AuSaMicS™ Life Science

TDS
AS-1438
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ECC Agar

E. coli & Coliform Chromogenic Medium | Catalogue No. AS-1438

1. Product Overview

ECC Agar (AS-1438) is a selective and differential chromogenic culture medium for the simultaneous detection and enumeration of Escherichia coli and total coliform bacteria from a single plate, without the need for confirmatory testing. Compliant with ISO 9308-1:2014, it is used across water quality testing, food microbiology, environmental monitoring, and pharmaceutical QC laboratories.

2. Mode of Action

The medium incorporates two chromogenic enzyme substrates. A β-D-galactosidase substrate is cleaved by the enzyme common to all coliforms, releasing a salmon-red chromophore. A β-D-glucuronidase substrate is cleaved specifically by E. coli, releasing a blue-indigo chromophore that combines with the salmon component to produce a distinct blue-violet colony colour. Tergitol 7 selectively suppresses Gram-positive background flora.

3. Product Specifications

Synonyms	ECC Agar; *E. coli* Coliform Detection Medium; Chromogenic Coliform Agar (CCA)
Medium Type	Selective, differential, chromogenic — dual enzyme substrate system
Standards	ISO 9308-1:2014 | ISO 9308-2:2012 | ISO 7218:2007 | AS/NZS 4276 series | ISO 11133:2014
Final pH (25°C)	**7.0 ± 0.2**
Sterilisation	**DO NOT AUTOCLAVE — heat to boiling to dissolve, then cool to 45–50°C**
Appearance (powder)	Beige to light tan, free-flowing, homogeneous powder
Appearance (prepared)	Light amber to pale yellow, slightly opalescent gel
Incubation	**36 ± 2°C for 21 ± 3 hours, aerobically (ISO 9308-1:2014)**
Storage (powder)	2–25°C, dry, tightly sealed, protected from light
Storage (prepared plates)	2–8°C; use within 2 weeks; protect from light
HS Tariff Code	3821.00.00

4. Formula — per litre

Ingredient	g/L	Role
Peptone (enzymatic digest of casein)	~15.0	Primary nitrogen source — amino acids, peptides, growth factors
Yeast extract	~3.0	B-vitamins, trace elements, growth co-factors
Sodium pyruvate	~1.0	Energy source; supports recovery of stressed/injured coliforms
Sorbitol	~1.0	Carbohydrate; supports coliform growth and recovery
Sodium chloride	5.0	Osmotic balance
Disodium hydrogen phosphate (Na_2HPO_4)	~2.7	pH buffer component
Sodium dihydrogen phosphate (NaH_2PO_4)	~2.2	pH buffer component
Tergitol 7 (sodium heptadecyl sulphate)	0.15	Primary selective agent — suppresses Gram-positive organisms
β-D-galactosidase chromogenic substrate	Chromogenic	Cleaved by β-D-galactosidase — salmon-red in all coliforms
β-D-glucuronidase chromogenic substrate	Chromogenic	Cleaved by β-D-glucuronidase — blue-indigo in *E. coli*
IPTG (isopropyl-β-D-thiogalactopyranoside)	0.1	Inducer — enhances β-D-galactosidase expression
Agar	~12–15	Solidifying agent

Total dissolution: ~36–42 g/L | Final pH 7.0 ± 0.2 at 25°C | DO NOT AUTOCLAVE

5. Preparation Protocol

- Suspend the required amount of dehydrated ECC Agar in purified or distilled water per the label dissolution rate (g/L). Mix well.
- Heat with frequent agitation to boiling. Continue for approximately 1 minute to dissolve completely. Avoid prolonged boiling. DO NOT AUTOCLAVE.
- Cool to 45–50°C in a water bath. Do not allow the medium to set — pour while still molten.
- Pour 10–15 mL per 90 mm Petri dish and allow to solidify on a level surface.
- Dry the agar surface (lids ajar, room temperature, 30–60 minutes, or 37°C for 30 minutes) to prevent colony spreading.
- For membrane filtration: place the membrane filter grid-side up on the agar surface. Incubate at 36 ± 2°C for 21 ± 3 hours.

6. Colony Interpretation

Colony Colour	Organism / Group	Enzyme Activity
Dark blue to violet	*E. coli*	β-D-galactosidase + β-D-glucuronidase positive
Salmon-pink to red	Total coliforms (non-*E. coli*)	β-D-galactosidase positive only

Colony Colour	Organism / Group	Enzyme Activity
Colourless / no growth	Non-coliforms	Neither enzyme present — suppressed by Tergitol 7

E. coli count = blue-violet colonies. Total coliform count = blue-violet + salmon-pink/red colonies. Report as CFU per 100 mL of sample filtered (ISO 9308-1:2014). Note: some Aeromonas spp. may give false-positive blue-violet colonies — confirm with an oxidase test where relevant.

7. Quality Control — Organisms & CFU Specification

Organism (ATCC)	Inoculum (CFU)	Expected Result
Escherichia coli ATCC 25922	≤100 CFU	Good growth; dark blue to violet colonies
Escherichia coli ATCC 8739	≤100 CFU	Good growth; dark blue to violet colonies
Klebsiella (Enterobacter) aerogenes ATCC 13048	≤100 CFU	Good growth; salmon-pink to red colonies
Citrobacter freundii ATCC 43864	≤100 CFU	Good growth; salmon-pink to red colonies
Enterococcus faecalis ATCC 19433	≤100 CFU	Inhibited / partial growth; no typical colour
Staphylococcus aureus ATCC 25923	≤100 CFU	Inhibited / no growth; no typical colour

8. Applications

- Drinking water — ISO 9308-1:2014 membrane filtration, 100 mL sample volume
- Recreational water — bathing water, pools, beach water compliance
- Environmental water — rivers, lakes, stormwater, irrigation water
- Food and dairy — process water and hygiene monitoring
- Pharmaceutical QC — USP/EP process water testing for coliforms
- Environmental monitoring — surface sampling, wastewater and effluent compliance

9. Storage & Shelf Life

Dehydrated powder	24 months from date of manufacture when stored at 2–25°C, sealed, protected from light and moisture
Prepared plates	2 weeks at 2–8°C, protected from light

10. Literature & References

1. ISO 9308-1:2014. Water quality — Enumeration of Escherichia coli and coliform bacteria — Part 1: Membrane filtration method for waters with low bacterial background flora. Geneva: International Organization for Standardization.

2. Farnleitner AH, et al. Performance validation of chromogenic coliform agar for the enumeration of E. coli and coliform bacteria in water. Journal of Applied Microbiology, 2004.

3. Manafi M, Kneifel W. A combined chromogenic–fluorogenic medium for the simultaneous detection of total coliforms and E. coli in water. Zentralblatt für Hygiene und Umweltmedizin, 1990;189:225–234.

4. ISO 7218:2007. Microbiology of food and animal feeding stuffs — General requirements and guidance for microbiological examinations. Geneva: ISO.

5. ISO 11133:2014. Microbiology of food, animal feed and water — Preparation, production, storage and performance testing of culture media. Geneva: ISO.