1. Product and company identification

Trade Name

Formaldehyde 50%/ Methanol 1.5%, solution

Manufacturer, importer, supplier
Celanese Ltd.
222 W. Las Colinas Blvd., Suite 900N
Irving, TX  75039
United States
Phone:  972 443 4000
Internet:  www.celanese.com

Transportation emergency phone numbers:
For Chemical Emergency:  Spill Leak Fire Exposure or Accident
Call CHEMTREC Day or Night
DOMESTIC NORTH AMERICA:  800-424-9300
INTERNATIONAL, CALL +1 703-527-3887 (collect calls accepted)

Identified uses
Industrial use

2. Hazard Identification

GHS Classification

Hazards                              Category
Flammable liquid                     Category 4
Acute oral toxicity                 Category 3
Acute dermal toxicity               Category 3
Acute inhalation toxicity           Category 3
Skin corrosion/irritation            Category 1B
Skin sensitization                  Category 1
Germ cell mutagenicity              Category 2
Carcinogenicity                     Category 1B
Specific target organ systemic toxicity (single exposure) Category 1
Acute aquatic toxicity              Category 2

Label elements

Signal Word        Danger
Hazard Statements

- Combustible liquid
- Toxic if swallowed
- Toxic in contact with skin
- Toxic if inhaled
- Causes severe skin burns and eye damage
- May cause an allergic skin reaction
- Suspected of causing genetic defects
- May cause cancer
- Causes damage to organs
- Toxic to aquatic life

Precautionary statements

Keep away from flames and hot surfaces - No smoking

In case of fire:
Use foam, dry chemical, carbon dioxide (CO2) to extinguish.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust/fume/gas/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
Wash face, hands and any exposed skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Contaminated work clothing should not be allowed out of the workplace

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
Immediately call a POISON CENTER or doctor.

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
If skin irritation or rash occurs: Get medical advice/attention
Wash contaminated clothing before reuse.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Immediately call a POISON CENTER or doctor.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/attention.
Store locked up.
Store in a well-ventilated place. Keep cool.
Keep container tightly closed.
Dispose of contents/ container to an approved waste disposal plant.

3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No</th>
<th>Percent %</th>
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<tbody>
<tr>
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<td>50-00-0</td>
<td>50-50.5</td>
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<tr>
<td>Methanol</td>
<td>67-56-1</td>
<td>0-1.5</td>
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</tbody>
</table>

4. First aid measures
4. First aid measures

General Information
Remove contaminated, soaked clothing immediately and dispose of safely.

Skin
Wash off immediately with plenty of water for at least 15 minutes. Destroy contaminated shoes.

Eyes
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.

Inhalation
Move to fresh air. If breathing has stopped, apply artificial respiration. Call a physician immediately.

Ingestion
Do not induce vomiting. If conscious, give 2 glasses of water. Get immediate medical attention. Call a physician immediately.

Notes to physician
Observe for latent pulmonary edema. Chemical pneumonitis could follow respiratory exposure.

5. Fire-fighting measures

NFPA: Health: 3 Flammability: 2 Instability: 0

Suitable extinguishing media
Foam, Dry chemical, Carbon dioxide (CO2)

Extinguishing media which must not be used for safety reasons
Do not use a solid water stream as it may scatter and spread fire.

Special exposure hazards arising from the substance or preparation itself, its combustion products, or released gases
Under conditions giving incomplete combustion, hazardous gases produced may consist of Carbon monoxide Carbon dioxide (CO2) Combustion gases of organic materials must in principle be graded as inhalation poisons

Special protective equipment for fire-fighters
self-contained breathing apparatus (EN 133).

Environmental precautions
Dike and collect water used to fight fire. Water run-off and vapor cloud may be corrosive.

Other Information
Cool containers / tanks with water spray. Thoroughly decontaminate bunker gear and other fire-fighting equipment before re-use

6. Accidental release measures

Personal precautions
Avoid contact with the skin and the eyes. Keep away from heat and sources of ignition. Provide adequate ventilation.
Isolation
Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas. Isolate for 800 meters or 0.5 miles in all directions if tank, rail car, or tank truck is involved in fire. Evacuate downwind areas as conditions warrant to prevent exposure and to allow vapors or fumes to dissipate. Spills may expose downwind areas to toxic or flammable concentrations over considerable distances in some cases.

Environmental precautions
Prevent further leakage or spillage. Do not discharge into the drains/surface waters/groundwater.

Methods for cleaning up
Soak up with inert absorbent material. Do not use rags, paper towels or combustible materials to clean up a spill, because spontaneous combustion can occur. Keep in suitable, closed containers for disposal. Dispose of in accordance with local regulations.

Authority Notification
Within the United States, call the National Response Center (800-424-8802) and appropriate state and local authorities if the quantity released over 24 hours is equal to or greater than the reportable quantity listed below:

200lb/90 kg

7. Handling and storage

Advice on safe handling
Vapors may form explosive mixtures with air. The pressure in sealed containers can increase under the influence of heat. Refill and handle product only in closed system. Provide sufficient air exchange and/or exhaust in work rooms.

Protection - fire and explosion:
Keep away from sources of ignition - No smoking. Vapours are heavier than air and may spread along floors. Take necessary action to avoid static electricity discharge. Ground and bond containers when transferring material. In case of fire, emergency cooling with water spray should be available.

Technical measures/Storage conditions
Keep tightly closed in a dry, cool and well-ventilated place. Handle an open container with care. Store under nitrogen.

Material storage
Store locked up. The product will oxidize in air and release heat. Oxidization creates acids and peroxides, that may lead to corrosive damages in storage and handling equipment.

Incompatible products
Keep away from: Acids, Bases, Amines, Oxygen, Oxidizing agents, Reducing agents

8. Exposure controls / personal protection

OSHA Exposure Limits

<table>
<thead>
<tr>
<th>Components</th>
<th>TWA</th>
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<tbody>
<tr>
<td>Formaldehyde</td>
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<table>
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<th>Components</th>
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</thead>
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ACGIH Exposure Limits

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<tbody>
<tr>
<td>Methanol</td>
<td>200 PPM</td>
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<table>
<thead>
<tr>
<th>Components</th>
<th>STEL</th>
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<tr>
<td>Methanol</td>
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Ceiling Limit Value:

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<th>Components</th>
<th>Value</th>
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2005 NIOSH IDLH:

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<th>Value</th>
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<tr>
<td>Formaldehyde</td>
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<tr>
<td>Methanol</td>
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Mexico National Exposure Limits

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<tr>
<th>Components</th>
<th>LMPE - PPT</th>
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<tr>
<td>Methanol</td>
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<table>
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<table>
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<td>Formaldehyde</td>
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<table>
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<tr>
<th>Components</th>
<th>Mexican Ceiling Exposure Limit</th>
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<tbody>
<tr>
<td>Formaldehyde</td>
<td>3 mg/m³</td>
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Exposure controls

Engineering measures
General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred. Explosion-proof equipment (for example fans, switches, and grounded ducts) should be used in mechanical ventilation systems.

Protective equipment
A safety shower and eyebath should be readily available.
General advice
Avoid contact with skin and eyes. Do not breathe vapors or spray mist. Use only in an area equipped with a safety shower. Hold eye wash fountain available.

Respiratory protection
Based on workplace contaminant level and working limits of the respirator, use a respirator approved by NIOSH. The following is the minimum recommended equipment for an occupational exposure level. To estimate an occupational exposure level see Section 8 and Section 11.

For formaldehyde concentrations > 1 and < 10 times the occupational exposure level: Use air-purifying respirator with full facepiece fitted with either cartridge(s) or canister specifically approved for protection against formaldehyde, or a full facepiece powered air-purifying respirator fitted with either cartridge(s) or canister specifically approved for protection against formaldehyde. The air purifying element must have an end of service life indicator, or a documented change out schedule must be established. Otherwise, use supplied air.

For concentrations > 1 and < 100 times the occupational exposure level: Use Type C full facepiece supplied-air respirator operated in positive-pressure or continuous-flow mode.

For concentrations > the IDLH level or unknown concentration (such as in emergencies): Use self-contained breathing apparatus with full facepiece in positive-pressure mode or Type C positive-pressure full facepiece supplied-air respirator with an auxiliary positive-pressure self-contained breathing apparatus escape system.

For escape: Use positive-pressure self-contained breathing apparatus with full facepiece or full facepiece mask with chin style or front or back mounted type industrial size canister specifically approved for protection against formaldehyde.

Skin protection:
Wear impervious clothing and gloves to prevent contact. Butyl rubber is recommended. Other protective material may be used, depending on the situation, if adequate degradation and permeation data is available. If other chemicals are used in conjunction with this chemical, material selection should be based on protection for all chemicals present.

Eye/face protection:
Wear chemical goggles when there is a reasonable chance of eye contact. In addition to goggles, wear a face shield if there is a reasonable chance for splash to the face.

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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<tbody>
<tr>
<td>Appearance</td>
<td>liquid</td>
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<tr>
<td>Color</td>
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<tr>
<td>Odor</td>
<td>pungent</td>
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<tr>
<td>Flash point</td>
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<tr>
<td>Method</td>
<td>closed cup</td>
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<tr>
<td>Boiling point/range</td>
<td>99°C (210°F)</td>
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<td>pH</td>
<td>3-6</td>
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<td>Specific Gravity</td>
<td>1.126 @ 55 deg C</td>
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<tr>
<td>Water solubility</td>
<td>Soluble</td>
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</table>
10. Stability and reactivity

Reactivity
Stable if protected from heat and exposure to air.

Conditions to avoid
Avoid any source of ignition. Avoid contact with heat, sparks, open flame, and static discharge.

Incompatible Materials
Keep away from:
Oxygen
Oxidizing agents
Reducing agents
Acids
Bases

Hazardous Combustion or Decomposition Products:
In the presence of sufficient oxygen, combustion may produce oxides of nitrogen and carbon dioxide. Nitrogen oxides can react with water to produce nitric acid. Combustion under oxygen starved conditions may produce numerous toxic products including carbon monoxide, cyanides and nitriles., Thermal decomposition products may include oxides of carbon.

Possibility of hazardous reactions
May form explosive peroxides, Polymerization can occur, Polymerization is a highly exothermic reaction and may generate sufficient heat to cause thermal decomposition and/or rupture containers.
11. Toxicological information

Potential health effects

Routes of exposure
Skin, eyes, inhalation, ingestion.

Immediate effects

Skin
Causes skin burns. May cause allergic skin reaction. Symptoms of overexposure include: Central nervous system depression with headache, stupor, uncoordinated or strange behavior or unconsciousness. Redness or discoloration, swelling, itching, burning or blistering of skin. Prolonged and/or repeated skin contact with methanol-soaked material has produced toxic effects including vision effects and death.

Eyes
Exposure to liquid Causes severe eye burns, damage irreversible. Exposure to vapors Causes eye irritation. Symptoms of exposure may include: Eye irritation, burning sensation, pain, watering, and/or change of vision.

Inhalation
Causes respiratory tract irritation. May cause allergic respiratory reaction. Symptoms of exposure may include: Central nervous system depression with nausea, dizziness, headache, stupor, uncoordinated or strange behavior or unconsciousness. Adverse effects on vision. Nasal discharge, hoarseness, coughing, chest pain and breathing difficulty. Accumulation of fluid in the lungs (pulmonary edema); symptoms can be delayed for several hours.

Ingestion
Harmful if swallowed. Causes digestive tract burns. Symptoms may be delayed. Central nervous system depression with nausea, dizziness, headache, stupor, uncoordinated or strange behavior, or unconsciousness. Severe damage to the mouth, throat esophagus and/or stomach.

Other:
Formaldehyde is listed as a potential cancer hazard by OSHA, a known human carcinogen by The International Agency for Research on Cancer (IARC, Group 1), and is listed in the 12th Report on Carcinogens (RoC) released by The National Toxicology Program (NTP).

Methanol

**Acute oral toxicity**
LD50: > 5000 mg/kg

**Acute dermal toxicity**
LD50: > 5000 mg/kg

**Acute inhalation toxicity**
LC50 (4h): > 5 mg/l

**Skin corrosion/irritation**
irritating

**Skin Sensitization**
Species: guinea pig
Method: Maximization

**Serious eye damage/eye irritation**
irritant
Species: rabbit eye

**Carcinogenic effects**
No evidence of carcinogenicity
Species: rats
Formaldehyde 50%/ Methanol 1.5%, solution

Carcinogenic Effects

Species: mice
Study: inhalation lifetime study

in vitro Mutagenicity


in vivo Mutagenicity

Positive and negative results

Reproductive toxicity

Some indication of reproductive toxicity in animals at non-physiological levels

Developmental effects

Some indication of developmental toxicity in animals at non-physiological levels

Formaldehyde

Acute oral toxicity
LD50: 460 mg/kg

Acute dermal toxicity
Data waiving: formaldehyde has corrosive properties.

Acute inhalation toxicity
LC50 (30 min): 1000 mg/m³

Method: OECD 403

Skin corrosion/irritation
Species: rabbit
Method: OECD 404

Skin Sensitization
Species: mouse female
Method: OECD 429

Serious eye damage/eye irritation
Species: rabbit eye
Method: OECD 405

Species: rats

Carcinogenic Effects
Species: oral
Study: oral (drinking water) lifetime study
NOAEL: 82 mg/kg

in vitro Mutagenicity
Ames Test: positive - with and without metabolic activation - Method: OECD 471

in vivo Mutagenicity
Formaldehyde is a direct acting locally effective mutagen, with genotoxic effects limited to those cells in direct contact with formaldehyde (OECD SIDS). Did not cause chromosomal damage in rat bone marrow
Method: EU B.12

Reproductive toxicity
No toxicity to reproduction

Developmental effects
no adverse developmental effects

Routes of exposure
oral gavage
Species: mouse

Developmental effects
no adverse developmental effects
12. Ecological Information

Formaldehyde

Acute fish toxicity
Species: Danio rerio (Zebra fish)
Method: OECD 203
LC50: 6.7 mg/l (96h)

Acute daphnia toxicity
Species: Daphnia pulex
Method: OECD 202
EC50: 5.8 g/l (48h)

Species: Desmodesmus subspicatus
Method: OECD 201
EC50 (biomass): 4.89 mg/l (72h)

Species: Scenedesmus quadricauda
Method: OECD 201

Biodegradation
in fresh water
Readily biodegradable

Bioconcentration factor (BCF)
Method: OECD 301 C
0.396 l/kg

Other potential hazards
The substance does not meet the criteria for PBT / vPvB according to REACH, Annex XIII

Methanol

Acute fish toxicity
Species: Pimephales promelas (Fathead minnow)
Method: Flow-through
LC50: 28 g/l (96h)

Chronic fish toxicity
Species: Lepomis macrochirus (Bluegill sunfish)
Method: Flow-through
LC50: 15.4 g/l (96h)

Acute daphnia toxicity
Species: Daphnia magna
EC50: 24.5 g/l (48h)

Toxicity to aquatic plants
Species: Selenastrum capricornutum (green algae)
EC50: 7.1 mg/l (48h)

Biodegradation
48 % (5d)

Bioconcentration factor (BCF)
Bioaccumulative potential - low

Bioaccumulation
The substance does not meet the criteria for PBT / vPvB according to REACH, Annex XIII
12. Ecological Information

13. Disposal considerations

Disposal considerations
Dispose of spilled material in accordance with state and local regulations for hazardous waste. Recommended methods are incineration or biological treatment at a federally or state-permitted disposal facility. Note that this information applies to the material as manufactured; processing, use, or contamination may make this information inappropriate, inaccurate, or incomplete.

Note that this handling and disposal information may also apply to empty containers, liners and rinsate. State or local regulations or restrictions are complex and may differ from federal regulations. This information is intended as an aid to proper handling and disposal; the final responsibility for handling and disposal is with the owner of the waste.

EPA Hazardous Waste Code(s): U122

14. Transport information

US Department of Transportation

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<thead>
<tr>
<th>UN/NA Number</th>
<th>Formaldehyde, solutions</th>
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</thead>
<tbody>
<tr>
<td>Hazard class</td>
<td>8</td>
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<tr>
<td>Packing Group</td>
<td>III</td>
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<tr>
<td>Reportable Quantity (RQ)</td>
<td>200lb/90 kg</td>
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<tr>
<td>Emergency Resp. Guide</td>
<td>132</td>
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TDG

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<th>UN/NA Number</th>
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<tr>
<td>Class</td>
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<td>Packing Group</td>
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Mexico Transport Information

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ICAO/IATA

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<td>Hazard Class</td>
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<td>Packing group</td>
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IMDG

<table>
<thead>
<tr>
<th>UN/ID No.</th>
<th>FORMALDEHYDE SOLUTION</th>
</tr>
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</table>
15. Regulatory Information

US State Regulations
Chemicals associated with the product which are subject to the state right-to-know regulations are listed along with the applicable state(s):

Methanol 67-56-1
Pennsylvania Listed
New York Listed
New Jersey Listed
Illinois Listed
Massachusetts Listed
Rhode Island Listed

Formaldehyde 50-00-0
Pennsylvania Listed
New York Listed
New Jersey Listed
Illinois Listed
Louisiana Listed
Massachusetts Listed
Rhode Island Listed

California Prop. 65
WARNING: This product contains the following chemicals that are known to the State of California to cause cancer, birth defects or other reproductive harm.

Formaldehyde (50-00-0)
Methanol (67-56-1)

Formaldehyde 50-00-0
Listed

U.S. FEDERAL REGULATIONS

TSCA Inventory:
We certify that all components are either on the TSCA inventory or qualify for an exemption.

OSHA FORMALDEHYDE STANDARD: This product is capable of emitting free formaldehyde and is covered by the OSHA Formaldehyde Standard, 29 CFR 1910.1048.

Environmental Regulations:
Methanol 67-56-1
EPCRA Section 313 Listed
CERCLA Hazardous Substance Listed

Formaldehyde 50-00-0
EPCRA Section 313 Listed
CERCLA Hazardous Substance Listed
Extremely Hazardous Substance Listed

SARA 311:
Acute health: Yes
Chronic health: Yes
Fire: Yes
Sudden release of pressure: No
Reactive: No

INTERNATIONAL REGULATIONS

International Inventories
Australia (AICS)
Canada (DSL)
China (IECSC)
Europe (EINECS)
Japan (ENCS)
Korea (KECI)
Philippines (PICCS)

16. Other information

NFPA:
Health: 3 Flammability: 2 Instability: 0
HMIS:
Health: 3 Flammability: 2 Physical Hazard: 0

Prepared By
Product Stewardship Department
Celanese

For more information, other material safety data sheets or technical data sheets please consult the Celanese homepage (www.celanese.com)

Sources of key data used to compile the datasheet
Information contained in this safety data sheet is based on Celanese owned data and public sources deemed valid or acceptable. The absence of data elements required by ANSI or 1907/2006/EC indicates that no data meeting these requirements is available.

Other Information:
Observe national and local legal requirements
Changes against the previous version are marked by ***
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