



PRODUCT SPECIFICATION SHEET

Fluid Thioglycollate Medium (Thioglycollate Medium Fluid)(DM263)

Intended Use

Fluid Thioglycollate medium (Thioglycollate medium Fluid) (DM263) is recommended for sterility testing of biologicals and for cultivation of aerobes, anaerobes and microaerophiles.

Product Summary and Explanation

Quastel and Stephenson⁽¹⁾ noticed that the presence of a small amount of a compound containing an -SH group (cysteine, thioglycollic acid, glutathione) allowed "aerobic" growth of *Clostridium sporogenes* in tryptic digest broth. Falk, Bucca and Simmons⁽²⁾ brought out the advantages of using small quantities of agar (0.06-0.25%) in detecting contaminants during sterility testing of biologicals. Brewer⁽³⁾ demonstrated the value of combining a small amount of agar and a reducing substance. Brewer's experiments revealed that anaerobes grew equally well, in a liquid medium containing 0.05% agar, irrespective of presence or absence of sodium thioglycollate. Marshall, Gunnish and Luxen⁽⁴⁾ reported satisfactory cultivation of anaerobes in Brewer's Thioglycollate Medium in the presence of a mercurial preservative. Neutralization of the bacteriostatic effect of mercurial compounds by sodium thioglycollate was confirmed by Nungester, Hood and Warren⁽⁵⁾ and Portwood.⁽⁶⁾ Vera⁽⁷⁾ introduced incorporation of casein peptone. Malin and Finn⁽⁸⁾ reported the commonly used medium containing thioglycollate is inhibitory to some organisms in the presence of a carbohydrate.

Fluid Thioglycollate Medium is recommended in the FDA *Bacteriological Analytical Manual* (BAM)⁽⁹⁾ and the *Official Methods of Analysis of AOAC International*⁽¹⁰⁾ for the examination of food, and for determining the phenol coefficient and sporicidal effects of disinfectants. Fluid Thioglycollate Medium is also specified for sterility checks on banked blood.⁽¹¹⁾ It is one of the media recommended in the *USP* for use in sterility testing of articles purporting to be sterile; these formulations meet the requirements of the *USP* growth promotion test.⁽¹²⁾ Fluid Thioglycollate Medium is routinely used to check the sterility of stored blood in blood banks it is also intended for the examination of clear liquid or water-soluble materials.⁽¹³⁾

Principles of the Procedure

Fluid Thioglycollate medium contains pancreatic digest of casein, yeast extract, L-cystine which provides the growth factors necessary for bacterial multiplication. Dextrose is the carbon and energy source. L-cystine and sodium thioglycollate allows *Clostridium* to grow in this medium even under aerobic conditions. Small amount of agar added in the medium favors the growth of aerobes as well as anaerobes in the medium, even if sodium thioglycollate is deleted from the medium and also helps in maintaining low redox potential for stabilizing the medium. Sodium thioglycollate act as a reducing agent and neutralizes the toxic effects of mercurial preservatives and peroxides formed in the medium, thereby promoting anaerobiosis, and making the medium suitable to test materials containing heavy metals. Resazurin is an indicator dye when oxygen content increases slightly, it is indicated by a colour change of redox indicator, resazurin to red.

Formula / Liter

Ingredients	Gms / Liter
Pancreatic digest of casein	15.00
Yeast extract	5.00
Dextrose	5.50
Sodium chloride	2.50
L-Cystine	0.50
Sodium thioglycollate	0.50
Resazurin sodium	0.001





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Agar	0.75
Final pH: 7.1 ± 0.2 at 25°C	
Formula may be adjusted and/or supplemented as required to meet performance specifications	

Precautions

1. For Laboratory Use only.
2. IRRITANT. Irritating to eyes, respiratory system, and skin.
3. If more than the upper one-third of the medium has acquired a pink colour, the medium may be restored once by heating in a water bath or in free flowing steam until the pink colour disappears.
4. Do not reheat the media more than once; continued reheating gives rise to toxicity.

Directions

1. Suspend 29.75 grams of the medium in one liter of distilled water.
2. Heat to boiling, to dissolve the medium completely.
3. Autoclave at 121°C, 15 psi pressure, for 15 minutes / validated cycle.
4. Cool to 25°C and store in a cool dark place preferably below 25°C.

Note: FTM has a slight turbidity or haze

Quality Control Specifications

Dehydrated Appearance	Cream to yellow homogeneous free flowing powder
Prepared Medium	Light straw coloured, clear to slightly opalescent solution with upper 10% or less medium pink on standing.
Reaction of 2.97% Solution	pH : 7.1 ± 0.2 at 25°C
Gel Strength	Not Applicable

Expected Cultural Response: Cultural characteristics observed after an incubation at 30-35°C for not more than 3 days.

Sr. No.	Organisms	Results to be achieved	
		Inoculum (CFU)	Growth
1.	<i>Clostridium sporogenes</i> ATCC 19404	50 - 100	good-luxuriant
2.	<i>Clostridium sporogenes</i> ATCC 11437	50 - 100	good-luxuriant
3.	<i>Clostridium sporogenes</i> NBRC 14293	50 - 100	good-luxuriant
4.	<i>Clostridium perfringens</i> ATCC 13124	50 - 100	good-luxuriant
5.	<i>Bacteoides fragilis</i> ATCC 23745	50 - 100	good-luxuriant
6.	<i>Bacteroides vulgatus</i> ATCC 8482	50 - 100	good-luxuriant
7.	<i>Staphylococcus aureus</i> ATCC 25923	50 - 100	good-luxuriant
8.	<i>Staphylococcus aureus</i> ATCC 6538	50 - 100	good-luxuriant
9.	<i>Pseudomonas aeruginosa</i> ATCC 27853	50 - 100	good-luxuriant
10.	<i>Pseudomonas aeruginosa</i> ATCC 9027	50 - 100	good-luxuriant
11.	<i>Micrococcus luteus</i> ATCC 9341	50 - 100	good-luxuriant
12.	<i>Streptococcus pneumonia</i> ATCC 6305	50 - 100	good-luxuriant
13.	<i>Escherichia coli</i> ATCC 25922	50 - 100	good-luxuriant
14.	<i>Escherichia coli</i> ATCC 8739	50 - 100	good-luxuriant





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15.	<i>Escherichia coli</i> NCTC 9002	50 - 100	good-luxuriant
16.	<i>Salmonella Typhimurium</i> ATCC 14028	50 - 100	good-luxuriant
17.	<i>Salmonella Abony</i> NCTC 6017	50 - 100	good-luxuriant
18.	<i>Bacillus subtilis</i> ATCC 6633	50 - 100	good-luxuriant

The organisms listed are the minimum that should be used for quality control testing.

Test Procedure

Refer to appropriate references for standard test procedures.

Results

1. After incubation, growth is evidenced by the presence of turbidity compared to an uninoculated control.
2. Strict aerobes tend to grow in a thin layer at the surface of the broth; obligate anaerobes will grow only in that portion of the broth below the upper oxidized layer.

Storage

Store the sealed bottle containing the dehydrated medium at 10 - 30°C. Once opened and recapped, place container in a low humidity environment at the same storage temperature. Protect from moisture and light.

Expiration

Refer to the expiration date stamped on the container. The dehydrated medium should be discarded if not free flowing, or if the appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure

1. Anaerobes can be overgrown by more rapidly growing facultative organisms.
2. If plating medium reveals no growth examine and Gram stain broth.
3. Never rely on broth cultures exclusively for isolation of anaerobes. Some anaerobes may be inhibited by metabolic products or acids produced from more rapidly growing facultative anaerobes.
4. Consult appropriate texts for detailed information and recommended procedures.

Packaging

Product Name : Fluid Thioglycollate Medium (Thioglycollate Medium Fluid)

Product Code : DM263

Available Pack sizes : 100gm/ 500gm

References

1. Quastel and Stephenson. 1926. J. Biochem. 20:1125.
2. Falk, Bucca and Simmons. 1939. J. Bacteriol. 37:121.
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4. Marshall, Ginnish and Luxen. 1940. Proc. Soc. Exp. Biol. Med. 43:672.
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7. Vera. 1944. J. Bacteriol. 47:59.
8. Malin and Finn. 1957. J. Bacteriol. 62:349.
9. U.S. Food and Drug Administration. 2001. Bacteriological analytical manual, online. AOAC International, Gaithersburg, Md.
10. Horwitz (ed.). 2007. Official methods of analysis of AOAC International, 18th ed., online. AOAC International, Gaithersburg, Md.
11. Federal Register. 1992. Fed. Regist. 21:640.2.17.





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12. United States Pharmacopeial Convention, Inc. 2008. The United States pharmacopeia 31/The national formulary 26, Supp. 1, 8-1-08, online. United States Pharmacopeial Convention, Inc., Rockville, Md.
13. Federal Register, 1992, Fed. Regist., 27:640.2.17.

Further Information

For further information please contact your local MICROMASTER Representative.



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