



## ANALYSIS REPORT

Report n° AF-10- 29	DATE: 14/12/10	CONTACT: P. LE GUERROUÉ Pascale.Le.Guerroue@cedre.fr
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Request for analyses	
Organisation: Amorim Isolamentos Contact: Susana Silva	Contexte: Objective: Measurement of the sorption capacity of floating oil sorbent product "Corksorb G01006".

Sample					
<u>Sampled/Received:</u> <b>25 October 2010</b>		Type/origin: Floating oil sorbent Sample reception: 25/10/10		Quantity: 75L References: E/AF-10-80	
Report					
Written by: P. Le Guerroué F. Tanguy 	Read by: F.X.Merlin 	External diffusion: Amorim Isolamentos	Number of copies: 1	Internal copies: Service R&D	Number : 1

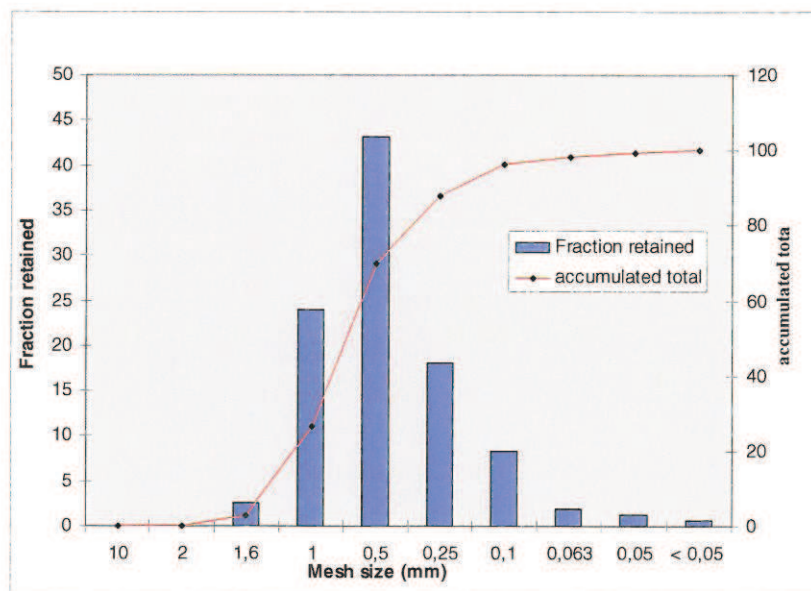
<p>Summary</p> <ul style="list-style-type: none"> <li>◆ The bulk sorbent product <b>Corksorb G01006</b> is hydrophobic (Cr water/Cr sat ratio is less than 0.25). The volume of water absorbed is 0,5 times its own weight.</li> <li>◆ Due to the low difference between Cr sat and Cr 90%, the capillarity of this product is very good.</li> <li>◆ The sorption capacity towards hydrocarbons is <b>8,3 ± 0,4</b>. (the product absorbs 8,3 times its own weight).</li> <li>◆ These tests carried out with the reference oil, with a viscosity of 42 to 45 cPs, confirm that the Corksorb G01006 sorbent can be recommended for use as a sorbent on floating oil pollution.</li> </ul>
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## ANALYSIS REPORT

### MEASUREMENT OF THE SORPTION CAPACITY OF FLOATING OIL SORBENT PRODUCT ACCORDING TO MODIFIED STANDARD NF T 90-360.

#### 1. PRODUCT: CORKSORB G01006

- ◆ Sorbent type: Bulk sorbent type A ( NFT 90362)
- ◆ Origin: CORKSORB G01006 sample from Amorim Isolamentos received on 25<sup>th</sup> October , 2010.
- ◆ Sample: E/AF-10-80
- ◆ Nature of the material: Vegetal granule - Cork - (CAS n°61789-98-8)
- ◆ Appearance: Dark brown granules
- ◆ Average density measured: 0,052
- ◆ Size grading :



Size grading of Corksorb G01006



## 2. TESTING MÉTHOD

### 2.1. Hydrocarbons retention

Measurement of the sorption capacity of floating oil sorbent product according to modified AFNOR standard method NT 90-360.

- Test conditions:
- Agitation time of 20 minutes
  - Draining time of 30 minutes
  - Cylinder leaned over 25 ° during draining
  - Test temperature of 20°C
  - Analysis solvent: methylene chloride

### 2.2. Water retention

The sorbent capacity on water is assessed using the same methodology as that used for hydrocarbons (NFT 90-360).

## 3. REFERENCE HYDROCARBON: BAL 110

- ◆ Light Arabian Crude topped at 110°C
- ◆ Density at 20 °C: 0,88 ± 0,02
- ◆ Viscosity at 20°C: 42-45 cPs

## 4. RESULTS

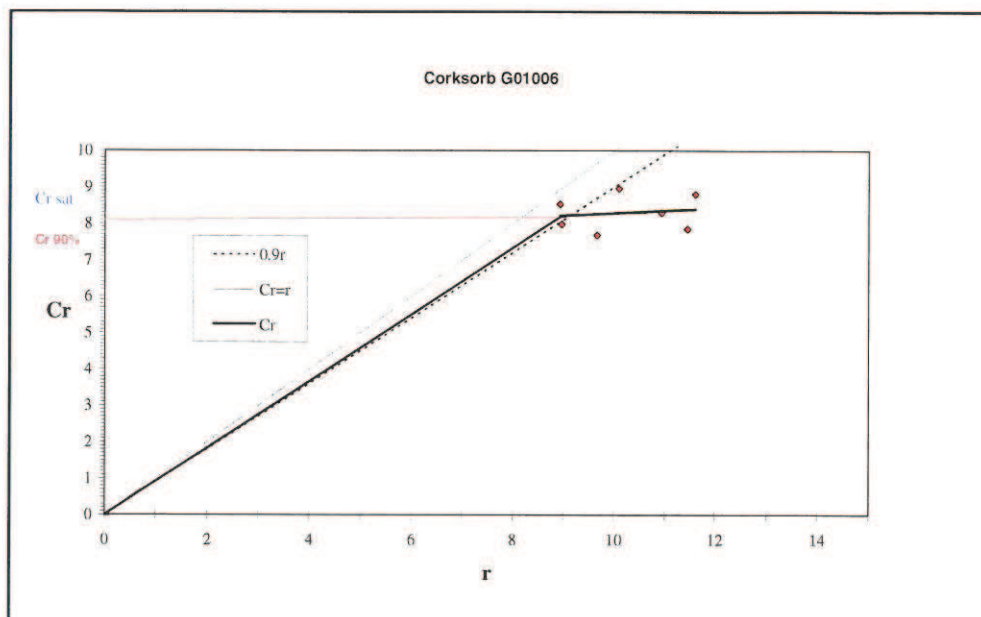
The tests were carried out with 24 g of hydrocarbons and a decreasing amount of sample.

### 4.1. Hydrocarbon absorption

Initial weight of hydrocarbons (grams)	Initiale weight of sorbents (grams)	Weight of sorbed hydrocarbons (grams)	r	Cr
24,127	2,702	23,061	8,93	8,53
24,841	2,771	22,117	8,96	7,98
24,032	2,487	19,096	9,66	7,68
24,099	2,386	21,384	10,10	8,96
24,212	2,213	18,351	10,94	8,29
24,165	2,110	16,567	11,45	7,85
24,097	2,076	18,275	11,61	8,80

**r** : Initial hydrocarbon weight / initial sorbent weight ratio.

**Cr** : Retention capacity: sorbed weight of hydrocarbons / initial weight of sorbents ratio.



#### 4.2. Water retention

Sorbent weight (grams)	Weight of water sorbed (grams)	Cr water	Cr water/Cr sat
3,054	1,31	0,43	0,05
3,090	1,82	0,59	0,07
3,100	1,52	0,49	0,06

**Cr water:** Retention capacity towards water

**Cr sat:** Retention capacity towards hydrocarbons

### 5. OBSERVATIONS

#### RETENTION CAPACITY TOWARDS REFERENCE HYDROCARBONS

Laboratory tests show:

- ◆ Conventional point Cr 90% (point for which 90% of hydrocarbons are retained by the sorbent) is **8,1**.
- ◆ Retention capacity at saturation, Cr sat is **8,3**.

#### RETENTION CAPACITY TOWARDS WATER

- ◆ In the same test conditions, 20' contact with water, the product G01006 absorbs 0,5 times of its weight in water.
- ◆ The Cr water / Cr sat ratio is **0,06**.

## VALIDITY

- ◆ Hydrocarbons retention
  - Saturation is defined within a confidence interval according to :  
$$(r_2 - r_1) / [(r_1+r_2)/2] = 0,26 (> 0.1)$$
  - The confidence interval at 95% on Cr sat is  $\pm 0,4$ . The corresponding relative tolerance interval is 5,0 % (<10%).
- ◆ Water retention  
[Cr water / Cr sat]: difference between data lower than 0, 04.

## 6. CONCLUSIONS

- ◆ The bulk sorbent product **Corksorb G01006** is hydrophobic (Cr water/Cr sat ratio is less than 0.25). The volume of water absorbed is 0,5 times its own weight.
- ◆ Due to the low difference between Cr sat and Cr 90%, the capillarity of this product is very good.
- ◆ The sorption capacity towards hydrocarbons is **8,3  $\pm$  0,4**. (the product absorbs 8,3 times its own weight).
- ◆ These tests carried out with the reference oil with a viscosity of 42 to 45 cPs, confirm that the Corksorb G01006 sorbent can be recommended for use as a sorbent on floating oil pollution.