Combining Automatic Handling Technoloby and Colony Counting Technology

**PDH series is an automatic petri dish handler for PSF Colony Counter series.
Easy automatic measurement can be performed by only set the petri dishes.
Since the petri dish lid can be opened and closed automatically, highly accurate colony counting can be performed even if there are mark, label, etc.
It is also possible to measure colonies around the petri dish as an option.
Remote control by network is available.**

Speed & Time saving

Achieves high-speed measurement of 100 petri dishes / hour. You may leave machine untill operation complete.

Easy

Simply set the petri dish and then push a button to achieve easy automatic colony couting. Automatic output of measurement reports is also possible.

Reliability

Reduced human error and realized stable and constant measurement.

Large number of samples

In PDH-521T9, 105 petri dishes can be installed at the same time. Customization up to 600 petri dishes is possible.

Samples management

Measurement conditions and sample information can be automatically entered using a QR code or barcode. It is also possible to mix samples with different types and measurement conditions.

Safety Precaution

- ☐ Make sure to read the instruction manual carefully before use.
- ☐ Specifications and appearance of products may change due to further improvement without prior notice.
- ☐ The actual color of the product may be slightly different from the printed picture in this brochure.

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Sales Distributor

2021/09/30 600

SHASHIN KAGAKU
PRODUCT COMPANY

New software is released!

Instantly measures the number of colonies in a sample with a high degree of accuracy and repeatability.

AUTOMATIC COLONY COUNTER

The World Latest Automatic Colony Counter

PSF Series

Improve your work efficiency with problem solutions.

Our Colony Counters solve these problems

Problem 1

Manual counting methods take time and also there is huge quantities of specimen.

- Manual counting takes too much time and delays other operations.
- Counting operation causes stiff neck and shoulders.

Problem 2

Measurement results are not consistent due to visual counting.

- Accurate measurement is hard when in measuring coliform bacteria larger than 0.5mm.
- Due to physical condition of the day, it may be possible to miss small colonies.

Problem 3

Measurement accuracy decreases when in measuring a widespread colony.

- There might be possibly existing beneath the widespread colonies on the surface of pouring culture medium, however it counts as single colony.

Problem 4

Existing measuring devices is unable to measure separately in terms of various color case.

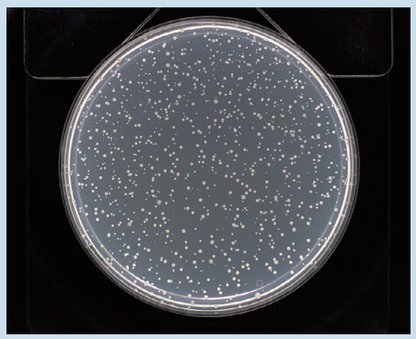
- In terms of manual counting, it uses different color marker to count, however this makes less work efficiency.

10 minutes manual counting method makes just *5 seconds.*

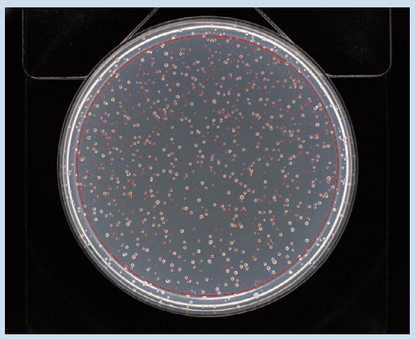
It may differ depending on the number and kind of the colonies.

What is "Automatic Colony Counter".

It is a device that enables to count immediately the number of colonies in a designated area.



Original image



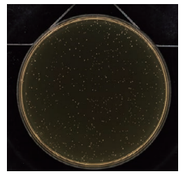
Measured image

Automatic Colony Counter will solve various problems.

Manual counting methods take time and also there is huge quantities of specimen.

1 Problem solution

In case of more than 300 colonies in one petri dish, it takes 5 minutes by manual measurement, but it takes only 3 seconds by automatic measurement.



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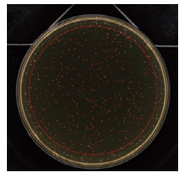


Measured image

Reason

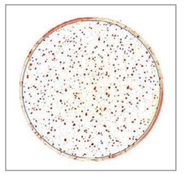
High speed image processing makes quick operation. Without fatigue, it enables to complete with one single person even many specimen case.

Measuring method is not consistent due to visual measurement.

2 Problem solution

Individual measurement with fixed size range of colonies makes stable and consistent measurement.

Original image



Measured image

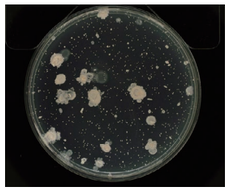
Reason

The area calculation of each colonies enabled to measure individually only designated diameter.As long as culture medium thickness is fixed, it enabled to measure only designated colony by fixed binary coefficient.

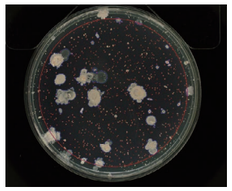
Measurement accuracy decreases when in measuring a widespread colony.

3 Problem solution

It measures only the area could be measured accurately and enables CFU conversion.



Original image



Measured image

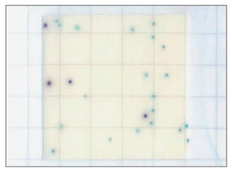
Reason

In terms of automatic measurement, widespread colonies can be excluded automatically from measurement objects. Measurable areas are automatically calculated and it enables accurate CFU conversion.

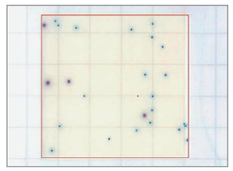
Existing measuring devices is unable to measure separately in terms of various color case.

4 Problem solution

Max 8 kinds of colonies can be measured individually. For example, "separate by different colors", "separate by different colors and sizes", "separate by different colors and brightness".it is possible to set conditions appropriately up to culture medium and colonies.



Original image



Measured image

Reason

This devices is equipped with color camera. Condition setting can be done easily by simple clicking the measurement objects on the display.

We provide solution about further problems below.

Problems		Solutions
1 Various shape of colonies is possible to measure automatically?	>	Colonies are selected by the brightness and their color information, therefore it does not matter for the shape.
2 Colonies with residue are possible to measure?	>	As long as colonies and residues size are different, it is possible to measure.
3 Various size of colonies is mixed, but is it possible to measure them automatically?	>	It is possible to set a wide range of colony sizes to measure all of them.
4 Very tiny and thin colonies are possible to measure?	>	It is possible to measure all as colony, for instance, brighter objects than culture medium.
5 Colonies are large and sticking together, then is it possible to measure under this condition?	>	It is possible to measure separately by overlap differentiation function.
6 Is it possible to compare visual measuring result and the result of automatic one.	>	It is possible to measure petri dishes marked with a pen by visual measurement.

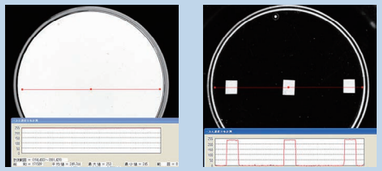
It enables accurate measurement even culture media with unclear colonies or uneven thickness.

Uniform light source solves slight difference between culture medium and colonies.

Necessity of uniform light source over the whole petri dish.

In order to measure accurately, it is necessary to have hardware with even light source and adjustment by software even culture medium has uneven conditions.Uniform light source can be performed both hardware and software aspects.

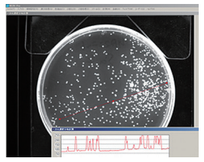
High accurate measurement can be achieved by calibrating brightness of culture medium which has uneven thickness.



Brightness graph in bright field and dark field.

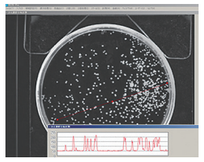
Even light source in 90 φ Petri dish exposed to both bright field and dark field.

Normal



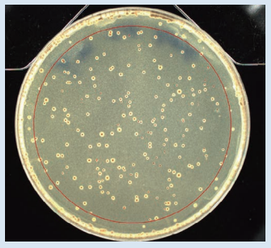
Inclination can be seen on the background image with monochrome conversion.

After calibration



Background of monochrome image with calibration can be processed by software.

Measurement functions when there is a residue or a sediment

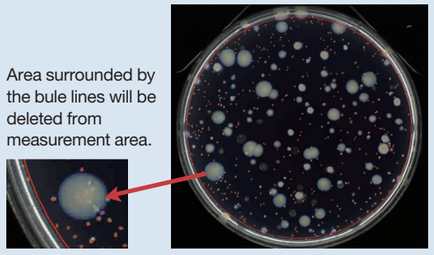


Measured by the difference of the feature between colonies and others.

It is possible to measure if there is a difference in size, brightness or color between the colonies and residues or sediments.

Automatic delete function for a widespread colony

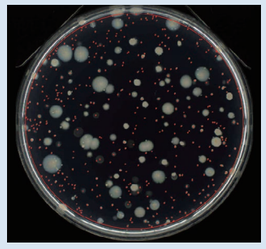
Area surrounded by the bule lines will be deleted from measurement area.



Undefined area will be automatically deleted

Colonies are usually within a certain size range, so larger ones can be excluded.
It is also possible to correct the excluded area.

Manual adjustment for measurement result



Automatic calculation with manual adjustment

1. Specify the size range of target colonies.
2. Area that needs to be checked by human can be added or deleted by manual mode. Combination of automatic and manual is possible.

Support/Compliant regulations and standards

CE FDA 21 CFR Part 11 GLP LIMS

FDA BAM | ISO7218：2007 | ISO4833.2 | ISO15189 | AOAC977.27 | CLSI | EUCAST | NF V08-100 | XP V08-034

High accurate counting can be achieved with various colony quantities.

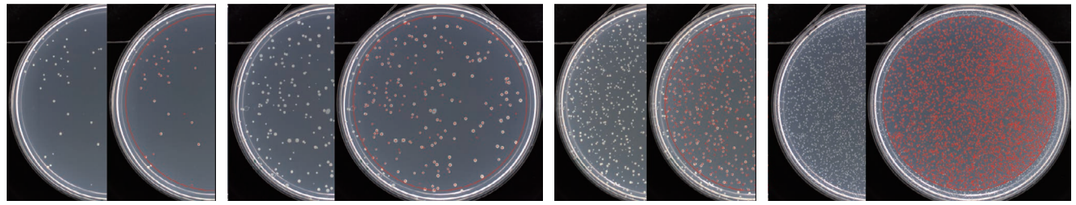
Counting accuracy of colonies with different quantities

Colonies with approx. 50 units

Colonies with approx. 200 units

Colonies with approx. 1000 units

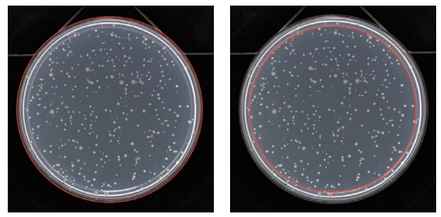
Colonies with approx. 4000 units



Under the same measurement condition, accurate counting can be achieved regardless of colony quantities.

More convenient and easier measurement

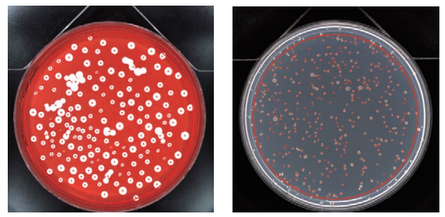
Automatic petri dish detection



Offset 0mm　Offset 5mm

The measurement area of a round petri dish can be detected and set automatically.
This enables measurement regardless of where the dish is placed on the stage, freeing the user from the hassle of setting an area and adjusting the petri dish position.
Of course, it is also possible to adjust the area range by setting the offset value beforehand.

Easy operation mode



Samples counted only by automatic binaryization

With the automatic binarization function, it is possible to count without making any troublesome condition setting.
Combined with the automatic petri dish detection function, the time required for setting conditions can be greatly saved.
Of course, you can count more accurately by setting the optimum conditions.

Measuring result can be displayed or transferred to Excel file.

The measurement number, sample name, number of colonies, CFU, etc. are displayed on the software.
It is possible to transfer the measurement results to Microsoft Excel. At that time, the image link is also recorded automatically.

Results list

No.	Sample name	Dilution ratio	Sample Volume(ml)	Number of colonies Class1	CFU/ml Class1
1	test1	0.001	0.001	399	399.00
2	test2	0.001	0.001	3589	3589.00
3	test3	0.001	0.001	3152	3152.00

Display on the software

Export to Excel file

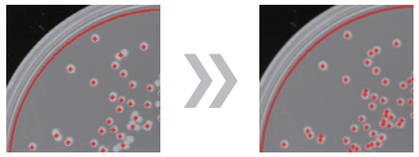
	A	B	C	D	E	F	G	H	I	J	K	L	M
2	Colony Counter Report											Date	2020/6/14
3												Operator	shimo
4	Area of region		10474.7			Instrument name		PSF-2100				Output by	Approval
5	Dish area		3835.21			Measurement type		Standard plate counting					
6	Area conversion		✔			Condition name		1一一般的500_円検出					
7	Region %		36.61			Remarks							
8	No.	Number of colonies				Dilution ratio	Sample Volume	CFU/ml				Sample name	Image link
9		Class1	Class2					Class1	Class2				
10	1	399				0.001	0.001	399				test1	
11	2	3589				0.001	0.001	3589				test2	
12	3	3152				0.001	0.001	3152					

Display in Excel Data File

Standard software corresponds to various kind of specimen like round or square patri dishes, or spiral plates.

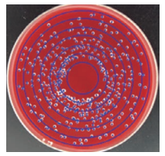
Overlap differentiation function

Overlapping colonies can be automatically separated for individual measurement.



Measurement on spiral plate

Standard software includes spiral plate measurement.



Any kind of spiral plater can be used by changing the area freely and it corresponds to 2 patterns (Ring type and Spiral type).
A ring type can output the number of colonies and spiral type can output cumulated colony within measurable area.

Adjustment function for uneven brightness

Even if the thickness of culture medium is not uniform, the brightness can be adjusted and measured with high accuracy.

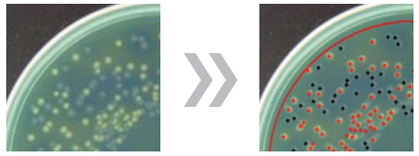
Image of uneven thickness　Simple binarized image　Image of adjustment function

Selective counting function by size

Due to selective counting function by size, it enables to count after removing scattered colonies.

Separate measurement by color extraction

Up to eight colors of colonies can be measured separately.



Specifications/ Products

Model	PSF-1100	PSF-2100	PSF-5100	PSF-7100	PSF-5100L	PSF-7100L	PSF-7100W
Dimensions of main unit	W280× D351×H630 mm						W700×D700 ×H1220 mm
Weight	19 kg						70 kg
Power Source	AC 1φ 100-240 V 50/60 Hz						
System configuration	Main Unit only. (PC and Monitor are sold separately)						
Operating environment	10-35 °C, 20-80 % humidity						
Camera	Color CMOS camera						
Number of pixels	3 MP	5 MP	12 MP	20 MP	12 MP	20 MP	20 MP
Calculated resolution	67 µm	53 µm	34 µm	28 µm	50 µm	42 µm	69 µm
Measurement object	Viable bacteria Colonies on petri dishes, Petri films, filters, compact dry, film media, Plaques and Inhibition zones*.						
Maximum count area**	100×134 mm				152×165 mm		250×250 mm
Round Petri Dishes	up to φ 100 mm				up to φ 150 mm		up to φ 200 mm
Multi-well plates	6, 12, 24-wells. Optional software required.						
Measurement time	1 to 5 seconds per petri dish. Depends on PC performance and measurement conditions.						
Maximum number of colonies	20,000 colonies (settings can be changed)						
Light shielding	Dust cover Shading Sliding Door is optional.		Shading Sliding Door				Rolling curtain
Top lighting (reflective)	Fixed type	Height adjustable***					none
Bottom lighting	Darkfield and brightfield						

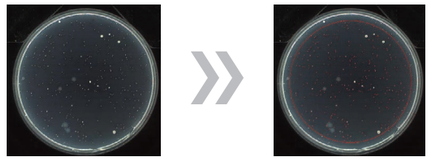
*Optional software is required to inhibition zone measurement. This software is standard only in PSF-7100W.
**For square petri dishes, use one that is smaller than the maximum count area.
*** It is possible to change the height position of the top lighting. By this function, the outline of colonies can be clearly photographed.

Japan's top Automatic Colony Counter with wide variety of measurement cases.

General viable bacteria

General viable bacteria cultured on agar media. All colonies in the measurement area were counted.

Original image　Measured image



Agar media, general viable bacteria

All colonies in the measurement area were counted.
Image is without manual correction

Lactic bacteria

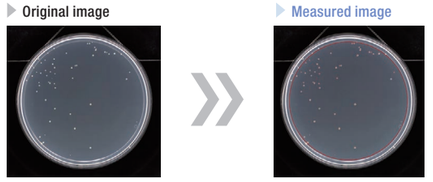
Original image　Measured image

All colony counting with a petri dish cover
If condensation laminates as a small mist, it enables to measure with cover.

Mutagen testing (Ames)

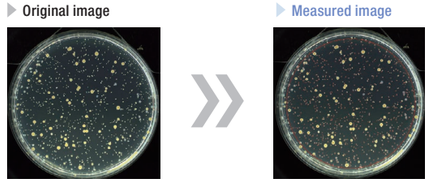
Even if the number of colonies increase or decreases by dilution, it enables to count accurately on the same setting regardless of the number of colonies.

Original image　Measured image



Food industry and food distribution industry

Original image　Measured image

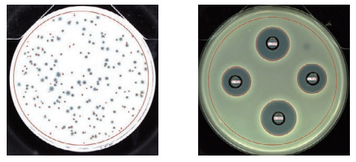


A measurement of general viable bacteria. All colonies in the measurement area were counted.

Pharmaceutical industry

It enables to measure colonies, inhibition zones in one device.

Plaque　Inhibition zone measurement

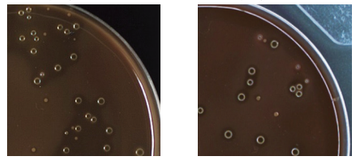


Optional software is required for inhibition zone measurement.

Specimen examples for each machines

Compares to PSF-1100, PSF-2100 can shoot sharper image with high contrast of colonies and culture media, therefore it can enhance measurement accuracy of tiny colonies.

Image of PSF-1100 type with top light　Image of PSF-2100 type with top light

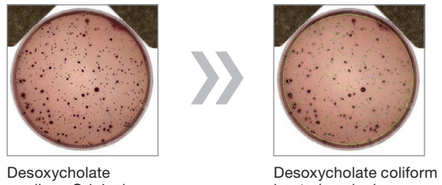


Due to clearer image of PSF-2100, it enables to enhance measurement accuracy for thin colony or same color colonies.
PSF-5100/7100 could take more clear pictures.

Water Analysis industry

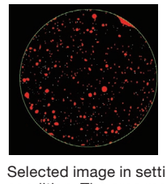
Desoxycholate medium, Original image of coliform bacteria

Original image　Measured image



Desoxycholate medium, Original image of coliform bacteria

Desoxycholate coliform bacteria colonies Measured image larger than 0.5mm



Selected image in setting condition. The area marked color is the colonies larger than 0.5mm.