

F-C20-033

SAFETY DATA SHEET MELAMINE

According to EC Regulation no. 1907/2006 (REACH) / EC Regulation no. 1272/2008 / Regulation no. 830/ 2015.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND THE COMPANY

1.1. Product identification

Name: MELAMINE
Other names: CYANUROTRIAMIDE, 2.4.6-TRIAMINE-1.3.5-TRIAZINE, TECHNICAL MELAMINE
IUPAC name: 1.3.5-triazine-2.4.6-triamine
Chemical formula: C₃H₆N₆
SMILES notation: Nc1nc(N)nc(N)n1
CAS number: 108-78-1
EINECS number: 203-615-4
ECHA reference number: 01-2119485947-16-0011

1.2. Relevant identified uses of the substance or mixture and uses advised against

According to Article 14.4 of Annex XI, section 3 of the EC Regulation no. 1907/2006 an exposure scenario is not needed, therefore, there is no detailed information concerning the use.

Identified uses: in high performance products such as wood-based panels, laminates, coatings, moulding powders and flame-retardants.

Uses advised against: food and fodder additive

1.3. Details concerning the supplier of the Safety Data Sheet

Producer:

Azomureș S.A.Tg.-Mureș, 300 Gheorghe Doja St., tel.0040-265 253 700, Romania
Fax: 0040-265 252 986, e-mail: office@azomures.com, www.azomures.com
e-mail (competent person responsible for the SDS): fds.azo@azomures.com

1.4. Emergency telephone number

The institution responsible with providing information in case of a health emergency is The National Institute for Public Health, Department for the International Sanitary Regulation and Toxicological Information.

Telephone: 0040-21.318.36.06, working hours: Monday – Friday from 8 a.m. to 3 p.m.

F-C20-033

SECTION 2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Melamine is an organic monoconstituent substance; it is not classified as hazardous, as the evidence is not sufficient for classification.

Classification according to EC Regulation no. 1272/2008 (CLP)

Conclusions are not sufficient for classification.

Human health hazard

The following aspect will be taken into consideration.

Skin contact: in case of prolonged contact it may cause red spots

Eye contact: it may cause mild and passing irritations

Ingestion: causes abdominal pains and diarrhea

Inhalation: irritation of the airways

Environmental hazards

No environmental hazard assessment was conducted as melamine is not a hazardous substance.

2.2. Labelling

Labeling according to CLP Regulation

According to the CLP Regulation 1272/2008/EC, the substance is not classified as dangerous.

EU label

Substance name: MELAMINE

ECHA reference number: 01-2119485947-16-0011

EINECS number: 203-615-4

Producer:

Azomureș S.A.Tg.-Mureș, 300 Gheorghe Doja St., tel. 0040-265 253 700, Romania

Fax: 0040-265 252 986, e-mail: office@azomures.com, www.azomures.com

Emergency telephone number: 0040-21.318.36.06,

Working hours: Monday – Friday from 8 a.m. to 3 p.m.

Content: melamine min. 99.7%

Net weight of the fertilizer

2.3. Other hazards

Melamine is not a PBT, not a vPvB substance, due to the low bioconcentration potential, the low partition coefficient n-octanol/water and low ecotoxicity.

F-C20-033

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1. Chemical identity of the substance

The product must be considered: Substance

Melamine is a monoconstituent substance (origin:organic)

CAS number: 108-78-1

EINECS number: 203-615-4

IUPAC name: 1.3.5-TRIAZINE-2.4.6-TRIAMINE

EC name: MELAMINE

Molecular formula: C₃H₆N₆

Molecular weight range: 126.1199

Purity degree: $\geq 99.7\%$

Typical concentration: 99.8% (w/w)

Concentration limit: $\geq 99.7\% - \leq 100\%$ (w/w)

Chemical identification of impurities

Water - CAS number: 7732-18-5

EINECS number: 231-791-2

IUPAC name: oxidane

Typical concentration: 0.1% (w/w)

Concentration limit: $\geq 0 - \leq 0.2\%$ (w/w)

Unknown impurities - IUPAC name: unknown impurity

Typical concentration: 0.1(w/w)

Concentration limit: $\geq 0 - \leq 0.2$ (w/w)

SECTION 4. FIRST AID MEASURES

4.1. Description of the first aid measures

4.1.1 First aid instructions are provided depending on the relevant exposure routes.

Skin contact: wash with soap and water. Remove contaminated clothing and footwear.

If symptoms occur, seek medical advice.

Eye contact: rinse/irrigate eyes with plenty of water. If symptoms occur, seek medical advice.

Ingestion: if the substance is swallowed, rinse mouth with water (only if the person is conscious).

Inhalation: remove the contaminated person from the exposure area.

If symptoms occur, seek medical advice.

4.1.2 Recommendations:

Remove the contaminated person from the exposure area. There are no special recommendations referring to special first-aid equipment.

F-C20-033

4.2. The most important symptoms and effects, acute as well as delayed

Overexposure by inhalation may lead to irritations of the airways (cough).
There are no known acute effects following overexposure to this product in case of skin contact or ingestion. It may cause irritations in case of eye contact.

4.3. Indications concerning any emergency medical assistance and necessary special treatments

Not available data.

SECTION 5. FIREFIGHTING MEASURES

5.1. Fire extinguishing means

Adequate extinguishing means

Small fire

Non-flammable substance: use the most efficient available means to extinguish the fire, depending on the materials involved.

Large fires

Non-flammable substance: use the most efficient available means to extinguish the fire, depending on the materials involved.

Inadequate extinguishing means

There are no data available for the products that must not be used for fire extinguishing.

5.2. Special hazards caused by the substance or mixture

Unusual fire and explosion hazards: no specific hazard

Hazardous thermal decomposition products: in case of fire, hazardous decomposition products may be released, such as: carbon monoxide, carbon dioxide, nitrogen oxides, ammonia, amines, hydrocyanic acid at $t > 600$ °C.

Special procedures for firefighting

Extinguish the fire from a safe area, or from the maximum possible distance. Keep temperatures low in the area surrounding the fire

5.3. Advice for firefighters

The protection of the firefighters is ensured with a self-contained breathing apparatus and adequate protection equipment.

F-C20-033

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1 For personnel not involved in emergency situations

(a) Protective equipment

Hand protection: adequate protective gloves (PVC, neoprene)

Eye protection: protective glasses with side shields

Skin protection

Protective clothing:

Dust resistant overalls (breastplate duck overalls, coat).

Winter or summer shirt (natural fibers – duck)

Protective footwear:

Protective boots resistant to corrosive chemical agents (rubber, PVC).

Chemical and mechanical aggression resistant boots, with anti-static properties that allow usage in explosive environments (leather with rubber soles).

(b) Avoid generation of dust and prevent dispersion by the wind. Wear adequate protection equipment.

6.2. Precautions for the environment

No special measures are requested.

6.3. Methods and material for containing fires and for cleaning

Method for containing and cleaning a spilled quantity

Discharge and spillage of a small quantity: vacuum or sweep the material and store it in a labeled container designated for that purpose. Wash the contaminated area with plenty of water.

Discharge and spillage of a large quantity: vacuum or sweep the material and store it in a labeled container designated for that purpose. If possible, reuse the material. Avoid the formation of dust clouds. Wash the contaminated area with plenty of water.

6.4. Reference to other sections

Note: see chapter Exposure control / individual protection, for information concerning personal protection equipment and the section Disposal considerations.

F-C20-033

SECTION 7. HANDLING AND STORAGE

7.1. Precautions for safe handling

7.1.1 Recommendations for safe handling

Avoid generation of dust and prevent dispersion by the wind. Wear adequate protection equipment - P2 protective mask, protective gloves and protective goggles with side shields.

Use adequate ventilation system. A local exhaust ventilation system is required.

7.1.2 Recommendations concerning good general hygiene practices at the work place

(a) Do not eat, drink or smoke in the working area. "NO SMOKING" signs are to be placed in the working area.

(b) Wash hands thoroughly after each use.

(c) Remove contaminated clothing and protection equipment before entering lunch areas.

7.2. Safe storage conditions, including possible incompatibilities

The product should be stored in closed, dry, clean and well ventilated areas away from heat of and fire sources.

The storage area will be protected.

Do not store together with incompatible substances.

Prolonged contact with the moisture in the atmosphere may cause the caking of the packed product.

The storage spaces should preferably be single level and be constructed of brick, concrete, not from combustible materials (like wood); the flooring must be flat, dry and smooth, without cavities.

The storage facilities must provide a good protection against bad weather against and avoid humidity absorption.

The storage facility must be cleaned before, during and after delivery of the product.

Melamine is packed in waxed polypropylene big bags of 350 kg, 500 kg, 750 kg, 1000 kg and 1200 kg, or in 25 kg multi-layer paper bags with a valve. The tolerance is $\pm 1\%$ of the net weight of the quantity packed in each bag.

Do not stack the 1000 kg bags on more than 2 rows, as there is the risk of ripping /breaking.

The storage area will be protected.

Adequate packing materials: wood, plastic.

The melamine bags are placed on wooden pallets and are manipulated using forklifts or pallet trucks.

The melamine is delivered in covered vehicles, clean and dry, the bags loaded on these vehicles being seated and secured in such a way as to avoid tipping over during transport.

The bulk melamine is delivered in clean, dry and sealed silo tanks.

The marking on the bag is in compliance with the legislation in use.

The marking on the bags and as well as all the accompanying documents must be edited in at least one official language of the member state where the product is traded, unless the contract specifies another official language. Packed chemical products are identified through the information written on labels or package.

The identification information for the bulk product are specified in the accompanying documents.

F-C20-033

7.3 Specific end use (s)

Not applicable.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

No official exposure limits are specified according to ACGIH (1995-1996): no testing.
Relevant DNEL / DMEL values and NOAEL values are provided in the CSA, depending on the type of exposure for workers in an industrial setting and for the general public.

No local effects were observed following dermal and inhalation exposure, therefore no DNEL values were derived for local effects.

Workers exposure

Acute systemic effects - dermal - DNEL: 31.6 mg/kg bw

LD50: 31600 mg/kg bw

- inhalation - DNEL: > 21 mg/m³

LD50: > 5190 mg/m³

Long term systemic effects - dermal - DNEL: 14.4 mg/kg bw/day
(repeated dose)

NOAEL: 720 mg/kg bw/day

DNEL: 12.6 mg/kg bw/day

NOAEL: 630 mg/kg bw/day

DNEL: 25.2 mg/kg bw/day

NOAEL: 1260 mg/kg bw/day

- inhalation - DNEL: 8.9 mg/m³

NOAEC: 111 mg/m³

Public exposure

Long term systemic effects - dermal - DNEL: 6.3 mg/kg bw/day
(repeated dose)

NOAEL: 630 mg/kg bw/day

- inhalation - DNEL: 2.2 mg/m³

NOAEC: 54.8 mg/m³

- oral - DNEL: 0.63 mg/kg bw/day

NOAEL: 63 mg/kg bw/day

8.2. Exposure control

8.2.1 Appropriate Engineering Controls

General measures at company level

The CSSM (The Committee for Work Health and Safety) was constituted at the company level, where the risk factors of professional injury and illness in the work place are assessed.

The evaluation of the risks of professional injury and illness at the work place was carried out by committees established by the management; preventive measures were taken to eliminate or to

F-C20-033

diminish the risks that cannot be avoided, having as purpose the work safety and health, reduction of work injuries and of professional illnesses.

The Chemical Plant:

- Risk evaluation when using dangerous chemical substances
- Ammonium Nitrate Plant II-III-ADEX (operation – chemists, mechanic, electric and automation maintenance, packing machinists)

As a result of the analysis and evaluation of the risks at the work place:

The plan for prevention and protection at company level was elaborated and approved

A record is held of the work places of great danger and imminent danger of injury

A situation of the hazardous chemical substances used in the work process is kept

The toxic gases, released by chemical substances at the work place, are monitored.

The health of the staff exposed to the action of chemical substances is supervised and monitored

The auditing of the safety and health at the work place is carried out, establishing the noncompliance with the law in force and taking measures to ensure compliance with such laws.

Statistics are drafted, referring to work accidents and professional illnesses caused by hazardous chemical substances

Intervention teams in case of chemical accident with periodically instructed staff are organized at company level

Authorized employees of the internal prevention and protection service perform the inspection of the work places according to the operational procedure

The explosion protection document is elaborated according to Government Ordinance no. 1058/2006 for the following plants: Ammonia, Nitric Acid, and Ammonium Nitrate.

The equipment used in areas with danger of explosion is certified upon availability date.

Workers have access to personal instructions regarding the usage of dangerous chemical substances:

- The staff has individual protection equipment
- Measures of collective protection are ensured.

Collective protection measures for the source of risk – Melamine

Technical Measures

Monitoring system of the main functioning parameters for the safety of the equipment (pressure, temperature, concentration, flow capacity, level etc), with acoustic and optical warning signals in case of malfunction.

Toxic gas, fire and explosion detectors

Protection devices – flange fenders on all the dangerous liquids layouts

Ammonia and nitric acid layouts painted in conventional colors

Signaling for work safety health and according to Government Ordinance no. 971/2006 (safety, warning, interdiction, obligation marks, delimitation of danger zones)

Ventilation systems.

Rescue showers for the danger of splashing with corrosive substances.

Water sources with upward jet (for washing the eyes in case of splashing)

Periodical ISCIR inspections of under-pressure equipment.

Toxic gases level control

Organization and provision of individual insulating protection equipment

Endowment and organization of medical help trained in case of gassing.

Issuing date: 08.02.2018	Version: 9	Page: 8 / 21
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Administrative measures

Manufacturing regulation, work instructions regarding work safety and health and fire prevention
Safety data sheets for hazardous substances

Organization of an information system for surveillance and intervention:

- Action plan in case of fire
- Internal Emergency Plan (PUI).
- Evacuation action plan in emergency situations
- Action plan in case of earthquake
- Action plan for safe road transport (PSTR).

Authorization for the job position, employees in the production sector, maintenance, repair (mechanic, electric, automation) in technological installations.

Work safety and health training for Azomures employees, in all stages (upon hiring, at work, periodically, supplementary) and work safety and health instruction for the employees from the companies that perform services based on contract and for the persons that are on the platform with the employer's permission, related to:

- risk of professional injury and illness at the work place
- minimal requests of health and safety of work, stipulated by legal regulations applicable to the specific activity at the work place
- tasks and responsibilities of the employees
- usage of work equipment and individual protection equipment
- prevention and protection measures, action plan in case of danger
- giving first aid to the injured at the work place

Risk management measures for human health

No risk management measures were identified.

8.2.2. Personal protection measures, such as personal protection equipment

- (a) Respiratory protection: P2 protective mask
- (b) Hand protection: adequate protection gloves
- (c) Eye protection: protective goggles with side shields
- (d) Skin protection:

Protection clothing:

Dust resistant overalls (breastplate duck overalls, coat).

Winter or summer shirt (natural fibers – duck)

Protective footwear:

Protective boots resistant to corrosive chemical agents (rubber, PVC).

Chemical and mechanical aggression resistant boots, with anti-static properties that allow usage in explosive environments (leather with rubber soles).

8.2.3 Environmental exposure control

Melamine is of no concern with regard to human or environmental exposure. No risk management measures were identified for this substance. The users will be informed concerning the product safe usage rules.

Issuing date: 08.02.2018	Version: 9	Page: 9 / 21
--------------------------	------------	--------------

F-C20-033

SECTION 9.	PHYSICAL AND CHEMICAL PROPERTIES
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9.1. Information concerning the main physical and chemical properties
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a) Aspect of the substance/mixture

Aspect: fine, crystalline powder

b) Odor: odorless

No	Properties	Results	Values used for CSA / Discussions
(c)	Physical state 20 °C and 1013 hPa	Melamine is a white powder	Value used for CSA: solid
(d)	Boiling point/ boiling temperature interval	A waiver is proposed	Melamine decomposes and sublimates at temperatures close to and above the melting temperature.
(e)	Melting / freezing point	361 °C	Value used for CSA: 634 K at 1013 hPa
(f)	Flammability	non flammable	Value used for CSA: non flammable
(g)	Relative density	1.57	Value used for CSA: 1.57 at 20 °C
(h)	Granulometry	Particle median diameter <100µm	
(i)	Vapour pressure	A waiver is requested.	Value used for CSA: 0.00000001 Pa at 20 °C
(j)	Water solubility	3.48 g/L at 20 °C	Value used for CSA: 3.48 g/L at 20 °C
(k)	Partition coefficient n-octanol/water	-1.73	Value used for CSA: log Kow (Pow): -1.22 at 20 °C
(l)	Autoflammability	>400°C	No autoflammability was observed
(m)	Dissociation constant	pKb1 = 7.3	Value used for CSA: pKa at 20 °C: 6.7
(n)	Oxidising properties		Value used for CSA: Oxidizing: no
(o)	Stability in organic solvents and identity of relevant degradation products	The stability of melamine is considered to be high	According to Annex IX of REACH, the study is "only required if the stability of the substance is considered to be critical". The stability of melamine is high and is not considered to be critical.
(p)	Surface tension	A waiver is requested	Melamine does not have tensioactive properties.

Issuing date: 08.02.2018	Version: 9	Page: 10 / 21
--------------------------	------------	---------------

F-C20-033

No	Properties	Results	Values used for CSA / Discussions
			Surface activity is not a desired property of melamine.
(r)	Flash point	The flash point is a possible characteristic of liquids. The method is not applicable.	Although the flash point is a property of liquids, it was reported in 3 documents (possibly referring to the same source) for the solid melamine to be >280 °C.
(s)	Explosive properties	Melamine powder has a low potential for explosibility	Value used for CSA: non explosive
(ș)	Viscosity		Melamine is a solid. Therefore the determination of the viscosity is technically not feasible.
(t)	Thermal stability	Melamine is stable until cca. 280 °C.	Combustible vapours develop at >280 °C. Hazardous decomposition products are possible: > 300 °C: liberation of NH ₃ > 600 °C: liberation of HCN

9.2. Additional information

No available additional information.

SECTION 10. STABILITY AND REACTIVITY
10.1. Reactivity

No available data.

10.2. Chemical stability

The product is stable in normal conditions of storage, handling and usage.

10.3. Hazardous reactions potential

Not applicable.

F-C20-033

10.4. Conditions to avoid

Temperature – heating above 300 °C

Keep away from heat sources, sparks and flames.

10.5. Incompatible materials

Contamination with acid substances.

10.6. Hazardous decomposition products

When heated at temperatures > 600°C it may release toxic gases: carbon monoxide, carbon dioxide, nitrogen oxides, ammonia, amines, and hydrocyanic acid.

Keeping the product at high temperatures for long periods of time may lead to the decomposition of melamine, releasing ammonia and forming melam, melam and melon (corrosive polycondensation products).

SECTION 11. TOXICOLOGICAL INFORMATION

Toxicokinetics (absorption, metabolism, distribution and elimination)

Oral absorption: fast, to a large extent, maximal plasma concentration in rats after ca. 1 h, no first pass effect. Absorption mainly in the small intestine.

Plasma elimination: half-life of 2.7 to 4.9 h in the various species.

Distribution: to body water.

Elimination: mainly with urine.

Metabolism: none; melamine is excreted unchanged.

11.1. Information on toxicological effects

The relevant hazard classes for which information is provided are:

- (a) Acute toxicity
- (b) Skin corrosion / irritation
- (c) Eye irritation / damage
- (d) Sensitization of the skin or the respiratory system
- (e) Mutagenicity germ cell
- (f) Carcinogenicity
- (g) Toxicity for reproduction
- (h) STOT (specific target organs of toxicity) – unique exposure
- (i) STOT (specific target organs of toxicity) – repeated exposure
- (j) Aspiration hazard

11.1.1 Information for each hazard class

(a) Acute toxicity

oral - rat - LD50: 3161 mg/kg bw

dermal - rat - LD50> 3161 mg/kg bw

inhalation - rat - LC50> 5190 mg/m³

Melamine has a low acute toxicity by the oral, dermal and inhalation route.

Value used for CSA: LD50 (oral, rat): 3161 mg/kg bw

(b) Repeated dose toxicity

oral - NOAEL: 63 mg/kg bw/day (13 weeks, rat)

dermal - NOAEL > 72 respectively > 63 mg/kg bw/day (13 weeks, rat)

inhalation - NOAEC : 165.8 mg/m³ (13 weeks, rat)

Value used for CSA (route: oral):

NOAEL: 63 mg/kg bw/day (subchronic and long-term; rat)

Affected organs: urinary tract: urinary bladder

(b) Skin corrosion / irritation

Melamine is not irritant for the skin.

(c) Eye irritation

Eye irritation: studies indicate that melamine is not irritant for the eyes.

(d) Sensitization of the skin or the respiratory system

Studies indicate that melamine is not a skin or respiratory sensitizer.

(e) Mutagenicity

Evaluation of results: mostly negative

Value used for CSA: genetic toxicity: negative

Therefore no classification of melamine as to genotoxicity is required.

(f) Carcinogenicity - Melamine is not carcinogenic for female rats or for mice of either sex.

Melamine is carcinogenic for male rats at high doses.

Value used for CSA (route: oral): NOAEL: ca. 140 mg/kg bw/day (2 years, male rats)

Target organs: urogenital: urinary bladder

No classification as to carcinogenicity is required.

(g) Toxicity for reproduction

Not toxic for reproduction.

Toxicity for reproduction: 1060 mg/kg bw/day (rat, developmental toxicity)

NOAEL: 400 mg/g bw/day (rat, maternal toxicity)

(h) STOT – single exposure - no data available

(i) STOT – repeated exposure - no data available

(j) Aspiration hazard - no data available

11.1.2 The data in this subsection apply to the melamine – they are available in the Chemical Safety Report.

11.1.3 The results of experimental studies by route of exposure:

The acute toxicity after oral administration – experimental studies were done on mice male/female, rats male/female.

F-C20-033

LD50 was determined by methods: NTP standards, BASF – test and Internal guidelines of Hoechst AG. The study result provides LD50 > 3000 mg/kg bw. NTP study was selected as the key study. It reports an LD50 = 3161 mg/kg bw.

The acute toxicity after administration by inhalation – experimental studies were done on rats male/female. LC50 was determined by methods: Muijser H (1998), OECD Guideline 403, EU Methode B.2, BASF test.

Muijser (1988) study is considered to be sufficiently reliable, the LC50 inhalation, rat > 5190 mg/m³.

The acute toxicity after dermal administration - experimental studies were done on rabbit, the results reporting an LD50: > 1000 mg/kg bw. The determination of the LD50 dermal, rat is waived, but an old study yielding an LD50 dermal, rat > 1000 mg/kg bw.

The studies results lead to the conclusion that melamine has a low acute toxicity by the oral, dermal and inhalation route.

11.1.4 For the following hazard classes: STOT – single exposure, STOT – repeated exposure, aspiration hazard - no data available.

11.1.5 *Information on the likely routes of exposure*

On the likely routes of exposure are inhalation, ingestion et exposing skin / eyes.

Dermal exposure - there was no study has been carried out, because it was not considered necessary.

Inhalation exposure – one study was performed, but it is clear if the exposure was made from dust, fumes, or aerosols; the NOAEL being different depending on the duration of exposure.

Ingestion exposure – no data available.

Details of the exposure can be found in the Chemical Safety Report.

11.1.6 *Symptoms related to the physical, chemical and toxicological characteristics*

No data available.

11.1.7 *The known delayed and immediate effects and the chronic effects of long term exposure and short term exposure*

Known effects after long term exposure - rat NOAEL: 63 mg/kg bw/day affected organs are urinary tract: bladder.

In humans, produces melamine crystals in urine when the concentration exceeds a certain threshold.

11.1.8 *Interactive effects*

No data available.

11.1.9 *Absence of specific data*

No data available.

SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity

Aquatic compartment (including sediments)

Melamine is of low toxicity (ecotoxicity) for aquatic organisms.

Short-term toxicity for fish

Acute toxicity: The acute toxicity of melamine to fish is low:

LC50 (48 hours) > 500 mg/L

Long-term toxicity for fish

Value used for CSA: EC10/LC10 or NOEC: 1500 mg/L

Toxicity for aquatic invertebrates

Short-term toxicity - freshwater - Daphnia magna

EC50 / LC50 (48 hours): 200 mg/L based on mortality and immobility

Long-term toxicity - freshwater - Daphnia magna

Value used for CSA: NOEC: 18 mg/L

Toxicity for algae

Value used for CSA: EC10/LC10 or NOEC for freshwater algae: 98 mg/L

EC50/LC50 for freshwater algae: 325 mg/L

Other aquatic organisms – no available data.

PNEC calculation - PNEC aqua (freshwater): 1.8 mg/L

PNEC aqua (marine water): 0.18 mg/L

PNEC aqua (intermittent releases): 2 mg/L

PNEC sediments (freshwater): 19.4 mg/kg dry sediment

PNEC sediments (marine water): 1.94 mg/kg dry sediment

Terrestrial compartment

Toxicity to soil macro-organisms, except for arthropods

melamine has a low potential to absorb to soil. Based on the low n-octanol/water partition coefficient also the adsorption to soil or sediment is expected to be low.

Toxicity to terrestrial plants - low

PNEC soil: 5.67 mg/kg dry soil

Atmospheric compartment - No available data.

Microbiological activity in STP

Toxicity for aquatic micro-organisms

EC50 (2 hours) > 100 mg/L

For sewage treatment plant: PNEC STP: 200 mg/L10

Specific effects relevant for the food chain (secondary poisoning)

PNEC oral: 22 mg/kg food

12.2. Persistence and degradability

Abiotic degradability

Hydrolysis

Melamine is a stable molecule that is hydrolysed only by mineral acid or inorganic alkali. Hydrolysis proceeds stepwise, with loss of one, two, or all three amino groups, i.e. producing ammeline, ammelide and cyanuric acid.

Photolysis - No data except for the light absorption spectra are available. The maximum light absorption was determined at 235 nm.

Phototransformation in air, water and soil - no data are available

Biodegradation

Value used for CSA: Biodegradation in water: under test conditions no biodegradation observed.

Melamine is not readily biodegradable and also not inherently biodegradable.

Issuing date: 08.02.2018	Version: 9	Page: 15 / 21
--------------------------	------------	---------------

F-C20-033

Melamine can be degraded by adapted micro-organisms or if additional energy is supplied to the micro-organisms.

12.3. Potential for bioaccumulation

Aquatic bioaccumulation

Bioconcentration factors BCF of <1 were reported for fish in most cases. Melamine is of low toxicity to aquatic organisms, no classification is required. Melamine does not bioaccumulate.

Terrestrial bioaccumulation

No available data.

Secondary poisoning

The PNEC oral is 22 mg/kg food. There are no indications from the n-octanol/water partition coefficient, the aquatic bioaccumulation assays and the toxicokinetic studies with mammals that melamine might bioaccumulate in the food chain.

12.4. Mobility in soil

Adsorption/desorption

Melamine has a low potential for adsorption. LogKoc estimated by QSAR is low, between 1.1 and 1.5.

Volatilization

Volatilisation as indicated by the Henry's law constant is very low. The Henry's law constant is estimated to $2 \cdot 10 \exp -13$ atm. m³/mol at 25 °C.

Distribution modeling - Melamine distributes only to the water (94%) and to the air (6%).

12.5. PBT and vPvB assessment results

Melamine is not a PBT nor a vPvB substance.

12.6. Other adverse effects

There is no information concerning other adverse effects on the environment.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Recycle the product in accordance with local regulations in use.

Packaging wastes contaminated with melamine that cannot be reused must be directed to a company authorized for the disposal of packaging wastes.

Relevant provisions of the harmonized EU legislation and domestic legislation regarding waste.

F-C20-033

National legislation in force:

Law no. 211/2011 concerning wastes treatment.

Law no. 265/2006 – The Law on environment protection.

Law no. 249/2015 related to the packaging and waste packaging management.

GD no. 856/2002 - The evidence of wastes management, with subsequent modifications.

Law on labor security and health no. 319/2006, GD no. 1425/2006 on approving the Methodological Norms for the enforcement of the provisions set by the Law on labor security and health no. 319/2006, GD no.355/2007 on the surveillance of workers' health with subsequent modifications.

Decision no. 1061/2008 on transport of hazardous or non-hazardous wastes on Romanian territory, with subsequent modifications.

UE Legislation in force:

Regulation (EC) no. 1907/2006 of the European Parliament and of the Council regarding the Registration, evaluation authorization and restriction of chemicals (REACH).

Regulation (EC) no. 1272/2008 of the European Parliament and of the Council on the classification, labeling and packaging of substances and mixtures.

European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR).

European Agreement concerning the International Carriage of Dangerous Goods by Rail (RID).

SECTION 14.	TRANSPORT INFORMATION
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Melamine is not classified according to UN Orange Book, RID, ADR, and IMDG; it is not considered dangerous for transportation.

Chapters 14.1; 14.2; 14.3; 14.4 are not applicable.

14.5. Environmental hazards

No available information.

14.6. Special precautions for users
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Melamine is packed in waxed polypropylene big bags of 350 kg, 500 kg, 750 kg, 1000 kg and 1200 kg, or in 25 kg multi-layer paper bags with a valve. The tolerance is $\pm 1\%$ of the net weight of the quantity packed in each bag.

The marking on the bag is in compliance with the legislation in use.

The marking on the bags and as well as all the accompanying documents must be edited in at least one official language of UE (for export).

Packed chemical products are identified by the data written on the label or on the package. Identification data for the product delivered in bulk are specified in accompanying documents.

Each delivery is accompanied by the Declaration of Conformity.

At the client's request the product is accompanied by the Test Report.

Melamine is delivered in clean, dray, covered transport means. The bags must be placed so as not to turn over during transportation.

F-C20-033

14.7. Bulk transport, according to Annex II to MARPOL convention and IBC Code

Not applicable.

SECTION 15. REGULATORY INFORMATION

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

Relevant information regarding the domestic legislation

Law on labor security and health no. 319/2006, GD no.1425/2006 on approving the Methodological Norms for the enforcement of the provisions set by the Law on labor security and health no. 319/2006, GD no. 355/2007 on the surveillance of workers' health with subsequent modifications.
Law no. 265/2006 for the amendment of GEO no.195/2005 on environment protection
Decision no. 1391/2006 for the approval of the Regulation concerning the application of Government Emergency Ordinance no. 195/2002 regarding traffic on public roads, with subsequent amendments and supplements.
Government Ordinance no. 651/2003 for the modification and completion of Government Decision no. 716/2001 for establishing trading conditions for chemicals fertilizers coming from domestic production and import.
Law no. 278/2013 on industrial emissions.

Relevant information regarding the EU legislation

Regulation (EC) no. 1907/2006 of the European Parliament and of the Council regarding the Registration, evaluation authorization and restriction of chemicals (REACH).
Regulation (EC) no. 1272/2008 of the European Parliament and of the Council on the classification, labeling and packaging of substances and mixtures.
Regulation (EU) no. 286/2011 by the Commission from 10.03.2011 amending Regulation (EC) no. 1272/2008.
Regulation (EC) no. 830/2015 of the Commission from date of 28.05.2015 amending Regulation (EC) no. 1907/2006.
EC no. 2003/2003 regulation of the European Parliament regarding fertilizers with its subsequent amendments relating to EN standards drawn up by the European Committee for Standardization.
European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), 2017 edition.
Regulation referring to the International Carriage of Dangerous Goods by Rail (RID), 2017 edition
International Maritime Dangerous Goods (IMDG), 2017 edition.

15.2 Chemical safety assessment

A chemical safety assessment (CSA) was conducted and a chemical safety report (CSR) was elaborated for melamine.

F-C20-033

SECTION 16.	ADDITIONAL INFORMATION
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a) A clear evidence of added, deleted or modified information
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Version (revision, edition) number	Date	Page number	Evolution of the information
edition 5, revision 0	06.01.2014	7, 14	At page 7, chapter 8.2.1. Organizational measures, Monitoring and intervention plans were modified. At page 14 section 15.1 – information regarding national legislation was modified.
version 6	06.11.2014	1, 2, 5	All pages were replaced edition and revision with version. At page 1 was modified the form number. At page 2, section 2.2 – labeling, the value melamine content was modified. At page 5, section 7.2 – safe storage conditions were added 1200 kg bags.
version 7	01.06.2015	1, 2, 13	At page 1, section 1.4 emergency telephone number was modified. At page 2, in section 2.1 it was removed classification in accordance with directive 67/548/ EEC. At page 13, chapter 13.1 - Waste treatment methods national legislation was modified.
version 8	04.04.2016	11, 16	At page 11, section 11 they have introduced additional toxicological data. At page 16, section 15.1 it was introduced Regulation no.830/2015.
version 9	08.02.2018	2, 3, 6, 16	At page 2 section 2.2 has changed the content of melamine. At page 3 section 3.1 changed purity degree of melamine. At page 6 and 16 section 7.2 și 14.6 were added 350 kg bags.

Issuing date: 08.02.2018	Version: 9	Page: 19 / 21
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b) List of abbreviations and acronyms used throughout the Safety Data Sheet

- SDS - Safety Data Sheet
- ECHA - European Chemicals Agency
- EC - European Commission
- ESIS - European Chemical Substances Information System
- (FE) EFMA - Fertilizers Europe (European Fertilizer Manufacturers Association)
- REACH - EC Regulation No. 1907/2006 of the European Parliament and Council concerning the registration, evaluation, authorization and restriction of chemical substances
- CSR - Chemical Safety Report
- CSA - Chemical Safety Assessment
- DNEL - Derived no effect level
- DMEL - Derived minimal effect level
- PNEC - Predicted No Effect Concentration
- LOAEL - Lowest observed adverse effect level
- LOAEC - Lowest observed adverse effect concentration
- STP - Sewage treatment plant
- BCF - Bioconcentration factor
- NOAEL - No observed adverse effect level
- NOAEC - No observed adverse effect concentration
- QSAR - Quantitative structure-activity relationship
- EC50 - Concentration of toxic material for which 50% of the tested organisms survive
- LD50 - Lethal dose for 50% of the tested population
- LC50 - Lethal concentration for 50% of the tested population
- STOT - Specific target organs of toxicity
- PBT - Persistent, Bioaccumulative, Toxic
- vPvB - Very Persistent, Very Bioaccumulative
- ISCIR - State Inspection for the Control of Boilers, Under-Pressure Vessels and Lifting Devices
- ACGIH - American Conference of Governmental Industrial Hygienists
- ADR - European Agreement referring to the International Carriage of Dangerous Goods by Road, 2017 edition
- RID - Regulation referring to the International Carriage of Dangerous Goods by Rail (RID), 2017 edition
- IMDG - Regulations referring to the maritime transportation of hazardous Substances, 2017 edition
- MARPOL - International Convention for the Prevention of Pollution from Ships
- IBC - International Code for the construction and equipment of ships carrying dangerous chemicals in bulk
- w/w - mass unit

Issuing date: 08.02.2018	Version: 9	Page: 20 / 21
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c) Bibliography

Studies according to the Chemical Safety Report

Guidance on safe use – The joint/individual ECHA Registration file for the substance

Official Journal of the European Union – EU Regulation no. 830/2015 of the European Council of 28.05.2015

EFMA - Guidance for the Compilation of Safety Data Sheets for Fertilizer Materials.

ESIS - European Chemical Substances Information System

Official Journal of the European Union – EC Regulation no. 1907/2006 of the European Parliament and Council concerning the registration, evaluation, authorization and restriction of chemical substances (REACH)

Note:

The information included in this safety data sheet is based on the data available at the time of publication.

The client and the user assume all risks regarding usage, handling and storage of this product.

There are no guarantees for the product in case of improper handling, transport and storage of the product, not complying with the specifications of the Technical Specification and the Safety Data Sheet.