



Compact Dry

An easy test method for counting microorganisms



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General information

Compact Dry is a *ready-to-use* test method which helps to reduce the time needed to perform microbial testing. Therefore, it allows maximum productivity by increasing efficiency. The plates can be used to test raw materials as well as finished products like food, beverages and cosmetics. In combination with a wet swab sampling system such as Promedia ST-25 (Art. No. Z0302, available from R-Biopharm), Compact Dry plates can also be used for surface monitoring especially for areas which are difficult to reach.

Compact Dry is an *easy-to-read* results test method. Place 1 ml of sample (liquid food or homogenized/ diluted solid food) onto the plate and wait until the liquid spread over the whole plate by itself. Incubate the plates at the temperature specified in the package inserts. The grown colonies are pigmented with different colors, developed by chromogenic substrates and redox indicators. The type of bacteria is identified by its color. For further investigation single colonies can be easily selected and picked from the plate surface.

Compact Dry is also an *easy-to-store* test method. The plates can be kept at room temperature for up to 24 months. Therefore samples can be applied to the plates directly on-side. The firmly closing lid allows the safe transport of the Compact Dry plates. The plates can be used over an incubation temperature range of 20 - 42 °C. The rigid structure of the Compact Dry plates enables easy, slip-proof stacking in the incubator and prevents leakage of sampling material. This saves space and keeps the incubator neatly.

Additionally membrane filters can be tested using Compact Dry plates. Pipette 1 ml of sterile water (or physiological sodium chloride solution; for example RIDA® NaCl, Art. No. Z0301) into the middle of the Compact Dry plate. Filter 100 ml water or any other liquid using an ordinary sterile membrane filter (e.g. Ø 47 mm, 0.45 µm pore size) for microbiological analysis. Place the filter on the moisturized nutrient pad with trap side up. Colonies will grow on the filter.

Membrane filter method: Procedure for Compact Dry

- Select a suitable Compact Dry Plate (e.g. EC), remove the plate cap and pipette 1 ml of sterile water (or sodium chloride solution) into the middle of the dry sheet.
- Using sterile tweezers pick up a sterile membrane filter.
- Remove the funnel from a sterilized filtering device and place the sterile membrane filter on the filter grid.
- Set the funnel, pour the sample water into the funnel and filter the sample water under reduced pressure.
- After filtering the sample, wash the inner surface of the funnel with 20 - 30 ml of sterile water and filter it. Repeat the same steps two or three times.
- Detach the funnel and take the membrane filter out with sterilized tweezers. Put the filter on the prepared Compact Dry plate avoiding any bubbles. The trap side has to be up.
- Turn over the capped plate and put in an incubator for incubation under the prescribed condition.

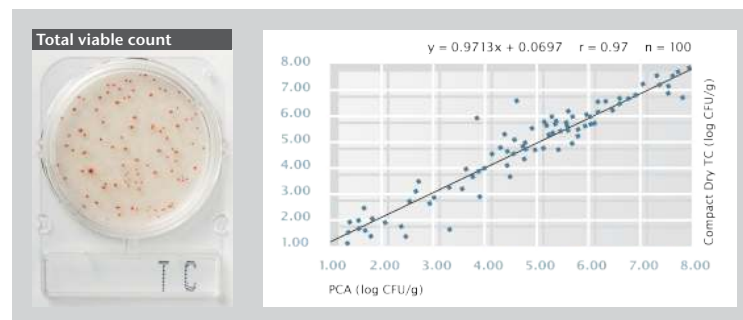
Compact Dry menu

Compact Dry TC (Total Count)

Compact Dry TC is a test plate for total viable mesophilic count, which contains a standard nutrient medium. The colonies grown on Compact Dry TC are red due to the redox indicator triphenyl tetrazolium chloride. Therefore they are easily to identify and to differentiate from possible food residues.

The diagram shows the excellent correlation between the Compact Dry TC method and the conventional PCA method (standard plate count agar). The comparison data have been prepared by evaluating 100 different food samples.

For the product Compact Dry TC not only the shown internal study has been finished successfully. The detection system for total count in food samples has already gained various official approvals (s. table on last page).



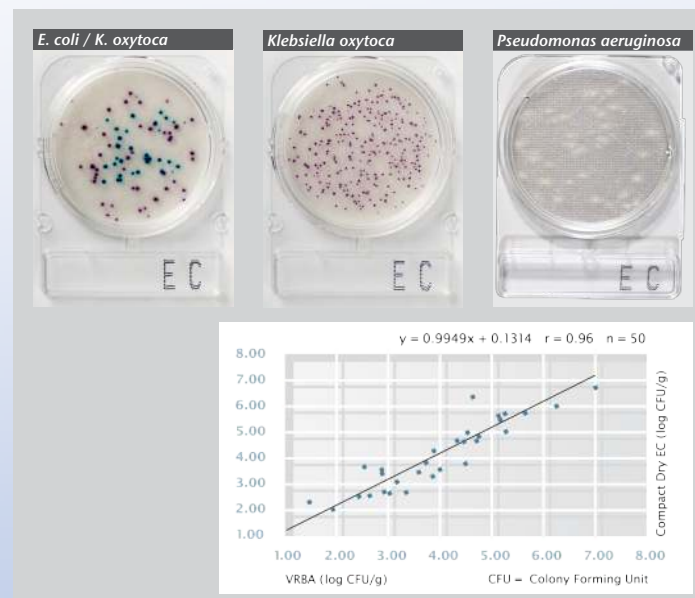
Detection of lactic acid bacteria using Compact Dry TC

For the detection of lactic acid bacteria it is recommended to use Compact Dry TC. Samples should be diluted using sterilized saline and incubated under anaerobic conditions at 30 °C.

Compact Dry EC (*E. coli* and coliforms) bacteria form blue and red colonies

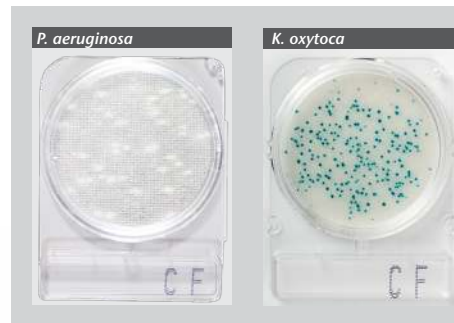
Compact Dry EC is a medium for *E. coli* and coliforms. The medium contains two kinds of chromogenic enzyme substrates: Magenta-Gal and X-Gluc. Due to these substrates *E. coli* forms blue to blue purple colonies while coliforms show a reddish, red violet or pink coloration. The total coliform group count is the sum of all colonies identified as coliforms or *E. coli*.

Regression line data from the Compact Dry EC method for enumeration of coliforms plotted versus the conventional VRBA method (violet red bile agar) show a very good correlation per 50 food samples. Furthermore Compact Dry EC has gained various official approvals (s. table on last page), also.



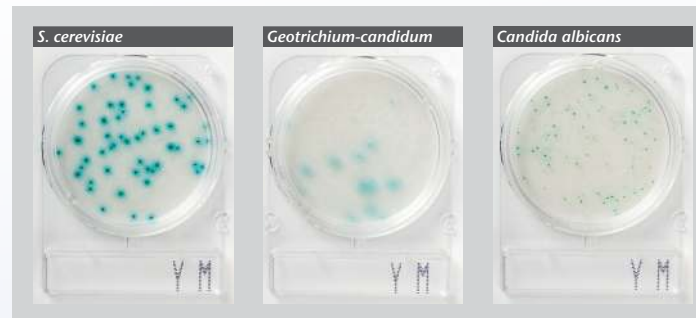
Compact Dry CF for Coliforms

For the detection of coliforms Compact Dry CF is an easy tool. Coliforms grow with blue/blue green colonies as the recipe contains the chromogenic enzyme substrate X-GAL. The growth of bacteria others than coliforms is mainly inhibited, but in case of growth they form colorless colonies. Compact Dry CF has gained various approvals (see table on last page).



Compact Dry YM for Yeast and Mold

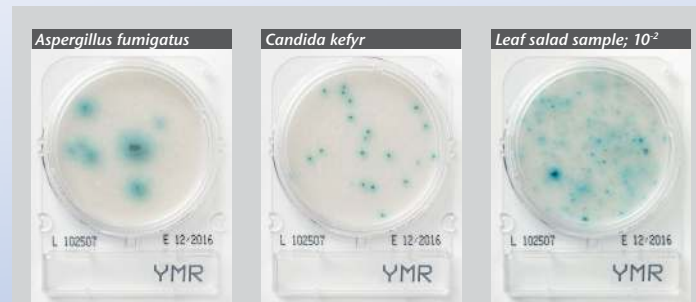
With Compact Dry YM yeasts and molds can be differentiated by color development. The medium contains the chromogenic enzyme substrate X-Phos which turns blue with most types of yeast. Molds form their characteristic 3-dimensional, “fluffy” colonies in different typical colors. Antibiotics in the medium of Compact Dry YM plates inhibit the growth of bacteria. The plates containing the diluted sample can be evaluated after 3 to 7 days of incubation time. The Compact Dry YM allows a very good 3-dimensional growth of yeast and mold. Compact Dry YM has gained various approvals (see table on last page).



Compact Dry YMR for rapid detection of Yeasts and Molds

Detection within 48 h!

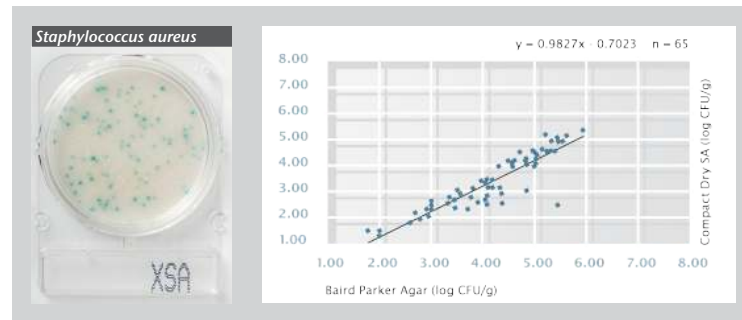
With Compact Dry YMR yeasts and molds can be detected after only 48 to 72 h incubation time. The chromogenic enzyme substrate contained in the nutrient pad turns blue with most types of yeast and molds, whereas molds may change quickly to their own characteristic pigmentation. Molds can easily form 3-dimensional, fluffy colonies between the nutrient pad and the lid of the plate, even in only 72 hours. Antibiotics in the medium of Compact Dry YMR inhibit the growth of bacteria. Compact Dry YMR has gained various approvals (see table on last page).



Compact Dry X-SA for *Staphylococcus aureus*

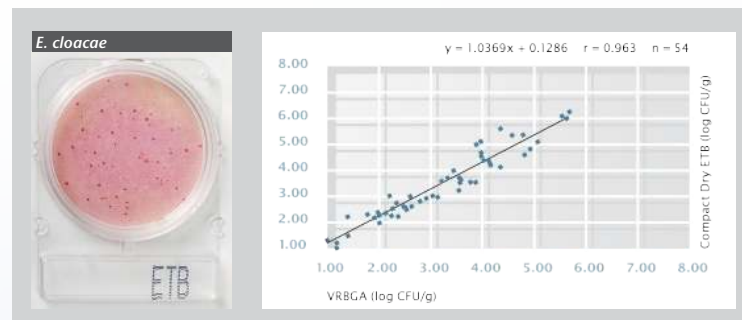
Compact Dry X-SA is a medium used to determine *Staphylococcus aureus* by means of selective growth and differentiation via chromogenic substrates. The medium is based on an improved mannitol-salt agar. During growth *Staphylococcus aureus* converts substrates for acid phosphatase and β -glucosidase into blue colored products. This results in formation of light blue colonies.

Compact Dry X-SA has gained various approvals (s. table on last page). For further information please consider the special Compact Dry X-SA flyer.



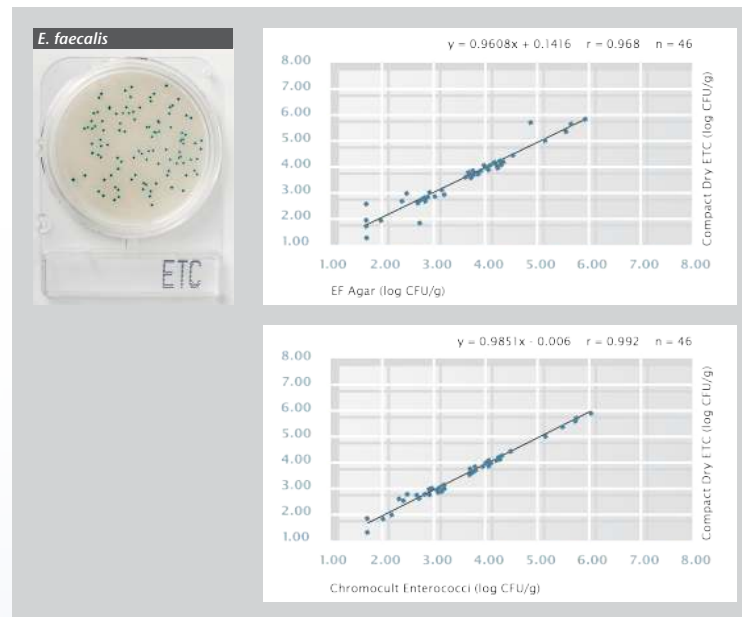
Compact Dry ETB for *Enterobacteriaceae*

Compact Dry ETB serves for easy and fast detection of *Enterobacteriaceae*. The medium contains glucose and selective agents for differentiation and enumeration of *Enterobacteriaceae*. Specific colonies will be almost visible in a red color. Due to the crystal violet contained in the nutrient pad of Compact Dry ETB colonies can be colored reddish violet, occasionally. The medium has gained various official approvals (s. table on last page).



Compact Dry ETC is a plate for easy detection of *Enterococci* in food and water

Enterococci occur and grow in a variety of fermented foods. The presence of *Enterococci* in food products has long been considered as an indication of poor sanitary conditions during production and processing. On the other hand, *Enterococci* are specifically used for the fermentation of a variety of foods. It is claimed that *Enterococci* play an important role in the development of the organoleptic properties of the fermented foods. For water, the presence of *Enterococci* serves as an indicator of fecal contamination. *Enterococci* in water can only come from human or animal feces. The Compact Dry ETC is based on the usage of X-glucoside (X-Gluc.) and antibiotics as selective agents. *Enterococci* will grow with blue to blue green colonies after incubation for 24 hours at 37 °C.



Compact Dry ETC is official approved by NordVal for water testing (s. table on last page).

Compact Dry SL for *Salmonella*

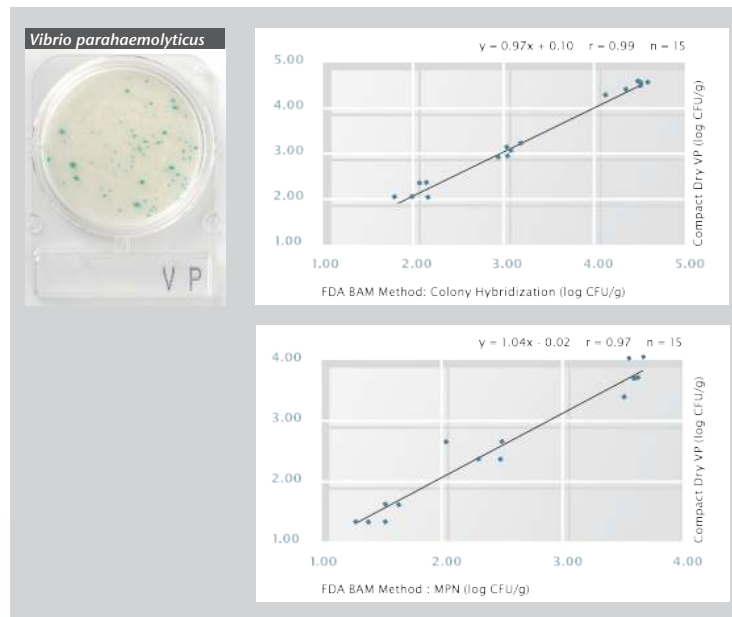
With Compact Dry SL an easy and reliable detection of *Salmonella* is possible using the regular pre-enrichment procedures for food samples according to ISO 6579:2007. The principle of *Salmonella* detection on Compact Dry SL is fielded into three different criteria which can be observed on the detection plate:

1. Color change of the medium from blue-purple to yellow. The color change is due to an alkalization reaction caused by the *Salmonella* specific enzyme lysine decarboxylase.
2. The occurrence of green to black colonies caused by decomposition of a chromogenic substrate (green-blue) as well as the ability of *Salmonella* to produce hydrogen sulfide (colonies will be colored black if iron ions are present).
3. The motility of *Salmonella* proven by migration of colonies from the point of inoculation of sample to other areas of the detection plate.



Compact Dry VP for *Vibrio parahaemolyticus* and *Vibrio* spp.

Vibrio parahaemolyticus is a bacterium that can cause cholera. *Vibrio parahaemolyticus*-associated gastroenteritis is the infection caused by this organism. *Vibrio parahaemolyticus* naturally inhabits coastal waters and is present in higher concentrations during the summer; it is a halophilic or salt-requiring organism. *Vibrio parahaemolyticus* is found in marine environments, sea foods, and the feces of patients with acute enteritis. Compact Dry VP can not only easily detect *Vibrio parahaemolyticus*, but also differentiate *Vibrio parahaemolyticus* from other vibrios. The product contains a specific chromogenic substrate for *Vibrio parahaemolyticus* which develops blue/green or blue colonies, whereas other vibrios develop white colonies.



Compact Dry CC for determination of total count in tea products

To monitor the hygienic status of products and environmental surfaces in the production side it is mandatory to conduct analysis for the total amount of microorganisms. But it isn't always possible to evaluate correctly using standard plate count media, because of growth inhibiting substances which may occur in special foods or as disinfectant residues on surfaces. Especially tea extracts and beverages which are produced from the extracts can contain catechin which is known to be a strong inhibitor of bacterial growth. Compact Dry CC contains a modified standard nutrient medium with additives which can



neutralize the inhibiting effects from catechin or other bacteriostatic agents. The chromogenic substrate is responsible for the blue-green coloration of the grown colonies.

Compact Dry PA for *Pseudomonas aeruginosa*

Pseudomonas aeruginosa is an opportunistic pathogenic bacterium of both humans and plants and can cause a variety of diseases especially in people with weakened immune systems. *P. aeruginosa* and other members of the genus (e.g. *P. putida*) are also known to occur as a cause of spoilage in food products.

On Compact Dry PA growing pseudomonads colonies will develop a red coloration which is due to the integrated redox indicator die Tetrazolium salt. The differentiation of *P. aeruginosa* to other pseudomonads is the formation of a greenish-yellow halo surrounding the colony (see image).



Some other bacterial genera or *Pseudomonas* species are able to grow in some cases, but will form colorless or red colonies without the greenish-yellow halo (colonies marked with black circles in the image). Around 20 % of the *P. aeruginosa* strains will occur without halo, also.

Compact Dry AQ for detection of heterotrophic water bacteria

Most of the common standard methods for total count of heterotrophic water bacteria recommend to use nutrient rich media as well as incubation temperatures at $36 \pm 1^\circ \text{C}$. Due to these conditions for growth versus the condition requirement of water bacteria it might be possible that only a part of the actual microbial load in the sample will be detected. Compact Dry AQ is a medium that also contains a full composition of nutrients on one side, but with significantly lower nutrient concentration as

common PC media. Withal there is a longer incubation period at lower temperatures necessary for Compact Dry AQ. These conditions will lead to a better representation of slowly growing bacteria or those which are adapted to rather low temperatures besides fast-growing organisms which prefer high nutrient concentrations.

Detailed information can be found within the special flyer for Compact Dry AQ.

Compact Dry LS for the detection of *Listeria* spp.

Listeria can be found in all areas of the biotic environment. These organisms are known as so called „dirt germs“. From about 10 already known species there is only one pathogenic organism *Listeria monocytogenes* described as cause of food poisoning. Infections may cause sepsis, meningitis or encephalitis and be fatal very often. Infections of pregnant women will have unexceptional dramatically consequences for the fetal development.

The risk potential of contaminations with *L. monocytogenes* can be estimated very well via the

quantitative determination of the total amount of *Listeria* in the samples. Consequentially counter measures during food production can be taken early without direct detection of the pathogen. Compact Dry LS contains a standard nutrient medium for detection of *Listeria* spp. The implemented chromogenic substances lead to a blue coloration of colonies on Compact Dry LS.

Detailed information about this product can be found within the special flyer.

Compact Dry X-BC for the detection of *Bacillus cereus*

The Gram-positive bacterium *Bacillus cereus* is able to produce survivable spores and is wide spread in soil and waters. Therefore, it is quite obvious that this organism can enter the production chain of foods relatively easy. *B. cereus* is not only able to spoil foods; moreover it possesses toxic characteristics because of its toxin that can cause vomit and diarrhea. The routinely control of foods for contaminations with *B. cereus* is therefore recommended.

Compact Dry X-BC plates have to be incubated at 30°C for 24 hours. The chromogenic substances in the medium are used by *B. cereus* to form green-blue colonies. The Compact Dry X-BC nutrient pad is approved according to ISO 16140 (s. table on last page).

Detailed information concerning handling and validation results can be found in the special flyer for Compact Dry X-BC.

Features and benefits

Compact Dry combines the features and benefits of the traditional plate media with the modern features of dehydrated film media.

This unique combination will shorten your test time and increase your lab efficiency, thus reducing your total costs.

| Steps | Criteria | Homemade plates | Prepared plates | Other dehydrated plates | Compact Dry |
|-------------------------------|---------------------------------------|-----------------|-----------------|-------------------------|-------------|
| Preparation and storage | Ready to use | | • | • | • |
| | Long shelf life at RT | | | | • |
| | Small size (for storage and disposal) | | | • | • |
| Inoculation (simple and fast) | Liquid samples | | | • | • |
| | Surfaces | | | • | • |
| Incubation | Small size | | | • | • |
| | Tidely closing system | | | | • |
| | No contact to incubator surfaces | | | | • |
| Reading and interpretation | Easy counting (chromogenic) | | • | • | • |
| | Easy picking and cloning | • | • | | • |
| Validation | Standardization of the production | | • | • | • |
| | Validation/approvals | • | • | • | • |

Product overview

| Product | Art. No. | Packaging | Application | Incubation time | Incubation temperature |
|----------------------------------|----------|------------|--------------------------------|-----------------|---|
| Compact Dry AQ | HS9541 | 100 plates | Heterotrophic water bacteria | 48 ± 2 hours* | 35 ± 1 °C* |
| | HS9542 | 40 plates | | | |
| Compact Dry CC | HS7311 | 100 plates | Total count in tea products | 48 hours | 35 ± 2 °C |
| | HS7312 | 40 plates | | | |
| Compact Dry CF | HS8791 | 100 plates | Coliforms | 18 - 24 hours | 35 ± 2 °C; 40 - 42 °C for fecal coliforms |
| | HS8792 | 40 plates | | | |
| Compact Dry EC | HS8781 | 100 plates | <i>E. coli</i> and coliforms | 24 hours | 35 ± 2 °C |
| | HS8782 | 40 plates | | | |
| Compact Dry ETB | HS9431 | 100 plates | <i>Enterobacteriaceae</i> | 24 - 48 hours | 35 - 37 °C |
| | HS9432 | 40 plates | | | |
| Compact Dry ETC | HS9461 | 100 plates | <i>Enterococci</i> | 20 - 24 hours | 35 ± 2 °C |
| | HS9462 | 40 plates | | | |
| Compact Dry LS | HS8811 | 100 plates | <i>Listeria spp.</i> | 24 hours | 35 - 37 °C |
| | HS8812 | 40 plates | | | |
| Compact Dry PA | HS9491 | 100 plates | <i>Pseudomonas aeruginosa</i> | 48 ± 3 hours | 35 ± 1 °C |
| | HS9492 | 40 plates | | | |
| Compact Dry SL | HS9401 | 100 plates | <i>Salmonella</i> | 20 - 24 hours | 41 - 43 °C |
| | HS9402 | 40 plates | | | |
| Compact Dry TC | HS8771 | 100 plates | Total Count | 48 hours ** | 35 ± 2 °C** (20 - 42 °C) |
| | HS8772 | 40 plates | | | |
| Compact Dry VP | HS8821 | 100 plates | <i>Vibrio parahaemolyticus</i> | 18 - 24 hours | 35 - 37 °C |
| | HS8822 | 40 plates | | | |
| Compact Dry X-BC | HS9721 | 100 plates | <i>Bacillus cereus</i> | 24 hours | 30 °C |
| | HS9722 | 40 plates | | | |
| Compact Dry X-SA | HS9621 | 100 plates | <i>Staphylococcus aureus</i> | 24 hours | 35 - 37 °C |
| | HS9622 | 40 plates | | | |
| Compact Dry YM | HS8801 | 100 plates | Yeasts and molds | 3 - 7 days | 25 - 30 °C |
| | HS8802 | 40 plates | | | |
| Compact Dry YMR | HS9801 | 100 plates | Yeasts and molds | 48 - 72 hours | 25 - 30 °C |
| | HS9802 | 40 plates | | | |

* See instructions for use for special incubation conditions according to ISO 6222

** please use the incubation temperature/time according to the legal specification of each country's food regulations

Approvals

| Product name | Validation (Ref. No.) | | |
|-----------------|-----------------------|------------|---------------|
| | MicroVal | NordVal | AOAC-RI |
| Compact Dry AQ | --- | --- | --- |
| Compact Dry CC | --- | --- | --- |
| Compact Dry CF | <u>MV0806-003LR</u> | <u>035</u> | <u>110401</u> |
| Compact Dry EC | <u>MV0806-004LR</u> | <u>036</u> | <u>110402</u> |
| Compact Dry ETB | <u>MV0806-002LR</u> | <u>034</u> | --- |
| Compact Dry ETC | --- | <u>047</u> | --- |
| Compact Dry LS | --- | --- | --- |
| Compact Dry PA | --- | --- | --- |
| Compact Dry SL | --- | --- | --- |
| Compact Dry TC | <u>RQA2007LR01</u> | <u>033</u> | <u>010404</u> |
| Compact Dry VP | --- | --- | --- |
| Compact Dry XBC | <u>2011-LR41</u> | <u>045</u> | --- |
| Compact Dry XSA | <u>2008LR14</u> | <u>042</u> | <u>081001</u> |
| Compact Dry YM | <u>RQA2008LR10</u> | <u>043</u> | <u>100401</u> |
| Compact Dry YMR | <u>2016LR61</u> | <u>050</u> | pending |

MicroVal and NordVal approvals are according to the international standard “Microbiology of food and animal feed – Method validation”; EN ISO 16140.

Compact Dry TC also is approved by:

- Servico Publico Federal; Minsterio da agricultura, pecuaria e ae Astecimento;
Brazil No. AUP/CGI/DIPOA No. 0453/2006
- Microbiological Methods Committee; Microbiology Evaluation Division;
Bureau of Microbial Hazards, Food Directorate, Health Products and Food Branch, Health Canada; Ottawa, Ontario K1A 0L2

Compact Dry plates are produced at an ISO 9001 certified production site.

References

Hasan Aycicek, Utku Oguz, Koray Karci (2006)

Determination of total aerobic and indicator bacteria on some raw eaten vegetables from wholesalers in Ankara, Turkey. Int. J. Hyg. Environ.-Health 209: 197 - 201

Nissui Pharmaceutical granted PTM status for Compact Dry TC, Inside Laboratory Management; AOAC, July 2004: 19 - 22

Bachmann, B., Lüthi, M. (2003)

Evaluation mikrobiologischer Methoden zur Prüfung von Trinkwasser im Feld für Katastropheneinsätze. Mitt. Lebensm. Hyg. 94: 579 - 593

Ellis P., Kirchof G. and Meldrum R. (2003)

Evaluation of the Compact Dry SL method for the detection of Salmonella in spiked food samples. Poster presentation at HPA 1st Scientific Conference, University of Warwick, September 2003

Ellis, P. and Meldrum R. (2002)

Comparison of the Compact Dry TC and 3M Petrifilm ACP dry sheet media methods with the spiral plate method for the examination of randomly selected foods for aerobic colony count. J. Food Prot. 65: 423 - 425

Ellis P and Meldrum Rj (2001)

Evaluation of dryfilm methods for aerobic colony counts. Poster presentation at PHLS 26th Scientific Conference, University of Warwick, September 2001

Mizuochi, S. and Kodaka, H. (2000)

Evaluation of dry sheet medium culture plate (Compact Dry TC) method for determining numbers of bacteria in food samples. J. Food Prot. 63: 665 - 667

Mizuochi, S., Kamiya, H., Kodaka, H., Sengoku, H., and Horigome, K. Compact Dry for the Enumeration of Bacteria in Food. ASM 1999 General Meeting, Chicago 1999

Kodaka, H. and Ishikawa, M. (1995)

Evaluation of new medium with chromogenic substrates for members of the family Enterobacteriaceae in urine sample. J. Clin. Microbiol. 33: 199 - 201.

Curiale, M.S. and Sons, T., et. al (1991)

Dry rehydratable film for enumeration of total coliforms and escherichia coli in foods: Collaborative study. J. Assoc. Off. Anal. Chem. 74: 635 - 648

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