

## Superior® Classic Smoke – for Sanitary Sewer Testing

### *For Professional Use Only*

Smoke testing of sanitary sewer collection systems was initiated in 1961 at McPherson, Kansas. Excessive infiltration was a problem, and the most practical method developed was a visual test utilizing smoke that would meet the following criteria: relatively harmless; free from oily or colored stains; allow sewer personnel to operate without the danger of fire or explosion. Superior® Classic Smoke satisfies these requirements and has proven itself by over 50 years of field experience successfully testing Hundreds of Millions of feet of sewer line.

Smoke testing of sanitary sewer collection systems is endorsed by EPA in all regions, and included as an integral part of contracted inflow/infiltration studies. Zinc chloride type smoke, preferred by the Environmental Protection Agency, is manufactured by the Superior Signal Company, and has been the choice of sewer service contractors and municipalities for over 50 years.

Superior® Classic Smoke has the exclusive properties of leaving no visible residue and containing no explosive materials. Approximately 50% of the visible portion is atmospheric moisture. Small amounts of smoke mixed with large volumes of air, utilized in the *Superior Smoke Testing Technique* for sanitary sewer collection systems, can enter dwellings through the same faults in house plumbing systems that provide egress of unhealthy, lethal and/or explosive sewer gases. The tests are performed under infinite volume conditions due to the characteristics of the sewer system. The concentration of smoke at a specific point would be influenced by the infinite volume of the system, size of fault, velocity of air flow, duration of test, and position of the blower in relation to the fault. Considering the amount of air/smoke mixture induced into the test segment, size of faults, duration of tests (minutes), infinite volume of the system due to roof vents, probably less than 1% of the smoke would be found at any one leak.

Superior® Smoke is not a true smoke, but contains a large percentage of atmospheric moisture that provides high visual obscurity at low concentrations. The mist formation is seeded by zinc chloride and some other products of combustion such as free carbon. The toxicity of the materials must be represented relative to the application and, in this case, brief exposure time.

Notices sent out within 24 hours of smoke tests should advise the nature of the tests and request individuals to notify the administrators of the program concerning anticipated personal problems. While giving advance notices, discrete neighborhood inquiries can identify persons suffering from lung ailments such as emphysema, who should never be exposed to any smoke. The necessary arrangements to cooperate in any manner as not to jeopardize their condition can be completed at this time.

Authorities in the Occupational and Environmental Health Departments of several universities, including Dr. James Sterner, Professor of Occupational Health, College of Medicine, University of California, and Dr. Jack E. Peterson, Associate Professor of Civil Engineering of Marquette, Professor of Occupational and Environmental Medicine, University of Illinois, Ph.D. Industrial Health, Certified Industrial Hygienist, have extended opinions in support of Superior® Smoke. Based on the reported data and theory, these people believe Superior® type smoke to be the best available source of smoke.

Superior® Classic Smoke satisfies all your smoke test requirements: economical, convenient, and effective. With a T.O.P. of 2100, it is ten times more efficient than crude oil. Proper implementation of the *Superior Smoke Testing Technique* will effectively find sources of surface water inflow, and result in less than 1% of houses tested having smoke enter them. Through this type of testing program, overloading of residential sewer lines causing backups of sewerage into homes and discharges of improperly treated sewage from overloaded treatment plants can be successfully minimized.

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# MATERIAL SAFETY DATA SHEET

## SECTION 1: PRODUCT INFORMATION

Product Identifier: Superior® Classic Smoke  
Chemical Name: Screening Smoke  
Product Use: Superior® Smoke for Sanitary Sewer Testing (Professional Use Only)

Manufacturer's information: SUPERIOR SIGNAL COMPANY LLC  
PO Box 96, Spotswood, NJ 08884 USA

Emergency Phone # (732) 251-0800 Fax # (732) 251-9442 E-Mail: [info@superiorsignal.com](mailto:info@superiorsignal.com)

## SECTION 2: PRODUCT INGREDIENTS (SMOKE)

Neither TLV nor PEL applicable because product is intended for use in short term tests.

	TLV	PEL	8-hour time weighted average
Hydrated Zinc Chloride:	1 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	
Water Condensate:	-	-	
Carbon Monoxide:	55 mg/m <sup>3</sup>	55 mg/m <sup>3</sup>	

All other ingredients are present in negligible amounts and/or are non-hazardous.

Concentrations of the various smoke components depend entirely on the size of solid(s) burned, volume of the space and ventilation of the space. They are not independently predictable or knowable.

Superior® Classic Smoke products are available in various sizes that provide sufficient materials to create easily visible smoke for different sized areas at a concentration of 10 mg/m<sup>3</sup>.

Superior® #1A	- 4,000 ft <sup>3</sup> / 113 m <sup>3</sup>	} recommended for testing
Superior® #2B	- 8,000 ft <sup>3</sup> / 227 m <sup>3</sup>	} building plumbing
Superior® #3C	- 40,000 ft <sup>3</sup> / 1133 m <sup>3</sup>	> recommended for testing
Superior® #W3C	- 40,000 ft <sup>3</sup> / 1133 m <sup>3</sup>	> sanitary sewer collection systems

## SECTION 3: PHYSICAL DATA (SMOKE)

Boiling Point: Not Applicable  
Vapor Pressure: Not Applicable  
Vapor Density: Not Applicable  
Solubility in Water: Soluble (Zinc Chloride)  
pH: No Data  
Appearance and Odor: Gray to white, with an odor of burning paper

## SECTION 4: FIRE & EXPLOSION HAZARD DATA

(SMOKE): Flash Point (method used): None  
Auto Ignition: Not Applicable  
Flammable limits in air: Not Applicable

(SOLID PRODUCT): Extinguishing Media: Use media suitable for surrounding fire.

(SMOKE / SOLID PRODUCT): Normal fire fighting protective equipment: self-contained breathing apparatus and full protective clothing.

(SMOKE / SOLID PRODUCT): Unusual fire and explosion hazards: None Known

## SECTION 5: REACTIVITY DATA (SOLID PRODUCT)

Stability: Stable under normal conditions  
Hazardous decomposition products: See Section 2  
Hazardous polymerization: None Known

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**SECTION 6: HEALTH HAZARD ASSESSMENT (SMOKE)**

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- **General:** Superior<sup>®</sup> Classic Smoke can be used without hazard if applied as directed. The main effects of the smoke are some irritation of the throat, an awareness of an odd odor, and the appearance of smoke. These effects act as a warning and are desirable to prevent voluntary overexposure. Individuals should be urged not to accept exposures that cause minor irritation, but to leave the area and ventilate well to dissipate the smoke.
- **Ingestion:** Not a significant route of exposure.
- **Eye Contact:** Acute exposure is not likely to induce eye irritation.
- **Skin Absorption:** Not a significant route of exposure.
- **Inhalation:** Acute exposure can cause irritation of the respiratory tract and mucous membranes. In itself irritation is not usually regarded as a toxic effect unless it is sufficient to cause inflammation and then inflammation, not irritation, is the toxic effect.
- **Effects of Overexposure:** Irritation of the respiratory passages; cough; nausea. Gross overexposure to dense smoke concentrations for periods of ten minutes or more could result in throat irritation and mucous membrane congestion requiring medical treatment. Coughs, chills, fever and pulmonary edema can result from overwhelming exposure. Increasingly severe overexposure is likely to result in increasingly severe irritation and inflammation to all mucous membranes contacted by the smoke with most severe effects usually appearing in the respiratory tract.

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**SECTION 7: EMERGENCY AND FIRST AID PROCEDURES**

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Remove victim to fresh air. If breathing is difficult, get medical attention.

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**SECTION 8: TOXICOLOGICAL PROPERTIES (SMOKE)**

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Carcinogen listed by: IARC (No) NTP (No) OSHA (No) OTHER (No)

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**SECTION 9: DISPOSAL METHOD**

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(SMOKE): Ventilate area. Use local exhaust to keep exposure to a minimum. The duration of smoke would be short and the length of exposure could be reduced further by opening doors and windows for a few minutes, if and when the smoke appears.

(SOLID PRODUCT): Disposal Method: Dispose in chemical disposal area in a manner that complies with local, state and federal regulations.

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**SECTION 10: PREPARATION OF THE MSDS**

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The information herein is given in good faith, but no warranty, express or implied, is made.

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