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Biological Enzyme Substrate Method
Detection System

— Conforms to GB/T 5750-2023 Standard Examination Methods for Drinking Water enzyme substrate method
— Conforms to HJ 1001-2018 Determination of Total Coliforms, Fecal Coliforms, and Escherichia coli in Water Quality by Enzyme Substrate Method

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Guangdong Huankai Biological Technology Co., Ltd

Guangdong Huankai Biological Technology Co., Ltd. is located in the National High-Tech Industrial Development Zone of Zhaoqing City, covering an area of 200 acres. The company focuses on the development and production of rapid microbial detection products, cell culture media, disposable laboratory consumables, intelligent instrumentation equipment, and the refined extraction of biological materials. Currently, it boasts a product line that includes cell culture media, vaccine culture media, biochemical identification reagents, microbial test strips, quantitative microbial strains, fluorescent quantitative PCR reagents, and other rapid testing reagent series, as well as food safety rapid intelligent instrumentation equipment, and various disposable laboratory consumables. With over a hundred products in its portfolio, its business spans bio-pharmaceuticals, vaccine production, medical devices, food and beverages, aquaculture, and more, serving research institutions, universities, disease control departments, food and drug inspection agencies, and third-party testing organizations.

Guangdong Huankai Biological Technology Co., Ltd. serves as the industrial expansion production and R&D base for Guangdong Huankai Microbial Sciences Co., Ltd. (affiliated with the Microbiology Institute of Guangdong Academy of Sciences), standing as one of the largest production and R&D bases for culture media and rapid detection reagents in China. The company has developed thousands of products with independent intellectual property rights, securing a leading position in domestic sales. It hosts the "Guangdong Province Food Microbial Safety Engineering Technology Research and Development Center" and has been recognized as a National High-Tech Enterprise, Intellectual Property Demonstration Enterprise in Guangzhou Development Zone, Private Science and Technology Enterprise of Guangdong Province, and more, garnering numerous qualifications and honors.

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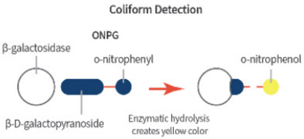
Enzyme Substrate Coliform Test System aka E.S.C.T.S. uses proprietary Defined Substrate Technology (DST) to simultaneously detect total coliforms and E. coli. Two nutrient-indicators, ONPG and MUG, are the major sources of carbon in E.S.C.T.S and can be metabolized by the coliform enzyme β-galactosidase and the E. coli enzyme β-glucuronidase, respectively.

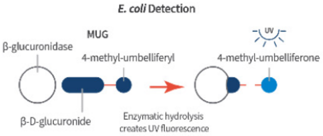
FEATURES

Referencing the enzyme substrate method detection requirements for culture media in GB/T 5750-2023 "Standard Examination Methods for Drinking Water" and HJ1001-2018, Huankai Biotech independently developed the MMO-MUG culture medium. Validation with 100 strains including coliforms, Escherichia coli, or thermotolerant coliforms (including strains isolated from water samples and standard strains) demonstrated high specificity of the culture medium, clear positive strain characteristics, and no false-negative occurrences. High sensitivity allows for the precise detection of coliforms and Escherichia coli or thermotolerant coliforms in water samples as low as 1 MPN/100mL, while significantly inhibiting non-coliforms commonly found in water samples, including enzyme substrate false-positive strains. The product has been tested with over 200 samples, including drinking water, surface water, groundwater, domestic wastewater, and industrial wastewater.

PRINCIPLES

The total coliforms, fecal coliforms, and Escherichia coli are capable of producing β-galactosidase, which decomposes the colorless substrate ortho-nitrophenyl-β-D-galactopyranoside (ONPG) into yellow ortho-nitrophenol. Escherichia coli can also produce β-glucuronidase, decomposing 4-methylumbelliferyl-β-D-glucuronide (MUG) into 4-methylumbelliferone, which fluoresces under UV light. After incubation at 36±1°C, a yellow well indicates the presence of total coliforms; a yellow well with fluorescence indicates Escherichia coli; and at 44.5°C, a yellow well indicates fecal coliforms, with those fluorescing indicating Escherichia coli. The number of positive reactions is counted and compared against the Most Probable Number (MPN) chart to calculate the concentration of total coliforms, fecal coliforms, and Escherichia coli.





PARAMETERS OF E.S.C.T.S. W / QC KIT

PRODUCT		SKU	SPECIFICATIONS
ONPG-MUG Culture Media		DW001	• 100pc/box • vacuum sealed • pre-sterilized
97 well quantitative plate		DW-DLP-97	• Ethylene oxide sterilization • The 97 grid quantitative plate can detect ≤2419MPN/100mL total coliform and Escherichia coli or fecal coliform without dilution.
51 well quantitative plate		DW-DLP-51	• Ethylene oxide sterilization • The 51 grid quantitative plate can detect • ≤2419MPN/100mL total coliform and Escherichia coli or fecal coliform without dilution.
97 well standard positive colorimetric plate		DW-YXP-97	• Equipped with yellow and fluorescent colorimetric substances to assist in interpreting positive results • Ethylene oxide sterilization
51 well standard positive colorimetric plate		DW-YXP-51	• Equipped with yellow and fluorescent colorimetric substances to assist in interpreting positive results • Ethylene oxide sterilization
Sampling Bottle		DW-QYP-100	• 20 bottles/box, 5 boxes per carton • Each bottle contains 10 mg sodium thiosulfate • Irradiated and sterilized
Quality Control		QSM006	• Traceable quality control samples • Contains Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa

PARAMETERS OF E.S.C.T.S. W / QC KIT

ITEMS	SKU	SPECIFICATIONS
 Programmable Sealing Machine Elite Sealer-1	778860728	• Dimensions: 420mm x 320mm x 360mm • Weight: about 12kg • Sealing speed: 12 seconds per piece • Warm-up time: <4min • Certification : ISO certified • Program-controlled system with counting function • Can continuously seal quantitative plates without interruption, improving work efficiency • The silicone holder is designed according to the Huankai biological quantitative plate, making the sealing of the quantitative plate smooth. • Noise: <48dB(A) • Cover temperature:＜40℃ • Working voltage: AC110V~220V • Working environment temperature: -10℃~50℃
 Black Box Type Triple Purpose UV Analyzer UV Analyzer-1	778860729	• Light source turn on method: manual • Light source: long-life LED, 365nm and 254nm wavelength UV lamp • Material: Metal • Dimensions: 320×320×260 mm • Weight: 3kg • Working voltage: AC110V~220V

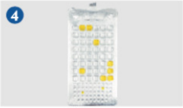
DRINKING WATER LAB TEST

——Suitable for tap water systems, centers for disease control and prevention, import & export inspection and quarantine systems, third-party testing laboratories

Add MMO-MUG culture medium to 100mL water sample and mix evenly.

Pour into a 97-grid quantitative plate and quantify without dilution. Range: 1-200MPN/100mL total coliforms and Escherichia coli.

After sealing on a programmable quantitative sealing machine, incubate at 36±1°C for 24 hours.



Results reading :
Colorless: negative; Only yellowing: total coliform positive;Turns yellow and fluoresces: Escherichia coli is positive

Quality Control System

Please complete under the guidance of professionals

HOW TO USE:

1. Prepare 1 empty sterile bottle (>300mL) and 300mL of diluent (sterile water or sterile PBS buffer).
2. Take the quality control sample freeze-dried powder out of the refrigerator and place it at room temperature for 10 to 15 minutes to reach equilibrium temperature.
3. Open the quality control lyophilized powder, add 3 mL of diluent to dissolve the lyophilized powder, and transfer all to a sterile bottle after it is fully dissolved.
4. Add a small amount of diluent to rinse the freeze-dried powder bottle, recover all quality control sample bacterial suspensions into sterile bottles, pour the remaining diluent and shake thoroughly. The total volume is 300mL.
5. The amount of freeze-dried powder for each quality control sample can be used for 3 parallel experiments. Pour the quality control sample suspension into the sampling bottle and adjust the volume of each bottle to 100mL.
6. Pour MMO-MUG culture medium into each sampling bottle containing quality control samples and mix evenly. Pour all the mixed solution into a 97-well quantitative plate and seal with film, and incubate at 36±1C for 24 hours.
7. Interpretation: Yellow grids are positive for total coliform, yellow and fluorescent are positive for Escherichia coli, count quantitatively according to the MPN table.

PRODUCT LIST

ITEMS	SKU	SPECIFICATIONS
ONPG-MUG Culture Media	DW001	100 pc/box
97-well quantitative plate	DW-DLP-97	For detecting ≤2419MPN/100ML total coliforms and Escherichia coli or fecal coliforms
51-well quantitative plate	DW-DLP-51	For detecting ≤200MPN/100ML total coliforms and Escherichia coli or fecal coliforms
97-well positive colorimetric plate	DW-YXP-97	For assisting in interpreting positive results
51-well positive colorimetric plate	DW-YXP-51	For assisting in interpreting positive results
quality control samples	QSM006	Used for quality control of enzyme substrate method detection
Elite Sealer-1	778860728	Used with quantitative plates for quantitative detection of coliform
UV Analyzer-1	778860729	observe and analyze the sample