Landesanstalt für Umweltschutz Baden-Württemberg

Ökologische Umweltbeobachtung 4

Ecotoxicological characterization of waste – Method development for determining the "ecotoxicological (H14)" risk criterion



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- R. Kostka-Rick: Ökotoxikologische Charakterisierung von Abfällen Literaturstudie, 2002.
- Fa. ÖkoTox: Durchführung von Pflanzentests mit Abfallproben, 2003.
- Fa. TÜV-Süddeutschland: Feststoff-Analytik von Abfällen, 2003.

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1 Summary

The Directive on hazardous waste 91/689/EEC names 14 criteria for the characterization of hazardous wastes. For the definition of the criterion H14, relevant for waste (ecotoxic), there are, so far, no measuring procedures and/or corresponding indications adapted to the substrate "waste". However in the future particular importance will be attributed to the criterion H14 for the estimation of the environmental hazards originating from certain types of waste.

In order to cover the time period between the enforcement of the European Waste List on 1.1.2002 and the availability of usable methods for waste probing through biotests, the Ministry for Environment and Transport Baden-Württemberg has published a Preliminary Implementation Manual (October 2002) with wich, mainly supported by chemical analysis, the ecotoxicity should be illustrated. With this the enforcement of the European Waste List should be made possible.

With this project accomplished on behalf of the Ministry for the Environment and Transport Baden-Württemberg (MET) the content of the Preliminary Implementation Manual were examined for plausibility. A literature study conducted in this context (Kostka-Rick 2002) documents the current state of research and the developments in the area of ecotoxicological waste characterization in view of the suitability for the enforcement, in particular, within the course of the European standard development.

Standardised biotest procedures and those already successfully used in other domains were employed for the ecotoxicological characterization of hazardous wastes. Besides the ecotoxicological examination of the original sample and the waste eluate, an extensive chemical analysis was also conducted.

The procedures were examined for their reproducibility, suitability as a routine test and information content, and recommendations regarding the execution of the Directive 91/689/EEC, criterion H14, concerning hazardous wastes, were derived.

The examined waste samples, predominantly determined as hazardous, demonstrated a very wide range of toxicity, from non-toxic up to very toxic. Some samples were also genotoxic. The involved procedures originating from the aquatic field proved to be suitable as well and are recommended for the ecotoxicological examination of waste eluates. Regarding the procedures for sediment examination, the fundamental suitability of the methods was shown; however the methodology must still be adapted to the testing of wastes. For the evaluation, the biotest results were classified into three classes. By means of the toxicity ranges 1-3 the wastes were divided in hazardous and/or non hazardous wastes. The classification, based on the toxicity ranges hazardous or non hazardous, did not coincide for all samples with the classification according to the Preliminary Implementation Manual of the state. The criterion H14 - ecotoxic – is only depicted by the ecotoxicological test procedures since complex samples usually contain more than one pollutant.

Based on the available investigation of 24 waste types originating from different industrial sectors with 6 different biotest procedures, it is suggested to use a minimum test battery consisting of an aquatic test procedure, the algae test, and two procedures for solid phase examination, the plant test and the bacteria contact test.

The introduction of a limit test, instead of the more complex G-value determination by means

of dilution series, reduced the test extent further and, thus, the analysis costs. With the approaches described in this study the criterion H14 of the EEC Directive 91/689/EC concerning hazardous wastes is manifestly and economically defined, and a comprehensible waste classification into the category hazardous and/or (only) non-hazardous, depending on their ecotoxicological effect, is made possible. The Directive 91/689/EEC on hazardous waste names 14 criteria - H1 to H14 – for the description of hazardous waste products. For the determination of criterion H14 (ecotoxic) there is so far no measuring method adapted to the substrate "waste" and no allowed limit value. In the appendix of the Standards of the European Committee for Standardisation (CEN 2002) ecotoxicological testing procedures are described that seem adequate for the assessment of hazardous wastes.

The ecotoxicological risk potential of waste is best described using biological test methods. Also in the wastewater directive, the ecotoxicological test methods have become more significant for the evaluation of certain wastewater types. There clear limit values are set for the assessment of toxicity of wastewater produced by the chemical industry (Appendix 22 to the wastewater ordinance based on Article 7a of the Federal Water Act).

On the national and/or international level, there are standardised test protocols for a series of biological test methods that assure reproducible results. At the present moment, other bioassays are being considered in national and /or international standardisation procedures.

The biological test method used for regulating purposes must respond to requirements such as standardisation (DIN, CEN and ISO), routine suitability, economy and reproducibility. A substantial battery of ecotoxicological tests should consist of test organisms coming from different food chain levels (destruents, producers, consumers) and capture the end points acute and chronic toxicity.

The literature study conducted within the scope of this project summarizes the current state of the research and the use of ecotoxicological test methods for the evaluation of waste toxicity (Kostka-Rick 2002). While in few cases a direct, solid-waste-oriented ecotoxicological characterization was first realized with terrestrial biotests, aquatic bioassay methods are widely used for the evaluation of waste eluates or landfill leachate. In view of the large variety of methods, a standardised procedure for the collection of waste eluates is a fundamental condition for a uniform ecotoxicological evaluation of wastes based as well on chemical analysis as on biological methods.

Besides a clear emphasis on aquatic rather than on terrestrial bioassay methods, significant differences in the handling of e.g. waste eluates used in biotests were noticed. Hereby, as well as for the optimization and determination of adequate, i.e. ecotoxicologically substantial test batteries that are also economical, a clarification is still necessary before a norm can be defined.

Numerous current developments, on the one hand in the domain of terrestrial bioassay methods which originate principally from polluted soils and sediments, and on the other hand in the miniaturisation and the rationalisation of various standard test systems - while maintaining the validation criteria - promise a rational and thus economical use for routine operation in the future.

As little experience with ecotoxicological methods for the evaluation of risk potentials of wastes exists, in this project standardised bioassay methods and those already proven in other fields (e.g. wastewater) were tested on selected waste types. In addition, two terrestrial test systems, which up to now were barely or not at all employed for the determination of waste ecotoxicity, were used. All of the samples, sediments as well as eluates, underwent a chemical analysis. The waste samples were collected thanks to the kind support of the Factory inspectorates and of the waste producers. The classification into hazardous wastes through ecotoxicological characterization is compared with the classification based on Preliminary Implementation Manual by the State of Baden-Württemberg. A methodological proposition for the realization of the criterion H14 is presented.

3 Principle of bioassays

The toxicity of waste samples and /or of waste eluates is assessed according to several dilution steps in the respective test system (Table 1). Thereby the sample is repeatedly diluted until no further toxicity can be detected.

Effect threshold

For each biological test system a test-specific effect threshold level beyond which an effect is considered toxic is fixed. It means, for example, in the luminescent bacteria test, that the light emission intensity must have decreased by at least 20 % before this effect is considered toxic. If the reduction of the light emission intensity is below 20 %, then this effect is not called a toxic effect. For the daphnia test the effect threshold is at 10 %. For the algae, luminescent bacteria, bacteria contact and plant tests the effect threshold is at 20 %.

Dilution steps

The waste eluates are diluted with dilution water, in the solid phase test the solid matter samples are diluted with the appropriate control medium (e.g. sand or standard soil).

		NA: 1: 1		
Dilution	Dilution step	Mix ratio sample	sample proportion	Diluant proportion in
	G-value	+ diluant	in test formulation	test formulation [%]
			[%]	
1:1	1	1+0	100	0
1:2	2	1+1	50	50
1:3	3	1+2	33.3	66.7
1:4	4	1+3	25	75
1:6	6	1+5	16.7	83.3
1:8	8	1+7	12.5	87.50
1:12	12	1+11	8.3	91.7

Table 1:Dilution steps in the bioassay and G-values.

The dilution step of the sample (G-value) is determined, which causes no further toxix effect in the test system (Figure 1). In the daphnia test, a G-value of 6 means that the sample is diluted in a 1:6 ratio, representing a sample proportion of 16.7 % (dilutant, water proportion of 83.3 %), and indicates no toxicity above the effect threshold of 10 %.

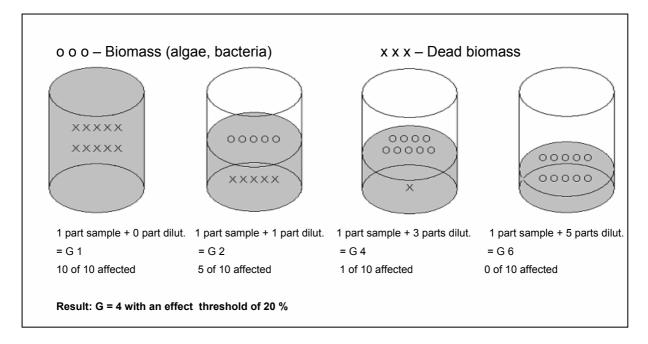


Figure 1: Principle for conducting a biotest.

In addition the EC values are indicated in the data sheets (Appendix). The EC value is, in contrast to the G-value, a calculated value that is determined from the dilution steps and the obtained effect in the biotest (e.g. by Probit analysis). The EC value stands for "effect concentration", it describes the sample concentration (= sample share in %) which causes a defined effect in the test. Thus, for example, a sample with an $EC_{20} = 25$ % achieves a 20 % effect with a sample fraction of 25 %.

4 Methodology

4.1 Sample collection and conservation

The waste samples were collected at the wasteproducing companies. The waste samples were temporarily stored at -20°C up to the time of testing. Altogether 24 waste samples were examined.

4.2 Sample preparation

The waste samples were homogenized, and appropriate sample fractions were taken for the investigation. The samples were ground and used without any additional sample preparation to carry out the solid phase test (bacteria contact test and plant test). For the solid phase test the samples were investigated starting from dilution step 2. Quartz sand was used as diluting medium for the bacteria contact test whereas standard soil was used for the plant test.

Eluate preparation according to DIN 38414 S4

For preparing an aqueous eluate, 1 part waste, corresponding to 100 g dry matter, was suspended in 1 litre water (de-ionized) in a 2000 mlglass flask (Schott). The suspension was rotated with 10 rpm in an overhead shaker for 24 h at ambient temperature. Fine particles were separated by centrifugation with 11 000 g at 20°C over 20 min, followed by filtration (0.45 μ m). The eluate was stored at 4°C in the dark up to the testing time, however no longer than 14 days.

4.3 Selection of the biological test procedures

The aqueous eluate of all waste samples was investigated by means of the miniaturized algae test, the luminescent bacteria test, the *umu*-test and the daphnia test (DIN 38412-33, EN ISO 11348-34, DIN 38415-3 and DIN 38412-30), all DIN standardised test procedures.

In addition two terrestrial test procedures, the plant test according to OECD 208A and the bacteria contact test to DIN 38412-48, were tested, procedures which until now have hardly been used and/or are not yet used for monitoring waste toxicity. The plant test according to OECD 208A is a standardised method that was employed in the main to characterize soils and contaminated sites.

Good experiences regarding reproducibility and sensitivity were made so far with the bacteria contact test, particularly in sediment investigation (Gratzer and Ahlf 1999).

All test procedures, other than the bacteria contact test, are mentioned also in Appendix B of the European standards by the European Committee for Standardisation (CEN 2002) as possible procedures for the characterization of waste ecotoxicity.

Other test procedures developed for soil and contaminated site investigations are not suitable

for animal protection reasons or because of the long test duration (Nematode test, fish test). The chironomid toxicity test (OECD Draft document 218) was not included in the investigation program, since LFU experiences have shown that it is not yet sufficiently reproducible. Solid phase testing with luminescent bacteria was foregone, since the luminescent bacteria can adsorb onto the solid particles, thus may influence the test result. For this reason the bacteria contact test with Arthrobacter globiformis was selected as additional solid phase test, since this test procedure determines the toxicity through a substrate conversion in the medium and, thus the adsorption of test bacteria onto the solid particles has no influence on the test result.

Algae test according to DIN 38412-33

In the algae test the chronically toxic effect of aqueous test material is determined by measuring the biomass production of algae. The index for algae biomass is the chlorophyll fluorescence. The test algae are, in culture usually unicellular, the green alga, *Scenedesmus subspicatus* CHODAT, representative for primary producers in the plankton. The algae test was modified and miniaturized to the point that it can be performed on a micro-plate with 24 wells (test volume 2 ml).

Daphnia test DIN 38412-30

The test organism *Daphnia magna STRAUS*, a member of the Phyllopoda order, is a part of the zooplankton in stagnant waters. As a filter of particulate organic substance, it is classified in its ecological function as a consumer of lower rank between destruents (e. g. bacteria) and

primary producers (Algae) on one side and consumers of higher rank (e. g. fish) on the other side. In the daphnia test, the acute toxic effect of aqueous test material is determined on *Daphnia magna STRAUS* after a testing time of 48 h.

Luminescent bacteria test EN ISO 11348-2

In the luminescent bacteria test the inhibition of the light emitted by the bacterium Vibrio fischeri through aqueous test material is measured. This bacterium represents the group of destruents.

Umu-test DIN 38415-3

Using the umu-test, the genotoxic potential of an environmental sample is determined. The genetically modified test organism, Salmonella typhimurium, TA1535/pSK1002 is exposed under predetermined conditions to various concentrations of the test material. Thereby the genotoxins induce, via DNA-damage, the umuCgene of the test organism which is involved in DNA-repair. The induction of the gene is detected by means of the reporter gene lacZ through the ß galactosidase activity. The induction rate of the umuC-gene is the measure for the mutagenic potential of the test material. The effect of substances whose metabolism can be activated was determined through addition of S9 (enzyme preparation from rat liver).

Bacteria contact test DIN 38412-48

The test, originally developed for sediment analysis, allows a direct ecotoxicological assessment of contaminated solid matter by measuring an enzyme activity (dehydrogenase activity) of *Arthrobacter globiformis*. The test allows that the effect of adsorbed pollutants in solid environmental samples may be estimated. The bacteria are directly incubated with the sediments, and the dye resazurine is converted, in the presence of the bacterial enzyme dehydrogenase, into resorufine, the concentration of which is measured by photometry. The results are available within a day. For determining the G-value, the samples are mixed in various quantities with the reference sediment (quartz sand). Testing starts from a sample concentration of 50 %. The G10- and G100 values are measured in order to be able to proceed to a ranking into toxicity classes.

Plant test according to OECD 208A

The effect of solid matter samples on terrestrial plants is examined by measuring the germination rate, the growth of spring length and the dry weight. The exposition time is 14-21 days. Two dicotyledon species *Brassica oleracea* (cauli-flower) and *Lycopersicum esculentum* (tomato), and one monocotyledon specie, *Avena sativa* (oat) are tested. For the definition of the G-value the waste samples are mixed in different quantities with a reference soil (standard soil of LUFA Speyer). Testing starts from a sample concentration of 50 %.

4.4 Chemical analysis

The parameters cited below were investigated in all the waste samples according to TA Siedlungsabfall (Technical Instruction on Domestic Waste). The results are listed in the data sheets in the Appendix.

Original substance analysis

Arsenic, lead, cadmium, chromium, cobalt, copper, nickel, mercury, Zinc, AOX, carbohydrate, lipophilic, TOC, benzene, toluene, ethylbenzene, xylene, total BTEX, total PAH (16 EPA - Environmental Protection Agency) and the water soluble portion.

Eluate analysis

The eluates obtained to perform aquatic bioassays were checked for the following pollutant contents:

Arsenic, lead, cadmium, chromium, copper, nickel, mercury, zinc, manganese, AOX, DOC, NH₄-N total, PAH (16 EPA), PCB, BTEX and chlorinated hydrocarbon. In addition, selected samples were measured for chromium-(VI) and long chain hydrocarbons.

Physico-chemical Parameter

In the eluates pH value, oxygen content and electrical conductivity were measured. Before performing the biological test, the pH value and the oxygen content were adjusted, when necessary, to values appropriate for the test procedure. When the eluate underwent changes, for example through precipitation or formation of a two phase system, then they were separated.

4.5 Waste samples

The waste samples were collected directly at the industrial waste producers (Table 2). The samples were stored at -20°C.

Waste code	Sample number	Waste type	Sampling
		06 05 Sludge from on-site effluent treatment	
060503	26	Sludge from on-site effluent treatment other than those	27.06.2002
	08	01 Waste from MFSU and removal of paint and varnish	
080111*	27	Waste Paint and varnish containing organic solvents or other dan- gerous substances	27.06.2002
080113*	8	Sludges from paint or varnish containing organic solvents or other dangerous substances	27.06.2002
080113*	4	Sludges from paint or varnish containing organic solvents or other dangerous substances	21.06.2002
080115*	12	Aqueous sludges containing paint or varnish containing organic solvents or other dangerous substances	12.09.2002
080115*	19	Aqueous sludges containing paint or varnish containing organic solvents or other dangerous substances	21.10.2002
080115*	1	Aqueous sludges containing paint or varnish containing organic solvents or other dangerous substances	27.06.2002
080116	3	Aqueous sludge containing paints and varnishes other than those	21.06.2002
080116	13	Aqueous sludges containing paint or varnishes other than those	12.09.2002
		10 10 Wastes from casting of non-ferrous species	
101008	6	Casting cores and moulds after metal pouring other than those mentioned, moulding sand	11.07.2002
101008	9	Casting cores and moulds after metal pouring other than those mentioned, core sand	11.07.2002

Table 2:

tested waste types, * - mark: hazardous waste according to Directive 91/689/EC.

	11 01 Wastes from chemical surface treatment and coating of metals and other materials (for ex. galvanic processes, zinc coating processes, pickling processes, etching, phosphating, alkaline degreasing and anodizing)										
110109*	2	Sludges and filter cakes containing dangerous substances, galvani- zation	16.05.2002								
110109*	30	Sludges and filter cakes containing dangerous substances	27.01.2003								
110110	28	Sludges and filter cakes other than those	16.10.2002								
110110	17	Sludges and filter cakes other than those	16.10.2002								
12 01 Wastes from shaping and physical and mechanical surface treatment of metals and plastics											
120114*	14	Machining sludges containing dangerous substances	12.09.2002								
120114*	7	Machining sludges containing dangerous substances	27.06.2002								
120116*	16	Waste blasting material containing dangerous substances	10.10.2002								
120116* and 120117	21	Waste blasting material containing dangerous substances and waste blasting material, other than	16.10.2002								
		19 01 Wastes from incineration and pyrolysis of waste									
190107*	23	Solid wastes from flue-gas treatment	15.10.2002								
190112	22	Bottom ash and slag other than those	17.10.2002								
190113	24	Fly ash containing dangerous substances	17.10.2002								
	19 08 W	astes from waste water treatment plants not otherwise specified									
190813*	18	Sludge containing dangerous substances from other treatment of industrial waste water	17.10.2002								
	19	9 10 Wastes from shredding of metal containing wastes									
191004	11	Fluff-light fraction and dust, other than those	21.05.2002								

Table 2:

tested waste types, * - Mark: hazardous waste according to Directive 91/689/EC – Follows.

5 Results

5.1 Sampling

The samples were taken directly from the waste collection containers of the varous locations. With heterogeneous waste both liquid and solid materials were sampled in order to obtain as representative a sample as possible. Eight of the twenty-four waste samples were paint and varnish residues from the automobile industry, four samples originated from metal surface treatment, two waste samples were moulds and/or sands from an aluminium foundry, three waste samples were flue gas treatment residues and/or cinders from an incineration plant, two waste samples each were treatment sludge, blasting material wastes and sludge from a wastewater treatment and a shredder light fraction. The latter originated from a shredder plant for mechanical processing of old cars and from scrap-iron of consumer goods (stove, refrigerator). All samples were photographically documented (see Appendix II).

5.2 Sample preparation

Generally the investigated waste samples were easy to process, their consistency was mostly from paste to firm and they could be broken up well. Only a few samples presented difficulties during the sample preparation. A few paint and varnish sludge and some treatment sludge had, in some cases high solvent concentrations. Particularly the paint and varnish sludge exhibited a two phase system (solid and liquid) in some cases, which was counteracted by renewed homogenization. Before testing, particles > 2 cm were removed out of sample 11 (shredder light fraction - polystyrene, plastic) and of sample 22 (rust and bottom-ash - metal parts).

The pH value of samples 24, 22, and 23 (wastes from the incineration plant) was highly alkaline, the pH value of sample 30 (sample containing lead-chromate from surface treatment) was highly acid and had to be adjusted before testing.

While diluting sample 23 (waste from the fluegas treatment) with water, the former warmed up (approx. 40°C).

Sample 1, a paint and varnish sludge sample, was liquid. This one was handled as an eluate and tested directly.

5.3 Eluate preparation

A sample (number 26, sludge from an on-site wastewater treatment) was hard to filter through a membrane filter due to the proportion of fine particles so that the filtration took several hours.

With a sample (number 27, residues of paint and varnish waste) the membrane filter dissolved due to the high solvent content in the eluated sample. Here the membrane filtration of the

sample was foregone and solely a glass fiber was used. This sample formed afterwards a two phase system with an aqueous and a solvent phase. The solvent phase was decanted, as water-insoluble phases can not be examined in the biotest.

While adjusting the pH value of the eluate - for the biotests the pH value must be in the neutral range - partly a precipitation, supposedly of heavy metal salts, occurred. These were again filtered after pH adjustment (sample 30, sludge containing lead-chromate from surface treatment, sample 24, filter dust from the incineration plant).

5.4 Biotest results

The biotest results obtained showed the large toxicity range of the samples, from non-toxic to highly toxic with a G-value of up to 80 000. The biotest results are summarized in Table 3, and are shown in comparison in Figure 2 (aquatic test systems) and Figure 3 (solid phase test). The G-values marked with a > symbol in Figure 3 indicate test results that are above the indicated G-value, but which were not determined more precisely. The individual results of the biotesting and the chemical analysis are attached in the data sheets in the Appendix.

5.4.1 Eluate

Algae test

Four of the 24 waste eluates were determined as non-toxic by means of the algae test. Sample 1 (liquid paint and varnish waste, directly tested) showed the highest toxicity with a G-value of 80 000, and sample 30 (sludge containing leadchromate from the surface treatment) with a G-value of 24 000.

Daphnia test

Three of the 24 waste eluates were determined as non-toxic by means of the daphnia test. Also in the Daphnia test the highest toxicity was detected in sample 1 with a G-value of 20 000 and in sample 30 with a G-value of 50 000.

Luminescent bacteria test

Five of the 24 waste eluates were determined as non-toxic by means of luminescent bacteria testing, the highest toxicity was also measured in sample 1 with a G-value of 6 400 and sample 30 with a G-value of 2 500.

Umu-Test

With the *umu*-test, a genotoxicity potential was determined in the eluate of sample 27 (paint and varnish waste), sample 1 (liquid paint and varnish waste) and sample 30 (treatment sludge containing lead-chromate). All other samples did not show genotoxicity.

5.4.2 Solid phase

Bacteria contact test

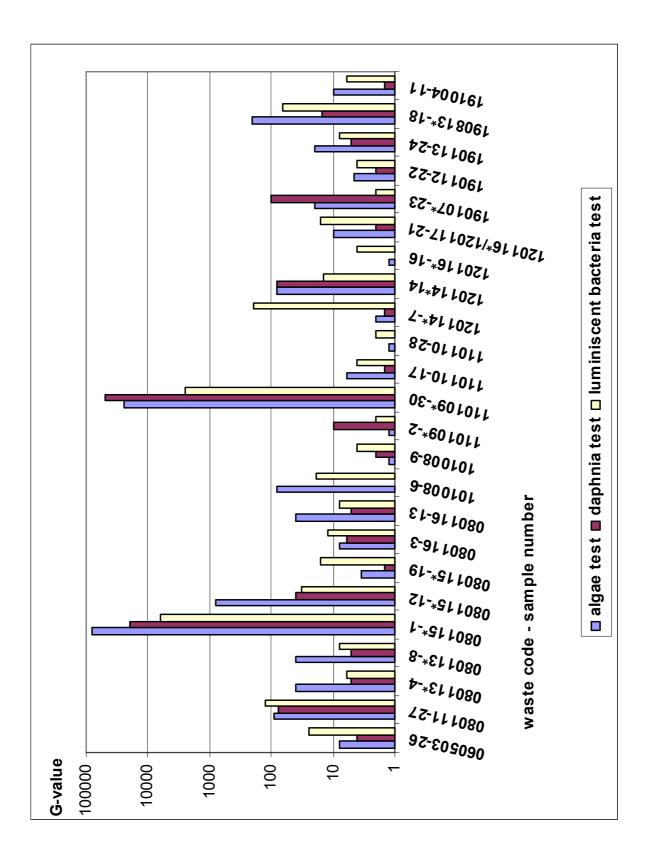
In the bacteria contact test, all samples, except sample 9 (core sand), were toxic. A statement regarding the greatest toxicity shown cannot be met, as only dilution steps 2, 10 and 100 were examined. Samples 1 (liquid paint and varnish sludge), 8, 13, 19, 4 and 12 (paint and varnish sludge), sample 6 (moulding sand), sample 16 (blasting material waste) and sample 24 (filter dust from the incineration plant) caused, in the 1:2 dilution, a de-coloration of the dye resazurine, possibly for chemical reasons, that can lead to test inaccuracy. During test preparation, sample 26 (sludge from an on-site wastewater treatment) became lumpy and flocculated.

Plant test

Sample 7 (treatment sludge) did not give a clear result in the plant test so that no G-value can be indicated. A plant toxicity was shown in all samples, except in sample 6 (moulding sand). The highest G-values were determined in sample 27 (paint and varnish waste) with a G-value of 16 384, sample 30 (sludge containing lead-chromate from the surface treatment) with a G-value of 65 536 and sample 23 (waste from the flue-gas treatment of an incineration plant) with a G-value of 2 048.

Figure 2:

Comparison of the toxicity of waste sample eluates in aquatic test systems.





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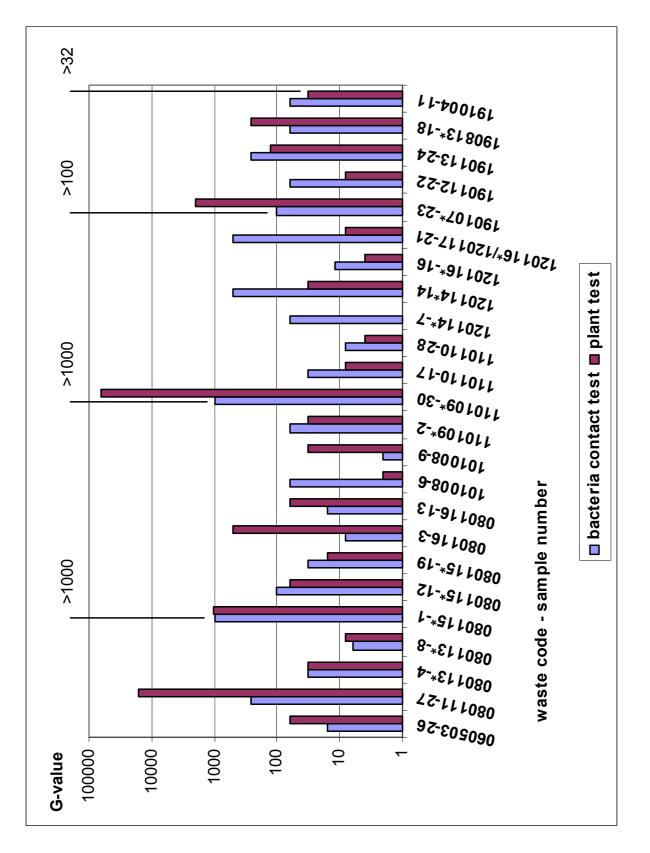


Figure 3:

Comparison of toxicity of waste samples in terrestrial test systems; >32, >1 000, >10 000 – G-value is above the indicated G-value.

5.5 Reproducibility and routine suitability of the biotest procedures

5.5.1 Investigation of the eluate – aquatic test procedure

Algae test, daphnia test, luminescent bacteria test, *umu*- test

The four applied aquatic biotest procedures showed good reproducibility within 2 weeks (sample preparation and test repeating included). Usually the G-value was confirmed or deviated by rarely more than a maximum 2 dilution steps. The four test procedures, algae test, daphnia test, luminescent bacteria test and *umu*-test, are standardised tests, according to DIN, and were well suited to the testing of the waste eluates. Only sample 7 (treatment sludge from surface treatment, waste reference 120114 *) turned out to be a sample difficult to test by the algae and plant tests due to nonreproducible results.

5.5.2 Investigation of the original sample – tests on solid phase

Plant test

In the plant test the wastes were examined in two independent batches with 3 different plant types for the three effect criteria, germinating rate, sprig length and dry weight, and G-values were determined for each sample. The test lasts 14-21 days, depending on the germinating time. Out of the three effect criteria the germinating rate is the least suitable parameter, since it is not only affected by the sample composition materials but also by the sample structure and the water flow capacity. Sprig length and dry weight are better suitable criteria than the germination rate and are equivalent in their informative capability.

The plant test detected toxicity in concentration ranges comparable to those obtained with the aquatic test, however the former showed a larger deviarion in the test results. Since only two test runs were possible, the G-value determination could not be repeated in each case. The three different plant types showed in some cases varying levels of high toxicity, demonstrating the necessity for parallel testing with different plant types. Among the defined Gvalues of a waste sample the most representative G-value was determined over all three plant types and the two effect criteria, sprig length growth and dry weight, respectively. The most representative value is the most frequently measured one. In the evaluation the results were weighted differently since the water supply of the used standard soil improved clearly, starting from the second test series. In the last test series the experimental plants were probably damaged due to a brief experiment temperature increase (see Chapter 7).

Bacteria contact test

The bacteria contact test proved to be fast to implement and a method well suited to determining waste toxicity. Waste sample compounds can interact with the dye Resazurine which leads to a small initial concentration of the dye and thus a reduction of the test accuracy. However this effect is corrected over a blank value (sample and dye, without inoculum). A sample pH value below 6 can also lead to a resazurine reduction and this was considered in the test result evaluation. The obtained results demonstrate the reproducibility of the test. The bacteria contact test showed a higher sensitivity of the test system than the aquatic and plant tests (see Chapter 7).

		<u>c</u>	Τ	6	6	6	6	6	6	6	6	6	c	6	6	6	6	6	6	6	6	6	6	6	6	6	6
test		toxic		yes	yes	yes	yes	yes	yes	yes	yes	yes	ou	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Plant test		G-value		64	16 384	32	8	1 024	64	16	512	64	2	8	32	65 536	8	4	n. d.	32	4	8	2 048	8	128	256	>32
Intact test		toxic		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	ou	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Bacteria contact test		G-value		10-100	>100	10-100	2-10	>1 000	10-100	2-10	2-10	10-100	10-100	2	10-100	>100	10-100	2-10	10-100	>100	2-10	>100	>100	10-100	>100	10-100	10-100
<i>umu -</i> test	genotoxic	without	S9/with S9	no	yes/no	no	no	yes/no	no	no	no	no	no	no	no	yes/no	ou	ou	no	no	no	ou	ou	ou	no	no	ou
Luminescent bacteria test		toxic		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	ou	yes	ou	ou	yes	yes	ou	yes	ou	yes	yes	yes	yes
Luminescen		G-value		24	128	6	64	6 400	32	8	12	8	16	4	2	2 500	2	2	96	8	2	16	2	4	6	48	16
nia test		toxic		yes	yes	yes	yes	yes	yes	yes	yes	yes	ou	yes	yes	yes	yes	ou	yes	yes	ou	yes	yes	yes	yes	yes	yes
Daphni		G-value		4	75	2	2	20 000	30	2	9	2	1	2	10	50 000	2	١	2	>80	1	2	50	2	2	15	2
Algae test		toxic		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	ou	ou	yes	yes	ou	yes	yes	ou	yes	yes	yes	yes	yes	yes
Alga		G-value		8	06	40	40	80 000	800	4	8	40	80	1.25	1.25	24 000	9	1.25	2	80	1.25	15	15	2	20	200	10
sample	number			26	27	4	8	1	12	19	3	13	9	6	2	30	17	28	7	14	16	21	23	22	24	18	11
waste	reference			060503	080111*	080113*	080113*	080115*	080115*	080115*	080116	080116	101008	101008	110109*	110109*	110110	110110	120114*	120114*	120116*	120116*/ 120117	190107*	190112	190113	190813*	191004

Results

Biotest results (n. d. - not detectable).

Table 3:

25

5.6 Classification

To be able to evaluate the data, the biotest results were classified and divided into three toxicity classes: non to moderately toxic - Class 1, toxic - Class 2 and very toxic - Class 3 (Table 4). For the classification by toxicity classes the biotest showing the largest G-value was quoted, for example, in the algae test sample 1 showed the highest G-value with 80 000, thereby class 3, very toxic, is to be assigned to this waste sample. If genotoxic effects are detected, then the waste sample is always to be classified in class 3.

Toxicity class	Evaluation	Algae test, daphnia test, lumi- nescent bacteria test, plant test, bacteria contact test	<i>umu-</i> test
		G-value	Effect
1	non to moder- ately toxic	1-10	non-genotoxic
2	toxic	>10-100	-
3	very toxic	>100	genotoxic

Table 4: Scheme of the classification (Explanation in the text).

Among the 24 waste samples, three samples, sample 9 (core sand), 28 (sludge and filter cake from surface treatment of metals) and 16 (waste blasting material) were classified in toxicity class 1 - non to moderately toxic. 11 waste samples were assigned the toxicity class 2 - toxic -, 10 waste samples the toxicity class 3 - very toxic (Table 5).

Most waste samples were toxic in several test systems. Sample 19 (paint and varnish waste) was toxic only in the plant test, samples 17 (sludge from surface treatment) and 22 (rust and bottom-ash from an incineration plant) were toxic only in the bacteria contact test. Three samples were asigned the toxicity class 3 due to genotoxic effects. However, samples 1 (liquid paint and varnish sludge), 27 (paint and varnish waste), and 30 (sludge containing lead-chromate from surface treatment) were also classified in toxicity class 3, due to highly toxic effects in all three aquatic tests and in both terrestrial tests.

The daphnia test showed the smallest test sensitivity. 16 of the 24 waste samples were classified as toxicity class 1 - non to moderately toxic, six samples as toxicity class 2 – toxic, and two samp-les as toxicity class 3 - very toxic. The bacteria contact test exhibited the largest test sensitivity, only six of the 24 waste samples were classified as toxicity class 1 (Table 5).

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U	LIU	

EAV	Sample number			<i>umu-</i> test	Maximal toxicity class			
		Algae test	Daphnia test	Luminescent bacteria test	Bacteria contact test	Plant test	Geno- toxic without/ with S9	
060503	26	1	1	2	2	2	no	2
080111*	27	2	2	3	3	3	yes/no	3
080113*	4	2	1	1	2	2	no	2
080113*	8	2	1	2	1	1	no	2
080115*	1	3	3	3	3	3	no/yes	3
080115*	12	3	2	2	2	2	no	3
080115*	19	1	1	1	1	2	no	2
080116	3	1	1	2	1	3	no	3
080116	13	2	1	1	2	2	no	2
101008	6	2	1	2	2	1	no	2
101008	9	1	1	1	1	1	no	1
110109*	2	1	2	1	2	2	no	2
110109*	30	3	3	3	3	3	yes/yes	3
110110	17	1	1	1	2	1	no	2
110110	28	1	1	1	1	1	no	1
120114*	7	1	1	2	2	n. a.	no	2
120114*	14	2	2	1	3	2	no	3
120116*	16	1	1	1	1	1	no	1
120116* 120117	21	2	1	2	3	1	no	3
190107*	23	2	2	1	3	3	no	3
190112	22	1	1	1	2	1	no	2
190113	24	2	1	1	3	3	no	3
190813*	18	3	2	2	2	3	no	3
191004	11	1	1	2	2	2	no	2
Number in class 1	toxicity	11	16	12	6	8	21	3
Number in class 2	•	9	6	9	11	8	-	11
Number in class 3	toxicity	4	2	3	7	7	3	10

Table 5:

Classification of the test results.

5.7 Distinguishing between hazardous and non-hazardous waste depending on the biotest result classification

Based on the biotest result classification it is possible to decide upon a classification as hazardous or non-hazardous.

Class 1 - non to moderately toxic

If the waste, based on its obtained biotest results, is classified as class 1 - non to moderately toxic -, then it is non-hazardous.

Class 2 - toxic

It is debateable as to whether the toxicity class two is to be assigned to the category nonhazardous or already into the category hazardous (see Section 5.8).

Class 3 - very toxic

If the waste is classified as class 3 - very toxic – then it is hazardous.

5.8 Comparison of the classification based on the toxicity classes to the ranking based on the Preliminary Implementation Manual

In Table 6 the classification of wastes based on their biotest results is compared with the Preliminary Implementation Manual (PIM, Ministry for the Environment and Transport Baden-Württemberg, 2002). In Table 4 of the PIM, orientation values, derived for solids, are indicated for distinguishing between hazardous and nonhazardous wastes. These values are based on chemical analysis parameters. Besides concentration data for various materials there are also sum values in which different heavy metal contents are summed up to an aggregated orientation value (sum a, sum b, sum c). Derived orientation values for eluate are likewise set (Appendix I).

5.8.1 Hazardous wastes based on classification as toxicity class 2

When waste is classified as hazardous starting from toxicity class 2, thus starting from Ghw-value 10 (hazardous waste), then it follows:

Based on the Preliminary Implementation Manual 10 of the 24 wastes are rated as hazardous waste. Based on classification starting from toxicity class 2, 21 wastes are rated as hazardous waste. The classification, starting from toxicity class 2, in hazardous or not, corresponds for 11 of the 24 waste samples (45.8 %) to the ranking based on the Preliminary Implementation Manual (Figure 4).

12 waste samples are classified starting from toxicity class 2 as hazardous, however they are non-hazardous based on the Preliminary Implementation Manual. This applies to six of the eight checked paint and varnish sludges, to both treatment sludges, to the moulding sand from the aluminium foundry, the bottom-ash from the incineration plant, a waste with the designation "sludge and filter cake", and a sludge from the wastewater treatment.

The biotest procedures detected no toxicity in waste sample 16 (waste blasting material from stainless steel), however it is classified as hazardous based on the Preliminary Implementation Manual due to increased heavy metal contents in the solid matter. The high heavy metal contents are probably not bio-available and cause no toxicity in the biotests.

5.8.2 Hazardous wastes based on classification as toxicity class 3

When waste is classified as hazardous starting from toxicity class 3, thus starting from Ghwvalue 100, then it follows: Based on the Preliminary Implementation Manual, 10 of the 24 wastes are rated as hazardous waste. Based on classification, starting from toxicity class 3, 10 wastes are rated as hazardous waste. The classification based on toxicity class 1-3, in hazardous or not, corresponds for 18 of the 24 waste samples (75 %) to the classification based on the Preliminary Implementation Manual (Figure 4).

The waste samples 2 (galvanic sludge, tox. class 2), sample 16 (waste blasting material, tox. class 1) and sample 11 (shredder light fraction, tox. class 2) are rated as hazardous, based on the Preliminary Implementation Manual, how-ever they do not reach the toxicity class 3.

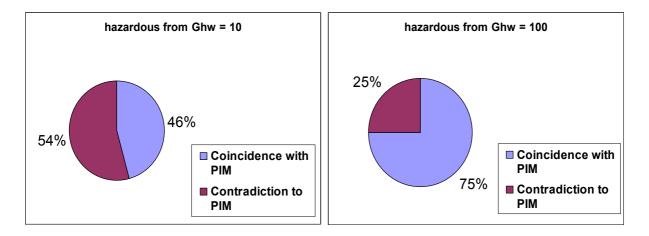


Figure 4: Comparison of the classification, based on toxicity classes, to the ranking, based on the Preliminary Implementation Manual (PIM) – Coincidence or contradiction.

Contradiction with PIM (hazardous from tox. class 3)	по	Ю	Ю	по	Q	yes	оц	yes	ou	ou	Q
Contradiction with PIM (hazardous from tox. class 2)	yes	ou	yes	yes	Q	yes	yes	yes	yes	yes	оц
Classification H14 toxicity class	7	3	2	2	в	3	2	e	2	7	-
Orientation values Tab. 5 (eluate values) of PIM	no OV exceeded	no OV exceeded	no OV exceeded	no OV exceeded	OV for nickel and AOX in liquid sample exceeded	no OV exceeded	no OV exceeded	no OV exceeded	no OV exceeded	no OV exceeded	no OV exceeded
Orientation values Tab. 4 (solid matter) of PIM	no OV exceeded	Sum BTEX and PAH exceeded	no OV exceeded	no OV exceeded	no OV exceeded	no OV exceeded	no OV exceeded	no OV exceeded	no OV exceeded	no OV exceeded	no OV exceeded
Waste description	Sludge from on-site wastewater treatment, other than those under 06 05 02	Paint and varnish wastes containing organic solvents or other hazardous substances	Paint and varnish wastes containing organic solvents or other hazardous substances	Paint and varnish wastes containing organic solvents or other hazardous substances	Aqueous sludge, containing paint and varnish with organic solvents or other hazardous substances	Aqueous sludge, containing paint and varnish with organic solvents or other hazardous substances	Aqueous sludge, containing paint and varnish with organic solvents or other hazardous substances	Aqueous sludge, containing paint and varnish, other than those under 08 01 15	Aqueous sludge, containing paint and varnish, other than those under 08 01 15	Casting cores and moulds after pouring, other than those under 10 10 07; moulding sand	Casting cores and moulds after pouring, other than those under 10 07; core sand
Sample number	26	27	4	8	.	12	19	n	13	Q	б
Waste code	060503	080111*	080113*	080113*	080115*	080115*	080115*	080116	080116	101008	101008

Table 6:

Comparison of the ecotoxicological classification to the orientation values (OV) of the Preliminary Implementation Manual (PIM) by MET (2002), yes – no OV exceeded, toxicity class 2 or 3; 1/ yes – OV exceeded, toxicity class = 1; no – no contradiction with PIM.

Waste code	Sample number	Waste description	Orientation values Tab. 4 (solid matter) of PIM	Orientations values Tab. 5 (eluate values) of PIM	Classification H14 toxicity class	Contradiction with PIM (hazardous from tox. class 2)	Contradiction with PIM (hazardous from tox. class 3)
110109*	2	Sludge and filter cakes containing hazardous substances	OV for cooper and Sum c exceeded	no OV exceeded	2	оц	1 / yes
110109*	30	Sludge and filter cakes containing hazardous substances	OV for lead, nickel, chromium (VI), sum b and c exceeded	OV for chromium (VI) and nickel exceeded	3	ои	по
110110	17	Sludge and filter cakes, except those under 11 01 09	no OV exceeded	no OV exceeded	2	yes	no
110110	28	Sludge and filter cakes, other than those under 11 01 09	no OV exceeded	no OV exceeded	1	ои	по
120114*	2	Treatment sludge containing hazardous substances	no OV exceeded	no OV exceeded	2	yes	ои
120114*	14	Treatment sludge containing hazardous substances	no OV exceeded	no OV exceeded	3	yes	yes
120116*	16	Blasting material wastes containing hazardous substances	OV for cooper, nickel and sum C exceeded	no OV exceeded	.	1 / yes	1 / yes
120116* and 120117	21	Blasting material wastes containing hazardous substances	OV for nickel and sum C exceeded	no OV exceeded	3	ои	по
190107*	53	Solid waste from flue-gas treatment	no OV exceeded	OV for cadmium and lead exceeded	3	ои	по
190112	22	Rust- and bottom-ashes as well as slag, other than those under 19 01 11	no OV exceeded	no OV exceeded	2	yes	по
190113	24	Filter dust from incineration or pyrolysis of wastes	OV for lead, cadmium sum a and c exceeded	OV for lead exceeded	3	ои	по
190813*	18	Sludge containing hazardous substances from an other treatment of industrial wastewater	no OV exceeded	OV for AOX exceeded	3	ои	по
191004	7	Shredder light fractions and dust, other than those under 19 10 03	OV for lead, cooper, mercury, sum a and sum c exceeded	no OV exceeded	2	ou	1 / yes

Table 6:

Comparison of the ecotoxicological classification to the orientation values (OV) of the Preliminary Implementation Manual (PIM) by MET (2002), yes – no OV exceeded, toxicity class 2 or 3; 1/ yes – OV exceeded, Toxicity class = 1; no – no contradiction with PIM. Continue.

5.9 Comparison of ecotoxicological and chemical characterization of waste

5.9.1 Waste group specific description

Usually it is difficult to establish a correlation between ecotoxicity and concentration of individual pollutants or groups of pollutants in complex environmental samples. Also in waste samples it is usually not possible to define a relationship between ecotoxicity and concentration of individual pollutants. However, a high correlation between eluate toxicity and AOX concentration could be demonstrated (see Chapter 5.9.2). Investigations of complex samples with biological test procedures show effects as a sum effect, therefore bio test results are usually not comparable to analysis results of individual chemical parameters. The chemical analysis values, used in the Preliminary Implementation Manual of the State Baden-Württemberg as orientation values for the evaluation of waste hazard potential, give an idea of the pollutant concentrations of the complex waste sample. Estimates of the prospective risk derived thereby can however be deficient, since, on the one hand, not all pollutant concentrations are known and, on the other hand, no statement on the pollutant interaction can be met.

06 05 Sludge from an on-site wastewater treatment plant

In this group one sample (number 26) with the waste code 060503 was investigated. It consists of sludge of an on-site waste water treatment

plant of the automobile industry with a phosphate sedimentation unit. The sample indicated a light toxicity in the algae test and daphnia test, and an increased toxicity in the luminescent bacteria test and in both solid phase tests. Based on the ecotoxicological classification, the waste was ranked in class 2, however, it is categorized as non- hazardous, according to the Preliminary Implementation Manual, since no orientation values were exceeded (Table 6). In the eluate an increased DOC concentration (250 mg/l) and an increased ammonium concentration (77 mg/l) were measured, therefore, a toxic effect of ammonia formed at increased pH value cannot be excluded (see Section 5.9.2). The orientation value for nickel in the eluate (1 000 µg/l) was not exceeded (802 µg/l), also small quantities of volatile hydrocarbons were detected in the eluate (31 µg/l). The current classification of the Preliminary Implementation Manual in nonhazardous is confirmed, according to the bio test results, if wastes are first considered hazardous, starting at toxicity class 3.

08 01 Wastes from MFSU and removal of paint and varnish

In this waste group eight wastes of different waste codes were examined. All wastes of group 0801 were classified in toxicity classes 2 - 3, six of the eight samples are however non-hazardous, according to the orientation values of the Preliminary Implementation Manual.

Waste sample 27 was toxic and genotoxic in all test systems and is classed as toxicity class 3. The eluate showed a high DOC value with 11

000 mg/l. This value exceeds the orientation values of BTEX and PAH in solid matter, according to the Preliminary Implementation Manual and thereby the waste is considered as hazardous. The former ranking in hazardous was confirmed by the biotest results.

Waste sample 4 showed in the algae test, in the bacteria contact test and in the plant test toxic effects that led to the classification as toxicity class 2. However, the orientation values of the Preliminary Implementation Manual were not exceeded. In the eluate, volatile hydrocarbons (ethylbenzene and xylene) were detected in the mg/l range (for chemical-analytical reasons not more precisely measurable), whereas the BTEX concentration in the solid of 277 mg/kg is below the orientation value for solids of 1 000 mg/kg. In addition, the paint and varnish sludge contains bactericidal substances. The current classification in non-hazardous of the Preliminary Implementation Manual is confirmed, according to the biotest results, if wastes starting from toxicity class 3, are ranked as hazardous.

Waste sample 8 was toxic in the algae and luminescent bacteria tests, and was classified as toxicity class 2: the eluate exhibited increased zinc values (10.1 mg/l) which possibly caused the toxicity in the algae and luminescent bacteria tests (algae test $EC_{50} = 0.25$ mg/l, Altlasten-Fachinformation 2003). Increased BTEX values in the eluate (1.9 mg/l) and in the solid (791 mg/kg) were measured, however, the orientation values of the Preliminary Implementation Manual were not exceeded. The current classification in non-hazardous of the Preliminary Implementation Manual is confirmed according to the biotest results, if wastes starting from toxicity class 3, are ranked as hazardous.

Waste sample 1 is liquid and was directly investigated without eluate preparation. It belongs to the three most toxic waste samples and is very toxic in all test procedures and, in addition, it is genotoxic. The sample exceeded the orientation values in the eluate for nickel (1 100 mg/l) and for AOX (3.4 mg/l). The current classification in hazardous of the Preliminary Implementation Manual was confirmed by the biotest results.

Waste sample 12 was toxic in all test procedures, very toxic in the algae test which led to a classification into toxicity class 3. With 1.3 mg/l the orientation value for AOX in eluate (1.5 mg/l) was just not reached, however, it can cause toxicity in the aquatic test systems. The current classification in non-hazardous of the Preliminary Implementation Manual was not confirmed by the biotest results.

Waste sample 19 was classified as toxicity class 2, due to the plant test result. However it did not exceed the orientation values. Increased values for BTEX with 283 mg/kg (OV = 1 000 mg/kg), PAH with 90.3 mg/kg (OV = 200 mg/kg) and AOX (210 mg/kg) in the solid phase were measured. The current classification in non-hazardous of the Preliminary Implementation Manual is confirmed according to the bio test results, if wastes starting from toxicity class 3, are ranked as hazardous.

Waste sample 3 was toxic in the luminescent bacteria test and very toxic in the plant test which led to classification into toxicity class 3. Orientation values of the PIM were not exceeded, however, increased zinc values in the eluate (0.9 mg/l) and in the solid (135 600 mg/kg) were detected and can have caused toxicity (algae test $EC_{50} = 0.25$ mg/l, Altlasten-Fachinformation 2003). The current classification in non-hazardous of the Preliminary Implementation Manual was not confirmed by the biotest results.

Waste sample 13 was toxic in the algae test and in both solid phase tests, and was classified in toxicity class 2. It exhibited a particularly high AOX concentration in the solid matter (1 260 mg/kg), however not in the aqueous eluate (0.27 mg/l), which could explain the toxic effects in both solid phase tests. Remarkable in the eluate were the high DOC content of 1 100 mg/l and also the ammonia nitrogen content of 78 mg/l. A toxic effect of ammonia cannot be excluded (see Section 5.9.2). During the sample preparation for the chemical analysis a gel formed, so that PCB and PAH could not be determined. However, orientation values of the Preliminary Implementation Manual were not exceeded. The current classification in nonhazardous of the Preliminary Implementation Manual is confirmed according to the biotest results, if wastes starting from toxicity class 3, are ranked as hazardous.

10 10 Wastes from foundry of non-ferrous metals

In this waste group there are two wastes from the aluminium foundry with the same waste code 101008, a moulding sand (sample 6) and a core sand (sample 9). The core sand was classified as non-toxic into class 1, the moulding sand as toxic into class 2 due to the results in the algae, luminescent bacteria and bacteria contact tests. The core sand contained hardener and amines and showed clearly higher heavy metal contents than the moulding sand. The moulding sand contained only bentonite. No orientation values of the Preliminary Implementation Manual are exceeded. The current classification in nonhazardous is confirmed according to the biotest results, if wastes, starting from toxicity class 3, are ranked as hazardous.

11 01 Wastes from the chemical surface treatment and coating of metals an other materials (for ex. galvanization, zinc galvanization, pickling processes, etching, phosphatizing, alkaline degreasing and anodization)

4 waste samples, two out of the waste code 110109 * and two out of the waste code 110109 were investigated.

The waste of sample 2 (galvanization, waste code 110109 *), originating from the coating of printed circuit boards, was ranked as toxicity class 2. The orientation values for copper and sum c were exceeded. The waste is hazardous based on the Preliminary Implementation Manual. The current classification in hazardous is confirmed according to the biotest results, when wastes starting from toxicity class 2, are classified as hazardous.

The waste of sample 30 (sludge containing lead chromate), likewise waste code 110109 *, was

classified in toxicity class 3, due to high toxicity in all biotests and proven genotoxicity. The orientation values for lead, nickel, chromium-(VI), sum b and c in the solid as well as chromium-(VI) in the eluate were exceeded. The current classification in hazardous based on the Preliminary Implementation Manual was confirmed by the biotest results.

Waste sample 17 out of the waste code 110110 was toxic only in the bacteria contact test (toxicity class 2). Orientation values of the Preliminary Implementation Manual were not exceeded, and the chemical analysis parameters showed no peculiarity. The current classification of the Preliminary Implementation Manual in nonhazardous is confirmed according to the biotest results, when wastes starting from toxicity class 3, are classified as hazardous.

Waste sample 28 of the waste code 110110 was toxic in no test systems and the orientation values of the Preliminary Implementation Manual were not exceeded; only the nickel content of the sample was increased (1 100 mg/kg, OV = 2500 mg/kg). The current classification in non-hazardous was confirmed by the biotest results.

12 01 Wastes from processes in mechanical shaping as well as physical and mechanical surface treatment of metals and plastics

Two waste samples of the waste codes 120116 * and/or 120116*/120117 and two of the waste code 120114 * were examined.

The treatment sludge of sample 7 was bacterially toxic in both bacteria test systems, which led to the classification as toxicity class 2. It originated from vehicle-part-cleaning processes and the waste from wet separators. Volatile hydrocarbons were detected (m-/p-xylene 55 µg/l, o-xylene 21 µg/l, ethyl-benzene 14 µg/l). Sample 7 showed an increased DOC value (110 mg/l) in the eluate and an increased portion of lipophilic substances (37 % weight) in the solid matter. Its investigation showed in some cases nonreproducible results in the algae test and, in particular, in the plant test. Orientation values of the Preliminary Implementation Manual were not exceeded. The current classification in nonhazardous of the Preliminary Implementation Manual is confirmed by the bio test results, when wastes starting from toxicity class 3, are classified as hazardous.

The treatment sludge of sample 14 was toxic to very toxic in all test systems, except in the luminescent bacteria test, and is classified as toxicity class 3. It originates from cleaning processes of car bodies, and it contains metal chips and surfactants which could cause toxicity in the eluate investigation and in the solid phase tests. The high zinc contents were remarkable in the solid with 77 000 mg/kg and in the eluate with 26.4 mg/l which, likewise, can lead to toxicity in biological test systems (algae test $EC_{50} = 0.25 \text{ mg/l}$, Altlasten-Fachinformation 2003). Orientation values of the Preliminary Implementation Manual were not exceeded. The current classification in non-hazardous based on the Preliminary Implementation Manual was not confirmed by the biotest results.

Waste sample 16 (blasting material waste from stainless steel) indicated no toxicity in the biotests, however, it is ranked as hazardous based on the Preliminary Implementation Manual, owing to increased heavy metal contents in the solid matter. The increased heavy metal contents are probably not bio-available and cause also no toxicity in the solid phase tests. The current classification in hazardous of the Preliminary Implementation Manual was not confirmed by the biotest results.

Waste sample 21 (waste blasting material) exhibited increased toxicity values in the algae test, in the luminescent bacteria test, and in the bacteria contact test, and was classified as toxicity class 3. The orientation values for nickel and sum c were exceeded, reason why the waste is considered as hazardous. The present waste had initially two different waste codes (120116*/120117), however, due to small quantities, they were collected and disposed of together. The current classification in hazardous was confirmed by the biotest results.

19 01 Wastes from incineration and pyrolysis of waste materials

This concerns three different wastes of an incineration plant.

The filter dust of waste sample 24 was classified as toxicity class 3, owing to toxicity in the algae-, bacteria contact- and plant tests, and showed clearly values exceeding the orientation values of the Preliminary Implementation Manual for heavy metals, sum C, cadmium and lead in the solid matter and lead in the eluate (19 mg/l, OV = 1 mg/l). The current classification in hazardous of the Preliminary Implementation Manual was confirmed by the biotest results.

The solid waste from the flue-gas treatment - waste sample 23 - (flue-gas scrubbing) was toxic in all test systems, except in the luminescent bacteria test, and was classified in toxicity class 3. The orientation values for cadmium and lead (eluate) were exceeded, the arsenic concentration of 395 μ g/l failed to reach the orientation value (500 μ g/l), and the mercury value amounted 6.6 μ g/l (OV = 20 μ g/l). The current classification in hazardous was confirmed by the biotest results.

Rust and bottom ash of the waste code 190112 showed toxicity only in the bacteria contact test (sample 22, toxicity class 2), and exhibited increased AOX values (120 mg/kg) in the solid matter analysis and increased lead (562 μ g/l) and zinc values (740 μ g/l) in the eluate analysis which, however, did not exceed the orientation values of the Preliminary Implementation Manual. The current classification of the Preliminary Implementation Manual in non-hazardous is confirmed, according to the biotest results, when wastes starting from toxicity class 3, are classsified as hazardous.

19 08 Wastes from wastewater treatment plants

In this waste group, a waste of the waste code 190813*, sample 8, was investigated. Toxicity was demonstrated in all biotests, in particular, a high algae and plant toxicity which led to classification into toxicity class 3. AOX 820 mg/kg were measured in the solid matter, in the eluate still 2.1 mg/l (OV eluate = 1.5 mg/l), and the orientation value was thereby exceeded. The current classification of the Preliminary Implementation Manual in hazardous was confirmed by the biotest results.

19 10 Wastes from shredding of waste containing metals

Sample 11, shredder light fraction, from the group 1910 was examined (191004). The waste sample was characterized by heterogeneous material, and metals, plastics and other materials could be identified in the sample. The sample showed a slight toxicity in the algae and daphnia tests, a moderate toxicity in the luminescent bacteria, bacteria contact and plant tests, leading to a classification as toxicity class 2.

The orientation values for lead, copper, mercury, sum a and c (solid matter) were exceeded. The current classification in hazardous of the Preliminary Implementation Manual is confirmed according to the biotest results, when wastes starting from toxicity class 2, are classified as hazardous.

5.9.2 Relation between toxicity and chemical parameters

In the following selected chemical parameters which can influence the test results of waste investigations and toxicity detection are discussed.

DOC concentration

The DOC concentration of the examined waste sample ranged between 1mg/l and 11 000 mg/l in the eluate. The DOC concentration is a sum parameter which describes the content of organic carbon compounds, but makes no distinction between toxic or non-toxic compounds. Thus, sample 27, exhibiting a DOC concentration of 11 000 mg/l, was toxic and genotoxic in all test systems and was classified into toxicity class 3. According to the Preliminary Implementation Manual of the state Baden-Württemberg, it exceeded the orientation values for BTEX and PAH in the solid phase. The observed relation between DOC concentration in eluate samples of various industrial wastes and their toxicity in different biotest systems is not compelling, but refers only to a possible group of pollutants. Thus it should be individually checked which toxic organic carbon compounds are contained in the sample.

AOX concentration

For the AOX concentration of the waste eluate a close correlation (correlation coefficient r = 0.8) with the biotest results in the eluate (algae test, luminescent bacteria test, daphnia test) was demonstrated, however, no correlation with the plant test results (r = 0.08) for the AOX content in the solid was proven.

Ammonium concentration

In general, the waste samples contained small ammonium concentrations, except two samples (number 13 - 78 mg/l, number 26 - 77 mg/l). To what extent the ammonium contents affected the test results cannot be exactly clarified, since pollutants e.g. AOX were also detected. Gellert (2000) could prove by means of wastewater treatment plant effluents that a rising N total concentration (up to 44.1 mg/l) in wastewater samples did not correlate with the algae test, daphnia test or luminescent bacteria test. The toxic effect of ammonium and/or ammonia depends strongly on the pH and the temperature, since, at increased temperature and pH value, ammonia is formed increasingly, the latter being clearly more toxic than ammonium (Warg 1987). Ammonium can also have a beneficial effect as nutrient in the biotest which can lead to an underestimation of the toxicity of waste samples.

Conductivity

In 5 waste sample eluates the conductivity was partly very high (sample 30, conductivity 97 700 μ S/cm). The high conductivity was connected with an increased concentration of heavy metals in the tested waste samples, so that the toxic effect was probably due to increased heavy metal concentrations.

Zinc concentration

In some waste samples a high zinc concentration was measured, up to 119 200 mg/kg in the solid matter and up to 26.4 mg/l in the eluate. Toxic effects of zinc begin with a concentration of 0.25 mg/l in the algae test (Altlasten-Fachinformation 2003) and, thus, cannot be excluded when considering the investigated wastes and/or waste eluates. Orientation values for zinc are not specified in the Preliminary Implementation Manual.

The identification of at least the substance class which is primary responsible for the toxicity determined in biotests, can be done by means of a separation of the complex waste samples and/or eluate with a subsequent biological and chemical investigation of the individual fractions. To this regard, an investigation strategy pertaining to industrial and local wastewater was developed by the US-EPA (Kristensen 1992) and one pertaining to sediments by Brack et al. (1999), as well as Hollert and Braunbeck (2001).

6 Proposed Procedure

In this investigation project the wastes were assessed regarding their toxicity and their genotoxicological effect potential by means of a total of six biological test procedures. The acute toxicity was determined using the luminescent bacteria test, the bacteria contact test and the daphnia test; the chronic toxicity with the algae test and the plant test; and the genotoxicity was captured with the *umu*-test.

Apart from the investigation of eluates on watersoluble pollutants and their effects, the effect of adsorbed pollutants was examined in the solid matter sample based on solid phase tests, by the plant test even on higher ranked phytoorganisms. However, the investigation procedure with six biological tests, used in this project, is too time- and cost intensive for a routine waste examination, so that the issue of the minimum extent of ecotoxicological waste examination, i.e. a minimum test battery, arises.

A test battery is a combination of test procedures performed for examining environmental samples, in order to ensure a risk estimation which is as complete as possible. Thus, for example, four biological test procedures are used for the examination of wastewater (fish egg test, daphnia test, luminescent bacteria test, algae test), in order to protect the water bodies against hazardous discharges with consideration of the different trophic levels. Should the extent of waste investigation with biological test procedures be meaningfully reduced to a minimum by introduction of a minimum test battery, then the following has to be considered:

- Which test systems are relevant for the classification of the waste toxicity?
- The acute and chronic effect should be examined and different trophic levels (producers, consumers and destruents) determined.
- At least one test with waste eluate should be included in the test battery, in order to define the effect of pollutants that can be mobilized.
- Likewise, a solid phase test should be included in the test battery, in order to determine the toxicity of the unchanged sample.
- How is a further reduction of the test extent and thus of the costs possible?

6.1 Definition of a minimum test battery

By comparing the results of the various test procedures to the classification into the maximum toxicity class using all results of the ecotoxicological examination (Table 7), it is clear that the classification into one of the toxicity classes determined by the daphnia tests agrees only to 25 % with the overall result. The bacteria contact test exhibits the best agreement with 79 % and the plant test with 70 %.

If one combines two test procedures, the best agreement with the overall classification is reached by using the combination of algae test and bacteria contact test (92 %) and the combination of bacteria contact test and plant test (91 %).

If one combines three test procedures, the overall classification into the respective toxicity class is already obtained to 100 % with the combination of algae test, bacteria contact test and plant test. In addition, the combinations of luminescent bacteria test, bacteria contact test, plant test and of algae test, luminescent bacteria test and bacteria contact test, respectively, lead already to a 96 % agreement with the classification in each case.

Test combination	Concordance with overall clas- sification [quantity]	Concordance with overall classification [%]
Algae test	11 of 24	46
Daphnia test	6 of 24	25
Luminescent bacteria test	11 of 24	46
Bacteria contact test	19 of 24	79
Plant test	16 of 23	70
Algae test, luminescent bacteria test	15 of 24	63
Algae test, daphnia test	15 of 24	63
Algae test, bacteria contact test	22 of 24	92
Algae test, plant test	19 of 23	83
Luminescent bacteria test, plant test	18 of 23	78
Luminescent bacteria test, daphnia test	12 of 24	50
Luminescent bacteria test, bacteria contact test	20 of 24	83
Daphnia test, bacteria contact test	19 of 24	79
Daphnia test, Plant test	16 of 23	70
Bacteria contact test, Plant test	21 of 23	91
Algae test, luminescent bacteria test, Plant test	19 of 23	83
Algae test, luminescent bacteria test, bacteria con- tact test	23 of 24	96
Algae test, luminescent bacteria test, daphnia test	16 of 24	67
Algae test, bacteria contact test, plant test	23 of 23	100
Algae test, bacteria contact test, daphnia test	22 of 24	92
Algae test, plant test, daphnia test	20 of 23	87
Luminescent bacteria test, bacteria contact test, plant test	22 of 23	96
Luminescent bacteria test, bacteria contact test, daphnia test	20 of 24	83
Luminescent bacteria test, plant test, daphnia test	18 of 23	78
Bacteria contact test, plant test, daphnia test	21 of 23	91

Table 7: Comparison of classification in toxicity class of the respective test procedure and /or test combination with the overall classification.

The combination of the three test procedures algae test, bacteria contact test and plant test is sufficient for illustrating the toxicity of the wastes examined here. The test procedures allow the acute and chronic effects to be captured, the different trophic levels to be investigated, and that the toxic effect of both the eluate and the solid phase waste is assessed.

Based on the results compiled here and under the condition that the obtained results are transferable to other wastes, the following minimum test battery is suggested for the ecotoxicological waste investigation:

Minimum test battery:	Eluate investigation:	Algae test
	Solid phase investigation:	Plant test, bacteria contact test

The daphnia test, as representative of the consumers group, is not represented in this test battery, owing to lack of sensitivity, further studies are needed here (see Chapter 7).

In order to further minimize the technical and economic expenditures, it is suggested to introduce a limit test:

6.2 Limit test

The wastes are not examined by means of dilution series up to the G-value (which indicates no more toxicity), but only in the dilution step Ghw (hazardous waste), still to be defined, located between hazardous and non-hazardous. If the toxicity is below the defined dilution step (e.g. G 10 or G 100), then the waste is considered nonhazardous.

6.3 Eluate investigations for genotoxicity with the *umu*-test

The *umu*-test detected genotoxicity in three samples. If the *umu*-test or other procedure for the genotoxicity determination is already used

for the description of criterion H7 carcinogenic and/or H11 mutagenic, than its use can be dispensed with for the description of criterion H14. The *umu*-test is nevertheless a test method considered in the CEN draft (2002) for the description of the H14 criterion.

6.4 Economy

The costs for waste sample testing on their ecotoxicity were evaluated by means of company data and of own budget calculations (Table 8).

A clear cost reduction is already reached when a minimum ecotoxicological test battery is used. The introduction of a limit test reduces the total costs of an ecotoxicological characterization to approximately $315 \in$ / sample. The analysis of the waste sample, according to the parameter list of the Preliminary Implementation Manual, costs $1338 \in$ / sample (oral report TÜV-South), thereof the cost for the dioxin testing alone amounts to $550 \in$, and for the eluate analysis to $277 \in$.

Even if it is assumed that, for a decision making in the scope of the Preliminary Implementation Manual, the determination of all parameters is not always necessary (e.g. by excluding the dioxin investigation in the galvanization sludge), compared to that the costs for biotesting remain nevertheless in a justifiable order of magnitude. However, the time requirement for the plant test (approx. 3 weeks) could be a problem when the executive authority has to make fast decisions.

Test	Costs (€) G-value determination	Costs (€) Limit-Test (G _{hw} = 10 or 100)	Costs (€) chemical analysis ac- cording to Preliminary Implementation Manual
Luminescent bacteria test	210	70	
Algae test – miniaturized form (own estimation)	150	70	
Daphnia test	210	70	
Plant test (3 species)	700	175	
Bacteria contact test (own estimation)	150	70	
Cost, total	1 420	455	
minimum test battery: algae test, bacteria con- tact test, plan test	1 000	315	1 338

Table 8: Cost estimation for a waste sample (Company data and own estimation).

7.1 Eluate investigation

With the eluate investigation basically, the criterion H13 (leaching product) is checked. The statements in this report impute that an ecotoxicological eluate means at the same time that the waste is ecotoxicological. The EEC Directive 91/689/EC is not very well formulated, in so far as a waste is identified as hazardous solely when the eluate, as a leaching product, fulfills one of the characteristics mentioned above in the list (thus H1 to H12). The subsequent criterion H14 is therewith not considered. There is no conclusive reason for it. An editorial correction of the EEC Directive is suggested.

7.2 Biological test procedures

Plant test

For the testing of the original waste sample, the plant test according to OECD (2000) represents a standardised method. The results showed however a larger range. An important factor of influence on the variability of the G-values is possibly the heterogeneity of the sample material, its miscibility with the standard soil and its water retaining capacity. The germ rate proved to be the less suitable effect criterion, as it is also affected by the sample structure and its water flow capacity. Beyond that, a very small germination during the test leads to a statistic uncertainty of the two other effect criteria. Here, further adjustments of the test system to the test matrix of waste samples and their relatively large heterogeneity with regard to the structure and the water flow capacity should be made. In addition, it is recommended to check for suitable plant types (heat tolerant, representative of the Leguminousae), to select the standard soil and the test design.

Bacteria contact test

The bacteria contact test proved to be a method that is fast to implement and which supplies sensitive and reproducible results within a day. For some waste samples, sample substances led to a reduction of the reaction indicator Resazurine and affected hereby the accuracy of the test results. For some samples the aqueous fraction and other fractions of the sample separate, which can lead to an inaccuracy at the test start. Here, further adjustments should be made to the matrix of the waste samples, before introducing it as a routine method.

Biotest procedure with a representative of the function level consumers

The group of the consumers is not represented in the test battery recommended here. In the scope of the investigation, the daphnia test was performed as their representative, however, it proved not to be sufficiently sensitive. Yet the group of the consumers should, in principle, not be left out. Thus, other methods of ecotoxicological testing are to be checked for their suitability to waste investigation. Firstly, methods which are already included in the CEN regulation, e.g. the Collembola test (CEN 2002) or the Nematode test (Traunsburger et al. 1997) should be primarily investigated. Another, DIN standardised test method, which could be applied to the waste eluate examination, is the fish egg test (DIN 38415-6). For the fish egg test no permission is required according to animal protection laws. If a suitable test organism can be found for the examination of the trophic level consumers, a comparison of its sensitivity with the test battery recommended here is to be done, in order to minimize the economic expenditures of the waste toxicity investigation.

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9. Appendix

- **Appendix I:** Orientation values of the Preliminary Implementation Manual of the Ministry for Environment and Transport of Baden Württemberg, October 2002
- Table Ia:Orientation values of the Preliminary Implementation Manual (Oct. 2002) for solid
matter contents

	Parameter	Contents of hazardous substances in the origi- nal substance referred to dry matter mg/kg
	Antimony, lead, copper, nickel, selenium,	2 500
	Arsenic, chromium (VI), thallium, tin from or- ganic compounds	1 000
	Cadmium	100
	Mercury	50
Sum a	Mercury, cadmium,	100
Sum b	Mercury, cadmium, tin (org. comp.), thallium, chromium (VI), arsenic,	1 000
Sum c	Mercury, cadmium, tin (org. comp.), thallium, chromium (VI), arsenic, selenium, nickel, copper, lead, antimony	2 500
	Benzene /BTEX	Benzen:25/BTEX:1 000
	Dioxins /Furans TCDD_TE	25
	Highly volatile halogenated hydrocarbons	25
	Mineral oil hydrocarbons, to the extent not shown to be irrelevant (e.g. paraffins)	4 000, however maxi- mum up to residual satu- ration
	PAH (16 after EPA)	200
	Benzo-a-pyrene	50
	PCB total	50
	РСР	5
	Cyanide, total	1 000
	Beryllium	1 000

- Appendix I Orientation values of the Preliminary Implementation Manual of the Ministry for Environment and Transport of Baden Württemberg, October 2002
- Table Ib:
 Orientation values of the Preliminary Implementation Manual (October 2002) for the eluates

Parameter	value mg/l
pH-value	5.5-13.0
Phenols	50
Arsenic	0.5
Lead	1
Cadmium	0.1
Chromium (VI)	0.1
Copper	5
Nickel	1
Mercury	0.02
Fluoride	25
NH4 nitrogen	200
Cyanides, highly soluble	0.5
AOX	1.5

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Appendix II: Data sheets - Biological test results and chemical analysis

			Data Sheet sa	mple no. 1			
	and removal of paints and removal of paints		ic solvents or		sample number 1	waste code 080115	Date 27.06.2002
other dangerous sul	bstances; liquid sampl	e, no eluate prepa	aration				
		Ecotoxiko	logical chara	cterization			
Algae test							
80%-sample	G _A -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity			
[%Inhibition]	10	[%]	[%]		_		
100	>10	-	-	yes	_		
100 100	80000 80000	0.0013 0.0016	0.0025 0.0029	yes yes	-		
Median	80000	0.0014	0.0029	yes			
Daphnia test							
100%-sample	G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition] 100	>10000	[%]	[%]	[%]	yes		
100	20000	0.003	0.005	0.014	yes		
	20000	0.000	0.000	0.011			
Median	20000	0.003	0.005	0.014	yes		
Luminescent bacte		EC armste	EC commit	Taulatt	7		
50%-sample [%Inhibition]	G _L -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	_		
100	6400	[%] 0.0265	[%] 0.0469	yes	-		
100	6400	0.0288	0.0489	yes			
Median	6400	0.0276	0.0479	yes	_		
Bacteria contact te			-				
50%-sample	G _B -sample	Toxicity	-				
[%Inhibition]	> 1000						
-	>1000	yes	-				
Median							
wedian	>1000		-				
	>1000	yes]				
•	>1000	yes]				
Plant test			t height	G⊳ dry sh	oot weight	Toxicity]
Plant test 50%-sample	>1000 G _p germination rate 256	yes Gp Shooi 64			oot weight	Toxicity yes]
Plant test 50%-sample (Brassica	G _P germination rate	G _p Shoot 64	1	2	56	yes	
Plant test 50%-sample (Brassica Lycopersicon	G_P germination rate 256 1024	G _p Shoo 64 25	6	10	56)24		
Plant test	G _P germination rate	G _p Shoot 64	6	10	56	yes	
Plant test 50%-sample (Brassica Lycopersicon Avena	G _P germination rate 256 1024 1024	G _p Shoo 64 25	6	10	56)24	yes yes	
Plant test 50%-sample (Brassica Lycopersicon Avena most representativ	G _P germination rate 256 1024 1024 ve G _P -value	G _p Shoo 64 25	6	10	56)24	yes yes yes	
Plant test 50%-sample (Brassica Lycopersicon Avena most representativ	G _P germination rate 256 1024 1024 re G _P -value S9	G _p Shoo 6 ⁴ 25 25	6	10	56)24)24	yes yes yes 1024	
Plant test 50%-sample (Brassica Lycopersicon Avena most representativ	G _P germination rate 256 1024 1024 re G _P -value S9 GEU	Gp Shoo 64 25 25 25	4 6 6 Genotoxicity	10	56)24)24)24 GEU	yes yes yes 1024 VD	
Plant test 50%-sample (Brassica Lycopersicon Avena most representativ	G _P germination rate 256 1024 1024 re G _P -value S9 GEU IR < 1.5	Gp Shoo 64 25 25 25 25 25 17 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	4 6 6 6 6 6 6 6 6 6 7 7 7 7 7 7 7 7 7 7	10	56)24)24)24 GEU IR < 1.5	yes yes 1024 VD IR < 1.5	GEU > 1.5
Plant test 50%-sample (Brassica Lycopersicon Avena most representativ	G _P germination rate 256 1024 1024 re G _P -value S9 GEU	Gp Shoo 64 25 25 25	4 6 6 Genotoxicity	10	56)24)24)24 GEU	yes yes yes 1024 VD	GEU > 1.5 no
Plant test 50%-sample (Brassica Lycopersicon	G _P germination rate 256 1024 1024 re G _P -value S9 GEU IR < 1.5 -	Gp Shoo 64 25 25 25 25 25 25 25 25 25 25 25 25 25	4 6 6 6 Genotoxicity GEU > 1.5 no	10	56)24)24 GEU IR < 1.5	yes yes 1024 VD IR < 1.5 1.67	Genotoxicit GEU > 1.5 no yes yes

queous sludge co ther dangerous su	and removal of paint ntaining paints and v bstances; liquid sam	arnishes with organi			sample number	waste code 080115	Date 27.06.2002
queous sludge co ther dangerous su	ntaining paints and v	arnishes with organi					
	ibstances; liquid sam	ple, no eluate prepa	ration			000113	27.06.2002
			ITALION				
		C	hemical charad	torization			
		C C	nemical charac	tenzation			
quid sample							
Dry weight %	Water content %	рН	Cond. µS/cm				
0	100	6.05	2090				
		A states			NP-11		
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
0.27	4.9	0.05	4.8	49	5	0	290
Hydro	carbons	Lipophilic subst.	тос	Benzene	Toluene	Ethylbenzene	Xylene
	ew.%	Gew.%	Gew.%	mg/kg	mg/kg	mg/kg	mg/kg
	.041	5.4	59.8	< 0.01	0.3	4.6	29
0			00.0	0.01	. 0.0		
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranthene
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
33.9	40	0.3	<0.1	0.83	2.1	<0.1	0.67
Pyrene	Benz(a)ar		Chrysene		luoranthene	Benzo(k)flu	
mg/kg	mg		mg/kg		g/kg	mg/	
2.8	0.3	33	1.2	0).56	<0.	1
Dibonz(ak)anthracene	Benzo(ghi	nondono	Indono(1.2	,3-cd)pyrene	Benzo(a)pyrene	AOX
	ig/kg	mg/			g/kg	mg/kg	mg/kg
().12	0.1			0.1	0.1	420
		0.1	•		0.1	0.1	420
Water sol	uble portion	Sum PAH	(16 EPA)				
Ge	ew.%	mg/	kg				
	9.8	49.	3				
emarks quid, black, solver	nt smell, colored up to	o 1:1000; no eluate p	preparation, but dir	ectly tested, filte	ered only through gla	ass fiber	

		0)ata Sheet sar	nble no. 2			
	nical surface treatmer				sample number	waste code	Date
	zinc galvanization, pi dizing); Sludge and fi				2	110109	16.05.2002
angerous substanc				intaining	L L		1
		Ecotoxiko	logical chara	cterization			
Algae test - eluate	G comple	EC comple	EC comple	Taviaity	-		
80%-sample [%Inhibition]	G _A -sample	EC ₂₀ -sample [%]	EC ₅₀ -sample [%]	Toxicity	-		
86.9	>4	-		ves	-		
-27	1.25	-	-	no			
-65.2	1.25	-	-	no			
Median	1.25	-	-	no			
Daphnia test - elua	te						
100%-sample	G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]		[%]	[%]	[%]			
30	10	6.9	18.6	123.0	yes		
50	10	6.9	12.4	38.0	yes		
Median	10	6.9	15.5	80.5	yes		
uminescent bacte	eria test- eluate G _I -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	7		
[%Inhibition]		[%]	[%]	Toxicity	-		
	2	-		20			
5.4	2		-	no			
6.2	2	-	-	no	-		
					-		
6.2	2	-	-	no			
6.2 Median	2 2	-	-	no			
6.2 Median	2 2	-	-	no			
6.2 Median Bacteria contact te 50%-sample [%Inhibition]	2 2 st - solid matter	-	-	no			
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3	2 2 st - solid matter G _B -sample	- - Toxicity yes	-	no			
6.2 Median Bacteria contact te 50%-sample [%Inhibition]	2 2 st - solid matter	- - Toxicity	-	no			
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3 103.4	2 2 st - solid matter G _B -sample	- - Toxicity yes	-	no			
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3 103.4	2 2 st - solid matter G _B -sample - 10-100	- - Toxicity yes yes	-	no			
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3 103.4 Median Plant test - solid m	2 2 st - solid matter G _B -sample - 10-100 10-100 atter	- - Toxicity yes yes yes		no		Test	1
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3 103.4 Median Plant test - solid m 50%-sample (0)	2 2 st - solid matter G _B -sample - 10-100 10-100 atter G _P germination rate	- - Toxicity yes yes yes Gp Shoot	- -	no no G _P dry sł	noot weight	Toxicity	
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3 103.4 Median Plant test - solid m 50%-sample (0)	2 2 st - solid matter G _B -sample - 10-100 10-100 atter G _P germination rate >32	- Toxicity yes yes yes Gp Shoot		no no G _P dry sł	>32	yes]
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3 103.4 Median Vedian Plant test - solid m 50%-sample Brassica	2 2 st - solid matter G _B -sample - 10-100 10-100 atter S _P germination rate >32 <64	- - - - - - - - - - - - - - - - - - -	- -	no no G _P dry st	>32 64	yes yes	
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3 103.4 Median Vedian Plant test - solid m 50%-sample Brassica	2 2 st - solid matter G _B -sample - 10-100 10-100 atter G _P germination rate >32	- - - - - - - - - - - - - - - - - - -		no no G _P dry st	>32	yes yes yes	
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3 103.4 Median Plant test - solid m 50%-sample Brassica Lycopersicon	2 2 st - solid matter G _B -sample - 10-100 10-100 atter S _P germination rate >32 <64	- - - - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - - -	no no G _P dry sł	>32 64 32	yes yes	
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3 103.4 Median Plant test - solid m 50%-sample Brassica Lycopersicon	2 2 st - solid matter G _B -sample - 10-100 10-100 atter G _P germination rate >32 <64 >32 - -	- - - - - - - - - - - - - - - - - - -		no no G _P dry sł	>32 64 32 <64	yes yes yes yes	
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3 103.4 Median Plant test - solid m 50%-sample Grassica _ycopersicon Avena	2 2 st - solid matter G _B -sample - 10-100 10-100 atter S _P germination rate >32 <64 >32 - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - - -		no no G _P dry sł	>32 64 32 <64 >32	yes yes yes yes yes	
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3 103.4 Median Plant test - solid m 50%-sample GBrassica	2 2 st - solid matter G _B -sample - 10-100 10-100 atter G _P germination rate >32 <64 >32 - >32 <64 e G _P -value	- - - - - - - - - - - - - - - - - - -		no no G _P dry st	>32 64 32 <64 >32	yes yes yes yes yes yes	
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3 103.4 Median Plant test - solid m 50%-sample GBrassica Lycopersicon Avena most representativ	2 2 st - solid matter G _B -sample - 10-100 10-100 atter 32 <64 >32 <64 >32 <64 e G _P -value vithout S9	- - - - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - - -	no no G _P dry sł	>32 64 32 <64 >32 128	yes yes yes yes yes yes 32	
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3 103.4 Median Plant test - solid m 50%-sample GBrassica	2 2 st - solid matter G _B -sample - 10-100 10-100 atter S _P germination rate >32 <64 >32 <64 e G _P -value vithout S9 GEU	- - - - - - - - - - - - - - - - - - -		no no G _P dry st	•32 64 32 •64 •32 128 GEU	yes yes yes yes yes 32 VD	Genotoxici
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3 103.4 Median Plant test - solid m 50%-sample GBrassica Lycopersicon Avena most representativ	2 2 st - solid matter G _B -sample - 10-100 10-100 atter S _P germination rate >32 <64 >32 <64 e G _P -value ////////////////////////////////////	- - - - - - - - - - - - - - - - - - -		no no G _P dry st	32 64 32 ≪64 32 128 GEU IR < 1.5	yes yes yes yes yes 32 VD IR < 1.5	GEU > 1.8
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3 103.4 Median Plant test - solid m	2 2 st - solid matter G _B -sample - 10-100 10-100 atter 32 <64 >32 <64 >32 <64 e G _P -value vithout S9 GEU IR < 1.5 1.5	- - Toxicity yes yes yes yes Gp Shoot 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 32 <6 53 <6 53 <6 53 <6 53 <6 53 <6 53 53 <6 53 53 <6 53 53 53 <6 53 53 53 53 53 53 53 53 53 53		no no G _P dry st	•32 64 32 <64 •32 128 GEU IR < 1.5 1.5	yes yes yes yes yes 32 VD IR < 1.5 0.67	GEU > 1.5 no
6.2 Median Bacteria contact te 50%-sample [%Inhibition] 92.3 103.4 Median Plant test - solid m 50%-sample GBrassica Lycopersicon Avena most representativ	2 2 st - solid matter G _B -sample - 10-100 10-100 atter S _P germination rate >32 <64 >32 <64 e G _P -value ////////////////////////////////////	- - - - - - - - - - - - - - - - - - -		no no G _P dry st	32 64 32 ≪64 32 128 GEU IR < 1.5	yes yes yes yes yes 32 VD IR < 1.5	GEU > 1.

galvanic processes, zinc galvanization, pickling processes, etching, phosphating, alkaline degreasing and anodizing); Sludge and filter cakes from surface treatment containing dangerous substances, galvanization Chemical characterization - eluate Dry weight % Water content % pH Cond. µS/cm 39 61 9.57 5140 DOC TOC NH4 Mercury Cadmium Chromium, total Ni mg/l mg/l mg/l µg/l Q	te code Date 10109 16.05.20 ickel Соррен µg/l µg/l 16.6 228
palvanic processes, zinc galvanization, pickling processes, etching, phosphating, alkaline legreasing and anodizing); Sludge and filter cakes from surface treatment containing langerous substances, galvanization Chemical characterization - eluate Dry weight % Water content % pH Cond. µS/cm 39 61 9.57 5140 DOC TOC NH4 Mercury Cadmium Chromium, total Ni mg/l mg/l mg/l µg/l Quit Quit Q	ickel Соррен µg/l µg/l
Dry weight % Water content % pH Cond. µS/cm 39 61 9.57 5140 DOC TOC NH4 Mercury Cadmium Chromium, total Ni mg/l mg/l mg/l µg/l µg/l </th <th>ickel Coppe</th>	ickel Coppe
Dry weight % Water content % pH Cond. μS/cm 39 61 9.57 5140 DOC TOC NH4 Mercury Cadmium Chromium, total Ni mg/l mg/l mg/l µg/l µg/l µg/l µg/l µg/l 40 - < <0.5 <0.1 <0.5 1 Lead Zinc Manganese Arsenic Cobalt AOX	μg/l μg/l
39 61 9.57 5140 DOC TOC NH4 Mercury Cadmium Chromium, total Ni mg/l mg/l mg/l μg/l	μg/l μg/l
39 61 9.57 5140 DOC TOC NH4 Mercury Cadmium Chromium, total Ni mg/l mg/l mg/l μg/l	μg/l μg/l
mg/l mg/L μg/l μg/l <t< th=""><th>μg/l μg/l</th></t<>	μg/l μg/l
40 - < <0.5 <0.1 <0.5 1 Lead Zinc Manganese Arsenic Cobalt AOX	
40 - < <0.5 <0.1 <0.5 1 Lead Zinc Manganese Arsenic Cobalt AOX	
ua/l ua/l ua/l ua/l ua/l ma/l	
3.37 42 <5 <0.5 2.5 0.11	
	E 138 PCB 15 μg/l μg/l
	.011 0.006
	.011 0.000
PCB 180 PCB 77 PCB 105 PCB 118 PCB 126 PCB 169 PC	B 189
	µg/l
0.001 < < < < <	<
Naphthalene Acenaphthylene Acenaphtene Fluorene Phenanthrene Anthracene Fluore	anthene Pyrene
μg/l μg/l μg/l μg/l μg/l μg/l μg/l	µg/l µg/l
	.003 0.002
Benzo(a)- Chrysene Benzo(b)- Benzo(k)- Benzo(a)-pyrene Indeno(1,2,3-cd) Diber	nz(a,h)- Benzo(g,ł
	racene perylen
	µg/l µg/l
0 0.001 0.001 0 0.001 0 0.	.001 0.001
Biphenyl Benzene Toluene Ethylbenzene m-/p-Xylene o-Xylene Dichlor	rmethane 1,1-Dichler
hall nall nall nall nall nall nall	µg/l µg/l
0.003 < 0.27 0.78 1.73 0.84	< 4
	· · ·
	orethene Bromdich
Dichlorethene Dichlorethene Trichlorethan methane Dichlorethane	methan
	µg/l µg/l
< < 0.264 < < <	< <
1,1,2- Tetrachlorethene Dibromchlor- Tribrom- 1,2-Dichlor- 1,3-Dichlor- 1,4-D	Dichlor- hydroca
	nzene Index (H
	µg/l mg/l
	<

	mical surface treatme	nt and coating of me	etals and other ma	terials (for ex	sample number	waste code	Date
	, zinc galvanization, p				2	110109	16.05.2002
	odizing); Sludge and				-	110100	10.00.2002
ngerous substar	ices, galvanization			Ū			
		Chemical cha	aracterization -	solid matter			
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
16	230	0.29	36	145200	120	0.06	650
		<u></u>					
	ocarbons	Lipophilic subst.		Benzene	Toluene	Ethylbenzene	Xylene
	EW.% .006	Gew.% 0.016	Gew.%	mg/kg	mg/kg	mg/kg <0.01	mg/kg 0.03
0	.000	0.016	2.5	<0.01	<0.01	<0.01	0.03
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranther
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
< 0.04	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.47
			<u> </u>				
Pyrene	Benz(a)ar		Chrysene		luoranthene	Benzo(k)flu	
mg/kg <0.1	mg. <0		mg/kg <0.1		ig/kg <0.1	mg/kg <0.1	
NO.1		.1	NU.1		SU. 1	<0.	
Dibenz(al	n)anthracene	Benzo(ghi))perylene	Indeno(1,2	,3-cd)pyrene	Benzo(a)pyrene	AOX
'n	ng/kg	mg/	·· · ·		ng/kg mg/kg		mg/kg
	<0.1	<0.	.1	<	<0.1	<0.1	96
M/- (0	(40 554)				
Water so	luble portion	Sum PAH					
			1				
We	eight %	mg/	'kg				
We		mg/ <1	kg I				
We	eight %	mg/ <1	'kg 1				
We	eight % 6.8	mg/ <1	kg 1				
We marks	eight % 6.8	mg/ <1	kg1				
We marks	eight % 6.8	mg/ <1	kg				
We marks	eight % 6.8	mg/ <1	kg				
We marks	eight % 6.8	mg/ <1	kg				
We marks	eight % 6.8						
We marks	eight % 6.8	mg/<]
We marks	eight % 6.8]
We marks	eight % 6.8						
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We marks	eight % 6.8						
We marks	eight % 6.8						
We marks	eight % 6.8						
We marks	eight % 6.8						
We marks	eight % 6.8						
We marks	eight % 6.8						
We marks	eight % 6.8						

1			Data She	eet no. 3			
Waste from MFSL	J and removal of paints a	and varnishes			sample number	waste code	Date
	ontaining paints and var		those mentioned	in 080115	3	080116	21.06.2002
		Ecotoxiko	logical chara	ctorization			
		ECOLOXING	nogical chara	clenzation			
Algae test - eluat	e I G₄-sample I	EC ₂₀ -sample	EC ₅₀ -sample	Tavisity	-		
80%-sample [%Inhibition]	G _A -sample	[%]	[%]	Toxicity	_		
99.8	>4		-	yes	-		
100	8	15.7	19.2	yes	_		
100	8	18.4	21.3	yes	-		
Median	8	17.1	20.3	yes	1		
Daphnia test - elu		EC comula	FC commis	EC comple	Taulaita	1	
100%-sample [%Inhibition]	G _D -sample	EC ₁₀ -sample [%]	EC ₂₀ -sample [%]	EC ₅₀ -sample [%]	Toxicity		
100	10	16.7	20.4	30.1	yes		
100	2	35.1	39.6	50.2	yes		
Median	6	25.9	30.0	40.2	yes		
	•		•	•			
Luminescent bac	teria test- eluate						
50%-sample	G _L -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity			
[%Inhibition]		[%]	[%]				
64.8	16	9.9	29.6	yes			
54.2	8	16.5	41.9	yes			
Median	12	13.2	35.7	yes			
Bacteria contact 50%-sample [%Inhibition] 40.9	test - solid matter G _B -sample 2-10	Toxicity]				
Median	2-10	yes					
Plant test - solid 50%-sample	Matter	Gp Shoot	t height	G _{P D} ry sho	ot weight	Toxicity	7
Brassica	>32					yes	1
	<64	25	6	51	2	yes	1
Lycopersicon	>32					yes	1
	<64	51		-		yes	
Lycopersicon						,	
	-	-		-		-	-
	- 64	- <6		25		- yes	-
Avena	- 64						
Avena most representat	64 tive G _P -value			25		yes	-
Avena most representat	64 tive G _P -value					yes	Genotoxici
Avena most representat umu-test - eluate	- 64 tive G _p -value without S9	<6	4	25	57	yes 512 VD IR < 1.5	Genotoxicii GEU > 1.5
Avena most representat	- 64 ive G _P -value without S9 GEU	<6 VD	4 Genotoxicity	25	GEU	yes 512 VD	
Avena most representat	- 64 ive G _P -value without S9 GEU IR < 1.5	<6 VD IR < 1.5	4 Genotoxicity GEU > 1.5	25	GEU IR < 1.5	yes 512 VD IR < 1.5	GEU > 1.5

			Data She	eet no. 3			
Vaste from MFSU	and removal of paints	and varnishes			sample number	waste code	Date
	ntaining paints and var		those mentioned	in 080115	3	080116	21.06.2002
	<u> </u>		haracterizatio				
Dry weight	Water content %	рН	Cond. µS/cm				
94.3	5.7	8.42	3490				
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
ma/l	ma/l	ma/L	µq/l	µg/l	µg/l	µq/l	µq/l
7.9	-	11	-	<0.1	<0.5	1.4	17.5
Lead	Zinc	Manganese	Arsenic	Cobalt	AOX	1	
µg/l	μq/l	µg/l	µg/L	µg/l	mg/l		
3.07	889	<5	<0.5	42.7	0.03		
PCB 8	НСН	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
µg/l	μg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	0.004	0.012	0.026	0.012
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	1
µg/l	µg/l	µq/l	µg/l	µg/l	µg/l	µq/l	
0.002	<	0.002	<	<	<	<	
Naphthalene	Acenaphthylene	Aconomistorio	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Durrama
	µg/l	Acenaphtene µg/l	µq/l	µg/l	µg/l	µg/l	Pyrene
μg/l n.b.	n.b.	n.b.	n.b.	n.b.	n.b.	0.009	μg/l 0.008
11.0.	11.0.	n. b .	11.0.	11.0.	11.0.	0.003	0.000
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-pyrene	Indeno(1,2,3-cd)	Dibenz(a,h)-	Benzo(g,h,
anthracene	,	fluoranthene	fluoranthene		pyrene	anthracene	perviene
µg/l	µg/l	µg/l	µq/l	µq/l	µq/l	µg/l	µg/l
0.001	0.002	0.001	0	0.002	0	<	0.001
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-	1.1-
ырпену	Delizene	Toluelle	Laryibenzene	m-p-Aylene	0-Aylerie	methane	Dichlorethe
µq/l	µg/l	µq/l	µq/l	µq/l	µq/l	µq/l	µg/l
n.b.	1.04	3.03	0.59	2.22	1.1	<	<
aia 1 0	trans 1.2	Trichler		Tatua abla um ath an a	1,2-	Trichlorethene	Dramatic
cis-1,2-	trans-1,2-	Trichlor-	1,1,1-	Tetrachlormethane	· · ·	richiorethene	Bromdichle
Dichlorethene µq/l	Dichlorethene µq/l	<u>methane</u> µq/l	Trichlorethan µg/l	µg/l	Dichlorethane µg/l	µg/l	methane
μg/i <	μ <u>μ</u> μμ/ι <	μg/i 0.1	μg/i <	μg/i <	μg/i <	µg/i <	μg/l <
`		0.1					
1.1.2-	Tetrachlorethene	Dibromchlor-	Tribrom-	1.2-Dichlorbenzene	1.3-	1.4-	hvdrocar.
Trichlorethane		methane	methane	.,_ 210110100120110	Dichlorbenzene	Dichlorbenzene	Index (H53
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l
<	<	Pg/. <	×9,.	<u>بون</u> ۲	<u>۳9</u> ۰۰ <	~ ~	-

			Data Shee	t no. 3			
Waste from MFSU	and removal of paints	and varnishes			sample number	waste code	Date
Aqueous sludge co	ntaining paints and va	arnishes other than	those mentioned in	080115	3	080116	21.06.2002
		Chemi	cal characteriza	tion - solid ma	tter		
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
0.52	1.6	0.18	5.6	11	3.6	< 0.05	135600
	carbons	Lipophilic subst.		Benzene	Toluene	Ethylbenzene	Xylene
	EW.%	Gew.%	Gew.%	mg/kg	mg/kg	mg/kg	mg/kg
0	.009	0.17	5.2	<0.01	<0.01	0.09	0.38
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranthene
mg/kg	mg/kg	mg/kg	mg/kg	ma/ka	mg/kg	ma/ka	ma/ka
0.47	1.7	<0.1	<0.1	<0.1	0.29	<0.1	0.1
				•••		•	
Pyrene	Benz(a)an	thracene	Chrysene	Benzo(b)fl	uoranthene	Benzo(k)flu	oranthene
mg/kg	mg/	kg	mg/kg	mg	ı/kg	mg/kg	
<0.1	<0.	.1	<0.1	<().1	<0.	1
Dile a sectad		Dawaa (aki	\	la de a e (4.0	0 1)	D	AOX
	i)anthracene Ig/kg	Benzo(ghi mg/			3-cd)pyrene	Benzo(a)pyrene	mg/kg
	(0.1	<0			<u>ı/kg</u> .1	mg/kg 0.1	<1 rig/kg
	0.1					0.1	
Water sol	uble portion	Sum PAH	(16 EPA)				
	ight %	mg/					
	0.2	2.09					
olid-lumpy, grey; chalk	smell						
				080116 v. 21.0	6.2002		

			Data Sheet sa	mble no. 4			
					sample number	waste code	Date
	and removal of paint	, 0	s from paint or vari	nish containing	4	080113	21.06.2002
organic solvents or	other dangerous sub	stances					
		Ecotoxiko	ological charac	terization	·		
Algae test - eluate		-			_		
80%-sample	G _A -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity			
[%Inhibition]		[%]	[%]				
100	40	5.1	6.6	yes			
100	40	5.1	6.7	yes			
Median	40	5.1	6.7	yes			
100%-sample [%Inhibition]	G _D -sample	EC ₁₀ -sample [%]	EC ₂₀ -sample [%]	EC ₅₀ -sample [%]	Toxicity		
400							
100	5	16.2	19.9	29.4	yes		
100	5 5	16.2 34.0	19.9 38.4		yes yes		
				29.4	1		
100 Median Luminescent bacto	5 5 eria test- eluate	34.0 25.1	38.4 29.1	29.4 48.4 38.9	yes		
100 Median Luminescent bactt 50%-sample	5 5	34.0 25.1 EC ₂₀ -sample	38.4 29.1 EC ₅₀ -sample	29.4 48.4	yes		
100 Median Luminescent bact 50%-sample [%Inhibition]	5 5 eria test- eluate G _L -sample	34.0 25.1 EC ₂₀ -sample [%]	38.4 29.1 EC ₅₀ -sample	29.4 48.4 38.9 Toxicity	yes		
100 Median Luminescent bacto 50%-sample [%Inhibition] 47.3	5 5 eria test- eluate G∟sample 8	34.0 25.1 EC ₂₀ -sample [%] 17.1	38.4 29.1 EC ₅₀ -sample [%] 51.8	29.4 48.4 38.9 Toxicity yes	yes		
100 Median Luminescent bacte 50%-sample [%Inhibition]	5 5 eria test- eluate G _L -sample	34.0 25.1 EC ₂₀ -sample [%]	38.4 29.1 EC ₅₀ -sample	29.4 48.4 38.9 Toxicity	yes		

Bacteria contact test - solid matter

50%-sample	G _B -sample	Toxicity
[%Inhibition]		
-	10-100	yes
Median	10-100	yes

Plant test - solid matter

50%-sample	G _P Germination rate	Gp Shoot height	G _P Dry shoot weight	Toxicity
Brassica	64	128	64	yes
	>2048	512	512	yes
Lycopersicon	>128	32	32	yes
	>2048	>2048	2048	yes
Avena	32	32	32	yes
	<128	256	256	yes
most representa	ative G _P -value			32

umu-test - elua		1 1/2		Eluate with S9			
	GEU	VD	Genotoxicity		GEU	VD	Genotoxicity
	IR < 1.5	IR < 1.5	GEU > 1.5		IR < 1.5	IR < 1.5	GEU > 1.5
	1.5	1.67	no		1.5	0.67	no
	1.5	1.67	no		1.5	0.67	no
	1.5	1.67	no				
Median	1.5	1.67	no	Median	1.5	0.67	no

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Appendix

			Data Sheet sa	amble no. 4			
Waste from MFSU	J and removal of paint a	and varnish, sludges	from paint or va	rnish containing	sample number	waste code	Date
	r other dangerous subs			5	4	080113	21.06.2002
		Chen	nical characte	erization - eluate	I		
Dry weight	Water content %	pН	Cond. µS/cm	1			
68	32	7.21	665				
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	mg/l	mg/L	µq/l	µg/l	µg/l	µq/l	µg/l
74	-	42	5.9	<0.1	<0.5	13.6	9.1
				<u> </u>			
Lead	Zinc	Manganese	Arsenic	Cobalt	AOX		
µg/l	µg/l	µg/l	µg/L	μg/l	mg/l		
3.5	10100	220	<0.5	158	0.02		
PCB 8	НСН	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
-	<	<	<	0.01	0.028	0.064	0.035
							1
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	
μg/l	µg/l	µg/l	µg/l	μg/l	μg/l	µg/l	
0.005		<	<	-	-	-	
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
2.02	<	<	0.008	0.014	<	0.01	0.012
_							
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-pyrene	Indeno(1,2,3-cd)	Dibenz(a,h)-	Benzo(g,h,i)-
anthracene		fluoranthene	fluoranthene		pyrene	anthracene	perylene
μg/l 0.002	µg/l <	μg/l 0.004	µg/l <	µg/l <	µg/l <	μg/l <	µg/l <
0.002		0.004	``		`	`	``
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-	1.1-
			,		,	methane	Dichlorethen
µg/l	μg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.012	<	2	~ 100	~ 450	~ 220	<	<
							
cis-1,2-	trans-1,2-	Trichlor-methane	1,1,1-	Tetrachlor-methane	1,2-	Trichlorethene	Bromdichlor-
Dichlorethene	Dichlorethene		Trichlorethan		Dichlorethane		methane
μg/l <	µg/l <	μg/l <	μg/l <	µg/l <	µg/l <	μg/l <	µg/l <
`		· · ·	<u> </u>			<u> </u>	```
1,1,2-	Tetrachlorethene	Dibromchlor-	Tribrom-	1,2-Dichlorbenzene	1,3-	1,4-	hydrocar
Trichlorethane		methane	methane	,	Dichlorbenzene		Index (H53)
µg/l	µg/l	µg/l	µg/l	µg/l	μg/l	μg/l	mg/l
<	<	<	<	<	<	<	-

			Data Sheet sar	nble no. 4			
aste from MFSU	and removal of paint	and varnish			lfd Nr.	EAV	Datum
udges from pain	t or varnish containing	g organic solvents or	other dangerous si	ubstances	4	080113	21.06.2002
		Chemic	al characteriza	tion - solid mat	ter		
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1.7	9.9	0.37	3.2	170	1.9	<0.05	21600
L h . el e		I in a hill a sub at	тос	Bannana	Tabaaaa	Etherline and a second	Vedere
	ocarbons eight %	Lipophilic subst. Weight %	Weight %	Benzene	Toluene	Ethylbenzene	Xylene
VVe	9.3	7.4	29.4	mg/kg 0.02	mg/kg 0.27	mg/kg 47	mg/kg 230
	9.0	7.4	23.4	0.02	0.27	47	230
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranther
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
277	16	<0.1	<0.1	<0.1	0.29	<0.1	<0.1
Pyrene		Benz(a)anthracene Chrysene Benzo(b)fluora			Benzo(k)flu		
mg/kg	mg		mg/kg		g/kg	mg/	
<0.1	<0).1	<0.1	<).1	<0.1	
Dihanz/a	h)anthracana	Banzo/ahi)nomdono	Indona/1.2	2 od)nurono	Banzo(a)nurana	AOX
	h)anthracene ng/kg	Benzo(ghi mg/			3-cd)pyrene g/kg	Benzo(a)pyrene mg/kg	mg/kg
	<0.1	<0).1	<0.1	430
emarks Jlid-pasty, grey, a	ammonia smell]

i

Wastes from cast	ing of non-ferrous sp	ecies. Casting cc	res and moulds a	after metal	sample number	waste code	Date
	n those mentioned in				6	101008	11.07.2002
		Ecotoxiko	ological chara	cterization			
Algae test - elua	te						
80%-sample	G _A -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity]		
[%Inhibition]		[%]	[%]				
100	80	3.1	15.7	yes	-		
100	80	2.3	9.9	yes	4		
Median	80	2.7	12.8	yes	-		
Daphnia test - el		<u> </u>		50			
100%-sample	G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition] 0	1	[%]	[%]	[%]	no		
0	1	-	-	-	no		
0			-		110		
Median	1	-	-	-	no		
	cteria test- eluate				-		
50%-sample	G _L -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	4		
[%Inhibition]	10	[%]	[%]		4		
68.8 66.3	16 16	7.9 7.1	24.8 26.8	yes	-		
00.5	10	1.1	20.0	yes	-		
Median	16	7.5	25.8	yes]		
Bacteria contact	test - solid matter						
50%-sample	G _B -sample	Toxicity]				
[%Inhibition]							
[%Inhibition] 94.1	10-100	yes					
	10-100	yes	-				
94.1			-				
94.1	10-100 10-100	yes yes					
94.1 Median	10-100						
94.1 Median Plant test - solid	10-100		t height	G⊳ dry sł	loot weight	Toxicity	
94.1 Median Plant test - solid 50%-sample	10-100	yes	t height	G _P dry sł	ioot weight	Toxicity	
94.1 Median Plant test - solid 50%-sample	10-100	yes	-	G _P dry sł	-	Toxicity]
94.1 Median Plant test - solid 50%-sample Brassica	10-100 matter G _P germination ra - 2 -	yes Gp Shoo - 2	2	G _P dry sł	- 2 -	-]
94.1 Median Plant test - solid 50%-sample Brassica Lycopersicon	10-100 matter G _P germination ra - 2 - 4	yes Gp Shoo - 2 - 2 - 2		G _P dry sł	- 2 - 2 2	-	
94.1 Median Plant test - solid 50%-sample Brassica Lycopersicon	10-100 matter G _P germination ra - 2 - 4 -	yes Gp Shoo - - - 2 - 2			- 2 - 2 2 - 2 - 2	no yes	
94.1 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena	10-100 matter G _P germination rd - 2 - 4 - 4 - 2	yes Gp Shoo - 2 - 2 - 2			- 2 - 2 2	no yes yes	
94.1 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena	10-100 matter G _P germination rd - 2 - 4 - 4 - 2	yes Gp Shoo - - - 2 - 2			- 2 - 2 2 - 2 - 2	no yes	
94.1 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena	10-100 matter G _P germination rd - 2 - 4 - 4 - 2	yes Gp Shoo - - - 2 - 2			- 2 - 2 2 - 2 - 2	no yes yes	
94.1 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representa	10-100 matter G _P germination ra - 2 - 4 - 4 - 2 tive G _P -value	yes Gp Shoo - - - 2 - 2			- 2 - 2 2 - 2 - 2	no yes yes	
94.1 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representa	10-100 matter G _P germination ra - 2 - 4 - 4 - 2 tive G _P -value	yes 	Genotoxicity		- 2 - 2 2 - 2 - 2	no yes yes	Genotoxicit
94.1 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representa	matter G _P germination ra - 2 - 4 - tive G _P -value without S9	yes Gp Shoo - 2 - 2 - 2 - 2 2			- 2 - 2 - 32	no yes yes 2	Genotoxicit GEU > 1.5
	matter G _P germination ra - 2 - 4 - tive G _P -value without S9 GEU	yes 	Genotoxicity		- 2 - 2 - 32 - 32 - 6 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	no yes yes 2 VD	Genotoxicit GEU > 1.5 no

			Data Sheet s	amble no. 6			
Wastes from cast	ing of non-ferrous sp	pecies, Casting co	res and moulds a	after metal	sample number	waste code	Date
pouring other thar	those mentioned in	n 101007, mouldin	g sand		6	101008	11.07.2002
		Chei	mical charact	erization - elua	ate		
Dry weight %	Water content %	рН	Cond. µS/cm]			
96.7	3.27	7	439				
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	mg/l	mg/L	µg/l	µg/l	µg/l	µg/l	µg/l
85	-	1.4	0.1	1	95.2	87.7	189
					•	•	
Lead	Zinc	Manganese	Arsenic	Cobalt	AOX		
µg/l	µg/l	µg/l	μg/L	µg/l	mg/l		
36	1280	1420	2.3	43.4	0.05		
				505 50	505 (0)	505 (00	505 (50
PCB 8	HCH	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
μg/l <	μg/l <	μg/l <	µg/l <	µg/l	µg/l	µg/l	μg/l 0.048
```		```		0.012	0.043	0.093	0.040
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	1
μg/l	µg/l	µg/l	µg/l	μg/l	µg/l	µg/l	
0.007	<	0.007	<	<	<	<	
					•	•	1
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
10	0.23	0.27	0.64	5.1	0.83	1.2	1
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-	Indeno(1,2,3-cd)		Benzo(g,h,i)
anthracene		fluoranthene	fluoranthene	pyrene	pyrene	anthracene	perylene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.19	0.72	0.03	0.006	0.011	<	0.002	0.004
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-methane	1.1-
Diprietty	Delizene	Toluelle		пт-ир-хутепе	0-Aylene	Dictrior-methane	Dichlorethen
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
1.1	0.58	1.43	1.03	2.24	1.81	<	<
		-					
cis-1,2-	trans-1,2-	Trichlor-	1,1,1-	Tetrachlor-	1,2-	Trichlorethene	Bromdichlor
Dichlorethene	Dichlorethene	methane	Trichlorethan	methane	Dichlorethane		methane
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	<	<	<	<
			<u> </u>				
1,1,2-	Tetrachlor-	Dibromchlor-	Tribrom-	1,2-	1,3-	1,4-	hydrocar
Trichlorethane	ethene	methane	methane		Dichlorbenzene		Index (H53)
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l
<	<	<	<	<	<	<	-

		species, Casting cor		ifter metal	sample number	waste code	Date
ouring other that	n those mentioned	in 101007, moulding		ation colid	6	101008	11.07.2002
<u> </u>			al characteriz				
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg 1.8	mg/kg 5.2	mg/kg 0.19	mg/kg 17	mg/kg 56	mg/kg 11	mg/kg <0.05	mg/kg 144
1.0	5.2	0.19	17	50		<0.05	144
Hydro	carbons	Lipophilic subst.	TOC	Benzene	Toluene	Ethylbenzene	Xylene
Wei	ight %	Weight %	Weight %	mg/kg	mg/kg	mg/kg	mg/kg
0	.14	0.15	1.9	0.07	0.22	0.07	0.18
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranthen
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
0.54	7.8	0.12	<0.1	0.21	2.4	0.3	0.19
0.01	1.0	0=	0.1	0.21		010	0110
Pyrene	Benz(a)a	nthracene	Chrysene	Benzo(b)	fluoranthene	Benzo(k)flue	oranthene
mg/kg		g/kg	mg/kg mg/kg		mg/l		
0.3	<	0.1	0.1	(	0.11	<0.	1
Dibonz(ab	)anthracene	Benzo(ghi)	nervlene	Indeno(1 3	2,3-cd)pyrene	Benzo(a)pyrene	AOX
•	g/kg	mg/l			ng/kg	mg/kg	mg/kg
	0.1	<0.			<0.1	<0.1	20
	uble portion	Sum PAH	(16 EPA)				
vvei	ight % 0.3	mg/l 11.	kg 5				
emarks	ery, sooty	F					
	and the second se	Carl Carlos and Carlos	and the second se	110000			

			Data Sheet sa	mble no.7			
Wastes from shap	ing and physical and m	nechanical surface t	treatment of meta	als and plastics.	sample number	waste code	Date
	containing dangerous			,	7	120114	27.06.2002
Algae test - eluate		-	logical chara		1		
80%-sample [%Inhibition]	G _A -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity			
51.9	2	[%]	[%]	ves			
-78.3	1.25	-	-	no			
Median	1.6	-	-	yes	}		
Daphnia test - elu	late						
100%-sample	G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]		[%]	[%]	[%]			
80	2	-	-	-	yes		
0	1	-	-	-	no		

100%-sample	G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity
[%Inhibition]		[%]	[%]	[%]	
80	2	-	-	-	yes
0	1	-	-	-	no
Vedian	1.5	-	-	-	ves

#### Luminescent bacteria test- eluate

50%-sample	G _L -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	
[%Inhibition]		[%]	[%]		
100	128	1.2	4.5	yes	
100	64	2.0	6.1	yes	
Median	96	1.6	5.3	yes	

#### Bacteria contact test - solid matter

50%-sample	G _B -sample	Toxicity
[%Inhibition]		
78.3		yes
-	10-100	yes
Median	10-100	yes

#### Plant test - solid matter

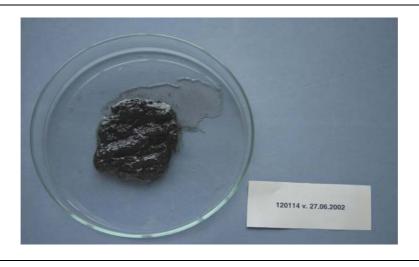
50%-sample	G _P germination rate	Gp Shoot height	G _P dry shoot weight	Toxicity
Brassica	128	128	128	yes
	<128	<128	1024	yes
Lycopersicon	-	256	>256	yes
	256	<128	<128	yes
Avena	<16	32	32	yes
	>2048	256	<2048	yes
most representative G _P -value				not detectable

umu-test - eluate	without S9	Eluate with S9					
	GEU	VD	Genotoxicity		GEU	VD	Genotoxicity
	IR < 1.5	IR < 1.5	GEU > 1.5		IR < 1.5	IR < 1.5	GEU > 1.5
	1.5	0.67	no		1.5	0.67	no
	1.5	0.67	no		1.5	0.67	no
Median	1.5	0.67	no	Median	1.5	0.67	no

astes from shap	ing and physical and n	nechanical surface t	reatment of met	als and plastics.	sample number	waste code	Date
	containing dangerous			ale and plactice,	7	120114	27.06.2002
		Chem	ical characte	rization - eluate	)		
Dry weight %	Water content %	рН	Cond. µS/cm	]			
60.9	39.1	7.8	800	]			
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	mg/l	mg/L	µq/l	µg/l	µg/l	µg/l	µg/l
110	-	0.55		<0.1	<05	18.4	11.2
Lead	Zinc	Manganese	Arsenic	Cobalt	AOX		
µg/l	µg/l	µg/l	µg/L	µg/l	mg/l		
3.74	302	231	<0.5	3.7	0.04		
PCB 8	НСН	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
µg/l	μg/l	μg/l	μg/l	μg/l	µg/l	μg/l	µg/l
-	<	<	<	<	0.009	0.016	0.01
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	
<	-	<	<	-	-	-	
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
µq/l	µg/l	µg/l	µq/l	µg/l	µg/l	µg/l	µq/l
0.381	0.016	<	0.034	0.029	×	0.019	0.041
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-pyrene	Indeno(1,2,3-cd)	Dibenz(a,h)-	Benzo(g,h,
anthracene		fluoranthene	fluoranthene		pyrene	anthracene	perylene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	<	<	<	<
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-methane	1.1-
ырпепу	Delizene	Toluelle	Ethylbenzene	III-/p-xylefie	0-Aylene	Dichlor-methane	Dichlorethe
µq/l	μg/l	µg/l	µg/l	µg/l	µg/l	μg/l	µg/l
0.008	<	<	14	55	21	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	<
cis-1,2-	trans-1,2-	Trichlor-methane	1,1,1-	Tetrachlor-	1,2-	Trichlorethene	Bromdichlo
Dichlorethene	Dichlorethene		Trichlorethan	methane	Dichlorethane		methane
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	<	<	<	<
1,1,2-	Tetrachlorethene	Dibromchlor-	Tribrom-	1.2-	1,3-	1.4-	hudroocr
1,1,2- Trichlorethane	retrachiorethene	methane	methane	1,2- Dichlorbenzene	1,3- Dichlorbenzene	1,4- Dichlorbenzene	hydrocar. Index (H53
memorethane		memane	memane	DICITIONDELIZERE	DICTIONDELIZERE	DICITIONDELIZENE	
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l

	an and also start and	we also also also as when a set	in a star a star of second all	a and planting	sample number	waste code	Date
	containing dangerou	mechanical surface t	reatment of metals	s and plastics,	7	120114	27.06.200
		Chemica	al characterizat	ion - solid m	atter		
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
10	130	0.92	310	340	120	0.45	2085
Hvdro	carbons	Lipophilic subst.	тос	Benzene	Toluene	Ethylbenzene	Xylene
	ght %	Weight %	Weight %	mg/kg	mg/kg	mg/kg	mg/kg
	47	5.4	59.8	<0.01	0.3	4.6	29
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranthe
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
72.2	4.3	<0.1	<0.1	1.3	7.6	<0.1	0.65
Burrana	<b>D</b> ====(=)==		Chanada			Demon (la) flu	
Pyrene		nthracene	Chrysene	· · · ·	luoranthene	Benzo(k)flu	
mg/kg 1.4		/kg .3	mg/kg 3.8		ig/kg ).18	mg/ <0.	
1.4	0	.5	5.0		. 10	٩٥.	<u> </u>
Dibenz(ah	)anthracene	Benzo(ghi)	perylene	Indeno(1,2	,3-cd)pyrene	Benzo(a)pyrene	AOX
	g/kg	mg/l		m	g/kg	mg/kg	mg/kg
<	0.1	<0.	1	<	0.1	0.19	390
	uble portion	Sum PAH	(16 EPA)				
Wei	ght %	mg/l	kg				
(	).5	27.	7				

liquid, pasty, black, solvent smell, liquid supernatant portion, eluate showed oily characteristic



	J and removal of paint a	nd varnich Sluda	es from point or :	varnich	sample number	waste code	Date
	solvents or other dang			arnisn	8	080113	27.06.2002
containing organic	contointe er ether durig				0	000110	27.00.2002
Algae test - eluat	e	Ecotoxiko	ological chara	cterization			
80%-sample	G _A -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	]		
[%Inhibition]		[%]	[%]				
100	40	5.6	7.3	yes			
100	40	2.7	5.6	yes	]		
100	40	2.7	5.1	yes			
Median	40	2.7	5.6	yes	]		
Daphnia test - elı	iato						
100%-sample	G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]	on campio	[%]	[%]	[%]	TOXICITY		
100	5	38.8	42.1	49.2	yes		
90	5	42.9	48.5	61.2	yes		
90	2	49.4	55.8	70.5	yes		
Median	5	42.9	48.5	61.2	yes		
inculari	<b>.</b> .	72.0	40.0	01.2	<b>J</b> 03		
	teria test- eluate				_		
50%-sample	G _L -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity			
[%Inhibition]		[%]	[%]	-			
79	64	1.9	9.8	yes	1		
78.7	64	1.8	9.6	yes			
Median	64	1.8	9.7		4		
	04	1.0	9.7	yes	J		
	test - solid matter						
50% cample			7				
50%-sample	G _B -sample	Toxicity	]				
[%Inhibition]	G _B -sample	Toxicity					
[%Inhibition] 44.5	-	Toxicity yes					
[%Inhibition]	G _B -sample						
[%Inhibition] 44.5 43.4	2-10	yes					
[%Inhibition] 44.5 43.4	-	yes					
[%Inhibition] 44.5 43.4 Median	2-10 2-10	yes yes					
[%Inhibition] 44.5 43.4 Median Plant test - solid 50%-sample	2-10 2-10	yes yes	t height	G _P Dry sł	noot weight	Toxicity	]
[%Inhibition] 44.5 43.4 Median Plant test - solid 50%-sample	2-10 2-10 2-10 matter G _P Germination rate	yes yes yes	t height	G _P Dry st		Toxicity	]
[%Inhibition] 44.5 43.4 Median Plant test - solid 50%-sample	2-10 2-10 2-10	yes yes yes		G _P Dry sł	noot weight	Toxicity	]
[%Inhibition] 44.5 43.4 Median Plant test - solid 50%-sample Brassica	2-10 2-10 2-10 matter G _P Germination rate	yes yes yes G _p Shoot	3	G _P Dry st			
[%Inhibition] 44.5 43.4 Median Plant test - solid 50%-sample Brassica	2-10 2-10 matter G _P Germination rate	yes yes yes G _p Shoot	5	G _P Dry sł	8		
[%Inhibition] 44.5 43.4 Median Plant test - solid 50%-sample Brassica Lycopersicon		yes yes yes G _p Shoot	3	G _P Dry st	8 - 8 -	yes	
[%Inhibition] 44.5 43.4 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena		yes yes yes G _p Shoot	3	G _P Dry st	8 - 8	yes	
[%Inhibition] 44.5		yes yes yes G _p Shoot	3	G _P Dry sł	8 - 8 -	yes - yes	
[%Inhibition] 44.5 43.4 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most represental	- 2-10 2-10 matter G _P Germination rate 8 - >32 - 8 sive G _P -value	yes yes yes G _p Shoot	3		8 - 8 -	yes yes yes	
[%Inhibition] 44.5 43.4 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena		yes yes <b>yes</b> <b>G</b> p Shoot 16 	5	G _P Dry sł	8 - 8 - 8	yes yes yes 8	
[%Inhibition] 44.5 43.4 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most represental		yes yes yes G _p Shoot 16 	Genotoxicity		8 - 8 - 8 8 - 8 8	yes yes yes 8	Genotoxici
[%Inhibition] 44.5 43.4 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most represental		yes yes yes G _p Shoot	Genotoxicity GEU > 1.5		8 - 8 - 8 - 8 - 8 - 8 - 8 - 8 - 8 - 8 -	yes yes yes 8 VD IR < 1.5	GEU > 1.
[%Inhibition] 44.5 43.4 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most represental		yes yes yes G _p Shoot 16 	Genotoxicity GEU > 1.5 no		8 - 8 8 6 6 8 1 8 1 7 8 8 1 7 8 8 1 7 8 8	yes yes yes 8 VD IR < 1.5 0.67	GEU > 1.5 no
[%Inhibition] 44.5 43.4 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most represental		yes yes yes G _p Shoot	Genotoxicity GEU > 1.5		8 - 8 - 8 - 8 - 8 - 8 - 8 - 8 - 8 - 8 -	yes yes yes 8 VD IR < 1.5	GEU > 1.8
[%Inhibition] 44.5 43.4 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representat		yes yes yes G _p Shoot 16 	Genotoxicity GEU > 1.5 no		8 - 8 8 6 6 8 1 8 1 7 8 8 1 7 8 8 1 7 8 8	yes yes yes 8 VD IR < 1.5 0.67	GEU > 1.5 no

		Ľ	Data Sheet sa	mble no.8			
Waste from MFSL	J and removal of paint	and varnish, Sludge	es from paint or v	/arnish	sample number	waste code	Date
	solvents or other dang		·		8	080113	27.06.2002
		Chemi	ical character	rization - eluat	e		
Dry weight %	Water content %	рН	Cond. µS/cm	1			
64.5	35.5	6	747				
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	mg/l	mg/L	µg/l	µg/l	µg/l	µg/l	µg/l
410	-	13	<0.05	<0.1	<0.5	15.1	116
Lead	Zinc	Manganese	Arsenic	Cobalt	ΑΟΧ	T	
	-	•			-	ł	
μg/l 2.72	μg/l 10100	μg/l 295	μg/L <0.5	μg/l 151	mg/l 0.03	ł	
2.12	10100	295	<0.5	151	0.03	L	
PCB 8	НСН	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	<	0.012	0.022	0.012
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	
0.002	<	<	<	<	<	<	
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
μg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
11	<	0.004	0.04	0.019	<	0.009	0.009
			-		-		
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-	Indeno(1,2,3-cd)-	Dibenz(a,h)-	Benzo(g,h,i)-
anthracene		fluoranthene	fluoranthene	pyrene	pyrene	anthracene	perylene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.001	0.004	0.001	<	0.002	<	<	0.001
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-	1,1-
Dipiteliyi	Delizene	Toluelle	Luiyibenzene	III-/p-Aylelle	0-Aylerie	methane	Dichlorethene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
n.b.	<	14	450	1040	410	<	<
						•	•
cis-1,2-	trans-1,2-	Trichlor-methane	1,1,1-	Tetrachlor-	1,2-	Trichlorethene	Bromdichlor-
Dichlorethene	Dichlorethene		Trichlorethan	methane	Dichlorethane		methane
µg/l	μg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	<	<	<	<
1,1,2-	Tetrachlorethene	Dibromchlor-	Tribrom-	1.2-	1.3-	1.4-	hydrocar
	retrachiorethene			,	/ ·	,	•
		mothano	mothanc	Dichlorhonzono	I Dichlorhonzono	Dichlorhonzono	
Trichlorethane µg/l	µg/l	<u>methane</u> µg/l	methane μg/l	Dichlorbenzene µg/l	Dichlorbenzene µg/l	Dichlorbenzene µg/l	Index (H53) mg/l

1

	U and removal of paint	and varnish, Sludo	es from paint or va	rnish	sample number	waste code	Date
containing organi	c solvents or other dar	igerous substances	•		8	080113	27.06.2002
		Chemica	l characterizati	on - solid m	atter		
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1.7	1025	6.2	100	70	67	<0,05	119200
Llvd	rocarbons	Lipophilic subst.	тос	Benzene	Toluene	Ethylbenzene	Xylene
	/eight %	Weight %	Weight %	mg/kg	mg/kg	mg/kg	mg/kg
•••	6.2	10	24.3	0.05	1.3	150	640
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranther
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
791	50	<0.1	<0.1	0.42	0.98	<0.1	<0.1
Pyrene	Benz(a)an	thracene	Chrysene	Benzo(b)	fluoranthene	Benzo(k)flu	oranthene
mg/kg	mg		mg/kg		ng/kg	mg/	
0.1	0.4		1.2	(	0.56	<0.	
Dihana(	h)anthracana	Banza/ahi	mandana	Indona/4 (		Banza/a)nurana	AOX
	ah)anthracene mg/kg	Benzo(ghi) mg/			2,3-cd)pyrene	Benzo(a)pyrene	-
	<0.1	//////////////////////////////////////		mg/kg <0.1		mg/kg <0.1	mg/kg 210
						0.1	2.0
	oluble portion	Sum PAH					
VV	/eight % 1.7	mg/ 52.	к <u>д</u> 1				
	k, solvent smell, liquid	supernatant portion					
<mark>Remarks</mark> liquid-pasty, blacl	<, solvent smell, liquid	supernatant portion					

			Data Sheet sa	amble no. 9			
Wastes from castin	g of non-ferrous spec	ies, Casting cores	and moulds afte	r metal pouring	sample number	waste code	Date
	entioned in 101007, c			,	9	101008	11.07.2002
		Feetewilke		oto vizoti o v			
		ECOLOXIKO	ological chara	cterization			
Algae test - eluate	G _₄ -sample	EC ₂₀ -sample	EC comple	Taviaity	Г		
80%-sample [%Inhibition]	G _A -sample	[%]	EC ₅₀ -sample	Toxicity	-		
13.9	1.25	[70]	[%]				
-3.5	1.25	-	-	no no			
-3.5	1.25	-	-	no	-		
Median	1.25	-	-	no	_		
Daphnia test - elua		EC comulo	EC comple	EC comple	Taulaitu		
100%-sample	G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]	2	[%]	[%]	[%]	1/02		
100 70	2	-	-	-	yes		
70	Ζ	-	-	-	yes		
Median	2	-	-	-	yes		
			•				
Luminescent bact	oria tost- oluato						
50%-sample	G ₁ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	7		
[%Inhibition]	of equipte	[%]	[%]	reality			
27.5	4	32.7	119.9	yes			
29.9	4	26.7	109.7	yes	_		
20.0		20.1	100.1	ycs	-		
Median	4	29.7	114.8	yes	-		
	-			1	-		
Bacteria contact te	est - solid matter						
50%-sample	G _B -sample	Toxicity	]				
[%Inhibition]	-B - ministra	. exiety					
16.3	2	no	1				
10.0	-		1				
			1				
Median	2	no	]				
Plant test - solid m 50%-sample	natter G _P Germination rate	Gp Shoo	t heiaht	G₀ Drv sh	oot weight	Toxicity	7
Brassica	-	4	-		8	yes	1
	<32	64			32	yes	1
Lycopersicon	32	8			8	yes	1
	64	64			64	yes	1
Avena	2	2			2	no	1
	<32	<3			2 64		1
most representativ			<u> </u>			yes 32	1
						~=	
umu-test - eluate v		1/5	0	Eluate with S9	05:		
	GEU	VD	Genotoxicity		GEU	VD	Genotoxici
	IR < 1.5	IR < 1.5	GEU > 1.5		IR < 1.5	IR < 1.5	GEU > 1.5
	1.5	0.67	no		1.5	0.67	no
	1.5	0.67	no		1.5	0.67	no
Madian		0.07		Median		0.07	
Median		0.67	no	Median	1.5	0.67	no

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			Data Sheet sa	amble no. 9			
Vactor from costi	na of non formula and	ion Conting cores	and maulda afta	r motol nouring	sample number	waste code	Date
	ng of non-ferrous spec nentioned in 101007, c		and moulds alle	r metai pouning	9	101008	11.07.2002
		Chen	nical characte	erization - eluate	9		
Dry weight %	Water content %	pH	Cond. µS/cm	ſ			
99.9	0.1	5 adj. to 7.3	85.2	İ			
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	ma/l	ma/L	µg/l	μg/l		µg/l	µg/l
13	- -	0.05	<0.05	<0.1	<0.5	<0.5	4.1
10		0.00	40.00	-0.1	40.0	40.0	7.1
Lead	Zinc	Manganese	Arsenic	Cobalt	AOX		
µg/l	µg/l	µg/l	µg/L	µg/l	mg/l		
2.87	91	<5	<0.5	1.1	0.02		
PCB 8	цец	PCB 18	PCB 28	PCB 52	PCB 101	DCD 439	PCB 153
μg/l	HCH µg/l	μg/l	μg/l	μg/l	μg/l	<u>PCB 138</u> μg/l	рсв 153 µg/l
μ <u>μ</u> γ/ι <	μy/i <	µg/i <	µg/i <	μy/i <	0.006	0.01	0.005
<u>``</u>	`	``		``	0.000	0.01	0.005
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	
µg/l	µq/l	µg/l	µg/l	µq/l	µg/l	µq/l	
0.001	<	<	<	<	<	<	
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
22	0.002	0.003	0.004	0.006	0.007	0.002	0.002
22	0.002	0.005	0.004	0.000	0.007	0.002	0.002
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-pyrene	Indeno(1.2.3-cd)	Dibenz(a,h)-	Benzo(g,h,
anthracene	<b>,</b>	fluoranthene	fluoranthene		pyrene	anthracene	perylene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0	0.001	0	<	0.001	<	<	0
D' I I I I	<b>B</b>	<b>T</b> . 1		and the Markense	. V. I	D'	
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-methane	1,1-
							Dichlorethe
μg/l 0.005	μg/l <	µg/l <	µg/l <	μg/l 0.94	μg/l 1.09	μg/l <	µg/l <
0.005	``			0.94	1.09	`	
cis-1,2-	trans-1.2-	Trichlor-	1,1,1-	Tetrachlor-	1.2-	Trichlor-ethene	Bromdichlo
Dichlorethene	Dichlorethene	methane	Trichlorethan	methane	Dichlorethane		methane
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	<	<	×	×
			·		·		·
1,1,2-	Tetrachlorethene	Dibromchlor-	Tribrom-	1,2-	1,3-	1,4-	hydrocar.
Trichlorethane		methane	methane	Dichlorbenzene	Dichlorbenzene	Dichlorbenzene	Index (H53
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l
<	<	<	<	<	<	<	1

			Data Sheet san	nble no. 9			
Westes from eastin	ng of non-ferrous spec	ica Casting cores	and maulda offer r	notal nauring	sample number	waste code	Date
	ientioned in 101007, c		and moulds after 1	netai pounny	9	101008	11.07.2002
		Chemica	al characterizat	ion - solid m	natter		
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
<0.1	1	0.02	1.3	2.2	<1	0.07	12
Hydro	carbons	Lipophilic subst.	тос	Benzene	Toluene	Ethylbenzene	Xylene
	ight %	Weight %	Weight %	mg/kg	mg/kg	mg/kg	mg/kg
	.002	<0.01	0.6	<0.01	0.01	0.04	0.26
		•					-
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranthene
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
0.31	3.3	0.1	<0.1	<0.1	0.15	<0.1	<0.1
Pyrene	Benz(a)ant	hracono	Chrysene	Benzo(b)f	luoranthene	Benzo(k)flu	oranthene
mg/kg	mg/ł		mg/kg	. ,	ig/kg	mg/	
<0.1	<0.1		<0.1		<0.1		
	n)anthracene	Benzo(ghi)			2,3-cd)pyrene	Benzo(a)pyrene	AOX
	ng/kg <0.1	mg/ <0.			ig/kg <0.1	mg/kg <0.1	mg/kg 15
	uble portion	Sum PAH					
	eight % <0.1	mg/ 3.5					
		0.0	•				
Remarks	any hoizo						1
core sand, solid-st	ony, beige						
	BALLY ST				1		
					Contraction of the		
			111 - 200				
		100			and the second se		
		Ander					
	Street Street	Contraction of			and the second second		
					and the second second		
	1				The second second		
				101008 K v. 11	.07.2002		
				Statistics of the local division of the loca	and the second second		
	teritoria del parte						
1							

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		D	ata Sheet sar	nble no. 11			
Wastes from shree those mentioned	edding of metal containing in 191003	g wastes, Fluff-lig	ht fraction and du	ust, other than	sample number 11	waste code 191004	Date 21.05.2002
	to	Ecotoxiko	ological chara	cterization			
Algae test - eluat 80%-sample	G _A -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	7		
[%Inhibition]	O _A -Sumple	[%]	[%]	TOXICITY	-		
100	10	9.9	14.2	yes	-		
100	10	14.3	16.4	yes	-		
89.1	4	29.1	42.6	yes	-		
Median	10	14.3	16.4	yes	]		
Danhnia taat ol	uato						
Daphnia test - el 100%-sample	G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]	op-sample	[%]	[%]	[%]	TOXICITY		
30	2	63.8	77.2	111.2	yes		
10	1	100.0	-	-	no		
10		100.0			110		
Median	1.5	81.9	77.2	111.2	yes		
	cteria test- eluate				-		
50%-sample	G _L -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity			
[%Inhibition]		[%]	[%]				
60.6	16	11.64	35.14	yes			
59.2	16	11.56	36.74	yes	_		
Median	16	11.6	35.9	yes	-		
Bactoria contact	test - solid matter						
50%-sample	G _B -sample	Toxicity	٦				
[%Inhibition]	OB-Sumple	TOXICITY	-				
76.8		yes	-				
98.4	10-100	yes	-				
30.4	10-100	yes	-				
Median	10-100	yes	-				
meanan	10-100	ycs					
Plant test - solid							-
50%-sample	G _P Germination rate	Gp Shoo			hoot weight	Toxicity	4
Brassica	2	8			>32	yes	4
	>32	>3			>32	yes	4
Lycopersicon	16	8			16	yes	4
A	>32	>3		, ,	>32	yes	4
Avena	2	2			2	no	4
	4	4	•	, ,	>32	yes	4
most representa	itive G _P -value					>32	1
	e without S9			Eluate with S9			
umu-test - eluate		VD	Genotoxicity		GEU	VD	Genotoxicit
umu-test - eluate	GEU			1			
umu-test - eluate	GEU IR < 1.5		GEU > 1.5		IR < 1.5	IR < 1.5	GEU > 1.5
umu-test - eluate	IR < 1.5	IR < 1.5					
umu-test - eluate	IR < 1.5 1.5	<b>IR &lt; 1.5</b> 0.67	GEU > 1.5 no no		1.5	0.67	GEU > 1.5 no no
umu-test - eluate	IR < 1.5	IR < 1.5	no				no

		D	ata Sheet san	nble no. 11			
astes from shree	Iding of metal containir	ng wastes. Fluff-ligi	nt fraction and du	ist. other than	sample number	waste code	Date
nose mentioned in	•	.g			11	191004	21.05.2002
		Chem	ical character	rization - eluat	e	L	
Dry weight %	Water content %	pH	Cond. µS/cm	1			
92.69	7.31	8.1	983				
52.05	7.51	0.1	300	 			
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	mg/l	mg/L	µg/l	µg/l	µg/l	µg/l	µg/l
85	-	0.1	0.5	8.7	<0.5	69.6	210
Lead	Zinc	Manganese	Arsenic	Cobalt	ΑΟΧ	1	
ug/l	µq/l	µg/l	µg/L	µq/l	ma/l		
16.3	3510	854	<u>µg/∟</u> <0.5	12.1	0.47		
10.5	5510	004	-0.0	12.1	0.47		
PCB 8	НСН	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	<	0.01	0.023	0.013
505 (00	B05		505 (10	505 (00	505 (00	505 (00	
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	
μg/l 0.002	µg/l <	μg/l 0.001	µg/l <	µg/l <	µg/l <	μg/l <	
0.002	<u>``</u>	0.001	<u>``</u>	<u>`</u>		<u> </u>	
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.32	0.077	0.12	0.11	0.2	0.017	0.024	0.019
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-	Indeno(1,2,3-cd)	Dibenz(a,h)-	Benzo(g,h,
anthracene	omysene	fluoranthene	fluoranthene	pyrene	pyrene	anthracene	perviene
µg/l	µg/l	µg/l	µg/l	µq/l	µq/l	µg/l	µg/l
<	0.002	0.001	<	0.002	0.001	Ő	0.001
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-methane	1,1-
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	μg/l	Dichlorethe µg/l
0.083	2.17	6.17	2.35	4.57	11	0.46	<
		1	1				
cis-1,2-	trans-1,2-	Trichlor-	1,1,1-	Tetrachlor-	1,2-	Trichlorethene	Bromdichle
Dichlorethene	Dichlorethene	methane	Trichlorethan	methane	Dichlorethane		methane
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	<	<	0.11	<
1.1.2-	Tetrachlorethene	Dibromchlor-	Tribrom-	1.2-	1.3-	1.4-	hydrocar
Trichlorethane		methane	methane	,	Dichlorbenzene	Dichlorbenzene	Index (H5
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l
<	<	<	<	<	<	<	-

stes from shree	ding of metal containi	ng wastes, Fluff-ligh	t fraction and dus	t, other than	sample number	waste code	Date
se mentioned ir	n 191003				11	191004	21.05.200
		Chemisch	e Charakterisi	ierung - Fes	tstoff		
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
32	3300	31	520	10650	340	189	17130
Hydro	ocarbons	Lipophilic subst.	тос	Benzene	Toluene	Ethylbenzene	Xylene
Weight %		Weight %	Weight %	mg/kg	mg/kg	mg/kg	mg/kg
1.8		2.2	22.1	4	20	8.3	35
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranth
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
67.3	3.1	0.47	0.14	1.3	6.4	0.4	5.8
Pyrene	Benz(a)an	thracene	Chrysene	Benzo(b)	fluoranthene	Benzo(k)flu	oranthene
mg/kg	mg/		mg/kg	mg/kg		mg/kg	
6.9	1.9		2		1.9	0.85	
Dibenz(a	h)anthracene	Benzo(ghi)	pervlene	Indeno(1.2	2,3-cd)pyrene	Benzo(a)pyrene	AOX
r	ng/kg	mg/	kg		ng/kg ).89	mg/kg	mg/kg
	0.31	1.2	2	(	0.89	1.7	6000
	luble portion	Sum PAH					
We	eight % 0.9	mg/l 35.					

# **Remarks**

heterogeneous sample with particles of various sizes,



					sample number	waste code	Date
	J and removal of paint a solvents or other dange		us sludges conta	lining paint or varnish	12	080115	12.09.2002
Algae test - eluat	٩	Ecotoxiko	logical chara	cterization			
80%-sample	G _A -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	]		
[%Inhibition]		[%]	[%]				
100	1280	0.1	0.2	yes			
100	640	0.2	0.3	yes			
100	800	0.3	0.3	yes			
Median	800	0.2	0.3	yes			
Daphnientest - E	luat						
100%-Probe	G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]		[%]	[%]	[%]			
100	>20	7.3	7.9	9.2	yes		
100	40	2.1	2.3	2.7	yes		
100	20	11.2	13.0	17.2	yes		
Median	30	7.3	7.9	9.2	yes		
	teria test- eluate	<b>50</b>	<b>50</b>	<b>.</b>	1		
50%-sample	G _L -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	-		
[%Inhibition] 100	32	[%]	[%]		-		
100	32	<u>5.3</u> 5.5	15.2 15.8	yes	-		
100				yes			
Median	32 32	5.8 <b>5.5</b>	16.3 15.8	yes yes	-		
	test - solid matter	Toxioity	1				
50%-sample	test - solid matter G _B -sample	Toxicity	]				
50%-sample [%Inhibition]	G _B -sample						
50%-sample [%Inhibition] 101.8	G _B -sample	yes					
50%-sample [%Inhibition]	G _B -sample						
50%-sample [%Inhibition] 101.8 99.8	G _B -sample	yes					
50%-sample [%Inhibition] 101.8 99.8 Median	G _B -sample >100 10-100 10-100	yes yes					
50%-sample [%Inhibition] 101.8 99.8 Median Plant test - solid	G _B -sample >100 10-100 10-100	yes yes	t height	G _P Dry sho	ot weight	Toxicity	]
50%-sample [%Inhibition] 101.8 99.8 Median Plant test - solid 50%-sample	G _B -sample >100 10-100 10-100 matter G _P Germination rate -	yes yes yes Gp Shool <6	4	<64	4	Toxicity yes	]
50%-sample [%Inhibition] 101.8 99.8 Median Plant test - solid 50%-sample	G _B -sample >100 10-100 10-100 matter	yes yes yes G _P Shoot <6	4 1	<64 64	4		]
50%-sample [%Inhibition] 101.8 99.8 Median Plant test - solid 50%-sample Brassica	G _B -sample >100 10-100 10-100 matter G _P Germination rate - 64 256	yes yes yes G _p Shool <6 64 <6	4 1 4	<64 64 125	4 8	yes	
50%-sample [%Inhibition] 101.8 99.8 Median Plant test - solid 50%-sample Brassica	G _B -sample >100 10-100 10-100 matter G _P Germination rate - 64	yes yes yes Gp Shool <6 6 64 64 12	4 4 8	<64 64 128 128	4 	yes yes	
50%-sample [%Inhibition] 101.8	G _B -sample >100 10-100 10-100 matter G _P Germination rate - 64 256 128 -	yes yes <b>yes</b> <b>G</b> p <b>Shoo</b> i <6 64 <6 12 <6	4 4 8 4	<64 64 122 122 64 64	4 8 8 8 4	yes yes yes yes yes	
50%-sample [%Inhibition] 101.8 99.8 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena	G _B -sample >100 10-100 10-100 matter G _P Germination rate - 64 256 128 -	yes yes yes Gp Shool <6 6 64 64 12	4 4 8 4	<64 64 128 128	4 8 8 8 4	yes yes yes yes yes yes	
50%-sample [%Inhibition] 101.8 99.8 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena	G _B -sample >100 10-100 10-100 matter G _P Germination rate - 64 256 128 -	yes yes <b>yes</b> <b>G</b> p <b>Shoo</b> i <6 64 <6 12 <6	4 4 8 4	<64 64 122 122 64 64	4 8 8 8 4	yes yes yes yes yes	
50%-sample [%Inhibition] 101.8 99.8 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representat	G _B -sample >100 10-100 10-100 matter G _P Germination rate - 64 256 128 - 128 - <16 tive G _P -value	yes yes <b>yes</b> <b>G</b> p <b>Shoo</b> i <6 64 <6 12 <6	4 4 8 4	<64 64 121 121 122 <64 <64	4 8 8 8 4	yes yes yes yes yes yes	
50%-sample [%Inhibition] 101.8 99.8 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representat	G _B -sample >100 10-100 10-100 matter G _P Germination rate - 64 256 128 - 128 - <16 tive G _P -value without S9	yes yes yes Gp Shool <6 6 6 6 6 4 6 2 3 2	4 4 8 4 2	<64 64 122 122 64 64	4	yes yes yes yes yes yes 64	Genotovicit
50%-sample [%Inhibition] 101.8 99.8 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representat	G _B -sample >100 10-100 10-100 matter G _P Germination rate - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 - - 64 256 - - 64 256 - - 64 64 256 - - 64 64 64 64 64 64 64 64 64 64	yes yes yes G _p Shool <6 6 64 <66 12 <6 32 VD	4 4 8 4 2 Genotoxicity	<64 64 121 121 122 <64 <64	4 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	yes yes yes yes yes 64	
50%-sample [%Inhibition] 101.8 99.8 Median Plant test - solid 50%-sample Brassica Lycopersicon	G _B -sample >100 10-100 10-100 matter G _P Germination rate - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 - - 61 - - 61 - - 61 - - 61 - - 61 - - 61 - - 61 - - 61 - - 61 - - 62U IR < 1.5	yes yes yes G _p Shool <6 6 6 6 6 6 6 32 VD IR < 1.5	4 4 8 4 2 Genotoxicity GEU > 1.5	<64 64 121 121 122 <64 <64	4 6 8 7 4 7 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	yes yes yes yes yes 64 VD IR < 1.5	Genotoxicit GEU > 1.5
50%-sample [%Inhibition] 101.8 99.8 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representat	G _B -sample >100 10-100 10-100 matter G _P Germination rate - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - - 64 - 64 - - 64 - - - 64 - - - - - - - - - - - - -	yes yes yes g _p Shoot <6 64 <6 12 <6 32 32 VD IR < 1.5	4 4 8 4 2 Genotoxicity GEU > 1.5	<64 64 121 121 122 <64 <64	4 8 8 4 4 5 1 1 7 5 1.5	yes yes yes yes yes 64 VD IR < 1.5 0.67	GEU > 1.5 no
50%-sample [%Inhibition] 101.8 99.8 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representat	G _B -sample >100 10-100 10-100 matter G _P Germination rate - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 256 128 - - 64 - - 61 - - 61 - - 61 - - 61 - - 61 - - 61 - - 61 - - 61 - - 61 - - 62U IR < 1.5	yes yes yes G _p Shool <6 6 6 6 6 6 6 32 VD IR < 1.5	4 4 8 4 2 Genotoxicity GEU > 1.5	<64 64 121 121 122 <64 <64	4 6 8 7 4 7 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	yes yes yes yes yes 64 VD IR < 1.5	GEU > 1.5

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aste from MESU	and removal of paint a	and varnish Aqueo	us sludges conta	ining paint or varnish	sample number	waste code	Date
	solvents or other dang		ao olaagoo oolila		12	080115	12.09.2002
		Cher	nical characte	erization - eluate			
Dry weight %	Water content %	pH	Cond. µS/cm				
36.8	63.2	8.1	1238				
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
			-		· · · , · · ·		
mg/l 270	mg/l	mg/L	μg/l	µg/l	µg/l	μg/l 44.2	µg/l
270	-	0.05	0.1	<0,1	<0,5	44.2	14.4
Lead	Zinc	Manganese	Arsenic	Cobalt	AOX		
ug/l	ua/l	ug/l	ua/L	ug/l	ma/l		
<u> </u>	μg/i 304	μg/i 173	μ <u>g/L</u> 2.5	μ <u>μ</u> μμη 1.4	1.3		
3.00	304	175	2.0	1.4	1.3		
PCB 8	нсн	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
µg/l	μg/l	μq/l	µq/l	μg/l		ua/l	ua/l
<u>µg/i</u> <	μg/i <	μ <u>μ</u> γ/ι <	μ <u>g</u> /1 <	μ <u>μ</u> γη <	0.009	0.019	0.011
			`		0.003	0.013	0.011
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	
µq/l	µg/l	μq/l	µq/l	μq/l	ua/l	µg/l	
0.001	μ <u>g</u> /i <	μ <u>g</u> /1 <	× ×	<	×	μ <u>μ</u> αγη <	-
0.001						-	
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
µg/l	µg/l	µg/l	µq/l	µg/l	µq/l	µg/l	µq/l
0.14	<	<	0.029	0.013	0.029	0.005	0.004
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-pyrene	Indeno(1,2,3-cd)	Dibenz(a,h)-	Benzo(g,h,i)
anthracene	•	fluoranthene	fluoranthene		pyrene	anthracene	perviene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	0.001	<	0	<	0	<	0.001
					- Videns	Dichlor-methane	1,1-
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene		
		Toluene	Ethylbenzene		-		
μg/l	Benzene µg/l	Toluene μg/l	μg/l	μg/l	μg/l	μg/l	Dichlorether µg/l
			,		-		
μg/l 0.046	µg/l <	µg/l <	μg/l 11	μg/l 59	μg/l 17	μg/l <	μg/l <
μg/l 0.046 cis-1,2-	μg/l < trans-1,2-	µg/l < Trichlor-	μg/l 11 <b>1,1,1-</b>	μg/l 59 Tetrachlor-	μg/l 17 <b>1,2-</b>	µg/l	µg/l < Bromdichlo
μg/l 0.046 cis-1,2- Dichlorethene	µg/l < trans-1,2- Dichlorethene	µg/l < Trichlor- methane	μg/l 11 1,1,1- Trichlorethan	μg/l 59 Tetrachlor- methane	μg/l 17 1,2- Dichlorethane	µg/l < Trichlorethene	µg/l < Bromdichlo methane
μg/l 0.046 cis-1,2- Dichlorethene μg/l	μg/l < trans-1,2- Dichlorethene μg/l	μg/l < Trichlor- methane μg/l	μg/l 11 <b>1,1,1-</b> Trichlorethan μg/l	μg/l 59 Tetrachlor- methane μg/l	μg/l 17 1,2- Dichlorethane μg/l	μg/l < Trichlorethene μg/l	 Bromdichlor methane µg/l
µg/l 0.046 cis-1,2- Dichlorethene	µg/l < trans-1,2- Dichlorethene	µg/l < Trichlor- methane	μg/l 11 1,1,1- Trichlorethan	μg/l 59 Tetrachlor- methane	μg/l 17 1,2- Dichlorethane	µg/l < Trichlorethene	µg/l < Bromdichlo methane
μg/l 0.046 cis-1,2- Dichlorethene μg/l <	μg/l < trans-1,2- Dichlorethene μg/l <	μg/l < Trichlor- methane μg/l 0.112	μg/l 11 1,1,1- Trichlorethan μg/l <	μg/l 59 Tetrachlor- methane μg/l <	μg/l 17 1,2- Dichlorethane μg/l <	μg/l < Trichlorethene μg/l <	μg/l < Bromdichlo methane μg/l <
μg/l 0.046 cis-1,2- Dichlorethene μg/l < 1,1,2-	μg/l < trans-1,2- Dichlorethene μg/l	μg/l < Trichlor- methane μg/l 0.112 Dibromchlor-		μg/l 59 Tetrachlor- <u>methane</u> μg/l < < 1,2-	μg/l 17 1,2- Dichlorethane μg/l < 1,3-	μg/l < Trichlorethene μg/l < 1,4-	μg/l < Bromdichlo methane μg/l < hydrocar
μg/l 0.046 cis-1,2- Dichlorethene μg/l < 1,1,2- Trichlorethane	μg/l < trans-1,2- Dichlorethene μg/l < Tetrachlorethene	μg/l < Trichlor- methane μg/l 0.112 Dibromchlor- methane	<u>µg/l</u> 11 <u>Trichlorethan</u> <u>µg/l</u> < Tribrom- methane	μg/l 59 Tetrachlor- <u>methane</u> μg/l < < 1,2- Dichlorbenzene	- μg/l 17 Dichlorethane μg/l < 1,3- Dichlorbenzene	μg/l < Trichlorethene μg/l < 1,4- Dichlorbenzene	μg/l < Bromdichlo methane μg/l < hydrocar Index (H53)
μg/l 0.046 cis-1,2- Dichlorethene μg/l <	μg/l < trans-1,2- Dichlorethene μg/l <	μg/l < Trichlor- methane μg/l 0.112 Dibromchlor-		μg/l 59 Tetrachlor- <u>methane</u> μg/l < < 1,2-	μg/l 17 1,2- Dichlorethane μg/l < 1,3-	μg/l < Trichlorethene μg/l < 1,4-	μg/l < Bromdichlo methane μg/l < hydrocar

		I	Data Sheet sa	mble no. 12			
Nanto from MESU	and removal of paint a	and vornich Aqueo	ua aludada conto	ining point or vornigh	sample number	waste code	Date
	solvents or other dance		us sludges conta	ining paint or varnish	12	080115	12.09.2002
			al characteriz	ation - solid matt	er		
				-			
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
8.9	11	0.13	8.1	30	78	<0,05	440
Hydro	carbons	Lipophilic subst.	тос	Benzene	Toluene	Ethylbenzene	Xylene
	ight %	Weight %	Weight %	mg/kg	mg/kg	mg/kg	mg/kg
	2.9	4.5	33	<0,01	0.01	0.75	5.5
				-,			
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranthene
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
6.26	4.1	0.36	0.1	0.9	2.5	<0.1	0.11
Pyrene	Benz(a)ant	bracana	Chrysene	Benzo(b)fluc	ranthana	Benzo(k)flue	aranthana
mg/kg	mg/l		mg/kg	mg/k		mg/l	
0.77	0.2		0.28	<0.2		<0.	
0.11	0.2		0.20	-0.	1	-0.	1
Dibenz(ah	)anthracene	Benzo(ghi)	perylene	Indeno(1,2,3-	-cd)pyrene	Benzo(a)pyrene	AOX
m	ig/kg	mg/	kg	mg/k	(g	mg/kg	mg/kg
<	<0.1	<0.	1	<0.7	1	<0.1	920
Water sol	uble portion	Sum PAH	(16 EPA)				
We	ight %	mg/	kg				
	1.9	9.3	2				
Remarks rey, pasty,							
				080115 v. 12.09.20	002		

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	U and removal of paint a	nd varnish, Aqueo	ous sludges conta	aining paint or varnish	sample number	waste code	Date
	mentioned in 080115.	· · · / 1·		312 22	13	080116	12.09.2002
		Ecotoxiko	ological chara	cterization			
Algae test - eluat	te						
80%-sample	G₄-sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	<b>–</b>		
[%Inhibition]		[%]	[%]	Toxicity	_		
100	40	5.9	7.9	yes			
100	40	3.4	5.5	yes	_		
100		0.4	0.0	yes	_		
Median	40	4.6	6.7	ves			
5							
Daphnia test - el 100%-sample	uate G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]		[%]	[%]	[%]	ioxiony		
100	5	36.4	39.5	46.2	yes		
100	5	27.0	28.5	31.6	yes		
100		21.0	20.0	01.0	yes		
Median	5	31.7	34.0	38.9	yes		
inculum	<u> </u>	01.7	04.0	00.0	ycs		
	cteria test- eluate				_		
50%-sample	G _L -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity			
[%Inhibition]	ļ	[%]	[%]				
42.9	8	22.2	62.5	yes			
48.6	8	17.0	50.3	yes	_		
Median	8	19.6	56.4	yes	-		
noulun	<u> </u>	10.0	00.4	j00			
	test - solid matter		-				
50%-sample	G _B -sample	Toxicity	_				
[%Inhibition]	40,400		4				
73	10-100	yes	-				
			-				
Median	10-100		_				
wedian	10-100	yes	1				
Plant test - solid							-
50%-sample	G _P Germination rate	Gp Shoo		G _P Dry shoo		Toxicity	4
Brassica	>128	64		128		yes	_
	1024	<12		<12		yes	_
Lycopersicon	>128	64		128		yes	
	512	25		256		yes	]
Avena	>128	32		32		yes	]
	<128	<1	28	<12	8	-	
	tive G _P -value					64	
most representa							
most representa				Eluate with S9			
•	without S9						
•		VD	Genetovicity				Genetovisi
•	GEU	VD	Genotoxicity		GEU IR < 1.5		
•	GEU IR < 1.5	IR < 1.5	GEU > 1.5		IR < 1.5	IR < 1.5	GEU > 1.5
•	GEU IR < 1.5 1.5	<b>IR &lt; 1.5</b> 0.67	GEU > 1.5 no		IR < 1.5 1.5	IR < 1.5 0.67	GEU > 1.5 no
most representa umu-test - eluate	GEU IR < 1.5	IR < 1.5	GEU > 1.5		IR < 1.5	IR < 1.5	Genotoxici GEU > 1.5 no no

			Data Sheet	samble no. 13			
Waste from MESI	J and removal of paint	and varnish Aquer	ous sludges conta	aining paint or varnish	sample number	waste code	Date
	nentioned in 080115.				13	080116	12.09.2002
					10	000110	12.00.2002
		Ch	emical charac	cterization - eluate			
Dry weight %	Water content %	рН	Cond. µS/cm				
37.3	62.7	7.6	1880				
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	mg/l	mg/L	µg/l	µg/l	µg/l	µg/l	µg/l
3100	-	78	-	<0.1	<0,5	3.6	14.2
Lead	Zinc	Manganese	Arsenic	Cobalt	AOX		
µg/l	µg/l	µg/l	µg/L	µg/l	mg/l		
3.84	357	204	<0.5	2.8	0.27		
PCB 8	НСН	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
ua/l	ua/l	μg/l	uq/l	ρ <u>ροβ 52</u> μα/Ι		<u>рсв 136</u> ua/l	μq/l
- 3	xtract formed a gel)	µg/i	µy/i	μιγη	μγ/ι	μy/i	μg/i
	ktruot formoù û gorj						
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	
not detectable (ex	xtract formed a gel)						
					-		
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
not detectable (e	xtract formed a gel)		1				
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-pyrene	Indeno(1,2,3-cd)	Dibenz(a,h)-	Benzo(g,h,i)-
anthracene	<b>,</b>	fluoranthene	fluoranthene		pyrene	anthracene	pervlene
µg/l	µg/l	µg/l	µg/l	µq/l	µg/l	µg/l	µg/l
not detectable (e	xtract formed a gel)				1 10		. 0
					-		
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-methane	1,1- Dichlorethene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
-	0.6	<	0.9	8.1	7.65	<	<
cis-1,2-	trans-1,2-	Trichlor-	1,1,1-	Tetrachlor-methane	1,2-	Trichlorethene	Bromdichlor-
Dichlorethene	Dichlorethene	methane	Trichlorethan		Dichlorethane		methane
µg/l	µg/l	µg/l	µg/l	µg/l	μg/l	µg/l	µg/l

cis-1,2-	trans-1,2-	Trichlor-	1,1,1-	Tetrachlor-methane	1,2-	Trichlorethene	Bromdichlor-
Dichlorethene	Dichlorethene	methane	Trichlorethan		Dichlorethane		methane
µg/l	μg/l	µg/l	µg/l	μg/l	µg/l	µg/l	µg/l
<	<	<	<	<	<	<	<
1,1,2-	Tetrachlorethene	Dibromchlor-	Tribrom-	1,2-Dichlorbenzene	1,3-	1,4-	hydrocar
Trichlorethane		methane	methane		Dichlorbenzene	Dichlorbenzene	Index (H53)
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l
<	<	<	<	<	<	<	-

	and removal of pain	t and varnish, Aqueo	ous sludges containir	ng paint or varnish	sample number	waste code	Date
ther than those m	entioned in 080115.		Ū.	••	13	080116	12.09.2002
		Chem	ical characteriza	ation - solid matt	er		
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
3	1.3	0.15	250	170	5.5	<0.05	140
Hydro	ocarbons	Lipophilic subst.	тос	Benzene	Toluene	Ethylbenzene	Xylene
	eight %	Weight %	Weight %	mg/kg	mg/kg	mg/kg	mg/kg
-	20	21	55.1	<0.01	< 0.01	0.17	2.3
	Naukéh alawa		<b>A b</b> + - d <b>b</b>	<b></b>	Dhamantharan	A	<b>F</b> 1
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranthe
mg/kg 2.47	<u>mg/kg</u> 10	mg/kg <0.1	mg/kg <0.1	mg/kg 48	mg/kg 11	mg/kg <0.1	mg/kg <0.1
2.47	10	<0.1	<0.1	40		<0.1	<0.1
Pyrene	Benz(a)ar	thracene	Chrysene	Benzo(b)fluo	ranthene	Benzo(k)flu	oranthene
mg/kg	mg	/kg	mg/kg	mg/k		mg/l	kg
0.22	<0	.1	0.11	<0.1		<0.	1
Dibenz/at	n)anthracene	Benzo(ghi	nervlene	Indeno(1,2,3-	cd)nyrene	Benzo(a)pyrene	AOX
	ng/kg	mg/		mg/k		mg/kg	mg/kg
	<0.1	<0.	1	<0.1	9	< 0.1	1260
Water sol	luble portion eight %	Sum PAH	(16 EPA)				
vve	3.1	mg/ 69.	3				
<u>emarks</u> asty, black-grey, v	with an aqueous pha	se, light solvent sme	II				
<i>,,</i> ,, ,,							
							]

		D	ata Sheet san	nble no. 14			
Maataa fram aha	ning and physical and m		treatment of ma	tala and plactica	sample number	waste code	Date
	ping and physical and mession of the physical and mession of the physical sector of the phy		realment of me	tais and plastics,	14	120114	12.09.2002
		Ecotoxiko	logical chara	cterization			
Algae test - elua		<b>FO</b>	50		-		
80%-sample	G _A -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	4		
[%Inhibition] 100	80	<b>[%]</b> 2.7	[%] 3.4		-		
100	80	2.4	<u> </u>	yes yes	-		
100	00	2.4	1.0	yes	-		
Vedian	80	2.5	2.5	yes	]		
Daphnia test - e 100%-sample	uate G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC sample	Toxicity		
	G _D -sample			EC ₅₀ -sample	Toxicity		
[%Inhibition] 100	>10	[%]	[%]	[%]	yes		
100	>10	3.5	4.2	5.9			
100	80	- 3.5	4.2	5.9	yes yes		
Median	80	3.5	4.2	5.9	yes		
Wealan	00	5.5	7.2	3.3	yes		
	cteria test- eluate	<b>FO</b>		<b>T</b>	7		
50%-sample	G _L -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	4		
[%Inhibition]	0	[%]	[%]		4		
47.3 45.7	8 8	14.5 17.1	51.2	yes	-		
45.7	0	17.1	53.5	yes	-		
Median	8	15.8	52.4	yes	-		
	t test - solid matter		7				
50%-sample	G _n -sample	LOXICITY					
50%-sample	G _B -sample	Toxicity	-				
[%Inhibition]	G _B -sample	_	-				
	G _B -sample - >100	yes yes	-				
[%Inhibition] 97.8 94.7	>100	yes					
[%Inhibition] 97.8 94.7	-	yes					
[%Inhibition] 97.8 94.7 Median	>100	yes yes					
[%Inhibition] 97.8 94.7 Median Plant test - solic	>100 >100 matter	yes yes yes	theight	G. Dry ek	noot weight	Toyicity	1
[%Inhibition] 97.8 94.7 Median Plant test - solic 50%-sample	>100	yes yes	theight	G _P Dry sh	noot weight	Toxicity	
[%Inhibition] 97.8 94.7 Median Plant test - solic 50%-sample	>100 >100 matter	yes yes yes Gp Shoot					]
[%Inhibition] 97.8 94.7 Median Plant test - solic 50%-sample Brassica	>100 >100 matter G _P Germination rate	yes yes yes Gp Shoot	2		32	yes	]
[%Inhibition] 97.8 94.7 Median Plant test - solic 50%-sample Brassica		yes yes yes Gp Shoot	2		32 64	yes yes	
[%Inhibition] 97.8 94.7 Median Plant test - solic 50%-sample Brassica Lycopersicon		yes yes yes Gp Shoot	2		32 64 32	yes yes yes	
[%Inhibition] 97.8 94.7 Median Plant test - solic 50%-sample Brassica Lycopersicon		yes yes <b>yes</b> <b>G</b> p <b>Shoot</b> 32 32 32 <12	2 2 28 6		32 64	yes yes yes yes	
[%Inhibition] 97.8 94.7 Median Plant test - solic 50%-sample Brassica _ycopersicon Avena		yes yes yes Gp Shoot	2 2 28 6		32 64 32 <16	yes yes yes	
[%Inhibition] 97.8 94.7 Median Plant test - solic 50%-sample Brassica Lycopersicon Avena		yes yes <b>yes</b> <b>G</b> p <b>Shoot</b> 32 32 32 <12	2 2 28 6		32 64 32 <16	yes yes yes yes yes	
[%Inhibition] 97.8 94.7 Median Plant test - solic 50%-sample Brassica Lycopersicon Avena most representa		yes yes <b>yes</b> <b>G</b> p Shoot 32 32 32 32 32 32 32 32 32 32 32 32 32	2 2 28 6 3		32 64 32 <16 -	yes yes yes yes yes <b>32</b>	
[%Inhibition] 97.8 94.7 Median Plant test - solic 50%-sample Brassica Lycopersicon Avena most representa		yes yes <b>yes</b> <b>G</b> p Shoot 32 32 32 <12 <11 16	2 28 6 3 3 Genotoxicity		32 64 32 	yes yes yes yes 32	
[%Inhibition] 97.8 94.7 Median Plant test - solic 50%-sample Brassica Lycopersicon Avena most representa		yes yes yes Gp Shoot 32 32 >12 <1 16 VD IR < 1.5	2 2 28 6 3		32 64 32 	yes yes yes yes 32 VD IR < 1.5	
[%Inhibition] 97.8 94.7 Median Plant test - solic 50%-sample Brassica Lycopersicon Avena most representa		yes yes yes Gp Shoot 32 32 32 32 32 32 32 32 32 32 32 32 32	2 28 6 3 3 Genotoxicity		32 64 32 	yes yes yes yes 32 VD IR < 1.5 0.67	
[%Inhibition] 97.8		yes yes yes Gp Shoot 32 32 >12 <1 16 16 VD IR < 1.5 0.67 0.17	2 28 6 5 6 6 6 6 6 7 7 7 7 8 7 7 7 7 7 7 7 7 7 7		32 64 32 	yes yes yes yes 32 VD IR < 1.5	Genotoxici GEU > 1.5 no no
[%Inhibition] 97.8 94.7 Median Plant test - solic 50%-sample Brassica Lycopersicon Avena most representa		yes yes yes Gp Shoot 32 32 32 32 32 32 32 32 32 32 32 32 32	2 28 6 3 <b>Genotoxicity</b> <b>GEU &gt; 1.5</b> no		32 64 32 	yes yes yes yes 32 VD IR < 1.5 0.67	GEU > 1.5 no

		D	ata Sheet san	nble no. 14			
Nastas from shan	ing and physical and r	mechanical surface	treatment of me	tale and plastics	sample number	waste code	Date
	containing dangerous		tieatment of me	tais and plastics,	14	120114	12.09.2002
		Chem	ical characte	rization - eluat	e		
Dry weight %	Water content %	рН	Cond. µS/cm	]			
89.85	10.15	10.6 adj. to 7	478	]			
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	mg/l	mg/L	µg/l	µq/l	µq/l	µg/l	µg/l
30	-	0.23	-	0.1	2.2	37.9	113
				<u> </u>			
Lead	Zinc	Manganese	Arsenic	Cobalt	AOX		
µg/l	µg/l	µg/l	µg/L	µg/l	mg/l		
18.8	26400	173	<0.5	1.8	0.05	-	
PCB 8	НСН	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	0.029	0.13	0.2	0.12
				0.020	0.10	0.2	0.11
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	
0.008	<	0.037	<	<	<	<	
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
µg/l	µg/l	µg/l	µq/l	µg/l	µg/l	µg/l	µg/l
0.12	0.012	0.029	0.009	0.032	0.004	0.034	0.031
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-	Indeno(1,2,3-cd)	Dibenz(a,h)-	Benzo(g,h,i
anthracene	-	fluoranthene	fluoranthene	pyrene	pyrene	anthracene	perylene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.006	0.011	<	<	<	<	0.005	0.009
Binhamul	Benzene	Toluene	Ethydhonsono	m /n Vulana	o Vulono	Dichlor-methane	1.1-
Biphenyl	Denzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dictrior-methane	Dichlorethe
µq/l	ua/l	ua/l	ua/l	µq/l	µg/l	ua/l	ua/l
0.001	μ <u>μ</u> μμη <	μ <u>μ</u> γ/i <	μ <u>μ</u> γ/	μ <u>μ</u> γ/ι <	μ <u>μ</u> γ/ι <	μ <u>μ</u> γ/i <	μ <u>μ</u> γ/ι <
0.001				``	``	``	
cis-1,2-	trans-1,2-	Trichlor-methane	1,1,1-	Tetrachlor-	1,2-	Trichlorethene	Bromdichlo
Dichlorethene	Dichlorethene		Trichlorethan	methane	Dichlorethane		methane
µq/l	µg/l	µq/l	µq/l	µq/l	µg/l	µq/l	µq/l
<	<	<	<	<	<	<	<
1,1,2-	Tetrachlorethene	Dibromchlor-	Tribrom-	1,2-	1,3-	1,4-	hydrocar.
Trichlorethane		methane	methane		Dichlorbenzene		Index (H53
µq/l	µg/l	µq/l	µq/l	µg/l	µg/l	µg/l	mg/l

Vastes from shaping and physical and mechanical surface treatment of metals and plastics,         Itachining sludges containing dangerous substances       Ital       120114       12.09         Chemical characterization - solid matter         Arsenic       Lead       Cadmium       Chromium       Copper       Nickel       Mercury       Zi         mg/kg       m	Arsenic mg/kg 15 Hydrocarbo GEW.% 0.27 Sum BTEX N mg/kg 0.14 Pyrene mg/kg <0.1	Lead mg/kg 4.4 ons aphthalene mg/kg <0.1	Lipophilic subst. Gew.% 0.44 Acenaphtene mg/kg	I characterizat Chromium mg/kg 160 TOC Gew.% 1.8	tion - solid ma <u>Copper</u> <u>mg/kg</u> <u>360</u> <u>Benzene</u> <u>mg/kg</u>	14 atter Nickel mg/kg 120	120114 Mercury mg/kg	Date 12.09.2002 Zinc mg/kg 77000
Leading dangerous substances         Chemical characterization - solid matter         Arsenic       Lead       Cadmium       Chromium       Copper       Nickel       Mercury       Zi         mg/kg	Arsenic           mg/kg           15           Hydrocarbo           GEW.%           0.27           Sum BTEX         N           mg/kg           0.14           Pyrene           mg/kg           <0.1	Lead mg/kg 4.4 ons aphthalene mg/kg <0.1	Chemica Cadmium mg/kg 0.22 Lipophilic subst. Gew.% 0.44 Acenaphtene mg/kg	Chromium           mg/kg           160           TOC           Gew.%           1.8	Copper mg/kg 360 Benzene mg/kg	atter Nickel mg/kg 120	Mercury mg/kg	Zinc mg/kg
Arsenic         Lead         Cadmium         Chronium         Copper         Nickel         Mercury         Zi           mg/kg	mg/kg           15           Hydrocarbd           GEW.%           0.27           Sum BTEX         N           mg/kg           0.14           Pyrene           mg/kg           <0.1	mg/kg 4.4 ons aphthalene mg/kg <0.1	Cadmium mg/kg 0.22 Lipophilic subst. Gew.% 0.44 Acenaphtene mg/kg	Chromium           mg/kg           160           TOC           Gew.%           1.8	Copper mg/kg 360 Benzene mg/kg	Nickel mg/kg 120	mg/kg	mg/kg
mg/kg         mg/kg <th< td=""><th>mg/kg           15           Hydrocarbo           GEW.%           0.27           Sum BTEX         N           mg/kg           0.14           Pyrene           mg/kg           &lt;0.1</th></th<>	mg/kg           15           Hydrocarbo           GEW.%           0.27           Sum BTEX         N           mg/kg           0.14           Pyrene           mg/kg           <0.1	mg/kg 4.4 ons aphthalene mg/kg <0.1	mg/kg       0.22       Lipophilic subst.       Gew.%       0.44       Acenaphtene       mg/kg	mg/kg 160 <b>TOC</b> Gew.% 1.8	mg/kg 360 Benzene mg/kg	mg/kg 120	mg/kg	mg/kg
15         4.4         0.22         160         360         120         <0,05         770           Hydrocarbons         Lipophilic subst.         TOC         Benzene         Toluene         Ethylbenzene         Xyl           GEW.%         Gew.%         Gew.%         mg/kg         0.1         <	15           Hydrocarbo           GEW.%           0.27           Sum BTEX         N           mg/kg           0.14           Pyrene           mg/kg           <0.1	4.4 ons aphthalene mg/kg <0.1	0.22 Lipophilic subst. Gew.% 0.44 Acenaphtene mg/kg	160 <b>TOC</b> Gew.% 1.8	360 Benzene mg/kg	120		
HydrocarbonsLipophilic subst.TOCBenzeneTolueneEthylbenzeneXylGEW.%Gew.%Gew.%mg/kgmg/kgmg/kgmg/kgmg/kgmg/kg0.270.441.8<0.01	Hydrocarbc           GEW.%           0.27           Sum BTEX         N           mg/kg           0.14           Pyrene           mg/kg           <0.1	aphthalene mg/kg <0.1	Lipophilic subst. Gew.% 0.44 Acenaphtene mg/kg	TOC Gew.% 1.8	Benzene mg/kg	•	<0,05	77000
GEW.%         Gew.%         Gew.%         mg/kg         mg/kg <th< td=""><th>GEW.% 0.27  Sum BTEX N mg/kg 0.14  Pyrene mg/kg &lt;0.1</th><td>aphthalene mg/kg &lt;0.1</td><td>Gew.% 0.44 Acenaphtene mg/kg</td><td>Gew.% 1.8</td><td>mg/kg</td><td>Toluene</td><td></td><td></td></th<>	GEW.% 0.27  Sum BTEX N mg/kg 0.14  Pyrene mg/kg <0.1	aphthalene mg/kg <0.1	Gew.% 0.44 Acenaphtene mg/kg	Gew.% 1.8	mg/kg	Toluene		
GEW.%         Gew.%         Gew.%         mg/kg         mg/kg <th< td=""><th>GEW.% 0.27  Sum BTEX N mg/kg 0.14  Pyrene mg/kg &lt;0.1</th><td>aphthalene mg/kg &lt;0.1</td><td>Gew.% 0.44 Acenaphtene mg/kg</td><td>Gew.% 1.8</td><td>mg/kg</td><td></td><td>Ethylbenzene</td><td>Xylene</td></th<>	GEW.% 0.27  Sum BTEX N mg/kg 0.14  Pyrene mg/kg <0.1	aphthalene mg/kg <0.1	Gew.% 0.44 Acenaphtene mg/kg	Gew.% 1.8	mg/kg		Ethylbenzene	Xylene
0.27         0.44         1.8         <0.01         <0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01 <t< td=""><th>0.27           Sum BTEX         N           mg/kg         0.14           Pyrene         mg/kg           &lt;0.1</th></t<>	0.27           Sum BTEX         N           mg/kg         0.14           Pyrene         mg/kg           <0.1	<b>aphthalene</b> mg/kg <0.1	0.44 Acenaphtene mg/kg	1.8				mg/kg
mg/kg         mg/kg <th< td=""><th>mg/kg           0.14           Pyrene           mg/kg           &lt;0.1</th></th<>	mg/kg           0.14           Pyrene           mg/kg           <0.1	mg/kg <0.1	mg/kg		<0.01			0.13
mg/kg         mg/kg <th< td=""><th>mg/kg           0.14           Pyrene           mg/kg           &lt;0.1</th></th<>	mg/kg           0.14           Pyrene           mg/kg           <0.1	mg/kg <0.1	mg/kg	Acononhtylono	Eluoropo	Bhononthrono	Anthracana	Fluoranther
0.14         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1 <th< td=""><th>0.14 Pyrene mg/kg &lt;0.1</th><td>&lt;0.1</td><td></td><td></td><td></td><td></td><td></td><td>mg/kg</td></th<>	0.14 Pyrene mg/kg <0.1	<0.1						mg/kg
Pyrene         Benz(a)anthracene         Chrysene         Benzo(b)fluoranthene         Benzo(k)fluoranthe           mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         mg/kg           <0.1	Pyrene mg/kg <0.1	-	<01					<0.1
mg/kg         mg/kg         mg/kg         mg/kg         mg/kg           <0.1	mg/kg <0.1	Benz(a)ar	0.1	0	011	0.1	0.1	0.1
<0.1         <0.1         <0.1         <0.1         <0.1           Dibenz(ah)anthracene         Benzo(ghi)perylene         Indeno(1,2,3-cd)pyrene         Benzo(a)pyrene         Additional and the second and the seco	<0.1							
Dibenz(ah)anthracene         Benzo(ghi)perylene         Indeno(1,2,3-cd)pyrene         Benzo(a)pyrene         Ad           mg/kg         mg/kg <t< td=""><th></th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>								
mg/kg         mg/kg <th< td=""><th>Dibenz(ah)anth</th><td>&lt;0</td><td>0.1</td><td>&lt;0.1</td><td>&lt;</td><td>0.1</td><td>&lt;0</td><td>.1</td></th<>	Dibenz(ah)anth	<0	0.1	<0.1	<	0.1	<0	.1
mg/kg         mg/kg <th< td=""><th></th><td>racene</td><td>Benzo(ahi</td><td>pervlene</td><td>Indeno(1.2</td><td>.3-cd)pyrene</td><td>Benzo(a)pyrene</td><td>XOA</td></th<>		racene	Benzo(ahi	pervlene	Indeno(1.2	.3-cd)pyrene	Benzo(a)pyrene	XOA
Water soluble portion         Sum PAH (16 EPA)           Weight %         mg/kg	mg/kg		mg/	kg	m	g/kg	mg/kg	mg/kg
Weight % mg/kg	<0.1		<0.	.1	<	0.1	<0.1	<1
Weight % mg/kg	Water soluble	portion	Sum PAH	(16 EPA)				
0.5 <1								
	0.5		<1					
emarks owdery, black, light solvent smell		vent smell						

vvastes from shanii	an anal alaysis stars t		Data Sheet sa		Lesson to the t		<b>.</b>
Waste blasting mat	ng and physical and merial containing dange	echanical surface erous substances	e treatment of me	etals and plastics,	sample number 16	waste code 120116	Date 10.10.2002
		Ecotoxiko	logical chara	cterization			
Algae test - eluate 80%-sample	G₄-sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	1		
[%Inhibition]	O _A -Sumple	[%]	[%]	TOXICITY	4		
-1.1	1.25	-	-	no	1		
-4.8	1.25	-	-	no	]		
Median	1.25	-	-	no	J		
Danhnia taat alu							
Daphnia test - elua 100%-sample	G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]		[%]	[%]	[%]			
0	1	-	-	-	no		
0	1	-	-	-	no		
Median	1	-	-	-	no		
Luminescent bact		<b>50</b>	<b>FO</b>	To all all a	-		
50%-sample	G _L -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	4		
[%Inhibition] 5.9	2	[%]	[%] -	no	-		
11.8	2	81.7	-	no	-		
11.0	2	01.7		110	1		
Median	2	81.7	-	no	1		
Bacteria contact t		Taulaka	1				
Bacteria contact t 50%-sample	est - solid matter G _B -sample	Toxicity	]				
Bacteria contact t 50%-sample [%Inhibition]			]				
Bacteria contact to 50%-sample [%Inhibition] 80.29	G _B -sample	yes					
Bacteria contact to 50%-sample [%Inhibition] 80.29 56.41	G _B -sample - 2-100	yes yes					
Bacteria contact t 50%-sample [%Inhibition] 80.29 56.41 70.36	G _B -sample - 2-100 10-100	yes yes yes					
Bacteria contact to 50%-sample [%Inhibition] 80.29 56.41	G _B -sample - 2-100	yes yes					
Bacteria contact t 50%-sample [%Inhibition] 80.29 56.41 70.36 Median Plant test - solid n	G _B -sample - 2-100 10-100 2-10 2-10	yes yes yes					
Bacteria contact t 50%-sample [%Inhibition] 80.29 56.41 70.36 Median Plant test - solid n 50%-sample	G _B -sample - 2-100 10-100 2-10 2-10 matter G _P germination rate	yes yes yes <b>yes</b> <b>G</b> p Shoot			oot weight	Toxicity	]
Bacteria contact t 50%-sample [%Inhibition] 80.29 56.41 70.36 Median Plant test - solid n 50%-sample	G _B -sample - 2-100 10-100 2-10 atter G _P germination rate 16	yes yes yes yes Gp Shood		• •	8	yes	]
Bacteria contact t 50%-sample [%Inhibition] 80.29 56.41 70.36 Median Plant test - solid n 50%-sample [ Brassica	G _B -sample - 2-100 10-100 2-10 matter Gp germination rate 16 2	yes yes yes yes Gp Shoo 4			8 2	yes yes	
Bacteria contact t 50%-sample [%Inhibition] 80.29 56.41 70.36 Median Plant test - solid n 50%-sample	G _B -sample - 2-100 10-100 2-10 natter G _P germination rate 16 2 -	yes yes yes yes Gp Shoot 4 2 4			8 2 4	yes yes yes	
Bacteria contact t 50%-sample [%Inhibition] 80.29 56.41 70.36 Median Plant test - solid n 50%-sample Brassica Lycopersicon	G _B -sample - 2-100 10-100 2-10 natter G _P germination rate 16 2 - 2	yes yes yes yes Gp Shoot 4 2 4 4			8 2 4 4	yes yes yes yes	
Bacteria contact t 50%-sample [%Inhibition] 80.29 56.41 70.36 Median Plant test - solid n 50%-sample [ Brassica	G _B -sample - 2-100 10-100 2-10 natter G _P germination rate 16 2 - 2 32	yes yes yes yes Gp Shoot 4 2 4 4 4 4			8 2 4 4 4 4	yes yes yes yes yes	
Bacteria contact t 50%-sample [%Inhibition] 80.29 56.41 70.36 Median Plant test - solid n 50%-sample Brassica Lycopersicon Avena	G _B -sample - 2-100 10-100 2-10 hatter S _P germination rate 16 2 - 2 32 - -	yes yes yes yes Gp Shoot 4 2 4 4			8 2 4 4	yes yes yes yes	
Bacteria contact t 50%-sample [%Inhibition] 80.29 56.41 70.36 Median Plant test - solid n 50%-sample Brassica Lycopersicon	G _B -sample - 2-100 10-100 2-10 hatter S _P germination rate 16 2 - 2 32 - -	yes yes yes yes Gp Shoot 4 2 4 4 4 4			8 2 4 4 4 4	yes yes yes yes yes yes	
Bacteria contact t 50%-sample [%Inhibition] 80.29 56.41 70.36 Median Plant test - solid n 50%-sample Brassica Lycopersicon Avena most representati	G _B -sample - 2-100 10-100 2-10 hatter G _P germination rate 16 2 - 2 32 - ve G _P -value	yes yes yes yes Gp Shoot 4 2 4 4 4 4			8 2 4 4 4 16	yes yes yes yes yes yes	
Bacteria contact t 50%-sample [%Inhibition] 80.29 56.41 70.36 Median Plant test - solid n 50%-sample Brassica Lycopersicon Avena	G _B -sample - 2-100 10-100 2-10 natter G _P germination rate 16 2 - 2 32 - ve G _P -value without S9 GEU	yes yes yes yes Gp Shoot 4 2 4 4 4 4			8 2 4 4 4 4	yes yes yes yes yes yes	Genotoxicit
Bacteria contact t 50%-sample [%Inhibition] 80.29 56.41 70.36 Median Plant test - solid n 50%-sample Brassica Lycopersicon Avena most representati	G _B -sample - 2-100 10-100 2-10 natter G _P germination rate 16 2 - 2 32 - ve G _P -value without S9	yes yes yes yes Gp Shoor 4 2 4 4 4 2 4 4 4 2 2 4 4 4 2 1 8 7 8 1 8 7 8 1 8 7 8 1 9 8 1 9 8 1 9 8 1 9 9 8 1 9 9 9 9 9			8 2 4 4 4 16	yes yes yes yes yes 4 VD IR < 1.5	Genotoxicit GEU > 1.5
Bacteria contact t 50%-sample [%Inhibition] 80.29 56.41 70.36 Median Plant test - solid n 50%-sample Brassica Lycopersicon Avena most representati	G _B -sample - 2-100 10-100 2-10 natter Sp germination rate 16 2 - 2 32 - 2 32 - ve G _P -value without S9 GEU IR < 1.5 1.5	yes yes yes yes yes G _P Shoor 4 4 2 4 4 4 2 4 4 4 2 5 1 8 5 10.67	Genotoxicity GEU > 1.5 no		8 2 4 4 16 6 6 6 6 8 6 8 7 7 8 7 8 7 8 7 8 7 8 7	yes yes yes yes yes 4 VD IR < 1.5 0.67	GEU > 1.5 no
Bacteria contact t 50%-sample [%Inhibition] 80.29 56.41 70.36 Median Plant test - solid n 50%-sample Brassica Lycopersicon Avena most representati	G _B -sample - 2-100 10-100 2-10 natter G _P germination rate 16 2 - 2 32 - ye G _P -value without S9 GEU IR < 1.5	yes yes yes yes Gp Shoor 4 2 4 4 4 2 4 4 4 2 2 4 4 4 2 1 8 7 8 1 8 7 8 1 8 7 8 1 9 8 1 9 8 1 9 8 1 9 9 8 1 9 9 9 9 9	Genotoxicity GEU > 1.5		8 2 4 4 4 16 6 6 6 6 8 6 8 9 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8	yes yes yes yes yes 4 VD IR < 1.5	GEU > 1.5

		ſ	Data Sheet sa	mble no. 16			
Vastes from shap	ing and physical and r	nechanical surface	e treatment of me	etals and plastics.	sample number	waste code	Date
	iterial containing dang				16	120116	10.10.2002
		Chen	nical characte	erization - eluat	e		
Dry weight %	Water content %	pH	Cond. µS/cm	1			
100	0	8.15	39.5				
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	ma/l	mg/L	µg/l	µq/l	µg/l	μg/l	μg/l
13	-	0.46	<0.05	<0.1	<0.5	38.7	4.1
	-			O a h a h	1.0.1	1	
Lead	Zinc	Manganese	Arsenic	Cobalt	AOX		
μg/l	μg/l	µg/l	µg/L	µg/l	mg/l		
4.29	58	198	<0.5	1.7	0.05		
PCB 8	НСН	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	<	0.012	0.026	0.012
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	
0.002	<	0.001	<	<	<	<	
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.2	0.003	0.006	0.01	0.024	0.001	0.009	0.009
Benzo(a)- anthracene	Chrysene	Benzo(b)- fluoranthene	Benzo(k)- fluoranthene	Benzo(a)-pyrene	Indeno(1,2,3-cd)- pyrene	Dibenz(a,h)- anthracene	Benzo(g,h,i
µg/l	µg/l	µq/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.001	0.002	0.002	0.003	0.001	× ×	μg/i <	μ <u>g</u> /i <
					<b></b>		
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor- methane	1,1- Dichlorether
µg/l	µg/l	µg/l	µg/l	µq/l	µg/l	µg/l	µg/l
0.003	<	<	<	<	<	<	<
cis-1,2-	trans-1,2-	Trichlor-	1,1,1-	Tetrachlor-	1,2-	Trichlorethene	Bromdichlo
Dichlorethene	Dichlorethene	methane	Trichlorethan	methane	Dichlorethane		methane
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	<	<	<	<
1,1,2-	Tetrachlorethene	Dibromchlor-	Tribrom-	1.2-	1,3-	1.4-	hydrocar
Trichlorethane	rendemoremente	methane	methane	Dichlorbenzene	Dichlorbenzene	,	Index (H53
μg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l
μ <u>g</u> /i <	<u>µg</u> /i <	μ <u>g</u> /i <	μ <u>g</u> /i	μ <u>μ</u> γη <	μ <u>g</u> /i <	μg/i <	

Chemical characterization - solid matter         Arsenic       Lead       Cadmium       Chromium       Copper       Nickel       Mercury         mg/kg       Meight %       Weight %       Weight %       mg/kg	Date 10.2002 Zinc ng/kg 2300 Xylene ng/kg 0.27 ranther
Chemical characterization - solid matter         Arsenic       Lead       Cadmium       Chromium       Copper       Nickel       Mercury         mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg         62       12       0.04       177000       4900       83300       0.35         Hydrocarbons       Lipophilic subst.       TOC       Benzene       Toluene       Ethylbenzene       X         Weight %       Weight %       Weight %       mg/kg       mg/kg       mg/kg       0.04       0.024       0.3       <0.01       0.04       0.04         Sum BTEX       Naphthalene       Acenaphtene       Acenaphtylene       Fluorene       Phenanthrene       Anthracene       Fluorene         mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1       <0.1<	Zinc ng/kg 2300 Kylene ng/kg 0.27
ArsenicLeadCadmiumChromiumCopperNickelMercurymg/kgmg/kgmg/kgmg/kgmg/kgmg/kg62120.041770004900833000.35HydrocarbonsLipophilic subst.TOCBenzeneTolueneEthylbenzene>Weight %Weight %Weight %mg/kgmg/kgmg/kgmg/kgmg/kg0.0140.0240.3<0.01	ng/kg 2300 Kylene ng/kg 0.27
mg/kg         mg/kg <th< td=""><td>ng/kg 2300 Kylene ng/kg 0.27</td></th<>	ng/kg 2300 Kylene ng/kg 0.27
mg/kg         mg/kg <th< td=""><td>ng/kg 2300 Kylene ng/kg 0.27</td></th<>	ng/kg 2300 Kylene ng/kg 0.27
62       12       0.04       177000       4900       83300       0.35         Hydrocarbons       Lipophilic subst.       TOC       Benzene       Toluene       Ethylbenzene       X         Weight %       Weight %       Weight %       mg/kg       mg/kg       mg/kg       mg/kg       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X <t< td=""><td>2300 Xylene ng/kg 0.27</td></t<>	2300 Xylene ng/kg 0.27
Weight %         Weight %         Weight %         mg/kg	ng/kg 0.27
Weight %         Weight %         Weight %         mg/kg	ng/kg 0.27
0.014     0.024     0.3     <0.01     0.01     0.04       Sum BTEX     Naphthalene     Acenaphtene     Acenaphtylene     Fluorene     Phenanthrene     Anthracene     Fluorene       mg/kg     mg/kg     mg/kg     mg/kg     mg/kg     mg/kg     mg/kg       0.31     <0.1	0.27
mg/kg         mg/kg <th< td=""><td>ranthei</td></th<>	ranthei
mg/kg         mg/kg <th< td=""><td>rantine</td></th<>	rantine
0.31     <0.1     <0.1     <0.1     <0.1     <0.1       Pyrene     Benz(a)anthracene     Chrysene     Benzo(b)fluoranthene     Benzo(k)fluorant mg/kg       mg/kg     mg/kg     mg/kg     mg/kg	malka
Pyrene         Benz(a)anthracene         Chrysene         Benzo(b)fluoranthene         Benzo(k)fluoranthene           mg/kg         mg/kg         mg/kg         mg/kg         mg/kg	ng/kg <0.1
mg/kg mg/kg mg/kg mg/kg	<u> </u>
	nene
<0.1         <0.1         <0.1         <0.1	
Dibenz(ah)anthracene Benzo(ghi)perylene Indeno(1,2,3-cd)pyrene Benzo(a)pyrene	AOX
mg/kg mg/kg mg/kg	ng/kg
<0.1 <0.1 <0.1 <0.1	2
Water soluble portion Sum PAH (16 EPA)	
Weight % mg/kg	
<0.1 <1	
marks sting material made of stainless steel, powdery, grey	

			Data Sheet	samble no. 17			
Vastes from chemi	cal surface treatmen	t and coating of n	netals and other	materials (for ex	sample number	waste code	Date
	zinc coating process				17	110110	16.10.2002
	and anodizing), Sluc						
110109	and anotaling), orac	igee and meet ear					
					4		
		Ecotoxiko	logical chara	cterization			
Algae test - eluate			U				
80%-sample	G _A -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	1		
[%Inhibition]	e A compre	[%]	[%]	. exiting			
50.8	6	13.6	70.5	yes			
79.6	10	10.4	27.1	yes			
81.2	4	30.3	48.6	yes			
Median	6	13.6	48.6				
	0	13.0	40.0	yes	1		
Denhuis tt'	4-						
Daphnia test - elua		EC commit-	EC commit-	EC comula	<b>T</b> and 14		
100%-sample	G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]		[%]	[%]	[%]			
20	2	-	-	-	yes		
10	1	-	-	-	no		
Median	1.5	-	-	-	yes		
Luminescent bact	eria test- eluate						
50%-sample	G _I -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	1		
[%Inhibition]		[%]	[%]				
11.9	2	106.2	[/0]	no			
10.2	2	-	-				
10.2	2	-	-	no			
Median	2	106.2		<b>no</b>			
Median	2	106.2	-	no			
Median	2	106.2	-	no			
Median		106.2	-	no			
Bacteria contact te	est - solid matter		<u>-</u>	no	]		
Bacteria contact te		106.2 Toxicity	-	no	]		
Bacteria contact te 50%-sample [%Inhibition]	est - solid matter G _B -sample	Toxicity		no	]		
Bacteria contact te 50%-sample [%Inhibition] 75.9	est - solid matter G _B -sample -		 	no	]		
Bacteria contact te 50%-sample [%Inhibition]	est - solid matter G _B -sample	Toxicity		no	]		
Bacteria contact te 50%-sample [%Inhibition] 75.9	est - solid matter G _B -sample -	<b>Toxicity</b> yes		no	]		
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7	est - solid matter G _B -sample - 10-100	Toxicity yes yes yes		no	]		
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1	est - solid matter G _B -sample - 10-100 10-100	Toxicity yes yes		no	]		
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1	est - solid matter G _B -sample - 10-100 10-100	Toxicity yes yes yes		no	]		
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median	est - solid matter G _B -sample - 10-100 10-100 10-100	Toxicity yes yes yes		no	]		
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m	est - solid matter G _B -sample - - 10-100 10-100 10-100 atter	Toxicity yes yes yes yes			oot weight	Toxicity	
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m 50%-sample	est - solid matter G _B -sample - 10-100 10-100 10-100	Toxicity yes yes yes yes ges	t height	G _P dry sh	oot weight	Toxicity	
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m 50%-sample	est - solid matter G _B -sample - 10-100 10-100 10-100 atter S _P germination rate	Toxicity yes yes yes yes Gp Shoc	nt height	G _P dry sh	2	no	
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m 50%-sample ( Brassica	est - solid matter G _B -sample - 10-100 10-100 10-100 - 10-100 - - - -	Toxicity yes yes yes yes Gp Shoc	t height	G _P dry sh	2	no no	
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m 50%-sample ( Brassica	est - solid matter G _B -sample - 10-100 10-100 10-100 10-100 - - - - - - - - - - - - -	Toxicity yes yes yes yes Gp Shoc	t height	G _P dry sh	2 2 4	no no yes	
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m 50%-sample Brassica	est - solid matter G _B -sample - 10-100 10-100 10-100 10-100 Batter - 2 2 8	Toxicity yes yes yes yes G _p Shoc	t height 2 4	G _P dry sh	2 2 4 8	no no yes yes	
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m 50%-sample Brassica	est - solid matter G _B -sample - 10-100 10-100 10-100 10-100 Matter - 2 2 8 - -	Toxicity yes yes yes yes G _P Shoc	<b>it height</b> 2 2 4 3 2	G _P dry sh	2 2 4 8 2	no no yes yes no	
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena	est - solid matter G _B -sample - 10-100 10-100 10-100 10-100 Matter - 2 2 2 8 - 4	Toxicity yes yes yes yes G _p Shoc	<b>it height</b> 2 2 4 3 2	G _P dry sh	2 2 4 8	no no yes yes no yes	
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena	est - solid matter G _B -sample - 10-100 10-100 10-100 10-100 Matter - 2 2 2 8 - 4	Toxicity yes yes yes yes G _P Shoc	<b>it height</b> 2 2 4 3 2	G _P dry sh	2 2 4 8 2	no no yes yes no	
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena	est - solid matter G _B -sample - 10-100 10-100 10-100 10-100 Matter - 2 2 2 8 - 4	Toxicity yes yes yes yes G _P Shoc	<b>it height</b> 2 2 4 3 2	G _P dry sh	2 2 4 8 2	no no yes yes no yes	
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena	est - solid matter G _B -sample - 10-100 10-100 10-100 10-100 Matter - 2 2 2 8 - 4	Toxicity yes yes yes yes G _P Shoc	<b>it height</b> 2 2 4 3 2	G _P dry sh	2 2 4 8 2	no no yes yes no yes	
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena most representativ	est - solid matter G _B -sample - 10-100 10-100 10-100 10-100 Batter - 2 2 2 8 - 4 ye G _P -value	Toxicity yes yes yes yes G _P Shoc	<b>it height</b> 2 2 4 3 2	G _P dry sh	2 2 4 8 2	no no yes yes no yes	
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena most representativ	est - solid matter G _B -sample - 10-100 10-100 10-100 10-100 - - - 2 2 8 - 2 8 - 4 ve G _P -value - vithout S9	Toxicity yes yes yes G _p Shoc	t height 2 2 4 3 2	G _P dry sh	2 2 4 8 2 -	no yes yes no yes 8	Genotoxicit
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena most representativ	est - solid matter G _B -sample - 10-100 10-100 10-100 - - 2 2 2 8 - 4 ve G _P -value GEU	Toxicity yes yes yes Gp Shoc	t height 2 2 4 3 2 4 4 5 6 6 enotoxicity	G _P dry sh	2 2 4 4 8 2 2	no yes yes no yes 8	Genotoxicity GFU > 1 5
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena most representativ	est - solid matter G _B -sample - 10-100 10-100 10-100 - - - 2 2 2 8 - 4 re G _P -value without S9 GEU IR < 1.5	Toxicity           yes           yes           yes           yes           ges           yes	t height 2 2 4 3 2 4 4 Genotoxicity GEU > 1.5	G _P dry sh	2 2 4 8 2 - - GEU IR < 1.5	no no yes yes no yes 8 VD IR < 1.5	GEU > 1.5
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena most representativ	est - solid matter G _B -sample - 10-100 10-100 10-100 - - - 2 2 2 8 - 2 2 8 - 4 /re G _P -value vithout S9 GEU IR < 1.5 1.5	Toxicity           yes           yes <td>t height 2 2 4 3 2 4 Genotoxicity GEU &gt; 1.5 no</td> <td>G_P dry sh</td> <td>2 2 4 8 2 - - - GEU IR &lt; 1.5 1.5</td> <td>no no yes yes no yes 8 VD IR &lt; 1.5 0.67</td> <td>GEU &gt; 1.5 no</td>	t height 2 2 4 3 2 4 Genotoxicity GEU > 1.5 no	G _P dry sh	2 2 4 8 2 - - - GEU IR < 1.5 1.5	no no yes yes no yes 8 VD IR < 1.5 0.67	GEU > 1.5 no
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena most representativ	est - solid matter G _B -sample - 10-100 10-100 10-100 - - - 2 2 2 8 - 4 re G _P -value without S9 GEU IR < 1.5	Toxicity           yes           yes           yes           yes           ges           yes	t height 2 2 4 3 2 4 4 Genotoxicity GEU > 1.5	G _P dry sh	2 2 4 8 2 - - GEU IR < 1.5	no no yes yes no yes 8 VD IR < 1.5	GEU > 1.5
Bacteria contact te 50%-sample [%Inhibition] 75.9 71.7 78.1 Median Plant test - solid m	est - solid matter G _B -sample - 10-100 10-100 10-100 - - - 2 2 2 8 - 2 2 8 - 4 /re G _P -value vithout S9 GEU IR < 1.5 1.5	Toxicity           yes           yes <td>t height 2 2 4 3 2 4 Genotoxicity GEU &gt; 1.5 no</td> <td>G_P dry sh</td> <td>2 2 4 8 2 - - - GEU IR &lt; 1.5 1.5</td> <td>no no yes yes no yes 8 VD IR &lt; 1.5 0.67</td> <td>GEU &gt; 1.5 no</td>	t height 2 2 4 3 2 4 Genotoxicity GEU > 1.5 no	G _P dry sh	2 2 4 8 2 - - - GEU IR < 1.5 1.5	no no yes yes no yes 8 VD IR < 1.5 0.67	GEU > 1.5 no

			Data Sheet	samble no. 17			
Wastes from chem	nical surface treatment	and coating of n	netals and other	materials (for ex.	sample number	waste code	Date
	s, zinc coating process g and anodizing), Slud				17	110110	16.10.2002
110109							
		Ch	emical chara	cterization - elu	ate		
Dry weight %	Water content %	рН	Cond. µS/cm				
22.1	77	7.8	4900				
DOC	TOC	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	mg/l	mg/L	µg/l	µg/l	µg/l	µg/l	µg/l
56	-	0.03		<0.1	<0.5	121	11.4
Lead	Zinc	Manganese	Arsenic	Cobalt	ΑΟΧ	[	
µg/l	μα/Ι	µg/l	µg/L	µg/l	mg/l		
2.57	110	132	<u>µg/۲</u> <0,5	μ <u>μ</u> η 1	0.02		
PCB 8	НСН	PCB 18	PCB 28	PCB 52	PCB 101	DCB 439	PCB 153
	μq/l	μg/l		μg/l	μα/Ι	PCB 138	μg/l
μg/l <	μy/i <	μ <u>μ</u> γ/i <	μg/l <	0.005	0.013	μg/l 0.023	0.022
、 、	<u> </u>	<u> </u>	、 、	0.005	0.013	0.023	0.022
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	
<	<	<	<	<	<	<	
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
µg/l	µg/l	µg/l	µg/l	µg/l	μg/l	µg/l	µg/l
0.047	0.002	0.027	0.02	0.13	<	0.036	0.021
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-pyrene	Indeno(1,2,3-cd)-	Dibenz(a,h)-	Benzo(g,h,i)-
anthracene		fluoranthene	fluoranthene	(u) pj:ee	pyrene	anthracene	perylene
μg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	0.004	0.002	0	0.003	<	<	<
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-methane	1,1-Dichlorethene
µg/l	μg/l	µg/l	µg/l	μg/l	μg/l	μg/l	µg/l
<	<	~	<	<	~	<	<
cis-1.2-	trans-1.2-	Trichlor-	1,1,1-	Tetrachlor-	1.2-	Trichlorethene	Bromdichlor-
,	,				,	richioretherie	
Dichlorethene µg/l	Dichlorethene µg/l	methane µg/l	Trichlorethan µg/l	<b>methane</b> μg/l	Dichlorethane µg/l	µg/l	methane µg/l
μg/i <	μg/i <	μg/i <	μg/i <	μg/i <	μg/i <	μg/i <	μg/i <
1,1,2-	Tetrachlorethene	Dibromchlor-	Tribrom-	1,2-	1,3-	1,4-	hydrocarIndex
Trichlorethane		methane	methane	Dichlorbenzene		Dichlorbenzene	(H53)
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l
<	<	<	<	<	<	<	-

alvanic processe	mical surface treatmen es, zinc coating proces ng and anodizing), Slue	ses, pickling proc	esses, etching, pho	osphating,	sample number 17	waste code 110110	Date 16.10.2002
		Chem	ical characteria	zation - solid	matter		
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
12	83	<0.01	200	730	47	<0.05	340
Hvdr	ocarbons	Lipophilic subs	тос	Benzene	Toluene	Ethylbenzene	Xylene
	eight %	Weight %	Weight %	mg/kg	mg/kg	mg/kg	mg/kg
	0.021	0.021	1.6	<0.01	< 0.01	<0.01	< 0.01
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranthene
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
< 0.04			<0.1	<0.1	<0.1	< 0.1	0.38
	10.1						
Pyrene	Benz(a)ant	nracene	Chrysene	Benzo(b)fl	uoranthene	Benzo(k)fluoranthene	
mg/kg	mg/k	g	mg/kg	m	g/kg	mg/kg	
0.16	<0.1		<0.1	<	0.1	<0.1	
Dibenz(a	h)anthracene	Benzo(ah	i)pervlene	Indeno(1.2	3-cd)pyrene	Benzo(a)pyrene	AOX
	mg/kg		/kg		g/kg	mg/kg	mg/kg
	<0.1	<(	).1	<	0.1	<0.1	9
Water so	oluble portion	Sum PAH	(16 EPA)				
	eight %		/kg				
	3.2	<	1				
<u>Remarks</u>							
ranular, blue							
ranalar, blac							



Wastes from was	te water treatment plant	s not otherwise sp	ecified,		sample number	waste code	Date
	dangerous substances			waste water	18	190813	17.10.2002
	1-	Ecotoxiko	ological chara	cterization			
Algae test - eluat 80%-sample	G _A -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	7		
[%Inhibition]	O _A -sample	[%]	[%]	TOXICITY			
99.9	>4	-	-	yes			
100	200	0.7	1.0	yes			
100	200	0.85	1.1	yes			
Median	200	0.8	1.0	yes	1		
Daphnia test - el 100%-sample	uate G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]		[%]	[%]	[%]			
100	20	3.1	3.7	5.3	yes		
100	10	10.6	12.2	15.9	yes		
Median	15	6.8	8.0	10.6	yes		
Luminescent bac 50%-sample	cteria test- eluate G _I -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	7		
[%Inhibition]	-L		[%]	. exiony	1		
100	32	[%] 3.7	9.6	yes			
100	64	2.4	7.7	yes			
Median	48	3.0	8.7	yes			
	test - solid matter		-				
50%-sample	G _B -sample	Toxicity					
[%Inhibition]			_				
96.8	-	yes	_				
98.4	10-100	yes	_				
	40.400		_				
Median	10-100	yes					
Plant test - solid	matter						
50%-sample	G _P germination rate	Gp Shoo			oot weight	Toxicity	]
Brassica	>1024	25			56	yes	-
······	-	<28			256	-	
_ycopersicon	1024	25			56	yes	
A	<256	<28			256	-	-
Avena	>1024	25			024	yes	-
nost representa	>4096	102	24		-	yes	_
nost representa	uve G _P -value			· · · · · · · · · · · · · · · · · · ·		256	
umu-test - eluate	without S9			Eluate with S9			
	GEU	VD	Genotoxicity		GEU	VD	Genotoxicit
	IR < 1.5	IR < 1.5	GEU > 1.5		IR < 1.5	IR < 1.5	GEU > 1.5
	1.5	0.67	no		1.5	0.67	no
	1.5	0.67	no		1.5	0.67	no
Median	1.5	0.67	no	Median	1.5	0.67	no

			Data Sheet sa	amble no. 18			
Wastes from wast	e water treatment plant	ts not otherwise sp	ecified,		sample number	waste code	Date
Sludge containing	dangerous substances	from other treatm	ent of industrial v	waste water	18	190813	17.10.2002
		Chei	nical charact	erization - eluate	9		
Dry weight %	Water content %	рН	Cond. µS/cm	ľ			
59.6	40.4	9 adj. to 7.5	3170	[			
DOC	TOC	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	mg/l	mg/L	µq/l	µq/l	µg/l	µq/l	µg/l
390	-	19	-	<0,1	<0.5	93.5	78.8
Land	71		A	0-1-14	407	T	
Lead	Zinc	Manganese	Arsenic	Cobalt	AOX	ļ	
µg/l	µg/l	µg/l	µg/L	µg/l	mg/l	ļ	
2.87	31	37	<0.5	35.9	2.1	l	
PCB 8	НСН	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	<	<	<	<
			p				P
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	]
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	
<	<	<	<	<	<	<	]
Nauhthalaua	Acononhéhulona	Aconomistorio	Fluenene	Dhananthuana	Améhana anna	Fluenentheme	Dumono
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
μg/l 0.075	μg/l <	μg/l <	μg/l <	µg/l	µg/l <	µg/l	µg/l
0.075	<	<	<	0.015	<	n.b.	n.b.
Benzo(a)- anthracene	Chrysene	Benzo(b)- fluoranthene	Benzo(k)- fluoranthene	Benzo(a)-pyrene	Indeno(1,2,3-cd)-	Dibenz(a,h)- anthracene	Benzo(g,h,i)- perylene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
n.b.	n.b.	<	<	<	<	<	<
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-methane	1,1- Dichlorethene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.005	76	160	0.4	3.34	1.34	<	<
-1- 4.0	tura 10	Taishten		Taturalita	10	Tricklensthe	Dura an all a la l
cis-1,2-	trans-1,2-	Trichlor-	1,1,1-	Tetrachlor-	1,2- Diablanthana	Trichlorethene	Bromdichlor-
Dichlorethene	Dichlorethene	methane	Trichlorethan	methane	Dichlorethane		methane
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	0.146	<	<	<	<	<
1,1,2-	Tetrachlorethene	Dibromchlor-	Tribrom-	1,2- Diablash	1,3- Diabhain	1,4- Diabhrachanna	hydrocar
Trichlorethane		methane	methane	Dichlorbenzene	Dichlorbenzene	Dichlorbenzene	Index (H53)
μg/l <	µg/l <	μg/l <	μg/l <	µg/l <	µg/l	µg/l	mg/l
<	<	<	<	<	<	<	-

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	dangerous substance	es nom other treatm	ent of moustnal wa	sie waler	18	190813	17.10.2002
		Chemic	al characteriza	tion - solid m	atter		
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
<0.1	19	0.34	101	30	330	2.4	400
	ocarbons	Lipophilic subst.	TOC	Benzene	Toluene	Ethylbenzene	Xylene
	eight %	Weight %	Weight %	mg/kg	mg/kg	mg/kg	mg/kg
	0.77	2.1	9.6	5.9	34	0.04	0.26
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranther
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
40.2	0.5	0.6	<0.1	0.4	0.5	<0.1	0.4
10.2	0.0	0.0	-0.1	0.1	0.0	-0.1	0.1
Pyrene			Chrysene	Benzo(b)f	luoranthene	Benzo(k)flu	oranthene
mg/kg mg/l		/kg	mg/kg	m	g/kg	mg/	kg
0.2			0.2	(	0.1	<0.	1
Dibenz(a	h)anthracene	(0)	ghi)perylene Indeno		2,3-cd)pyrene	Benzo(a)pyrene	AOX
	ng/kg	mg/		mg/kg		mg/kg	mg/kg
	<0.1	<0.	1	<	:0.1	<0.1	820
Water so	luble portion	Sum PAH	(16 EPA)				
	eight %	mg/					
	3	3	Č				

190813 v. 17.10.2002



			Data Sheet sa	mble no.19			
	I am all many according from a limit of				sample number	waste code	Date
	I and removal of paint a organic solvents or oth			ining paint or	19	080115	21.10.2002
	0	0					
Algae test - eluate	•	Ecotoxik	ological charad	cterization			
80%-sample	G _⊿ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	1		
[%Inhibition]	CA campic	[%]	[%]	Toxiony			
53.9	4	30.7	67.8	yes			
59.8	3	32.8	63.3	yes			
				Í Í			
Median	3.5	31.8	65.5	yes	]		
Daphnia test - elu	inte						
100%-sample	G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]		[%]	[%]	[%]	TOXICITY		
0	1	-	-	-	no		
20	2	-	-	-	yes		
	_				,		
Median	1.5	-	-	-	yes		
Luminescent bac				•	1		
50%-sample	G _L -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity			
[%Inhibition]	-	[%]	[%]				
50	8	13.2	50.4	yes	-		
49.9	8	14.6	50.6	yes			
Median	8	13.9	50.5	yes	-		
			·		-		
Bacteria contact	test - solid matter						
50%-sample	G _B -sample	Toxicity	]				
[%Inhibition]							
47.7	-	yes					
63.2	2-10	yes					
			-				
Median	2-10	yes	1				
Plant test - solid I	matter						
50%-sample	G _P germination rate	Gp Shoo	ot height	G _P dry sh	noot weight	Toxicity	7
Brassica	-				-		1
	>128	1	6		16	yes	1
Lycopersicon	>32		6		16	yes	1
	64		28		128	yes	
Avena	>32		32		>32	yes	
	>128	1	6		16	yes	
most representat	ive G _P -value					16	]
	without SC			Elucito with CO			
	GEU	VD	Genotoxicity	Eluate with S9	GEU	VD	Genotoxicit
umu-test - eluate	GEU		GEU > 1.5	<u> </u>	IR < 1.5	IR < 1.5	GEU > 1.5
umu-test - eluate		ID < 1 5				0.1 < /1	I GEU / 1.5
umu-test - eluate	IR < 1.5	IR < 1.5					
umu-test - eluate	IR < 1.5 1.5	0.67	no		1.5	0.67	no
umu-test - eluate	IR < 1.5						

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			Data Sheet sa	mble no. 19			
Waste from MFSU	and removal of paint a	and varnish. Aqueo	ous sludges contai	ning paint or	sample number	waste code	Date
	organic solvents or oth			311	19	080115	21.10.2002
		Che	mical characte	rization - eluat	te		
Dry weight %	Water content %	рН	Cond. µS/cm	1			
59.8	40.2	9.7 adj. to 7.2	875				
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	mg/l	mg/L	µg/l	µg/l	µg/l	µg/l	µg/l
150	-	0.06	-	<0.1	1.6	5.1	12.6
Lead	Zinc	Manganese	Arsenic	Cobalt	ΑΟΧ	1	
µg/l	µg/l	µg/l	µg/L	µq/l	mg/l		
10.3	87	ېږ 5	<0.5	1.8	0.05	]	
PCB 8	НСН	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
					μq/l	μg/l	μg/l
µg/l	µg/l <	μg/l <	µg/l <	µg/l <	0.009	0.013	0.008
	、	``	``	```	0.009	0.013	0.006
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	1
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	1
<	-	0.001	<	-	-	-	
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
µg/l	µg/l	μg/l	µg/l	µg/l	µg/l	µg/l	µg/l
5.908	0.007	0.011	0.009	0.016	<	0.006	0.007
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-	Indeno(1,2,3-cd)-	Dibenz(a,h)-	Benzo(g,h,i)-
anthracene		fluoranthene	fluoranthene	pyrene	pyrene	anthracene	perylene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.001	0.001	<	<	<	<	<	<
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-methane	1,1- Dichlorethene
µg/l	µg/l	µq/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.021	<	0.7	18	79	49	<	<
aia 1.2	trans 4.0	Trichlor-	1,1,1-	Tetrachlor-	4.2	Trichlorethene	Bromdichlor-
cis-1,2- Dichlorethene	trans-1,2- Dichlorethene		1,1,1- Trichlorethane		1,2- Dichlorethane	richiorethene	
ucnioretnene µg/l	μg/l	<u>methane</u> μg/l	µg/l	methane µg/l	µg/l	μg/l	methane µg/l
μ <u>μ</u> γ/ι <	μy/i <	μy/i <	µg/i <	µg/i <	µg/i <	μy/i <	µy/i <
	<b>T</b> - 4	Diharamahi	Tailean an	10	10		hander on the t
1,1,2- Trichlorethane	Tetrachlorethene	Dibromchlor- methane	Tribrom- methane	1,2- Dichlorbenzene	1,3- Dichlorbenzene	1,4- Dichlorbenzene	hydrocarInde (H53)
µg/l	µg/l	μg/l	µg/l	µg/l	µg/l	µg/l	mg/l
<u>µg</u> /i <	μg/i <	/yg/i <	μg/i <	μ <u>g</u> /i <	μg/i <	μg/i <	-
	-						-

	J and removal of paint organic solvents or o			ing paint or	sample number 19	waste code 080115	Date 21.10.2002
		5	al characterizat	tion - solid n	natter		
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1	195	0.14	11	24	5.1	< 0.05	5330
				_			
	ocarbons	Lipophilic subst.		Benzene	Toluene	Ethylbenzene	Xylene
W	eight %	Weight %	Weight %	mg/kg	mg/kg	mg/kg	mg/kg
	0.78	0.61	31.8	0.07	0.3	43	240
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranthen
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
283	90	<0.1	<0.1	<0.1	0.18	0.12	<0.1
						-	
Pyrene	Benz(a)aı		Chrysen		)fluoranthen	Benzo(k)fl	
mg/kg mg/			mg/kg		ng/kg	mg.	
<0.1 <0.		.1	<0.1		<0.1	<0	.1
Dibenz(a	h)anthracene	Benzo(ah	i)perylene	Indeno(1.	2,3-cd)pyrene	Benzo(a)pyrene	XOA
	mg/kg <0.1	mg <0		r	ng/kg	mg/kg	mg/kg
	<0.1	<0	).1		<0.1	<0.1	210
Water so	oluble portion	Sum PAH	(16 EPA)				
	eight %	mg	/kg				
	0.6	90	0.3				
emarks anular, black, so	olvent smell						



			Data Sheet sa	mble no. 21			
Wastes from shapi	ng and physical and m	echanical surface	treatment of meta	als and plastics,	sample number	waste code	Date
Waste blasting mat mentioned in 1201	erial containing dange	rous substances a	nd waste blasting	g material, other than	21	120116/120117	16.10.2002
		Ecotoxiko	ological chara	cterization			
Algae test - eluate 80%-sample	G₄-sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	1		
[%Inhibition]	O _A oumpio	[%]	[%]	Toxicity	-		
100	10	10.1	12.2	yes	-		
100	>10	-	-	yes	-		
100	20	6.0	24.6	yes	1		
Median	15	8.0	18.4	yes	1		
Daphnia test - elu 100%-sample	ate G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]	OD-Sample	[%]	[%]	[%]	TOXICITY		
50	2	[ /0] -	[/0] -	[/0] -	yes		
10	1	-	-	-	no		
10	1	-	-	-	10		
Median	1.5	-	-	-	yes		
•			•	-			
Luminescent bact	eria test- eluate						
50%-sample	G _L -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	1		
[%Inhibition]		[%]	[%]				
69.4	16	8.0	25.4	yes			
68.6	16	9.8	27.4	yes	-		
Median	16	8.9	26.4	yes	+		
					4		
Bacteria contact t	est - solid matter						
		Toxicity					
50%-sample	G _B -sample	Toxicity					
50%-sample [%Inhibition]	G _B -sample						
50%-sample		<b>Toxicity</b> yes					
50%-sample [%Inhibition] 82.7	G _B -sample >100						
50%-sample [%Inhibition] 82.7	G _B -sample						
50%-sample [%Inhibition] 82.7 Median	G _B -sample >100 >100	yes					
50%-sample [%Inhibition] 82.7 Median Plant test - solid r	G _B -sample >100 >100	yes yes	theight	G. drv sho	ot weight	Toxicity	
50%-sample [%Inhibition] 82.7 Median Plant test - solid n 50%-sample	G _B -sample >100 >100	yes	t height	G _P dry sho	ot weight	Toxicity	
50%-sample [%Inhibition] 82.7 Median Plant test - solid n 50%-sample	G _B -sample >100 >100 >100 natter G _P germination rate	yes yes Gp Shoo	-		-		
50%-sample [%Inhibition] 82.7 Median Plant test - solid r 50%-sample Brassica	G _B -sample >100 >100 >100 matter G _P germination rate >32	yes yes Gp Shoo	6	4	-	yes	
50%-sample [%Inhibition] 82.7 Median Plant test - solid r 50%-sample Brassica	G _B -sample >100 >100 >100 natter G _P germination rate >32 16	yes yes Gp Shoo	5 3		3	yes yes	
50%-sample [%Inhibition] 82.7 Median Plant test - solid r 50%-sample Brassica Lycopersicon	G _B -sample >100 >100 >100 matter G _P germination rate >32	yes yes G _P Shoo	6 3 6	4	3	yes	
50%-sample [%Inhibition] 82.7 Median Plant test - solid r 50%-sample Brassica Lycopersicon	G _B -sample >100 >100 >100 natter G _P germination rate >32 16 >32	yes yes Gp Shoo 11 <1	5 3 5 3	4 <8 16	3	yes yes yes yes	
50%-sample [%Inhibition] 82.7 Median Plant test - solid r 50%-sample Brassica Lycopersicon Avena	G _B -sample >100 >100 >100 >100 natter G _P germination rate >32 16 >32 - 2	yes yes Gp Shoo 10 <1 10	5 3 5 3	4 <8 16 <8	3	yes yes yes	
50%-sample [%Inhibition] 82.7 Median Plant test - solid r 50%-sample Brassica Lycopersicon Avena most representati	G _B -sample >100 >100 >100 natter G _P germination rate >32 16 >32 - 2 ve G _P -value	yes yes Gp Shoo 10 <1 10	5 3 5 3	4 <8 16 <8	3	yes yes yes yes yes	
50%-sample [%Inhibition] 82.7 Median Plant test - solid r 50%-sample Brassica Lycopersicon Avena most representati	G _B -sample >100 >100 >100 >100 natter G _P germination rate >32 16 >32 - 2 ve G _P -value without S9	yes yes Gp Shoo 16 4 4	5 3 3 3	4 <8 16 <8	3	yes yes yes yes yes 8	
50%-sample [%Inhibition] 82.7 Median Plant test - solid r 50%-sample Brassica Lycopersicon Avena most representati	G _B -sample >100 >100 >100 >100 natter G _P germination rate >32 16 >32 - 2 ve G _P -value without S9 GEU	yes yes Gp Shoo 16 <{ 16 <{ 16 <{	Genotoxicity	4 <8 16 <8 4	GEU	yes yes yes yes 8	
50%-sample [%Inhibition] 82.7 Median Plant test - solid r	G _B -sample >100 >100 >100 natter G _P germination rate >32 16 >32 - 2 ve G _P -value without S9 GEU IR < 1.5	yes yes Gp Shoo 16 <6 16 <6 16 <6 16 16 <12 17 18 <1.5	5 3 3 3	4 <8 16 <8 4	GEU IR < 1.5	yes yes yes yes yes 8	Genotoxici GEU > 1.{
50%-sample [%Inhibition] 82.7 Median Plant test - solid r 50%-sample Brassica Lycopersicon Avena most representati	G _B -sample >100 >100 >100 >100 natter G _P germination rate >32 16 >32 - 2 ve G _P -value without S9 GEU	yes yes Gp Shoo 16 <{ 16 <{ 16 <{	Genotoxicity	4 <8 16 <8 4	GEU	yes yes yes yes 8	
50%-sample [%Inhibition] 82.7 Median Plant test - solid r 50%-sample Brassica Lycopersicon Avena most representati	G _B -sample >100 >100 >100 natter G _P germination rate >32 16 >32 - 2 ve G _P -value without S9 GEU IR < 1.5	yes yes Gp Shoo 16 <6 16 <6 16 <6 16 16 <12 17 18 <1.5	Genotoxicity GEU > 1.5	4 <8 16 <8 4	GEU IR < 1.5	yes yes yes yes 8 VD IR < 1.5	GEU > 1.8
50%-sample [%Inhibition] 82.7 Median Plant test - solid r 50%-sample Brassica Lycopersicon Avena most representati	G _B -sample >100 >100 >100 natter G _P germination rate >32 16 >32 16 >32 2 ve G _P -value without S9 GEU IR < 1.5 1.5	yes yes Gp Shoo 16 <6 10 <6 10 <6 10 10 <7 10 10 10 10 10 10 10 10 10 10	Genotoxicity GEU > 1.5 no	4 <8 16 <8 4	GEU IR < 1.5 1.5	yes yes yes yes 8 VD IR < 1.5 0.67	GEU > 1.5 no

			Data Sheet sa	mble no. 21			
Vastes from shap	ing and physical and r	mechanical surface	treatment of meta	Is and plastics,	sample number	waste code	Date
Vaste blasting ma nentioned in 1201	aterial containing dang	erous substances a	nd waste blasting	material, other than	21	120116/120117	16.10.2002
		Che	mical characte	erization - eluate			
Dry weight %	Water content %	Ha	Cond. µS/cm				
100	0	9.2 adj. to 7.1	221				
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	mg/l	mg/L	µg/l	µq/l	µg/l	µg/l	µg/l
26	-	0.49	0.1	0.9	71.2	44.7	140
Lead	Zinc	Manganese	Arsenic	Cobalt	ΑΟΧ		
µg/l	µg/l	µq/l	µq/L	µg/l	mg/l		
16.4	86	6	<0.5	1.8	0.07		
PCB 8	нсн	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
µg/l	µg/l	µg/l	µg/l	µg/l	µq/l	µg/l	µq/l
<	<	<	<	<	0.011	0.029	0.014
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	
µq/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	
0.004	<	0.002	<	<	<	<	
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
µg/l	µq/l	µq/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.307	0.014	0.017	0.02	0.071	<	0.025	0.027
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-pyrene	Indeno(1,2,3-cd)	Dibenz(a,h)-	Benzo(g,h,i
anthracene		fluoranthene	fluoranthene	20.120(d) pj. 0.10	pyrene	anthracene	pervlene
µg/l	µg/l	µg/l	µg/l	µq/l	µq/l	µg/l	µq/l
<	0.007	0.003	<	0.002	0.001	<	0.002
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-	1.1-
Diplicity	Bonzono	rondonio	Laryibonizono	in /p xylone	e xylone	methane	Dichlorethe
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.005	0.2	0.27	0.35	2.56	1.48	<	<
cis-1,2-	trans-1,2-	Trichlor-methane	1,1,1-	Tetrachlor-	1,2-	Trichlorethene	Bromdichlo
Dichlorethene	Dichlorethene		Trichlorethane	methane	Dichlorethane		methane
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	<	<	<	<
1,1,2-	Tetrachlorethene	Dibromchlor-	Tribrom-	1,2-	1,3-	1,4-	hydrocar.
Trichlorethane		methane	methane	Dichlorbenzene	Dichlorbenzene	,	Index (H53
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l
<	<	<	<	<	<	<	-

Arsenic       Lead       Chemical characterization - solid matter         Arsenic       Lead       Cadmium       Chromium       Copper       Nickel       Mercury       Zinc         mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg         6.9       120       0.49       7300       460       3650       3.7       1330         Hydrocarbons       Lipophilic subst.       TOC       Benzene       Toluene       Ethylbenzene       Xylene         Weight %       Weight %       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg         0.024       0.04       0.8       <0.01       0.01       0.03       0.22				Data Sheet san	nble no. 21			
entioned in 120116           Chemical characterization - solid matter           Arsenic         Lead         Cadmium         Chromium         Copper         Nickel         Mercury         Zinc           mg/kg         mg/kg <td< th=""><th>astes from shap</th><th>ing and physical and</th><th>mechanical surface</th><th>treatment of metals</th><th>s and plastics,</th><th>sample number</th><th>waste code</th><th>Date</th></td<>	astes from shap	ing and physical and	mechanical surface	treatment of metals	s and plastics,	sample number	waste code	Date
Chemical characterization - solid matter         Arsenic       Lead       Cadmium       Chromium       Copper       Nickel       Mercury       Zinc         mg/kg       0.1       0.1       0.1       0.1       0.1       0.1       0.1       0.1       0.1       0.1       0.1       0.1			gerous substances a	nd waste blasting r	material, other than	21	120116/120117	16.10.2002
mg/kg         mg/kg <th< td=""><td></td><td>10</td><td>Chemi</td><td>cal characteriza</td><td>ation - solid matt</td><td>ter</td><td></td><td></td></th<>		10	Chemi	cal characteriza	ation - solid matt	ter		
mg/kg         mg/kg <th< td=""><td>Arconic</td><td>Load</td><td>Cadmium</td><td>Chromium</td><td>Connor</td><td>Nickol</td><td>Moreury</td><td>Zino</td></th<>	Arconic	Load	Cadmium	Chromium	Connor	Nickol	Moreury	Zino
6.9         120         0.49         7300         460         3650         3.7         1330           Hydrocarbons         Lipophilic subst.         TOC         Benzene         Toluene         Ethylbenzene         Xylene           Weight %         Weight %         Weight %         Weight %         mg/kg         0.1         <0.1								
Hydrocarbons         Lipophilic subst.         TOC         Benzene         Toluene         Ethylbenzene         Xylene           Weight %         Weight %         Weight %         mg/kg         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1								
Weight %         Weight %         Weight %         mg/kg	0.3	120	0.43	7300	400	5050	5.1	1550
Weight %         Weight %         Weight %         mg/kg	Hvdro	carbons	Lipophilic subst.	TOC	Benzene	Toluene	Ethylbenzene	Xvlene
0.024         0.04         0.8         <0.01         0.01         0.03         0.22           Sum BTEX         Naphthalene         Acenaphtene         Acenaphtylene         Fluorene         Phenanthrene         Anthracene         Fluoranthe           mg/kg         0.11         0.13         <0.1								
Sum BTEX         Naphthalene         Acenaphtene         Acenaphtylene         Fluorene         Phenanthrene         Anthracene         Fluoranthe           mg/kg         0.11         0.11         0.11         0.13         <0.1								
mg/kg         mg/kg <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>								
0.26         -0.1         -0.1         -0.1         -0.1         0.13         -0.1         0.11           Pyrene         Benz(a)anthracene         Chrysene         Benzo(b)fluoranthene         Benzo(k)fluoranthene           mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         mg/kg           0.13         <0.1	Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranther
Pyrene         Benz(a)anthracene         Chrysene         Benzo(b)fluoranthene         Benzo(k)fluoranthene           mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         mg/kg           0.13         <0.1	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
mg/kg         mg/kg         mg/kg         mg/kg           0.13         <0.1	0.26	<0.1	<0.1	<0.1	<0.1	0.13	<0.1	0.11
mg/kg         mg/kg         mg/kg         mg/kg           0.13         <0.1								
0.13         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1 <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>								
Dibenz(ah)anthracene     Benzo(ghi)perylene     Indeno(1,2,3-cd)pyrene     Benzo(a)pyrene     AOX       mg/kg     mg/kg     mg/kg     mg/kg     mg/kg     mg/kg       <0.1								
mg/kg         mg/kg <th< td=""><td>0.13</td><td>&lt;0</td><td>.1</td><td>&lt;0.1</td><td>&lt;0.1</td><td>1</td><td>&lt;0</td><td>.1</td></th<>	0.13	<0	.1	<0.1	<0.1	1	<0	.1
mg/kg         mg/kg <th< td=""><td>Dihana(a)</td><td></td><td>Banna/ahi</td><td>and an a</td><td>Indepedd 0.0</td><td></td><td></td><td>10V</td></th<>	Dihana(a)		Banna/ahi	and an a	Indepedd 0.0			10V
<0.1         <0.1         <0.1         10  Water soluble portion         Sum PAH (16 EPA)            10  Weight %         mg/kg               10  0.8         <1			Benzo(gni	perylene			Benzo(a)pyrene	
Water soluble portion     Sum PAH (16 EPA)       Weight %     mg/kg       0.8     <1			<0	.1	<0.1	1	<0.1	10
Weight %         mg/kg           0.8         <1						-		
0.8 <1 <1 <			Sum PAH	(16 EPA)				
emarks	We							
		0.8						
		ey						
			10					
		1						
		100000000000000000000000000000000000000				1000		
		The second second second				COLUMN ACCOUNTS		
120116 und 120117 v. 16.10.2002				12	10116 und 120117 v. 16.10.20	102		

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			Data Sheet sa	amble no. 22			
	neration and pyrolysis of	waste, Bottom as	sh and slag other	than those	sample number	waste code	Date
mentioned in 190	111				22	190112	17.10.2002
		Ecotoxiko	ological chara	cterization			
Algae test - elua					-		
80%-sample	G _A -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	_		
[%Inhibition]		[%]	[%]				
100	6	25.0	-	yes			
66.8	3	45.9	59.5	yes			
				-			
Median	4.5	35.4	59.5	yes			
Daphnia test - el	uate						
100%-sample	G _n -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]		[%]	[%]	[%]	. emeny		
70	2	-	-	-	yes		
100	2	-	-	-	yes		
100	-				,00		
Median	2	-	-	-	yes		
					yes		
Luminescent ba	cteria test- eluate						
50%-sample	G ₁ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity			
[%Inhibition]	OL-Sample	[%]	[%]	TOXICITY			
22.2	4	<u> </u>	138.6	yes			
20.5	4	48.2	122.4				
20.5	4	40.2	122.4	yes			
Median	4	44.8	130.5	yes	_		
				1			
Bacteria contact	test - solid matter						
50%-sample	G _B -sample	Toxicity	7				
[%Inhibition]	OB-30mpic	TOXICITY	-				
106.4		yes					
92.4	10-100	,					
105.0	10-100	yes	-				
Median	10-100	yes	-				
weulan	10-100	yes	J				
Plant test - solid	matter						
50%-sample	G _P germination rate	Gp Shoo	t height	G₀drvsh	oot weight	Toxicity	1
Brassica	8	4			4	yes	-
	>32	2			2	yes	1
Lycopersicon	4	4			8	yes	1
Licoberaicoli	>32	8			8	yes	1
Avena	2	4			4		1
Avena	32	4			8	yes	-
		٤			0	yes	-
	uve Gp-value			l		8	J
most representa							
•				Eluato with SO			
most representa umu-test - eluate	e without S9	VD	Constaulate	Eluate with S9			Constantati
·	e without S9 GEU	VD	Genotoxicity	Eluate with S9	GEU	VD	
·	e without S9 GEU IR < 1.5	IR < 1.5	GEU > 1.5	Eluate with S9	IR < 1.5	IR < 1.5	GEU > 1.5
·	e without S9 GEU IR < 1.5 1.5	IR < 1.5 0.67	GEU > 1.5 no	Eluate with S9	IR < 1.5 1.5	IR < 1.5 0.67	GEU > 1.5 no
•	e without S9 GEU IR < 1.5	IR < 1.5	GEU > 1.5	Eluate with S9	IR < 1.5	IR < 1.5	GEU > 1.5
•	e without S9 GEU IR < 1.5 1.5	IR < 1.5 0.67	GEU > 1.5 no	Eluate with S9	IR < 1.5 1.5	IR < 1.5 0.67	no

	eration and pyrolysis o	of waste, Bottom as	sh and slag other	than those	sample number	waste code	Date
mentioned in 1901	111				22	190112	17.10.2002
		Cher	nical characte	erization - eluat	e		
					-		
Dry weight %	Water content %	pH	Cond. µS/cm				
60.4	39.6	12.5 adj. to 7	8220	-			
DOC	TOC	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
ma/l	mg/l	ma/L	µg/l	ua/l	µq/l	µg/l	µq/l
13	-	1.3	0.1	0.2	7.4	<0.5	112
Lead	Zinc	Manganese	Arsenic	Cobalt	AOX		
µg/l	µg/l	µg/l	µg/L	µg/l	mg/l		
562	740	<5	<0.5	1.4	0.02		
PCB 8	нсн	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
ug/l	ua/l	ug/l	ua/l	ua/l	ua/l	ua/l	ua/l
<	<	<	<	<	0.011	<	0.008
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	
<	<	<	<	<	<	<	
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
	µq/l	µg/l	µq/l	µq/l	µq/l	µq/l	µq/l
0.031	0.003	0.002	0.004	0.011	μ <u>μ</u> γ/ι <	0.005	0.005
0.001	0.000	0.002	0.001	0.011		0.000	0.000
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-pyrene	Indeno(1,2,3-cd)	Dibenz(a,h)-	Benzo(g,h,i)
anthracene	-	fluoranthene	fluoranthene	.,	pyrene	anthracene	perylene
µg/l	μg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0	0.001	0	<	0.002	<	<	<
Dishaud	Devere	<b>T</b> - 1	E dhu dh a mar a mar		- Volene	Diskiss medican	4.4
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-methane	1,1- Dichlorethen
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.004	0.4	0.22	<	< 49/1	< 49/1	×9/1	<u>۳</u> 9/י
0.001	0.1	0.22					
cis-1,2-	trans-1,2-	Trichlor-	1,1,1-	Tetrachlor-	1,2-	Trichlorethene	Bromdichlo
Dichlorethene	Dichlorethene	methane	Trichlorethan	methane	Dichlorethane		methane
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	<	<	<	<
440	Tetrachlorethene	Dibromchlor-	Tribrom-	1.2-	1.3-	1.4-	budre co-
1,1,2- Trichlorethane	retracmoretnene	Dibromchior- methane	methane	,	1,3- Dichlorbenzene	,	hydrocar Index (H53)
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mdex (H53)
μ <u>μ</u> η <	μg/i <	μg/i <	μ <u>g</u> /i <	μg/i <	μg/i <	μg/i <	iiig/i

Chemical characterization - solid matter         Arsenic       Lead       Cadmium       Chromium       Copper       Nickel       Mercury       mg/kg         mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       mg/kg       0.1       <0.1       <0.1       <0.1		eration and pyrolysis	of waste, Bottom as	h and slag other th	han those	sample number	waste code	Date
Arsenic         Lead         Cadmium         Chronium         Copper         Nickel         Mercury           mg/kg         0.1         <0.1	entioned in 1901	11				22	190112	17.10.2002
mg/kg         rd           7.4         210         4.7         96         1020         49         4.5           Hydrocarbons         Lipophilic subst.         TOC         Benzene         Toluene         Ethylbenzene         X           Weight %         Weight %         Weight %         Weight %         mg/kg         mg/kg         mg/kg         mg/kg         rd           0.002         <0.01         1         0.01         0.01         0.08            Sum BTEX         Naphthalene         Acenaphtene         Acenaphtylene         Fluorene         Phenanthrene         Anthracene         Fluo           mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         rd         rd           0.59         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1			Chemic	al characteriza	tion - solid m	atter		
7.4         210         4.7         96         1020         49         4.5           Hydrocarbons         Lipophilic subst.         TOC         Benzene         Toluene         Ethylbenzene         X           Weight %         Weight %         Weight %         Mg/kg         mg/kg         mg/kg         mg/kg         r           0.002         <0.01         1         0.01         0.01         0.08            Sum BTEX         Naphthalene         Acenaphtene         Acenaphtylene         Fluorene         Phenanthrene         Anthracene         Fluo           mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         r           0.59         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1            Pyrene         Benz(a)anthracene         Chrysene         Benzo(b)fluoranthene         Benzo(k)fluoranth           mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         mg/kg           <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1           Dibenz(ah)anthracene         Benzo(ghi)perylene         Indeno(1,2,3-cd)pyrene<	Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
Hydrocarbons         Lipophilic subst.         TOC         Benzene         Toluene         Ethylbenzene         X           Weight %         Weight %         Weight %         Weight %         mg/kg         mg/kg         mg/kg         r           0.002         <0.01								mg/kg
Weight %         Weight %         Weight %         mg/kg         mg/kg         mg/kg         r           0.002         <0.01	7.4	210	4.7	96	1020	49	4.5	1900
Weight %         Weight %         Weight %         mg/kg         mg/kg         mg/kg         r           0.002         <0.01	Hydro	carbons	l inonhilic subst	тос	Benzene	Toluene	Fthylbenzene	Xylene
0.002         <0.01         1         0.01         0.01         0.01         0.08           Sum BTEX         Naphthalene         Acenaphtene         Acenaphtylene         Fluorene         Phenanthrene         Anthracene         Fluo           mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         r           0.59         <0.1								mg/kg
mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         rg/kg         rg/kg <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0.49</td></th<>								0.49
mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         mg/kg         rg/kg         rg/kg <th< td=""><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td></th<>			1					
0.59         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1         <0.1 <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Fluoranthen</td></th<>								Fluoranthen
Pyrene         Benz(a)anthracene         Chrysene         Benzo(b)fluoranthene         Benzo(k)fluoranthene           mg/kg         mg/kg         mg/kg         mg/kg         mg/kg           <0.1								mg/kg
mg/kg         mg/kg         mg/kg         mg/kg         mg/kg           <0.1	0.59	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
mg/kg         mg/kg         mg/kg         mg/kg         mg/kg           <0.1	Pyrene	Benz(a)ar	nthracene	Chrysene	Benzo(b)f	luoranthene	Benzo(k)flu	oranthene
<0.1         <0.1         <0.1         <0.1         <0.1           Dibenz(ah)anthracene         Benzo(ghi)perylene         Indeno(1,2,3-cd)pyrene         Benzo(a)pyrene           mg/kg         mg/kg         mg/kg         mg/kg         r           <0.1	mg/kg	mg	/kg	mg/kg	m	g/kg		
mg/kg         mg/kg         mg/kg         r           <0.1								
mg/kg         mg/kg         mg/kg         r           <0.1	Dihonz/ol	alanthracana	Banzo(abi)	nondono	Indono(1.2	2 od)pyropo	Banza (a) nurana	AOX
<0.1         <0.1         <0.1         <0.1           Water soluble portion         Sum PAH (16 EPA)								mg/kg
Water soluble portion     Sum PAH (16 EPA)       Weight %     mg/kg       3.2     <1		<0.1	<0.	ry 1	<	9/Kg (0.1	<0.1	120
			•	·				
ag, grey-black, solid, coarsely granular, humid								
	ag, grey-black, so	olid, coarsely granula	r, humid					
						1200		
			. Man					
						a second second second		
			ALL STREET					
			adate to the second	<b>a</b>				
			A. Porta					
		A REAL PROPERTY AND A REAL						
			Care -					
190112 v. 17.10.2002			The P	. /				

			Data Sheet sa	mble no. 23			
Wastes from incine	ration and pyrolysis of	waste, Solid wast	es from flue-gas t	reatment	sample number 23	waste code 190107	Date 17.10.2002
Algae test - eluate		Ecotoxiko	ological charad	cterization			
80%-sample	G _A -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	٦		
[%Inhibition]	- A	[%]	[%]	. exiting	-		
100	>10	-	-	yes			
100	20	8.6	10.0	yes			
100	10	11.2	12.2	yes	-		
Median	15	9.9	11.1	yes	]		
Daphnia test - elu	ato						
100%-sample	G _n -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]	on campic	[%]	[%]	[%]			
100	100	-	-	-	yes		
100	50	2.8	3.1	3.8	yes		
100	40	3.9	4.2	4.9	yes		
Median	50	3.3	3.7	4.4	yes		
		010	•				
Luminescent bact	eria test- eluate						
50%-sample	G ₁ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	7		
[%Inhibition]	el cambie	[%]	[%]	reality	-		
18.2	2	-	-	no			
19.4	2	-	-	no			
Median	2	-	-	no			
Median	2	-	-	no			
Bacteria contact t	est - solid matter			no	1		
Bacteria contact t		- Toxicity	-	no	1		
Bacteria contact t 50%-sample [%Inhibition]	est - solid matter	Toxicity	-	no	1		
Bacteria contact t 50%-sample [%Inhibition] 92.5	est - solid matter G _B -sample -	<b>Toxicity</b> yes		no	1		
Bacteria contact t 50%-sample [%Inhibition]	est - solid matter	Toxicity	-	no	1		
Bacteria contact t 50%-sample [%Inhibition] 92.5 99.5	est - solid matter G _B -sample -	<b>Toxicity</b> yes	-	no	1		
Bacteria contact t 50%-sample [%Inhibition] 92.5 99.5	est - solid matter G _B -sample - >100	Toxicity yes yes	-	no	1		
Bacteria contact t 50%-sample [%Inhibition] 92.5 99.5 Median Plant test - solid n	est - solid matter G _B -sample - >100 >100 natter	Toxicity yes yes yes				Toxicity	
Bacteria contact t 50%-sample [%Inhibition] 92.5 99.5 Median Plant test - solid n 50%-sample	est - solid matter G _B -sample - >100 >100	Toxicity yes yes			oot weight	Toxicity	
Bacteria contact t 50%-sample [%Inhibition] 92.5 99.5 Median Plant test - solid n 50%-sample	est - solid matter G _B -sample - >100 >100 natter G _P germination rate	Toxicity yes yes yes Gp Shoo	t height	G _P dry sh			
Bacteria contact t 50%-sample [%Inhibition] 92.5 99.5 Median Plant test - solid n 50%-sample Brassica	est - solid matter G _B -sample - >100 >100 natter G _P germination rate >4096	Toxicity yes yes yes Gp Shoo	t height	G _P dry sh	)48	yes	
Bacteria contact t 50%-sample [%Inhibition] 92.5 99.5 Median Plant test - solid n 50%-sample Brassica	est - solid matter G _B -sample - >100 >100 natter G _P germination rate >4096 >128	Toxicity yes yes yes Gp Shoo 204 >12	t height 48 28	G _P dry sh 2( >′	048 128	yes yes	
Bacteria contact t 50%-sample [%Inhibition] 92.5 99.5 Median Plant test - solid n 50%-sample Brassica Lycopersicon	est - solid matter G _B -sample - >100 >100 - natter G _P germination rate >4096 >128 1024	Toxicity yes yes yes Gp Shoo 200 >12 204	t height 48 28 48	G _P dry sh 	048 128 048	yes yes yes	
Bacteria contact t 50%-sample [%Inhibition] 92.5 99.5 Median Plant test - solid n 50%-sample Brassica Lycopersicon	est - solid matter G _B -sample - >100 >100 natter G _P germination rate >4096 >128 1024 >128	Toxicity           yes           yes           yes           Gp Shoo           204           >11           204	t height 48 28 48 28	G _P dry sh 	048 128 048 128	yes yes yes yes	
Bacteria contact t 50%-sample [%Inhibition] 92.5 99.5 Median Plant test - solid n 50%-sample Brassica Lycopersicon Avena	est - solid matter G _B -sample - >100 >100 >100 natter G _P germination rate >4096 >128 1024 >128	Toxicity yes yes yes Gp Shoo 200 >12 204	t height 48 28 48 28	G _P dry sh 	048 128 048	yes yes yes	
Bacteria contact t 50%-sample [%Inhibition] 92.5 99.5 Median Plant test - solid n 50%-sample Brassica Lycopersicon Avena	est - solid matter G _B -sample - >100 >100 >100 natter G _P germination rate >4096 >128 1024 >128	Toxicity           yes           yes           yes           Gp Shoo           204           >11           204	t height 48 28 48 28	G _P dry sh 	048 128 048 128	yes yes yes yes yes	
Bacteria contact t 50%-sample [%Inhibition] 92.5 99.5 Median Plant test - solid n 50%-sample Brassica Lycopersicon Avena most representati	est - solid matter G _B -sample - >100 >100 >100 natter G _P germination rate >4096 >128 1024 >128 1024 >128 (256) ve G _P -value without S9	Toxicity           yes           yes           yes           gp Shoo           204           >11           204           >11           102	t height 48 28 48 28 28 24	G _P dry sh 	048 128 148 128 096	yes yes yes yes 2048	
Bacteria contact t 50%-sample [%Inhibition] 92.5 99.5 Median Plant test - solid n 50%-sample Brassica Lycopersicon Avena most representati	est - solid matter G _B -sample - >100 >100 natter G _P germination rate >4096 >128 1024 >128 <256 ve G _P -value without S9 GEU	Toxicity yes yes yes Gp Shoo 200 ≥17 200 ≥17 107 107 VD	t height 48 28 48 28 24 24 Genotoxicity	G _P dry sh 2( >' 2( >' 2( >' 2( >'	048 128 148 128 096 GEU	yes yes yes yes 2048	
Bacteria contact t 50%-sample [%Inhibition] 92.5 99.5 Median Plant test - solid n	est - solid matter G _B -sample - >100 >100 >100 matter G _P germination rate >4096 >128 1024 >128 1024 >128 <256 ve G _P -value without S9 GEU IR < 1.5	Toxicity           yes           yes           yes           ge           204           >11           204           >11           102           VD           IR < 1.5	t height 48 28 48 28 24 Genotoxicity GEU > 1.5	G _P dry sh 2( >' 2( >' 2( >' 2( >'	048 128 048 128 096 GEU IR < 1.5	yes yes yes yes 2048	Genotoxicity GEU > 1.5
Bacteria contact t 50%-sample [%Inhibition] 92.5 99.5 Median Plant test - solid n 50%-sample Brassica Lycopersicon Avena most representati	est - solid matter G _B -sample - >100 >100 >100 Additional Additional >4096 >128 1024 >128 1024 >128 2256 ve G _P -value without S9 GEU IR < 1.5 1.5	Toxicity           yes           yes           yes           ges           200           >11           200           >11           101           VD           IR < 1.5	t height 48 28 48 28 24 24 <b>Genotoxicity</b> <b>GEU &gt; 1.5</b> no	G _P dry sh 2( >' 2( >' 2( >' 2( >'	048           128           048           128           096           IR           IR           1.5	yes yes yes 2048 VD IR < 1.5 0.67	GEU > 1.5 no
Bacteria contact t 50%-sample [%Inhibition] 92.5 99.5 Median Plant test - solid n 50%-sample Brassica Lycopersicon Avena most representati	est - solid matter G _B -sample - >100 >100 >100 natter G _P germination rate >4096 >128 1024 >128 1024 >128 <256 ve G _P -value without S9 GEU IR < 1.5	Toxicity           yes           yes           yes           ge           204           >11           204           >11           102           VD           IR < 1.5	t height 48 28 48 28 24 Genotoxicity GEU > 1.5	G _P dry sh 2( >' 2( >' 2( >' 2( >'	048 128 048 128 096 GEU IR < 1.5	yes yes yes yes 2048	GEU > 1.5

			Data Sheet sa	mble no. 23			
Wastes from incin	eration and pyrolysis o	f waste. Solid wast	tes from flue-das t	reatment	sample number	waste code	Date
			de lien nue gue		23	190107	17.10.2002
		Chei	mical characte	erization - eluate	9		
Dry weight %	Water content %	рН	Cond. µS/cm	Ī			
100	0	8.04	97700	Ι			
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	mg/l	mg/L	µg/l	µg/l	µg/l	µg/l	µg/l
24	-	0.76	6.6	3010	20.9	20.2	33.9
Lead	Zinc	Manganese	Arsenic	Cobalt	ΑΟΧ	r	
μg/l	µg/l	µg/l	µg/L	µq/l	mg/l		
1070	284	2480	395	17.8	0.25		
1070	204	2400	535	17.0	0.25	L	
PCB 8	НСН	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	0.001	<	<	<	0.008	0.011	0.006
			•				1
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	
μg/l	µg/l	µg/l	µg/l	µg/l	µg/l	μg/l	
<	<	<	<	<	<	<	J
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
µg/l	µg/l	µq/l	µg/l	µq/l	µg/l	µg/l	µq/l
0.028	0.001	0.002	0.002	0.006	Ő	0.003	0.004
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-pyrene			Benzo(g,h,i)-
anthracene		fluoranthene	fluoranthene		pyrene	anthracene	perylene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	μg/l <	µg/l <
0	0	0	<	0.001	<	<	
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-methane	1,1- Dichlorethene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.001	<	0.3	0.3	1.91	0.97	<	<
cis-1,2-	trans-1,2-	Trichlor-	1,1,1-	Tetrachlor-	1,2- Diable sthese	Trichlorethene	Bromdichlor-
Dichlorethene	Dichlorethene	methane	Trichlorethane	methane	Dichlorethane	// میں	methane
μg/l <	µg/l <	μg/l 0.11	µg/l <	µg/l <	µg/l <	μg/l <	µg/l <
`		0.11				`	
1,1,2- Trichlorethane	Tetrachlorethene	Dibromchlor- methane	Tribrom- methane	1,2- Dichlorbenzene	1,3- Dichlorbenzene	1,4- Dichlorbenzene	hydrocarIndex (H53)
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l

r.

atoo from inoir	oration and pyrolygia	of wooto Solid woot	on from fluin and tra	otmont	sample number	waste code	Date
astes nonn inch	eration and pyrolysis	oi waste, soliu wast	es nom nue-yas ne	alment	23	190107	17.10.2002
		Chemic	al characterizat	tion - solid m	natter		
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
3	570	37	24	79	13	50	1240
Hydr	ocarbons	Lipophilic subst.	тос	Benzene	Toluene	Ethylbenzene	Xylene
	eight %	Weight %	Weight %	mg/kg	mg/kg	mg/kg	mg/kg
	0.002	<0.01	1.1	< 0.01	0.02	0.16	0.8
	0.002	<b>~0.01</b>	1.1	<0.01	0.02	0.10	0.0
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranthen
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
0.98	0.14	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	Benz(a)ar	thracene	Chrysene	Benzo(b)	luoranthene	Benzo(k)flu	oranthene
mg/kg	mg		mg/kg	( )	ng/kg	mg/	
<0.1	<0		<0.1		<0.1	<0	
Dibenz(a	h)anthracene	Benzo(ghi	perviene	Indeno(1 3	2,3-cd)pyrene	Benzo(a)pyrene	AOX
	ng/kg	mg/			ig/kg	mg/kg	mg/kg
	<0.1	<0			<0.1	<0.1	55
Water so	luble portion	Sum PAH	(16 EPA)				
	eight %	mg/					
	96	<					

flue-gas desulfurization, flue-gas residue, hygroscopic; no salt added for LB-test; heat development caused by dest. water addition for eluate preparation, pH 10-11; pH 8 after filtration



## Ecotoxikological characterization

80%-sample	G _A -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity
[%Inhibition]		[%]	[%]	
100	>10	-	-	yes
100	20	9.1	17.8	yes
100	80	2.4	5.8	yes
Median	50	5.7	11.8	ves

## Daphnia test - eluate

100%-sample	G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity
[%Inhibition]		[%]	[%]	[%]	
100	5	-	-	-	yes
100	5	27	28.5	31.6	yes
Median	5	27	28.5	31.6	yes

## Luminescent bacteria test- eluate

50%-sample	G _L -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity
[%Inhibition]		[%]	[%]	
33.8	8	24.8	95.0	yes
25.4	4	38.8	100.4	yes
Median	6	31.8	97.7	yes

## Bacteria contact test - solid matter

50%-sample	G _B -sample	Toxicity
[%Inhibition]		
99.4	-	yes
106.5	>100	yes
Median	>100	yes

#### Plant test - solid matter

50%-sample	G _P Germination rate	Gp Shoot height	G _P Dry shoot weight	Toxicity
Brassica	128	64	64	yes
	<128	256	512	yes
Lycopersicon	>128	128	128	yes
	256	512	512	yes
Avena	>128	128	128	yes
	<128	256	512	yes
most representative G _P -value				128

#### umu-test - eluate without S9 Eluate with S9 GEU VD Genotoxicity GEU VD Genotoxicity IR < 1.5 IR < 1.5 GEU > 1.5 IR < 1.5 IR < 1.5 GEU > 1.5 1.5 0.67 no 1.5 0.67 no 1.5 0.67 no 1.5 0.67 no Median 1.5 0.67 Median 1.5 0.67 no no

Date

17.10.2002

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		I	Data Sheet sa	mble no. 24			
Nastes from incine	eration and pyrolysis o	f waste. Flv ash cor	ntaining dangerou	is substances	sample number	waste code	Date
					24	190113	17.10.2002
				rization - eluate	)		
Dry weight %	Water content %	pН	Cond. µS/cm				
100	0	11.8 adj. to 7.4	37500	J			
DOC	TOC	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	mg/l	mg/L	µg/l	µg/l	µg/l	µg/l	µg/l
4	-	0.08	1	2.1	234	152	45.5
Lead	Zinc	Manganese	Arsenic	Cobalt	ΑΟΧ	1	
µg/l	µq/l	µg/l	µg/L	µq/l	mg/l		
19000	1610	<5	28	1.7	0.04	1	
PCB 8	HCH	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	0.007	0.011	0.019	0.01
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	1
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	
0.002	<	0.001	<	<	<	<	
Newbellene	<b>A</b>	<b>A b</b> 4	<b>E</b> 1	Discussion	A 41		Dumana
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
μg/l 0.25	μg/l 0	μg/l 0.001	μg/l 0.003	μg/l 0.008	μg/l 0	μg/l 0.005	μg/l 0.005
0.25	0	0.001	0.003	0.008	0	0.005	0.005
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-pyrene	Indeno(1,2,3-cd)-	Dibenz(a,h)-	Benzo(g,h,i)
anthracene	-	fluoranthene	fluoranthene	.,	pyrene	anthracene	perylene
µg/l	µg/l	µg/l	μg/l	μg/l	µg/l	µg/l	µg/l
0	0.001	0.001	0	0.001	0	0	<
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-methane	1.1-
Diplicity	Donzono		Lanyibonizono	in /p /yiono	o Agiono		Dichlorethen
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.001	<u>بون</u> ۲	µg,1 <	0.25	2.2	0.86	<u>بوم.</u> <	μ <u>9</u> 9/1 <
cis-1,2-	trans-1,2-	Trichlor-	1,1,1-	Tetrachlor-	1,2-	Trichlorethene	Bromdichlor
Dichlorethene	Dichlorethene	methane	Trichlorethane	methane	Dichlorethane		methane
μg/l <	µg/l <	µg/l <	μg/l <	μg/l <	μg/l <	µg/l <	μg/l <
	<u> </u>						•
1,1,2-	Tetrachlor-ethene	Dibromchlor-	Tribrom-	1,2-	1,3-	1,4-	hydrocar
Trichlorethane		methane	methane	Dichlorbenzene	Dichlorbenzene	Dichlorbenzene	Index (H53)
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l
~	<	<	<	<	<	<	-

astes from incineration and pyrolysis of waste, Fly ash containing dangerous substances				sample number 24	waste code 190113	Date 17.10.2002	
		Chemic	al characterizat	tion - solid m	•	130113	17.10.2002
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
33	6100	270	250	990	83	11	16500
Hydr	ocarbons	Lipophilic subst.	тос	Benzene	Toluene	Ethylbenzene	Xylene
	eight %	Weight %	Weight %	mg/kg	mg/kg	mg/kg	mg/kg
	0.002	<0.01	1	<0.01	0.01	0.13	0.56
	0,002	N0.01		<0.01	0.01	0.13	0.50
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranthe
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
0.7	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	Pyrene Benz(a)anthracene		Chrysene	Benzo(b)	fluoranthene	Benzo(k)fluoranthene	
mg/kg	mg	/kg	mg/kg	mg/kg		mg/kg	
<0.1	<0.1		<0.1		<0.1	<0.1	
Dihawa/a	h) an thur a come	Damas/ah	) nomdono	Indeped		Benzo(a)pyrene	AOX
•	h)anthracene		Benzo(ghi)perylene		Indeno(1,2,3-cd)pyrene		
	ng/kg <0.1		mg/kg <0.1		mg/kg <0.1		mg/kg 380
	0.1				<0.1	<0.1	360
Water soluble portion			Sum PAH (16 EPA)				
Weight % 27.7		mg/kg <1					
	<b>Z</b> 1.1	· · · · ·					
marks							



			Data Sheet sar				
Sludge from on-si mentioned in 060	te effluent treatment, Slu	Idge from on-site	effluent treatment	other than those	sample number 26	waste code 060503	Date 27.06.2002
	502				20	000505	27.00.2002
		Ecotoxiko	ological chara	cterization			
Algae test - eluat			-		-		
80%-sample	G _A -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity			
[%Inhibition]		[%]	[%]				
100	8	17.1	22.4	yes			
100	8	13.1	17.4	yes			
Median	8	15.1	19.9	yes			
Daphnia test - elu 100%-sample	uate G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]		[%]	[%]	[%]	TOXICITY		
100	5	34.5	38.0	45.6	yes		
100	2	-	-	-	yes		
100		-			ycs		
Median	3.5	34.5	38.0	45.6	yes		
Median	5.5	54.5	30.0	43.0	yes		
	teria test- eluate	FC commis		Taulalta	-		
50%-sample	G _L -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	-		
[%Inhibition]		[%]	[%]		-		
68.1	32	4.5	20.7	yes			
65.7	16	6.8	25.8	yes	-		
Median	24	5.6	23.2		-		
Meulan	24	5.0	23.2	yes			
	test - solid matter G _B -sample	Toxicity	ı				
50%-sample [%Inhibition]	G _B -sample	TOXICITY					
	10 100						
82.2	10-100	yes					
	10-100	yes					
	10-100 10-100	yes yes					
82.2							
82.2 Median Plant test - solid	10-100 matter	yes					
82.2 Median Plant test - solid 50%-sample	10-100 matter G _P germination rate	yes Gp Shoo	t height		oot weight	Toxicity	
82.2 Median Plant test - solid 50%-sample	10-100 matter G _P germination rate >32	yes Gp Shoc	32		16	Toxicity yes	
82.2 Median Plant test - solid 50%-sample Brassica	10-100 matter G _P germination rate >32 -	yes Gp Shoo	32	,	-	yes	
82.2 Median Plant test - solid 50%-sample	10-100 matter G _P germination rate >32 - 32	yes Gp Shoo >(	32	>	16 - 		
82.2 Median Plant test - solid 50%-sample Brassica Lycopersicon	Io-100           matter           Gp germination rate           >32           -           32           >256	yes Gp Shoo >( >2	32 	>	16 - 32 256	yes	
82.2 Median Plant test - solid 50%-sample Brassica Lycopersicon	10-100           matter           G _P germination rate           >32           -           32           >256           8	yes <u>Gp Shoo</u> >( 	32 32 56 6	>	16 - 	yes	
82.2 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena	10-100           matter           G _P germination rate           >32           -           32           -           32              >256           8           <16	yes <u>Gp Shoo</u> >( 	32 	>	16 - 32 256	yes yes yes	
82.2 Median Plant test - solid 50%-sample Brassica	10-100           matter           G _P germination rate           >32           -           32           -           32              >256           8           <16	yes <u>Gp Shoo</u> >( 	32 32 56 6	>	16 - 	yes yes yes yes	
82.2 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena	10-100           matter           G _P germination rate           >32           -           32           -           32              >256           8           <16	yes <u>Gp Shoo</u> >( 	32 32 56 6	>	16 - 	yes yes yes yes yes	
82.2 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena	10-100         matter         G _P germination rate         >32         -         32         >256         8         <16	yes <u>G_ρ Shoc</u> >( 	32 56 6 28	>	16 	yes yes yes yes yes 64	
82.2 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representat	10-100           matter           G _P germination rate           >32           -           32           >256           8           <16	yes Gp Shoo >( 	32 56 6 28 <b>Genotoxicity</b>	>	16 	yes yes yes yes 64	Genotoxicit
82.2 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representat	10-100         matter         G _P germination rate         >32         -         32         >256         8         <16	yes <u>G_ρ Shoc</u> >( 	32 56 6 28	>	16 	yes yes yes yes yes 64	Genotoxicit GEU > 1.5
82.2 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representat	10-100           matter           G _P germination rate           >32           -           32           >256           8           <16	yes Gp Shoo >( 	32 56 6 28 <b>Genotoxicity</b>	>	16 	yes yes yes yes 64	
82.2 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representat	10-100           matter           G _P germination rate           >32           -           32           >256           8           <16	yes Gp Shoo >( >2 1 12 VD IR < 1.5	32 56 6 28 Genotoxicity GEU > 1.5	>	16 	yes yes yes yes 64 VD IR < 1.5	GEU > 1.5
82.2 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representat	10-100           matter           Gp germination rate           >32           -           32           >256           8           <16	yes Gp Shoo >3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -	32 56 6 28 <b>Genotoxicity</b> <b>GEU &gt; 1.5</b> no	>	16 	yes yes yes yes 64 VD IR < 1.5 0.67	GEU > 1.5 no

		1	Data Sheet san	nble no. 26			
Sludge from on-site	e effluent treatment, SI	udge from on-site	effluent treatment	other than those	sample number	waste code	Date
nentioned in 06050	02				26	060503	27.06.2002
		Cher	nical character	rization - eluate	•		
Dry weight %	Water content %	pН	Cond. µS/cm	1			
77.7	22.3	8.25	1601	]			
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	mg/l	mg/L	µg/l	µg/l	µg/l	µg/l	µg/l
250	-	77	1.4	0.5	1.7	802	24.1
Lead	Zinc	Manganese	Arsenic	Cobalt	AOX	1	
µg/l	μg/l	µg/l	µg/L	µg/l	mg/l		
2.16	132	86	µg/∟ 7	3	0.03		
2.10	102	00	,	5	0.00	I	
PCB 8	НСН	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
-	<	<	<	0.006	0.018	0.018	0.012
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	
µg/l	μg/l	µg/l	µg/l	µg/l	µg/l	µg/l	
<	-	<	<	-	-	-	
					1		
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
1.696	0.03	0.134	0.089	0.067	<	0.015	0.042
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-pyrene	Indeno(1,2,3-cd)	Dibenz(a,h)-	Benzo(g,h,i)
anthracene	-	fluoranthene	fluoranthene		pyrene	anthracene	perylene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.004	<	0.002	0.001	0.002	0.009	<	0.001
		<u> </u>				<b></b>	
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-methane	1,1- Dichlorethen
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.032	<	<	7	16	8	<	<
cis-1.2-	trans-1.2-	Trichlor-	1.1.1-	Tetrachlor-	1.2-	Trichlorethene	Bromdichlor
Dichlorethene	Dichlorethene	methane	Trichlorethane	methane	Dichlorethane	menioremene	methane
µg/l	μg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
µg/i <	μ <u>μ</u> γ/ι <	µg/i <	μ <u>μ</u> γ/i	μg/i <	μg/i <	μg/i <	μ <u>μ</u> γ/i <

Tribrommethane µg/l <

Dibromchlormethane µg/l < 
 1,2 1,3 1,4 

 Dichlorbenzene
 Dichlorbenzene
 Dichlorbenzene

 μg/l
 μg/l
 μg/l

 <</td>
 <</td>

hydrocar.-Index (H53) mg/l

©L	fU
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**1,1,2-**<u>Trichlorethane</u> μg/l <

Tetrachlorethene

µg/l <

Iudge from on-site effluent treatmen entioned in 060502       Arsenic     Lead       mg/kg     mg/kg       11     21       Hydrocarbons       GEW.%       24       Sum BTEX     Naphthalene       mg/kg     mg/kg       0.39     8.6	· •	Al characterizati Chromium mg/kg 11 TOC Gew.% 16.2		Nickel mg/kg 190 Toluene mg/kg	waste code 060503 Mercury mg/kg 0.09 Ethylbenzene mg/kg	27.06.2002 Zinc mg/kg 1000 Xylene mg/kg
mg/kg     mg/kg       11     21       Hydrocarbons       GEW.%     24       Sum BTEX     Naphthalene       mg/kg     mg/kg       0.39     8.6	Cadmium mg/kg 0.29 Lipophilic subst. Gew.% 13	Chromium mg/kg 11 TOC Gew.%	Copper mg/kg 114 Benzene mg/kg	Nickel mg/kg 190 Toluene mg/kg	mg/kg 0.09 Ethylbenzene mg/kg	mg/kg 1000 Xylene
mg/kg     mg/kg       11     21       Hydrocarbons       GEW.%     24       Sum BTEX     Naphthalene       mg/kg     mg/kg       0.39     8.6	mg/kg 0.29 Lipophilic subst. Gew.% 13	mg/kg 11 <b>TOC</b> Gew.%	mg/kg 114 Benzene mg/kg	mg/kg 190 Toluene mg/kg	mg/kg 0.09 Ethylbenzene mg/kg	mg/kg 1000 Xylene
11         21           Hydrocarbons         GEW.%           24         24           Sum BTEX         Naphthalene           mg/kg         mg/kg           0.39         8.6	0.29 Lipophilic subst. Gew.% 13	11 <b>TOC</b> Gew.%	114 Benzene mg/kg	190 Toluene mg/kg	0.09 Ethylbenzene mg/kg	1000 Xylene
Hydrocarbons       GEW.%       24       Sum BTEX     Naphthalene       mg/kg     mg/kg       0.39     8.6	Lipophilic subst. Gew.% 13	TOC Gew.%	Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Xylene
GEW.%           24           Sum BTEX         Naphthalene           mg/kg         mg/kg           0.39         8.6	Gew.% 13	Gew.%	mg/kg	mg/kg	mg/kg	
GEW.% 24 Sum BTEX Naphthalene mg/kg mg/kg 0.39 8.6	Gew.% 13	Gew.%	mg/kg	mg/kg	mg/kg	
24           Sum BTEX         Naphthalene           mg/kg         mg/kg           0.39         8.6	13					
mg/kg mg/kg 0.39 8.6	Acenaphtene			0.01	0.08	0.3
mg/kg mg/kg 0.39 8.6	Acenaphtene					
0.39 8.6		Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranthen
•	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	0.23	<0.1	0.55	3.8	0.1	0.94
Pyrene Benz(a)	anthracene	Chrysene	Benzo(b)f	luoranthene	Benzo(k)flu	oranthene
	ng/kg	mg/kg	m	g/kg	mg/	'kg
1.1	4.9	0.28	<0.1		<0.1	
Dibenz(ah)anthracene	Benzo(ghi	)pervlene	Indeno(1.2	,3-cd)pyrene	Benzo(a)pyrene	AOX
						mg/kg
<0.1	mg/kgmg/kg <0.1 <0.1 <0.1		0.1	mg/kg <0.1	21	
Water soluble portion Weight %	Sum PAH					
0.7	mg/ 20	.5				
<u>emarks</u> blid, granular, grey-brown, solvent sr	nell					

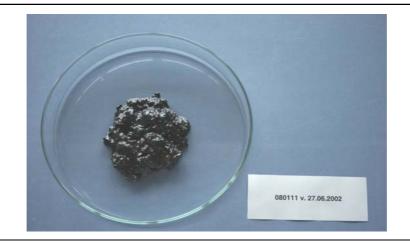
			Data Sheet sa	mble no. 27			
							<b>.</b>
	J and removal of paint a		Paint and varnisi	n containing	sample number	waste code	Date
organic solvents o	r other dangerous subs	tances			27	080111	27.06.2002
Algae test - eluat	٩	Ecotoxiko	ological chara	cterization			
80%-sample	G _A -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	]		
[%Inhibition]		[%]	[%]				
100	>10	-	-	yes			
100	80	1.6	2.2	yes			
100	100	1.1	1.4	yes			
Median	90	1.3	1.8	yes	]		
Daphnia test - elu	Jate						
100%-sample	G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]		[%]	[%]	[%]			
100	100	2.1	2.4	3.2	yes		
100	50	2.8	3.1	3.8	yes		
Median	75	2.4	2.7	3.5	yes		
Luminescent bac	staria taat aluata						
50%-sample	G ₁ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	7		
[%Inhibition]		[%]	[%]	. exicity	1		
96.4	>16	1.2	3.6	yes	-		
100	128	0.8	2.9	yes	-		
100	128	0.0	2.7	yes	-		
	120						
Median	128	0.8	2.9	yes	1		
	128 test - solid matter G _B -sample >100				1		
Bacteria contact 50%-sample [%Inhibition]	test - solid matter G _B -sample	0.8 Toxicity			]		
Bacteria contact 50%-sample [%Inhibition] 104.1 Median Plant test - solid	test - solid matter G _B -sample >100 >100 matter	0.8 Toxicity yes yes	2.9	yes		Touisie	1
Bacteria contact 50%-sample [%Inhibition] 104.1 Median Plant test - solid 50%-sample	test - solid matter G _B -sample >100 >100 matter G _P germination rate	0.8 Toxicity yes yes Gp Shoo	2.9	yes	oot weight	Toxicity	]
Bacteria contact 50%-sample [%Inhibition] 104.1 Median Plant test - solid	test - solid matter G _B -sample >100 >100 matter	0.8 Toxicity yes yes Gp Shoo 10	2.9	yes	-	yes	
Bacteria contact 50%-sample [%Inhibition] 104.1 Median Plant test - solid 50%-sample Brassica	test - solid matter G _B -sample >100 >100 matter G _P germination rate >1024 -	0.8 Toxicity yes yes Gp Shoo 10	2.9 t height 24	yes G _P dry sh	-	yes -	
Bacteria contact 50%-sample [%Inhibition] 104.1 Median Plant test - solid 50%-sample	test - solid matter G _B -sample >100 >100 	0.8 Toxicity yes yes Gp Shoo 10 	2.9	yes G _P dry sh	- - 024	yes - yes	
Bacteria contact 50%-sample [%Inhibition] 104.1 Median Plant test - solid 50%-sample Brassica Lycopersicon	test - solid matter G _B -sample >100 >100 	0.8 Toxicity yes yes Gp Shoo 10 	2.9 t height 24 384	G _P dry sh	- - 024 384	yes - yes yes	
Bacteria contact 50%-sample [%Inhibition] 104.1 Median Plant test - solid 50%-sample Brassica	test - solid matter G _B -sample >100 >100 matter G _P germination rate >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - >1024 - - - - - - - - - - - - -	0.8 Toxicity yes yes Gp Shoo 10 	2.9 t height 24 1024 1024 1024 1024 1024 1026	G _P dry sh	- - 024 384 -	yes - yes yes yes	
Bacteria contact 50%-sample [%Inhibition] 104.1 Median Plant test - solid 50%-sample Brassica Lycopersicon	test - solid matter G _B -sample >100 >100 G _P germination rate >1024 - >1024  - >1024  	0.8 Toxicity yes yes Gp Shoo 10 	2.9 t height 24 1024 1024 1024 1024 1024 1026	G _P dry sh	- - 024 384	yes - yes yes	
Bacteria contact 50%-sample [%Inhibition] 104.1 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena	test - solid matter G _B -sample >100 >100 matter G _P germination rate >1024 - >1024 - >1024 (G _P germination rate >1024 (G _P germination rate) (G _P germi	0.8 Toxicity yes yes G _P Shoo 10 	2.9 t height 24 24 24 24 24 24 24 24 24 24	G _P dry sh	- 024 384 - 6384 - 6384	yes yes yes yes yes 16384	
Bacteria contact 50%-sample [%Inhibition] 104.1 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representat	test - solid matter G _B -sample >100 >100 >100 >100 >100 matter G _P germination rate >1024 - >1024 >1024 <64 <1024 tive G _P -value without S9 GEU	0.8 Toxicity yes yes Gp Shoo 10 10 10 25 41 VD	2.9 t height 24 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024 1024	yes           G _P dry sh	- 024 384 - 6384 - 6384 - 6584	yes yes yes yes yes 16384	
Bacteria contact 50%-sample [%Inhibition] 104.1 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representat	test - solid matter           G _B -sample           >100           >100	0.8 Toxicity yes yes Gp Shoo 10 	2.9 t height 24 24 384 366 96 Genotoxicity GEU > 1.5	yes           G _P dry sh	- 024 384 - 6384 GEU IR < 1.5	yes - yes yes yes 16384 VD IR < 1.5	Genotoxicity GEU > 1.5
Bacteria contact 50%-sample [%Inhibition] 104.1 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representat	test - solid matter G _B -sample >100 >100 matter G _P germination rate >1024 - >1024 >1024 -   -   >1024   -   -   >1024   -   024   -   024   024   024   024   024   024   024   024   024   024   024   1024   1024   1024   1024   1024   1024   1024   105	0.8 Toxicity yes yes Gp Shoo 10 	2.9 t height 24 24 24 24 24 24 26 96 Genotoxicity GEU > 1.5 no	yes           G _P dry sh	- 024 384 - 6384 GEU IR < 1.5 1.5	yes yes yes yes 16384 VD IR < 1.5 0.67	GEU > 1.5 no
Bacteria contact 50%-sample [%Inhibition] 104.1 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representat	test - solid matter G _B -sample >100 >100 matter G _P germination rate >1024 - >1024 - >1024 -   >1024   -   >1024   -   >1024   ive G _P -value	0.8 Toxicity yes yes G _P Shoo 10 10 10 10 25 41 VD IR < 1.5 0.67 0.17	2.9 t height 24 24 384 366 96 Genotoxicity GEU > 1.5	yes           G _P dry sh		yes yes yes yes 16384 VD IR < 1.5 0.67 0.67	GEU > 1.5 no no
Bacteria contact 50%-sample [%Inhibition] 104.1 Median Plant test - solid 50%-sample Brassica Lycopersicon Avena most representat	test - solid matter G _B -sample >100 >100 matter G _P germination rate >1024 - >1024 >1024 -   -   >1024   -   -   >1024   -   024   -   024   024   024   024   024   024   024   024   024   024   024   1024   1024   1024   1024   1024   1024   1024   105	0.8 Toxicity yes yes Gp Shoo 10 	2.9 t height 24 24 24 24 24 24 26 96 Genotoxicity GEU > 1.5 no	yes           G _P dry sh	- 024 384 - 6384 GEU IR < 1.5 1.5	yes yes yes yes 16384 VD IR < 1.5 0.67	no

			Data Sheet sai	mble no. 27			
Waste from MFSU	and removal of paint a	and varnish, Waste	Paint and varnish	n containing	sample number	waste code	Date
organic solvents or	other dangerous subs	tances			27	080111	27.06.2002
		Cher	nical characte	rization - eluate			
Dry weight %	Water content %	рН	Cond. µS/cm	1			
49	51	6.65	63.7	]			
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	mg/l	mg/L	µq/l	µg/l	µq/l	µg/l	µg/l
11000	-	0.14	0.2	2.7	<0.5	9.8	20.7
Lead	Zinc	Manganese	Arsenic	Cobalt	AOX		
µg/l	µg/l	µg/l	µg/L	µg/l	mg/l		
0.93	11200	7	<0.2	-	0.03		
PCB 8	НСН	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
μg/l	µg/l	μg/l	µg/l	µg/l	µq/l	µg/l	µg/l
<	<	<	<	<	0.004	<	<
				•	•		-
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	
<	<	<	<	<	<	<	
No	A	A	<b></b>	Dia	A 41		D
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
µg/l	μg/l -	μg/l 0.007	μg/l 0.018	μg/l 0.004	μ <u>g</u> /l 0.019	μg/l 0.001	μg/l 0.002
-	-	0.007	0.010	0.004	0.019	0.001	0.002
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-pyrene	Indeno(1,2,3-cd)-	Dibenz(a,h)-	Benzo(g,h,i)-
anthracene		fluoranthene	fluoranthene	(u) pj: cc	pyrene	anthracene	perylene
µg/l	µg/l	µg/l	µg/l	µq/l	µq/l	µg/l	µq/l
0	<	<	<	0.001	<	<	<
			8	8			8
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-	1,1-
						methane	Dichlorethene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
-	-	-	-	-	-	-	-
cis-1,2-	trans-1,2-	Trichlor-	1,1,1-	Tetrachlor-	1.2-	Trichlorethene	Bromdichlor-
Dichlorethene	Dichlorethene	methane	Trichlorethane	methane	Dichlorethane	memoremene	methane
µg/l	µq/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
-	-	-	-	-	-	-	-
1,1,2-	Tetrachlorethene	Dibromchlor-	Tribrom-	1,2-	1,3-	1,4-	hydrocar
Trichlorethane		methane	methane	Dichlorbenzene	Dichlorbenzene	Dichlorbenzene	Index (H53)
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l
-	-	-	-	-	-	-	-

ste from MFSU	and removal of paint	and varnish, Waste	Paint and varnish of	ontaining	sample number	waste code	Date
anic solvents or	other dangerous sub	stances			27	080111	27.06.200
		Chemic	al characterizat	ion - solid ma	atter		
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
0.92	224	0.32	15	2.1	13	<0.05	35400
Hvdro	Hydrocarbons Lipophilic subst. TOC Benzen				Toluene	Ethylbenzene	Xylene
Weight %		Weight %	Weight %	mg/kg	mg/kg	mg/kg	mg/kg
13		3.9	35.1	0.87	100	8200	31000
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranthe
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
39301	1007	0.66	0.2	<0.1	1.4	<0.1	0.82
Pyrene	Benz(a)an	thracene	Chrysene	Benzo(b)	fluoranthene	Benzo(k)flu	oranthene
mg/kg	mg/		mg/kg	m	ng/kg	mg/kg	
<0.1	0.2		0.2		<0.1	<0	
Dibenz(ah	)anthracene	Benzo(ghi	)nervlene	Indeno(1 2	2,3-cd)pyrene	Benzo(a)pyrene	AOX
							-
<	g/kg 0.1	mg/ 0.	3		ng/kg 0.3	mg/kg 0.23	mg/kg 420
Water sol	uble portion	Sum PAH	(16 EPA)				
Wei	ght %	mg	(ka				

## **Remarks**

liquid-pasty, dark black colored; high solvent content in the eluate causes a two-phase system; solvent phase was decanted in a separation funnel and discarded; membrane filter (Cellulose-Nitrate) dissolved, sample filtered only with glass fiber



r

Wastes from abom			Data Sheet sa	mble no. 28			
wastes from chemi	cal surface treatment	and coating of met	tals and other mat	terials (for ex.	sample number	waste code	Date
galvanic processes	, zinc coating processe	es, pickling proces	ses, etching, phos	sphating, alkaline	28	110110	16.10.2002
degreasing and and	dizing), Sludges and f	ilter cakes other th	nan those mentior	ned in 110109			
		Ecotoxiko	ological chara	cterization			
Algae test - eluate	G _A -sample	EC ₂₀ -sample	EC comple	Taviaita	7		
80%-sample [%Inhibition]	G _A -sample		EC ₅₀ -sample	Toxicity	-		
-4.8	1.25	[%]	[%]	20	_		
-4.0	1.25	-	-	no no	_		
Median	1.25	-	-	no	_		
wedian	1.25	-	-	no			
Daphnia test - elua	ate G _p -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC sample	Toxicity		
100%-sample [%Inhibition]	OD-Sallihie			EC ₅₀ -sample	Toxicity		
	1	[%]	[%]	[%]			
0	1	-	-	-	no		
U	1	-	-	-	no		
Median	1	-	-	-	no		
luminoocont boot	aria taat aluata						
Luminescent bact 50%-sample	G ₁ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	7		
[%Inhibition]	GL-Sample			TOXICITY	_		
-0.8	2	[%]	[%]	20	_		
-0.8	2	-	-	no no	_		
-4.9	2	-	-	110	_		
Median	2	-	-	no			
					_		
Bacteria contact te	est - solid matter						
50%-sample	G _B -sample	Toxicity	]				
50%-sample [%Inhibition]	G _B -sample	Toxicity	]				
	G _B -sample	Toxicity yes					
[%Inhibition]							
[%Inhibition] 48.7	2-10	yes					
[%Inhibition] 48.7	2-10	yes					
[%Inhibition] 48.7 59.7	2-10 2-10	yes yes					
[%Inhibition] 48.7 59.7 Median Plant test - solid m	2-10 2-10 2-10 2-10	yes yes yes					
[%Inhibition] 48.7 59.7 Median Plant test - solid m 50%-sample	2-10 2-10 2-10 2-10 matter G _P Germination rate	yes yes yes Gp Shoo			oot weight	Toxicity	]
[%Inhibition] 48.7 59.7 Median Plant test - solid m 50%-sample	2-10 2-10 2-10 G _P Germination rate >32	yes yes yes Gp Shoo			4	yes	]
[%Inhibition] 48.7 59.7 Median Plant test - solid m 50%-sample Brassica	2-10 2-10 2-10 3-10 G _P Germination rate >32 16	yes yes yes Gp Shoo	3		4	yes yes	]
[%Inhibition] 48.7 59.7 Median Plant test - solid m 50%-sample Brassica	2-10 2-10 2-10 3-10 6p Germination rate >32 16 4	yes yes yes Gp Shoo 4 2	4 3 2		4 4 2	yes yes yes	]
[%Inhibition] 48.7 59.7 Median Plant test - solid m 50%-sample Brassica Lycopersicon	2-10 2-10 2-10 atter G _P Germination rate >32 16 4 4	yes yes yes Gp Shoo	4 3 2 4		4 4 2 4	yes yes	]
[%Inhibition] 48.7 59.7 Median Plant test - solid m 50%-sample Brassica	2-10 2-10 2-10 <b>2-10</b> <b>atter</b> G _P Germination rate >32 16 4 4 -	yes yes yes Gp Shoo	4 3 2 4		4 4 2 4 4	yes yes yes	
[%Inhibition] 48.7 59.7 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena	2-10 2-10 2-10 <b>2-10</b> <b>32</b> 16 4 4 4 - 8	yes yes yes Gp Shoo	4 3 2 4		4 4 2 4	yes yes yes yes yes yes	
[%Inhibition] 48.7 59.7 Median Plant test - solid m 50%-sample Brassica Lycopersicon	2-10 2-10 2-10 <b>2-10</b> <b>32</b> 16 4 4 4 - 8	yes yes yes Gp Shoo	4 3 2 4		4 4 2 4 4	yes yes yes yes yes	
[%Inhibition] 48.7 59.7 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena most representativ	2-10 2-10 2-10 <b>2-10</b> <b>atter</b> <b>G</b> _P Germination rate >32 16 4 4 - 8 <i>y</i> e G _P -value	yes yes yes Gp Shoo	4 3 2 4		4 4 2 4 4	yes yes yes yes yes yes	
[%Inhibition] 48.7 59.7 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena most representation	2-10 2-10 2-10 atter G _P Germination rate >32 16 4 4 - 8 ve G _P -value vithout S9	yes yes yes Gp Shoo 4 2 2 4 2 2 4	4 3 2 4 2		4 4 2 4 4 4 2 2	yes yes yes yes yes yes 4	Genotovicit
[%Inhibition] 48.7 59.7 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena	2-10 2-10 2-10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	yes yes yes Gp Shoo 4 2 4 2 4 4 2 4 4 2 4 4 4 4 2 4 4 4 4	Genotoxicity		4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	yes yes yes yes yes yes 4 VD	
[%Inhibition] 48.7 59.7 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena most representativ	2-10 2-10 2-10 <b>2-10</b> <b>32</b> 16 4 4 - 8 <i>y</i> e G _P -value vithout S9 <u>GEU</u> IR < 1.5	yes yes yes Gp Shoo 4 2 4 2 4 2 4 4 2 4 4 2 4 4 2 4 4 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Genotoxicity GEU > 1.5		4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	yes yes yes yes yes yes 4 VD IR < 1.5	Genotoxicit GEU > 1.5
[%Inhibition] 48.7 59.7 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena most representation	2-10 2-10 2-10 <b>2-10</b> <b>2-10</b> <b>32</b> 16 4 4 4 4 - 8 <i>re</i> <b>G</b> _P -value vithout <b>S9</b> <b>GEU</b> <b>IR &lt; 1.5</b> 1.5	yes yes yes Gρ Shoo 4 2 2 4 2 2 4 2 2 4 2 4 2 2 4 2 4 2 4	Genotoxicity GEU > 1.5 no		4 4 4 2 5 4 4 2 5 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	yes yes yes yes yes 4 VD IR < 1.5 0.67	GEU > 1.5 no
[%Inhibition] 48.7 59.7 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena most representation	2-10 2-10 2-10 <b>2-10</b> <b>32</b> 16 4 4 - 8 <i>y</i> e G _P -value vithout S9 <u>GEU</u> IR < 1.5	yes yes yes Gp Shoo 4 2 4 2 4 2 4 4 2 4 4 2 4 4 2 4 4 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Genotoxicity GEU > 1.5		4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	yes yes yes yes yes yes 4 VD IR < 1.5	GEU > 1.5
[%Inhibition] 48.7 59.7 Median Plant test - solid m 50%-sample Brassica Lycopersicon Avena most representation	2-10 2-10 2-10 <b>2-10</b> <b>2-10</b> <b>32</b> 16 4 4 4 4 - 8 <i>re</i> <b>G</b> _P -value vithout <b>S9</b> <b>GEU</b> <b>IR &lt; 1.5</b> 1.5	yes yes yes Gρ Shoo 4 2 2 4 2 2 4 2 2 4 2 4 2 2 4 2 4 2 4	Genotoxicity GEU > 1.5 no		4 4 4 2 5 4 4 2 5 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	yes yes yes yes yes 4 VD IR < 1.5 0.67	GEU > 1.5 no

			Data Sheet sa	mble no. 28			
Wastes from chem	ical surface treatment	and coating of met	als and other mat	erials (for ex	sample number	waste code	Date
galvanic processes	s, zinc coating processe odizing), Sludges and	es, pickling proces	ses, etching, phos	phating, alkaline	28	110110	16.10.2002
		Che	mical characte	rization - eluate	1		
Dry weight %	Water content %	рН	Cond. µS/cm	l			
18.4	81.6	7.92	1679				
DOC	тос	NH4	Mercury	Cadmium	Chromium. total	Nickel	Copper
mg/l	mg/l	mg/L	µg/l	µg/l	µg/l	µg/l	µg/l
14		9.8	0.1	0.3	<0.5	81.6	8.3
		0.0	0.1	0.0	-0.0	01.0	0.0
Lead	Zinc	Manganese	Arsenic	Cobalt	AOX		
µg/l	µg/l	µg/l	µg/L	µg/l	mg/l		
0.92	113	18	<0.2	0.7	0.02		
PCB 8	НСН	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	0.004	0.011	0.016	0.008
					-		
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	
0.001	<	0.001	<	<	<	<	l
Nanhthalana	A som om håbe dom o	Acenaphtene	Elverane	Phenanthrene	Anthropone	Fluoranthene	Pvrene
Naphthalene µq/l	Acenaphthylene µq/l	Acenaphtene µg/l	Fluorene µq/l	µq/l	Anthracene µq/l	µg/l	µg/l
0.081	μg/i <	0.003	μy/i <	0.008	μg/i <	0.005	0.004
0.001		0.000		0.000		0.000	0.004
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-pyrene	Indeno(1,2,3-cd)	Dibenz(a,h)-	Benzo(g,h,i)
anthracene		fluoranthene	fluoranthene	201120(u) p3.0110	pyrene	anthracene	perylene
µg/l	µg/l	µq/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	0.003	<	<	<	<	0.01	0
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-	1,1-
						methane	Dichlorethen
µg/l	μg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
0.002	<	<	<	0.33	0.15	<	<
cis-1.2-	trans-1.2-	Trichlor-	1.1.1-	Tetrachlor-	1.2-	Trichlorethene	Bromdichlor
CIS-1,2- Dichlorethene	Dichlorethene	methane	1,1,1- Trichlorethane	netrachior-	1,2- Dichlorethane	inchiorethene	methane
µg/l	μg/l	μg/l	µg/l	µg/l	µq/l	µg/l	µg/l
µy/i <	µg/i <	μy/i <	μy/i <	µy/i <	μg/i <	μy/i <	μ <u>μ</u> η <
•	•						
1,1,2-	Tetrachlorethene	Dibromchlor-	Tribrom-	1,2-	1,3-	1,4-	hydrocar
Trichlorethane		methane	methane	Dichlorbenzene	,	Dichlorbenzene	Index (H53)
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l
<	<	<	<	<	<	<	-

			Data Sheet sar	nble no. 28			
Vastes from chem	ical surface treatment	and coating of met	als and other mate	erials (for ex.	sample number	waste code	Date
	, zinc coating process odizing), Sludges and				28	110110	16.10.2002
	3,, 3						
		Chemic	al characteriza	ation - solid ma	tter		
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
16	12	0.05	180	94	1100	<0.05	1020
Hydro	carbons	Lipophilic subst.	тос	Benzene	Toluene	Ethylbenzene	Xylene
	ight %	Weight %	Weight %	mg/kg	mg/kg	mg/kg	mg/kg
	).15	0.15	2	<0.01	<0.01	<0.01	<0.01
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranthen
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
<0.04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0,1
Pyrene	Benz(a)ant	hracene	Chrysene	Benzo(b)fl	uoranthene	Benzo(k)flu	oranthene
	mg/kg mg/kg mg/kg				i/kg	Benzo(k)fluoranthene mg/kg	
<0.1	<0.1		<0.1		).1	<0.1	
Dila ana/ak		Demos (mb)	)	land a se a (d. D.	0	<b>D</b>	
	i <b>)anthracene</b> ig/kg	Benzo(ghi mg		Indeno(1,2,	3-cd)pyrene	Benzo(a)pyrene mg/kg	AOX mg/kg
<	:0.1	<0	.1	mg/kg <0.1		<0.1	20
Watar aal	uble nortion		(46 EDA)				
	uble portion ight %	Sum PAH mg					
	1.1	<					
asty-solid, grey-bl		P					
				110110 B v. 16.10.2002			

			Data Sheet sar	nble no. 30			
Wastes from chem	nical surface treatment a	and coating of met	als and other mate	erials (for ex.	sample number	waste code	Date
	s, zinc coating processe				30	110109	27.01.2003
	nodizing), Sludges and f						
					1		
Algae test - eluate			ological charac	terization	_		
80%-sample	G _A -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	1		
[%Inhibition]	00000	[%]	[%]				
100	32000 20000	0.0050	0.0079	yes			
100 100	24000	0.0048	0.0081 0.0098	yes	_		
Median	24000	0.0052	0.0098	yes yes	-		
	24000	0.0000	0.0001	yes			
Daphnia test - elu							
100%-sample	G _D -sample	EC ₁₀ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity		
[%Inhibition]	50000	[%]	[%]	[%]			
100	50000	-	-	-	yes		
Madian	50000						
Median	50000	-	-	-	yes		
Luminescent bac	teria test- eluate						
50%-sample	G ₁ -sample	EC ₂₀ -sample	EC ₅₀ -sample	Toxicity	7		
[%Inhibition]	-Lb	[%]	[%]	. existing			
100	2500	0.04	0.3012	yes			
100	2500	0.06	0.255	yes			
Median	2500	0.05	0.28	yes	-		
Bacteria contact	test - solid matter						
50%-sample	G _B -sample	Toxicity					
[%Inhibition]							
-	>100	yes					
85.7	>100	yes					
Median	>100	yes					
	· · · · · ·	-					
Plant test - solid		C. Shaa	t h ciabt	C day of	hoot weight	Tovisity	1
50%-sample Brassica	G _P germination rate >65536	Gp Shoo >65	t height		hoot weight	Toxicity	4
DIASSICA	>05536	>05 >131		-	31072	yes	1
Lycopersicon	>65536	>65			5536	yes	1
Lycopersicon	65536	655			5536	yes yes	1
Avena	8192	<4(			192	yes	1
	<8192	163			6384	yes	1
most representat		100				65536	j
umu-test - eluate	without S9 GEU	VD	Genotoxicity	Eluate with S9	GEU	VD	Genotoxicity
	IR < 1.5	IR < 1.5	GEU > 1.5		IR < 1.5	IR < 1.5	GEU > 1.5
	>3072	IIX 5 1.0	yes		3072	0.0003	yes
	6140	0.0002	yes		1540	0.0003	yes
	12280	0.0002	yes		1540	0.0006	yes
Median	9210	0.0001	yes	Median	1540	0.0006	yes
moulan	2210	0.0001	763	moulun	1040	0.0000	1 363

			Data Sheet sa	mble no. 30			
Nastes from chem	ical surface treatment	and coating of met	als and other mate	erials (for ex.	lfd Nr.	EAV	Datum
galvanic processes	, zinc coating processe odizing), Sludges and f	es, pickling process	ses, etching, phos	phating, alkaline	30	110109	27.01.2003
		Cher	mical characte	rization - eluate	•		
Dry weight %	Water content %	pl	4	Cond. µS/cm			
75.7	24.3	1.45 a		20900			
DOC	тос	NH4	Mercury	Cadmium	Chromium, total	Nickel	Copper
mg/l	mg/l	mg/L	µg/l	µq/l	mg/l	µg/l	µq/l
50	-	n.b	<50	<10	3 520	1830	340
Lead	Zinc	Manganese	Arsenic	Cobalt	AOX	Chromium VI	1
		v					
μg/l 56	μg/l 1290	μg/l 110	μg/L <0.5	μg/l <0.2	mg/l <0.5	mg/l 3460	
	.200		0.0	0.2	0.0	0.000	
PCB 8	НСН	PCB 18	PCB 28	PCB 52	PCB 101	PCB 138	PCB 153
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	0.005	0.016	0.031	0.017
PCB 180	PCB 77	PCB 105	PCB 118	PCB 126	PCB 169	PCB 189	1
μα/l	μq/l	μq/l	μq/l	μq/l	μq/l	μg/l	
0.002	µg/i <	μg/i <	μg/i <	µg/i <	μg/i <	µg/i <	
0.002				-			
Naphthalene	Acenaphthylene	Acenaphtene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
µg/l	μg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
n.b.	<	0.006	0.006	0.01	<	0.006	0.005
Benzo(a)-	Chrysene	Benzo(b)-	Benzo(k)-	Benzo(a)-pyrene	Indeno(1,2,3-cd)-	Dibenz(a,h)-	Benzo(g,h,i)-
anthracene		fluoranthene	fluoranthene		pyrene	anthracene	perviene
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
<	<	<	<	<	~	<	
	_					I	
Biphenyl	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Dichlor-methane	1,1- Dichlorethen
µg/l	μg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
n.b.	<	<	5.98	14	11	<	<
-1- 4.0	turan a <b>1</b> 0	Talahlan		Tatus also	4.0	Talablandh	Durantial
cis-1,2-	trans-1,2-	Trichlor-	1,1,1-	Tetrachlor-	1,2- Diable with an a	Trichlorethene	Bromdichlor
Dichlorethene	Dichlorethene	methane	Trichlorethane	methane	Dichlorethane	110/	methane
μg/l <	μg/l <	μg/l <	μg/l <	µg/l <	µg/l <	µg/l <	µg/l <
<u>`</u>	<u>`</u>	<	<		<.		<u>د</u>
1,1,2-	Tetrachlorethene	Dibromchlor-	Tribrom-	1,2-	1,3-	1,4-	hydrocar
Trichlorethane		methane	methane	Dichlorbenzene	Dichlorbenzene	Dichlorbenzene	Index (H53)
µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l
<	0.1	<	<	<	<	<	-

		Chemic	al characterizat	tion - solid ma	atter		
Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Mercury	Zinc
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
24	57000	0.05	136000	108	2500	<0.05	168
Hydro	ocarbons	Lipophilic subst.	тос	Benzene	Toluene	Ethylbenzene	Xylene
GEW.%		Gew.%	Gew.%	mg/kg	mg/kg	mg/kg	mg/kg
0.07		0.09	n.b.	<0.01	<0.01	0.3	1.7
Sum BTEX	Naphthalene	Acenaphtene	Acenaphtylene	Fluorene	Phenanthrene	Anthracene	Fluoranther
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	Benz(a)an	thracene	Chrysene	Benzo(b)f	luoranthene	Benzo(k)flu	oranthene
mg/kg	mg/kg		mg/kg	mg/kg		mg/kg	
<0.1	<0.1		<0.1	<0.1		<0.1	
	h)anthracene	Benzo(ghi			,3-cd)pyrene	Benzo(a)pyrene	AOX
mg/kg		mg/kg		mg/kg		mg/kg	mg/kg
<0.1		<0.1		<0.1		<0.1	n.b.
Water so	luble portion	Sum PAH	(16 FPA)	Chrom VI	1		
Weight %		mg/kg		mg/kg	1		
	6.9		<1				



## chemical analysis -detection limit

Parameter	Detection limit	Parameter	Detection limit	Parameter	Detection limit
Solid matter		Eluate		Eluate	
Arsenic	0,1 mg/kg	DOC	0,3 mg/l	Naphthalene	0,002 µg/l
Lead	0,5 mg/kg	NH4	0,02 mg/l	Acenaphthylene	0,002 µg/l
Cadmium	0,01 mg/kg	Cadmium	0,1 µg/l	Acenaphtene	0,002 µg/l
Chromium	0,5 mg/kg	Chromium	0,5 µg/l	Fluorene	0,002µg/l
Copper	0,5 mg/kg	Nickel	0,5 µg/l	Phenanthrene	0,002 µg/l
Nickel	0,5 mg/kg	Copper	0,5µg/l	Anthracene	0,002 µg/l
Mercury	0,05 mg/kg	Lead	0,5 µg/l	Fluoranthene	0,002 µg/l
Zinc	0,1 mg/kg	Zinc	10 µg/l	Pyrene	0,002 µg/l
AOX	1 mg/kg	Maganese	5 µg/l	Benzo(a)anthracene	0,002 µg/l
Hydrocarbons	0,002 Gew. %	Arsenic	0,5 µg/l	Chrysene	0,002 µg/l
Lipohilic substances	0,01 Gew. %	Cobalt	0,5 µg/l	Benzo(b)fluoranthene	0,002 µg/l
ТОС	0,1 Gew. %	PCB 8	0,002 µg/l	Benzo(k)fluoranthene	0,002µg/l
Benzene	0,01 mg/kg	нсн	0,002 µg/l	Benzo(a)pyrene	0,002 µg/l
Toluene	0,01 mg/kg	PCB 18	0,002 µg/l	Indeno(1,2,3-cd)pyrene	0,002 µg/l
Ethylbenzene	0,01 mg/kg	PCB 28	0,002 µg/l	Dibenz(a,h)anthracene	0,002 µg/l
Xylene	0,01 mg/kg	PCB 52	0,002 µg/l	Benzo(g,h,i)perylene	0,002 µg/l
Sum BTEX	0,04 mg/kg	PCB 101	0,002 µg/l	Biphenyl	0,002 µg/l
Naphthalene	0,1 mg/kg	PCB 138	0,002 µg/l	Benzene	3 µg/l
Acenaphtene	0,1 mg/kg	PCB 153	0,002 µg/l	Toluene	3 µg/l
Acenaphtylene	0,1 mg/kg	PCB 180	0,002 µg/l	Ethylbenzene	3 µg/l
Fluorene	0,1 mg/kg	PCB 77	0,002µg/l	m-/p-Xylene	3 µg/l
Phenanthrene	0,1 mg/kg	PCB 105	0,002µg/l	o-Xylene	3 µg/l
Anthracene	0,1 mg/kg	PCB 118	0,002 µg/l	Dichlormethane	3 µg/l
Fluoranthene	0,1 mg/kg	PCB 126	0,002µg/l	1,1-Dichlorethene	0,05 µg/l
Pyrene	0,1 mg/kg	PCB 169	0,002 µg/l	cis-1,2-Dichlorethene	0,25µg/l
Benz(a)anthracene	0,1 mg/kg	PCB 189	0,002µg/l	trans-1,2-Dichlorethene	0,25µg/l
Chrysene	0,1 mg/kg			Trichlormethane	0,01µg/l
Benzo(b)fluoranthene	0,1 mg/kg			1,1,1-Trichlorethane	0,01 µg/l
Benzo(k)fluoranthene	0,1 mg/kg			Tetrachlormethane	0,01 µg/l
Benzo(a)pyrene	0,1 mg/kg			1,2-Dichlorethane	0,1 µg/l
Dibenz(ah)anthracene	0,1 mg/kg			Trichlorethene	0,01 µg/l
Benzo(ghi)perylene	0,1 mg/kg			Bromdichlormethane	0,01 µg/l
Indeno(1,2,3-cd)pyrene	0,1 mg/kg			1,1,2-Trichlorethane	0,01 µg/l
Sum PAH (16 EPA)	1 mg/kg			Tetrachlorethene	0,01 µg/l
Water soluble portion	0,1 Gew. %			Dibromchlormethane	0,01 µg/l
				Tribrommethane	0,01µg/l
				1,2-Dichlorbenzene	0,1 µg/l
				1,3-Dichlorbenzene	0,1 µg/l
				1,4-Dichlorbenzene	0,1 µg/l
				Hydrocarbon-Index (H53)	0,1 mg/l
				AOX (Eluate acc. to DIN 38414-S4)	0,01 mg/l