## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1. Product identifier
- **Product form**: Mixture
- **Product name**: Ethanol (0.0001% - 0.0999%) in Nitrogen

### 1.2. Relevant identified uses of the substance or mixture and uses advised against
- **Use of the substance/mixture**: Test gas/Calibration gas.

### 1.3. Details of the supplier of the safety data sheet
- **Calgaz, division of Air Liquide**
  821 Chesapeake Drive
  Cambridge, 21613 - USA
  T 1-410-228-6400 - F 1-410-228-4251
  info@Calgaz.com - www.Calgaz.com

### 1.4. Emergency telephone number
- **Emergency number**: CHEMTREC: 1-800-424-9300
  Internationally: 1-703-527-3887

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture
- **Classification (GHS-US)**
  Compressed gas H280
- **Full text of H-phrases**: see section 16

### 2.2. Label elements
- **GHS-US labeling**
- **Hazard pictograms (GHS-US)**: GHS04
- **Signal word (GHS-US)**: Warning
- **Hazard statements (GHS-US)**: H280 - Contains gas under pressure; may explode if heated
- **Precautionary statements (GHS-US)**: P202 - Do not handle until all safety precautions have been read and understood
  P271 - Use only outdoors or in a well-ventilated area
  P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
  P313 - Get medical advice/attention
  CGA-PG05 - Use a back flow preventive device in the piping
  CGA-PG21 - Open valve slowly
  CGA-PG06 - Close valve after each use and when empty
  CGA-PG10 - Use only with equipment rated for cylinder pressure
  CGA-PG14 - Approach suspected leak area with caution
  CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)
  P403 - Store in a well-ventilated place

### 2.3. Other hazards
- No additional information available

### 2.4. Unknown acute toxicity (GHS-US)
- Not applicable

## SECTION 3: Composition/information on ingredients

### 3.1. Substance
- Not applicable

### 3.2. Mixture
- Not applicable
**SECTION 4: First aid measures**

4.1. Description of first aid measures

First-aid measures general : If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.

First-aid measures after skin contact : Adverse effects not expected from this product.

First-aid measures after eye contact : Adverse effects not expected from this product.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Symptoms similar to those listed under inhalation.

Symptoms/injuries after inhalation : May displace oxygen and cause rapid suffocation.

Symptoms/injuries after skin contact : Adverse effects not expected from this product.

Symptoms/injuries after eye contact : Adverse effects not expected from this product.

Symptoms/injuries after ingestion : Ingestion is not considered a potential route of exposure.

Chronic symptoms : Adverse effects not expected from this product.

4.3. Indication of any immediate medical attention and special treatment needed

If you feel unwell, seek medical advice. If breathing is difficult, give oxygen.

**SECTION 5: Firefighting measures**

5.1. Extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

Unsuitable extinguishing media : Do not use water jet.

5.2. Special hazards arising from the substance or mixture

Fire hazard : The product is not flammable.

Explosion hazard : Product is not explosive. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.

Reactivity : None known.

5.3. Advice for firefighters

Firefighting instructions : In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire.

Protection during firefighting : Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Do not enter fire area without proper protective equipment, including respiratory protection.

**SECTION 6: Accidental release measures**

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ensure adequate ventilation.

6.1.1. For non-emergency personnel

Protective equipment : Wear protective equipment consistent with the site emergency plan.


6.1.2. For emergency responders

Protective equipment : Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Equip cleanup crew with proper protection.

Emergency procedures : Evacuate and limit access. Ventilate area.
6.2. Environmental precautions
Try to stop release if safe to do so.

6.3. Methods and material for containment and cleaning up
For containment: Try to stop release if safe to do so.
Methods for cleaning up: Dispose of this material and its container in accordance with local regulations.

6.4. Reference to other sections
See also Sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed: Pressurized container: Do not pierce or burn, even after use. Use equipment rated for cylinder pressure.

Precautions for safe handling: Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area.

Safe handling of the gas receptacle: Protect cylinders from physical damage; do not drag, roll, slide or drop. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.

Hygiene measures: Do not eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures: Comply with applicable regulations.
Storage conditions: Do not expose to temperatures exceeding 52°C (125°F). Keep container closed when not in use. Protect cylinder from physical damage. Store in well ventilated area.

Incompatible products: None known.
Incompatible materials: None known.

7.3. Specific end use(s)
Test gas/Calibration gas.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Ethanol (0.0001% - 0.0999%) in Nitrogen</th>
<th>ACGIH</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OSHA</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nitrogen (7727-37-9)</th>
<th>ACGIH</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OSHA</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ethyl alcohol (64-17-5)</th>
<th>ACGIH</th>
<th>ACGIH STEL (ppm) 1000 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OSHA</td>
<td>OSHA PEL (TWA) (mg/m³) 1900 mg/m³</td>
</tr>
<tr>
<td></td>
<td>OSHA</td>
<td>OSHA PEL (TWA) (ppm) 1000 ppm</td>
</tr>
</tbody>
</table>

8.2. Exposure controls

Appropriate engineering controls: Ensure exposure is below occupational exposure limits. Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leaks. Oxygen detectors should be used when asphyxiating gases may be released. Consider work permit system e.g. for maintenance activities.

Skin and body protection: Wear suitable protective clothing, e.g. - lab coats, coveralls or flame resistant clothing.
Respiratory protection: None necessary during normal and routine operations. See sections 5 & 6.
Thermal hazard protection: None necessary during normal and routine operations.
Environmental exposure controls: Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.
SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas
Appearance : Clear, colorless gas.
Molecular mass : Not applicable for gas-mixtures.
Color : Colorless
Odor : Odorless.
Odor threshold : No data available
pH : Not applicable for gas-mixtures.
Relative evaporation rate (butyl acetate=1) : No data available
Relative evaporation rate (ether=1) : Not applicable for gas-mixtures.
Melting point : No data available
Freezing point : No data available
Boiling point : No data available
Flash point : No data available
Auto-ignition temperature : No data available
Decomposition temperature : No data available
Flammability (solid, gas) : Not flammable - not combustible
Vapor pressure : Not applicable.
Relative vapor density at 20 °C : No data available
Relative density : No data available
Relative gas density : Similar to air.
Solubility : Water: Solubility in water of component(s) of the mixture :
Log Pow : Not applicable for gas-mixtures.
Log Kow : Not applicable for gas-mixtures.
Viscosity, kinematic : Not applicable.
Viscosity, dynamic : Not applicable.
Explosive properties : Not applicable - not flammable.
Oxidizing properties : None.
Explosive limits : Not applicable - not flammable

9.2. Other information

Additional information : None.

SECTION 10: Stability and reactivity

10.1. Reactivity

None known.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

None known.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

None known.

10.6. Hazardous decomposition products

Under normal conditions of storage and use hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified
**Ethanol (0.0001% - 0.0999%) in Nitrogen**

**Safety Data Sheet**

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<table>
<thead>
<tr>
<th>Nitrogen (7727-37-9)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 inhalation rat (ppm)</td>
<td>820000 ppm/4h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ethyl alcohol (64-17-5)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 inhalation rat (mg/l)</td>
<td>124.7 mg/l/4h</td>
</tr>
<tr>
<td>LC50 inhalation rat (ppm)</td>
<td>66180 ppm/4h</td>
</tr>
</tbody>
</table>

- **Skin corrosion/irritation**: Not classified
- **Serious eye damage/irritation**: Not classified
- **Respiratory or skin sensitization**: Not classified
- **Germ cell mutagenicity**: Not classified
- **Carcinogenicity**: Not classified
- **Ethyl alcohol (64-17-5)**
  - **IARC group**: 1 - Carcinogenic to humans
  - **Reproductive toxicity**: Not classified
  - **Specific target organ toxicity (single exposure)**: Not classified
  - **Specific target organ toxicity (repeated exposure)**: Not classified
  - **Aspiration hazard**: Not classified
  - **Symptoms/injuries after inhalation**: May displace oxygen and cause rapid suffocation.
  - **Symptoms/injuries after skin contact**: Adverse effects not expected from this product.
  - **Symptoms/injuries after eye contact**: Ingestion is not considered a potential route of exposure.
  - **Symptoms/injuries upon intravenous administration**: Not known.
  - **Chronic symptoms**: Adverse effects not expected from this product.

**SECTION 12: Ecological information**

**12.1. Toxicity**

**Ethanol (64-17-5)**

<table>
<thead>
<tr>
<th></th>
<th>12.0 - 16.0 ml/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 fish 1</td>
<td>9268 - 14221 mg/l (Exposure time: 48 h - Species: Daphnia magna)</td>
</tr>
<tr>
<td>EC50 Daphnia 1</td>
<td>&gt; 100 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])</td>
</tr>
<tr>
<td>LC50 fish 2</td>
<td>2 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])</td>
</tr>
</tbody>
</table>

**Nitrogen (7727-37-9)**

Persistence and degradability: No data available.

**Bioaccumulative potential**: No ecological damage caused by this product.

**12.2. Persistence and degradability**

**Ethanol (0.0001% - 0.0999%) in Nitrogen**

Persistence and degradability: No data available.

**Nitrogen (7727-37-9)**

Persistence and degradability: No ecological damage caused by this product.

**Bioaccumulative potential**: No data available.

**12.3. Bioaccumulative potential**

**Ethanol (0.0001% - 0.0999%) in Nitrogen**

- **Log Pow**: Not applicable for gas-mixtures.
- **Log Kow**: Not applicable for gas-mixtures.
- **Bioaccumulative potential**: No data available.

**Nitrogen (7727-37-9)**

- **Log Pow**: Not applicable for inorganic gases.
- **Bioaccumulative potential**: No ecological damage caused by this product.

**Ethyl alcohol (64-17-5)**

- **Log Pow**: -0.32
12.4. Mobility in soil

<table>
<thead>
<tr>
<th>Ethanol (0.0001% - 0.0999%) in Nitrogen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility in soil</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nitrogen (7727-37-9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecology - soil</td>
</tr>
</tbody>
</table>

12.5. Other adverse effects

Effect on ozone layer : None.

Effect on the global warming : No known ecological damage caused by this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Contact supplier if guidance is required. Do not discharge into any place where its accumulation could be dangerous. Ensure that the emission levels from local regulations or operating permits are not exceeded.

Waste disposal recommendations : Refer to the CGA Pamphlet P-63 "Disposal of Gases" available at www.cganet.com for more guidance on suitable disposal methods.

SECTION 14: Transport information

In accordance with DOT

Transport document description : UN1956 Compressed gas, n.o.s. (Ethanol, Nitrogen), 2.2

UN-No.(DOT) : UN1956

Proper Shipping Name (DOT) : Compressed gas, n.o.s.

Department of Transportation (DOT) Hazard Classes : 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115

Hazard labels (DOT) : 2.2 - Non-flammable gas

DOT Symbols : G - Identifies PSN requiring a technical name

DOT Packaging Exceptions (49 CFR 173.xxx) : 306;307

DOT Packaging Non Bulk (49 CFR 173.xxx) : 302;305

DOT Packaging Bulk (49 CFR 173.xxx) : 314;315

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 75 kg

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 150 kg

DOT Vessel Stowage Location : A - The material may be stowed “on deck” or “under deck” on a cargo vessel and on a passenger vessel.

Additional information

Other information : No supplementary information available.

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

ADR

Transport document description : UN 1956 COMPRESSED GAS, N.O.S., 2.2

Class (ADR) : 2 - Gases
Ethanol (0.0001% - 0.0999%) in Nitrogen
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Hazard labels (ADR) : 2.2 - Non-flammable compressed gas

<table>
<thead>
<tr>
<th>Transport by sea</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>UN-No. (IMDG)</td>
<td>1956</td>
</tr>
<tr>
<td>Proper Shipping Name (IMDG)</td>
<td>COMPRESSED GAS, N.O.S.</td>
</tr>
<tr>
<td>Class (IMDG)</td>
<td>2.2 - Non-flammable, non-toxic gases</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Air transport</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>UN-No.(IATA)</td>
<td>1956</td>
</tr>
<tr>
<td>Proper Shipping Name (IATA)</td>
<td>COMPRESSED GAS, N.O.S.</td>
</tr>
<tr>
<td>Class (IATA)</td>
<td>2</td>
</tr>
</tbody>
</table>

SECTION 15: Regulatory information

15.1. US Federal regulations

<table>
<thead>
<tr>
<th>Nitrogen (7727-37-9)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bulk ethanol (64-17-5)</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
<td></td>
</tr>
</tbody>
</table>

15.2. International regulations

**CANADA**

<table>
<thead>
<tr>
<th>Nitrogen (7727-37-9)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the Canadian DSL (Domestic Sustances List)</td>
<td></td>
</tr>
<tr>
<td>WHMIS Classification</td>
<td>Class A - Compressed Gas</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bulk ethanol (64-17-5)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the Canadian DSL (Domestic Sustances List)</td>
<td></td>
</tr>
</tbody>
</table>
| WHMIS Classification | Class B Division 2 - Flammable Liquid
class D Division 2 Subdivision B - Toxic material causing other toxic effects |

**EU-Regulations**

<table>
<thead>
<tr>
<th>Nitrogen (7727-37-9)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Bulk ethanol (64-17-5)</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)</td>
<td></td>
</tr>
</tbody>
</table>

**Classification according to Regulation (EC) No. 1272/2008 [CLP]**
Not classified

**Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]**

15.2.2. National regulations

<table>
<thead>
<tr>
<th>Nitrogen (7727-37-9)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the AICS (Australian Inventory of Chemical Substances)</td>
<td></td>
</tr>
<tr>
<td>Listed on IEUBC (Inventory of Existing Chemical Substances Produced or Imported in China)</td>
<td></td>
</tr>
<tr>
<td>Listed on the Korean ECL (Existing Chemicals List)</td>
<td></td>
</tr>
<tr>
<td>Listed on NZIoC (New Zealand Inventory of Chemicals)</td>
<td></td>
</tr>
<tr>
<td>Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bulk ethanol (64-17-5)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on IARC (International Agency for Research on Cancer)</td>
<td></td>
</tr>
<tr>
<td>Listed on the AICS (Australian Inventory of Chemical Substances)</td>
<td></td>
</tr>
<tr>
<td>Listed on IEUBC (Inventory of Existing Chemical Substances Produced or Imported in China)</td>
<td></td>
</tr>
<tr>
<td>Listed on the Japanese ENCS (Existing &amp; New Chemical Substances) inventory</td>
<td></td>
</tr>
<tr>
<td>Listed on the Korean ECL (Existing Chemicals List)</td>
<td></td>
</tr>
<tr>
<td>Listed on NZIoC (New Zealand Inventory of Chemicals)</td>
<td></td>
</tr>
<tr>
<td>Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)</td>
<td></td>
</tr>
<tr>
<td>Listed on the Canadian IDL (Ingredient Disclosure List)</td>
<td></td>
</tr>
</tbody>
</table>
Ethanol (0.0001% - 0.0999%) in Nitrogen
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### 15.3. US State regulations

<table>
<thead>
<tr>
<th>Bulk ethanol (64-17-5)</th>
<th>U.S. - California - Proposition 65 - Carcinogens List</th>
<th>U.S. - California - Proposition 65 - Developmental Toxicity</th>
<th>U.S. - California - Proposition 65 - Reproductive Toxicity - Female</th>
<th>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</th>
<th>No significance risk level (NSRL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nitrogen (7727-37-9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - Massachusetts - Right To Know List</td>
</tr>
<tr>
<td>U.S. - New Jersey - Right to Know Hazardous Substance List</td>
</tr>
<tr>
<td>U.S. - Pennsylvania - RTK (Right to Know) List</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bulk ethanol (64-17-5)</th>
</tr>
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<tbody>
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<tr>
<td>U.S. - New Jersey - Right to Know Hazardous Substance List</td>
</tr>
<tr>
<td>U.S. - Pennsylvania - RTK (Right to Know) List</td>
</tr>
</tbody>
</table>

### SECTION 16: Other information

**Indication of changes**: Revised safety data sheet in accordance with OSHA final rule on GHS implementation promulgated March 26, 2012.

**Other information**: This Safety Data Sheet is offered pursuant to OSHA’s Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product.

**Full text of H-phrases**:

<table>
<thead>
<tr>
<th>Compressed gas</th>
<th>Gases under pressure Compressed gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Irrit. 2A</td>
<td>Serious eye damage/eye irritation Category 2A</td>
</tr>
<tr>
<td>Flam. Liq. 2</td>
<td>Flammable liquids Category 2</td>
</tr>
<tr>
<td>H225</td>
<td>Highly flammable liquid and vapor</td>
</tr>
<tr>
<td>H280</td>
<td>Contains gas under pressure; may explode if heated</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation</td>
</tr>
</tbody>
</table>

SDS US (GHS HazCom 2012)

*This Safety Data Sheet is offered pursuant to OSHA’s Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this gas mixture. To the best of Calgaz’s knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this gas mixture is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.*