		5 APPLICANT'S SUMMARY AND CONCLUSION	
5.1	**Materials and methods**	Hydrogen cyanide liquid stabilized (purity of 98%) was tested for its inhibition potential effect to the growth of green algae (*Scenedesmus subspicatus Brinkmann)* in accordance with Annex to Decree of Ministry of Environment No. 299 /1998 Coll., Part 103, Method III, Growth Inhibition of Alga; Test Guideline No. 201, Alga, Growth Inhibition Test, OECD, 1984 and Method C.3, Alga Inhibition Test, EEC Directive 67/548/EEC, Annex V. Algal culture were exposed under static conditions to a negative control and eight test substance concentrations in a range – finding test and to a negative control (8 replicates) and seven test substance concentrations (3 replicates each). Whole test was completly repeated once more. The cell density in each flask was determined at 0, 24, 48 and 72 hours after the start of the test and the cell density measured by microscope. Based on the algae growth rate and the growth of biomass for each time interval were calculated. Test shows no significant deviations from the given above guidelines.	
5.2	**Results and discussion**	Based on nominal test substance concentratios, the inhibition of growth of biomass E_bC_{50} (0 – 72h) for hydrogen cyanide liquid stabilised (purity 98 %) was found to be 0.04 $mg.l^{-1}$. The algae growth rate E_rC_{50} (0 – 72 h) was found to be 0.12 $mg.l^{-1}$. According to Recommendation No. 25/1999 Coll. of the Goverment of Czech Republic test substance, hydrogen cyanide liquid stabilized is classified as very toxic to aqueous organisms – algae growth. No abnormalities were observed. Decrease in test substance concentrations at the end of test was less than 20 % of that one at the beginning of test. The lowest concentration tested has no observed effect on the growth of algae. The highest concentration tested inhibited growth more than 50 relative to the control. Deviation in pH of solutions at the beginning and end of the test was not more than 1.5 units.	
5.2.1	NOEC	Not determined	
5.2.2	E_rC_{50} (0 – 72h)	0.12 $mg.l^{-1}$	
5.2.3	E_bC_{50} (0 – 72h)	0.04 $mg.l^{-1}$	
5.3	**Conclusion**	Based on nominal concentrations and under the static conditions of the test, the inhibition of growth of biomass E_bC_{50} (0 – 72h) for hydrogen cyanide liquid stabilized (purity of 98%) was found to be 0.04 $mg.l^{-1}$. The algae growth rate E_rC_{50} (0 – 72h) was found to be 0.12 $mg.l^{-1}$. The NOEC was not determined.	
5.3.1	Reliability	1	
5.3.2	Deficiencies	No deviations from the guidelines were recorded. Test substance was in a liquid state and stabilized.	

Table 1: Test organisms

Criteria	Details
Species	Frashwater green algae *Scenedesmus subspicatus Brinkmann 1953*
Strain	SAG 86/81
Source	Autotroph organisms collection of the Botanic Institute of Academy of Sciences, Czech Republic, Třeboň, 15 Oct 2001
Laboratory culture	Yes
Method of cultivation	The stock culture of the green algal species was transferred from the sloped agar tubes and grown in conical flasks containing 100 ml of the nutrient medium, incubated at laboratoty temperature with indirect dailylight and once a weak transfered to fresh medium. All nutrient solutions are prepared using filter – sterilized distilled water of the conductivity less than 5 µS. cm^{-1}. The inoculation and transfer of algae suspensions is done under sterile conditions.
Pretreatment	The pre – cultures are inoculated with 1x 10^4 cells. ml^{-1}. For the test, the algae from the exponentially growing pre – culture was used, incubated under the conditions of the test for tree days and then exposed to the various test concentrations. The density of the pre – culture cells was measured immediately before the beginning of the test and the required volume of the inoculum was calculated.
Initial cell concentration	Each test culture started with a cell concentration of 1x 10^4 cells. ml^{-1}.

Table 2: Test system

Criteria	Details
Volume of culture flasks	Conical Erlenmayer flasks provided with the air-transmition stopper filled with each 50 ml of the test suspension (containing chosen volume of the test substance stock solution, 5 ml of nutrient stock solution, calculated volume of algal culture and distilled water to make-up the volume).
Culturing apparatus	The Erlenmayer flasks were placed illuminated platform of the shaking apparatus, exposed in an incubator at 23 ± 2 °C under continuous illumination and shaking for 72 hours.
Light quality	Illumination was provided by fluorescent lamps of white type, min 6,000 lux, max 10,000 lux, continuous light.
Procedure for suspending algae	By mixing on the shaking apparatus (40 mm swing length, 4 degree frequency), without the aeration.
Number of vessels/ concentration	3 vessels/ concentration; 3 controls without test substance; in each case 6 vessels. Whole test constituted of two runs.

Table 3: Test conditions

Criteria	Details
Test temperature	Definitive test: 1st run: 22.5 °C; 2nd run: 22.0 – 22.5 °C
pH	Measured at the beginning of the test and at 72 hours
Aeration of dilution water	No aeration during the test.
Light intensity	Definitive test: 1st run: 6,200 – 6,300 lux 2nd run: 6,300 – 6,400 lux
Photoperiod	Continuous light

Table 4: Test conditions (monitoring of concentrations)

Test run	Beginning of test calculated concentration HCN [mg.l^{-1}]	Beginning of test measured concentration HCN [mg.l^{-1}]	End of test measured concentration HCN [mg.l^{-1}]	Difference of measured concentration HCN [%]
1st run	0.30	0.32	0.29	9.4
1st run	0.12	0.13	0.11	15.4
2nd run	0.30	0.30	0.26	13.3
2nd run	0.12	0.13	0.11	15.4

Table 5(1): Algal density data *Time of measurement: 25 Feb 02*

Nominal Test-Substance Concentration [mg/l]	Inhibition of algae growth (× 10^{-4} cells/mL)			pH measured		Mean growth inhibition	
	24 h	48 h	72 h	pH 0 h	pH 72 h	I_r (%)	I_A (%)
Range – finding test							
Control	3.7500	37.5000	175.0000	-	-	-	-
2.55	0.6250	0	0			100	100
1.20	0.6250	0.6250	0.6250			100	100
0.75	1.8750	0.6250	0.6250			100	99.8
0.60	1.2500	0.6250	1.2500			95.9	100
0.30	1.2500	1.2500	2.5000			82.0	99.0
0.15	2.5000	5.6250	10.0000			55.2	91.6
0.045	3.7500	13.1250	104.3750			9.9	47.3
0.015	4.3750	20.6250	131.8750			5.2	30.0

Table 5(2): Algal density data *Time of measurement: 4March 02*

Nominal Test-Substance Concentration [mg/l]	Algal cell density (× 10^{-4} cells/mL)			pH measured		Mean growth	
	24 h	48 h	72 h	pH 0 h	pH 72 h	I_r (%)	I_A (%)
1st run							
Definitive test							
Control	7.0833	45.6250	180.2083	7.78	8.87	-	-
0.30	0.8333	3.1250	4.1667	7.81	7.94	72.3	97.5
0.15	1.2500	5.0000	7.5000	7.80	7.95	61.3	94.7
0.12	2.0833	8.9583	12.2917	7.80	8.02	51.4	89.5
0.09	2.9167	10.4167	26.6667	7.80	8.19	37.0	82.8
0.06	3.7500	18.9583	37.7500	7.80	8.63	17.3	59.3

0.03	5.2083	22.0833	83.9583	7.79	8.70	14.5	52.4
0.015	5.8333	46.2500	166.4583	7.78	8.97	1.7	5.3

Table 5(3): Algal density data *Time of measurement: 11March 02*

Nominal Test-Substance Concentration [mg/l]	Algal cell density ($\times 10^{-4}$ cells/mL)			pH measured		Mean growth	
	24 h	48 h	72 h	pH 0 h	pH 72 h	I_r (%)	I_A (%)
2. run							
Definitive test							
Control	5.8333	32.9167	172.0833	7.88	9.25	-	-
0.30	1.4583	2.2917	4.5833	7.95	7.76	70.3	97.1
0.15	2.5000	3.1250	6.0417	7.93	7.79	65.1	95.0
0.12	2.7083	4.1667	9.7917	793	7.84	55.8	92.4
0.09	3.1250	8.1250	18.1250	7.93	7.94	43.6	85.4
0.06	3.3333	12.9167	34.3750	7.92	8.25	31.4	74.7
0.03	3.7500	17.7083	75.6250	7.91	9.07	16.3	53.6
0.015	4.3750	23.1250	133.3333	7.90	9.20	5.2	25.0

Table 6: Effect data

Test run	E_bC_{50} (0 – 72h) $mg.l^{-1}$	95% c.I.	Approximation function	E_rC_{50} (0 – 72h) $mg.l^{-1}$	95% c.I.	Approximation function
1	**0.04**	0.03 – 0.05	log linear	**0.12**	0.10 – 0.14	4. degree polynom
2	**0.03**	0.03 – 0.04	Gryck-Haustein	**0.11**	0.09 – 0.12	2. degree polynom

Table 7: Validity criteria for algal growth inhibition test according to OECD Guideline 201

	Fulfilled	Not fullfilled
Cell concentration in control cultures increased at least by a factor of 16 within 3 days	x	
Concentration of test substance ≥80% of initial concentration during test	x	
pH of solutions at the beginning and end of the test does not deviate more than 1.5 unit.	x	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A7.4.1.4 Annex Point IIA VII.7.4 and IIIA VII.3		**Inhibition to microbial activity (aquatic)**	
		1 REFERENCE	**Official use only**
1.1	**Reference**	Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: **ATSDR** (2004, Toxicological profile of cyanide) (**DOC IV_1**) and Hazardous Substance Data Bank (**HSDB**), National Library of Medicine´s TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* (**DOC IV_2**). Suplement literature: **1.** Klecka GM, Landi LP, Bodner KM. 1985. Evaluation of the OECD activated sludge, respiration inhibition test. Chemosphere 14:1239-1251. **2.** Malaney GW, Sheets WD, Quillin R. 1959. Toxic effects of metallic ions on sewage microorganisms. Sewage Ind Wastes 31:1909-1915. **3.** Raef SF, Characklis WG, Kessick MA, et al. 1977a. Fate of cyanide and related compounds in aerobic microbial systems--II. Microbial degradation. Water Res 11:485-492. **4.** EPA. 1978c. Reviews of the environmental effects of pollutants. V. Cyanide. Cincinnati, OH: U.S.Environmental Protection Agency Health Effects Research Laboratory, Office of Research and Development. PB289920. **5.** EPA. 1979. Cyanides. In: Water-related environmental fate of 129 priority pollutants. Vol. 1.Washington, DC: U.S. Environmental Protection Agency, Office of Water Planning and Standards, Office of Water and Waste Management. EPA440479029a. PB80204373. 12-1-12-12. **6.** EPA. 1992f. U.S. Environmental Protection Agency. Fed Regist 57:26248. **7.** Gaudy, A.F, Gaudy, E.T, Feng,Y.J, et al. 1982. Treatment of cyanide waste by the extended aeration process. J Water Pollut Control Fed 54:153-164. **8.** Pettet, A.E.J, Mills, E.V. 1954. Biological treatment of cyanides with and without sewage. J Appl Chem 4:434-444. **9.** Richards, D.J., Shieh, W.K. 1989. Anoxic-oxic activated-sludge treatment of cyanides and phenols. Biotechnol Bioeng 33:32-38. **10.** Shivaraman, N., Kumaran, P., Pandey, R.A., et al. 1985. Microbial degradation of thiocyanate, phenol and cyanide in a completely mixed aeration system. Environ Pollut Ser A 39:141-150. **11.** Akcil, A., Mudder, T., 2003. Microbial destruction of cyanide wastes in gold mining: Process review. Biotechnol Lett 25:445-450 **12.** Verschueren, K. Handbook of Environmental Data on Organic Chemicals. 3rd ed. New York, NY: Van Nostrand Reinhold Co., 1996., p. 1119	
1.2	**Data protection**	No	
1.2.1	Data owner	Unrestricted data	
1.2.2	Companies with letter of access		
1.2.3	Criteria for data protection	Data submitted to the CA MS after 13 may 2000 for the purpose of entry existing active substance into Annex I/IA	

		2 GUIDELINES AND QUALITY ASSURANCE	
2.1	**Guideline study**	No presented	
2.2	**GLP**	No	
2.3	**Deviations**	Not available	
		3 MATERIALS AND METHODS	
3.1	**Test material**	Hydrogen cyanide	
3.1.1	Lot/Batch number	Not relevant.	
3.1.2	Purity		
3.1.3	Further relevant properties	Water solubility, vapour pressure, chemical stability, dissociation constant, and biodegradability: see Physical and chemical properties	
3.1.4	Method of analysis	Various methods	
3.2	**Preparation of TS solution**		
3.3	**Reference substance**	No	
3.4	**Testing procedure**		
3.4.1	Dilution water		
3.4.2	Test organisms	*Actinomyces, Alcaligenes, Arthrobacter, Bacillus, Micrococcus, Neisseria, Paracoccus, Pseudomonas*, and *Thiobacillus*	
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	Monitoring of TS concentration		
3.4.8	Statistics		
		4 RESULTS	
4.1	**Results test substance**		
4.1.1	Effect data		
4.1.2	Other effects	No	
4.2	**Results of controls**		
4.2.1	N°/ % of animals showing adverse effects		
4.3	**Test with ref. substance**	Not performed	

		5 APPLICANT'S SUMMARY AND CONCLUSION	
5.1	**Materials and methods**		
5.2	**Results and discussion**	Cyanide ion is toxic to microorganisms at concentrations as low as 5–10 mg/L (**1, 2**), acclimation increases tolerance to this compound (**3**). A number of pure cultures of microorganisms degrade low concentrations of cyanide under both aerobic and anaerobic conditions (**4, 5, and 6**). Mixed microorganisms in sewage sludge or activated sludge acclimated to cyanide also significantly biodegrade concentrations up to 100 mg/L of most simple and complex cyanides (**7, 8, 9, and 10**). A number of microorganisms have been identified that are capable of uptake, conversion, sorption, and/or precipitation of the cyanide ion, cyanate, and thiocyanate, including species of the genera, *Actinomyces, Alcaligenes, Arthrobacter, Bacillus, Micrococcus, Neisseria, Paracoccus, Pseudomonas*, and *Thiobacillus* (**11**). Some of these species, for example *Pseudomonas*, are capable of using the cyanide ion and thiocyanate as the sole source of carbon and nitrogen and therefore, are particularly effective at cyanide degradation. **Inhibition of microbiological activity** **25mg.l^{-1} HCN without obvious impact (12)**	
5.3	**Conclusion**	Cyanide ion is toxic to microorganisms at concentrations as low as 5–10 mg/L, acclimation increases tolerance to this compound. A number of pure cultures of microorganisms degrade low concentrations of cyanide under both aerobic and anaerobic conditions. A number of microorganisms have been identified that are capable of uptake, conversion, sorption, and/or precipitation of the cyanide ion, cyanate, and thiocyanate, including species of the genera, *Actinomyces, Alcaligenes, Arthrobacter, Bacillus, Micrococcus, Neisseria, Paracoccus, Pseudomonas*, and *Thiobacillus*. **Inhibition of microbiological activity** **25mg. l^{-1} HCN without obvious impact (12)**	
5.3.1	Reliability	2	
5.3.2	Deficiencies	None	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A7.4.2 **Annex Point IIA VII.7.5**	**BIOCONCENTRATION**	Official use only
References:	1. Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: **ATSDR** (2004, Toxicological profile of cyanide) (**DOC IV_1**) and Hazardous Substance Data Bank (**HSDB**), National Library of Medicine´s TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* (**DOC IV_2**). 2. Institute for Health and Consumer Protection, European Chemicals Bureau, Technical Guidance Document on Risk Assessment, Part II, p. 126 (**DOC IV_74**) 3. JACC No 53, Cyanides of Hydrogen, Sodium and Potassium, and acetone Cyanohydrin (CAS No. 74-90-8, 143-33-9, 151-50-8 and 75-86-5), ECETOC JACC REPORT No. 53 European Centre for Ecotoxicology and Toxicology of Chemicals Volume I (**DOC IV_3**) 4. JACC No 53, Cyanides of Hydrogen, Sodium and Potassium, and acetone Cyanohydrin (CAS No. 74-90-8, 143-33-9, 151-50-8 and 75-86-5), ECETOC JACC REPORT No. 53 European Centre for Ecotoxicology and Toxicology of Chemicals, Volume II (**DOC IV_4**) Supplement literature from ATSDR and HSDB: 5. EPA. 1979. Cyanides. In: Water-related environmental fate of 129 priority pollutants. Vol. 1.Washington, DC: U.S. Environmental Protection Agency, Office of Water Planning and Standards, Office of Water and Waste Management. EPA440479029a. PB80204373. 12-1-12-12. 6. EPA. 1980a. Water quality criteria documents: Availability. U.S. Environmental Protection Agency. Fed Regist 45:79318-79379. 7. EPA. 1985a. Ambient water quality for cyanide - 1984. Washington, DC: Office of Water Regulations and Standards, Criteria and Standards Division. EPA440584028. PB85227460. 8. EPA. 1992f. U.S. Environmental Protection Agency. Fed Regist 57:26248. 9. EPA. 1978c. Reviews of the environmental effects of pollutants. V. Cyanide. Cincinnati, OH: U.S.Environmental Protection Agency Health Effects Research Laboratory, Office of Research and Development. PB289920. 10. Hansch, C. et al; Exploring QSAR. Hydrophobic, Electronic, and Steric Constants. ACS Prof Ref Book. Heller SR, consult. ed., Washington, DC: Amer. Chem. Soc. p. 3 (1995) 11. Meylan, W.M. et al; Environ. Toxicol. Chem. 18: 664-72 (1999) 12. Franke, C. et al; Chemosphere 29: 1501-14 (1994)	
Detailed justification:	The biocidal product URAGAN D2 is the same as the technical grade active substance. There are no data available to indicate that simple metal cyanides and hydrogen cyanide bio concentrate in aquatic organisms (**5,6,7,8**). Due to its physical properties (K_{ow} < 5) hydrogen cyanide is not expected to bio concentrate. Bioconcentration factor (BCFs) of 0.735 can be calculated for hydrogen	

	cyanide, using the equation of Technical Guidance Document on Risk Assessment, part II, (p. 126) (**1**). log BCF = 0.85 . log Kow – 0.70 (Log Kow = 0.66) Log BCF = 0.85. 0.66 – 0.70 = - 0.139 BCF = 0.735 There is no evidence of bio magnification of cyanides in the food chain (**9**). Accumulation of cyanide in food webs is not expected, considering the rapid detoxification of cyanide by most species and the lethal effects of large doses of cyanide (**9**). There is no indication of bio magnification of cyanides in aquatic and terrestrial food chains (**9**). Because of the high toxicity of cyanides at high doses and rapid metabolism at low doses, bio magnification of cyanide in animals seems unlikely. Cyanide is not accumulated or stored in any mammalian species that have been studied. An estimated BCF of 3 was calculated for hydrogen cyanide, using a log Kow of -0.25(**10**) and a regression-derived equation (**11**). According to a classification scheme (**12**), this BCF suggests the potential for bio concentration in aquatic organisms is low.	
Undertaking of intended data submission [ ]	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A7.4.3.2 **Annex Point IIIA XIII.2.2**	**Effects on reproduction and the growth rate on an appropriate species of fish**	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	**Technically not feasible [ ]** **Scientifically unjustified [x]**	
Limited exposure [ ]	**Other justification [ ]**	
Detailed justification:	According to the TNsG on data requirements (p. 74) Chronic aquatic toxicity data would be necessary for this product type, unless the release is intermittent or the intended use is limited to closed spaces with insignificant aquatic release. The use is limited to closed spaces; release to the environment is possible only indirectly, through precipitation from air and is negligible.	
Undertaking of intended data submission		

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A7.4.3.4 **Annex Point IIIA XIII.2.4**	**Effects on reproduction and growth rate with an invertebrate species**	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	**Technically not feasible [ ]** **Scientifically unjustified [x]**	
Limited exposure [ ]	**Other justification [ ]**	
Detailed justification:	According to the TNsG on data requirements (p. 74) Chronic aquatic toxicity data would be necessary for this product type, unless the release is intermittent or the intended use is limited to closed spaces with insignificant aquatic release. The use is limited to closed spaces; release to the environment is possible only indirectly, through precipitation from air and is negligible.	
Undertaking of intended data submission		

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A7.5.1.1 **Annex Point IIA VII.7.4**	**Inhibition to microbiological activity**	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	**Technically not feasible [ ]** **Scientifically unjustified [x]**	
Limited exposure [ ]	**Other justification [ ]**	
Detailed justification:	According to the TNsG on data requirements (p. 74) the test is necessary if a large release to the terrestrial compartment is possible. The use is limited to closed spaces, hydrogen cyanide is used in the form of a gas for fumigation; the main environmental compartment it enters is air. Hydrogen cyanide tends to ascend to higher levels of the atmosphere. Direct release to the terrestrial compartment is not expected.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A7.5.1.2 **Annex Point IIIA XIII.3.2**	**Acute toxicity test to earthworms or other soil non-target organisms**	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	**Technically not feasible [ ]** **Scientifically unjustified [x]**	
Limited exposure [ ]	**Other justification [ ]**	
Detailed justification:	According to the TNsG on data requirements (p. 74) the test is necessary if a large release to the terrestrial compartment is possible. The use is limited to closed spaces, hydrogen cyanide is used in the form of a gas for fumigation; the main environmental compartment it enters is air. Hydrogen cyanide tends to ascend to higher levels of the atmosphere. Direct release to the terrestrial compartment is not expected.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A7.5.1.3	**Acute toxicity to plants**	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	**Technically not feasible [ ]** **Scientifically unjustified [x]**	
Limited exposure [ ]	**Other justification [ ]**	
Detailed justification:	According to the TNsG on data requirements (p. 74) the test is necessary if a large release to the terrestrial compartment is possible. The use is limited to closed spaces, hydrogen cyanide is used in the form of a gas for fumigation; the main environmental compartment it enters is air. Hydrogen cyanide tends to ascend to higher levels of the atmosphere. Direct release to the terrestrial compartment is not expected.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A7.6 **Annex Point IIA VII.7.8 and IIIA XII.4 and IIIA XIII.5**	**Summary of ecotoxicological effects, fate and behaviour of the substance in the environment**	
This section number is covered by Document IIA		

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

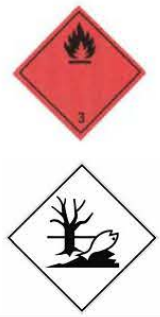
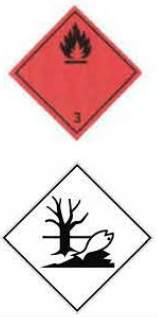
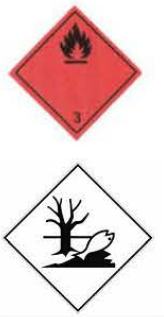
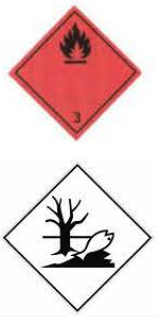
Section A8 **Annex Point IIA VIII**	**MEASURES NECESSARY TO PROTECT MAN, ANIMALS AND THE ENVIRONMENT**	

Section A8.1 **Annex Point IIA** **VIII.8.1**	**Recommended methods and precautions concerning handling, use, storage, transport or fire**		
Recommended methods and precautions concerning handling, use	Evacuate affected area. Use personal protective equipment. Prevent contact with the substance. In any case prevent inhaling. Provide fresh air supply into and sufficient ventilation of closed spaces. Prevent contamination of the environment; prevent the substance from entering surface waters and sewerage.		
Use	The product may be handled only by trained personnel! Use personal protective equipment.		
	Respiratory protection	Self-contained breathing apparatus or face mask equipped with B2 filter or equivalent (e.g. combined filter A2B2E2K2P3D).	
	Eye protection	Self-contained breathing apparatus or face mask equipped with B2 filter or equivalent (e.g. combined filter A2B2E2K2P3D).	
	Hand protection:	Use standard chemical resistant (nitrile) rubber gloves or full chemical suite.	
	Skin protection:	Gastight chemical protective clothing and rubber boots	
Storage	Due to the danger or accidental release of HCN, only personnel authorised to handle HCN may enter the storeroom, and only with a gasmask ready to use. Structure of the storeroom must comply with ČSN 73 0804 standard (fire safety) with annexes and changes permitted by ČSN 65 0201 or equivalent national fire safety standard.		
Fire	Fire fighting measures Fragmented water stream, powder A-B-C-D Firefighters must be equipped with protective chemical suite and self-contained breathing apparatus		

Transport

UN 1614 HYDROGEN CYANIDE, STABILIZED
containing less than 3% water and absorbed in a porous inert material

	Road transport ADR	***Rail transport RID***	***Maritime transport IMDG:***	***Air transport ICAO/IATA:***
UN number:	1614	1614	1614	1614
Class:	6.1	6.1	6.1	6.1
Classification:	TF1	TF1		
Packing group:	I	I	I	I
Label:				
Safety mark:				

				
Note:			HYDROGEN CYANIDE, STABILIZED Marine pollutant: yes EmS No.:	Hydrogen cyanide, stabilized PAO: not permitted CAO: not permitted
Additional information: ***Limited quantity transport:*** NOT PERMITTED. ***Below-the-limit quantity transport:*** NOT PERMITTED				

Section A8.2 **Annex Point IIA** **VIII.8.2**	**In case of fire, nature of reaction products, combustion gases, etc.**	
	Liquid evaporates very quickly. Vapours form explosive mixtures with air. Liquid hydrogen cyanide tends to polymerise. This reaction is catalysed by alkali substances and generates ammonia, which further promotes polymerisation – with possible occurrence of explosions. When diluted with water, explosive and highly toxic mixtures of vapours and air form above the water surface. Combustion gases: carbon monoxide, carbon dioxide, nitrogen oxides.	

Section A8.3 **Annex Point IIA** **VIII.8.3**	**Emergency measures in case of an accident**	
	Evacuate affected area. Use personal protective equipment Prevent contact with the substance. In any case prevent inhaling. Provide fresh air supply into and sufficient ventilation of closed spaces. Observe common occupational and hygienic regulations. If contamination occurs, inform competent authorities. If possible, pump spilled hydrogen cyanide back to a secure and gas-tight vessel. Protect from sparks and flames. Dilute HCN puddles with water and treat with caustic soda and green vitriol. If the spill enters sewerage, add approx. 10kg green vitriol and 2kg 100% NaOH to each kg of spilled HCN in the place of release. If soil contamination occurs, the soil must be detoxified and removed. When carrying out the above mentioned, use personal protective equipment (see 8.1) Ventilate the contaminated area.	

Section A8.4 Annex Point IIA VIII.8.4	**Possibility of destruction or decontamination following release in or on the following: (a) air, (b) water, including drinking water, (c) soil**	
	Air: When the escape into the atmosphere of hydrocyanic acid will be diluted in the atmosphere Persistence half-life of hydrogen cyanide in the atmosphere is 1-3 years. The most important mechanism of its degradation in air is a reaction with hydroxyl radicals released by air moisture. **Water:** When using the method of application properly, it cannot escape into the aquatic environment. **Soil:** When using the method of application properly, it cannot escape into the soil. The ability of hydrogen cyanide to get bound to dry soil is also low.	

Section A8.5 Annex Point IIA VIII.8.5	**Procedures for waste management of the active substance for industry or professional users**	
	After the treatment has finished, empty cans and reels (free of hydrogen cyanide) shall be collected and disposed of. According to the Waste Catalogue the substance is a hazardous waste. Hand over marked packaging, incl. waste identification sheet, for disposal to a specialised company authorised to carry out such operations.	
Section A8.5.1 Annex Point IIA VIII.8.5.1	**Possibility of re-use or recycling**	
	No, hydrogen cyanide is a gas	
Section A8.5.2 Annex Point IIA VIII.8.5.2	**Possibility of neutralisation of effects**	
First aid measures		
General measures:	Upon administering first-aid it is necessary to obtain medical help immediately! Inform medical staff about first-aid administered. Ensure protection of the person administering first-aid.	
Inhalation:	Move the affected person to fresh air, remove contaminated clothing and wash, if necessary; protect from cold. At the same time, administer Nitramyl by inhalation (if available), even if the person is unconscious but breathing sufficiently: Break the vial with Nitramyl (best in a handkerchief), and place near the mouth and nose of the victim to ensure deep inhaling, alternatively administer medicinal oxygen. If the patient is not breathing, start with artificial respiration using a resuscitation apparatus (pulmotor, Saturn oxi etc.). Do not apply mouth to mouth artificial breathing – danger of poisoning for the rescuer!	
Skin contact:	Wash contaminated skin with large quantities of (preferably lukewarm) water with soap. Immediately remove contaminated clothing; if poisoning symptoms appear, follow the above instructions for inhalation exposure. Obtain medical help immediately.	

Eye contact:	Rinse with large quantities of water for 10-15 minutes. While rinsing, keep eyelids open even by using force. Always obtain immediate medical help! Inform medical staff about first-aid administered, and the fact that the affected person has handled hydrogen cyanide.	
Ingestion:	Since hydrogen cyanide is soaked in a sorbent material, ingestion is not expected. However, poisoning from clothing soaked with HCN vapours is possible.	
Other data:	If unconscious, or collapsed and vomiting, place the affected person to a recovery position on a side (to prevent vomitus aspiration). Upon administering first-aid it is necessary to obtain medical help immediately!	

Professional user	
Each group must be equipped with a first-aid box, should any poisoning occur. Apart from standard equipment, the first-aid box must also contain:	
Amylium nitrosum (inhal. ampoules, 150mg) (e.g., Nitramyl, Inhalationsampullen, Berco; Amylnitrit – Brechampullen, Thilo)	20 ampoules
OR	
medicinal oxygen	1 bottle per person in contact with HCN
CYANOKIT for i.v. treatment by trained doctors	1 packaging
The first-aid box shall be made ready to use prior to the gas filling commencement.	

Section A8.5.3 **Annex Point IIA** **VIII.8.5.3**	**Conditions for controlled discharge including leachate qualities on disposal**	
	Hydrogen cyanide is a gas, no landfill is done	

Section A8.5.4 **Annex Point IIA** **VII.8.5.4**	**Conditions for controlled incineration**	
	Hydrogen cyanide is a gas and cannot be incinerated.	

Section A8.6 **Annex Point IIA** **VIII.8.6**	**Observations on undesirable or unintended side-effected, e.g. on beneficial and other non-target organisms**	
	Due to the use pattern (i.e. fumigation in enclosed spaces) and physical properties of hydrogen cyanide, other beneficial or non-target organisms will not be exposed. Consequently, these studies are not applicable and no other data are available. There will be no exposure to wildlife. The fumigation will not leave a residue to which non-target organisms / species could be exposed to.	

Section A8.7 **Annex Point IIIA** **VIII.1**	**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 ground water against pollution caused by certain dangerous substance**	
	Hydrogen cyanide is a gas, it does not come into contact with ground water.	

	Evaluation by Competent Authorities	
Date		
Evaluation of applicant's presentation		
Conclusion		
Remarks		

Section A9 Annex Point IIA IX.	**CLASSIFICATION AND LABELLING**

Current classification	**Harmonised classification and labelling according to Annex VI to Regulation (EC) No. 1272/2008**
Hazard classification and Category Code(s)	Flam. Liq. 1; Acute Tox.1; Aquatic Acute 1; Aquatic Chronic 1
Hazard statement Code(s)	H224; H330; H400; H410
	Self-classification and labelling according to Annex VI to Regulation (EC) No. 1272/2008
Hazard classification and Category Code(s)	Flam. Liq. 1; Acute Tox.1; STOT SE 1 Aquatic Acute 1; Aquatic Chronic 1
Hazard statement Code(s)	H224; H300; H310; H330; H370 H400; H410

Labelling	
Pictogram and Signal word	 **Danger**
Hazard statements	H224 Extremely flammable liquid and vapour H300 Fatal if swallowed H310 Fatal in contact with skin H330 Fatal if inhaled H370 Causes damage to organs (brain, heart, testes) exposure: oral, dermal, inhalation H410 Very toxic to aquatic life with long lasting effects
Precautionary statement(s)	P210 Keep away from heat/sparks/open flames/hot surfaces. — No smoking. P260 Do not breathe dust/fume/gas/mist/vapours/spray. P262 Do not get in eyes, on skin, or on clothing. P281 Use personal protective equipment as required. P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P310 Immediately call a POISON CENTER or doctor/physician.
Supplementary label information	Designation of uses: Wood preservatives, Rodenticides, Insecticides, acaricides and products to control other arthropods Only for professional, trained and licensed users (fumigators). Read enclosed instructions before use.

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's proposal	
Conclusion	
Remarks	