



**INTERNAL REPORT ON
TESTING
OF
CELL-U-SORB SORBENT**

**AS PER
CANADIAN GENERAL STANDARDS BOARD
METHOD CGSB-183.2**

Prepared for

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1.0 INTRODUCTION

Environment Canada's Emergencies Engineering Division (EED) is mandated to test and evaluate oil spill containment and recovery equipment. In conjunction with its research partners, the EED plays an active role in developing standards for evaluating such equipment as well as conducting product testing.

2.0 OBJECTIVE

The purpose of these tests was to evaluate the sorbent's performance as per test methods listed in CGSB-183.2, the Canadian General Standards Board, Method for Testing Sorbents, developed in part by the Emergencies Engineering Division.

3.0 PROCEDURES

3.1 Materials and Equipment

3.1.1 Sorbent Description

The following brief description of the sorbent is based on information supplied by the manufacturer or distributor as well as from quantitative and qualitative observations obtained during testing. Such information is provided since it may be useful when interpreting or comparing results.

Based on the supplied literature, the Cell-u-Sorb is a 100% cellulose based sorbent produced from recycled materials. It was developed in order to deal with hydrocarbon spills on water and is stated to be hydrophobic. According to the distributor\manufacturer the product is capable of sorbing between 8 to 12 times its weight in oil based products. The product is said to be biodegradable and will contribute 7000 BTU's per pound during incineration, with very little ash.

The product supplied for testing was observed to be a relatively uncompressed, brown, fibrous material. The bulk density of the loosely packed material was calculated to be approximately 0.047 g/cm³.





4.0 RESULTS AND DISCUSSION

Test results are listed in Laboratory Data Sheets, appended to the report.

4.1 The Dynamic Degradation Test

During the Degradation Pre-Test, a suspension of sorbent material caused the water to become murky and opaque. Approximately 90% of the sorbent was observed to float on the water. The average water pick-up ratio was calculated to be 19.8 grams of water per gram of sorbent.

The sorbent was observed to remain afloat during the Dynamic Degradation Test which involved returning the wetted sample, used in the Pre-Test, back to the test jar filled with water and a layer of 10 mL of oil. Upon completion of the Dynamic Degradation Test, a suspension of oil droplets and sorbent particles was observed but the test water appeared to be less murky than at the completion of the Degradation Pre-Test. An oil sheen was still visible at the completion of the test.

4.2 The L-Test

The sorbent was observed to have the following oil sorption ratios:

Oil Type	Oil Viscosity (cP)	Oil Pick-up Ratio (g oil per g sorbent)
Diesel Fuel	3	11.0
Medium Oil	230	18.9
Heavy Oil	8600	9.6

The sorbent samples were observed to become saturated in both diesel fuel and the medium oil. Samples sank when tested in the diesel fuel and are suspected of sinking in medium oil although this could not be confirmed due to the opacity of the oil.

Due to the flow characteristics of the heavy oil, samples tested in this oil were allowed to drain for 2 minutes rather than the prescribed 30 seconds.

It should be noted that the product's average water sorption capacity (obtained under dynamic conditions) exceeded the average oil sorption capacities of the sorbent. The oil sorption capacities were obtained under stagnant conditions.





5.0 CONCLUSIONS AND RECOMMENDATIONS:

The Cell-U-Sorb sorbent material was tested using certain CGSB 183.2 test methods, in order to evaluate its performance.

The sorbent passed the bouyancy test and stayed afloat in water under dynamic (wave) conditions.

Oil sorption capacities, expressed as weight ratios of liquid sorbed per unit weight of sorbent, varied according to the viscosity of the oil used.

