

**EC-SAFETY DATA SHEET**  
**ACCORDING TO DIRECTIVES 2001/58/EC**

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**1. IDENTIFICATION OF THE PREPARATION AND COMPANY**

1.1 Product details - Trade name:

**Degesch Phostoxin, Detia Gas-Ex-T, Detia Gas-Ex-P**

1.2 Producer: Detia Freyberg GmbH  
Supplier: Detia Degesch GmbH  
Dr.-Werner-Freyberg Str. 11  
D-69514 Laudenbach  
Germany

Telephone number + 49/6201/708-(0)-503

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**2. COMPOSITION / INFORMATION ON HAZARDOUS INGREDIENTS**

Preparation with ignition inhibiting additives

2.1	Chem. Characterization / Concentration / Symbol / R-phrases / CAS-No.		
	Aluminium phosphide	56-57 % T+, F, N	R 15/29-28-32-50 CAS-No. 20859-73-8
	Ammonium carbamate	Xn	R 22 CAS-No. 111-78-0
2.2	Chem. Characterization / Concentration / TLV (Germany)		
	Hydrogen phosphide	0.1 ml/m <sup>3</sup> (ppm), 0.14 mg/m <sup>3</sup> /	CAS-No. 7803-51-2
	Odour threshold for hydrogen phosphide:	from 0.02 up to 3 ppm depending on the sensitivity <sup>1b)</sup>	
	Ammonia	50 ppm, 35 mg/m <sup>3</sup>	CAS-No. 7664-41-7
	Carbon dioxide	5000 ppm, 9100 mg/m <sup>3</sup>	CAS-No. 124-38-9

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**3. POSSIBLE HAZARDS**

On contact with water or acids the product develops the extremely flammable and toxic hydrogen phosphide (phosphine); ammonia and carbon dioxide

3.1 For humans: see Nos. 11 and 15 below

3.2 For the environment: see No. 12 below

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**4. \* FIRST AID MEASURES**

4.1 Inhalation: in case of headache, dizziness, feeling of constriction, difficult breathing and nausea immediately leave the danger zone and seek fresh air; consult a physician; inhale products for acute treatment following exposition of smoke gas (eg a beclometasone (Ventolair<sup>®</sup>) spray).

4.2 Eye contact: remove rests of preparation with fluff-free cloth; rinse with plenty of water and apply eye drops only after no more powdery residues are visible.

4.3 Skin contact: remove any rests by brushing; only then use water for cleansing

4.4 Special aids required for First Aid measures: have methyl prednisolon (application by physician) and products for acute treatment following exposition of smoke gas (eg a beclometasone (Ventolair<sup>®</sup>) spray) available

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**5. FIRE-FIGHTING MEASURES**

- 5.1 Suitable extinguishing media: the product itself does not burn; extinguish fires in the vicinity with dry sand or powder and then with CO<sub>2</sub>
  - 5.2 Extinguishing media that must not be used for safety reasons: water, extinguishers containing water
  - 5.3 Special hazards from the substance itself, its combustion products or from its vapours: in case of fires hazardous combustion gases are formed: caustic phosphoric acid aerosols (phosphoric pentoxide)
  - 5.4 Special protective equipment for firefighting: respiratory equipment, see No. 8.1 below
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**6. ACCIDENTAL RELEASE MEASURES**

See Nos. 8 and 13 below

- 6.1 Person-related precaution measures: leave danger zone immediately; see No. 8 below
  - 6.2 Environment protection measures: n.a.
  - 6.3 Methods for cleaning up / taking up: n.a.
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**7. HANDLING AND STORAGE**

- 7.1 Handling
    - 7.1.1 Advice on safe handling: follow regulations for the handling of dangerous goods
  - 7.2 Storage
    - 7.2.1 Demands upon storerooms and containers: see No. 7.1.1
    - 7.2.2 Further information on storage conditions:  
Obviate contact with water, acids and ambient humidity
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**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

see also No. 2.2: TLV

- 8.1 Respiratory protection: respiratory equipment suitable for hydrogen phosphide, filter B, colour grey
  - 8.2 Hand protection: suitable gloves
  - 8.3 Eye protection: n.a.
  - 8.4 Body protection: suitable protective clothing
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**9. \* PHYSICAL AND CHEMICAL PROPERTIES**

- 9.1 Appearance:
- 9.1.1 Form: under the influence of ambient air the solid products develop gaseous phosphine
- 9.1.2 Colour: greyish-green
- 9.1.3 Odour: garlic or carbide-like
- 9.2 pH-value (20 °C): n.a.
- 9.3 Boiling point / range (in °C): n.a.
- 9.4 Melting point / range (in °C): aluminium phosphide > 500 °C <sup>11)</sup>
- 9.5 Data relevant to safety:
- 9.5.1 Flash point in °C: n.a.
- 9.5.2 Inflammability: in contact with water / humidity, acids an extremely flammable gas is developed
- 9.5.3 Selfignition: contains additives to prevent self-ignition
- 9.5.4 Fire enhancing properties: n.a.
- 9.6 Explosion danger in vol%:
- 9.6.1 Lower explosion limit: hydrogen phosphide 1.8 <sup>1a)</sup> (1.79-1.89)
- 9.6.2 Upper explosion limit: n.v.
- 9.7 Further information
- 9.7.1 Vapour pressure: hydrogen phosphide 34.6 bar (20°C)<sup>9)</sup>
- 9.7.2 Relative density: n.a.
- 9.7.3 Settled appearance density: (powder) 0.95 g/cm<sup>3</sup>
- 9.8 General solubility:
- 9.8.1 Solubility in water: not applicable due to decomposition
- 9.8.2 Liposolubility/solvent: n.t.
- 9.8.3 Distribution coefficient (n-octanol/water): n.a.
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**10. STABILITY AND REACTIVITY**

- 10.1 Conditions to be avoided: see No. 7 above
- 10.2 Substances to be avoided: water and acids cause aluminium phosphide to decompose in a violent reaction into extremely flammable and toxic hydrogen phosphide
- 10.3 Hazardous decomposition products: hydrogen phosphide, phosphoric pentoxide, phosphoric acid (No. 5.3)
- 10.4 Further information:
- 10.4.1 Stabilizers available: yes
- 10.4.2 Change of aggregation condition: Influence on safety: uncontrolled development of hydrogen phosphide can cause fires
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**11. TOXICOLOGICAL DATA**

- 11.1 Acute toxicity:
- 11.1.1 Swallowing, LD<sub>50</sub> rat oral (mg/kg): aluminium phosphide: 8.7 <sup>2)</sup> Phostoxin: 11.5 <sup>3)</sup>
- 11.1.2 Inhalation, LC<sub>50</sub> rat inhalative (4hrs.): hydrogen phosphide 11 ppm = 0.015 mg/l<sup>4)</sup>
- 11.1.3 Skin contact, LD<sub>50</sub> rat dermal (mg/kg): n.v.
- 11.1.4 Eye contact: n.v.
- 11.2 Chronical effect: none known
- 11.2.1 Sensitizing effect: Gas-Ex-T: no skin sensitization <sup>10)</sup>
- 11.2.2 Carcinogenic effect: -
- 11.2.3 Genotype variating effect: -
- 11.2.4 Reproduction endangering effect: -
- 11.2.5 Anaesthetizing effect: -
- 11.3 Other information: inhalation and ingestion of large quantities may lead to very serious poisoning. Highly dangerous after 1/2 to 1 hour are already 400-600 mg/m<sup>3</sup> = 290-430 ppm phosphine<sup>16)</sup>  
IDLH (Immediately Dangerous to Life and Health) = 282 mg/m<sup>3</sup> = 200 ppm phosphine (US EPA,1985)<sup>5)</sup>
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**12. ECOLOGICAL INFORMATION**

- 12.1 Ability to decompose: n.a.  
12.2 Reaction in sewerage plants: n.a.  
12.3 Aqueous toxicity:  $LC_{50}$  (rainbow trout, 96 hrs.) =  $9.7 \times 10^{-3}$  ppm<sup>6)</sup>  
 $EC_{50}$  (daphnia magna, 24 hrs.) = 0.2 mg/l<sup>7)</sup>  
12.4 Ecotoxicity: phosphine decomposes in the atmosphere within 5 - 28 hours<sup>8)</sup>
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**13. DISPOSAL CONSIDERATIONS**

- 13.1 For substance / preparation / residues: product: waste code #: 061301  
13.2 Recommendation: degassed material should be disposed of under observation of the prevailing regulations (waste code #: 060316)
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**14. \* TRANSPORT INFORMATION**

- 14.1 **Road-/rail transport** acc. to ADR/RID:  
14.1.1 class: 4.3, UN 1397, PG: I  
14.1.2 Description of goods: Aluminium phosphide  
14.1.3 Labels: Dangerous when wet 4 = main risk  
Toxic = subsidiary risk  
14.1.4 Red (warning) board: starting 20 kgs net weight  
14.1.5 Remarks: limited quantities acc. to chapter 3.4 not possible  
14.2 **Sea transport** acc. to IMDG-Code  
14.2.1 class: 4.3 UN-No.: 1397 Packing Group I  
14.2.2 Proper shipping name: ALUMINIUM PHOSPHIDE  
14.2.3 Labels: Dangerous when wet 4 = main risk  
Toxic = subsidiary risk  
Marine pollutant: no  
14.2.4 EmS-Code: F-G, S-N  
14.3 **Air transport** acc. to IATA-DGR/ICAO-TI  
14.3.1 See sea transport and packaging instructions: 412  
14.3.2 Proper shipping name: Aluminium phosphide  
14.3.3 See sea transport  
14.3.4 Remarks: max. weight 1 kg/inner packaging, 15 kg/outer packaging cargo aircraft only  
14.4 **Transport by barge** acc. to ADN/ADNR see road transport
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**15. REGULATIONS**

Labelling according to German Regulations concerning dangerous Goods including EC regulations (including Directive 1999/45/EC\*\*)

- 15.1 Symbol: F, T+, N\*\*  
15.2 Hazard description: highly flammable, very toxic, dangerous for the environment\*\*  
15.3 R-phrases: 15/29 - Contact with water liberates toxic, extremely flammable gas.  
26/28 - Very toxic by inhalation and if swallowed.  
32 - Contact with acids liberates very toxic gas  
50\*\* - Very toxic to aquatic organisms.  
15.4 S-phrases: 1/2 - Keep locked up and out of the reach of children.  
3/9/49 - Keep only in the original container in a cool well-ventilated place.  
7/8 - Keep container tightly closed and dry.  
13 - Keep away from food, drink and animal feedingstuffs.  
20/21 - When using do not eat, drink or smoke.  
22 - Do not breathe dust.  
30 - Never add water to this product.  
43 - In case of fire, use dry sand, powder or CO<sub>2</sub>. Never use water.  
45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).  
61\*\* - Avoid release to the environment. Refer to special instructions/safety data sheets.  
15.5 Additional: empty packaging must not be reused

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**16. ADDITIONAL INFORMATION****LEGEND:**

- \* = changes from previous version
- \*\* = Classification/labelling according to Directive 1999/45/EC have to be applied for preparations within the scope of Directive 91/414/EEC (plant protection products) or Directive 98/8/EC (biocides) as from 30 July 2004.
- n.a. = not applicable
- n.t. = not tested
- n.v. = not available
- TLV = Threshold Limit Value

**REFERENCES:**

- 1) WHO Environmental Health Criteria 73: Phosphine and Selected Metal Phosphides: a) page 18, b) page 72, c) page 75
- 2) International Bio-Research Inc., D-Hannover: Acute oral toxicity of Aluminium phosphide in rats (1.1.1977)
- 3) Hazleton Laboratories America, Inc.: Acute oral toxicity study in rats of Degesch Phostoxin formulation (1.12.1983)
- 4) Waritz, R.S. & Brown, R.M. (1975): Acute and subacute inhalation toxicities of phosphine, phenylphosphine and triphenylphosphine; Am. Ind. Assoc. J., 36: 452-458.
- 5) US Environmental Protection Agency: EPA chemical profile: Phosphine, Washington DC, 1985
- 6) Laboratory for Pharmacology and Toxicology, D-Hamburg: Prüfung der akuten Toxizität von Aluminiumphosphid an Regenbogenforellen (24.11.1984)
- 7) Ökolimna, D-Burgwedel: Daphnientoxizitätstest mit Aluminiumphosphid, 1986
- 8) Frank, R.; Rippen, G.: Verhalten von Phosphin in der Atmosphäre, Lebensmitteltechnik Juli/August 1987
- 9) Drägerwerk AG: Dräger-Röhrchen-Handbuch: Boden-, Wasser- und Luftuntersuchungen sowie technische Gasanalyse, Lübeck, 1993
- 10) Bioagri Laboratórios Ltda.: Evaluation of skin sensitization of test substance DETIA GAS-EX-T-PASTILHAS DE 3g (27.07.2004)
- 11) Siemens Axiva GmbH & Co. KG, D-Frankfurt am Main: Aluminium phosphide technical: Melting point, boiling point, vapour pressure (09.07.2002)

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The above information is based on our present state of knowledge. It describes the product with respect to the safety measures required and should not therefore be construed as guaranteeing specific properties nor must it be altered or transferred to other products.

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**Subject: AW: Safety Data Sheets**

**Date:** Wednesday, 24 June 2009 10:06

**From:** Engel Günter <Guenter\_Engel@detia-degesch.de>

**To:** Brian Poyntz <brian@poyntzconsulting.com>

**Cc:** Pfromm Hartmut <hartmut\_pfromm@detia-degesch.de>

Dear Brian,

The MSDS for DETIA GAS - EX - T, P and EX - B Forte are unchanged, i.e. the

2007 version is still valid.

Best regards Guenter Engel DETIA DEGESCH GMBH