

**Test Certificate**

The Clock Spring Company L.P.  
14107 Interdrive West  
Houston, Texas 77032-3326

REF No  
Ord No

0803065: Issue 1  
Pre-Paid Check #24234

Date Tested  
Date Reported

07-19-2008  
07-31-2008

Phone: 281-590-8491  
Fax: 281-590-9528  
Attn: Jason Matocha

Item: 1 pipe section (18" long x 3.5" diameter) coated with fiberglass composite submitted to complete Cathodic Disbondment testing procedures.

Specification ASTM G 8-96(2003) Modified per customer requirements.

One 18" long x 3.5" diameter pipe section sample was supplied by Mr. Jason Matocha of The Clock Spring Company L.P. to perform Cathodic Disbondment testing on the fiberglass composite coating system. The sample was tested for 30 days at 72°F. Test conditions included an impressed voltage of -1.5VDC vs. SCE, a 5/8" introduced holiday and 3% electrolyte solution consisting of 1% each NaCl, Na<sub>2</sub>CO<sub>3</sub> and Na<sub>2</sub>SO<sub>4</sub> by weight in tap water. The test results are presented in Tables and Photographs on the following pages.

This report has been assembled to record the results of this testing of the above-mentioned material.

Should you have any questions or concerns please contact the undersigned at (281) 848-0270 or by email at [milton.pierson@bodycote.com](mailto:milton.pierson@bodycote.com), at your convenience.

Sincerely,

Bodycote Testing.



Milton L. Pierson  
Coatings Lab Supervisor

This certificate should not be reproduced other than in full, without the written approval of Bodycote Materials Testing Inc.  
These results pertain only to the item(s) tested as sampled by the client unless otherwise indicated.

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Cathodic Disbondment – ASTM G 8-96(2003) Test Results

Table 1. Test Parameters.

Immersed area = 65.94 square inches.
1 holiday was introduced (0.625" diameter).
Test began at 2:30 PM on 6/19/2008.
Test ended at 2:50 PM on 7/19/2008.
Resistance of test specimen before artificial holiday was made = > 30Mohm.
Electrolyte temperature ranged from 71.4 to 74.3°F during the course of the test.

Table 2. Measured Coating Thickness (Mils)

Sample #	Point 1	Point 2	Point 3	Point 4	Average
803065-1	210	205	205	210	208

Table 3. Electrical Measurements

Date	E1 (Volt)	E2 (Volt)	I (current) (Amperes)	DE = E2 - E1
6/20/08 10:00 AM	-0.83	-1.43	0.007	-0.6
6/21/08 10:20 AM	-0.88	-1.43	0.006	-0.55
7/03/08 04:00 PM	-0.98	-1.43	0.009	-0.45
7/18/08 04:00 PM	-1.04	-1.43	0.009	-0.39
7/19/08 02:50 PM	-1.04	-1.43	0.009	-0.39
Start to End Change	-0.21	0	0.002	0.21

Table 4. Disbonded Equivalent Circle Radius\* (mm)

Sample	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Average
803065-1	0	0	0	0	0	0	0	0	0

*\*Note: There was essentially no detectable failure of adhesion in any direction from the holiday for this sample.*

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Cathodic Disbondment – ASTM G 8-96(2003) Test Results

Photo 1. Sample appearance at beginning of test.



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Cathodic Disbondment – ASTM G 8-96(2003) Test Results

Photo 2. Sample appearance at middle of test.



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## Cathodic Disbondment – ASTM G 8-96(2003) Test Results

Photo 1. Appearance of holiday at middle of test. Note the buildup of a white deposit in the holiday and the bubbles forming on the coating surface in addition to in the holiday.



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Cathodic Disbondment – ASTM G 8-96(2003) Test Results

Photo 1. Sample appearance at end of test.



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## Cathodic Disbondment – ASTM G 8-96(2003) Test Results

Photo 1. Sample holiday and disbonded radius appearance at end of test. Note there appears to be no disbondment due to the cathodic action.

