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Institut für Umwelthygiene und Toxikologie
Direktor: Prof. Dr.rer.nat. Lothar Dunemann
Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V.

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Ansprechpartner: Herr Bien

Gelsenkirchen, den 26.09.2017

Oil binder "Sørb"
here: Occupational health evaluation and environmental testing in accordance with the Supplement to the German Oil Binder Guidelines dated 16.06.1998 and Worksheet DWA-A 716-1

Your order dated 14.06.2017 and notification 22 0012342 / 22 0012343 of the Materials Testing Agency (MPA) of North Rhine-Westphalia (NRW) dated 14.06.2017

Dear Sir or Madam,

In accordance with the above correspondence, you instructed us to perform an occupational health evaluation and an environmental testing and assessment of a binder named **"Sørb"**, sold by your company.

The evaluation to be performed in this instance was made on the basis of a Notification by the German Federal Minister for the Environment, Nature Conservation and Nuclear Safety dated 12.03.1990 (GMBl [Joint Ministerial Gazette] No. 18, p. 335) and the Supplement to the above Notification dated 16.06.1998 (GMBl No. 15, p. 312), and also the "General Requirements for Oil and Chemical Binders" in accordance with Worksheet DWA-A 716-1 of the German Association for Water Management, Sewage and Waste (DWA) of July 2011 in conjunction with Worksheet DWA-A 716-9 "Requirements for Oil Binders for Use in Traffic Areas" of December 2014.

The results of our tests and assessments apply to the examined test objects and the statutory rules at the time of testing. Publication or reproduction of this document in a shortened or changed form requires our express written consent.

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These provisions specify that, besides occupational health concerns, the specialist units named in the Joint Ministerial Gazette have to test whether the respective oil binders brought to market are suitable for use from an "environmental" perspective.

The "environmental" suitability testing was carried out according to the parameter settings for landfill classes I and II which are listed in the Appendix to the German Landfill Ordinance (DepV) currently in force, issued on 27.04.2009 (BGBl [German Federal Law Gazette] I, p. 900), last amended by Article 2 of the Ordinance dated 4th March 2016 (BGBl I, p. 382). According to this, the classification criteria for landfill class I are to be met for oil binders of types I, II, IV or "W", and those for landfill class II of the above Ordinance for oil binders of type III or "R", whilst, by way of derogation in both cases, a pH value range between 4.0 and 11.0 must be assured (cf. requirements for oil binders: LTwS [German Advisory Body's Guidelines for Storage and Transport of Substances Hazardous to Waters] No. 27, June 1999, Appendix 6, and the General Requirements for Oil and Chemical Binders: DWA-A 716-1, July 2011, Chapter 4.3).

1. Occupational health evaluation of the oil binder

The oil binder examined was a natural material consisting of peat ("sphagnum peat moss") to be used for absorbing oil. The oil binder reacted acidic (pH value = 2.6) in a suspension of the material containing a 0.01% calcium chloride solution (pH determination according to DIN ISO 10390) and was thus still within a range that should not cause irritations in case of skin or eye contact in accordance with Appendix 1, Part 3, Chapters 3.2 and 3.3 of the CLP Regulation on classification and labelling of substances, mixtures and articles (Regulation (EC) 1272/2008).

On the basis of the findings established by sieving (cf. Appendix 1), a content of < 0.1% of alveolar components in the product could be assessed as negligibly small.

With regard to issuing an occupational health clearance certificate, it can be stated that, due to the tests carried out and the information available to us, the use of oil binder **"Sørb"** for absorbing oil does not, overall, give rise to any concerns.

2. Environmental assessment

As can be seen from the results of the analyses, presented in tabular form in the attached Appendix 1, in comparison with the limit values of DepV, oil binder **"Sørb"**, which was submitted to us on 19.06.2017 by the Materials Testing Agency of North Rhine-Westphalia under reference "22 0012342 / 22 0012343" – despite increased proportions of dissolved organic carbon (DOC) - meets the "environmental" requirements applicable to oil binders of types I, II, and IV / "W" and of type III or "R".

As mentioned above, even though the concentration value of organic carbon content established in the eluate clearly ranges above the specified limits, according to the resolution of the working party on "Oil and chemical binders" of the German Association for Water Management, Sewage and Waste (DWA IG-7.1) dated 25.06.1999, an exceedance of the total organic carbon value (TOC) in binders is considered acceptable for those binders which are of natural origin and placed on the market in chemically unchanged form.

Therefore, from an environmental perspective, there are no concerns about the use of oil binder "**Sørb**" as oil binder of type III / "R" and of types I, II and IV / "W".

Yours faithfully
On behalf of
Director of the Institute

Dipl.-Umweltwiss. Sebastian Bien
Head of Specialist Area
Ecotoxicology and Mining Hygiene

Appendices:
3 appendices, total of three pages

Copy to:
∅ Materials Testing Agency (MPA), Dortmund

Allegro Capital, Logistics & More GmbH
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Oil binder "Sørb"

Processing period: 19.06. to 27.06.2017
HY Book Code: A2017-11260 to 11261

Substance analysis according to DIN ISO 10390

pH value = 2.6

Sieve analysis

> 63 µm = 100 %
< 63 µm = < 0. %

Eluate analysis according to DIN EN 12457-4

Parameter			Oil binder "Sørb"	Limit values according to Ordinance	
				Types I, II and IV / "W"	Type III / "R"
pH value			4,7	4 - 11	4 - 11
Organic carbon	C	mg/l	540	≤ 50	≤ 80
Phenols		mg/l	< 0,01	≤ 0,2	≤ 50
Arsenic	As	mg/l	< 0,001	≤ 0,2	≤ 0,2
Lead	Pb	mg/l	0,002	≤ 0,2	≤ 1
Cadmium	Cd	mg/l	< 0,0001	≤ 0,05	≤ 0,1
Copper	Cu	mg/l	0,009	≤ 1	≤ 5
Nickel	Ni	mg/l	0,001	≤ 0,2	≤ 1
Mercury	Hg	mg/l	< 0,00001	≤ 0,005	≤ 0,02
Zinc	Zn	mg/l	0,013	≤ 2	≤ 5
Fluoride	F^-	mg/l	0,09	≤ 5	≤ 15
Cyanide, easily released	CN^-	mg/l	< 0,01	≤ 0,1	≤ 0,5
Evaporation residue		mg/l	570	≤ 3000	≤ 6000
Barium	Ba	mg/l	0,021	≤ 5	≤ 10
Chromium	Cr all	mg/l	< 0,001	≤ 0,3	≤ 1
Molybdenum	Mo	mg/l	< 0,001	≤ 0,3	≤ 1
Antimony	Sb	mg/l	0,007	≤ 0,03	≤ 0,07
Selenium	Se	mg/l	< 0,001	≤ 0,03	≤ 0,05
Chloride	Cl^-	mg/l	9,9	≤ 1500	≤ 1500
Sulphate	SO_4	mg/l	< 5,0	≤ 2000	≤ 2000
Electrical conductivity		µS/cm	57	–	–

Examination methods (eluate analysis)

Parameter	Method
pH value	DIN EN ISO 10523 C5
DOC	DIN EN 1484 H 3
Total phenol	DIN EN ISO 14402 / DIN 38409 H 16
Arsenic	DIN EN ISO 17294-2
Lead	DIN EN ISO 17294-2
Cadmium	DIN EN ISO 17294-2
Copper	DIN EN ISO 17294-2
Nickel	DIN EN ISO 17294-2
Mercury	DIN EN 1483
Zinc	DIN EN ISO 17294-2
Fluoride	DIN EN ISO 10304-1 D 20
Cyanide, easily released	DIN EN ISO 14403-2 D 3
Water soluble proportion (evaporation residue)	DIN 38409 H 1
Barium	DIN EN ISO 17294-2
Chromium, all	DIN EN ISO 17294-2
Molybdenum	DIN EN ISO 17294-2
Antimony	DIN EN ISO 17294-2
Selenium	DIN EN ISO 17294-2
Chloride	DIN EN ISO 10304-1 D 20
Sulphate	DIN EN ISO 10304-1 D 20
Electrical conductivity	DIN EN 27888

Sample: Sørb on 26.06.2017
Method: Energy-dispersive X-ray spectroscopy (EDX)
ID: HY Book Code A2017-11260

Spectrum processing:
No peaks omitted

Processing option: Oxygen according to stoichiometry (normalised)
Number of iterations = 2

Standard:
C CaCO3 1-Jun-1999 12:00 AM

Element	% by mass	% by atom	% by compo-nent	Formula
C K	27.29	33.33	100.00	CO2
O	72.71	66.67		
Total	100.00