far side of the upstream and downstream manholes is only necessary when isolating a section of line. The smoke under pressure will fill the main, plus all connected lines, and follow the path of least resistance.

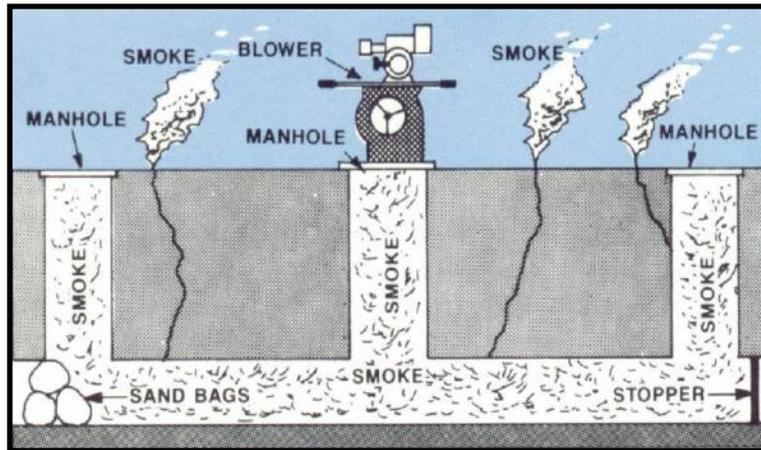
Procedure



⌘ The smoke will flow through all openings to the surface, revealing the location of faults. Best results are obtained on dry days when water is not leaking into the line.

⌘ Smoke tests are effective regardless of surface, type of soil, or depth, providing openings exist for the smoke to follow. It is not uncommon to see smoke exiting from cracks in paved surfaces.

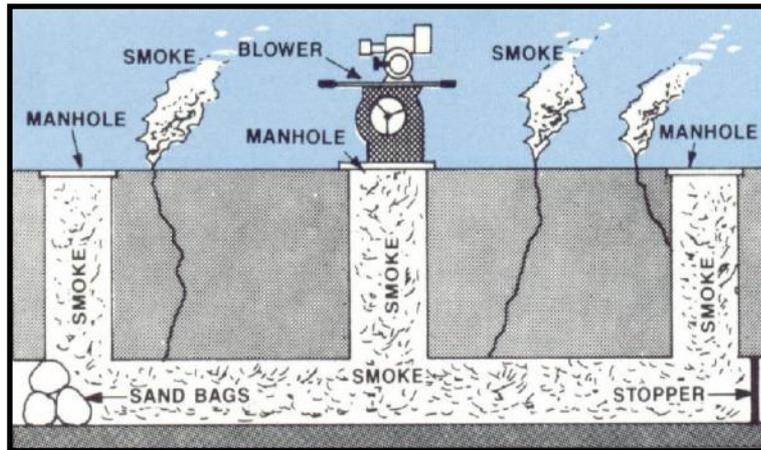
Procedure



⌘ Because of the possibility of igniting flammable vapors in the line, the blower should not be started over the manhole. It should be started first and then placed over the manhole.

⌘ If using classic smoke candles they should not be ignited and dropped into the manhole. Most smoke blowers provide a tray located on the intake side of the blower wheel where smoke candles should be placed.

Procedure



⌘ As a guideline, use two consecutive 3 minute smoke candles for each test lasting 5 to 6 minutes; generally two sections of line 600 to 800 feet of 8in. to 10in. pipe.

⌘ If using a liquid smoke system, turn on the fluid valve using a low to medium setting and allow to run for approximately 5 minutes. If you find smoke thins out too soon, turn the fluid off and allow the unit to reheat. Try again using a lower setting on the fluid valve.

Required Equipment



⌘ You will need ...

- ☑ Air/Smoke Blower

- ☑ Smoke Generator (Candles or Liquid)

- ☑ Line Plugs (If you wish to isolate a section)

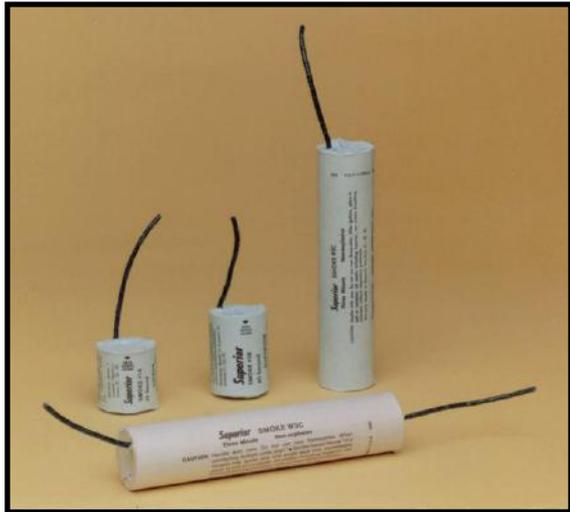
- ☑ Materials for recording your results.

 - ☒ Camera, notebook etc.

- ☑ Maintenance Personnel (2 -3)

 - ☒ Crew can easily test 10,000 linear feet per 8hr. shift.

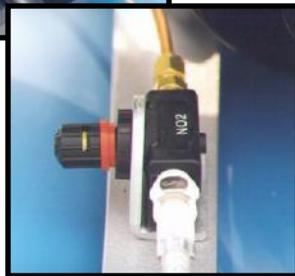
Classic Smoke Candles



*Available in various sizes
from 4,000 cubic feet in
30 seconds to 40,000
cubic feet in 3 minutes.
Versatile, can be
combined to meet your
specific needs!*

- ⌘ Most consistently visible smoke product.
 - ☑ Capable of being blown and seen 1000's of feet away.
 - ☑ Optical density 10 times that of burning oil.
- ⌘ Works with most any blower.
- ⌘ Won't get wet.
- ⌘ Meets recommendations of WEF, EPA and NASSCO.

Smoke Fluid Systems



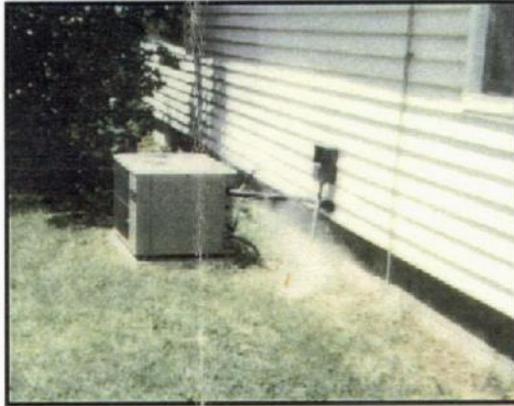
- ⌘ Engineered to optimize dry smoke output.
 - ☑ Unique heating chamber much larger than “muffler modification” type smokers; increases efficiency.
 - ☑ Custom machined fluid injection orifice.
 - ☑ Precision valve maximizes control.
 - ☑ Offering 2 designs; Squirrel Cage and Propeller.

Smoke Fluid Systems



- ⌘ Superior Smoke Fluid is as safe and clean as it gets!
- ⌘ Available in 1 gal., 5 gal., or 55 gal. containers.
- ⌘ Works in competitive systems.
- ⌘ Very competitively priced!

Liquid - vs- Candles



Liquid Smoke



Classic Superior Smoke

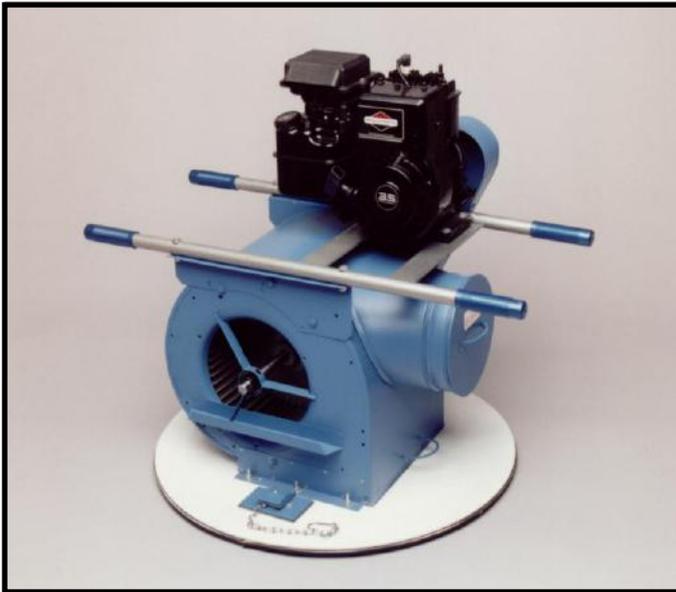


Liquid Smoke



Classic Superior Smoke

Dependable Blowers



Models 10-S/L, 20-S/L

- ⌘ Single unit, sturdy metal construction with high comfortable handles for easy handling.
- ⌘ Dependable 3.5 hp Briggs & Stratton gasoline engine.
- ⌘ 27 1/2 in custom fiberglass base.
- ⌘ Perfect balance of CFM & Static Pressure
- ⌘ Auxiliary outlet with 8' x 8" vinyl duct (model 20-S & 20-L only).

Dependable Blowers



Model 30-S/L

- ⌘ Low Profile Design.
- ⌘ Cast aluminum construction for ultra-durability.
- ⌘ Dependable 5.0 hp Briggs & Stratton, or Honda gasoline engine.
- ⌘ 10 blade propeller fan increases performance by 35%.
- ⌘ 4,300 CFM

Adjustable Output



⌘ Although our standard output of 1,800 cfm at 1.7in. static pressure is ideal for just about all situations, occasionally variations are needed to meet unique specifications. With the use of our **alternate pulley kit** Superior blowers (10 & 20-S/L) can be adapted to meet any smoke testing requirement.

Adjustable Output



- ⌘ Superior Signal's Alternate Pulley kit is available for all new and existing 10-S/L and 20-S/L smoke blowers. Simple installation of matched sets of pulleys and belts will provide either 4,000 cfm at 4.0 inches static pressure, or 4,200 cfm at 3.0 static pressure.

Notes on Toxicity



- ⌘ Both Classic Smoke candles and Smoke fluids are acceptable for smoke testing and can be used safely.
- ⌘ As with any substance, the degree of hazard will depend on the level of exposure.
- ⌘ When smoke testing, the anticipated exposure level is low.

Notes on Toxicity



- ⌘ Exaggerated claims like “100% Safe, 100% Clean” are simply not true.
- ⌘ Smoke from fluid systems is created by injecting a petroleum distillate into the engine exhaust. - Does it sound 100% safe to you?!

Notes on Toxicity



- ⌘ Beware of Scare Tactics made by competitors who warn to use a respirator if using Classic Smoke candles, and exposures exceed OSHA PEL (Permissible Exposure Limit).
- ⌘ Truth is, you need to wear a respirator if exposed to ANY product in levels that exceed OSHA PEL (even the competitors products!).
- ⌘ In addition, it would be rare to exceed these limits while smoke testing.

Notes on Toxicity



⌘ The bottom line...

☑ Nothing is 100% Safe.

☑ Both Classic Smoke candles and smoke fluids can be used safely as directed, and are acceptable products for smoke testing.

☑ Before using any product read and understand the MSDS.

Laterals, Houselines & Septic

⌘ Smoke testing is an excellent technique for locating leaks and sources of odors in houselines and septic systems. You should expect to find...

- ☑ Leaks permitting surface water inflow.
- ☑ Unknown or Illegal connections
- ☑ Poorly soldered joints or leaking seals and gaskets.
- ☑ Rodent Passages into line.

Procedure



- ⌘ It is not absolutely necessary to have the house line blocked off from the main, but doing so will increase test efficiency.
- ⌘ Smoke can be induced through the clean-out opening.
- ⌘ Vents should be only partially blocked to allow the air/smoke mixture to flow throughout the system.

Procedure



- ⌘ Superior Blower #5E provides 180 cfm which is perfect for testing house lines. Use with either our #1A (30 sec.) or #2B (1 min.) smoke candle.

Procedure



- ⌘ When you are sure the building is unoccupied, connect the blower to the cleanout and begin introducing fresh air.
- ⌘ Place the smoke item on tray located on the air intake side of the blower.
- ⌘ The smoke will be captured by the blower and flow into the line.
- ⌘ Begin searching for leaks.

Thanks for your Time!



⌘ You've reached the end of the presentation. For more information on Smoke testing contact the experts...

Superior Signal Company, Inc.

P.O. Box 96, Spotswood NJ 08884

1-800-945-TEST(8378), or (732) 251-0800

www.superiorsignal.com