

SAFETY DATA SHEET

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

1.1. Product identifier

Trade name

Copper Sulphate, Pentahydrate

Product no.

-

REACH registration number

01-2119520566-40-XXXX

Other means of identificationCuSO₄*5H₂O, EC# 231-847-6, CAS# 7758-99-8

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

Relevant identified uses of the substance or mixture

Flotation reagent in concentrators

Raw material for metal production

Uses advised against

-

1.3. Details of the supplier of the safety data sheet

Company and addressBoliden Commercial
Box 750
SE-101 35 Stockholm
Sweden

Tel +46 8 610 15 00

Fax +46 8 31 55 45

Contact person**E-mail****SDS date**

01-06-2015

SDS Version

1.0

1.4. Emergency telephone number

00 353 46 908 2000 (Tara mines Security). See section 16.

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Repr. 1B; H360

Carc. 1A; H350

Skin Sens. 1; H317

Acute. Tox. 4; H302

STOT RE 2; H373

Eye Irrit. 2; H319

Skin Irrit. 2; H315

Aquatic Chronic 1; H410

Aquatic Acute 1; H400

See full text of H-phrases in section 2.2.

2.2. Label elements

Hazard pictogram(s)

According to EC-Regulation 1907/2006 (REACH)



Signal word

Danger!

Hazard statement(s)

May damage fertility or the unborn child. (H360)
 May cause cancer. (H350)
 May cause an allergic skin reaction. (H317)
 Harmful if swallowed. (H302)
 May cause damage to organs through prolonged or repeated exposure. (H373)
 Causes serious eye irritation. (H319)
 Causes skin irritation. (H315)
 Very toxic to aquatic life with long lasting effects. (H410)

Safety statement(s)	General	-
	Prevention	Do not breathe dust/fume/gas/mist/vapours/spray. (P260). Avoid release to the environment. (P273). Wear protective gloves/protective clothing/eye protection/face protection. (P280).
	Response	Collect spillage. (P391). IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. (P301+P312). IF ON SKIN: Wash with plenty of POISON CENTER/doctor. (P302+P352). IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. (P305+P351+P338).
	Storage Disposal	- Dispose of contents/container to an approved waste disposal plant. (P501).

Identity of the substances primarily responsible for the major health hazards

Copper(II)sulphate, pentahydrate and Nickel(II)sulphate, hexahydrate.

2.3. Other hazards

-

Additional labelling

-

Additional warnings

-

VOC

-

SECTION 3: Composition/information on ingredients

3.1. Substances

NAME:	Copper(II)sulphate, pentahydrate
IDENTIFICATION NOS.:	CAS-no: 7758-99-8 EC-no: 231-847-6 REACH-no: 01-2119520566-40-XXXX
CONTENT:	ca 97%
CLP CLASSIFICATION:	Acute Tox. 4, STOT RE 2, Skin Irrit. 2, Eye Irrit. 2, Skin Sens. 1, Carc. 1A, Repr. 1B, Aquatic
Acute 1, Aquatic Chronic 1	H302, H315, H317, H319, H350, H360, H373, H400, H410 (M-acute = 10)

3.2. Mixtures

-

(*) See full text of H-phrases in section 16. Occupational exposure limits are listed in section 8, if these are available.

Other informations

The product also contains Nickel(II)sulphate, hexahydrate <2% and Sulphuric acid ca 1%.

SECTION 4: First aid measures**4.1. Description of first aid measures****General information**

In the case of accident: Contact a doctor or casualty department – take the label or this safety data sheet. Contact a doctor, if in doubt about the injured person's condition or if the symptoms continue. Never give an unconscious person water or similar.

Inhalation

Get the injured person into fresh air. Make sure there is always someone with the injured person. Prevent shock by keeping the injured person warm and calm. If the person stops breathing, give mouth-to-mouth resuscitation. If unconscious, roll the injured person onto side with the top leg bent at both knee and hip. Call an ambulance.

Skin contact

Remove contaminated clothing and shoes at once. Skin that has come in contact with the material must be washed thoroughly with water and soap. In case of irritation seek medical advice.

Eye contact

Remove contact lenses. Flush eyes with water (20-30°C) for at least 15 minutes. Keep eyelids well apart. Call a doctor.

Ingestion

In the case of ingestion, contact a doctor immediately and take this safety data sheet or the label from the material with you. Immediately give a couple of glasses of milk or water if the person is fully conscious. DO NOT try to induce vomiting. Hold head facing down so that no vomit runs back into the mouth and throat. Prevent shock by keeping the injured person warm and calm. Give mouth-to-mouth resuscitation if breathing stops. If unconscious, roll the injured person onto side with the top leg bent at both knee and hip. Call an ambulance.

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

Inhalation: Burning of the eyes, nose, mouth and throat, and coughing. Fine dust can cause metal fume fever (with symptoms similar to influenza).

Skin contact: Burning, reddening.

Eye contact: Severe burning, possibly corrosive damage.

Ingestion: Burning pains, a metal taste in the mouth, severe vomiting, and diarrhoea possibly containing blood. Risk of severe systemic effects (shock).

Ingestion of copper compounds may cause a pronounced gastrointestinal irritation, circulatory disturbance, effect on the central nervous system, liver and kidney damages, hemolysis and methemoglobinemia.

Repeated skin contact or inhalation of nickel compounds may cause sensitisation. Repeated inhalation of soluble nickel compounds is suspected to cause cancer in the sinuses of the nose, lung and throat.

Reproductive toxicity: This product contains teratogenic substances which can do long-term damage to human offspring. The effects on the child can be: death, deformity, delayed development, and functional disorders.

Carcinogenic effects: This product contains substances which are considered or proven to be carcinogenic. The danger may lie in inhalation, skin contact or ingestion.

Reproductive toxicity: This product contains substances which can do damage to reproductive capacity, e.g. damage to germ cells or hormonal regulation. The effects can be: sterility, reduced fertility, menstruation disorders, etc.

Sensitivity effects: This product contains substances which can give an allergic reaction on contact with skin. The allergic reaction will typically set in 12-72 hours after exposure as the substance penetrates the skin and reacts with proteins in the outer skin. The body's immune system sees the chemically changed protein as a foreign body and will try to destroy it.

Irritation effects: This product contains substances which cause irritation to skin and eyes, or when inhaled. Contact with locally irritative substances can cause the area of contact to be more prone to absorb damaging substances such as allergens.

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

None other than described in section 4.1.

Information to medics

Bring this safety data sheet.

SECTION 5: Firefighting measures**5.1. Extinguishing media**

Use extinguishing media appropriate for surrounding fire (micronized water, CO₂, foam).
Product is not flammable.

5.2. Special hazards arising from the substance or mixture

Copper sulphate dust may be formed as decomposition product (due to dehydration). Further heat exposure could generate toxic gases. Avoid breathing fumes that could be toxic due to presence of sulphur oxides, SO_x.

5.3. Advice for firefighters

Fire-fighters should wear proper protective equipment and self-contained (positive pressure if available) breathing apparatus with full face piece. Avoid spraying water directly to copper sulphate melt. Collect the contaminated water to avoid reaching of sewers or water courses. Move or keep containers cool using a diffuse spray of water.

SECTION 6: Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures**

Protect adequately all body parts. The air passages must be protected (suitable filter mask) if the material is in form of microcrystals (higher probability that the product forms dust). Keep away unauthorized people, children and animals.

6.2. Environmental precautions

Cover accidentally released copper sulphate with plastic, if there is a risk that the substance may be wetted by rain or water from fire extinguisher. Prevent the substance from spreading to wells, culverts or streams. Dam accidentally released liquid with sand, dirt or some other appropriate material. Contact appropriate authorities if the substance has been released into watercourses, effluent streams, drains or has contaminated the ground or vegetation.

6.3. Methods and material for containment and cleaning up

Do not use water to clean contaminated areas. Use sand or soil to contain the spillage. Cover the product with sand or soil and carefully clean up all spills of the product, avoiding generation of dust. Put in a clean and dry container, close and remove it from the area. Collected spillages are to be handled as toxic waste and disposed in a suitable way. If the accidental release is of significantly large volume always consult a specialist.

6.4. Reference to other sections

See section 13 with regard to the handling of waste. See section 8 for protective measures.

SECTION 7: Handling and storage**7.1. Precautions for safe handling**

Avoid dust generation. Do not breathe dust. Handle in a well ventilated area or wear adequate respiratory protection (anti-dust mask). Avoid contact with skin and eyes; wear working clothes, gloves and protective glasses. Do not eat, smoke or drink during use. After use keep the packaging well closed.

7.2. Conditions for safe storage, including any incompatibilities

Keep in sealed containers away from humidity and sunlight. Store the product in a well ventilated warehouse away from flammable product. Keep out of the reach of children, animals and unauthorized people. Keep away from food stuff.

Storage temperature

No data available.

7.3. Specific end use(s)

This product should only be used for applications described in Section 1.2
Transport in a big bag with an inner plastic sack.

SECTION 8: Exposure controls/personal protection**8.1. Control parameters**

OEL

According to EC-Regulation 1907/2006 (REACH)

Copper, dusts and mists (as Cu)
Limit value - Eight hours 1 mg/m³
Limit value - Short term 2 mg/m³

Copper, fume, respirable dust
Limit value - Eight hours 0,2 mg/m³

Nickel, inorganic compounds, water-insoluble (as Ni) (not Ni(CO)₄)
Limit value - Eight hours 0,5 mg/m³

Nickel, inorganic compounds, water-soluble (as Ni) (not Ni(CO)₄)
Limit value - Eight hours 0,1 mg/m³

Nickel, metal - total dust
Limit value - Eight hours 0,5 mg/m³

DNEL / PNEC

DNEL: 137 mg/kg bw/day - Duration: Long term – Systemic effects - Exposure: Dermal – Remarks: dry copper compounds, worker
DNEL: 13,7 g/kg bw/day - Duration: Long term – Systemic effects - Exposure: Dermal – Remarks: slurries or copper compounds insolution, worker
DNEL: 0,041 mg/kg bw/day - Duration: Long term – Systemic effects - Exposure: Oral – Remarks: general population

PNEC (Copper sulphate): 7,8 µg dissolved Cu/L - Exposure: Freshwater
PNEC (Copper sulphate): 5,6 µg dissolved Cu/L - Exposure: Marine water
PNEC (Copper sulphate): 87,1 mg/kg dw - Exposure: Freshwater sediment
PNEC (Copper sulphate): 676 mg/kg dw - Exposure: Marine water sediment
PNEC (Copper sulphate): 64,6 mg/kg dw - Exposure: Soil
PNEC (Copper sulphate): 230 µg /L - Exposure: Sewage Treatment Plant

8.2. Exposure controls

Compliance with the stated exposure limits values should be checked on a regular basis.

General recommendations

Observe general occupational hygiene.

Exposure scenarios

If there is an appendix to this safety data sheet, the indicated exposure scenarios must be complied.

Exposure limits

Trade users are covered by the rules of the working environment legislation on maximum concentrations for exposure. See work hygiene threshold values below.

Appropriate technical measures

Take ordinary precautions when using the product. Avoid inhalation of gas or dust.

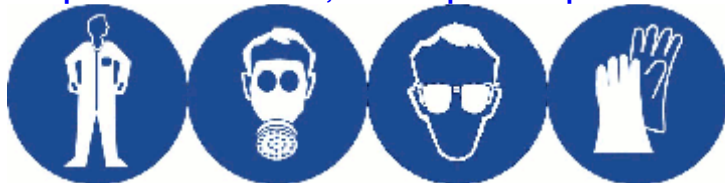
Hygiene measures

Whenever you take a break in using this product and when you have finished using it, all exposed areas of the body must be washed. Always wash hands, forearms and face.

Measures to avoid environmental exposure

Keep damming materials near the workplace. If possible collect spillage during work.

Individual protection measures, such as personal protective equipment



Generally

Only CE-marked personal protection equipment should be used.

Respiratory Equipment

If the ventilation at the work place is not sufficient, use a half or whole mask with an appropriate filter (P2) or an air-supplied respiratory protector. The choice depends on the concrete work situation and how long you will be using the product.

Skin protection

Special work clothing should be used. When working with this product for a long period of time, use a protective suit.

Hand protection

Use gloves of for example neoprene.

Eye protection

Use face shield. Use safety glasses with a side shield as an alternative.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	Colour	Odour	pH	Viscosity	Density (g/cm ³)
Solid, Crystalline (20 °C and 101.3 kPa)	Blue	None	-	Not applicable, the substance is a solid.	≥ 2,286

Phase changes

Melting point (°C)	Boiling point (°C)	Vapour pressure (mm Hg)
-	-	Not applicable

Data on fire and explosion hazards

Flashpoint (°C)	Ignition (°C)	Self ignition (°C)
Not applicable	-	Not applicable
Explosion limits (Vol %)	Oxidizing properties	Flammability (solid, gas)
Not applicable	Not applicable	Not applicable

Solubility

Solubility in water	n-octanol/water coefficient
Soluble (≥ 22g/100g (H ₂ O pH and temp. not stated.))	Not applicable

9.2. Other information

Solubility in fat	Additional information
-	Melting point/freezing point: Decomposes at 110 °C Surface tension: Not applicable (Surface tension is not applicable to inorganic salts.) Stability in organic solvents: Not applicable Dissociation constant: Not applicable Auto flammability: Not applicable Granulometry: d80 = ~2 mm, d50 = ~1.3 mm, d10 = ~0.6 mm

SECTION 10: Stability and reactivity

10.1. Reactivity

Reacts violently with hydroxylamine and magnesium.

10.2. Chemical stability

The product is stable under the conditions noted in section 7.

10.3. Possibility of hazardous reactions

Solution can react with magnesium forming hydrogen. Contact with hydroxylamine (NH₂OH) can ignite hydroxylamine. At temperatures over 400°C copper sulphate decomposes forming copper oxide and sulphur dioxide

10.4. Conditions to avoid

Avoid dehydration (caused by heating) of the salt which may give a fine powdered product and thereby give rise to dusting. Avoid unintentional contact with water since this will cause dissolution of the salt.

10.5. Incompatible materials

Magnesium, hydroxylamine

10.6. Hazardous decomposition products

The product decomposes at temperatures above 110°C. In a first step the salt is dehydrated thus producing water vapour and a finely divided powder. Further decomposition will give rise to toxic products such as SO_x gases while the copper is converted into an oxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity

Substance	Species	Test	Route of exposure	Result
Copper(II)sulphate pentahydrate	Rat	LD50	Oral	300 mg/Kg body weight

Skin corrosion/irritation

Causes skin irritation.

Serious eye damage/irritation

According to EC-Regulation 1907/2006 (REACH)

Causes serious eye irritation.

Respiratory or skin sensitisation

The product may irritate the skin, causing redness. May cause an allergic skin reaction. Repeated skin contact with nickel may cause sensitisation by inhalation and skin contact.

Germ cell mutagenicity

No data available.

Carcinogenicity

Nickel compounds in general are considered as carcinogenic IARC group 1. Water-soluble salts of nickel have not been proven carcinogenic in tests on animals. Soluble salts of nickel are suspected to cause cancer in the sinuses of the nose, lung and throat.

Reproductive toxicity

May damage fertility or the unborn child.

STOT-single exposure

No data available.

STOT-repeated exposure

May cause damage to organs.

Aspiration hazard

Repeated inhalation of nickel compounds may cause allergy and are suspected to cause cancer in the sinuses of the nose, lung and throat.

Long term effects

Reproductive toxicity: This product contains teratogenic substances which can do long-term damage to human offspring. The effects on the child can be: death, deformity, delayed development, and functional disorders.

Reproductive toxicity: This product contains substances which can do damage to reproductive capacity, e.g. damage to germ cells or hormonal regulation. The effects can be: sterility, reduced fertility, menstruation disorders, etc.

Carcinogenic effects: This product contains substances which are considered or proven to be carcinogenic. The danger may lie in inhalation, skin contact or ingestion.

Sensitivity effects: This product contains substances which can give an allergic reaction on contact with skin. The allergic reaction will typically set in 12-72 hours after exposure as the substance penetrates the skin and reacts with proteins in the outer skin. The body's immune system sees the chemically changed protein as a foreign body and will try to destroy it.

Irritation effects: This product contains substances which cause irritation to skin and eyes, or when inhaled. Contact with locally irritative substances can cause the area of contact to be more prone to absorb damaging substances such as allergens.

Ingestion hazard

Copper compounds may cause a pronounced gastrointestinal irritation, effect on the central nervous system, liver and kidney damages, hemolysis and methemoglobinemia. Symptoms of an acute poisoning may be vomiting, often containing blood, and jaundice.

SECTION 12: Ecological information

12.1. Toxicity

Copper sulphate is very toxic to fish and other aquatic organisms.

An acidic pH is favouring the solubility of copper compounds.

Substance	Species	Test	Test duration	Result
Copper(II)sulphate, pentahydrate	Fish (Lepomis macrochirus)	LC50	96h	1,10 mg/l
Copper(II)sulphate, pentahydrate	Daphnia Magna	EC50	48h	0,18 mg/l

12.2. Persistence and degradability

Substance	Biodegradability	Test	Result
	Inorganic metal compounds or metal ions are not biodegraded in the environment, but may with time be abiotically transformed into other compounds or states. The extent of the transformation depends on for example the size of the particles, oxygen supply, pH, the composition of organic and inorganic material in the ground, water and sediment. Copper ions are very toxic to aquatic organisms and cannot be biodegraded.		

12.3. Bioaccumulative potential

Substance	Potential bioaccumulation	LogPow	BFC
	Copper sulphate does not accumulate		

12.4. Mobility in soil

Copper sulphate is very soluble and is considered to have a high mobility in water. The mobility is affected by for example oxygen supply, pH, and the composition of organic and inorganic compounds in the ground, water and sediment.

According to EC-Regulation 1907/2006 (REACH)

12.5. Results of PBT and vPvB assessment

The substance does not meet the criteria for a PBT or vPvB substance.

12.6. Other adverse effects

Effects on the sewage treatment works: The product may raise the levels of ecotoxic metals in the sludge from the sewage treatment works. Copper may have an adverse effect on the microorganisms in sewage plants.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

The product is covered by the regulations on dangerous waste.

The ions of most heavy metal can be precipitated and filtrated as sulphides or as other compounds of low solubility. The precipitates are sent to an approved recipient of hazardous waste.

Waste containing this substance may not be incinerated in an incineration or co-incineration plant without permit. (Directive 2000/76/EC)

Waste

EWC code

06 04 05

Specific labelling

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Contaminated packing

Packaging which contains leftovers from the product must be disposed of in the same way as the product.

SECTION 14: Transport information

This product is covered by the conventions on dangerous goods.

14.1 – 14.4

ADR/RID

14.1. UN number	3077
14.2. UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Copper Sulphate)
14.3. Transport hazard class(es)	9
14.4. Packing group	III
Notes	-
Tunnel restriction code	3 E

IMDG

UN-no.	3077
Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Copper Sulphate)
Class	9
PG*	III
EmS	F-A, S-F
MP**	Yes
Hazardous constituent	-

IATA/ICAO

UN-no.	3077
Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Copper Sulphate)
Class	9
PG*	III

14.5. Environmental hazards

This product contains substances which can cause undesirable long-term effects in the water environment, due to its poor biodegradability.

14.6. Special precautions for user

Hazard identification number 90

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

No data available

(*) Packing group

(**) Marine pollutant

SECTION 15: Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****Restrictions for application**

People under the age of 18 must not be exposed to this product cf. Council Directive 94/33/EC. Only for industrial use. Pregnant and nursing women must not be exposed to the effects of this product. The risk, and possible technical precautions or design of the workplace to avoid such risk, must therefore be evaluated.

Demands for specific education

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Additional information

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Sources

EC regulation 1907/2006 (REACH)

Directive 2000/532/EC

EC Regulation 1272/2008 (CLP)

2011 Code of Practice, for the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001 (S.I. No. 619 of 2001)

15.2. Chemical safety assessment

Yes

SECTION 16: Other information**Full text of H-phrases as mentioned in section 3**

H302 - Harmful if swallowed.

H315 - Causes skin irritation.

H317 - May cause an allergic skin reaction.

H319 - Causes serious eye irritation.

H350 - May cause cancer.

H360 - May damage fertility or the unborn child.

H373 - May cause damage to organs through prolonged or repeated exposure.

H400 - Very toxic to aquatic life.

H410 - Very toxic to aquatic life with long lasting effects.

The full text of identified uses as mentioned in section 1

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Other symbols mentioned in section 2

-

Other

It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification.

The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.

A change (in proportion to the last essential change (first cipher in SDS version)) is marked with a blue triangle.

Emergency numbers

According to EC-Regulation 1907/2006 (REACH)

Austria: Poison Control Centre Emergency helpline +43 1 406 43 43, 112
Belgium: 070 - 245 245
Bulgaria: +359 2 9154 409
Czech Republic: Toxikologické informační středisko Telefon: +420 224 919 293, +420 224 915 402
Denmark: Kontakt Gifflinien på tlf.nr.: 82 12 12 12 (åbent 24 timer i døgnet).
Estonia: 112, 16662, ((+372) 626 93 90)
Finland: 09-4711/Myrkytystietokeskus tai suora numero 09-471977 Myrkytystietokeskus/HUS, Tukholmankatu 17, 00029 HUS (Helsinki) 112
France: ORFILA (INRS) : + 33 (0)1 45 42 59 59. 24 heures sur 24 et 7 jours sur 7
Germany: Giftnotruf Berlin, Emergency telephone: +49 30 19240 (Tag und Nacht)
Greece: +30 10 779 3777
Hungary: Telefon: 06-80-20-11-99
Iceland: Neyðarlínan: Sími 112. Eitrunarmiðstöð Landsspítalans. Sími: 543 2222.
Ireland: +353 1 8379964
Italy: Centro antiveleni di Roma - Policlinico Umberto I tel. 06-49978000
Latvia: +371 704 2468
Lithuania: Visuomenės sveikatos centrams +370 5 236 20 52 arba +370 687 53378
Malta: 2425 0000
Netherlands: 30-2748888
Norway: Giftinformasjonssentralen på tlf.nr.: 22 59 13 00, 113
Poland: +48 58301 65 16 / +48 58 349 2831
Portugal: Em caso de intoxicacao, ligue 808 250 143
Romania: +40 21 3183606
Slovakia: +421 2 54 77 4166
Slovenia: + 386 41 650500
Spain: Servicio de Información Toxicológica Teléfono: + 34 91 562 04 20 (solo emergencias toxicológicas) Información en español (24h/365 días)
Sweden: 112, 08-331231 (vardagar kl 9-17)
United Kingdom: 999 (or 111 for non-emergency medical advice). Emergency Action: In the event of a medical enquiry involving this product, please contact your doctor or local hospital accident and emergency department or the NHS enquiry service)

**Date of last essential change
(First cipher in SDS version)**

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**Date of last minor change
(Last cipher in SDS version)**

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