MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
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Gaithersburg, Maryland 20899-2300

SRM Number: 1202
MSDS Number: 1202
SRM Name: Fabric Smoldering Ignition Testing Materials

Date of Issue: 25 June 2012

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Description: This Standard Reference Material (SRM) is intended to be used to evaluate upholstery fabrics for their tendency to support smoldering combustion. The evaluation metric is the percent mass loss of the polyurethane foam after the specimen assembly is exposed to a burning SRM 1196 cigarette for 45 minutes. A unit of SRM 1202 is a single test specimen, which consists of two pieces of a reproducibly high smoldering standard polyurethane foam, two pieces of denim upholstery fabric, a piece of cotton fabric, and one pack of SRM 1196 cigarettes containing 20 cigarettes.

Substance: Carbon monoxide (CO) and carbon dioxide (CO_2), and other oxides of carbon.

Other Designations: Not applicable for this material.

2. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0–4): Health = 2 Fire = 1 Reactivity = 0

Note: This MSDS addresses the CO and CO_2 gas generated from the smoldering fabric and foam. The concentration of carbon monoxide and carbon dioxide generated as a combustion product are unknown, and while expected to be small, pose health hazards. These gases are not under pressure. This MSDS is for carbon monoxide and carbon dioxide and is provided for information to the user.

Major Health Hazards: Carbon monoxide is harmful if inhaled, may cause blood damage, and suffocation. Carbon dioxide may cause difficulty breathing.

Physical Hazards: There are no physical hazards associated with this material.

Potential Health Effects (Acute and Chronic)

Inhalation: CO and CO_2 may cause suffocation and exposure effects include changes in body temperature, changes in blood pressure, nausea, vomiting, chest pain, difficulty breathing, irregular heartbeat, headache, drowsiness, visual disturbances, pain in extremities, tremors, loss of coordination, hearing loss, visual disturbances, eye damage, blood disorders, unconsciousness, coma, and death. CO exposure may also include convulsions.

Skin Contact: No information available.

Eye Contact: No information available.

Ingestion: Ingestion of a gas is unlikely.

Listed as a Carcinogen/Potential Carcinogen

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens		X
In the International Agency for Research on Cancer (IARC) Monographs		X
By the Occupational Safety and Health Administration (OSHA)		X

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Components	CAS Number	EC Number (EINECS)	Nominal Concentration (%)
Carbon monoxide	630-08-0	211-128-3	1
Carbon dioxide	124-38-9	204-696-9	1

Note: The fume from the smoldering material is a complex mixture that has not been tested as a whole. The material contains organic and inorganic compounds incorporated in the matrix (see Certificate of Analysis), which have been reported to have toxic, mutagenic, and/or carcinogenic properties, and should be handled with care.

EC Classification: Carbon monoxide: Repr. Cat. 1, T; carbon dioxide is not classified.

EC Risk Phrases (R No): 23, 48/23, 61

EC Safety Phrases (S No): 45, 53

EC Risk/Safety Phrases: See Section 15, "Regulatory Information".

Note: The EC classification includes F, with a Risk Phrase, R12 stating that it is extremely flammable. This does not apply to the quantities that might be generated from this experiment.

4. First Aid Measures

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration by qualified personnel. Seek immediate medical attention.

Skin Contact: Rinse affected area with soap and water for at least 15 minutes. Seek medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Seek immediate medical attention.

Ingestion: Ingestion of a gas is unlikely.

5. Fire Fighting Measures

Fire and Explosion Hazards: Slight fire hazard.

Extinguishing Media: Regular dry chemical, carbon dioxide.

Fire Fighting: Avoid inhalation of combustion by-products.

Flash Point (°C): Not applicable.
Method Used: Not applicable.

Autoignition Temperature: 609 °C to 650 °C (1128 °F to 1202 °F) for CO. Not applicable to CO_2.

Flammability Limits in Air (for CO; not applicable to CO_2)

UPPER (Volume %): 74
LOWER (Volume %): 12.0 to 12.5

6. Accidental Release Measures

Occupational Release: Keep out of water supplies and sewers.

Disposal: Refer to Section 13, "Disposal Considerations".

7. Handling and Storage

Storage: Store and handle in accordance with all current regulations and standards.

Safe Handling Precautions: See Section 8, "Exposure Controls and Personal Protection".

8. Exposure Controls and Personal Protection

Carbon monoxide: The following values given for **pure** carbon monoxide are for informational purposes only.

OSHA (PEL): 55 mg/m^3 (50 ppm) TWA
ACGIH (TLV): 30 mg/m^3 (25 ppm) TWA
NIOSH (REL): 40 mg/m^3 (35 ppm) TWA; 1380 mg/m^3 (1200 ppm) IDLH; 229 mg/m^3 (200 ppm) Ceiling

Carbon dioxide: The following values given for **pure** carbon dioxide are for informational purposes only.

OSHA (PEL): 5000 ppm (90 000 mg/m^3) TWA
ACGIH (TLV): 5000 ppm (90 000 mg/m^3) TWA; 30 000 ppm (54 000 mg/m^3) STEL
NIOSH (REL): 5000 ppm (90 000 mg/m^3) TWA; 30 000 ppm (54 000 mg/m^3) STEL, 40 000 ppm IDLH

Ventilation: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Respirator: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29 CFR 1910.134 must be followed. Refer to NIOSH 24 CFR 84 for applicable certified respirators.

Eye Protection: Wear safety goggles. An eyewash station and drench shower should be readily available near the handling and use areas.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

9. PHYSICAL AND CHEMICAL PROPERTIES

Property	Carbon monoxide	Carbon dioxide
Appearance and Odor	colorless gas, odorless	colorless gas, odorless
Molecular Formula	CO	CO_2
Molar Mass (g/mol)	28.01	44.01
Density	1.25 g/L at 0 °C	not available
Specific Gravity (water = 1)	not available	1.522 at 21 °C
Boiling Point	–192 °C (–314 °F) liquid	not available
Vapor Pressure	760 mm Hg at –191 °C	43 700 mm Hg at 21 °C
Vapor Density (air = 1)	0.968	1.5
Water Solubility	2.3 % at 20 °C	soluble
Solvent Solubility	soluble in acetone, alcohol, benzene, ethyl acetate, chloroform	soluble in organic solvents, acetone, alcohol
pH	not applicable	acidic in solution

NOTE: The physical and chemical data provided are for the pure components. Physical and chemical data for the solution are not available.

10. STABILITY AND REACTIVITY

Stability: __X__ Stable _____ Unstable

Stable at normal temperatures and pressure.

Conditions to Avoid: Avoid inhalation of material or combustion by-products.

Incompatible Materials: Combustible materials, halogens, lithium, metal oxides, metals and oxidizing materials.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Oxides of carbon.

Hazardous Polymerization: _____ Will Occur __X__ Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: __X__ Inhalation _____ Skin _____ Ingestion

Toxicity data and endpoints listed by Registry of Toxic Effects of Chemical Substances (RTECS).

Toxicity Data for Carbon monoxide:

Rat, Inhalation LC_{50}: 1807 ppm (4 h); 13 500 mg/m^3 (15 min).
Mutagenic endpoint: Mouse, 1500 ppm (10 min).
Reproductive endpoint: Rat, (0 to 20 d pregnant), Inhalation TCLo: 150 ppm (24 h).

Toxicity Data for Carbon dioxide:

Rat, Inhalation LC_{50}: 470 000 ppm (30 min).
Mutagenic endpoint: No data available.
Reproductive endpoint: Rat, (10 d pregnant), Inhalation TCLo: 6 pph.

Health Effects: See Section 2, "Hazards Identification" for potential health effects.

Target Organs: Blood, central nervous systems.

Medical Conditions Aggravated by Exposure: Blood system disorders, heart or cardiovascular disorders, hormonal disorders, and respiratory disorders.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: No ecotoxicity data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated by DOT and IATA.

15. REGULATORY INFORMATION

U.S. Regulations

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.
SARA Title III Section 302 (40 CFR 355.30): Not regulated.
SARA Title III Section 304 (40 CFR 355.40): Not regulated.
SARA Title III Section 313 (40 CFR 372.65): Not regulated.
OSHA Process Safety (29 CFR 1910.119): Not regulated.
SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH:	Yes
CHRONIC HEALTH:	Yes
FIRE:	No
REACTIVE:	No
PRESSURE:	No

State Regulations:

California Proposition 65: Warning! This material contains a chemical (carbon monoxide) known to the state of California to cause reproductive effects.

Canadian Regulations:

WHMIS Information: Not provided for this material.

European Regulations

EC Classification

T: Toxic, Repr. Cat. 1

EC Risk Phrase(s):

R23 – Toxic by inhalation

R48/23 – Toxic: danger of serious damage to health by prolonged exposure through inhalation.

R61 – May cause harm to the unborn child.

EC Safety Phrase(s):

S45 – In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S53 – Avoid exposure – obtain special instructions before use.

National Inventory Status

U.S. Inventory (TSCA): Carbon monoxide and carbon dioxide are listed.
TSCA 12(b), Export Notification: Not listed.

16. OTHER INFORMATION

Sources: ChemAdvisor, Inc., MSDS, *Carbon Monoxide*, 20 December 2011.

ChemAdvisor, Inc., MSDS *Carbon Dioxide*, 20 December 2011.

EC; European Chemical Substance Information System (ESIS), *Carbon Monoxide, Index Number 006-001-00-2*, available at http://esis.jrc.ec.europa.eu/index.php?PGM=cla (accessed June 2012).

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.