MARIN MILJÖTEKNIK AB

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Test how SpillRemed(Marine)™ affect the flocculation process in the Marinfloc bilge water cleaning system.

The tests were performed 3-10 of August 2000 in Varekil, Sweden.
To see whether the product affects the flocculation process or not the following tests were performed:

1. 1% SpillRemed(Marine)™ was added to a mixture of 3% sludge[1] and water. To one bowl the bacteria was sprayed on top of the oil layer(1a), and to another it was stirred down(1b). The purpose was to see if the emulsion created by the bacteria was possible to break with the flocculent[2].

2. 1% Spillremed(Marine)™ was added to the Marinfloc standard bilge water[3]. There were two replicates(2a) and two reference samples where no bacteria were added(2b). The purpose was to see how the bacteria affect the bilge water and how they affect the flocculation process.

3. 1% of SpillRemed(Marine) ™ was added in the same matter as above but to a bilge water collected from M/V Kronprins Harald in order to get a comparison to real life conditions.

4. 1% of SpillRemed(Marine) ™ was added to bilge water from M/V Kronprins Harald. 4a is the sample with addition of bacteria and 4b is the reference sample. Flocculent was added prior to the addition of the bacteria to see if the product would affect the treated water due the possible use of a clean water tank.

The samples were left for one week at room temperature and flocculent was added to test 1-3. The following parameters were analysed: Oil content in the water phase, turbidity and colour. The settling behaviour of the flocs was noted visually. Oil content was measured with an oil content meter. (Rivertrace engineering, OCD2M). Colour was measured spectrophotometrically with a Hach spectrophotometer DR/2010 using the APHA Platinum-cobalt standard method[4]. Turbidity was measured with the same spectrophotometer using the Attenuation radiation method[5].

[1] Sludge collected from M/V Stena Scanrail
[2] Drew/Ashland Mitfloc 1090
[3] 3% Sludge emusified with 0,1% Drewclean 2000 in water with 1% salt(NaCl)
[4] Wat.Res. Vol.30 No 11, pp. 2271-2775, 1996
[5] Adapted from ISO Method 7027

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Results

Test	Oil content Before add. Of flocculent	Turbidity Before add. Of flocculent	Colour Before add. Of flocculent	Oil content After add. Of M1090	Turbidity After add. Of M1090	Colour After add. Of M1090
1a	9	30	182	0	17	55
1b	9	36	172	3	31	120
2a(mean)	>30	90	Over range	3	26	125
2b(mean)	>30	272	Over range	3,5	44	174,5
3a	3	17	329	0	23	156
3b	4	21	277	0	17	133
4a	----------	----------	----------	0	4	51
4b	----------	----------	----------	0	4	44

1. There was no direct difference between the two samples. The flocculation process was not affected in a negative way.
2. No significant difference was noted between the treated and the reference samples.
3. As in 2.
4. No extra coloration was noted in the treated sample.

Summary.

The different tests showed that the SpillRemed(Marine) ™ did not interfere with the flocculation process at these concentrations and conditions. It can therefore be used where a Marinfloc bilge water treatment system is installed. However caution should always be taken when using chemicals, or in this case bacteria, that end up in the bilge water and the product should be used according to the makers prescription.

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