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

1.1 Product identifier
   Trade name : Paraformaldehyde 91-93%
   Product code : 000000000050000767
   CAS-No. : 30525-89-4

1.2 Relevant identified uses of the substance or mixture and uses advised against
   Use of the Substance/Mixture : Chemical intermediate

1.3 Details of the supplier of the safety data sheet
   Company : Celanese Sales Germany GmbH
              Am Unisyspark 1
              65843 Sulzbach (Taunus), Germany
   E-mail address of person responsible for the SDS : HazCom@celanese.com

1.4 Emergency telephone number
   CHEMTREC: +1 703 527 3887 (Collect calls accepted)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
   Classification (REGULATION (EC) No 1272/2008)
   Acute toxicity , Category 4
   Skin corrosion , Category 1C
   Serious eye damage , Category 1
   Skin sensitisation , Category 1
   Carcinogenicity , Category 1B
   Germ cell mutagenicity , Category 2
   Specific target organ toxicity - single exposure , Category 3 , Respiratory system
   Acute aquatic toxicity , Category 3
   H302: Harmful if swallowed.
   H314: Causes severe skin burns and eye damage.
   H318: Causes serious eye damage.
   H317: May cause an allergic skin reaction.
   H350: May cause cancer.
   H341: Suspected of causing genetic defects.
   H335: May cause respiratory irritation.
   H402: Harmful to aquatic life.
Celanese Paraformaldehyde 91-93% have been tested in accordance with U.N. Test N1 and determined not to be a flammable solid.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms:

Signal word: Danger

Hazard statements:
- H302 Harmful if swallowed.
- H313 May be harmful in contact with skin.
- H332 Harmful if inhaled.
- H314 Causes severe skin burns and eye damage.
- H318 Causes serious eye damage.
- H317 May cause an allergic skin reaction.
- H350 May cause cancer.
- H341 Suspected of causing genetic defects.
- H335 May cause respiratory irritation.
- H402 Harmful to aquatic life.

Precautionary statements:

Prevention:
- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P260 Do not breathe dust or mist.
- P271 Use only outdoors or in a well-ventilated area.
- P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
- P270 Do not eat, drink or smoke when using this product.
- P264 Wash skin thoroughly after handling.
- P272 Contaminated work clothing should not be allowed out of the workplace.
- P273 Avoid release to the environment.

Response:
- P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P310 Immediately call a POISON CENTER or doctor/ physician.
- P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
- P363 Wash contaminated clothing before reuse.
- P308 + P313 IF exposed or concerned: Get medical advice/
Hazardous components which must be listed on the label:
Paraformaldehyde

2.3 Other hazards
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>EC-No. Index-No. Registration number</th>
<th>Classification</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paraformaldehyde</td>
<td>30525-89-4</td>
<td></td>
<td>Acute Tox.4; H302 Skin Corr.1C; H314 Skin Sens.1; H317 Eye Dam.1; H318 Acute Tox.4; H332</td>
<td>&gt;= 91 - &lt;= 93</td>
</tr>
<tr>
<td>formaldelyde</td>
<td>50-00-0 200-001-8 605-001-00-5</td>
<td></td>
<td>Acute Tox.3; H301 Acute Tox.3; H311 Skin Corr.1B; H314 Skin Sens.1; H317 Acute Tox.3; H331 Muta.2; H341 Carc.1B; H350</td>
<td>&lt;= 0.1</td>
</tr>
</tbody>
</table>

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Do not leave the victim unattended.

If inhaled : If unconscious, place in recovery position and seek medical advice.
If symptoms persist, call a physician.

In case of skin contact : If on skin, rinse well with water.
If symptoms persist, call a physician.

In case of eye contact : Remove contact lenses.
Protect unharmed eye.
If eye irritation persists, consult a specialist.

If swallowed

4.2 Most important symptoms and effects, both acute and delayed

Risks
- Harmful if swallowed or if inhaled
- May cause an allergic skin reaction.
- Causes serious eye damage.
- Causes severe burns.

4.3 Indication of any immediate medical attention and special treatment needed

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media:
- Water
- Foam
- Dry chemical
- Carbon dioxide (CO2)

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting
- Do not use a solid water stream as it may scatter and spread fire.
- Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Hazardous combustion products
- Carbon oxides
- Formaldehyde

5.3 Advice for firefighters

Special protective equipment for firefighters
- Wear self-contained breathing apparatus for firefighting if necessary.

Further information
- Standard procedure for chemical fires.
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions
- Avoid contact with the skin and the eyes.
- Avoid dust formation.
- Avoid breathing dust.
- Ensure adequate ventilation.
Mark the contaminated area with signs and prevent access to unauthorized personnel.

6.2 Environmental precautions

Environmental precautions: Do not flush into surface water or sanitary sewer system. Do not let product enter drains.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up: Pick up and arrange disposal without creating dust. Sweep up and shovel. Do not create a powder cloud by using a brush or compressed air. Non-sparking tools should be used. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling: For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Minimize dust generation and accumulation. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Ensure all equipment is electrically grounded before beginning transfer operations.

Paraformaldehyde decomposes to formaldehyde which can build up in a shipping container depending on time and temperature during transit. The level of formaldehyde exposure may be instantaneously high when the shipping container is opened. Provide adequate ventilation.

Advice on protection against fire and explosion: Provide appropriate exhaust ventilation at places where dust is formed. During processing, dust may form explosive mixture in air. Take measures to prevent the build up of electrostatic charge. Do not empty bag over drums with ignitable gas mixtures. Use explosion-proof equipment.

Hygiene measures: General industrial hygiene practice.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers: Keep container closed when not in use. Keep in a dry, cool and well-ventilated place. Store locked up. Electrical installations / working materials must comply with the technological safety standards.
SAFETY DATA SHEET

Paraformaldehyde 91-93%

Version 1.0  Revision Date: 19.09.2019  SDS Number: 0000000033679  Date of last issue: -
Date of first issue: 19.09.2019

Advice on common storage:
- Acids
- Bases
- Amines
- Oxidizing agents
- Reducing agents

Other data:
No decomposition if stored and applied as directed.

7.3 Specific end use(s)

SECTION 8: Exposure controls/personal protection

8.1 Control parameters
Contains no substances with occupational exposure limit values.
Formaldehyde is slowly emitted from Paraformaldehyde. The release rate and air concentration
are dependent on storage conditions including temperature and ventilation. This exposure limit
information on formaldehyde is provided for your reference.

8.2 Exposure controls

Engineering measures
Use with local exhaust ventilation.
Use explosion-proof equipment.

Personal protective equipment
Eye protection:
- Safety goggles

Hand protection
- Material: butyl-rubber
- Break through time: 480 min
- Glove length: 0.3 mm
- Protective index: Class 6

Skin and body protection:
- Protective suit

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties
- Appearance: solid prills
- Colour: white
- Odour: pungent
- Odour Threshold: 1 ppm
- pH: 4 - 5
- Melting point/range: 120 - 170 °C
- Flash point: Not applicable
- Bulk density: 890 kg/m3
SAFETY DATA SHEET

Paraformaldehyde 91-93%

Solubility(ies)
Water solubility : hydrolyses

9.2 Other information
Dust deflagration index (Kst) : < 200 m.b_/s

SECTION 10: Stability and reactivity

10.1 Reactivity
Stable under recommended storage conditions.

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Hazardous reactions : Stable under recommended storage conditions.

10.4 Conditions to avoid
Conditions to avoid : Keep away from fire, sparks and heated surfaces.
Take measures to prevent the build up of electrostatic charge.

10.5 Incompatible materials
Materials to avoid : Acids
Bases
Amines
Oxidizing agents
Reducing agents

10.6 Hazardous decomposition products
Hazardous decomposition products : Formaldehyde

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Components:

Paraformaldehyde:
Acute oral toxicity : LD50 (Rat): 680 mg/kg

Acute inhalation toxicity : LC50 (Rat): 1.07 mg/l
Exposure time: 4 h

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg

formaldehyde:
Acute oral toxicity : LD50 (Rat, male): 460 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity: LC50 (Rat): 1 mg/l
          Exposure time: 0.5 h
          Method: OECD Test Guideline 403

Acute dermal toxicity: 270 mg/kg

Skin corrosion/irritation

Components:

Paraformaldehyde:
Species: Rabbit
Result: Severe skin irritation

formaldehyde:
Species: Rabbit
Method: OECD Test Guideline 404
Result: Corrosive

Serious eye damage/eye irritation

Components:

Paraformaldehyde:
Species: Rabbit
Result: Severe eye irritation

formaldehyde:
Species: Rabbit
Method: OECD Test Guideline 405
Result: Corrosive

Respiratory or skin sensitisation

Components:

formaldehyde:
Species: Mouse
Method: OECD Test Guideline 429
Result: May cause sensitisation by skin contact.

Germ cell mutagenicity

Components:

Paraformaldehyde:
Genotoxicity in vitro: Test Type: Chromosome aberration test in vitro
Species: Chinese hamster cells
Metabolic activation: without metabolic activation
Method: OECD Test Guideline 473
Result: negative
Test Type: sister chromatid exchange assay
Species: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 479
Result: positive

Test Type: gene mutation test
Species: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: positive

Genotoxicity in vivo:
Species: Rat
Method: Mutagenicity (micronucleus test)
Result: negative

Reproductive toxicity

Components:

formaldehyde:
Effects on foetal development:
Species: Mouse
Application Route: Oral
Result: no adverse developmental effects

SECTION 12: Ecological information

12.1 Toxicity

Components:

Paraformaldehyde:
Toxicity to fish:
LC50 ( Oncorhynchus mykiss (rainbow trout)): 60 mg/l
Exposure time: 96 h

formaldehyde:
Toxicity to fish:
LC50 ( Danio rerio (zebra fish)): 6.7 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates:
EC50 ( Daphnia pulex (Water flea)): 5,800 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae:
(Desmodesmus subspicatus (green algae)): Method: OECD Test Guideline 201
EC50 ( Scenedesmus quadricauda (Green algae)): 4.89 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
12.2 Persistence and degradability

Components:
formaldehyde:
Biodegradability: Inoculum: Fresh water
Result: Readily biodegradable.
Method: OECD Test Guideline 301C

12.3 Bioaccumulative potential

Components:
formaldehyde:
Bioaccumulation: Bioconcentration factor (BCF): 0.4
Remarks: Does not significantly accumulate in organisms.

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment

Components:
formaldehyde:
Assessment: The substance does not meet the criteria for PBT / vPvB
according to REACH, Annex XIII.

12.6 Other adverse effects

Product:
Additional ecological information: No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Product: Dispose of as hazardous waste in compliance with local and
national regulations.
Contaminated packaging: Empty containers should be taken to an approved waste
handling site for recycling or disposal.

SECTION 14: Transport information

14.1 UN number
IMDG: Not regulated as a dangerous good
IATA: Not regulated as a dangerous good

14.2 UN proper shipping name
SAFETY DATA SHEET

Paraformaldehyde 91-93%

IMDG : Not regulated as a dangerous good
IATA : Not regulated as a dangerous good

14.3 Transport hazard class(es)
IMDG : Not regulated as a dangerous good
IATA : Not regulated as a dangerous good

14.4 Packing group
IMDG : Not regulated as a dangerous good
IATA (Cargo) : Not regulated as a dangerous good
IATA (Passenger) : Not regulated as a dangerous good

14.5 Environmental hazards
IMDG : Not regulated as a dangerous good

14.6 Special precautions for user
Remarks : Celanese Paraformaldehyde 91-93% have been tested in accordance with U.N. Test N1 and determined not to be a flammable solid.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code
Remarks : Not applicable for product as supplied.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

15.2 Chemical safety assessment
Chemical Safety Assessment (CSA) is not required

SECTION 16: Other information

Full text of H-Statements
H301 : Toxic if swallowed.
H302 : Harmful if swallowed.
H311 : Toxic in contact with skin.
H314 : Causes severe skin burns and eye damage.
H317 : May cause an allergic skin reaction.
H318 : Causes serious eye damage.
H331 : Toxic if inhaled.
H332 : Harmful if inhaled.
H341 : Suspected of causing genetic defects.
H350 : May cause cancer.

Full text of other abbreviations
Acute Tox. : Acute toxicity
Carc. : Carcinogenicity
Eye Dam. : Serious eye damage
Muta. : Germ cell mutagenicity
Paraformaldehyde 91-93%

Skin Corr. : Skin corrosion
Skin Sens. : Skin sensitisation

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemicals in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Classification of the mixture:
Acute Tox. 4 H302 Calculation method
Acute Tox. 4 H332 Calculation method
Skin Corr. 1C H314 Calculation method
Eye Dam. 1 H318 Calculation method
Skin Sens. 1 H317 Calculation method
Carc. 1B H350 Calculation method
Muta. 2 H341 Calculation method
STOT SE 3 H335 Calculation method
Aquatic Acute 3 H402 Calculation method

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the
specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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