Section A6.6.4/6.6.5/ 6.6.6 — Genotoxicity in vivo

Cytogenetic in-vivo-test

Annex Point IIA6.6.4 / 01

Official use only

1 REFERENCE

1.1	**Reference**	Kligerman, A.D.; et al. (1994): Cytogenetic effects of phosphine inhalation by rodents. I: Acute 6-hour exposure of mice; Environ. Mol. Mutagen. 23, 186 - 189
1.2	**Data protection**	No
1.2.1	Data owner	published
1.2.2		
1.2.3	Criteria for data protection	No data protection claimed

2 GUIDELINES AND QUALITY ASSURANCE

2.1	**Guideline study**	Yes. Approved by the "Animal Care Committee of the Health Effects Research Laboratory of the U.S. EPA " and set by "The National Institute of Health".
2.2	**GLP**	not stated (It is not stated in this publication, if the original study was conducted according GLP, but since the investigations were carried out in 1994, it can be presumed that the study was conducted in compliance with the GLP regulations.)
2.3	**Deviations**	not applicated

3 MATERIALS AND METHODS

3.1	**Test material**	Phosphine
3.1.1	Lot/Batch number	not stated
3.1.2	Specification	Deviating from specification given in section 2 as follows
3.1.2.1	Description	gaseous
3.1.2.2	Purity	750 ppm Phosphine in nitrogen, purity: 99.99 %
3.1.2.3	Stability	not indicated
3.1.2.4	Maximum tolerable dose	not indicated
3.2	**Test Animals**	
3.2.1	Species	mouse
3.2.2	Strain	CD-1
3.2.3	Source	Charles River Breeding Laboratories, Raleigh, NC, USA
3.2.4	Sex	male
3.2.5	Age/weight at study initiation	12 weeks approximately
3.2.6	Number of animals	5m per dose

Section A6.6.4/6.6.5/ 6.6.6 Genotoxicity in vivo

Cytogenetic in-vivo-test

Annex Point IIA6.6.4 / 01

	per group	
3.2.7	Control animals	Yes
3.3	**Administration/ Exposure**	inhalation
3.3.1	Number of applications	1
3.3.2	Interval between applications	6 h
3.3.3	Postexposure period	20 h after treatment
		Inhalation
3.3.4	Type	Whole-body inhalation
3.3.5	Concentration	0, 5, 10 and 15 ppm PH_3 (norminal)
		0, 5.24 ± 0.69, 9.94 ± 0.69 and 16.00 ± 1.15 (actual)
3.3.6	Vehicle	Nitrogen
3.3.7	Concentration in vehicle	750 ppm PH_3 in Nitrogen
3.3.8	Total volume applied	n. a.
3.3.9	Controls	Vehicle
3.4	**Examinations**	
3.4.1	Clinical signs	Yes
3.4.2	Tissue	bone marrow
		Number of animals: all animals
		Number of cells: not indicated
		Time points: 20 h after treatment
		Type of cells bone marrow smears
		Parameters: chromosomal aberrations (CA)
		sister chromatid exchanges (SCE)
		micronuleus (MN) formation
3.5	**Further remarks**	

4 RESULTS AND DISCUSSION

4.1	**Clinical signs**	After exposure to 15 ppm, the animals appeared lethargic and their breathing was shallow, but all survived. The controls and other exposed animals showed no outward signs of toxicity.

Section A6.6.4/6.6.5/ 6.6.6 — Genotoxicity in vivo

Cytogenetic in-vivo-test

Annex Point IIA6.6.4 / 01

4.2	**Haematology / Tissue examination**	See table A6_6_4-1
4.3	**Genotoxicity**	No
4.4	**Other**	no other significant effects

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1	**Materials and methods**	In-vivo mutagenicity study as described in 3.
5.2	**Results and discussion**	After exposure to 15 ppm, the animals appeared lethargic and their breathing was shallow, but all survived. The controls and other exposed animals showed no outward signs of toxicity. All measures of cytogenetic damage analyzed were negative. No evidence was found of SCE, CA, or MN induction. There was also no indication of rare highly damaged cells in any of the treated animals, with the vast majority of aberrations being simple chromatid deletions. The only statistically significant effect observed was a concentration-related slowing of the cell cycle (P =0.009) in the cultured splenocytes at all exposure levels. Thus in this study, there is no evidence that PH_3 is clastogenic, aneuploidogenic, or capable of inducing SCEs at or near toxic concentrations in male mice exposed by inhalation.
5.3	**Conclusion**	
5.3.1	Reliability	1
5.3.2	Deficiencies	No

Section A6.6.4/6.6.5/ 6.6.6 Genotoxicity in vivo

Cytogenetic in-vivo-test

Annex Point IIA6.6.4 / 01

Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	2005-11-25
Materials and Methods	MN test section: In the OECD guideline 474 (which was released after this study had already been performed) sampling times for bone marrow shorter than 24 h post-exposure are not recommended. No positive controls.
Results and discussion	Results for all measured endpoints were negative. A dose-related slight decrease of cell cycle duration was observed.
Conclusion	After a single 6 hr-treatment with up to 15 ppm PH_3, no genotoxic effects were observed in mice in vivo under the conditions of this test.
Reliability	2 Some doubts about test design, inexhaustive reporting (journal article), GLP status uncertain.
Acceptability	Acceptable
Remarks	
	COMMENTS FROM ...
Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A6.6.4/6.6.5/ 6.6.6 Genotoxicity in vivo

Cytogenetic in-vivo-test

Annex Point IIA6.6.4 / 01

Table A6_6_4-1. Results Table

Cytogenetic Effects of a 6-hr PH_3 Inhalation Exposure on Male CD-1 Mice							
PH_3 (ppm)	Animals	% Abnormal (CA)	SCE/ metaphase	Cell cycle (RI)	MN-PCEs/ 1000	MN_{bn}/1000	% PCEs
0	1	2	13.6	1.88	2.0	5.5	43
	2	3	10.4	1.81	2.0	5.0	53
	3	4	10.4	2.04	0.0	2.0	53
	4	3	12.0	1.71	6.0	4.0	75
	5	2	10.4	1.89	2.0	7.5	43
	0 ± s.d.	2.8 ± 0.8	11.4 ± 1.4	1.87 ± 0.12	2.6 ± 2.2	4.8 ± 2.0	53± 13
5	1	2	9.1	1.67	4.0	5.7	70
	2	2	10.5	1.69	5.0	5.5	73
	3	4	8.4	1.76	1.0	3.5	62
	4	3	12.2	1.72	6.0	4.5	47
	5	1	10.2	1.53	4.0	8.0	40
	0 ± s.d.	2.4 ± 1.1	10.1 ± 1.5	1.67 ± 0.09*	4.0 ± 1.9	5.4 ± 1.7	58 ± 14
	1	1	7.7	1.38	2.0	5.5	65
	2	1	11.6	1.57	2.0	2.5	40
	3	1	11.9	1.87	2.0	5.0	54
	4	0	10.2	1.66	3.0	5.5	49
	5	0	10.5	1.56	2.0	5.5	45
	0 ± s.d.	0.6 ± 0.5	10.4 ± 1.6	1.61 ± 0.18*	2.2 ± 0.4	4.8 ± 1.3	50 ± 9
15	1	2	12.3	1.54	1.0	4.5	50
	2	0	11.4	1.62	3.0	6.5	40
	3	0	10.0	1.49	3.0	8.5	34
	4	2	11.3	1.71	2.0	3.0	67
	5	1	12.2	1.46	0.0	6.0	33
	0 ± s.d.	1.0 ± 1.0	11.4 ± 0.9	1.56 ± 0.10*	1.8 ± 1.3	5.7 ± 2.1	45 ± 14

* statistically significant ($p < 0.05$)

Section A6.6.4/6.6.5/ 6.6.6 — Genotoxicity in vivo

Cytogenetic in-vivo test

Annex Point IIA6.6.4 / 02

Official use only

1 REFERENCE

1.1	**Reference**	Kligerman, A.D.; et al. (1994): Cytogenetic and germ cell effects of phosphine inhalation by rodents: II. Sub-acute exposure to rats and mice; Environ. Mol. Mutagen. 24, 301 - 306
1.2	**Data protection**	No
1.2.1	Data owner	published
1.2.2		
1.2.3	Criteria for data protection	No data protection claimed

2 GUIDELINES AND QUALITY ASSURANCE

2.1	**Guideline study**	Yes. Approved by the "Animal Care Committee of the Health Effects Research Laboratory of the U.S. EPA " and set by "The National Institute of Health".
2.2	**GLP**	not stated (It is not stated in this publication, if the original study was conducted according GLP, but since the investigations were carried out in 1994, it can be presumed that the study was conducted in compliance with the GLP regulations.)
2.3	**Deviations**	No

3 MATERIALS AND METHODS

3.1	**Test material**	Phosphine
3.1.1	Lot/Batch number	not stated
3.1.2	Specification	Deviating from specification given in section 2 as follows
3.1.2.1	Description	gaseous
3.1.2.2	Purity	21500 ppm Phosphine in nitrogen.
3.1.2.3	Stability	not indicated
3.1.2.4	Maximum tolerable dose	not indicated
3.2	**Test Animals**	
3.2.1	Species	mouse and rat
3.2.2	Strain	B6C3F1 mice and F344/N rats
3.2.3	Source	Mice: Charles River Breeding Laboratories, Raleigh , NC, USA Rat: Charles River Breeding Laboratories, Portage, MI, USA
3.2.4	Sex	male
3.2.5	Age/weight at study	Approximately 8 weeks

Section A6.6.4/6.6.5/ 6.6.6 — Genotoxicity in vivo

Cytogenetic in-vivo test

Annex Point IIA6.6.4 / 02

	initiation	
3.2.6	Number of animals per group	5m per dose
3.2.7	Control animals	Yes
3.3	**Administration/ Exposure**	Inhalation
3.3.1	Number of applications	6 hr/day for 9 days over an 11-day period
3.3.2	Interval between applications	5 days exposed, 2 days off, 4 days exposed
3.3.3	Postexposure period	18 to 20 h after treatment
		Inhalation
3.3.4	Type	whole-body inhalation
3.3.5	Concentration	0, 1.25, 2.5 and 5 ppm PH_3
3.3.6	Vehicle	Nitrogen
3.3.7	Concentration in vehicle	21,500 ppm PH_3 in nitrogen
3.3.8	Total volume applied	not indicated
3.3.9	Controls	Vehicle
3.4	**Examinations**	
3.4.1	Clinical signs	not indicated
3.4.2	Tissue	bone marrow, peripheral blood
		Number of animals: all
		Number of cells: not indicated
		Time points: 18 to 20 h after treatment
		Type of cells bone marrow smears (rat)
		peripheral blood (rat and mice)
		In mice, isolated mononuclear leucocytes were analysed for sister chromatid exchange (SCE); chromosomal aberrations (CA) were determined in peripheral blood cells (PBL), and micronucleus (MN) formation in binucleated (BN) lymphocytes and polychromatic erythrocytes (PCE). Bone marrow smears of rats were analysed for micronucleated PCEs, and peripheral blood was investigated for SCE and CA.
3.5	**Further remarks**	

Section A6.6.4/6.6.5/ 6.6.6 **Genotoxicity in vivo**

Cytogenetic in-vivo test

Annex Point IIA6.6.4 / 02

4 RESULTS AND DISCUSSION

4.1	**Clinical signs**	not indicated
4.2	**Haematology / Tissue examination**	See tables A6_6_4-1 and A6_6_4-2
4.3	**Genotoxicity**	No
4.4	**Other**	no other significant effect

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1	**Materials and methods**	In vivo cytogenetic study as described in 3
5.2	**Results and discussion**	Mouse (table A6_6_4-1): PH3 inhalation caused no statistically significant increases in SCE or CAs in PBLs. Or MN in peripheral blood PCEs or BN lymphocytes. In addition, all of the CAs observed were either simple chromatid or chromosome deletions and no highly damaged cells or complex exchanges were seen. As an additional verification of the MN data the mouse peripheral blood normochromatic erythrocytes (NCEs) were scored for MN induction. No statistically significant increases were found (data not shown). Rat (table A6_6_4-2): Cytogenetic results for the rat were similar to those observed with the mouse. There were no statistically significant increases in SCEs or CAs in PBLs or MN data, the rat bone marrow NCEs were scored for MN induction. No statistically increases were found (data not shown). Therefore, there is no evidence that PH3 causes cytogenetic damage in mice or rats under the conditions of this test.
5.3	**Conclusion**	
5.3.1	Reliability	1
5.3.2	Deficiencies	No

Section A6.6.4/6.6.5/ 6.6.6 Genotoxicity in vivo

Cytogenetic in-vivo test

Annex Point IIA6.6.4 / 02

Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	2005-11-25
Materials and Methods	MN test section: In the OECD guideline 474 (which was released after this study had already been performed) sampling times for bone marrow shorter than 24 h post-exposure are not recommended. No positive controls.
Results and discussion	Results for all measured endpoints were negative.
Conclusion	After treatment with up to 5 ppm PH_3 for 6 h/d over 9 d within a 11-d period, no genotoxic effects were observed in rats and mice in vivo under the conditions of this test.
Reliability	2 Some doubts about test design, inexhaustive reporting (journal article), GLP status uncertain.
Acceptability	Acceptable
Remarks	
	COMMENTS FROM ...
Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

Table A6_6_4-1. Cytogenetic Effects of Phosphine inhalation in the Peripheral Blood of Mice

Phosphine (ppm)	SCEs/ metaphase (PBL)	Aberrant metaphases (PBL) (%)	MN/ 1000 PCEs	MN-BN PBL/1000	Replicative index (PBL)	PCEs (%)
0	8.9 ± 0.5 (5)	1.2 ± 1.1 (5)	4.1 ± 1.7 (5)	2.3 ± 1.3 (5)	1.48 ± 0.12 (5)	8 ± 2 (5)
1.25	8.9 ± 0.5 (4)	2.5 ± 2.6 (4)	4.4 ± 1.1 (5)	2.6 ± 1.7 (5)	1.47 ± 0.24 (4)	8 ± 2 (5)
2.5	9.2 ± 0.7 (3)	2.0 ± 1.2 (5)	4.4 ± 1.5 (5)	4.5 ± 2.2 (5)	1.48 ± 0.27 (3)	7 ± 2 (5)
5.0	9.1 ± 0.6 (4)	1.2 ± 1.6 (5)	2.6 ± 0.2 (5)	2.2 ± 1.0 (5)	1.52 ± 0.06 (4)	6 ± 3 (5)

Table A6_6_4-2. Cytogenetic Effects of Phosphine inhalation in the Peripheral Blood and Bone Marrow of Rats

Phosphine (ppm)	SCEs/ metaphase (PBL)	Aberrant metaphases (PBL) (%)	MN/ 1000 bone marrows PCEs	Replicative index (PBL)	PCEs (%)
0	7.9 ± 0.3 (5)	1.8 ± 1.5 (5)	1.5 ± 0.6 (5)	1.53 ± 0.10 (5)	57 ± 5 (5)
1.25	8.4 ± 0.6 (5)	2.2 ± 2.3 (5)	0.6 ± 0.5 (5)	1.48 ± 0.10 (5)	62 ± 7 (5)
2.5	8.4 ± 0.6 (4)	2.5 ± 0.6 (4)	1.4 ± 0.9 (5)	1.64 ± 0.08 (4)	66 ± 6 (5)
5.0	8.2 ± 0.2 (5)	1.6 ± 1.1 (5)	2.0 ± 1.0 (5)	1.39 ± 0.17 (5)	59 ± 10 (5)

Section A 6.6.5 Genotoxicity in vivo

Annex Point IIA VI.6.6.5 *Unscheduled DNA Synthesis in primary hepatocytes in-vivo / in-vitro*

Official use only

1 REFERENCE

1.1	**Reference**	[redacted]GENOTOXICITY TEST ON PHOSPHINE IN THE IN VIVO /IN VITRO ASSAY FOR UNSCHEDULED DNA SYNTHESIS IN RAT PRIMARY HEPATOCYTE CULTURES AT TWO TIMEPOINTS.[redacted]
1.2	**Data protection**	[redacted]
1.2.1	Data owner	Detia Freyberg GmbH
1.2.2		
1.2.3	Criteria for data protection	[redacted]

2 GUIDELINES AND QUALITY ASSURANCE

2.1	**Guideline study**	[redacted]
2.2	**GLP**	[redacted]
2.3	**Deviations**	[redacted]

3 MATERIALS AND METHODS

3.1	**Test material**	[redacted]
3.1.1	Lot/Batch number	[redacted]
3.1.2	Specification	[redacted]
3.1.2.1	Description	[redacted]
3.1.2.2	Purity	[redacted]
3.1.2.3	Stability	[redacted]
3.1.2.4	Maximum tolerable dose	[redacted]

3.2	**Test Animals**	
3.2.1	Species	
3.2.2	Strain	
3.2.3	Source	
3.2.4	Sex	
3.2.5	Age/weight at study initiation	
3.2.6	Number of animals per group	
3.2.7	Control animals	
3.3	**Administration/ Exposure**	
3.3.1	Number of applications	
3.3.2	Interval between applications	
3.3.3	Postexposure period	
3.3.4	Type	
3.3.5	Concentration	
3.3.6	Vehicle	
3.3.7	Concentration in vehicle	
3.3.8	Total volume applied	
3.3.9	Controls	
3.4	**Examinations**	
3.4.1	Clinical signs	
3.4.2	Tissue	
3.5	**Further remarks**	

4 RESULTS AND DISCUSSION

4.1	**Clinical signs**	Labored breathing was seen in the animals exposed to 18 and 23 ppm of phosphine. A 5 to 7 percent weight loss was seen in the animals exposed to 13, 18 and 23 ppm.
4.2	**Haematology / Tissue examination**	n. a.
4.3	**Genotoxicity**	No
4.4	**Other**	see 4.1

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1	**Materials and methods**	[redacted]
5.2	**Results and discussion**	[redacted]
5.3	**Conclusion**	
5.3.1	Reliability	[redacted]
5.3.2	Deficiencies	[redacted]

Evaluation by Competent Authorities

EVALUATION BY RAPPORTEUR MEMBER STATE

Date	[redacted]
Materials and Methods	[redacted]
Results and discussion	[redacted]
Conclusion	[redacted]
Reliability	[redacted]
Acceptability	[redacted]
Remarks	

COMMENTS FROM ...

Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

[redacted]

Table A6_6_4-2. **Table for Cytogenetic In-Vivo-Test: Chromosomal Analysis (modify if necessary) in: erythrocytes / lymphocytes spermatogonia / other**

[redacted]											
[redacted]											
[redacted]											
[redacted]											
[redacted]											
	[redacted]										
	[redacted]										
	[redacted]										
[redacted]											
	[redacted]										
	[redacted]										
	[redacted]										
[redacted]											
[redacted]											
[redacted]											

Section A6.7 Carcinogenicity

Annex Point IIA6.7

Official use only

1 REFERENCE

1.1	**Reference**	[redacted]2-YEAR COMBINED INHALATION CHRONIC TOXICITY AND ONCOGENICITY STUDY OF PHOSPHINE IN RATS.[redacted]
1.2	**Data protection**	Yes
1.2.1	Data owner	Detia Freyberg GmbH
1.2.2	Companies with letter of access	[redacted]
1.2.3	Criteria for data protection	[redacted]

2 GUIDELINES AND QUALITY ASSURANCE

2.1	**Guideline study**	[redacted]
2.2	**GLP**	[redacted]
2.3	**Deviations**	[redacted]

[redacted]

Section A6.7 Carcinogenicity

Annex Point IIA6.7

Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Materials and Methods	
Results and discussion	[redacted]
Conclusion	NOAEL = 3 ppm PH_3. Assuming an hourly ventilation of 45 L/h/kg bw for the rat and a daily exposure time of 6 hours. this is equivalent to ca. 1.1 mg PH_3/kg bw/d.
Reliability	[redacted]
[redacted]	[redacted]
Remarks	
	COMMENTS FROM ...
Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A6.5/6.7 Annex Point IIA VI 6.5/6.7	Chronic toxicity/Carcinogenicity study, other mammalian	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA *As outlined in the TNsG on data requirements, the applicant must always be able to justify the suggested exemptions from the data requirements. The justifications are to be included in the respective location (section) of the dossier.* *If one of the following reasons is marked, detailed justification has to be given below. General arguments are not acceptable*	Official use only
Other existing data [X]	**Technically not feasible [ ]**	**Scientifically unjustified [X]**
Limited exposure [X]	**Other justification [ ]**	

Detailed justification:

[redacted]

Section A6.5/6.7 Annex Point IIA VI 6.5/6.7	Chronic toxicity/Carcinogenicity study, other mammalian
[redacted]	
Undertaking of intended data submission [ ]	
Evaluation by Competent Authorities	
EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]
Evaluation of applicant's justification	[redacted]

Section A6.5/6.7 Annex Point IIA VI 6.5/6.7	Chronic toxicity/Carcinogenicity study, other mammalian
	rat long-term study.
	[redacted]
Conclusion	[redacted]
Remarks	
	COMMENTS FROM OTHER MEMBER STATE *(specify)*
Date	*Give date of comments submitted*
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A6.8.1 Teratogenicity Study

Annex Point IIA VI.6.8.1 *(Inhalation)*

Official use only

1 REFERENCE

1.1	**Reference**	[redacted] An Inhalation Developmental Toxicity Study of Phosphine (PH_3) in Rats. [redacted]
1.2	**Data protection**	Yes
1.2.1	Data owner	Detia Freyberg GmbH
1.2.2	Companies with letter of access	[redacted]
1.2.3	Criteria for data protection	[redacted]

2 GUIDELINES AND QUALITY ASSURANCE

2.1	**Guideline study**	[redacted]
2.2	**GLP**	[redacted]
2.3	**Deviations**	[redacted]

3 MATERIALS AND METHODS

3.1	**Test material**	[redacted]
3.1.1	Lot/Batch number	[redacted]
3.1.2	Specification	[redacted]
3.1.2.1	Description	[redacted]
3.1.2.2	Purity	[redacted]
3.1.2.3	Stability	[redacted]
3.2	**Test Animals**	
3.2.1	Species	[redacted]
3.2.2	Strain	[redacted]
3.2.3	Source	[redacted]
3.2.4	Sex	[redacted]
3.2.5	Age/weight at study initiation	[redacted]
3.2.6	Number of animals per group	[redacted]
3.2.7	Control animals	[redacted]

Section A6.8.1 Teratogenicity Study

(Inhalation)

Annex Point IIA VI.6.8.1

3.2.8	Mating period	[redacted]
3.3	**Administration/ Exposure**	[redacted]
3.3.1	Duration of exposure	[redacted]
3.3.2	Postexposure period	[redacted]
		Inhalation
3.3.3	Concentrations	[redacted]
3.3.4	Particle size	[redacted]
3.3.5	Type or preparation of particles	[redacted]
3.3.6	Type of exposure	[redacted]
3.3.7	Vehicle	[redacted]
3.3.8	Concentration in vehicle	[redacted]
3.3.9	Exposure period / day	[redacted]
3.3.10	Controls	[redacted]
3.4	**Examinations**	
3.4.1	Body weight	[redacted]
3.4.2	Food consumption	[redacted]
3.4.3	Clinical signs	[redacted]
3.4.4	Examination of uterine content	[redacted]
3.4.5	Examination of foetuses	
3.4.5.1	General	[redacted]
3.4.5.2	Skelet	[redacted]
3.4.5.3	Soft tissue	[redacted]
3.5	**Further remarks**	

Section A6.8.1 **Teratogenicity Study**
(Inhalation)
Annex Point IIA VI.6.8.1

4 RESULTS AND DISCUSSION

4.1	**Maternal toxic Effects**	[redacted]
4.2	**Teratogenic / embryotoxic effects**	[redacted]
4.3	**Other effects**	[redacted]

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1	**Materials and methods**	[redacted]
5.2	**Results and discussion**	No maternally toxic, embryotoxic, fetotoxic or teratogenic effects were observed.
5.3	**Conclusion**	
5.3.1	LO(A)EL maternal toxic effects	[redacted]
5.3.2	NO(A)EL maternal toxic effects	[redacted]
5.3.3	LO(A)EL embryotoxic / teratogenic effects	[redacted]
5.3.4	NO(A)EL embryotoxic / teratogenic effects	[redacted]
5.3.5	Reliability	[redacted]
5.3.6	Deficiencies	[redacted]

Section A6.8.1 Teratogenicity Study

(Inhalation)

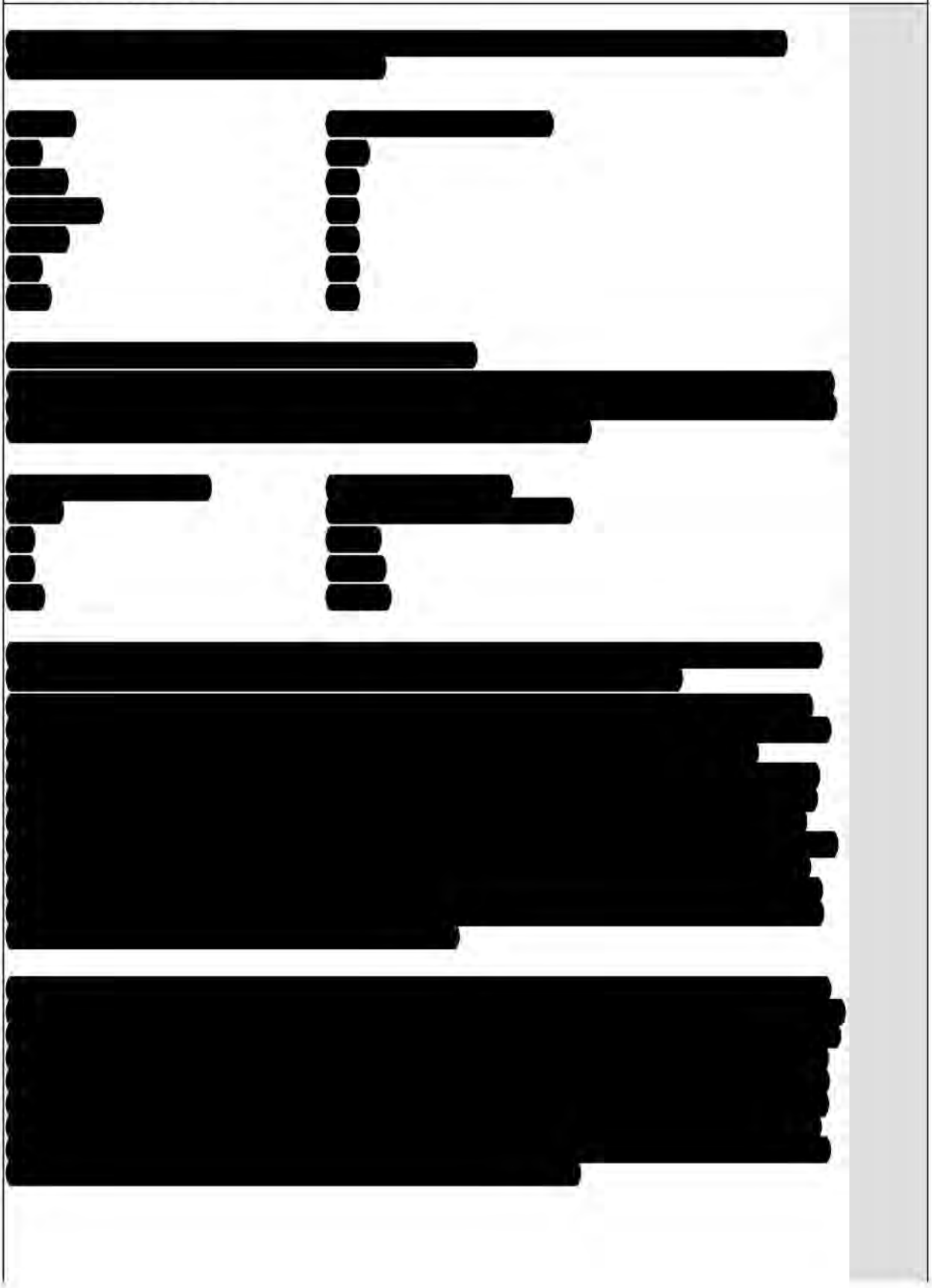
Annex Point IIA VI.6.8.1

Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Materials and Methods	[redacted]
Results and discussion	[redacted]
Conclusion	[redacted]
Reliability	[redacted]
Acceptability	[redacted]
Remarks	
	COMMENTS FROM ...
Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A6.8.1 **Annex Point IIA VI 6.8.1**	**Teratogenic test, rabbit**	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA *As outlined in the TNsG on data requirements, the applicant must always be able to justify the suggested exemptions from the data requirements. The justifications are to be included in the respective location (section) of the dossier.* *If one of the following reasons is marked, detailed justification has to be given below. General arguments are not acceptable*	Official use only
Other existing data [X]	**Technically not feasible [ ]** **Scientifically unjustified [X]**	
Limited exposure [X]	**Other justification [ ]**	
Detailed justification:		

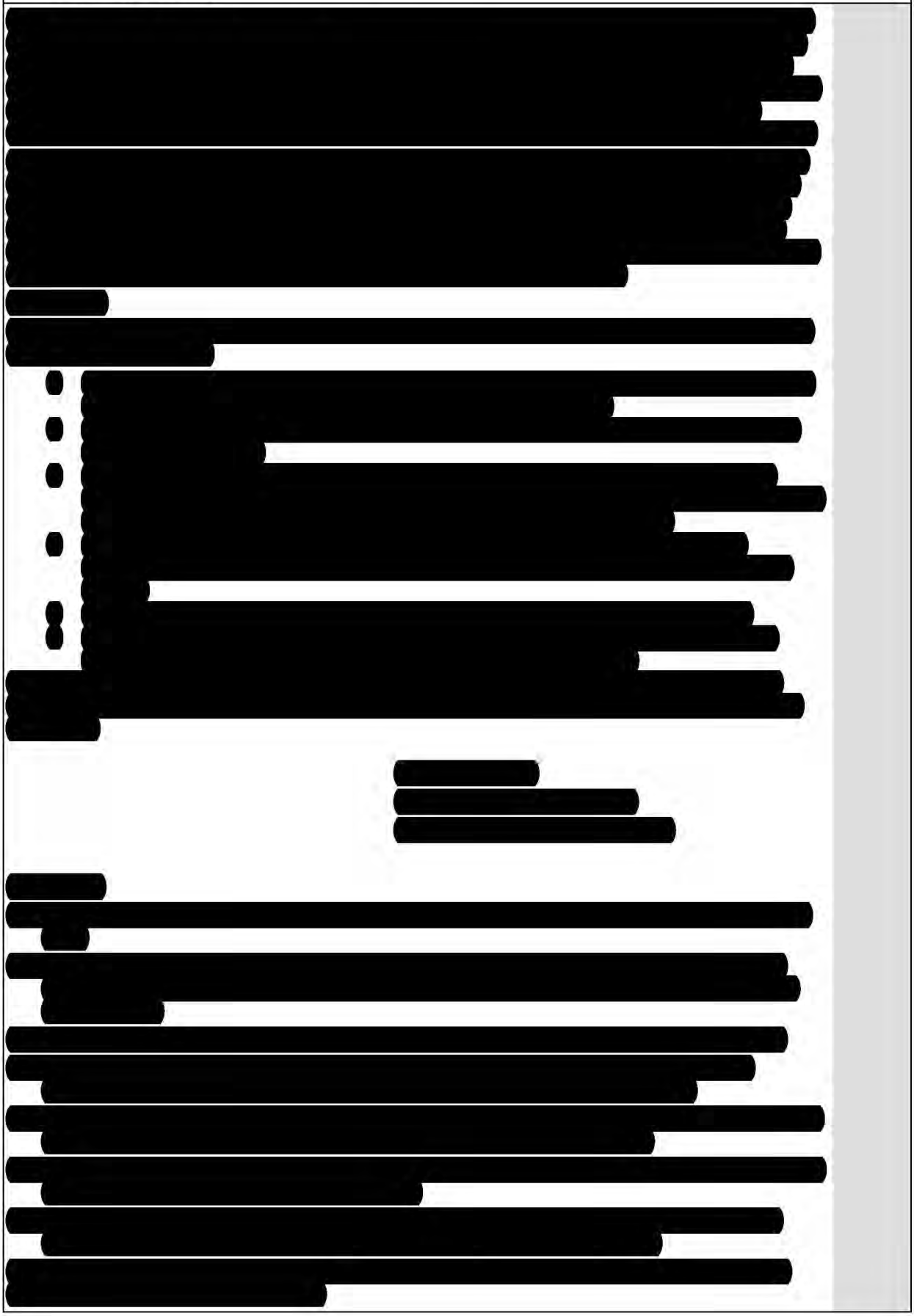
[redacted]

Section A6.8.1 **Teratogenic test, rabbit**
Annex Point IIA VI 6.8.1



Section A6.8.1 Teratogenic test, rabbit

Annex Point IIA VI 6.8.1



Undertaking of intended data submission [ ]	*Give date on which the data will be handed in later (Only acceptable if test or study is already being conducted and the responsible CA has agreed on the delayed data submission.)*
	Evaluation by Competent Authorities
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Evaluation of applicant's justification	[redacted]
Conclusion	[redacted]
Remarks	
	COMMENTS FROM OTHER MEMBER STATE *(specify)*
Date	*Give date of comments submitted*
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A6.8.2 Annex Point IIA6.8.2	Two generations reproduction study	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	**Technically not feasible [ ]**	**Scientifically unjustified [ ]**
Limited exposure [X]	**Other justification [X]**	

Detailed justification:

[redacted]

are no data available to suggest that aluminium phosphide will adversely affect the immune or

Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Evaluation of applicant's justification	[redacted]
Conclusion	[redacted]
Remarks	
	COMMENTS FROM OTHER MEMBER STATE *(specify)*
Date	*Give date of comments submitted*
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A6.9/02 Subchronic Neurotoxicity in Rats

Annex Point IIIA VI.1

Official use only

		1 REFERENCE
1.1	**Reference**	Schaefer,G.J. et al. (1998), Acute and Subchronic Inhalation Neurotoxicity of Phosphine in the Rat, Inhalation Toxicology 10 (4), 293-320. Published **Please note: This summary only refers to the subchronic section of the above publication. For details regarding the acute part, cf. document IIIA-6.9.**
1.2	**Data protection**	No
1.2.1	Data owner	N/A
1.2.2	Companies with letter of access	N/A
1.2.3	Criteria for data protection	N/A
		2 GUIDELINES AND QUALITY ASSURANCE
2.1	**Guideline study**	No, but comparable to OECD 424
2.2	**GLP**	Yes (not stated in this publication, but provided with the original study report of the acute section which was submitted by the participant for this CA report – cf. Doc. IIIA 6.9)
2.3	**Deviations**	None significant
		3 MATERIALS AND METHODS
3.1	**Test material**	Phosphine
3.1.1	Lot/Batch number	Not stated
3.1.2	Specification	See below
3.1.2.1	Description	Gaseous phosphine diluted with nitrogen, manufactured by: Scott Specialty Gases, South Plainfield, NJ, USA)
3.1.2.2	Purity	1 % phosphine in nitrogen (based on considerations reflecting the lower explosive limit of phosphine gas)
3.1.2.3	Stability	Not stated in this publication, but confirmed by other experiments.
3.2	**Reference Substance (positive control)**	None

Section A6.9/02 Subchronic Neurotoxicity in Rats

Annex Point IIIA VI.1

3.3	**Test Animals**	
3.3.1	Species	Rat
3.3.2	Strain	Crl: CD BRVAF/Plus
3.3.3	Source	Charles River Laboratories, Portage, MI, USA
3.3.4	Sex	Male/female
3.3.5	Rearing conditions	Open wire mesh cages with stainless steel floors
3.3.6	Age/weight at study initiation	Age: 7-8 wk Weight: 225-344/164-228 g (males/females)
3.3.7	Number of animals per group	16/16 (males/females), 6 additional animals/sex in control and high-dose groups (2-wk recovery experiment)
3.3.8	Control animals	Yes
3.4	**Administration**	
3.4.1	Exposure	Inhalation, whole-body exposure, 6 h/d, 5 d/wk, for 13 wk
3.4.2	Dose Levels	0.3/1.0/3.0 ppm PH_3
3.4.3	Vehicle	Posphine (PH_3) in nitrogen, diluted in air
3.4.4	Concentration in vehicle	1 % phosphine in nitrogen
3.4.5	Total volume applied	N/A
3.4.6	Postexposure period	14 d
3.4.7	Anticholinergic substances used	N/A
3.4.8	Controls	Air
3.5	**Examinations**	
3.5.1	Body Weight	Yes, at least once prior to initiation of test exposures and weekly thereafter. Food consumption: weekly.
3.5.2	Signs of Toxicity	All animals were observed at least twice per day for morbidity, mortality, injury, and availability of food and water. Any animal in poor health was identified for further monitoring and possible euthanasia. A detailed clinical examination of each animal was performed once during each study week. The examination included, but was not limited to observations of the general condition, skin, fur, eyes, ears, nose, oral cavity, thorax, abdomen, external genitalia, limbs, and feet, as well as evaluation of respiration and palpation of tissue masses.

Section A6.9/02 Subchronic Neurotoxicity in Rats

Annex Point IIIA VI.1

3.5.3	Neurobehavioural and Functional Observational Battery Evaluations	Behavioural tests were conducted on 11 animals/sex/group, which were randomly selected. Neurobehavioural tests were conducted on these same animals as well as on the additional 6 animals/sex/group from the 14-d recovery experiment (control and high-dose, cf. 3.3.7). FOB evaluations were conducted prior to initiation of exposure to the test article, and during wk 4, 8, and 13 of test article administration. During wk 4, 8, and 13 the animals were tested on Tuesday through Friday of the exposure week in a staggered fashion. On each of these days an approximately equal number of animals from each group was tested. In addition, recovery animals (cf. above) were evaluated approximately 2 wk after the end of the last exposure period. Each animal was observed for a minimum of 3 min. in a black Plexiglas, open-field observation box measuring 20 x 20 x 8 inches. the following evaluations were conducted: 1. Assessment of signs of autonomic function (lacrimation, salivation, piloerection, exophthalmus, measurement of urination and defecation, pupillary function), severity scores ranging from none to severe 2. Convulsions, tremors, or degree of palpebral closure, abnormal movements, both in the home cage and in the open field (description, incidence, severity) 3. Reactivity to general stimuli, such as removal from the cage or handling (scoring scale from no reaction to hyperactivity) 4. Arousal level during observations of the unperturbed subject in the open field, (coma to hyperalertness) 5. Posture and/or gait abnormalities (none to severe) 6. Fore- and hindlimb grip strength 7. Landing foot (hindfoot) splay 8. Sensorimotor responses (pain perception, heat evasion, auditory startle, sensorimotor/proprioceptive response to approaching/touching blunt object) 9. Any other unusual or abnormnla behaviour, stereotypies, emaciation, dehydration, hypo- or hypertonia, fur appearance, 10. Other observations, such as: Rearing activity in the open field, air righting, boy temperature, vocalisations, rate and ease of respiration Furthermore, motor activity was assessed in all animals subjected to the above examinations following the FOB tests. Animals were placed in a Digiscan (Omnitech Electronics, Columbus, OH, USA) activity monitor measuring 16 x 16 x 12 (height) inches and equipped with a computer analyser. Animals were recorded for 30 min. by 8 photocells each in two horizontal planes and one vertical plane. A range of different activities were recorded but only the following were used in comparisons between treated and control animals as the most representative activity parameters: horizomtal activity, vertical activity, total distance, and stereotypic time, which was operationally defined as the total time spent in repetitive movements.

Section A6.9/02 Subchronic Neurotoxicity in Rats

Annex Point IIIA VI.1

3.5.4	Clinical Chemistry	After 13 wk of exposure, blood samples from animals fasted for approx. 16 h were taken from the orbital sinus after carbon dioxide/oxygen inhalation. The following haematological parameters were evaluated: leukocyte count (total and differential), erythrocyte count, haemoglobin, haematocrit, mean corpuscular haemoglobin, mean corpuscular volume, mean corpuscular haematocrit concentration (calculated), platelet count, and reticulocyte count. The following biochemical parameters were evaluated: alkaline phosphatase, total bilirubin, aspartate aminotransferase, alanine aminotransferase, gamma-glutamyl transferase, sorbitol dehydrogenase, urea nitrogen, creatinine, total protein, albumin, globulin and albumin/globulin (A/G) ratio, glucose (fasting), total cholesterol, sodium, potassium, chloride, calcium, magnesium, phosphorus, and phosphokinase. The following urological parameters were evaluated: 16-h volume, color and appearance, pH, specific gravity, protein, glucose, ketones, urobilinogen, nitrites, bilirubin, occult blood, leukocytes, and microscopy of spun deposit.
3.5.5	Gross Pathology	6 animals/sex/group were randomly selected for neuropathology evaluations. The animals were euthanized by anaesthesia via intraperitoneal injecvtion of sodium pentobarbital to effect followed by whole-body perfusion in situ with 3 % paraformaldehyde and 3 % glutaraldehyde in 0.1 M phosphate buffer. At necropsy, both sciatic nerves with distal branches (tibial and peroneal) were dissected and affixed to labelled cards. All other tissues were eviscerated and submerged in fixative in labelled bags. Light-microscopic evaluation was performed on the following tissues: brain (cerebrum, cerebellum, pons/medulla oblongata), spinal cord at cervical and lumbar swelling, respectively, proximal sciatic nerves, peroneal nerve, tibial nerves, gasserian ganglion, cervical and lumbar dorsal root ganglia, and cervical and lumbar dorsal and ventral roots. For all other animals, a complete post-mortem examination was performed. The animals were euthanized by anaesthesia via intraperitoneal sodium pentobarbital injection to effect followed by exsanguination from the abdominal aorta. Absolute and relative organ weights were measured and calculated for the brain, adrenals, heart, kidney, liver, lung, and gonads. A full complement of organs and tissues was collected from those animals and stored for possible future examination.
3.5.6	Histopathology	Brain, spinal cord, and sciatic nerve sections collected from the neuropathology subgroups as given above were embedded in paraffin and subsequently stained. Sections of peroneal and tibial nerves were embedded in glycol methacrylate, processed to 1-µm-sections and subsequently stained.

Section A6.9/02 Subchronic Neurotoxicity in Rats

Annex Point IIIA VI.1

3.6	**Further remarks**	The following statistical analysis was conducted separately for each sex, parameter, and time period. First, Bartlett's test for homogeneity of variance was performed. In case of homogeneity, one-way ANOVA was carried out which – if significant - was followed by Dunnett's test for comparison of test and control groups. In case of non-homogeneity, a rank-transformed ANOVA was performed following by Dunn's test with a Bonferroni correction. Categorical or nominal data obtained durinfg FOB testing were analyzed using the Chi-square test for homogeneity of RxC contingency tables
		4 RESULTS AND DISCUSSION
4.1	**Body Weight**	No significant test substance-related adverse effects reported
4.2	**Clinical signs of toxicity**	Mortality In the 0.3 ppm group. 1 male died on day 101 with the cause of death unknown. In the 3 ppm group 1 male died on day 102 following blood sampling for clinical pathology and 1 female died on day 89. None of these deaths was considered phosphine-related. Clinical signs No significant test substance-related adverse effects reported
4.3	**Neurobehavioural and Functional Observational Battery Evaluations**	Behaviour/FOB No consistent or enduring test substance-related adverse effect on the behavioural or neurological status of male or female animals. Motor activity Observed differences were not attributed to phosphine exposure, as they were non-systematic, inconsistent between the sexes and were present prior to exposure to phosphine
4.4	**Clinical Chemistry, Haematology, and Urinalysis**	Haematology and Urinalysis No significant test substance-related adverse effects Clinical chemistry Mean serum chloride levels were slightly elevated as compared to control in the 1 and 3 ppm groups at termination, as well as in female 3 ppm recovery group animals. Although statistically significant in most instances, these findings were considered to be of no toxicological significance.
4.5	**Pathology**	No significant test substance-related adverse effects reported
4.6	**Histopathology**	No significant test substance-related adverse effects reported
4.7	**Other**	None

Section A6.9/02 Subchronic Neurotoxicity in Rats

Annex Point IIIA VI.1

Evaluation by Competent Authorities	
Date	2007/10/23
Materials and Methods	As presented above
Results and discussion	As presented above
Conclusion	NOAEL: 3 ppm (the highest dose tested), based on the absence of any test substance-related neurotoxic findings as well as any other relevant adverse effects
Reliability	2
Acceptability	Acceptable
Remarks	None
	COMMENTS FROM ...
Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A6.9 Delayed Neurotoxicity

Annex Point IIIA VI.1

Official use only

1 REFERENCE

1.1	**Reference**	[redacted] ACUTE NEUROTOXICITY STUDY IN RATS. [redacted]
1.2	**Data protection**	Yes
1.2.1	Data owner	Detia Freyberg GmbH
1.2.2	Companies with letter of access	[redacted]
1.2.3	Criteria for data protection	[redacted]

2 GUIDELINES AND QUALITY ASSURANCE

2.1	**Guideline study**	[redacted]
2.2	**GLP**	[redacted]
2.3	**Deviations**	[redacted]

3 MATERIALS AND METHODS

3.1	**Test material**	[redacted]
3.1.1	Lot/Batch number	[redacted]
3.1.2	Specification	[redacted]
3.1.2.1	Description	[redacted]
3.1.2.2	Purity	[redacted]
3.1.2.3	Stability	[redacted]
3.2	**Reference Substance (positive control)**	[redacted]

Section A6.9 Delayed Neurotoxicity

Annex Point IIIA VI.1

3.3	**Test Animals**	
3.3.1	Species	
3.3.2	Strain	
3.3.3	Source	
3.3.4	Sex	
3.3.5	Rearing conditions	
3.3.6	Age/weight at study initiation	
3.3.7	Number of animals per group	
3.3.8	Control animals	
3.4	**Administration**	
3.4.1	Exposure	
3.4.2	Dose Levels	
3.4.3	Vehicle	
3.4.4	Concentration in vehicle	
3.4.5	Total volume applied	
3.4.6	Postexposure period	
3.4.7	Anticholinergic substances used	
3.4.8	Controls	
3.5	**Examinations**	
3.5.1	Body Weight	
3.5.2	Signs of Toxicity	

Section A6.9 Delayed Neurotoxicity

Annex Point IIIA VI.1

3.5.3	Observation schedule	Evaluations of a series of neurobehavioral functions were conducted in [redacted]
3.5.4	Clinical Chemistry	[redacted]
3.5.5	Pathology	[redacted]
3.5.6	Histopathology	[redacted]

3.6 Further remarks

Section A6.9 Delayed Neurotoxicity

Annex Point IIIA VI.1

4 RESULTS AND DISCUSSION

4.1	**Body Weight**	[redacted]
4.2	**Clinical signs of toxicity**	[redacted]
4.3	**Clinical Chemistry**	[redacted]
4.4	**Pathology**	[redacted]
4.5	**Histopathology**	No lesions considered treatment related were noted in male or female [redacted]
4.6	**Other**	[redacted]

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1	**Materials and methods**	Acute neurotoxicity study in rats by whole-body inhalation, see 3.

Section A6.9 Delayed Neurotoxicity

Annex Point IIIA VI.1

5.2 Results and discussion

[redacted]

5.3 Conclusion

5.3.1	LOAEL	not calculated
5.3.2	NOAEL	> 40 ppm (with regard to anatomic pathology and the behavioral and neurological status observed in the functional observational battery) < 20 ppm (with regard to changes in motor activity on day 1)
5.3.3	Reliability	1
5.3.4	Deficiencies	No

Evaluation by Competent Authorities

EVALUATION BY RAPPORTEUR MEMBER STATE

Date [redacted]

Materials and Methods [redacted]

Results and discussion [redacted]

Conclusion [redacted]

Reliability [redacted]

[redacted]

Remarks

COMMENTS FROM ...

Section A6.9 Delayed Neurotoxicity

Annex Point IIIA VI.1

Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

[redacted]

[redacted]					

[redacted]

Table A6.9-2. Incidence of Macroscopic Observations

[redacted]

Section A6.12 **Human Case Report**

Annex Point IIA6.9.1 *Medical surveillance data on manufacturing plant personnel*

Official use only

1 REFERENCE

1.1 Reference

Guth, Erhard (2003): Arbeitsmedizinische Betreuung von Mitarbeitern, die Phosphorwasserstoff exponiert sind (Translation: Occupational Health Care for Employees under Hydrogen Phosphide (PH_3) Exposition); IAS, Mannheim, Germany, April 23, 2003

2 GUIDELINES AND QUALITY ASSURANCE (NOT APPLICABLE)

3 MATERIALS AND METHODS

All workers involved with the production of Aluminium phosphide containing products are regularly monitored at intervals of 12 months. In this health inspection the following parameters are assessed:
- Overall health check-up, especially regarding skin alterations and nerve reflexes
- Hearing and vision test
- ECG
- Urinalysis
- Red blood count
- Leucocytes
- Thrombocytes
- Differential blood count
- Liver status parameters
- Creatinine
- Blood glucose

In intervals of 24 to 36 months x-ray investigations of the chest are carried out, additionally every working place is inspected.

4 RESULTS

The above-mentioned health examinations conducted with the plant personnel showed no negative health effects during the investigation period of 15 years.

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1 Materials and methods see 3

5.2 Results and discussion see 4

5.3 Conclusion No negative health effects during the investigation period of 7 years

	Evaluation by Competent Authorities
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	2004-11-05
Materials and Methods	Deviating from study summary of the applicant, the following parameters were assessed: physical examination, sight and hearing test if required, urine examination (no further specification), differential blood count, transaminase and cholesterase activity and, in various cases, examination of breathing equipment, driving, steering, and overseeing work, and mercury (concentration in blood?- no further description given)
Results and discussion	Adopt applicant's version with the remark that the observation period was not 15 but about 10 years only.
Conclusion	Applicant's version is adopted with the remark that the observation period was about 10 years.
Remarks	
	COMMENTS FROM ... *(specify)*
Date	*Give date of comments submitted*
Materials and Methods	*Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A6.12 **Human Case Report**

Annex Point IIA6.9.2 *Direct observation, e.g. clinical cases, poisoning incedents*

Official use only

1 REFERENCE

1.1 Reference

K. E. Zipf, Th. Arndt, R. Heintz (1967): Clinical Observation of a Case of Phostoxin Poisoning; Archiv für Toxikologie, Vol. 22, No.4 (Reprint, Translation

2 GUIDELINES AND QUALITY ASSURANCE (NOT APPLICABLE)

3 MATERIALS AND METHODS (NOT APPLICABLE)

4 SUBJECT

A detailed case report of aluminium phosphide poisoning: a 25-year-old gardener's labourer swallowed 6 Phostoxin tablets (70% aluminium phosphide and approximately 30% ammonium carbamate) dissolved in water, suicide attempt.

5 FINDINGS / CONCLUSION

Severe circulatory, cardiac and renal failure and liver damage resulted. Clearly apparent changes in ECG and EEG were found. The histological findings for liver and kidneys corresponded to a great extent with those stated in the literature, thus providing intra vitam confirmation.
One probable reason for the man having survived drinking a lethal dose of Phostoxin is that he immediately vomited the major portion of the poison. A further reason is that, due to the characteristic carbide odour, the nature of the poisoning could be recognised immediately and appropriate treatment commenced without delay.

The application of extracorporal haemodialysis and medication with heart and circulatory preparations contributed decisively towards prevention of a lethal course.

	Evaluation by Competent Authorities
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	2004-11-05
Materials and Methods	The applicants version is acceptable with the comment that the patient not only swallowed the poison but inhaled it as well since the tablets have been dissolved in water which causes release of phosphine gas. In the hospital, an extensive gastric lavage with potassium permanganate and magnesium sulphate was carried out.
Results and discussion	Applicant's version is accepted. The RMS adds that the patient had experienced severe pain behind the sternum and in the epigastric region accompanied by an unbearable feeling of heat and burning throughout the body after swallowing the poison.
Conclusion	Applicant's version is adopted.
Remarks	
	COMMENTS FROM ... *(specify)*
Date	*Give date of comments submitted*
Materials and Methods	*Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A6.12 **Human Case Report**

Annex Point IIA6.9.3 *Health records, both from industry and other available sources*

Official use only

1 REFERENCE

1.1 Reference

Barbosa, A.; et al. (1994): Evaluation of phosphine genotoxicity at occupational levels of exposure in New South Wales, Australia; Occup Environ Med 51, 700 - 705

2 GUIDELINES AND QUALITY ASSURANCE (NOT APPLICABLE)

3 MATERIALS AND METHODS

Study on 31 phosphine fumigators and 21 controls during the high fumigation season. All were volunteers and were evaluated for genotoxicity variables, including micronuclei in peripheral blood lymphocytes and urine mutagenicity. In parallel, all fumigators and 17 controls were evaluated for full haematology, multiple biochemical analysis, whole blood and serum cholinesterase activity.

4 RESULTS

The results for micronuclei showed no significant differences between fumigators and controls, but detected a strong association between age and increased frequency of micronuclei. Measurement of urine mutagenicity did not show any significant difference between fumigators and controls, but did show increased excretion of mutagens in smokers. All haematological and biochemical variables were within normal ranges, except for some non-specific changes in biochemistry.

At monitored occupational exposures of < 2.4 ppm/h our results show no association between phosphine exposure and genotoxic or toxicological effects in fumigators.

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1 Materials and methods

see 3

5.2 Results and discussion

see 4

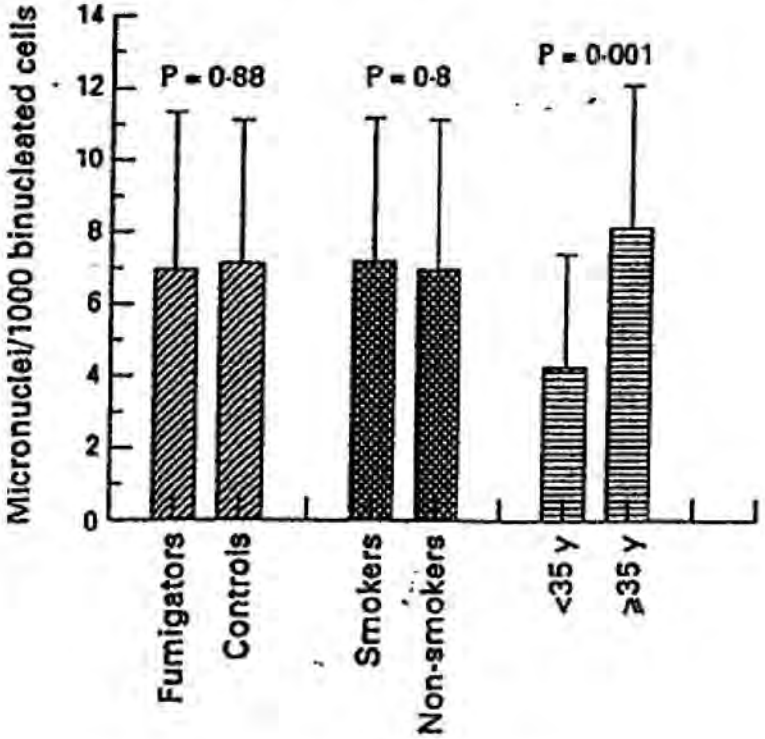
5.3 Conclusion

At monitored occupational exposures of < 2.4 ppm/h no association between phosphine exposure and genotoxic or toxicological effects in fumigators could be observed.

Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	2004-11-05
Materials and Methods	The following haematological parameters were evaluated: Haemoglobin (Hb), red cell count, packed cell volume mean cell volume, mean cell Hb concentration, platelet counts, whole blood counts, differential white cell counts, erythrocyte sedimentation rate. The following (bio)chemical parameters were evaluated: whole blood organochlorines (hexachlorobenzene, heptachlor epoxide, γ-chlordane, α-chlordane, Endrine, DDE, Lindane, Oxychlordane, Heptachlor, Aldrin, DDD, DDT and Dieldrin with a limit of detection of 1 µg/l) and serum and whole blood cholesterase activity. In 31 fumigators and 17 controls (four blood samples of the control group were determined to be unsatisfactory for analysis) the following parameters were analysed: sodium, potassium, chloride, bicarbonate, urs, creatinine, uric acid, glucose, protein, albumin, total bilirubin, AP, γ –glutamyl transpeptidase, serum aspartate aminotransferase, serum alanine aminotransferase, calcium, inorganic phosphate, cholesterol and triclycerides. Urine mutagenicity was tested in two strains of S. typhimurium (TA100, TA98) +/- S9 mix, with 50 and 100 µl urine extract. Environmental monitoring: Phosphine concentration in the breathing zone of fumigators was recorded during 8 fumigations with phosphine badges (Draeger, Germany) with detection limits ranging from 0.01 to 2.4 ppm/h.
Results and discussion	Applicants version is accepted with the remark that result of multiple biochemical analyses showed a variety of mild changes that could be considered to be associated with phosphine exposure (s. CA-Table A.6.12.3.2). Considering liver function in general, 53.1 % of fumigators had a (non-significant) increase of one or more variables compared with 35.3 % in the control.
Conclusion	At monitored occupational exposures of < 2.4 ppm/h, no association between phosphine exposure and genotoxic in fumigators could be observed but the result of multiple biochemical analyses showed a non-significant variety of mild changes which may be associated with liver damage due to phosphine toxicity.
Remarks	CA-Table A6.12.3.1 and A6.12.3.2 is added by CA
	COMMENTS FROM ... *(specify)*
Date	*Give date of comments submitted*
Materials and Methods	*Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Evaluation by Rapporteur Member State, CA-Tables

CA-Table IIA6.12.3.1 Frequency in micronuclei (mean (SD)) in peripheral blood lymphocytes



Frequency of micronuclei (mean (SD)) in fumigators versus controls, smokers versus non-smokers and test persons under 35 years of age and 35 years of age and over compared by Wilcoxon test.

CA-Table IIA6.12.3.2 Percentage of fumigators and controls with raised liver function variables

Liver variables	*Normal range*	*Fumigators n = 31 (%)*	*Range*	*Controls n = 17 (%)*	*Range*
Total bilirubin	3–18 μmol/l	2 (6·5)	19–21	0	—
Alkaline phosphatase	30–120 U/l	1 (3·2)	173	1 (5·9)	167
γ-Glutamyl transpeptidase	0–50 U/l	11 (35·54)	53–163	3 (17·6)	52–117
Alanine aminotransferase	0–45 U/l	8 (25·8)	47–156	2 (11·7)	48–71
Aspartate aminotransferase	0–45 U/l	1 (3·2)	47	0	—
≥ 1 Variable*		17 (54·8)	—	6 (35·3)	—

*Subjects with one or more raised liver function variables..

Section A6.12.3 Human Case Report

Annex Point IIA VI.6.9.3 *Health records, both from industry or other sources*

Official use only

1 REFERENCE

1.1	**Reference**	Garry, VF; Griffith, J; Danzl, TJ; Nelson, RL; Whorton, EB; Krueger, LA, Cervenka, J (1989): Applicators and Phosphine; Science, Vol. 246: 251-255

2 GUIDELINES AND QUALITY ASSURANCE (NOT APPLICABLE)

3 MATERIALS AND METHODS

3.1	**Substance**	Phosphine as fumigant (or Phosphine and other pesticides)
3.2	**Persons exposed**	
3.2.1	Sex	not stated
3.2.2	Age/weight	not stated
3.2.3	Known Diseases	Persons with known diseases were excluded from the study
3.2.4	Number of persons	40 (9 exposed to Phosphine only)
3.2.5	Other information	no
3.3	**Exposure**	Inhalation
3.3.1	Reason of exposure	occupational
3.3.2	Frequency of exposure	multiple
3.3.3	Overall time period of exposure	Application season (time period not specified)
3.3.4	Duration of single exposure	not stated
3.3.5	Exposure concentration/dose	Measured in the breathing zone: Workers involved in enclosed space application (grain bin), exposures ranged from 0.4 to 5.8 mg/m³ (n= 10) with a mean on 2.97 mg/m³. Phosphine release from the phosphide occurred in some instances in as little as 5 min. Among workers involved in open air application (rail car), exposure ranged from 0.1 to 0.90 mg/m³ (n=4).
3.3.6	Other information	
3.4	**Examinations**	100 metaphase lymphocytes from each sample were analyzed to detect gaps, deletion, breaks, or other aberrations.
3.5	**Treatment**	n. a.
3.6	**Remarks**	

4 RESULTS

4.1	**Clinical Signs**	no

Section A6.12.3 Human Case Report

Annex Point IIA VI.6.9.3 *Health records, both from industry or other sources*

4.2	**Results of examinations**	Examinated workers had significantly increased stable chromosome rearrangements, primarily translocations in G-banded lymphocytes. Less stable aberrations including chromatid deletions and gaps were significantly increased only during the application season, but not at this later time point.
4.3	**Effectivity of medical treatment**	no medical treatment
4.4	**Outcome**	n. a.
4.5	**Other**	n. a.

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1	**Materials and methods**	Human Genotoxicity Test
5.2	**Results and discussion**	see 4.2
5.3	**Conclusion**	We consider this study as not useful to assess the genotoxicity of Phosphine in humans for the following reasons: 1. The study has been conducted with a very small sample of workers who are exposed to phosphine "alone" (n=9), all other workers had been exposed to PH3 and other pesticides and symptoms therefore can not be directly related to Phosphine. Barbosa et al. who examined a greater group of fumigators (n = 31) did not find any association between phosphine exposure and genotoxic effects. 2. In this article it is said that control subjects were matched for age, sex and smoking habits, but in the evaluation of the data these factors are not taken into account. Smoking has a much higher influence on mutation frequency than Phosphine (Barbosa et al., 1994, IIIA 6.12.3) and DNA damage increases with age. All these factors are not considered in the evaluation of the data. 3. A second examination of the workers (6 weeks to 3 months later) showed no difference between the nonbanded 48-hours cultures from workers exposed weeks to months earlier and concurrent controls. The author itself states, that whether the chromosome rearrangements they observed are a specific effect of phosphine is uncertain at the time of the study (1989) and studies (in vitro and in vivo) on genotoxicity which were conducted later could not confirm the results of Gary et al.

Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	2005-12-05
Materials and Methods	Correct title of publication is: 'Human Genotoxicity: Pesticide Applicators and Phosphine'
Results and discussion	Accepted.
Conclusion	Accepted. This study is considered as not useful to assess the genotoxicity of phosphine in humans.
Remarks	
	COMMENTS FROM ... *(specify)*
Date	*Give date of comments submitted*
Materials and Methods	*Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A6.12 **Annex Point IIA6.9.4**	**Epidemiological studies on the general population**	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA *As outlined in the TNsG on data requirements, the applicant must always be able to justify the suggested exemptions from the data requirements. The justifications are to be included in the respective location (section) of the dossier.* *If one of the following reasons is marked, detailed justification has to be given below. General arguments are not acceptable*	Official use only
Other existing data [ ] **Limited exposure [ ]**	**Technically not feasible [ ]** **Scientifically unjustified [ ]** **Other justification [X]**	
Detailed justification: Data should only be submitted, if available. No epidemiological studies with aluminium phosphide have been conducted.		
Undertaking of intended data submission [ ]	*Give date on which the data will be handed in later (Only acceptable if test or study is already being conducted and the responsible CA has agreed on the delayed data submission.)*	
	Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	2004-11-05	
Evaluation of applicant's justification	Accepted.	
Conclusion	Applicant's justification is acceptable.	
Remarks		
	COMMENTS FROM OTHER MEMBER STATE *(specify)*	
Date	*Give date of comments submitted*	
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*	
Conclusion	*Discuss if deviating from view of rapporteur member state*	
Remarks		

Section A6.12 **Human Case Report**

Annex Point IIA6.9.5 *Diagnosis of poisoning including specific signs of poisoning and clinical tests Diagnosis of poisoning including specific signs of poisoning and clinical tests*

Official use only

1 REFERENCE

1.1 Reference

Chugh, S.N.; et al. (1991): Incidence & outcome of aluminium phosphide poisoning in a hospital study; Indian J Med Res [B] 94, June 1991, pp 232 - 235

2 GUIDELINES AND QUALITY ASSURANCE (NOT APPLICABLE)

3 SUBJECT

A total of 418 patients with aluminium phosphide poisoning admitted during January 1981 to December 1987, were studied and analysed for various parameters. The patients showed varied clinical features as shown in the following table:

	No. of patients	**%**
Gastrointestinal upset, nausea, epigastric burning, retching, pain, etc.	381	91.2
Clear mentation with restlessness, anxiety at admission	381	91.2
Shock	376	90.0
Signs of sympathetic overactivity (sweating, tachycardia)	278	66.5
Oliguria	214	51.2
Tachypnoea, dyspnoea, crepts and rhonchi	192	45.8
Acute renal failure (raised urea and NPN and serum creatinine etc.)	32	7.6
Hepato-biliary (tender hepatomegaly, raised SGOT/SGPT; jaundice)	18	4.3
Bradycardia	14	3.3

All patients were treated similarly with dopamine infusion (starting dose 4 – 8 µg/kg/min), intravenous glucose drip (2 – 3 l glucose saline in first 4 – 6 h), continuous O_2 administration, and systemic corticosteroids. Frequent electrocardiographic monitoring showed varied pattern of ST-T changes, conduction and rhythm disturbances (see following table).

ECG abnormalities (160 patients)	38.2%
ST-T changes (elevation or depression) in more than 2 leads	56
SVT	
Varied sino-atrial conduction (sino-atrial block, sinus pauses)	20
Atrial fibrillation or strial premature beats	14
Bradycardia	14
Bundle branch block: LBBB	6
RBBB	4
Ventricular tachycardia	3
Paricarditis (elevation with ST-T upwards)	3

Section A6.12	**Human Case Report**
Annex Point IIA6.9.5	*Diagnosis of poisoning including specific signs of poisoning and clinical tests Diagnosis of poisoning including specific signs of poisoning and clinical tests*

4 RESULTS

The above-mentioned health examinations conducted with the plant personnel showed no negative health effects during the investigation period of 7 years.

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1	**Materials and methods**	Hospital study on aluminium phosphide poisoning
5.2	**Results and discussion**	see above
5.3	**Conclusion**	The mortality was high and directly related to the dose of poison consumed. The bad prognostic indices and presence of complications further increased the mortality. The mortality did not have any relation with duration and time interval between ingestion and admission.

Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	2004-11-05
Materials and Methods	n.a.
Results and discussion	The comment of the applicant under the results section is not related to the study and is therefore not accepted. Information which should be given in this study summary should refer to the diagnosis of poisoning including specific signs of poisoning and clinical tests. Diagnosis of AlP poisoning was based on the history of intake, presence of gastrointestinal symptoms, shock (systolic BP < 90mm of Hg), and confirmed by a positive bedside silver nitrate impregnated paper test. Tables containing the main results were added by the RMS. The mortality rate was 77.2 %. Histopathological changes: lungs, liver and heart showed oedema and congestion. In addition in liver, kidney and heart, areas of necrosis were observed. The varied clinical features are explained by multiple organs being affected.
Conclusion	The applicant's version is adopted.
Remarks	CA-Table A6.12.5.1 and A6.12.5.2 were added by the RMS.
	COMMENTS FROM ... *(specify)*
Date	*Give date of comments submitted*
Materials and Methods	*Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*

Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Evaluation by Rapporteur Member State, CA-Tables

CA-Table IIA6.12.5.1 Clinical spectrum of aluminium phosphide poisoning

	No. of patients	%
Gastrointestinal upset, nausea, epigastric burning, retching, pain etc.	381	91.2
Clear sensation with restlessness, anxiety at admission	381	91.2
Shock	376	90.0
Signs of sympathetic overactivity (sweating, tachycardia)	278	66.5
Oliguria	214	51.2
Tachypnoea, dyspnoea, crepts and rhonchi	192	45.8
Acute renal failure (raised urea and NPN and serum creatinine etc.)	32	7.6
Hepato-biliary (tender hepatomegaly, raised SGOT/SGPT; jaundice)	18	4.3
Bradycardia	14	3.3

CA-Table IIA6.12.5.2 Electrocardiographic changes

Table IV. Electrocardiographic changes

ECG abnormalities (160 patients)	38.2%
ST-T changes (elevation or depression) in more than 2 leads	56
SVT	
Varied sino-atrial conduction (sino-atrial block, sinus pauses)	20
Atrial fibrillation or atrial premature beats	14
Bradycardia	14
Bundle branch block : LBBB	6
RBBB	4
Ventricular tachycardia	3
Pericarditis (elevation with ST-T upwards)	3

Section A6.12 Annex Point 6.9.6	Sensitisation/allergenicity observations	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA *As outlined in the TNsG on data requirements, the applicant must always be able to justify the suggested exemptions from the data requirements. The justifications are to be included in the respective location (section) of the dossier.* *If one of the following reasons is marked, detailed justification has to be given below. General arguments are not acceptable*	Official use only
Other existing data [ ] **Limited exposure [ ]**	**Technically not feasible [ ]** **Scientifically unjustified [ ]** **Other justification [X]**	
Detailed justification: Data should only be submitted, if available. No sensitisation / allergenisity case reports with aluminium phosphide are available.		
Undertaking of intended data submission [ ]	*Give date on which the data will be handed in later (Only acceptable if test or study is already being conducted and the responsible CA has agreed on the delayed data submission.)*	
	Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	2004-11-05	
Evaluation of applicant's justification	Applicant's justification is accepted	
Conclusion	Applicant's justification is acceptable	
Remarks		
	COMMENTS FROM OTHER MEMBER STATE *(specify)*	
Date	*Give date of comments submitted*	
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*	
Conclusion	*Discuss if deviating from view of rapporteur member state*	
Remarks		

Section A6.12 **Human Case Report**

Annex Point IIA6.9.7 *Specific treatment in case of an accident of poisoning: first aid measures, antidotes and medical treatment*

Official use only

1 REFERENCE

1.1 References

D. Weller (1982): Toxicology of Hydrogen Phosphide (Phosphine) Therapy of Poisoning, Degesch GmbH, Frankfurt, Germany
L. Benzing (1992): Erste Hilfe und Therapiemaßnahmen, Verlag Alfred Strothe, Germany
Detia-Degesch GmbH (2003) EC-Safety Data Sheet, Laudenbach, Germany

2 GUIDELINES AND QUALITY ASSURANCE (NOT APPLICABLE)

3 MATERIALS AND METHODS

First aid

Inhalation exposure:

(1) Move victims to fresh air in case of headache, dizziness, feeling of constriction, difficult breathing and/or nausea, consult a physician.
(2) Emergency personnel should avoid self-exposure
(3) Remove contaminated clothes
(4) Place victim on side if unconscious. Stay with victim and check his state of health even if he feels "healthy"
(5) Keep victim quiet, warm and comfortable.
(6) Victim should inhale a dexamethason (Auxiloson) spray
(7) Victim should always be accompanied to hospital or to physician

Dermal exposure:

(1) Remove any rests by brushing; only then use water for cleansing (in addition to the above mentioned points).

Eye contact:

(1) 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 (in addition to the above mentioned points).

Special aids required for First Aid measures:

(1) Have methyl prednisolon (application by physician) and a dexamethason spray available

Therapeutic regimes

Cortison: Methyl prednisolon first 1000 mg i.v. and i.m.
Inhalation of Auxilon spray
Treatment with Cystein (Reducdyn) i.v. and per os
In case of convulsions Diazepam
Symptomatic treatment
Correction of fluid loss and electrolyte disturbance
Dialysis, if the quantity of swallowed/inhaled Metal phosphide/Phosphine is not known

Section A6.12 **Human Case Report**

Annex Point IIA6.9.7 *Specific treatment in case of an accident of poisoning: first aid measures, antidotes and medical treatment*

4 RESULTS
(NOT APPLICABLE)

5 APPLICANT'S SUMMARY AND CONCLUSION
(NOT APPLICABLE)

Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	2004-11-05
Materials and Methods	Applicants version is acceptable.
Results and discussion	
Conclusion	Applicant's version is adopted
Remarks	
	COMMENTS FROM ... *(specify)*
Date	*Give date of comments submitted*
Materials and Methods	*Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A6.12 **Human Case Report**

Annex Point IIA6.9.8 *Prognosis following poisoning*

Official use only

1 REFERENCE

1.1 Reference

Misra, U.K.; et al. (1988): Acute Phosphine Poisoning following Ingestion of Aluminium Phosphide, Human Toxicol., 7, 343 - 354

2 GUIDELINES AND QUALITY ASSURANCE (NOT APPLICABLE)

3 MATERIALS AND METHODS

Eight cases of phosphine poisoning following ingestion of aluminium phosphide tablets for suicidal attempt are described. The clinical picture consisted of gastritis, altered sensorium and peripheral vascular failure in all cases, cardiac arrhytmia (3), jaundice and renal failure (1 each). Six patients died, the mean hospital stay was 19 h (range 4 – 72). Post-mortem examination was performed in two patients, revealing pulmonary oedema, gastrointestinal mucosal congestion, petechial haemorrahages on the surface of liver and brain. Histopathological changes included pulmonary oedma, desquamation of the lining epithelium of the bronchioles; vascuolar degeneration of hepatocytes, dilatation and engorgement of hepatic central veins, sinusoids and areas showing nuclear fragmentation.
The following table summarizes the clinical picture of oral aluminium phosphide poisoning patients:

Patient no.	Age/Sex	No. of tablets taken	Clinical features	Remarks
1	14/F	1	Gastritis, breathing difficulty, PVF**	Discharged Day 2
2*	31/M	2	Vomiting, coma, PVF**	Died 22 h
3	19/M	0.5	Gastritis, PVF**	Discharged Day 5
4*	26/M	20	Vomiting, drowsy, PVF**	Died 5.5 h
5	25/M	4	Vomiting, drowsy	Died 2 h
6	25/M	2	Vomiting, unconscious	Died 2 h
7	24/F	?	Vomiting, unconscious	Died 5.5 h
8	20/F	3	Vomiting, delirium, PVF**, renal failure, jaundice, ventricular tachycardia	Died 72 h

* subjected to autopsy
** peripheral vascular failure

Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	2004-11-05
Materials and Methods	The applicants version is acceptable The CA has added a table (CA-Table A6.12.8) to clarify the results.
Results and discussion	The applicant does not give any information about the prognosis after poisoning. According to MISRA et al. (1988), the mortality is high and a specific antidote is not available. Even the mechanism of phosphine poisoning is not clear, inhibiton of stage III mitochondrial respiration and non-competitive inhibition of cytochrome oxidase have been suggested. The RMS refers to the study summary A6.12.5 (Chugh, S.N. et al. 1991) where the information is given that mortality after AlP intoxication is high and related directly to the dose of poison consumed.
Conclusion	The applicant does not draw any conclusion. The RMS concludes that prognosis after AlP intoxication is very poor and is negatively correlated with the dose of poison consumed.
Remarks	CA-Table A6.12.8 was added by RMS.
	COMMENTS FROM ... *(specify)*
Date	*Give date of comments submitted*
Materials and Methods	*Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Evaluation by Rapporteur Member State, CA-Tables

CA-Table IIA6.12.8 Clinical summary of oral aluminium phosphide poisoning patients

Table 1 Clinical summary of oral aluminium phosphide poisoning patients

Patient no.	*Age/sex*	*No. of tablets taken*	*Clinical features*	*Remarks*
1	14F	1	Gastritis, breathing difficulty, PVF	Discharged day 2
2*	32M	2	Vomiting, coma, PVF	Died 22 h
3	19M	0.5	Gastritis, PVF	Discharged day 5
4*	36M	20	Vomiting, drowsy, PVF	Died 5.5 h
5	25M	4	Vomiting, drowsy	Died 2 h
6	25M	2	Vomiting, unconscious	Died 2 h
7	24F	7	Vomiting, unconscious	Died 5.5 h
8	20F	3	Vomiting, delirium, PVF, renal failure, jaundice, ventricular tachycardia	Died 72 h

* Subjected to autopsy.
PVF-peripheral vascular failure.

Section A6.13 Annex Point IIIA-IV.2	Toxic effects on livestock and pets	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [X]	**Other justification [ ]**	
Detailed justification: The submission of data or the performance of studies on livestock and pet for Aluminium phosphide are not considered to be required, since no residues of Aluminium phosphide in plants or feed stuff are to be expected, due to the reasons given in point 6.15, and therefore any uptake by poultry and / or lactating ruminants is not anticipated.		
Undertaking of intended data submission [ ]		
	Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	2004-11-05	
Evaluation of applicant's justification	Upon proper use of aluminium phosphide, no risk for pets and livestock is expected.	
Conclusion	Acceptable.	
Remarks		
	COMMENTS FROM OTHER MEMBER STATE *(specify)*	
Date	*Give date of comments submitted*	
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*	
Conclusion	*Discuss if deviating from view of rapporteur member state*	
Remarks		

Section A6.14 Other test(s) related to the exposure of humans

Annex Point IIA VI.6.9

Official use only

		1 REFERENCE
1.1	**Reference**	Garry, VF; Harkins, ME; Erickson, LL; Long-Simpson, LK; Holland, SE; Burroughs, BL (2002): Birth Defects, Season of Conception, and Sex of Children Born to Pesticide Applicators Living in the Red River Valley of Minnesota, USA; Environmental Health Perspectives, Vol. 110: 441-449.
		2 GUIDELINES AND QUALITY ASSURANCE (NOT APPLICABLE)
		3 MATERIALS AND METHODS
3.1	**Substance**	Different pesticides, among these phosphine
3.2	**Persons exposed**	
3.2.1	Sex	male
3.2.2	Age/weight	not stated
3.2.3	Known Diseases	not stated
3.2.4	Number of persons	536 children fathered by pesticide applicators
3.2.5	Other information	no
3.3	**Exposure**	not specified (for phosphine: inhalation)
3.3.1	Reason of exposure	occupational
3.3.2	Frequency of exposure	not specified
3.3.3	Overall time period of exposure	not specified
3.3.4	Duration of single exposure	not specified
3.3.5	Exposure concentration/dose	not specified
3.3.6	Other information	
3.4	**Examinations**	Statistical evaluation of birth defects, adverse developmental effects of children, sex of children
3.5	**Treatment**	no medical treatment
3.6	**Remarks**	
		4 RESULTS
4.1	**Clinical Signs**	see 4.2
4.2	**Results of examinations**	For phosphine: Adverse neurologic and neurobehavioral developmental effects clustered among the children born to applicators of the fumigant phosphine (odds ratio [OR] = 2.48; confidence interval [CI], 1.2-5.1).

Section A6.14 Other test(s) related to the exposure of humans

Annex Point IIA VI.6.9

4.3	**Effectivity of medical treatment**	no medical treatment
4.4	**Outcome**	n. a.
4.5	**Other**	n. a.

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1	**Materials and methods**	Statistical evaluation of birth defects of children fathered by pesticide applicators.
5.2	**Results and discussion**	see 4.2 and 5.3
5.3	**Conclusion**	We consider this study as not useful to assess the teratogenicity of Phosphine in humans for the following reasons: 1. The article in question is on children of farm families with parent-reported birth defects. Since the fathers are as farmers involved in application of different pesticides it is not possible to relate the effects directly to phosphine. 2. No information about the kind of application is given (e.g. concentrations or if PPE is used or not). 3. The authors report that they have previously demonstrated that the frequency of birth defects among children of residents of the Red River Valley (RRV), Minnesota, USA, was significantly higher than in other major agricultural regions. Nevertheless they do not consider other factors as reason for these birth defects but focus only on the use of pesticides. Additionally, the authors do not compare birth-defects of farm families with other non-farmer residents of this region. 4. The study bases on parent-reported information only (telephone interviews and written questionnaire), no medical examination has been conducted.

Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	2005-12-05
Materials and methods	Accepted.
Results and discussion	Accepted. The reported neurological/neurobehavioural effects consisted of an alledgedly increased rate of children with autism or attention-deficit/attention-deficit hyperactivity disorder. However, overall incidences were low (autism) and/or diagnostic criteria remained vague (all disorders), especially so, as the study was based totally on self-reporting and no medical examinations were performed.
Conclusion	Accepted. From this study, no conclusions can be drawn about a specific potential of aluminium phosphide/phosphine to influence the number of birth defects or the ratio of male vs. female offspring in families of fumigant applicators.
Remarks	
	COMMENTS FROM ... *(specify)*
Date	*Give date of comments submitted*
Materials and Methods	*Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A6.14 Annex Point IIIA-XI.2	Other test(s) related to the exposure of humans	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [X]	**Other justification [ ]**	
Detailed justification: All means of exposure of humans are discussed in the dossier, additional tests/studies are not considered to be required.		
Undertaking of intended data submission [ ]		
	Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	2004-11-05	
Evaluation of applicant's justification	Applicant's view is acceptable, expectable exposure is already covered by the studies submitted with this dossier.	
Conclusion	Acceptable.	
Remarks		
	COMMENTS FROM OTHER MEMBER STATE *(specify)*	
Date	*Give date of comments submitted*	
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*	
Conclusion	*Discuss if deviating from view of rapporteur member state*	
Remarks		

Section A6.15.1/6.15.2

Annex Point IIIAXL1

Identification and behaviour of the residues of the active substance

Official use only

[redacted]

[redacted]

[redacted]

[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Materials and Methods	[redacted]
Results and discussion	[redacted]
Conclusion	Residues on foodstuffs are not expected
Remarks	
	COMMENTS FROM ... *(specify)*
Date	*Give date of comments submitted*
Materials and Methods	*Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A6.15.1/6.15.2

Annex Point IIIAXL1

Identification and behaviour of the residues of the active substance

Official use only

[redacted]

Section A6.15.1/6.15.2

Annex Point IIIAXL1

Identification and behaviour of the residues of the active substance

[redacted]

[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Materials and Methods	[redacted]
Results and discussion	[redacted]
Conclusion	Residues on foodstuffs are not expected
Remarks	
	COMMENTS FROM ... *(specify)*
Date	*Give date of comments submitted*
Materials and Methods	*Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A6.15.3
Annex Point IIIAXI.1

Estimation of potential or actual exposure of the active substance to humans through diet and other means

Official use only

The estimation of potential and actual exposure through diet and other [redacted]

Reference 6.15.3/01: Köhl, W; Hofer, M. (2003): Aluminium and Magnesium Phosphide / Phosphine Gas – Deduction of Reference Figures (ARfD and ADI) for the Consumer Risk Assessment, SCC Scientific Consulting Company, Wendelsheim, Germany, 10 March 2003

Reference 6.15.3/02: Heller, G (2003): Products Generating Hydrogen Phosphide – Calculation of the Theoretical Maximum Daily Intake (TMDI), BPB Büro für praktische Biologie, Ingelheim, Germany

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Materials and Methods	[redacted]
Results and discussion	[redacted]
Conclusion	Through proper application, no residues of concern have to be expected on foodstuffs. Additionally the MRLs represent safe residue levels for chronic exposure.
Remarks	
	COMMENTS FROM ... *(specify)*
Date	*Give date of comments submitted*
Materials and Methods	*Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A6.15.4

Annex Point IIIA-XI.1.7

Proposed acceptable residues and the justification of their acceptability

Official use only

[redacted]

Unprocessed cereals 0.1 mg/kg
Other agricultural commodities 0.01 mg/kg

[redacted]

	Evaluation by Competent Authorities
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Materials and Methods	[redacted]
Results and discussion	[redacted]
Conclusion	Residues on foodstuffs are not expected
Remarks	
	COMMENTS FROM ... *(specify)*
Date	*Give date of comments submitted*
Materials and Methods	*Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A6.15.6 Summary and evaluation of data submitted under point 6.15

Annex Point IIIAXI.1

Official use only

Summary and evaluation of residue data

A summary and an evaluation of residue data for the active substance Aluminium phosphide is not required, since Aluminium phosphide, as a constituent of products for fumigation in underground tunnel systems, is not intended for direct application to growing crops.

Unlike conventional crop protection products, which must be applied over relatively large crop areas, Aluminium phosphide products are predominantly applied to discrete sites in form of pellets for fumigation.

The application of the products in underground tunnel systems excludes the direct contact with the plants. After decomposition, aluminium phosphide leaves a grey powder of aluminium hydroxide:

$$AlP + 3H_2O \rightarrow Al(OH)_3 + PH_3$$

Aluminium hydroxide is not toxic to plants, and will not be taken up if laying in the tunnel system.

The evolved phosphine gas will spread and remain in the burrows with some local emission into soil; the only imaginable way for uptake should therefore be through the roots, which will be minimal.

The phosphine gas is finally transformed with a very short half-life into phosphorous compounds (phosphates), which are not toxic but even fertilizing and no accumulation needs to be considered.

Therefore, Aluminium phosphide is not considered to generate any residues of practical significance.

Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	2004-12-03
Materials and Methods	Acceptable.
Results and discussion	Acceptable.
Conclusion	Residues on foodstuffs are not expected
Remarks	
	COMMENTS FROM ... *(specify)*
Date	*Give date of comments submitted*
Materials and Methods	*Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*

Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A7.1.1.1.1 Hydrolysis as a function of pH and identification of breakdown products

Annex Point IIA7.6.2.1

			Official use only
		1 REFERENCE	
1.1	**Reference**	[redacted] EXAMINATION OF THE BEHAVIOUR OF PHOSPHINE IN WATER. [redacted]	
1.2	**Data protection**	No	
1.2.1	Data owner	Detia Freyberg GmbH	
1.2.2	Companies with letter of access		
1.2.3	Criteria for data protection	No data protection claimed	
		2 GUIDELINES AND QUALITY ASSURANCE	
2.1	**Guideline study**	[redacted]	X
2.2	**GLP**	[redacted]	
2.3	**Deviations**	[redacted]	
		3 MATERIALS AND METHODS	
3.1	**Test material**	[redacted]	X
3.1.1	Lot/Batch number	[redacted]	
3.1.2	Specification	[redacted]	
3.1.3	Purity	[redacted]	
3.1.4	Further relevant properties	[redacted]	
3.2	**Reference substance**	[redacted]	
3.2.1	Initial concentration of reference substance		
3.3	**Test solution**	The mixture of 1000 ml PH_3/N_2 is conveyed through each of the washing [redacted]	
3.4	**Testing procedure**		
3.4.1	Test system	[redacted]	
3.4.2	Temperature	[redacted]	
3.4.3	pH	[redacted]	
3.4.4	Duration of the test	[redacted]	

Section A7.1.1.1.1 Hydrolysis as a function of pH and identification of breakdown products

Annex Point IIA7.6.2.1

3.4.5	Number of replicates	[redacted]
3.4.6	Sampling	[redacted]
3.4.7	Analytical methods	[redacted]
3.5	**Preliminary test**	[redacted]

4 RESULTS

4.1	**Concentration and hydrolysis values**	[redacted]
4.2	**Hydrolysis rate constant (k_h)**	[redacted]
4.3	**Dissipation time**	[redacted]
4.4	**Concentration – time data**	[redacted]
		[redacted]
4.5	**Specification of the transformation products**	[redacted]

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1	**Materials and methods**	[redacted]

Section A7.1.1.1.1
Annex Point IIA7.6.2.1

Hydrolysis as a function of pH and identification of breakdown products

5.2	**Results and discussion**	Obviously, phosphine was degraded within the entire period of the test. The degradation cause was not significantly influenced by the pH values of the test solution. The degradation can not be a hydrolysis reaction. It must be an oxidation. Possible oxidation products are phosphite and phosphate. Both are not of toxicological concern, neither in ecotoxicity nor in mammalian toxicity. The oxidation of phosphine is an exotherm reaction mostly dependent on the redox potential. The reaction partner of phosphine is oxygen whose concentration changed permanently and therefore, the redox potential, too. Neither OECD 111 nor EC method C.7 would be suitable methods for the determination of redox reactions.
5.2.1	k_H	Not suitable
5.2.2	DT_{50}	Not suitable
5.2.3	r^2	Not suitable
5.3	**Conclusion**	It was not possible to fulfil the validity criteria of a hydrolysis study as explained above but the study a valid degradation pathway of the very toxic phosphine to the oxidation products phosphite and phosphate which are not of toxicological concern.
5.3.1	Reliability	2
5.3.2	Deficiencies	Yes The hydrolysis test was performed without complete exclusion of oxygen. The buffers which were used for pH adjustment are unknown. But as no degradation (oxidation) was observed which dependents on pH this deficiency is neglectable The deficiency of oxygen exclusion gives the opportunity for an observation of oxidation process otherwise not observed as no guideline exists.

Section A7.1.1.1.1
Annex Point IIA7.6.2.1

Hydrolysis as a function of pH and identification of breakdown products

Evaluation by Competent Authorities

EVALUATION BY RAPPORTEUR MEMBER STATE

Date

Materials and Methods

Section A7.1.1.1.1 Hydrolysis as a function of pH and identification of breakdown products

Annex Point IIA7.6.2.1

Results and discussion	According to the BBA guideline 55 the analysis and presentation of the results comprises a table with incubation time, concentrations and percentages of the analysed chemical for each pH value and time step as well as a plot of incubation time versus log phosphine concentration. This is provided by the applicant in section 4.4 and Table A-7_1_1_1_1-4. In contrast to OECD guideline 111 or to EC guideline C.7, neither the calculation of a rate constant nor the identification of the degradation products are part of the BBA guideline 55. The results of the test show that phosphine is not stable in water for less than one week independent of the pH of the test solutions. Due to the nature of phosphine, it is justified that the degradation reaction is not a hydrolysis reaction, but must be an oxidation with the possible reaction products phosphite and phosphate. However, this conclusion is not given in the original study (Doc. IV-A, Section No. 7.1.1.1.1), but now included in the study summary. Therefore it does not appear to be reasonable to derive hydrolytic half life from the degradation curve.
Conclusion	The applicant provides a hydrolysis study as a function of pH for phosphine which is the basic degradation product of AlP. The applied method according to BBA guideline 55 is not directly comparable with the current standard methods OECD guideline 111 or EC guideline C.7 for investigation of the hydrolytic behaviour of a substance. For estimation of the hydrolytic behaviour of phosphine, all methods mentioned are inappropriate, because as stated by the applicant, the degradation is an oxidation and not a hydrolysis reaction. However, it is considered that the results of the submitted study are sufficient for the estimation of the degradation behaviour of phosphine in water.
Reliability	2
Acceptability	acceptable
Remarks	

	COMMENTS FROM ...
Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A7.1.1.1.1
Annex Point IIA7.6.2.1

Hydrolysis as a function of pH and identification of breakdown products

[redacted]

[redacted]		
[redacted]		
[redacted]		
[redacted]		

[redacted]

[redacted]	
[redacted]	
[redacted]	
[redacted]	
[redacted]	
[redacted]	
[redacted]	
[redacted]	

[redacted]

[redacted]	
[redacted]	
[redacted]	

Table A7.1.17.1-4: Hydrolysis of test compound, transformation products and

[redacted]

[redacted]

[redacted]

[redacted]

Section 7.1.1.1.1 Annex Point IIA7.6.2.1	Hydrolysis as a function of pH and identification of breakdown products of Aluminium phosphide	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ] **Limited exposure [ ]**	**Technically not feasible [ ]** **Scientifically unjustified [x]** **Other justification [ ]**	
Detailed justification:	[redacted]	
Undertaking of intended data submission [ ]	No data submission intended	
	Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	
Evaluation of applicant's justification	[redacted]	
Conclusion	[redacted]	
Remarks		
	COMMENTS FROM OTHER MEMBER STATE *(specify)*	
Date	*Give date of comments submitted*	
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*	
Conclusion	*Discuss if deviating from view of rapporteur member state*	
Remarks		

Section A7.1.1.1.2 Annex Point IIAVII7.6.2.2	Phototransformation in water	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA *As outlined in the TNsG on data requirements, the applicant must always be able to justify the suggested exemptions from the data requirements. The justifications are to be included in the respective location (section) of the dossier.* *If one of the following reasons is marked, detailed justification has to be given below. General arguments are not acceptable*	Official use only
Other existing data [ ]	**Technically not feasible** [X] **Scientifically unjustified** [X]	
Limited exposure [ ]	**Other justification** [ ]	
Detailed justification:	[redacted]	
Undertaking of intended data submission [ ]	*Give date on which the data will be handed in later (Only acceptable if test or study is already being conducted and the responsible CA has agreed on the delayed data submission.)*	
	Evaluation by Competent Authorities	
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	
Evaluation of applicant's justification	[redacted]	
Conclusion	[redacted]	
Remarks		
	COMMENTS FROM OTHER MEMBER STATE *(specify)*	
Date	*Give date of comments submitted*	
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*	
Conclusion	*Discuss if deviating from view of rapporteur member state*	
Remarks		

Section 7.1.1.2.1 Annex Point IIAVII7.6.1.1	Ready biodegradability	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ] Limited exposure [ ]	Technically not feasible [x] Scientifically unjustified [x] Other justification [ ]	
Detailed justification:	[redacted]	
Undertaking of intended data submission [ ]	No data submission intended	
	Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	2007/02/01	

Section 7.1.1.2.1 Annex Point IIAVII7.6.1.1	Ready biodegradability
Evaluation of applicant's justification	[redacted]
Conclusion	[redacted]
Remarks	
	COMMENTS FROM OTHER MEMBER STATE *(specify)*
Date	*Give date of comments submitted*
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section 7.1.1.2.2 Annex Point IIAVII7.6.1.2	Inherent biodegradability	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	**Technically not feasible** [x] **Scientifically unjustified** [x]	
Limited exposure [ ]	**Other justification** [ ]	
Detailed justification:	[redacted]	
Undertaking of intended data submission [ ]	No data submission intended	
	Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	
Evaluation of applicant's justification	[redacted]	
Conclusion	[redacted]	
Remarks		

Section 7.1.1.2.2 Annex Point IIAVII7.6.1.2	Inherent biodegradability
	COMMENTS FROM OTHER MEMBER STATE *(specify)*
Date	*Give date of comments submitted*
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section 7.1.1.2.3 Annex Point IIIAXII2.1	Biodegradation in seawater	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ] Limited exposure [ ]	Technically not feasible [x] Scientifically unjustified [x] Other justification [ ]	
Detailed justification:	[redacted]	
Undertaking of intended data submission [ ]	No data submission intended	
	Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	
Evaluation of applicant's justification	[redacted]	

Section 7.1.1.2.3 Annex Point IIIAXII2.1	Biodegradation in seawater
Conclusion	[redacted]
Remarks	
	COMMENTS FROM OTHER MEMBER STATE *(specify)*
Date	*Give date of comments submitted*
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section 7.1.2 Annex Point IIIAXII.2.1	Rate and route of degradation in aquatic systems including identification of metabolites and degradation products	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ] **Limited exposure [ ]**	**Technically not feasible [x]** **Scientifically unjustified [x]** **Other justification [ ]**	
Detailed justification:	[redacted]	
Undertaking of intended data submission [ ]	No data submission intended	
	Evaluation by Competent Authorities	
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	
Evaluation of applicant's justification	[redacted]	

Section 7.1.2 Annex Point IIIAXII.2.1	Rate and route of degradation in aquatic systems including identification of metabolites and degradation products
Conclusion	[redacted]
Remarks	
	COMMENTS FROM OTHER MEMBER STATE *(specify)*
Date	*Give date of comments submitted*
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A7.1.3 Annex Point IIAVII.7.7	Adsorption/desorption screening test	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	**Technically not feasible [X]** **Scientifically unjustified [X]**	
Limited exposure [ ]	**Other justification [ ]**	
Detailed justification:		
[redacted]		X
Undertaking of intended data submission [ ]		
	Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	
Evaluation of applicant's justification	[redacted]	
Conclusion	[redacted]	
Remarks		
	COMMENTS FROM OTHER MEMBER STATE *(specify)*	
Date	*Give date of comments submitted*	
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*	
Conclusion	*Discuss if deviating from view of rapporteur member state*	
Remarks		

Section A7.1.4.1 Annex Point IIIAXII.2.1	Field study on accumulation in the sediment	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA *As outlined in the TNsG on data requirements, the applicant must always be able to justify the suggested exemptions from the data requirements.* *The justifications are to be included in the respective location (section) of the dossier.* *If one of the following reasons is marked, detailed justification has to be given below. General arguments are not acceptable*	Official use only
Other existing data [ ] **Limited exposure [X]**	**Technically not feasible [X]** **Scientifically unjustified [X]** **Other justification [ ]**	
Detailed justification:	[redacted]	
Undertaking of intended data submission [ ]	*Give date on which the data will be handed in later (Only acceptable if test or study is already being conducted and the responsible CA has agreed on the delayed data submission.)*	
	Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	
Evaluation of applicant's justification	[redacted]	
Conclusion	[redacted]	
Remarks		
	COMMENTS FROM OTHER MEMBER STATE *(specify)*	
Date	*Give date of comments submitted*	
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*	
Conclusion	*Discuss if deviating from view of rapporteur member state*	
Remarks		

Section A7.1.4 Annex Point IIIAXII.2.2	Further studies on adsorption and desorption in water / sediment systems	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA *As outlined in the TNsG on data requirements, the applicant must always be able to justify the suggested exemptions from the data requirements.* *The justifications are to be included in the respective location (section) of the dossier.* *If one of the following reasons is marked, detailed justification has to be given below. General arguments are not acceptable*	Official use only
Other existing data [ ]	**Technically not feasible [X]** **Scientifically unjustified [X]**	
Limited exposure [ ]	**Other justification [ ]**	
Detailed justification:	[redacted]	
Undertaking of intended data submission [ ]	*Give date on which the data will be handed in later (Only acceptable if test or study is already being conducted and the responsible CA has agreed on the delayed data submission.)*	
	Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	
Evaluation of applicant's justification	[redacted]	
Conclusion	[redacted]	
Remarks		
	COMMENTS FROM OTHER MEMBER STATE *(specify)*	
Date	*Give date of comments submitted*	
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*	
Conclusion	*Discuss if deviating from view of rapporteur member state*	
Remarks		

Section 7.2.1 Annex Point IIIAXII.1.1	Aerobic Degradation in soil, initial study	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [x] Limited exposure [ ]	Technically not feasible [x] Scientifically unjustified [x] Other justification [ ]	
Detailed justification:	[redacted]	
Undertaking of intended data submission [ ]	No data submission intended	
	Evaluation by Competent Authorities	
Date	EVALUATION BY RAPPORTEUR MEMBER STATE [redacted]	

Section 7.2.1 Annex Point IIIAXII.1.1	Aerobic Degradation in soil, initial study
Evaluation of applicant's justification	[redacted]
Conclusion	[redacted]
Remarks	
	COMMENTS FROM OTHER MEMBER STATE *(specify)*
Date	*Give date of comments submitted*
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A7.2.2.4 Other soil degradation studies

Annex Point IIIAXII.1.4

Official use only

1 REFERENCE

1.1	**Reference**	Analyt. Labor, Fa. Dr. W. Freyberg (1983): EXAMINATION OF THE DECOMPOSITION BEHAVIOUR OF HYDROGEN PHOSPHIDE (PHOSPHINE) IN STANDARD SOILS, Fa. Dr. Werner Freyberg, report no.: not available, December 22, 1983
1.2	**Data protection**	No
1.2.1	**Data owner**	Detia Freyberg GmbH
1.2.3	**Criteria for data protection**	No data protection claimed

2 GUIDELINES AND QUALITY ASSURANCE

2.1	**Guideline study**	[redacted]
2.2	**GLP** *(only where required)*	[redacted]
2.3	**Deviations**	[redacted]

3 MATERIALS AND METHODS

In some fields the values indicated in the EC or OECD test guidelines are given as default values. Adopt, change or delete these default values as appropriate.

3.1	**Test material**	[redacted]
3.1.1	Lot/Batch number	[redacted]
3.1.2	Specification	[redacted]
3.1.3	Description	[redacted]
3.1.4	Purity	[redacted]
3.1.5	Stability	[redacted]
3.3	**Test method**	
3.3.1	Soils	[redacted]

Section A7.2.2.4 Other soil degradation studies

Annex Point IIIAXII.1.4

[redacted]

3.3.2 Apparatus and application

[redacted]

3.3.3 Test conditions

[redacted]

3.3.4 Analytical method

[redacted]

4 RESULTS

4.1 Decomposition in soil SP 213

[redacted]

4.2 Decomposition in soil SP 313

[redacted]

Section A7.2.2.4 Other soil degradation studies

Annex Point IIIAXII.1.4

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1 Materials and methods

[redacted]

5.2 Results and discussion

At 22°C Phosphine is very rapidly decomposed in soil. After 24 hours only 1.2 % (soil SP 213) and 11 % (soil SP 313) remaining active agent was found.

5.3 Conclusion

[redacted]

5.3.1 Reliability

[redacted]

5.3.2 Deficiencies

[redacted]

Section A7.2.2.4 Other soil degradation studies

Annex Point IIIAXII.1.4

Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Materials and Methods	[redacted]
Results and discussion	[redacted]
Conclusion	[redacted]
Reliability	[redacted]
Acceptability	[redacted]
Remarks	
	COMMENTS FROM ...
Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A7.2.2 Annex Point IIIAXII.1.1, IIIAXII.1.4	Aerobic degradation in soil, further studies	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA *As outlined in the TNsG on data requirements, the applicant must always be able to justify the suggested exemptions from the data requirements. The justifications are to be included in the respective location (section) of the dossier.* *If one of the following reasons is marked, detailed justification has to be given below. General arguments are not acceptable*	Official use only
Other existing data [X] **Limited exposure [ ]**	**Technically not feasible [X]** **Scientifically unjustified [X]** **Other justification [ ]**	
Detailed justification: [redacted]		
Undertaking of intended data submission [ ]	*Give date on which the data will be handed in later (Only acceptable if test or study is already being conducted and the responsible CA has agreed on the delayed data submission.)*	
	Evaluation by Competent Authorities	
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	
Evaluation of applicant's justification	[redacted]	
Conclusion	[redacted]	

Section A7.2.2 Annex Point IIIAXII.1.1, IIIAXII.1.4	Aerobic degradation in soil, further studies
Remarks	
	COMMENTS FROM OTHER MEMBER STATE *(specify)*
Date	*Give date of comments submitted*
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A7.2.3.1 Annex Point IIIAXII.1.2	Adsorption and desorption in accordance with the new test guideline EC C18 or OECD 106	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [X]	**Technically not feasible [X]** **Scientifically unjustified [X]**	
Limited exposure [ ]	**Other justification [ ]**	
Detailed justification: [redacted]		X
Undertaking of intended data submission [ ]		
	Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	
Evaluation of applicant's justification	[redacted]	
Conclusion	[redacted]	
Remarks		
	COMMENTS FROM OTHER MEMBER STATE *(specify)*	
Date	*Give date of comments submitted*	
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*	
Conclusion	*Discuss if deviating from view of rapporteur member state*	
Remarks		

Section A7.2.3.2 Mobility in at least three soil types and where relevant mobility of metabolites and degradation products

Annex Point IIIAXII.1.3

Official use only

1 REFERENCE

1.1	**Reference**	[redacted]DISTRIBUTION OF PH_3 IN SOIL - HORIZONTAL AND VERTICAL SPREADING,[redacted]
1.2	**Data protection**	No
1.2.1	Data owner	Detia Freyberg GmbH
1.2.2		
1.2.3	Criteria for data protection	No data protection claimed

2 GUIDELINES AND QUALITY ASSURANCE

2.1	**Guideline study**	[redacted]
2.2	**GLP**	[redacted]
2.3	**Deviations**	[redacted]

3 MATERIALS AND METHODS

3.1	**Test material**	[redacted]
3.1.1	Lot/Batch number	[redacted]
3.1.2	Specification	[redacted]
3.1.3	Purity	[redacted]

4 RESULTS

4.1	**Horizontal spreading:**	[redacted]

Section A7.2.3.2 **Mobility in at least three soil types and where relevant mobility of metabolites and degradation products**
Annex Point IIIAXII.1.3

[redacted]

4.1.1 Experiment A

[redacted]

4.1.2 Experiment B

[redacted]

4.1.3 Experiment C

[redacted]

Section A7.2.3.2 **Mobility in at least three soil types and where relevant mobility of metabolites and degradation products**

Annex Point IIIAXII.1.3

4.1.4 Horizontal spreading: Experiment D

[redacted]

4.2 Vertical spreading

[redacted]

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1 Materials and methods

[redacted]

Section A7.2.3.2 Annex Point IIIAXII.1.3 — Mobility in at least three soil types and where relevant mobility of metabolites and degradation products

[redacted]

5.2 Results and discussion

This experiment shows that the horizontal spreading of PH_3 in soil is relatively fast. In the first experiment the maximum phosphine concentration was determined 4 hours after the start of the experiment at each measurement point. Phosphine disappeared within 168 hours. Experiment B indicates that half of the application rate in covered soil result in similar phosphine concentration of the uncovered soil.
Experiment C and D show that the horizontal spreading is faster in dry soils.

It has been observed that the vertical spreading rate of PH_3 in soil is very low. During the whole experiment the highest concentration was found near the buried pellet. In a distance of 40 cm to the buried pellet only 3 – 15 % of the values detected at 10 cm to the buried pellet were measured.

After 24 hours phosphine has almost disappeared.

5.3 Conclusion

[redacted]

5.3.1 Reliability [redacted]

5.3.2 Deficiencies [redacted]

Evaluation by Competent Authorities
EVALUATION BY RAPPORTEUR MEMBER STATE
Date [redacted]

Section A7.2.3.2 Mobility in at least three soil types and where relevant mobility of metabolites and degradation products

Annex Point IIIAXII.1.3

Materials and Methods	[redacted]
Results and discussion	[redacted]
Conclusion	[redacted]
Reliability	[redacted]
Acceptability	[redacted]
Remarks	

	COMMENTS FROM ...
Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A7.3.1 Annex Point IIIAVII.5	Phototransformation in air	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [X]	Technically not feasible [ ]	Scientifically unjustified [X]
Limited exposure [ ]	Other justification [ ]	
Detailed justification: [redacted]		X
Undertaking of intended data submission [ ]		
	Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	

Section A7.3.1 Annex Point IIIAVII.5	Phototransformation in air
Evaluation of applicant's justification	[redacted]
Conclusion	[redacted]
Remarks	
	COMMENTS FROM OTHER MEMBER STATE *(specify)*
Date	*Give date of comments submitted*
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A7.3.2 Annex Point IIIAXII.3	Fate and behaviour in air, further studies	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [X]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Detailed justification: no further studies available, please see 7.3.1.		X
Undertaking of intended data submission [ ]		
	Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	
Evaluation of applicant's justification	[redacted]	
Conclusion	[redacted]	
Remarks		
	COMMENTS FROM OTHER MEMBER STATE *(specify)*	
Date	*Give date of comments submitted*	
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*	
Conclusion	*Discuss if deviating from view of rapporteur member state*	
Remarks		

Section A7.4.1.1 Acute toxicity to fish

Annex Point IIA VII.7.1

Official use only

1 REFERENCE

1.1	**Reference**	[redacted] EXAMINATION OF THE ACUTE TOXICITY OF ALUMINIUM PHOSPHIDE ON RAINBOW TROUT, [redacted]
1.2	**Data protection**	No
1.2.1	Data owner	Detia Freyberg GmbH
1.2.2		
1.2.3	Criteria for data protection	No data protection claimed

2 GUIDELINES AND QUALITY ASSURANCE

2.1	**Guideline study**	[redacted]
2.2	**GLP**	[redacted]
2.3	**Deviations**	[redacted]

3 MATERIALS AND METHODS

3.1	**Test material**	[redacted]
3.1.1	Lot/Batch number	[redacted]
3.1.2	Specification	[redacted]
3.1.3	Purity	[redacted]
3.1.4	Composition of Product	[redacted]
3.1.5	Further relevant properties	[redacted]
3.1.6	Method of analysis	[redacted]
3.2	**Preparation of TS solution for poorly soluble or volatile test substances**	[redacted]
3.3	**Reference**	[redacted]

Section A7.4.1.1 Acute toxicity to fish

Annex Point IIA VII.7.1

	substance	
3.3.1	Method of analysis for reference substance	[redacted]
3.4	**Testing procedure**	
3.4.1	Dilution water	[redacted]
3.4.2	Test organisms	[redacted]
3.4.3	Test system	[redacted]
3.4.4	Test conditions	[redacted]
3.4.5	Duration of the test	[redacted]
3.4.6	Test parameter	[redacted]
3.4.7	Sampling	[redacted]
3.4.8	Monitoring of TS concentration	[redacted]
3.4.9	Statistics	[redacted]
	4 RESULTS	
4.1	**Limit Test**	[redacted]
4.2	**Results test substance**	
4.2.1	Initial concentrations of test substance	[redacted]
4.2.2	Actual concentrations of test substance	[redacted]
4.2.3	Effect data (Mortality)	[redacted]
4.2.4	Concentration / response curve	[redacted]
4.2.5	Other effects	[redacted]
4.3	**Results of controls**	
4.3.1	Number/ percentage of animals showing adverse effects	[redacted]
4.3.2	Nature of adverse effects	[redacted]
4.4	**Test with**	[redacted]

Section A7.4.1.1 Acute toxicity to fish

Annex Point IIA VII.7.1

reference substance

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1 Materials and methods

As described in 3

5.2 Results and discussion

Of the surviving fish (after a 96 hour exposure period) those with only slight behaviour anomalies were free from symptoms after 2 hours. At a PH_3 concentration of 5.66 two fish survived the 96 hours exposure time but one of them died 5 hours later. No further deaths occurred during the following observation period of two weeks.

Effect values for AlP are related to a purity of 80 %. For 100 % purity the effect values are as follows:

LC_0 = 5.73 µl/l

LC_{50} = 7.98 µl/l

LC_{100} = 11.5 µl/l

5.2.1 LC_0 see table A7_4_1_1-7

5.2.2 LC_{50}

PH_3 in 10^{-3} ppm	Aluminium phosphide in 10^{-3} ppm
4.68 (4.24 – 5.16)# fLD_{50} = 1.103	9.65 (8.75 – 10.65)# fLD_{50} = 1.103

5.2.3 LC_{100} see table A7_4_1_1-7

5.3 Conclusion [redacted]

5.3.1 Other Conclusions

5.3.2 Reliability [redacted]

5.3.3 Deficiencies [redacted]

Evaluation by Competent Authorities	
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Materials and Methods	[redacted]
Results and discussion	[redacted]
Conclusion	[redacted]
Reliability	[redacted]
Acceptability	[redacted]
Remarks	

Section A7.4.1.1 Acute toxicity to fish

Annex Point IIA VII.7.1

	COMMENTS FROM ...
Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

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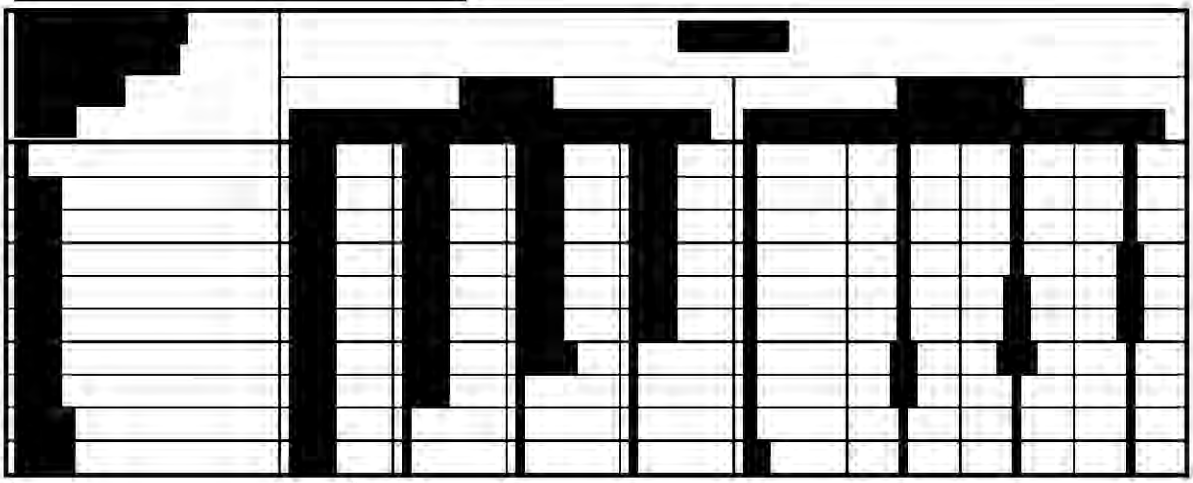

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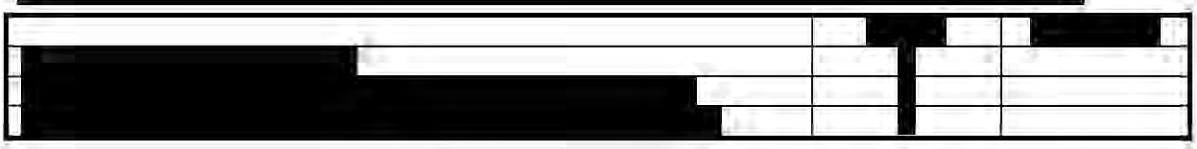

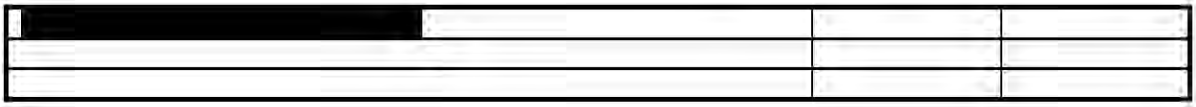

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Section A7.4.1.1 Acute toxicity to fish

Annex Point IIA VII.7.1

			Official use only
		1 REFERENCE	
1.1	**Reference**	[redacted]Acute toxicity of GASTOXIN TÉCNICO to Zebrafish (*Brachydanio rerio*),[redacted]	
1.2	**Data protection**	[redacted]	
1.2.1	Data owner	CASA BERNARDO LTDA	
1.2.2	Companies with letter of access	Detia Freyberg GmbH Detia Degesch GmbH	
1.2.3	Criteria for data protection	[redacted]	
		2 GUIDELINES AND QUALITY ASSURANCE	
2.1	**Guideline study**	[redacted]	
2.2	**GLP**	[redacted]	
2.3	**Deviations**	[redacted]	
		3 MATERIALS AND METHODS	
3.1	**Test material**		
3.1.1	Lot/Batch number	[redacted]	
3.1.2	Specification	[redacted]	
3.1.3	Purity	[redacted]	
3.1.4	Composition of product	[redacted]	
3.1.5	Further relevant properties	[redacted]	
3.1.6	Method of analysis	[redacted]	X
3.2	**Preparation of TS solution for poorly soluble or volatile test substances**	[redacted]	
3.3	**Reference substance**	[redacted]	

Section A7.4.1.1 Acute toxicity to fish

Annex Point IIA VII.7.1

3.3.1	Method of analysis for reference substance	[redacted]
3.4	**Testing procedure**	
3.4.1	Dilution water	[redacted]
3.4.2	Test organisms	[redacted]
3.4.3	Test system	[redacted]
3.4.4	Test conditions	[redacted]
3.4.5	Duration of the test	[redacted]
3.4.6	Test parameter	[redacted]
3.4.7	Sampling	[redacted]
3.4.8	Monitoring of TS concentration	[redacted]
3.4.9	Statistics	[redacted]he Trimmed Spearman-Karber Method (HAMILTON et al., 1978).

4 RESULTS

4.1	**Limit Test**	[redacted]
4.2	**Results test substance**	
4.2.1	Initial concentrations of test substance	[redacted]
4.2.2	Actual concentrations of test substance	[redacted]
4.2.3	Effect data (Mortality)	[redacted]
4.2.4	Concentration / response curve	[redacted]
4.2.5	Other effects	[redacted]
4.3	**Results of controls**	
4.3.1	Number/ percentage of animals showing adverse effects	[redacted]
4.3.2	Nature of adverse	[redacted]

Section A7.4.1.1 Acute toxicity to fish

Annex Point IIA VII.7.1

effects

4.4 Test with reference substance [redacted]

4.4.1 Concentrations [redacted]

4.4.2 Results [redacted]

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1 Materials and methods [redacted]

5.2 Results and discussion

The results of the acute toxicity study (LC_{50} – 98 hours) and 95 % confidence limits to GASTOXIN TÉCNICO were 48.15 µg/L and 36.77 – 63.05 µg/L ($P < 0.05$).

The highest concentration that showed no effect was 18.00 µg/L.

The lowest concentration that showed 100 % mortality was 160 µg/L.

5.3 Conclusion [redacted]

5.3.1 Other Conclusions [redacted]

5.3.2 Reliability [redacted]

5.3.3 Deficiencies [redacted]

Evaluation by Competent Authorities	
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Materials and Methods	[redacted]
Results and discussion	[redacted]
Conclusion	[redacted]
Reliability	[redacted]
Acceptability	[redacted]

Section A7.4.1.1 Acute toxicity to fish

Annex Point IIA VII.7.1

Remarks	No analytical monitoring of the test substance concentration was performed. Therefore, it cannot be excluded that the real effect values are lower than the values given related to nominal concentrations.
	COMMENTS FROM ...
Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

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Section A7.4.1.2 Acute toxicity to invertebrates

Annex Point IIA VII.7.2 *Daphnia magna*

Official use only

1 REFERENCE

1.1	**Reference**	Herrmann, von Holt (1986): Toxicity test on daphnia magna, Ökolimna, Burgwedel, Germany; unpublished Report-No. DM-FRE-08/86-034, 29.10.1986, dates of experimental work: 12.08.86 until 05.09.86
1.2	**Data protection**	No
1.2.1	Data owner	Detia Freyberg GmbH
1.2.2		
1.2.3	Criteria for data protection	No data protection claimed

2 GUIDELINES AND QUALITY ASSURANCE

2.1	**Guideline study**	[redacted]
2.2	**GLP**	No (GLP was not compulsory at the time the study was performed)
2.3	**Deviations**	No

3 MATERIALS AND METHODS

3.1	**Test material**	[redacted]
3.1.1	Lot/Batch number	[redacted]
3.1.2	Specification	[redacted]
3.1.3	Purity	[redacted]
3.1.4	Composition of Product	[redacted]
3.1.5	Further relevant properties	[redacted]
3.1.6	Method of analysis	[redacted]
3.2	**Preparation of TS solution for poorly soluble or volatile test substances**	[redacted]

Section A7.4.1.2 Acute toxicity to invertebrates

Annex Point IIA VII.7.2 *Daphnia magna*

3.3	**Reference substance**	
3.3.1	Method of analysis for reference substance	
3.4	**Testing procedure**	
3.4.1	Dilution water	
3.4.2	Test organisms	
3.4.3	Test system	
3.4.4	Test conditions	
3.4.5	Duration of the test	
3.4.6	Test parameter	
3.4.7	Sampling	
3.4.8	Monitoring of TS concentration	
3.4.9	Statistics	
	4 RESULTS	
4.1	**Limit Test**	
4.2	**Results test substance**	
4.2.1	Initial concentrations of test substance	
4.2.2	Actual concentrations of test substance	
4.2.3	Effect data (Immobilisation)	
4.2.4	Concentration / response curve	
4.2.5	Other effects	
4.3	**Results of controls**	
4.4	**Test with reference substance**	
4.4.1	Concentrations	

Section A7.4.1.2 Acute toxicity to invertebrates

Annex Point IIA VII.7.2 *Daphnia magna*

4.4.2 Results [redacted]

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1 Materials and methods [redacted]

5.2 Results and discussion

5.2.1 EC_0 The EC_0 could not be determined as at the lowest test concentration (0.1 mg/l) 25 % of the test organisms were immobile after 24 h.

5.2.2 EC_{50} A graphic determination of the EC_{50} was performed resulting in a 24h-EC_{50} of 0.2mg/l. Using probit analysis a 24h- EC_{50} of 0.18 mg/l can be derived.

5.2.3 EC_{100} The EC_{100} = 1.3 mg/l (24h).

As no analytical monitoring has been performed, it cannot be excluded that the real effect values are lower than the values given related to nominal concentrations.

5.3 Conclusion [redacted]

5.3.1 Reliability [redacted]

5.3.2 Deficiencies [redacted]

Evaluation by Competent Authorities	
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Materials and Methods	[redacted]
Results and discussion	[redacted]
Conclusion	[redacted]
Reliability	[redacted]
Acceptability	[redacted]
Remarks	

Section A7.4.1.2 Acute toxicity to invertebrates

Annex Point IIA VII.7.2 *Daphnia magna*

	COMMENTS FROM ...
Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

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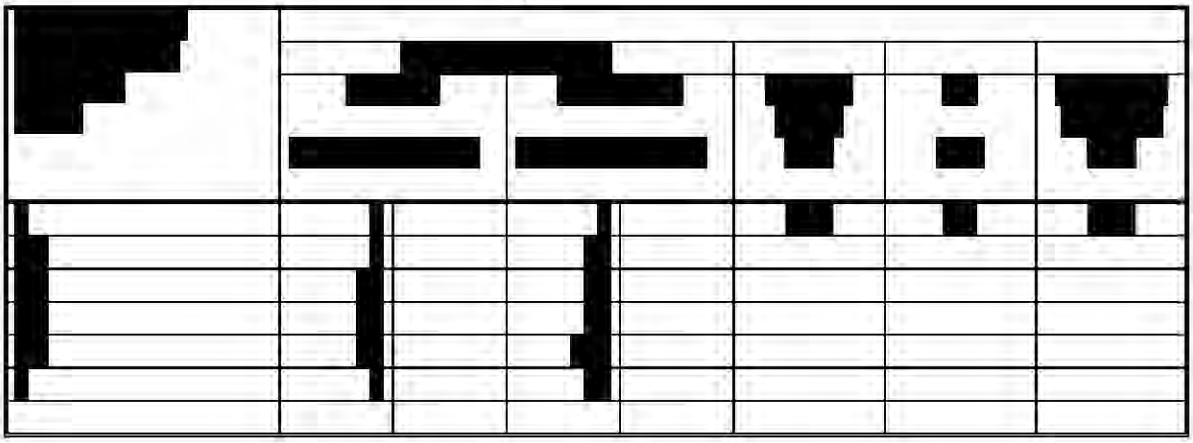

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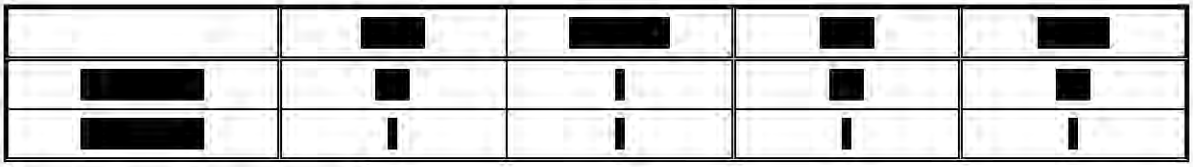

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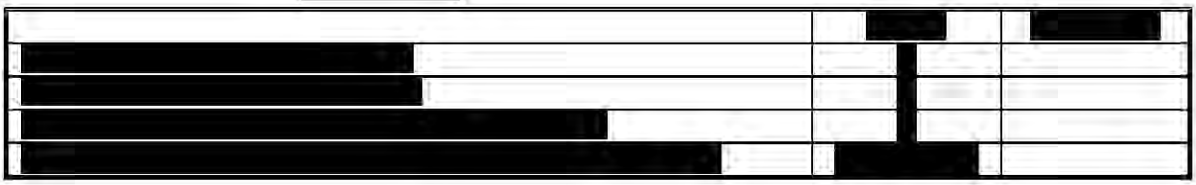
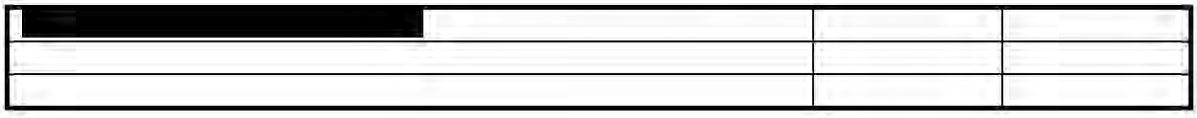




Section A7.4.1.2 Acute toxicity to invertebrates

Annex Point IIA7.2 *Daphnia similis*

Official use only

1 REFERENCE

1.1	**Reference**	[redacted]Acute Toxicity of GASTOXIN TÉCNICO to *Daphnia similis*,[redacted]
1.2	**Data protection**	[redacted]
1.2.1	Data owner	CASA BERNARDO LTDA
1.2.2	Companies with letter of access	Detia Freyberg GmbH Detia Degesch GmbH
1.2.3	Criteria for data protection	[redacted]

2 GUIDELINES AND QUALITY ASSURANCE

2.1	**Guideline study**	[redacted]
2.2	**GLP**	[redacted]
2.3	**Deviations**	[redacted]

3 MATERIALS AND METHODS

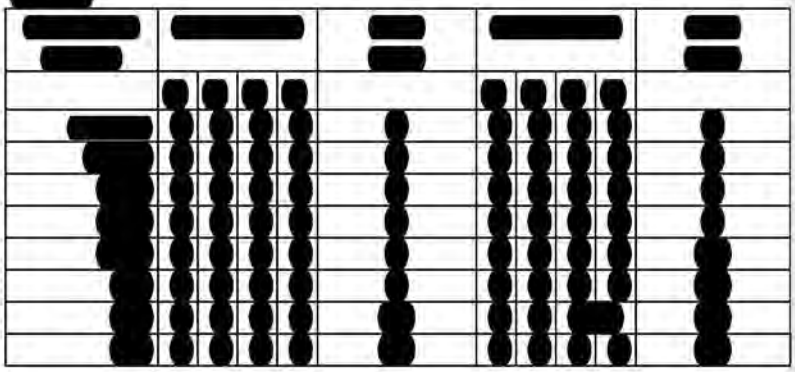
3.1	**Test material**	
3.1.1	Lot/Batch number	[redacted]
3.1.2	Specification	[redacted]

[redacted]

[redacted]

4 RESULTS

[redacted]



5 APPLICANT'S SUMMARY AND CONCLUSION

5.1 Materials and methods

[redacted]

5.2 Results and discussion

The results of the acute toxicity study to GASTOXIN TÉCNICO and potassium dichromate (reference test) were 0.37 mg/L and 0.23 mg/L, respectively and 95 % confidence limits were 0.30 – 0.47 mg/L and 0.23 – 0.25 mg/L, respectively. The NOEC was 0.10 mg/L; the lowest concentration (LLC) showing 100 % mortality was 1.80 mg/L. The percentage of immobilised organisms in the treatment control without the test substance after 48 hours was lower than 10 %. The dissolved oxygen level evaluated with an oxygen probe was higher than 2 mg/L during the 48-hour incubation.

5.3 Conclusion

[redacted]

5.3.1 Reliability

[redacted]

5.3.2 Deficiencies

[redacted]

	Evaluation by Competent Authorities
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	2012/01/19
Materials and Methods	Applicant's version is acceptable.
Results and discussion	Applicant's version is acceptable with the following comment: As no analytical monitoring has been performed, it cannot be excluded that the real effect values are lower than the values given related to nominal concentrations.
Conclusion	Applicants version can be adopted with the comment given above.
Reliability	3
Acceptability	not acceptable
Remarks	No analytical monitoring of the test substance concentration was performed. Therefore, it cannot be excluded that the real effect values are lower than the values given related to nominal concentrations.
	COMMENTS FROM ...
Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A7.4.1.3 Growth inhibition test on algae

Annex Point IIA7.3

			Official use only
		1 REFERENCE	
1.1	**Reference**	Bonetti, R. (1994): Toxicity effect of GASTOXIN TÉCNICO to *Selenastrum capricornutum*, Laboratory BIOAGRI BIOTECNOLOGIA AGRICOLA S/C LTDA, Piracicaba, SP; unpublished Report-No. D.4.1-051/94, 06.07.1994, dates of experimental work: 23.06.94 until 02.07.94	
1.2	**Data protection**	No	
1.2.1	Data owner	CASA BERNARDO LTDA	
1.2.2	Companies with letter of access	Detia Freyberg GmbH Detia Degesch GmbH	
1.2.3	Criteria for data protection	No data protection claimed	
		2 GUIDELINES AND QUALITY ASSURANCE	
2.1	**Guideline study**	[redacted]	
2.2	**GLP**	[redacted]	
2.3	**Deviations**	[redacted]	
		3 MATERIALS AND METHODS	
3.1	**Test material**		
3.1.1	Lot/Batch number	[redacted]	
3.1.2	Specification	[redacted]	
3.1.3	Purity	[redacted]	
3.1.4	Composition of Product	[redacted]	
3.1.5	Further relevant properties	[redacted]	
3.1.6	Method of analysis	[redacted]	X
3.2	**Preparation of TS solution for poorly soluble or volatile test substances**	[redacted]	
3.3	**Reference substance**	[redacted]	
3.3.1	Method of analysis for reference substance	[redacted]	

3.4 Testing procedure

3.4.1 Culture medium

Alga Culture Medium

Selenastrum capricornutum obtained from the CETESB São Paulo, SP, maintained in axenic stock culture at Bioagri using the L. C. Oligo Medium (Source: AFNOR, 1980) which have the following composition:

Name of Chemicals	Quantity used	Manufactured by
$Ca(NO_3)_2 \cdot 4H_2O$	40.00 mg/L	BIOAGRI BIOTECNOLOGIA AGRICOLA S/C LTDA, Piracicaba, SP
KNO_3	100.00 mg/L	
$MgSO_4 \cdot 7H_2O$	30.00 mg/L	
K_2HPO_4	40.00 mg/L	
$Cu\ SO_4 \cdot 5H_2O$	1.50 µg/L	
$(NH_4)_6Mo_7O_{24} \cdot 4H_2O$	3.00 µg/L	
$Zn\ SO_4 \cdot 7H_2O$	3.00 µg/L	
$Mn(NO_3)_2 \cdot 4H_2O$	3.00 µg/L	
$C_6H_5FeO_7 \cdot 5H_2O$	0.81 mg/L	
$FeSO_4$	31.25 µg/L	
$NaHCO_3$	150.00 mg/L	

[redacted]

3.4.2 Test organisms

[redacted]

3.4.3 Test system

[redacted]

3.4.4 Test conditions

[redacted]

3.4.5 Duration of the test

[redacted]

3.4.6 Test parameter

[redacted]

3.4.7 Sampling

[redacted]

3.4.8 Monitoring of TS concentration

[redacted]

3.4.9 Statistics

[redacted]

4 RESULTS

4.1 Limit Test

[redacted]

4.1.1 Concentration

[redacted]

4.1.2 Number/ percentage of animals showing adverse effects		[redacted]	
4.2	**Results test substance**		
4.2.1	Initial concentrations of test substance	[redacted]	
4.2.2	Actual concentrations of test substance	[redacted]	
4.2.3	Growth curves	[redacted]	
4.2.4	Concentration / response curve	[redacted]	
4.2.5	Cell concentration data	[redacted]	
4.2.6	Other observed effects	[redacted]	
4.3	**Results of controls**	[redacted]	
4.4	**Test with reference substance**	[redacted]	
4.4.1	Concentrations	[redacted]	
4.4.2	Results	[redacted]	
	5 APPLICANT'S SUMMARY AND CONCLUSION		
5.1	**Materials and methods**	[redacted]	
5.2	**Results and discussion**		X
5.2.1	NOEC	0.0056 mg/l	
5.2.2	LOEC	0.01 mg/l	
5.2.3	EC_{50}	(72 h): 0.058 mg/l and (96 h): 0.021 mg/l	
5.3	**Conclusion**	[redacted]	
5.3.1	Reliability	[redacted]	
5.3.2	Deficiencies	[redacted]	

	Evaluation by Competent Authorities
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Materials and Methods	[redacted]
Results and discussion	[redacted]
[redacted]	[redacted]
Reliability	[redacted]
Acceptability	[redacted]
Remarks	[redacted]
	COMMENTS FROM ...
Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

[redacted]

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

[redacted]

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

[redacted]

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

[redacted]

Section 7.4.1.4 Annex Point IIA7.4	Inhibition to microbial activity (aquatic)	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	Technically not feasible [ ] Scientifically unjustified [x]	
Limited exposure [x]	Other justification [ ]	
Detailed justification:	[redacted]	

Section 7.4.1.4 Annex Point IIA7.4	Inhibition to microbial activity (aquatic)
	[redacted]
Undertaking of intended data submission [ ]	No data submission intended
	Evaluation by Competent Authorities
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Evaluation of applicant's justification	[redacted]
Conclusion	[redacted]
Remarks	
	COMMENTS FROM OTHER MEMBER STATE *(specify)*
Date	*Give date of comments submitted*
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A7.4.2 Annex Point IIAVII.7.5	Bioconcentration	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ] Limited exposure [x]	Technically not feasible [x] Other justification [ ]	Scientifically unjustified [x]
Detailed justification:	[redacted]	

Section A7.4.2 Annex Point IIAVII.7.5	Bioconcentration
	toxicological effect depends on the amount of uptake and rather special [redacted]
Undertaking of intended data submission [ ]	No data submission intended
	Evaluation by Competent Authorities
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Evaluation of applicant's justification	Exposure to STP and surface water is negligible if AIP is used as intended. [redacted]
Conclusion	[redacted]
Remarks	
	COMMENTS FROM OTHER MEMBER STATE *(specify)*
Date	*Give date of comments submitted*
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A7.4.3.3 Annex Point IIIAXIII.2.3	Bioaccumulation in aquatic organisms	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	Technically not feasible [x] Scientifically unjustified [x]	
Limited exposure [x]	Other justification [ ]	
Detailed justification:	[redacted]	

Section A7.4.3.3 Annex Point IIIAXIII.2.3	**Bioaccumulation in aquatic organisms**
	[redacted]
Undertaking of intended data submission [ ]	No data submission intended
	Evaluation by Competent Authorities
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Evaluation of applicant's justification	[redacted]
Conclusion	[redacted]
Remarks	
	COMMENTS FROM OTHER MEMBER STATE *(specify)*
Date	*Give date of comments submitted*
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A7.4.3 Annex Point IIIAXIII.2.3.4	Effects on aquatic organisms, further studies	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA *As outlined in the TNsG on data requirements, the applicant must always be able to justify the suggested exemptions from the data requirements. The justifications are to be included in the respective location (section) of the dossier.* *If one of the following reasons is marked, detailed justification has to be given below. General arguments are not acceptable*	Official use only
Other existing data [ ] **Limited exposure [X]**	**Technically not feasible [X]** **Scientifically unjustified [X]** **Other justification [ ]**	
Detailed justification:	[redacted]	
Undertaking of intended data submission [ ]	*Give date on which the data will be handed in later (Only acceptable if test or study is already being conducted and the responsible CA has agreed on the delayed data submission.)*	
	Evaluation by Competent Authorities	
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	
Evaluation of applicant's justification	[redacted]	
Conclusion	[redacted]	
Remarks		
	COMMENTS FROM OTHER MEMBER STATE *(specify)*	
Date	*Give date of comments submitted*	
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*	
Conclusion	*Discuss if deviating from view of rapporteur member state*	
Remarks		

Section A7.5.1.1 Inhibition to microbial activity (terrestrial)

Annex Point IIA7.4

Official use only

		1 REFERENCE
1.1	**Reference**	[redacted] Studies on the effects of Phostoxin on the activity of the soil microflora (translation), [redacted]
1.2	**Data protection**	No
1.2.1	Data owner	Detia Freyberg GmbH
1.2.2	Companies with letter of access	
1.2.3	Criteria for data protection	No data protection claimed
		2 GUIDELINES AND QUALITY ASSURANCE
2.1	**Guideline study**	[redacted]
2.2	**GLP**	[redacted]
2.3	**Deviations**	[redacted]
		3 MATERIALS AND METHODS
3.1	**Test material**	[redacted]
3.1.1	Lot/Batch number	[redacted]
3.1.2	Specification	[redacted]
3.1.3	Purity	[redacted]
3.1.4	Composition of Product	[redacted]
3.1.5	Further relevant properties	[redacted]
3.1.6	Method of analysis	[redacted]
3.2	**Reference substance**	[redacted]
3.2.1	Method of analysis for reference substance	[redacted]
3.3	**Testing procedure**	[redacted]

Section A7.5.1.1 **Inhibition to microbial activity (terrestrial)**

Annex Point IIA7.4

3.3.1 Soil sample / inoculum / test organism

[redacted]

3.3.2 Test system

[redacted]

3.3.3 Application of TS

[redacted]

Section A7.5.1.1 **Inhibition to microbial activity (terrestrial)**

Annex Point IIA7.4

3.3.4 Test conditions

[redacted]

3.3.5 Test parameter

[redacted]

3.3.6 Analytical parameter

[redacted]

3.3.7 Duration of the test

[redacted]

3.3.8 Sampling

[redacted]

3.3.9 Monitoring of TS concentration

[redacted]

3.3.10 Controls

[redacted]

3.3.11 Statistics

[redacted]

4 RESULTS

4.1 Range finding test

[redacted]

4.1.1 Concentration

4.1.2. Effect data

4.2 Results test substance

[redacted]

Section A7.5.1.1 **Inhibition to microbial activity (terrestrial)**

Annex Point IIA7.4

4.2.1	Initial concentrations of test substance	[redacted]
4.2.2	Actual concentrations of test substance	[redacted]
4.2.3	Growth curves	[redacted]
4.2.4	Cell concentration data	[redacted]
4.2.5	Concentration/ response curve	[redacted]
4.2.6	Effect data	[redacted]
4.2.7	Other observed effects	[redacted]
4.3	**Results of controls**	[redacted]
4.4	**Test with reference substance**	[redacted]
4.1.1	Concentrations	[redacted]
4.1.2	Results	[redacted]

5 APPLICANT'S SUMMARY AND CONCLUSION

5.1	**Materials and methods**	[redacted]
5.2	**Results and discussion**	The following results were achieved.

(a) Dehydrogenase activity:

Mean value and dispersion in mg triphenyl formazan (TPF)/100 g dry soil weight as well as deviations in per cent for control purposes

X

Section A7.5.1.1 **Inhibition to microbial activity (terrestrial)**

Annex Point IIA7.4

During the first month soil 1 showed an increase in the dehydrogenase activity due to the moistening of the soil that had been received in relatively dry condition.

The formazan solvent-extraction after 56 days partly yielded 3 solvent layers. This was due to the unsatisfactory blending of the solvents. The sampling was, therefore, repeated on day 63; the 56-day values were not integrated. The activity of the microflora in soil 1 was reduced by approx. 29% by the treatment with Phostoxin but recovered steadily during the course of the test and was completely regenerated on day 83. The deviations from untreated soil were always within range II of the diagram of MALKOMES (1985). There was practically no deviation found in soil 2 from the untreated control soil.

Section A7.5.1.1 **Inhibition to microbial activity (terrestrial)**

Annex Point IIA7.4

[redacted]

Section A7.5.1.1 **Inhibition to microbial activity (terrestrial)**

Annex Point IIA7.4

[redacted]

The nitrification activity of the microflora in soil 1 was inhibited for a fortnight under the influence of the test substance. Thereafter a fast recovery was noted which could be considered completely after 28 days by comparing it with the control soil. Soil 2 showed no inhibition of nitrification.

5.2.1	NOEC	15.9 mg/kg dry soil after a period of 83 days
5.2.2	EC_{10}	Not observed
5.2.3	EC_{50}	Not observed
5.3	**Conclusion**	[redacted]
5.3.1	Reliability	[redacted]
5.3.2	Deficiencies	[redacted]

Section A7.5.1.1 Inhibition to microbial activity (terrestrial)

Annex Point IIA7.4

	Evaluation by Competent Authorities
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Materials and Methods	[redacted]
Results and discussion	[redacted]
Conclusion	[redacted]
Reliability	[redacted]
Acceptability	[redacted]
Remarks	
	COMMENTS FROM ...
Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Results and discussion	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A7.5.1.1 Inhibition to microbial activity (terrestrial)

Annex Point IIA7.4

[redacted]

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	
[redacted]	[redacted]
[redacted]	[redacted]
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[redacted]	[redacted]
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[redacted]	[redacted]
[redacted]	
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

[redacted]

Section A7.5.1.1 Inhibition to microbial activity (terrestrial)

Annex Point IIA7.4

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	
[redacted]	
[redacted]	[redacted]
[redacted]	[redacted]

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[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	
[redacted]	[redacted]
[redacted]	[redacted]

[redacted]

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Section A7.5.1.2 Annex Point IIIAXIII.3.2	Earthworm, acute toxicity test	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [X]	**Technically not feasible [ ]**	**Scientifically unjustified [X]**
Limited exposure [X]	**Other justification [ ]**	
Detailed justification: **Acute toxicity to earthworms** [redacted]		
Undertaking of intended data submission [ ]		
Evaluation by Competent Authorities		
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	2006-06-20	
Evaluation of applicant's justification	[redacted]	
Conclusion	[redacted]	
Remarks		
	COMMENTS FROM OTHER MEMBER STATE	
Date		
Evaluation of applicant's justification		

Section A7.5.1.2 Annex Point IIIAXIII.3.2	Earthworm, acute toxicity test
Conclusion	
Remarks	

Section A7.5.3 Annex Point IIIAXIII.1	Effects on birds	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA *As outlined in the TNsG on data requirements, the applicant must always be able to justify the suggested exemptions from the data requirements. The justifications are to be included in the respective location (section) of the dossier.* *If one of the following reasons is marked, detailed justification has to be given below. General arguments are not acceptable*	Official use only
Other existing data [X]	**Technically not feasible** [ ] **Scientifically unjustified** [X]	
Limited exposure [X]	**Other justification** [ ]	
Detailed justification:	[redacted]	
Undertaking of intended data submission [ ]	*Give date on which the data will be handed in later (Only acceptable if test or study is already being conducted and the responsible CA has agreed on the delayed data submission.)*	
	Evaluation by Competent Authorities	
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	
Evaluation of applicant's justification	[redacted]	
Conclusion	[redacted]	
Remarks		
	COMMENTS FROM OTHER MEMBER STATE *(specify)*	
Date	*Give date of comments submitted*	
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*	
Conclusion	*Discuss if deviating from view of rapporteur member state*	
Remarks		

Section 7.5.4.1 Annex Point IIIAXIII.3.1	Toxicity to honeybees and other non-target arthropods	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [X] Limited exposure [X]	Technically not feasible [ ] Other justification [ ]	Scientifically unjustified [X]
Detailed justification:	[redacted]	
Undertaking of intended data submission [x]	Information on effects on the pest organisms *Ephestia elutella*, *Plodia interpunctella*, *Prostephanus truncates* and *Trogoderma granarium* are submitted with this document.	

Section 7.5.4.1 Annex Point IIIAXIII.3.1	Toxicity to honeybees and other non-target arthropods
Evaluation by Competent Authorities	
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Evaluation of applicant's justification	[redacted]
Conclusion	[redacted]
Remarks	
	COMMENTS FROM OTHER MEMBER STATE
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A7.5.5 Annex Point IIAVII.7.5	Bioconcentration, terrestrial	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	Technically not feasible [ ] Scientifically unjustified [x]	
Limited exposure [x]	Other justification [ ]	
Detailed justification:	[redacted]	

Section A7.5.5 Annex Point IIAVII.7.5	Bioconcentration, terrestrial
	[redacted]
Undertaking of intended data submission [ ]	No data submission intended
	Evaluation by Competent Authorities
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Evaluation of applicant's justification	[redacted]
Conclusion	[redacted]
Remarks	
	COMMENTS FROM OTHER MEMBER STATE *(specify)*
Date	*Give date of comments submitted*
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*

Section A7.5.5 Annex Point IIAVII.7.5	Bioconcentration, terrestrial
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A7.5.6 Annex Point IIIAXII.3	Effects on other terrestrial non-target organisms	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA *As outlined in the TNsG on data requirements, the applicant must always be able to justify the suggested exemptions from the data requirements. The justifications are to be included in the respective location (section) of the dossier.* *If one of the following reasons is marked, detailed justification has to be given below. General arguments are not acceptable*	Official use only
Other existing data [X]	**Technically not feasible [ ]**	**Scientifically unjustified [X]**
Limited exposure [X]	**Other justification [ ]**	
Detailed justification:		

Section A7.5.6 Annex Point IIIAXII.3	Effects on other terrestrial non-target organisms
[redacted]	
Undertaking of intended data submission [ ]	*Give date on which the data will be handed in later (Only acceptable if test or study is already being conducted and the responsible CA has agreed on the delayed data submission.)*
	Evaluation by Competent Authorities
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Evaluation of applicant's justification	[redacted]
Conclusion	[redacted]
Remarks	
	COMMENTS FROM OTHER MEMBER STATE *(specify)*
Date	*Give date of comments submitted*
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A7.5. Annex Point IIIAXIII.3	Effects on terrestrial organism	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	**Technically not feasible [ ]** **Scientifically unjustified [x]**	
Limited exposure [x]	**Other justification [ ]**	
Detailed justification:	The target area is humidified soil in deeper layers (below 30 cm depth). [redacted]	

Section A7.5. Annex Point IIIAXIII.3	Effects on terrestrial organism
	[redacted]
Undertaking of intended data submission [ ]	No data submission intended
	Evaluation by Competent Authorities
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]

Section A7.5. Annex Point IIIAXIII.3	Effects on terrestrial organism
Evaluation of applicant's justification	[redacted]
Conclusion	[redacted]
Remarks	
	COMMENTS FROM OTHER MEMBER STATE *(specify)*
Date	*Give date of comments submitted*
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A8 Measures necessary to protect man, animals and the environment

Official use only

The information supplied in Annex A/8 should at least meet the requirements of the Safety Data Sheets Directive. The Safety Data Sheets should reflect the contents of Annex B where applicable.

If different measures are necessary for the active substance and its formulations this should be stated in different dossiers.

Specifications in the TNsG on data requirements (chapt.2 A 8) should be taken into account

For more detailed information about the expected contents of this form see TNsG Dossier Preparation Doc. III-A Section A8

Subsection (Annex Point)		
8.1		**Recommended methods and precautions concerning handling, use, storage, transport or fire (IIA8.1)**
8.1.0	**Methods and precautions concerning placing on the market**	The active ingredient is processed at our production site in Germany and further production sites outside the EU. (see Doc III-A Section A1 and A2) The packaging of the product is gastight and the material is not affected by the product. .(see Doc III-A Section A3) According to European legislation, the product has to be sold, bought and handled only by trained and certified personnel / users: In Germany the conditions to get a permission for the use of the product are regulated in the TRGS 512 ("Begasungen") and the administrative procedures concerning selling and buying of dangerous goods are regulated in a special directive ("Gefahrstoffverordnung"). In other European Countries the regulations are equal. For more details please see Appendix to Section 8.1.0.
8.1.1	**Methods and precautions concerning production, handling and use of the active substance and its formulations**	For handling and use of the product see: B8.1.1 **For the production of the active ingredient at the German production site:** Engineering controls: Mixing and filling cabines are closed systems and working without personnel. Dust and gases are continuously sucked of. Administrative procedures: Specific training of workers (yearly) Monitoring of the production process by the quality assurance unit Respiratory protective equipment is obligatory in this part of the production. PPE: protective gloves (leather) protective shoes flame resistant clothing (NOMEX) protective glasses

Section A8 Measures necessary to protect man, animals and the environment

Official use only

respiratory protective equipment: mask (Auer 3 S), filter (88 BST Auer)

For the formulation of the product:

Engineering controls: Dust and gases are continuously sucked of.

MAK value is continuously monitored.

Administrative procedures: Specific training of workers (yearly)

Monitoring of the production process by the quality assurance unit

PPE: protective gloves

8.1.2 Methods and precautions concerning storage of the active substance and its formulations

For the active substance and for the formulation:

Follow local regulations for the storage of dangerous goods (for Germany "TRGS 514"). For more details please see Appendix to Section 8.1.2.

Administrative procedures: Instruction of the workers, yearly

Regular emergency exercices

Alarm system

Do not store together with flammable substances, substances which need other extinguishing media, fertilizers with ammonium nitrate, organic peroxides, gases in pressure vessels (excluding fire extinguishers)

Type and material of containers: Aluminium bottles

Temperature regime: store in a cool, dry and well ventilated place.

Obviate contact with water, acids and ambient humidity.

Do not store in buildings where human beings or domestic animals reside.

Do not store together with food or feed.

8.1.3 Methods and precautions concerning transport of the active substance and its formulations

Road-/rail transport acc. to ADR/RID:

class: 4.3 (6.1), UN 1397, PG: I

Description of goods: Aluminium phosphide

Labels: Dangerous when wet 4 = main risk

Toxic = subsidiary risk

Red (warning) board: starting 20 kgs net weight

Remarks: limited quantities acc. to chapter 3.4 not possible

Sea transport acc. to IMDG-Code

class: 4.3 (6.1) UN-No.: 1397 Packing Group I

Proper shipping name: ALUMINIUM PHOSPHIDE

Section A8 Measures necessary to protect man, animals and the environment

Official use only

Labels: Dangerous when wet 4 = main risk
Toxic = subsidiary risk

EmS-Code: F-G, S-N

Air transport acc. to IATA-DGR/ICAO-TI

See transport and packaging instructions: 487

Proper shipping name: Aluminium phosphide

Remarks: max. weight 1 kg/inner packaging, 15 kg/outer packaging cargo aircraft only

Transport by barge acc. to ADN/ADNR see road transport

Mailings: not allowed

8.1.4 Methods and precautions concerning fire of the active substance and its formulations

Suitable extinguishing media: the product itself does not burn; extinguish fires in the vicinity with dry sand or powder and than with CO_2

Extinguishing media that must not be used for safety reasons: water, extinguishers containing water

Special protective equipment for firefighting: no special firefighting equipment is nescessary, the usual equipment in case of fire, including respiratory equipment, is sufficient.

8.2 In case of fire, nature of reaction products, combustion gases, etc. (IIA8.2)

In case of fire hazardous combustion gases are formed: caustic phosphoric acid aerosols (phosphoric pentoxide).

8.3 Emergency measures in case of an accident (IIA8.3)

8.3.1 Specific treatment in case of an accident, e.g. first-aid measures, antidotes, medical treatment if available

Inhalation: in case of headache, dizziness, fealing 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®) spray, a dexamethasone (Auxiloson®) spray).

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.

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

Ingestion: Induce vomiting (but NOT if the person is unconscious), consult a physician

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®) spray or a dexamethasone (Auxiloson®) spray) available

No antidote is available for phosphine/phosphide poisoning. Early

Section A8 Measures necessary to protect man, animals and the environment

Official use only

		recognition and management of the poisoning is essential.
8.3.2	**Emergency measures to protect the environment**	Aluminium phosphide and phosphine are very rapidly decomposed in the environment (see 8.4.1-8.4.3)
8.4		**Possibility of destruction or decontamination following release in or on the following: (a) Air; (b) Water, including drinking water; (c) Soil (IIA8.4)**
8.4.1	**Possibility of destruction or decontamination following release in the air**	Phosphine decomposes in the atmosphere within 5-28 hours. No risk for the atmosphere can be expected. (see also Doc III-A.2.10)
8.4.2	**Possibility of destruction or decontamination following release in water, including drinking water**	On contact with water aluminium phosphide develops gaseous phosphine, which decomposes in water with a half-life of approx. 4 - 5 days. Phosphine has a low potential to bioaccumulate in aquatic organisms.
8.4.3	**Possibility of destruction or decontamination following release in or on soil**	On contact with soil humidity aluminium phosphide develops gaseous phosphine, which decomposes in soil with a half-life of approx. 6 hours. The distribution and mobility behaviour there is no risk for a contamination of groundwater.
8.5		**Procedures for waste management of the active substance for industry or professional users e.g. possibility of re-use or recycling, neutralisation, conditions for controlled discharge, and incineration (IIA8.5)**
8.5.1	**Possibility of re-use or recycling**	not possible
8.5.2	**Possibility of neutralisation of effects**	n. a.
8.5.3	**Conditions for controlled discharge including leachate qualities on disposal**	For substance / preparation / residues: waste code #: 061301 (according to Guideline 2001/118/EC) Recommendation: only degassed material should be disposed of under observation of the prevailing regulations (waste code #: 060316) Under normal circumstances practical no residues for disposal will occur during intended use.
8.5.4	**Conditions for controlled incineration**	n. a.
8.6		**Observations on undesirable or unintended side-effects, e.g. on beneficial and other non-target organisms (IIA8.6)**

Section A8 Measures necessary to protect man, animals and the environment

		Official use only
	Aluminium phosphide is very toxic to non-target organisms, but the special conditions of use exclude contact (see Section B8).	
8.7	**Identification of any substances falling within the scope of List I or List II of the Annex to Directive 80/68/EEC on the protection of groundwater against pollution caused by certain dangerous substances (IIA8.7)**	

Evaluation by Competent Authorities	
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	
Materials and methods	
Results and discussion	
Conclusion	
Reliability	
Acceptability	
Remarks	
Date	
Results and discussion	
Conclusion	
Reliability	
Acceptability	
Remarks	

Appendix to Section 8.1.0
Extract of the German regulation TRGS 512 "Fumigations" (edition January 2007) concerning the conditions to get a permission for the use of the product:

unauthorized translation!

4. Permission, certificate of competence, technical expert knowledge

4.1 Permission

(1) The permission according to Number 3, Section 1 is granted to whoever

- as an applicant possesses the required reliability and, in so far as he heads the handling of the fumigants named in Number 1, Section 1 and 2, a certificate of competence according to Number 4.2 and
- has available to him holders of a certificate of competence in sufficient quantity.

Each change in the holders of the certificate of competence must be announced to the competent authority immediately.

(2) The permission and the certificate of competence according to Number 4.2 can be granted for a limited period, under certain conditions and, in particular, limited to particular types of fumigation activities. Conditions can also be imposed subsequently.

(3) In case of inexperienced fumigators or the employment of new fumigation technologies temporary permission can be granted provided that the applicant has available to him a sufficient number of persons with technical expert knowledge in training. In addition a certified training institution must supervise the first four fumigations.

(4) The necessary reliability for granting permission must be demonstrated by an official certificate of good conduct (reference O)

(5) An applicant has available to him a sufficient number of holders of a certificate of competence if he employs
- at least four holders of certificates of competence in the case of fumigations with sulphuryl difluoride, hydrogen cyanide or preparations forming hydrogen cyanide,
- at least two holders of certificates of competence in the case of fumigations with hydrogen phosphide or preparations forming hydrogen phosphide,
- at least one holder of a certificate of competence in the case of soil fumigations with preparations forming hydrogen phosphide.

(6) By applying for permission exclusively for the fumigation of transport units, it is sufficient to present two holders of the appropriate, valid certificates of competence according to Number 4.2. In this case, the permission is to be limited to this particular type of fumigation.

4.2 Certificate of competence

(1) The competent authority grants a certificate of competence to whoever

1. possesses the necessary reliability for handling the fumigants named in Number 1, Section 1 and 2,
2. proves by means of a certificate issued by an authorized physician according to § 15, Section 3 of the Hazardous Substance Ordinance that no reason exists to make him appear unsuited, neither physically nor mentally, to handle the fumigants named in Number 1, Section 1 and 2,
3. proves that he possesses the necessary expert knowledge and sufficient experience in fumigations and

4. is at least 18 years old.

(2) The necessary reliability must be demonstrated by an official certificate of good conduct (reference O).

(3) The medical examination to check the demands shall include the following tests:
- Assessment of the sense of smell and the ability to distinguish colours according to the recommendation of the Federal Ministry of Labour and Social Affairs for the performance of aptitude tests for holders of a certificate of competence (Federal Labour Gazette, issue 12/95, p. 41).
- Suitability for respiratory protection with a full-face mask with gas filter (GUV – G 26/group 2) during fumigations with hydrogen phosphide and/or hydrogen cyanide,
- Suitability for respiratory protection with a self-contained breathing apparatus (GUV – G 26/group 3) during fumigations with sulphuryl difluoride,

if no valid examination certificate is available (see Appendix 1 e).

The test for suitability for respiratory protection can be dispended with in the case of the restriction of the certificate of competence to pest control in the open air.

(4) The certificate of competence is to be limited to a maximum of 6 years and expires prematurely if the holder interrupts using the approved fumigants for more than two years. For certificates of competence for fumigations according to Annex 1c, the conditions given in Clause 1 apply to activities with fumigated transport units.

(5) The certificate of competence lapses if, according to Section 1, No. 2, a new certificate is not presented to the competent authority at the latest 6 years since the issuance of the certificate.

(6) In addition to the certificate according to Section 1, No. 2, a precondition for each extension of the certificate of competence is proof of successful participation in a further training course according to Annex 1b that is recognized by the competent authority. Section 5 applies accordingly.

4.3 Technical expert knowledge

(1) Proof of technical expert knowledge according to Number 4.2, Section 1, No. 3 is provided by whoever presents a certificate relating to participation in a course recognized by the competent authority for the intended activity in which an examination is passed. The certificate of competence is to be limited according to the proof of expert knowledge that is furnished.

(2) The participants of the course according to Annex 1a to c are imparted to the knowledge of performing fumigations without endangering human health and the environment.

(3) The course (see Annex 1a-c) must conclude with a theoretical and a practical examination. The examination can also be taken, either entirely or in part, at a subsequent date. The theoretical examination must be taken in writing according to the requirements of Annex 1d. Oral examination questions can be asked in addition.

(4) The examination must be taken before a representative of the competent authority in whose area the course is held, in the presence of a representative of the institution that holds the course. The result of the examination must be documented.

(5) A certificate showing the type of knowledge that has been conveyed is to be issued to the applicant for successful participation in the course. The certificate must be signed by the representative from the competent authority and the representative of the body running the course.

(6) In cases of restriction to individual areas of use the duration of the course can be shortened accordingly.

(7) The following is to be regarded as sufficient experience:

a) The participation in a minimum number of fumigations with each of the fumigants and in each case in the areas of use (e.g. fumigation of silo cells, rooms, stacks of sacks, flat stores, transport containers, ships) to which the certificate of competence that is applied for relates. (first two areas of use = at least 4 fumigation each; then at least 2 fumigations each).
b) Approximately 12-18 months practice under instruction of a head of fumigation. A period less than that required according to clause 1 may be sufficient in the case of limitation of the certificate of competence to preparations forming hydrogen phosphide or hydrogen cyanide, and areas of use with less hazardous potential (e.g. stocks with grain, stationary fumigation facilities or containers).
c) Proof of training as a first-aider.

One-off participation in a relevant fumigation is regarded as sufficient experience for pest control in the open air.

Extract of the German Hazardous Substances Ordinance (Gefahrstoffverordnung - GefStoffV) of 23 December 2004

The German Hazardous Substances Ordinance is a body of rules and regulations relating to hazardous materials. It contains stipulations in respect of handling, distribution, labelling, employee training and storage.
Link to public version:
http://www.baua.de/en/Topics-from-A-Z/Hazardous-Substances/Hazardous-Substances-Ordinance.html?_nnn=true&_nnn=true

Annex III (5)
Fumigation

5.1 Scope
Annex III (5) shall apply to the following: the use of fumigants specified in Annex III (5.2)
(1) first sentence (1-6); any other fumigants that are approved by the competent authority; fumigation activities involving highly toxic or toxic substances and preparations that are classified as biocidal products and are therefore subject to the approval procedure mandated by No. IIa of the Chemicals Act (Chemikaliengesetz).

5.2 Application restrictions
(1) Fumigation involving non-biocidal highly toxic or toxic substances or preparations that are not subject to the approval or registration procedure for fumigants mandated by No. IIa of the Chemicals Act (Chemikaliengesetz) shall be realized solely with the following substances and preparations:
1. Monobromethane (methyl bromide)
2. Hydrogen cyanide (prussic acid), as well as substances or preparations that are used to produce or vaporize hydrogen cyanide or volatile hydrogen cyanide compounds
3. Ethylene oxide
4. Hydrogen phosphide and substances or preparations that produce hydrogen phosphide
5. Formaldehyde and substances or preparations that are used to produce or vaporize formaldehyde
6. Sulfuryl difluoride.
The substances and preparations enumerated in items 1-6 above shall be used as fumigants solely under the conditions specified in paragraphs 2-4. The prohibition regarding items 1-6 shall not apply to packaged quantities of substances and preparations which, upon being used compliantly, produce a maximum of 15 grams of hydrogen phosphide and are released for pest control purposes. Sentence 2 shall likewise apply to any other fumigant that is authorized by the competent authority. Monobromethane shall be used as a fumigant within the meaning of item 1
(1) solely for purposes of (a) wood protection in buildings and (b) products destined for export to countries that specifically prescribe fumigation with monobromethane.
(2) Fumigation using the fumigants mentioned in paragraph 1 shall be subject to authorization by the competent authority. Item 1 shall not apply to fumigants used for medical purposes in program controlled gas sterilizers insofar as (a) the capacity of such sterilizer is less than one cubic meter and (b) the criteria for

specific procedures and materials elaborated by the Hazardous Substances Commission (Ausschuss für Gefahrstoffe) and promulgated by the Federal Ministry of Economics and Labor are fulfilled.
(3) Substances and preparations shall be used as fumigants within the meaning of paragraph 1 first sentence items 1, 2, and 4 insofar as such substances and preparations have been approved by the Federal Office of Consumer Protection and Food Safety (Bundesamt für Verbraucherschutz und Lebensmittelsicherheit). In the case of any non-approved substance or preparation, the competent authority shall be entitled to request that an assessment be realized by the Federal Institute for Risk Assessment (Bundesinstitut für Risikobewertung) or the Federal Institute for Materials Research and Testing (Bundesanstalt für Materialforschung).
(4) Any vessel that is in transit shall be fumigated solely with hydrogen phosphide, and shipping containers shall be fumigated solely with hydrogen phosphide and monobromethane. Ethylene oxide shall be used on vessels in transit solely in conjunction with fully automatic fumigation systems.

5.3 General regulations pertaining to fumigation
(1) Applicants for authorization to realize fumigation activities shall
1. possess the requisite dependability and, insofar as such applicant is in charge of handling fumigants, a certificate of competence pursuant to paragraph 2; or
2. shall have access to adequate numbers of holders of a competence certificate pursuant to paragraph 2. The competent authority shall be notified forthwith in the event any competence certificate changes hands.
(2) The competent authority shall grant a competence certificate insofar as the applicant
for such certificate
1. possesses sufficient dependability to realize activities with the fumigants mentioned in Annex III (5.2);
2. possesses a doctor's certificate pursuant to Article 15 (3) attesting to the fact that the applicant is not physically or mentally unfit to handle the envisaged fumigants;
3. demonstrates that the applicant is sufficiently knowledgeable to realize fumigation
activities;
4. is 18 years of age or older.
Expert knowledge pursuant to Article 5.3 (2) (3) shall be demonstrated by presentation of a certificate proving that the applicant has successfully passed a specialized course and the attendant examination for the envisaged activity, insofar as such course is accredited by the competent authority. The scope of the competence certificate shall be consistent with the proof of knowledgeability submitted by the applicant. The examination is to be taken before a representative of the competent authority.
(3) Authorization pursuant to paragraph 1 and the competence certificate pursuant to paragraph 2 shall be subject to restrictions and prohibitions, including restrictions regarding specific types of installations. The competent authority shall be entitled to promulgate supplementary requirements following issuance of the authorization.
(4) The competence certificate shall become null and void if a new doctor's certificate is not submitted to the competent authority within five years of the date of issuance of the original certificate pursuant to paragraph 2 (2).
5.3.1 General requirements pertaining to fumigation
(1) Fumigation shall be realized in such a way as to avoid placing the health and safety of any person at risk.
(2) A fumigation supervisor shall oversee all fumigation activities and shall possess a competence certificate that qualifies such supervisor for the envisaged activity. Supervision shall be deemed sufficient for fumigation in fully automatic gas sterilizers with less than one cubic meter capacity that do not fall within the scope of the exemption specified in No. 5.2 (2) insofar as a fumigation (sterilization) supervisor is responsible for the sterilizers that are being operated in a physically contiguous space. Fumigation shall be realized solely by persons that possess expert knowledge within the meaning of Annex 5.3 (2). Application of the foregoing to unskilled workers within the meaning of No. 5.3 (2) shall be excluded.
(3) Fumigation in fumigation facilities shall be realized solely in such facilities that
1. are gas-tight;
2. are ventilated in a manner that is safe for human beings and the environment
3. are installed in a space that is not frequented continuously by human beings. The foregoing shall not apply to fumigation realized in fully automatic gas sterilizers in sterile goods work areas.
5.3.2 Notification requirements
(1) Any person or company that intends to realize non-medical fumigation outside of a stationary fumigation facility using any fumigant specified in No. III (5.2) shall notify the competent authority in writing a minimum of one week prior to such fumigation (24 hours in advance for fumigation onboard ships). The competent authority shall be entitled to grant exemptions insofar as Good Reason exists for doing so.

(2) The notification pursuant to No. III (5.3.2) shall indicate the following:
1. The name of the fumigation supervisor
2. The date of the envisaged fumigation
3. A layout plan showing the location of the fumigation activities, the entity that is to be fumigated, and data regarding the goods to be fumigated in such entity
4. The designation of the envisaged fumigant and the quantity thereof that is to be used
5. The envisaged starting date and time of the fumigation procedure
6. The envisaged termination date and time of the fumigation procedure
7. The envisaged authorization date for resumed use of the fumigated space
8. Date and time of any leakage test that may be required.

5.3.3 Fumigation report
(1) A report regarding fumigation using any fumigant specified in No. III (5.2) shall be compiled and a copy of such report shall be sent to the competent authority upon request. Such report shall indicate at a minimum the type and quantity of fumigant used, the location at which it was used, the personnel involved in the fumigation, the date and time the fumigation procedure began and ended, and the authorization date for resumed use of the fumigated space.
(2) If any road vehicle, rail vehicle, tank, transport box or any other transport container is fumigated, the fumigation report shall also describe the fumigation equipment used and the disposal method for the fumigant residues. Such report shall be submitted to the customer for which the fumigation was realized.
5.3.4 Organizational measures
(1) The key phases of fumigation shall be realized in the presence of the following persons at a minimum: the fumigation supervisor, the holder of the applicable competence certificate (for fully automatic gas sterilizers only) and a person that meets the requirements laid down in No. III (5.3.1) (2) fourth sentence. Fumigation using hydrogen cyanide, sulfuryl difluoride or bromomethane shall be realized solely by holders of the applicable competence certificate.
(2) Any packaged and ready-made fumigation preparation that produces hydrogen phosphide shall be used solely under the direct supervision of a sufficient number of persons pursuant to No. III (5.3.1) (2), as well as assistants that have received appropriate instruction, insofar as the health of such personnel allows for the realization of fumigant preparation and deployment activities.
5.3.5 First aid
Adequate first aid equipment and medication shall be stored at any location at which fumigation activities are carried out and shall be maintained in a serviceable condition.

5.4 Regulations pertaining to the fumigation of any area, road vehicle, rail vehicle, tank, transport box or any other transport container located in an enclosed area or docked vessel
(1) The users of any building or other enclosed space shall be provided with at least 24 hours written notice prior to the commencement of any fumigation activities involving the use of any fumigant specified in No. 5.2, insofar as such fumigation is not realized at a healthcare facility. Such notice shall warn building users of any possible risk arising from such fumigant.
(2) Prior to the commencement of any fumigation activity, signs bearing the warnings specified in No. 5.6 (2) as well as the name, address and phone number of the fumigation provider shall be posted at all entrances to any area that is to be fumigated.
(3) A fumigation supervisor shall be available to take any necessary action from the time the fumigant is brought into the area that is to be fumigated until such time as the fumigation supervisor deems an area and the objects therein safe for use.
(4) The fumigation supervisor shall deem an area and the objects therein safe for use only insofar as an appropriate proof procedure has demonstrated that the fumigant employed in such area no longer poses a health or safety risk.

5.5 Special provisions pertaining to fumigation equipment
(1) The fumigation supervisor shall check to ensure that all fumigation equipment is leakproof. A log of all fumigation activities shall be maintained.
(2) All fumigation equipment with the exception of fully automatic gas sterilizers shall be operated at normal or low pressure.

5.6 Special provisions pertaining to road vehicles, rail vehicles, tanks, transport boxes and any other transport container
(1) Any road vehicle, rail vehicle, tank, transport box or any other transport container that is fumigated out of doors shall be positioned a minimum of 10 meters from the nearest building. The fumigation supervisor is to verify the gas-tightness of such objects, seal such objects, ensure that they are kept sealed and gas-tight during the entire fumigation process, and post a warning sign that is readily visible from all sides as well as the name, address and phone number of the fumigation provider. The warning sign shall be rectangular, at least 300 millimeters wide and at least 250 millimeters long. Its lettering shall be black, at least 25 millimeters high, and shall be inscribed on a white background.
(2) The warning sign shall contain the following at a minimum:
1. The icon for "toxic"
2. The word GEFAHR [Danger]
3. The words "DIESE EINHEIT IST BEGAST" [Under fumigation]
4. The name of the fumigant
5. The date and time of fumigation
6. The words "ZUTRITT VERBOTEN" [Entry prohibited]
The content and layout of the sign shall be as follows:

GEFAHR1
DIESE EINHEIT IST BEGAST2
MIT [name of fumigant*]
SEIT [date, time*]
ZUTRITT VERBOTEN3

*enter the applicable information
(3) Any fumigated road vehicle, rail vehicle, tank, transport box or any other transport container shall only be transported insofar as (a) the fumigation supervisor has determined that the fumigant that was used is not a safety or health hazard and (b) the container has been sealed and a warning sign pursuant to paragraph 5.6 (2) has been affixed to the container.
(4) Shipping containers containing fumigant shall only be transported insofar as the loading area for such containers are equipped with a mechanical ventilation system that prevents fumigant concentration from exceeding occupational exposure limit values. Any ship carrying fumigated containers shall be equipped with appropriate gas measuring devices and instructions for the use thereof, as well as appropriate first aid equipment.
(5) If a knowledgeable person pursuant to No. 5.3 (2) is unavailable at the time a fumigated road vehicle, rail vehicle, tank, transport box or any other transport container is to be opened, such object shall be opened under the supervision of a knowledgeable person who has the capacity to identify and assess any health or safety risk to workers
1(Danger)
2(Under fumigation)
3(Entry prohibited)

or third parties and who is authorized to have the necessary safeguards implemented in regard to such potential health or safety risk.

5.7 Regulations pertaining to the fumigation of ships in transit
(1) Fumigation shall be realized on ships only insofar as (a) the appropriate permit has been obtained from the competent authority and (b) two or more knowledgeable persons within the meaning of No. 5.3 (2) (3) are present during the transit period.
(2) After a reasonable amount of fumigation time has elapsed and prior to departure from the harbor, the fumigation supervisor shall provide the ship's captain with the following information:
1. All areas that have been fumigated, as well as other areas that will be off limits while the ship is in transit, are to be identified
2. Any technical changes that will be realized onboard in order to realize fumigation activities
3. A statement to the effect that all fumigated areas are sufficiently gas-tight
4. A statement to the effect that all areas adjacent to any fumigated areas are free of fumigant.