MilliporeSigma

Certified Reference Microorganisms

The Simple Way to Ensure Accurate Results, Every Time

Vitroids™ and LENTICULE® Discs

- Defined CFU range and low standard deviation
- Fast, reliable and easy to use

NCTC National Collection of Type Cultures — Operated by Public Health England

NCPF National Collection of Pathogenic Fungi — Operated by Public Health England

CECT

Produced in double accredited laboratory fulfilling ISO/IEC 17025 and ISO 17034

The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the U.S. and Canada.

Supelco®
Analytical Products

The Simple Way to Ensure Accurate Results, Every Time

Certified Reference Microorganisms

Why use CRMs in Microbiology?

In pharmaceutical, food, water and environmental microbiology, laboratory results are an important part of a wider process that helps to confirm that samples are of an acceptable microbiological quality, are safe and comply with relevant legislation or guidelines. Quality control is an essential element of a laboratory's quality assurance system and characterized authenticated reference materials are necessary for effective quality control.

The same is true of microbiological testing; the one factor that is repeatedly overlooked is careful sourcing of biological resources such as the quality control strains. Incorrect quality control materials may indicate that test results are acceptable when, in fact, there is a problem with the samples being tested. Alternatively, control results may indicate that a test is not performing correctly, instigating unnecessary investigations and repeat testing.

Ready-to-use microbiological controls minimize the need for maintaining control strains in the test laboratory and guarantee that an authenticated control culture is used for every quality control test. Such control materials must be fit-for-purpose, bearing in mind that for pharmaceutical, food, water and environmental samples, the ability to accurately and reliably enumerate microorganisms—often at relatively low numbers—is essential. It is also important that controls can be applied to the wide range of different matrices that are often tested in a single laboratory.

The application of a unique preservation technology involving controlled-drying of authenticated cultures of internationally accepted microbiology control strains has resulted in the production of single-use discs containing microorganisms, designed for use in pharmaceutical, food, water and environmental testing laboratories. These quality control materials, LENTICULE® discs (developed by Public Health England, PHE) and Vitroids™ (developed by RTC), are now available from MilliporeSigma and are manufactured under conditions compliant with ISO 17034:2016 (General requirements for the competence of reference material producers). The discs contain pure cultures of bacteria, yeasts or molds in a solid water-soluble matrix. Comprehensive certificates of analysis provide details about the mean number of colony forming units (CFU) per disc, the method used to determine the product data, and the number of subcultures from the original strains provided under licence by NCTC® and CECT®.

Single-use controls manufactured directly from cultures provided by recognised Biological Resource Centres (BRCs) such as NCTC® and CECT® mean that laboratories can be confident about the authenticity of their strains and the suitability of their quality control materials, factors that are of increasing importance as laboratories become more automated and new technologies emerge and are rapidly adopted in routine microbiology settings.

What are Vitroids™ and LENTICULE® discs?

Vitroids™ and LENTICULE® discs contain viable microorganisms in a certified quantity (generally accredited according ISO/IEC 17025), produced under reproducible conditions compliant with ISO 17034:2016 using authenticated strains from NCTC®, NCPF® and CECT®. Consisting of pure cultures of bacteria, fungi or yeasts in a solid water soluble matrix, they are stable for at least one year and are in a viable state with a shelf life of 1-3 years. The within-batch variation for every product is very low. Each batch is provided with a comprehensive certificate of analysis that specifies the mean number of colony forming units (CFU), an expanded uncertainty about the mean, details about the method used to determine the product data and the number of passages (subcultures) from the original strain.

Applications

- Daily quality control
- Performance testing of media acc. ISO 11133
- Validation of new methods
- Materials for proficiency testing or ring trials
- Method development
- Staff training
- Starter cultures

Stability

Certified Reference Microorganisms in this unique format are very stable and in most cases will remain so for many years at -20 °C. The numbers of CFUs do not change, the organisms need no recovery time and have no lag phase. Even a short period at ambient temperature, such as during shipment, is not an issue for product stability.

Save Time and Costs

Using Vitroids™ and LENTICULE® discs is time saving because it removes the need for preparing stock cultures.The organisms need no recovery time and no pre-enrichment step. In addition the product concentrations are designed in a range where no or only minimal dilutions are needed. The discs readily dissolve in liquid media and on agar plates resulting in easy handling and a very economical solution.

What is New Compared to Existing Reference Strain Products?

Utilization of new technology has allowed us to make major improvements in the field of Microbiological Reference Materials. The main areas of development are stability, temperature resistance, adjusting the narrow defined CFU range, rehydration time and better within batch reproducibility. In addition, each disc is certified according to ISO 17034 and ISO/IEC 17025.

Preparation

Most solid and liquid media or rehydration buffers can be used. Discs can be rehydrated in as little as 100 µL buffer, or in larger volumes, e.g. 100 mL medium. It is also possible to add the disc to a cooled molten medium used for pour plate techniques. The rehydration process takes approximately 10 minutes. On solid media, the disc forms a droplet that can be spread with a sterile loop. In liquid media, the disc dissolves very quickly.

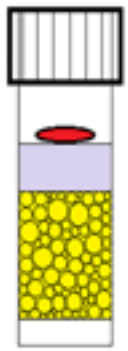
Packaging

The discs are packed individually in vials. The vials have a special screw-cap with seal and contain a desiccant at the bottom or in the cap. The vials are packed in a mylar bag with a zip.

Strains

LENTICULE® discs are prepared from a traceable culture obtained freeze-dried from the National Collection of Type Cultures (NCTC®) or National Collection of Pathogenic Fungi (NCPF®) and are manufactured by MilliporeSigma under license and control from Public Health England.

Vitroids™ are derived from a traceable culture obtained freeze-dried from CECT and produced according a MilliporeSigma patented technology. Both NCTC and CECT strains are conveniently matched to WDCM numbers and have cfu ranges that closely align with ISO 11133.



Vitroids™ and Lenticules® disc packaging

Get a FREE sample! of Vitroids™ & LENTICULE® discs*

For more information and a list of Certified Reference Microorganisms, visit: **SigmaAldrich.com/mibi-crm**

*Mention promo code SFV when placing your order. Limit one package per product and per customer; no shipping fee.

A New Partnership

Public Health England's NCTC® is a national BRC that preserves, maintains and regularly updates a specific collection of bacterial strains, ensuring there are no changes to physical characteristics, such as morphology and nutritional requirements, the genome and the proteome. It is one of several BRCs that provide authenticated biological reference and control strains. In addition, the PHE also developed the LENTICULE® disc that enables a laboratory to have an on demand source of a control for quantitative microbiology.

With increased worldwide demand for the accreditation of testing labs, as well as the development of fast, automated methods in microbiology, the use of Microbial Certified Reference Materials has increased substantially. With this in mind, it is an appropriate time to entrust the manufacture and distribution of these products to an ISO accredited manufacturing company such as MilliporeSigma, enabling the PHE organization to focus on research and development for new products to add to this portfolio. This R&D is further enhanced by an exciting project by PHE, in collaboration with the Wellcome Trust Sanger Institute (WTSI), to provide whole genome sequences using long-read technology for 3000 bacteria of clinical importance.

An integral part of this new partnership is MilliporeSigma's creation of a new, dedicated manufacturing facility in Buchs, Switzerland to provide the growth and development of Certified Reference Microorganisms, both for now and for the future. It will enable more scientists worldwide to easily access the NCTC®/NCPF® CRMs through the global supply chain of MilliporeSigma.

The MilliporeSigma facility in Buchs, Switzerland.

Certified Reference Microorganisms Portfolio

Cat. No.	Species	L/V*	Origin	Strain No.	CFU Range	CRM	WDCM
VT091112-10EA	Acinetobacter baumannii	V	CECT®	911	15-80	X	—
VT091114-10EA	Acinetobacter baumannii	V	CECT®	911	130-300	X	—
VT091115-10EA	Acinetobacter baumannii	V	CECT®	911	1,000-10,000	X	—
VT000532-10EA	Aspergillus brasiliensis (formerly Aspergillus niger)	V	CECT®	2574	15-80	X	00053
RMF02275L-10EA	Aspergillus brasiliensis (formerly Aspergillus niger)	L	NCPF®	2275	30-120		00053
VT000533-10EA	Aspergillus brasiliensis (formerly Aspergillus niger)	V	CECT®	2574	80-130	X	00053
CRM07464L-10EA	Bacillus cereus	L	NCTC®	7464	30-120	X	—
VT000013-10EA	Bacillus cereus	V	CECT®	193	80-130	X	00001
CRM07464M-10EA	Bacillus cereus	L	NCTC®	7464	500 - 50,000	X	—
VT000032-10EA	Bacillus subtilis	V	CECT®	356	15-80	X	00003
VT000036-10EA	Bacillus subtilis	V	CECT®	356	1,000-10,000	X	00003
VT000542-10EA	Candida albicans – Coming soon!	V	CECT®	1394	15-80	X	00054
RMF03255L-10EA	Candida albicans	L	NCPF®	3255	30-120		00055
VT000543-10EA	Candida albicans	V	CECT®	1394	80-130	X	00054
VT000546-10EA	Candida albicans	V	CECT®	1394	1,000-10,000	X	00054
RMF03255H-10EA	Candida albicans	L	NCPF®	3255	>100,000		00055
RM09750L-10EA	Citrobacter freundii	L	NCTC®	9750	30-120		—
VT004014-10EA	Citrobacter freundii	V	CECT®	401	130-300	X	—
VT004016-10EA	Citrobacter freundii	V	CECT®	401	1,000-10,000	X	—
CRM00506L-10EA	Clostridium bifermentans	L	NCTC®	506	30-120	X	00079
CRM13170L-10EA	Clostridium perfringens	L	NCTC®	13170	30-120	X	00201
CRM13170M-10EA	Clostridium perfringens	L	NCTC®	13170	500 - 50,000	X	00201
VT000072-10EA	Clostridium perfringens – Coming soon!	V	CECT®	376	15-80	X	00007
VT000074-10EA	Clostridium perfringens – Coming soon!	V	CECT®	376	130-300	X	00007
VT000076-10EA	Clostridium perfringens – Coming soon!	V	CECT®	376	1,000-10,000	X	00007
VT000082-10EA	Clostridium sporogenes	V	CECT®	485	15-80	X	00008
CRM11467L-10EA	Cronobacter sakazakii	L	NCTC®	11467	30-120	X	00214
VT001752-10EA	Enterobacter aerogenes	V	CECT®	684	15-80	X	00175
CRM10006L-10EA	Enterobacter aerogenes	L	NCTC®	10006	30-120	X	00175
VT001753-10EA	Enterobacter aerogenes	V	CECT®	684	80-130	X	00175
VT001754-10EA	Enterobacter aerogenes	V	CECT®	684	130-300	X	00175
VT000834-10EA	Enterobacter aerogenes	V	CECT®	194	130-300	X	00083
VT001756-10EA	Enterobacter aerogenes	V	CECT®	684	1,000-10,000	X	00175
CRM10006M-10EA	Enterobacter aerogenes	L	NCTC®	10006	500 - 50,000	X	00175
VT000092-10EA	Enterococcus faecalis	V	CECT®	481	15-80	X	00009
CRM00775L-10EA	Enterococcus faecalis	L	NCTC®	775	30-120	X	00009
VT000093-10EA	Enterococcus faecalis	V	CECT®	481	80-130	X	00009
VT000094-10EA	Enterococcus faecalis	V	CECT®	481	130-300	X	00009
VT000096-10EA	Enterococcus faecalis	V	CECT®	481	1,000-10,000	X	00009
CRM00775M-10EA	Enterococcus faecalis	L	NCTC®	775	500 - 50,000	X	00009
VT000877-10EA	Enterococcus faecalis	V	CECT®	795	50,000-150,000	X	00087
CRM00775H-10EA	Enterococcus faecalis	L	NCTC®	775	>100,000	X	00009
VT000102-10EA	Enterococcus faecium	V	CECT®	410	15-80	X	00010
VT000104-10EA	Enterococcus faecium	V	CECT®	410	130-300	X	00010
VT000105-10EA	Enterococcus faecium	V	CECT®	410	1,000-10,000	X	00010
VT000902-10EA	Escherichia coli	V	CECT®	515	15-80	X	00090
VT000902-10EA	Escherichia coli	V	CECT®	515	15-80	X	00090
VT000122-10EA	Escherichia coli	V	CECT®	516	15-80	X	00012
CRM13216L-10EA	Escherichia coli	L	NCTC®	13216	30-120	X	00202
CRM09001L-10EA	Escherichia coli	L	NCTC®	9001	30-120	X	00090
VT000133-10EA	Escherichia coli	V	CECT®	434	80-130	X	00013
VT000904-10EA	Escherichia coli	V	CECT®	515	130-300	X	00090
VT000906-10EA	Escherichia coli	V	CECT®	515	1,000-10,000	X	00090
VT000136-10EA	Escherichia coli	V	CECT®	434	1,000-10,000	X	00013
CRM09001M-10EA	Escherichia coli	L	NCTC®	9001	500 - 50,000	X	00090
VT000127-10EA	Escherichia coli	V	CECT®	516	50,000-150,000	X	00012
CRM09001H-10EA	Escherichia coli	L	NCTC®	9001	>100,000	X	00090
VT000909-10EA	Escherichia coli	V	CECT®	515	Variable	X	00090
CRM12900L-10EA	Escherichia coli O157:H7	L	NCTC®	12900	30-120	X	00014
VT072766-10EA	Fluoribacter bozemanae	V	CECT®	7276	1,000-10,000	X	—
VT072767-10EA	Fluoribacter bozemanae	V	CECT®	7276	50,000-150,000	X	—
CRM08167L-10EA	Klebsiella oxytoca	L	NCTC®	8167	30-120	X	—
VT000971-10EA	Klebsiella pneumoniae	V	CECT®	143	15-80	X	00097

Cat. No.	Species	L/V*	Origin	Strain No.	CFU Range	CRM	WDCM
VT000975-10EA	Klebsiella pneumoniae	V	CECT®	143	1,000-10,000	X	00097
CRM11368M-10EA	Legionella bozemanii	L	NCTC®	11368	500 - 50,000	X	—
CRM11371M-10EA	Legionella micdadei	L	NCTC®	11371	500 - 50,000	X	—
CRM12821L-10EA	Legionella pneumophila	L	NCTC®	12821	30-120	X	00205
CRM12821M-10EA	Legionella pneumophila	L	NCTC®	12821	500 - 50,000	X	00205
VT002057-10EA	Legionella pneumophila serogroup 1	V	CECT®	8734	50,000-150,000	X	00205
CRM11288L-10EA	Listeria innocua	L	NCTC®	11288	30-120	X	00017
CRM11994L-10EA	Listeria monocytogenes	L	NCTC®	11994	30-120	X	00019
CRM11994M-10EA	Listeria monocytogenes	L	NCTC®	11994	500 - 50,000	X	00019
VT001093-10EA	Listeria monocytogenes serotype 1/2a	V	CECT®	5873	80-130	X	00109
VT004835-10EA	Proteus hauseri	V	CECT®	484	1,000-10,000	X	—
VT000233-10EA	Proteus mirabilis	V	CECT®	4168	80-130	X	—
VT000237-10EA	Proteus mirabilis	V	CECT®	4168	50,000-150,000	X	—
VT001142-10EA	Pseudomonas aeruginosa	V	CECT®	118	15-80	X	00025
VT000262-10EA	Pseudomonas aeruginosa	V	CECT®	111	15-80	X	00026
VT000262-10EA	Pseudomonas aeruginosa	V	CECT®	111	15-80	X	00026
CRM10662L-10EA	Pseudomonas aeruginosa	L	NCTC®	10662	30-120	X	00114
VT001143-10EA	Pseudomonas aeruginosa	V	CECT®	118	80-130	X	00025
VT000263-10EA	Pseudomonas aeruginosa	V	CECT®	111	80-130	X	00026
VT000244-10EA	Pseudomonas aeruginosa	V	CECT®	110	130-300	X	00024
VT000264-10EA	Pseudomonas aeruginosa	V	CECT®	111	130-300	X	00026
VT000266-10EA	Pseudomonas aeruginosa	V	CECT®	111	1,000-10,000	X	00026
VT001145-10EA	Pseudomonas aeruginosa	V	CECT®	118	1,000-10,000	X	00025
CRM10662M-10EA	Pseudomonas aeruginosa	L	NCTC®	10662	500 - 50,000	X	00114
VT000267-10EA	Pseudomonas aeruginosa	V	CECT®	111	50,000-150,000	X	00026
VT000249-10EA	Pseudomonas aeruginosa	V	CECT®	110	Variable	X	00024
CRM09528L-10EA	Raoultella planticola	L	NCTC®	9528	30-120	X	—
CRM09528M-10EA	Raoultella planticola	L	NCTC®	9528	500 - 50,000	X	—
RMF03191L-10EA	Saccharomyces cerevisiae	L	NCPF®	3191	30-120		—
RMF03191M-10EA	Saccharomyces cerevisiae	L	NCPF®	3191	500 - 50,000		—
VT000292-10EA	Salmonella enterica subsp. enterica serovar Abony	V	CECT®	545	15-80	X	00029
VT000303-10EA	Salmonella enterica subsp. Enterica serovar Enteritidis	V	CECT®	4300	80-130	X	00030
VT000312-10EA	Salmonella enterica subsp. enterica serovar Typhimurium	V	CECT®	4594	15-80	X	00031
CRM12023L-10EA	Salmonella enterica subsp. enterica serovar Typhimurium	L	NCTC®	12023	30-120	X	00031
VT000313-10EA	Salmonella enterica subsp. enterica serovar Typhimurium	V	CECT®	4594	80-130	X	00031
CRM06676L-10EA	Salmonella enteritidis	L	NCTC®	6676	30-120	X	—
CRM07832L-10EA	Salmonella Nottingham	L	NCTC®	7832	30-120	X	—
CRM06571L-10EA	Staphylococcus aureus	L	NCTC®	6571	30-120	X	00035
CRM06571M-10EA	Staphylococcus aureus	L	NCTC®	6571	500 - 50,000	X	00035
VT000357-10EA	Staphylococcus aureus	V	CECT®	59	50,000-150,000	X	00035
VT000322-10EA	Staphylococcus aureus subsp. aureus	V	CECT®	239	15-80	X	00032
VT000323-10EA	Staphylococcus aureus subsp. aureus	V	CECT®	239	80-130	X	00032
VT000324-10EA	Staphylococcus aureus subsp. aureus	V	CECT®	239	130-300	X	00032
VT000326-10EA	Staphylococcus aureus subsp. aureus	V	CECT®	239	1,000-10,000	X	00032
CRM11047L-10EA	Staphylococcus epidermidis	L	NCTC®	11047	30-120	X	00132
RM11218Q-10EA	Vibrio furnissii	L	NCTC®	11218	>100		00186
RM10903Q-10EA	Vibrio parahaemolyticus	L	NCTC®	10903	>100		00037
RM11176L-10EA	Yersinia enterocolitica	L	NCTC®	11176	30-120		—

Negative Controls

Cat.Number	Description
RMBLANK0-10EA	Negative Control for LENTICULE® discs, no growth
RQC0001-10EA	Negative Control for Vitroids™ discs, no growth

To place an order or receive technical assistance

Order/Customer Service: SigmaAldrich.com/order
Technical Service: SigmaAldrich.com/techservice
Safety-related Information: SigmaAldrich.com/safetycenter

SigmaAldrich.com

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Microbial quality control in food according to EN ISO 11133

Culture media and certified reference materials

As a worldwide leading provider of industrial microbiology solutions, we address the needs of customers in industries where consumer safety is a major concern. Food manufacturing is particularly sensitive due to the potentially grave consequences that product contamination may have on the health of consumers. To minimize the risk, increasingly stringent standards are being set around the globe to regulate the production of food.

With the food industry frequently facing new or changed guidelines, staying up-to-date with regulatory requirements is challenging. The EN ISO 11133:2014 standard entitled “Microbiology of food, animal feed and water — Preparation, production, storage and performance testing of culture media” describes the general methodology and specifications for the preparation and performance testing of culture media for laboratory testing, while newer ISO standards for specific microorganisms published after 2014 may contain updated culture media formulations and/or quality control (QC) procedures.

For tests according to ISO 11133:2014, culture media and reference materials must fulfil specific quality requirements. Our range of regulatory compliant culture media makes it easier for you to stay compliant and remain one step ahead in microbial testing.

This flyer lists our most commonly used culture media for compliance with ISO 11133 (in GranuCult® prime, NutriSelect® prime or Chromocult® format) and the corresponding QC strains, available as convenient ready-to-use Vitroids™ and LENTICULE® discs.

Dehydrated culture media

Our broad range of high-quality dehydrated culture media products for the food industry ensures you will find the right medium for your needs and achieve accurate testing results. We have recently restructured our portfolio, as a consequence of which our dehydrated culture media fall under two main trademarks and three QC levels. This makes it easier for you to find the right medium with the required regulatory compliance.

The NutriSelect® brand covers our broad range of powdered culture media, while the GranuCult® brand represents our superior granulated culture media. The three QC levels **basic, plus and prime** as new brand extensions clearly indicate the degree to which these culture media are compliant. The prime level covers the full compliance spectrum according to F&B and pharma standards and includes QC release under ISO 17025 accreditation for culture media described in F&B standards.

Certified Reference Materials

Authenticated reference materials are necessary for effective QC in the laboratory, and this includes biological resources such as microbial QC strains. Ready-to-use microbiological controls minimize the need for maintaining control strains in the test laboratory and guarantee that an authenticated control culture is used for every test. Such control materials must be fit-for-purpose, bearing in mind that for food samples, the ability to accurately and reliably enumerate microorganisms—often at relatively low numbers—is essential. It is also important that controls can be applied to the wide range of different matrices that are often tested in a single laboratory.

A unique preservation technology involving the controlled drying of authenticated cultures of internationally accepted control strains has resulted in the production of single-use discs containing microorganisms that are suitable for quality testing of culture media according to ISO 11133. These quality control materials, the LENTICULE® and Vitroids™ discs, are manufactured in our ISO/IEC 17025 and ISO 17034 accredited lab in Buchs, Switzerland. The discs contain pure cultures of bacteria, yeasts or molds in a solid water-soluble matrix. Comprehensive certificates of analysis provide details about the mean number of colony forming units (CFU) per disc, the method used to determine the product data, and the number of subcultures from the original strains provided under license by NCTC® and CECT®. The products are designed with a range of CFU concentrations to ensure either no or only minimal dilution steps are required, thereby saving time and reducing the likelihood of cross-contamination.

Culture media and control stain product information

The following table lists most of the culture media mentioned in ISO 11133 in alphabetical order. The first column describes the culture media product, the second its catalogue number. In the following columns, the control strains that are mandatory according to 11133 and the suggested microbiological CRMs are shown. The table also helps to find the products with the best suited CFU range for the corresponding test.

Note that the table contains neither all our media and strains available nor all the media and strains mentioned in ISO 11133. It lists a selection of the most commonly used media and the recommended strains. Our full portfolio can be found on our website **SigmaAldrich.com/culture-media**

SigmaAldrich.com/mibi-crm

Culture media	Cat. No.	Control strain acc. ISO	Test method*	WDCM	Suggested CRM	CFU range
BAIRD-PARKER agar (base) acc. ISO 6888 and FDA-BAM, GranuCult® prime	**105406**	*Staphylococcus aureus*	prod. quant.	00034	VT000343	80-130
		Escherichia coli	sel. qual.	00012	VT000127	50,000-150,000
		Staphylococcus saprophyticus	spec. qual.	00159	VT001596	1,000-10,000
BHI (Brain Heart Infusion) broth acc. ISO 6888, GranuCult® prime	**110493**	*Staphylococcus aureus*	prod. qual.	00034	VT000342	15-80
Bismuth sulfite (BS) agar acc. to WILSON and BLAIR acc. ISO 6579 and FDA-BAM, NutriSelect® prime	**100191**	*Salmonella* Enteritidis / Typhimurium	prod. quant.	00031	VT000313	80-130
		Escherichia coli	sel. qual.	00012	VT000127	50,000-150,000
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
BRILA (Brilliant-green bile Lactose) broth acc. ISO 4831, ISO 4832 and FDA-BAM, GranuCult® prime	**105454**	*Escherichia coli*	prod. qual.	00012	VT000122	15-80
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
Buffered Peptone Water acc. ISO 6579, 19250, ISO 21528, ISO 22964, ISO 6887, FDA-BAM and EP, GranuCult® prime	**107228**	*Salmonella* Enteritidis / Typhimurium	prod. qual.	00031	VT000312	15-80
		Escherichia coli	prod. qual.	00012	VT000122	15-80
		Staphylococcus aureus	prod. quant.	00034	VT000342	15-80
		Listeria monocytogenes 4b	prod. quant.	00021	VT000212	15-80

Culture media	Cat. No.	Control strain acc. ISO	Test method*	WDCM	Suggested CRM	CFU range
Coliform agar acc.to ISO 9308-1, Chromocult®	**110426**	*Escherichia coli*	prod. quant.	00012	VT000123	80-130
		Enterobacter aerogenes	prod. quant.	00175	VT001753	80-130
		Citrobacter feundii	prod. quant.	00006	VT000063	80-130
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
		Pseudomonas aeruginosa	spec. qual.	00025	VT000256	1,000-10,000
FRASER broth (base) acc. ISO 11290, GranuCult® prime	**110398**	*Listeria monocytogenes*	prod. qual.	00021	VT000212	15-80
		Escherichia coli	sel. qual.	00012	VT000127	50,000-150,000
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
GIOLITTI-CANTONI broth (base) acc. ISO 6888, GranuCult® prime	**110675**	*Staphylococcus aureus*	prod. qual.	00034	VT000342	15-80
		Escherichia coli	sel. qual.	00012	VT000127	50,000-150,000
Glucose OF (Oxidative/ Fermentative) medium (base) acc. ISO 21528 and FDA-BAM, GranuCult® prime	**103865**	*Escherichia coli*	prod. quant.	00012	VT000123	80 - 130
		Pseudomonas aeruginosa	spec. qual.	00025	VT000256	1,000-10,000
Half FRASER (Demi FRASER) broth (base) with antibiotics acc. ISO 11290, GranuCult® prime	**100025**	*Listeria monocytogenes*	prod. qual.	00021	VT000212	15-80
		Escherichia coli	sel. qual.	00012	VT000127	50,000-150,000
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
Lauryl Sulfate broth acc. ISO 4831, ISO 7251 and FDA-BAM, GranuCult® prime	**110266**	*Escherichia coli*	prod. qual.	00012	VT000122	15-80
		Citrobacter freundii	prod. qual.	00006	VT000062	15-80
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
Listeria agar (base) acc. OTTAVIANI and AGOSTI acc. ISO 11290, Chromocult®	**100427**	*Listeria monocytogenes*	prod. quant.	00021	VT000213	80-130
		Escherichia coli	sel. qual.	00012	VT000127	50,000-150,000
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
MKTTn (MULLER-KAUFFMANN Tetrathionate Novobiocin) broth (base) acc. ISO 6579, GranuCult® prime	**105878**	*Salmonella* Enteritidis	prod. qual.	00030	VT000302	15-80
		Escherichia coli	sel. qual.	00012	VT000127	50,000-150,000
		Pseudomonas aeruginosa	sel. qual.	00025	VT000257	50,000-150,000
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
MMGA (Mineral Modified Glutamate) agar acc. ISO 16649, GranuCult® prime	**109045**	*Escherichia coli*	prod. quant.	00012	VT000123	80-130
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
		Citrobacter freundii	spec. qual.	00006	VT000066	1,000-10,000
		Pseudomonas aeruginosa	spec. qual.	00025	VT000256	1,000-10,000
		Escherichia coli	prod. qual.	00202	CRM13216L	30-120
MSRV (Modified Semi-solid RAPPAPORT-VASSILIADIS) medium (Base) acc. ISO 6579, NutriSelect® prime	**109878**	*Salmonella* Enteritidis	prod. qual.	00030	VT000302	15-80
		Escherichia coli	sel. qual.	00012	VT000127	50,000-150,000
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
MYP (Mannitol egg yolk polymyxin) agar (base) acc. ISO 7932, ISO 21871 and FDA-BAM, GranuCult® prime	**105267**	*Bacillus cereus*	prod. quant.	00001	VT000013	80-130
		Escherichia coli	sel. qual.	00012	VT000127	50,000-150,000
		Bacillus subtilis subsp. *spizizenii*	spec. qual.	00003	VT000036	1,000-10,000
Nutrient agar acc. ISO 6579, ISO 10273 and ISO 21528, GranuCult® prime	**105450**	*Salmonella* Enteritidis	prod. quant.	00030	VT000303	80-130
		Escherichia coli	prod. qual.	00012	VT000123	80-130
PEMBA (Polymyxin Pyruvate Egg yolk Mannitol Bromothymolblue Agar) (base) acc. ISO 21871, GranuCult® prime	**120589**	*Bacillus cereus*	prod. qual.	00001	VT000013	80-130
		Escherichia coli	sel. qual.	00012	VT000127	50,000-150,000
		Bacillus subtilis subsp. *spizizenii*	spec. qual.	00003	VT000036	1,000-10,000
Peptone salt solution (Maximum recovery diluent) acc. ISO 6887 and ISO 8199, GranuCult® prime	**112535**	*Escherichia coli*	prod. quant.	00012	VT000122	15-80
		Staphylococcus aureus	prod. quant.	00034	VT000342	15-80
Plate Count agar acc. ISO 4833, ISO 17410 and FDA-BAM, GranuCult® prime	**105463**	*Bacillus subtilis* subsp. *spizizenii*	prod. quant.	00003	VT000033	80-130
		Escherichia coli	prod. quant.	00012	VT000123	80-130
		Staphylococcus aureus	prod. quant.	00034	VT000343	80-130
Plate Count skimmed milk agar acc. ISO 4833 and ISO 17410, GranuCult® prime	**115338**	*Bacillus subtilis* subsp. *spizizenii*	prod. quant.	00003	VT000033	80-130
		Escherichia coli	prod. quant.	00012	VT000123	80-130
		Staphylococcus aureus	prod. quant.	00034	VT000343	80-130

Culture media	Cat. No.	Control strain acc. ISO	Test method*	WDCM	Suggested CRM	CFU range
Pseudomonas CFC/CN agar (base) acc. ISO 13720 and ISO 16266, GranuCult® prime	**107620**	*Pseudomonas aeruginosa*	prod. quant.	00024	VT000243	80-130
		Escherichia coli	sel. qual.	00012	VT000127	50,000-150,000
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
RVS (RAPPAPORT-VASSILIADIS-Soya) broth (base) acc. ISO 6579, GranuCult® prime	**107700**	*Salmonella* Typhimurium	prod. qual.	00031	VT000312	15-80
		Escherichia coli	sel. qual.	00012	VT000127	50,000-150,000
		Pseudomonas aeruginosa	sel. qual.	00025	VT000257	50,000-150,000
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
Selenite Cystine (SC) broth acc. ISO 6579 and FDA-BAM (contains sodium selenite), GranuCult® prime	**100212**	*Salmonella* Typhimurium	prod. qual.	00031	VT000312	15-80
		Pseudomonas aeruginosa	sel. qual.	00012	VT000127	50,000-150,000
		Escherichia coli	sel. qual.	00025	VT000257	50,000-150,000
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
Sorbitol MacCONKEY (SMAC) agar acc. ISO 16654 and FDA-BAM, GranuCult® prime	**100213**	*Escherichia coli* O157:H7	prod. qual.	00014	VT000143	80-130
		Staphylococcus aureus	sel. qual.	00034	VT000347	50,000-150,000
		Escherichia coli	sel. qual.	00012	VT000127	50,000-150,000
TBX (Tryptone Bile X-glucuronide) agar acc. ISO 16649, Chromocult®	**116122**	*Escherichia coli*	prod. quant.	00012,	VT000123	80-130
		Escherichia coli	prod. quant.	00202	VT002023	80-130
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
		Citrobacter freundii	spec. qual.	00006	VT000066	1,000-10,000
		Pseudomonas aeruginosa	spec. qual.	00025	VT000256	1,000-10,000
Tryptic Soy agar acc. EP, USP, JP, ISO and FDA-BAM, GranuCult® prime	**105458**	*Bacillus cereus*	prod. quant.	00001	VT000013	80-130
		Bacillus subtilis subsp. *spizizenii*	prod. quant.	00003	VT000033	80-130
		Escherichia coli	prod. quant.	00012	VT000123	80-130
		Listeria monocytogenes	prod. quant.	00021	VT000213	80-130
		Staphylococcus aureus	prod. quant.	00034	VT000343	80-130
VRB (Violet Red Bile Lactose) agar acc. ISO 4832 and FDA-BAM, GranuCult® prime	**101406**	*Escherichia coli*	prod. quant.	00012	VT000123	80-130
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
		Pseudomonas aeruginosa	spec. qual.	00025	VT000256	1,000-10,000
VRBD (Violet Red Bile Dextrose) agar acc. EP, USP, JP and ISO 21528, GranuCult® prime	**110275**	*Escherichia coli*	prod. quant.	00012	VT000123	80-130
		Salmonella Enteritidis	prod. quant.	00030	VT000303	80-130
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
XLD (Xylose Lysine Deoxycholate) agar acc. ISO 6579, GranuCult® prime	**105287**	*Salmonella* Enteritidis	prod. quant.	00030	VT000303	80-130
		Escherichia coli	sel. qual.	00012	VT000127	50,000-150,000
		Enterococcus faecalis	sel. qual.	00009	VT000097	50,000-150,000
Yeast Extract agar acc. ISO 6222, GranuCult® prime	**113116**	*Escherichia coli*	prod. quant.	00012	VT000123	80-130
		Bacillus subtilis subsp. *spizizenii*	prod. quant.	00003	VT000033	80-130

***abbreviations:**

prod. = productivity
sel. = selectivity
quant. = quantitative

qual. = qualitative
spec. = specificity
WDCM = World Data Centre for Microorganisms

CRM = Certified Reference Materials
CFU = Colony Forming Units

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