

## **Product Study**



**Comparison of the ITS Total Coliform/*E. coli* and Readycult® Coliform 100 Test Systems on their effectiveness of simultaneous detection of Total Coliform and *Escherichia coli* in water samples.**

**Prepared By:** Chem-Bac Laboratories, Inc.  
**Prepared For:** Industrial Test Systems, Inc.

# CHEM-BAC Laboratories, Inc.

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## Certificate of Analysis

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Client: Industrial Test Systems  
1875 Langston Street  
Rock Hill, SC 29730  
Attn: Howard Ray

Client Number: 9999  
Work Order: 1545-08  
Sample Date: 04-23-08  
Report Date: 06-09-08

### Product Comparison

A comparison study was conducted between the ITS Total Coliform/*E. coli* and the Readycult® Coliforms 100 test systems. The purpose of the study was to determine the effectiveness of both test systems in the simultaneous detection of Total Coliform and *Escherichia coli* at a concentration of 10 CFU/100 mls of water.

An *Escherichia coli* culture was prepared and its concentration measured spectrophotometrically. The culture was diluted with sterile buffer solution until a  $10^8$ CFU/ml concentration was achieved. Serial dilutions of the  $10^8$ CFU/ml culture were made in order to achieve the 10 CFU/ml working bacterial dilution. In order to verify the concentration of the bacterial solution, 1 ml was plated with Violet Red Bile Agar with MUG and counts were made following a 24 hour incubation period. A verification plate was prepared, in this manner, for each individual test trial of both the ITS and Readycult® test systems.

The study consisted of 20 trials of both the ITS and Readycult® tests. Fifteen of the test trials were performed at the incubation temperature of 35°C for 24 hours and 5 were performed at the alternative 48 hours at 20°C. Each trial consisted of inoculating the 100 ml Coliform test broth from both ITS and Readycult® with 1 ml of the 10 CFU/ml working bacterial dilution. Following the 24/48 hour incubation time; the color and fluorescent properties of each test system were documented. Any color change of the broth to blue-green, for both test systems, confirmed the presence of Coliform, and was reported as positive for Total Coliform. Fluorescence, in the blue-green broth using a UV light, confirmed the presence of *E. coli* and was reported as positive for *Escherichia coli*. No color change in the broth (the broth remained yellow) confirmed the absence of Total Coliform and was reported as negative. Verification count plates (VRBA w/MUG) prepared for each trial were used to determine an average Total Coliform/*E. coli* count of the working bacterial dilution used to inoculate the test systems. The test data for the study can be found on the following pages:

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### Total Coliform Data - 24 Hour @ 35°C Incubation Period

<u>Trial Number</u>	<u>Verification Count</u> (VRBA w/MUG) CFU/ml	<u>ITS Total Coliform Result</u> (Positive/Negative)	<u>Readycult® Total Coliform Result</u> (Positive/Negative)
Blank	0	Negative	Negative
1	11	Positive	Positive
2	12	Positive	Positive
3	9	Positive	Positive
4	10	Positive	Positive
5	10	Positive	Positive
6	11	Positive	Positive
7	9	Positive	Positive
8	10	Positive	Positive
9	12	Positive	Positive
10	8	Positive	Positive
11	9	Positive	Positive
12	10	Positive	Positive
13	7	Positive	Positive
14	10	Positive	Positive
15	9	Positive	Positive

### Escherichia Coliform Data - 24 Hour @ 35°C Incubation Period

<u>Trial Number</u>	<u>Verification Count</u> (VRBA w/MUG) (CFU/ml)	<u>ITS E. coli Result</u> (Positive/Negative)	<u>Readycult® E. coli Result</u> (Positive/Negative)
Blank	0	Negative	Negative
1	11	Positive	Positive
2	12	Positive	Positive
3	9	Positive	Positive
4	10	Positive	Positive
5	10	Positive	Positive
6	11	Positive	Positive
7	9	Positive	Positive
8	10	Positive	Positive
9	12	Positive	Positive
10	8	Positive	Positive
11	9	Positive	Positive
12	10	Positive	Positive
13	7	Positive	Positive
14	10	Positive	Positive
15	9	Positive	Positive

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### Total Coliform Data - 48 Hour @ 20°C Incubation Period

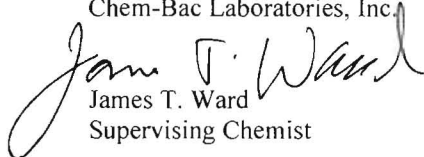
<u>Trial Number</u>	<u>Verification Count</u> (VRBA w/MUG) (CFU/ml)	<u>ITS Total Coliform Result</u> (Positive/Negative)	<u>Readycult® Total Coliform Result</u> (Positive/Negative)
Blank	0	Negative	Negative
1	10	Positive	Positive
2	8	Positive	Positive
3	11	Positive	Positive
4	10	Positive	Positive
5	9	Positive	Positive

### Escherichia Coliform Data - 48 Hour @ 20°C Incubation Period

<u>Trial Number</u>	<u>Verification Count</u> (VRBA w/MUG) (CFU/ml)	<u>ITS E. coli Result</u> (Positive/Negative)	<u>Readycult® E. coli Result</u> (Positive/Negative)
Blank	0	Negative	Negative
1	10	Positive	Positive
2	8	Positive	Positive
3	11	Positive	Positive
4	10	Positive	Positive
5	9	Positive	Positive

The average Total Coliform/E. coli count of the working bacterial dilution was determined to be 9.8 CFU/ml. All of the test systems, both ITS and Readycult®, detected the presence of both Total Coliform and Escherichia Coliform for both the 24 and 48 hour test conditions. The ITS test system was equally effective as the Readycult® system in the simultaneous detection of Total Coliform and Escherichia-coli at the concentration of 10 CFU/100 mls.

Respectfully Submitted,  
Chem-Bac Laboratories, Inc.

  
James T. Ward  
Supervising Chemist

## INDEX OF PHOTOGRAPHS

Photograph	Description
1	Visual Representation – Blank Trial 1
2	Visual Representation – 24 Hour Trial 1
3	Visual Representation – 48 Hour Trial 1



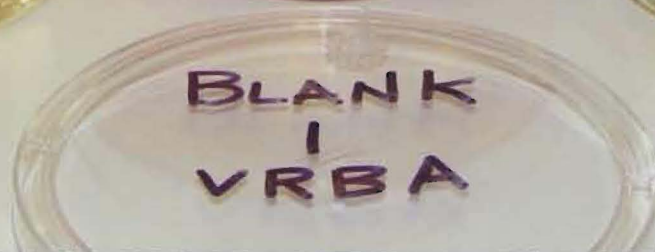
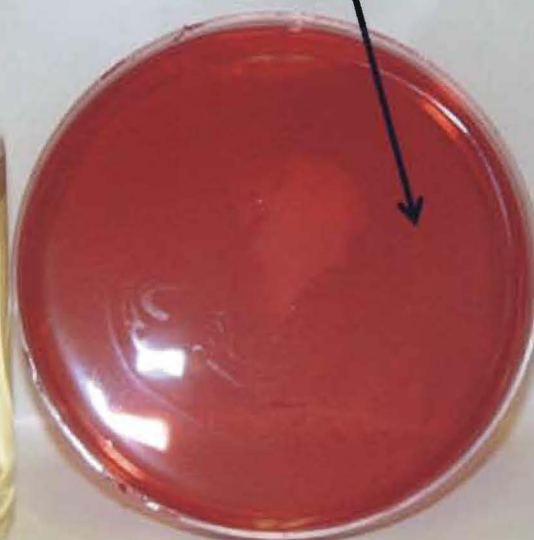
Readycult® Blank

June 9, 2008

Coliform Count Verification  
(Violet Red Bile Agar w/MUG)



ITS Blank



Visual Representation – Blank Trial 1

1

June 9, 2008

# Coliform Count Verification (Violet Red Bile Agar w/MUG)

ITS Result



Readycult® Result



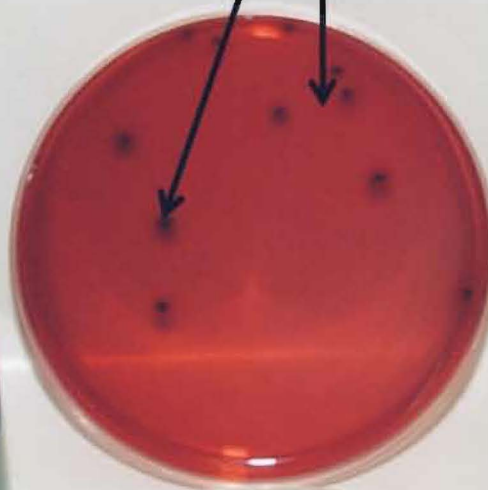
Visual Representation – 24 Hour Trial 1

June 9, 2008

Coliform Count Verification  
(Violet Red Bile Agar w/MUG)



ITS Result



Readycult® Result

Visual Representation – 48 Hour Trial 1