

. 3M™ Clean-Trace™ ATP Hygiene Monitoring System.
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Keeping
Food Safe through
Smart Innovation



Why is Cleaning Important?

- Cleaning is a first line of defence against cross contamination
- Cleaning is carried out to remove product residue and biofilms
- Equipment must be cleaned to be effectively sanitized
- Cleaning & sanitation improves product quality, shelf life, and reduces the risk of product recall
- Meets legal and due diligence requirements

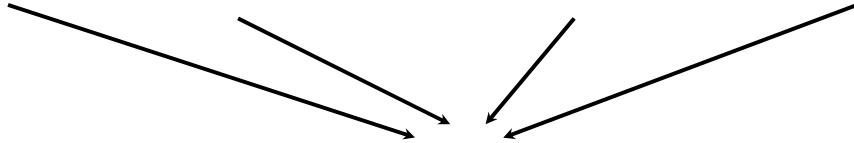
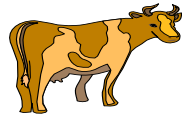
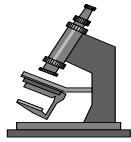
Cleaning & Monitoring the Process Environment

Study suggests ...

if an organism is found in the environment
there is a **70% chance** of it getting into
the food.

IAFP Rome 2007

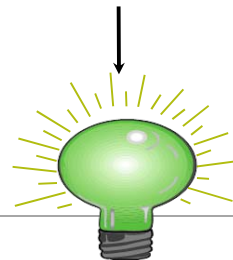
Principle behind ATP bioluminescence.



ATP:
Adenosine Triphosphate
The “energy currency” molecule of all living organisms

+

Luciferin/luciferase



increase in organisms
or organic residues



increase in ATP levels



increase in light
(RLU)

Bioluminescence -Reaction.

(Mg)- ATP + oxygen + D-Luciferin



firefly luciferase

oxyluciferin + carbon dioxide + AMP + pyrophosphate

+

LIGHT



3M™ Clean-Trace™ ATP Hygiene Monitoring System

3M™ Clean-Trace™ Surface/Water ATP tests.

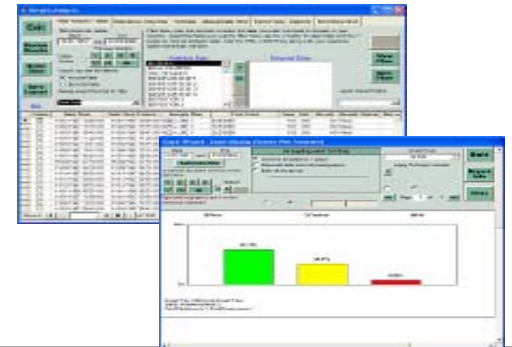
A simple, self-contained swab test used for measuring surface hygiene following cleaning and sanitation.

Also, the 3M™ Clean-Trace™ Water ATP Test for use with CIP rinse water or other process waters.

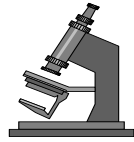


3M™ Clean-Trace™ Data Trending software

- Powerful and flexible
- Full trend analysis including charting and graphing
- Helps comply with auditing and reporting requirements



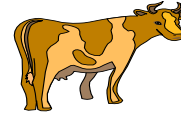
Benefits of using ATP as a “Risk” Indicator



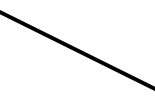
Microorganisms



**Food poisoning, spoilage
and shelf-life reduction cross infection.**



Organic product residues



Encourage microorganism growth.

Presence of ATP indicates direct and indirect risks

Benefits of ATP based rapid hygiene testing

- **Proactive:** allows corrective action to be taken prior to the processing of products.
- **Total hygiene monitoring:** identifies the presence of organic and microbial residues that are not visible on plant surfaces.
- **Indicates direct & indirect risks:** helping reduce the risk of product contamination.

Benefits of rapid hygiene monitoring tests

- **Reduce risks** to product safety and quality due to poor cleaning, ineffective sanitation and cross contamination.
- **Detection of residues** that are potential hazards, either directly such as allergens or indirectly as potential for use by microbes to proliferate.
- **Detection** of direct risk from microbes/biofilms.
- **Identify** one-off issues **where there is a need to reclean**, rapid results, immediate corrective action.
- **Identify where there are persistent problems** and a need to make changes in cleaning regime or possibly a need to replace equipment.
- **Provides data** to show due diligence and for audit reports

3M™ Clean-Trace™ NG Luminometer



- Advanced yet simple to use
- Extremely portable and lightweight (400g)
- Optional docking station - convenient way to provide an instant connection to a PC and battery charger
- Results available in less than 30 seconds

3M™ Clean-Trace™ Surface ATP Test

- The 3M™ Clean-Trace™ Surface ATP Swab is a simple, self-contained swab test used for measuring surface hygiene.
- Used to measure the cleanliness of a surface following cleaning.



Testing...



Swab a representative area of the surface to be tested. Typically 10X10cm on a flat surface

Once swabbing has been completed , return the swab to the tube.

Activate the 3M™ Clean-Trace™ Surface ATP Swab by pressing down the **blue handle** into the tube

Testing...3M™ Clean-Trace™ Surface ATP swab



Shake 5 Seconds



Place in NG system.



Measure.

3M™ Clean-Trace™ Water Total ATP Test



- The 3M™ Clean-Trace™ Water Total ATP test is a simple, self-contained swab test used for measuring water samples post cleaning e.g. CIP Final Rinses.
- Used to measure the cleanliness of a final rinse water following cleaning and measurement of organic contamination in water samples.

3M™ Clean-Trace™ Water Total ATP Test



Remove Test



Shake 5 seconds



Sample



Place in NG



Activate test



Measure

Sampling – Swab or Water test?

- Where surfaces are accessible, take swab samples.
- Where surfaces are inaccessible, e.g. inside large tanks on Clean In Place (CIP) systems, take a final rinse water sample



Clean-Trace system -Two-fold benefits

■ Rapid results

- provides immediate feedback after completion of cleaning.
- allows for corrective procedures to be instigated where 'Fail' results are recorded e.g. re-cleaning and re-testing.

Clean-Trace system -Two-fold benefits

■ Data trending

- trended results provide long term feedback of cleaning performance
- indicates areas that are showing a higher frequency of poor cleaning performance
- indicates adverse trends in cleaning performance
- helps measure overall consistency of the cleaning regime
- can be used in optimisation of cleaning regimes
- helps to demonstrate positive trends in cleaning efficiency as part of a continuous improvement approach to hygiene management

Principle of the system

Continuous improvement through:

- Maintenance of hygiene standards
 - allows for immediate corrective action to be taken
- Improvement of hygiene standards
 - identifies areas of concern
- Proof of due diligence
- Helping to instil a positive hygiene culture
 - provides a method of sharing hygiene results with key stakeholders
 - easy to interpret reports and graphs
- Supporting HACCP and quality management

Measuring modes

- **Measure Sample:**
measures and displays result only
- **Unplanned Testing:**
measures, displays and saves results with a date and time stamp only
- **Program Mode:**
measures displays and saves result against a pre-programmed test point

Sample Plans / Test Points

- **Sample Plan:** a collection of hygiene test points that are related to a specific area e.g. a production line
- **Test Point:** the individual hygiene sample points contained within a sample plan


Program Mode

- Results are displayed on the screen and stored in memory
- Sample Plans are transferred from the 3M™ Clean-Trace™ Data Trending Software to the instrument
- RLU results collected in program mode can be interpreted by the instrument and the result status displayed on the screen
 - Pass, Caution, Fail
- A 'Fail' result requires corrective action
 - Recorded through a re-test result
 - Stored alongside original result

3M Clean-Trace Data Trending.

Main Menu

3M™ Clean-Trace™ Data Trending Software



ADMINISTRATE

- Create Plan
- Edit Plan
- View Plan
- Database Maintenance
- Basic Setup

COMMUNICATE

- Collect Result(s) From Instrument
- Send Plan(s) To Instrument
- Exit

ANALYSE


- Results Analysis
- Graph Wizard
- Unplanned Analysis

Language:

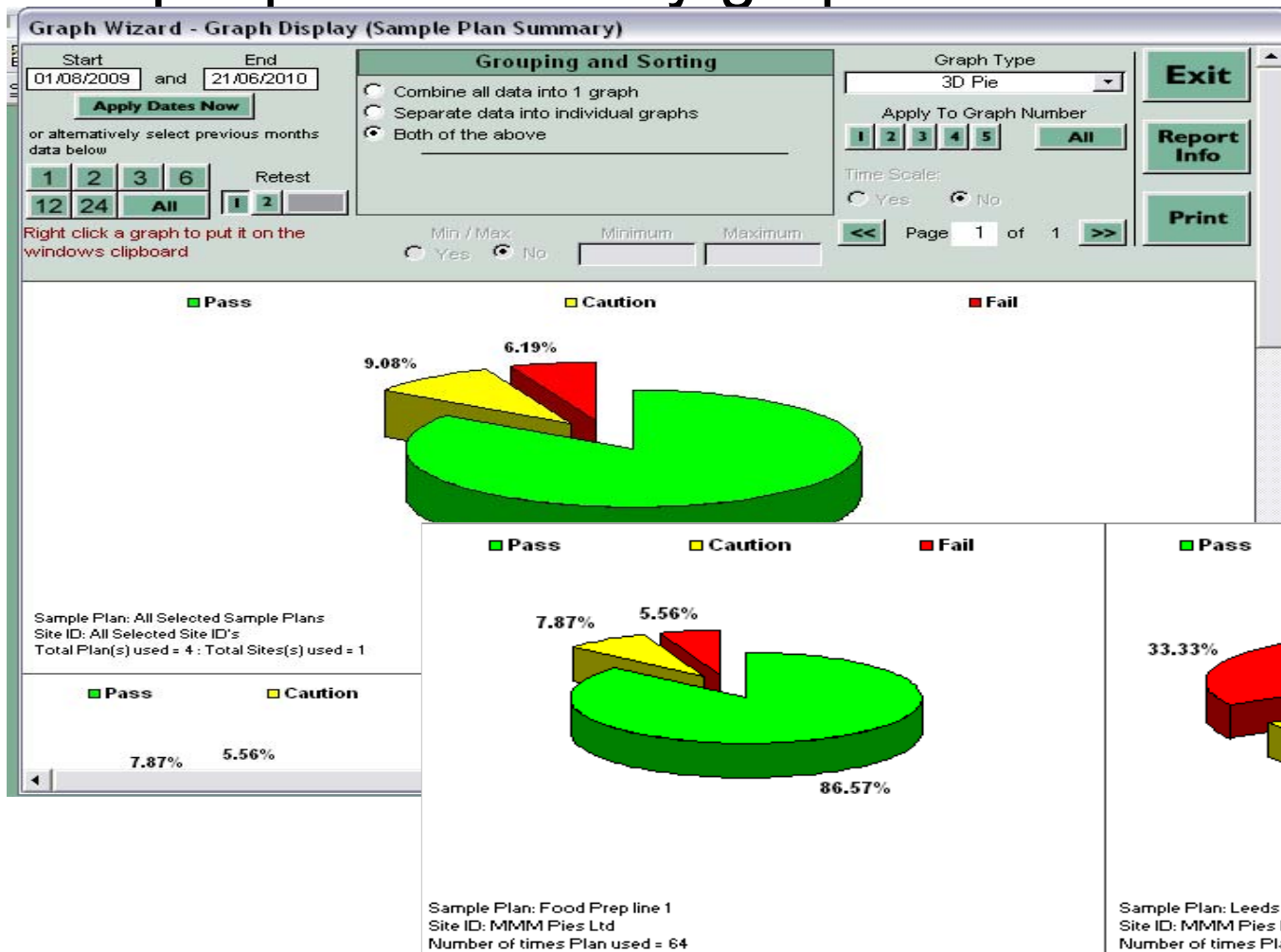
Version: 5.03
2nd December 2011

Website: <http://www.3m.com/microbiology>

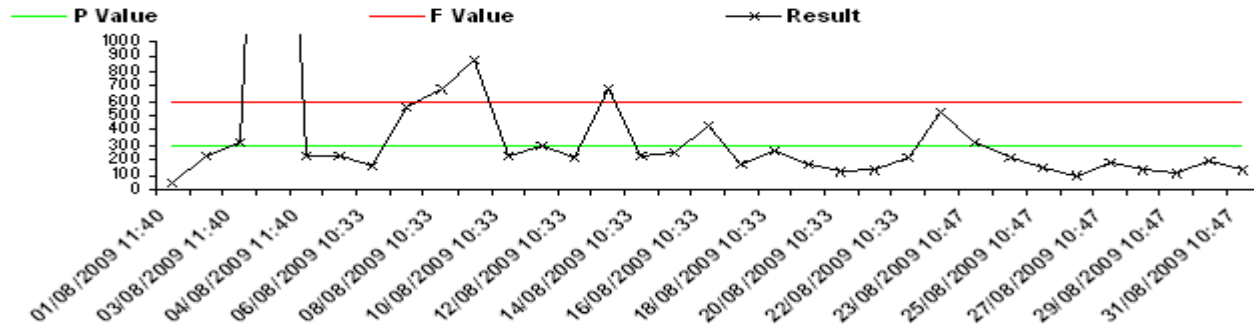
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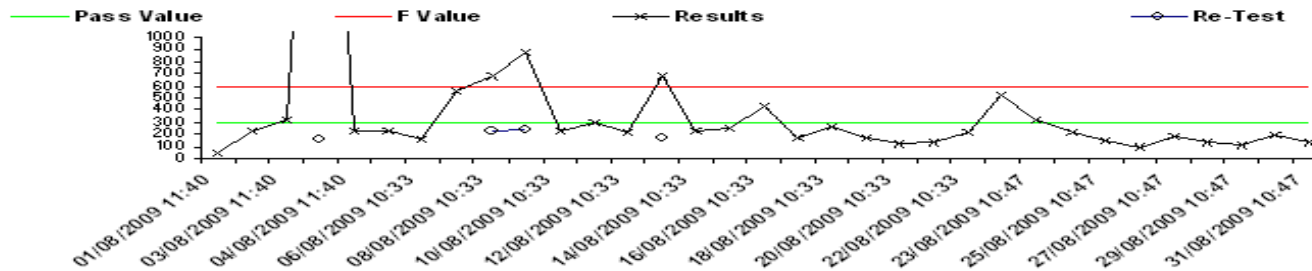
Sample plan summary graphs



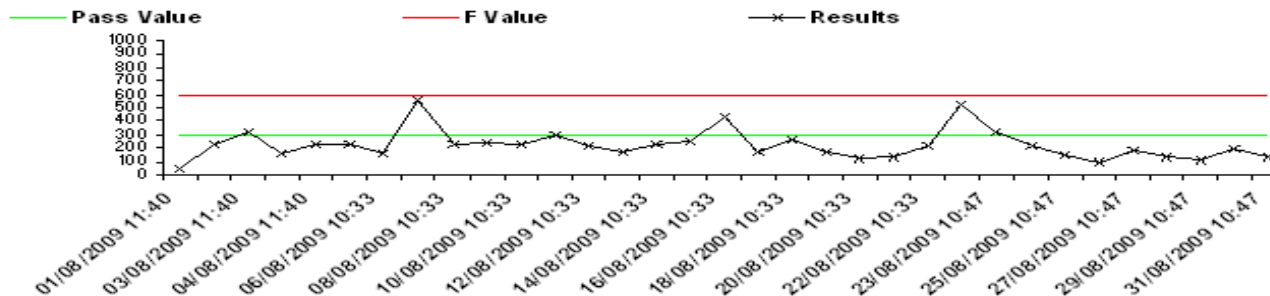
Test point trend options



First Result only



First and Re-test result



Final result only

Ranking report

Ranking Report

Index	Site(s)	Sample Plan(s)	Test Point(s)	Fail
1	MMM Pies Ltd	Pizza Line	Mixing area	100.00%
2	MMM Pies Ltd	Food Prep line 1	CONVEYOR TWO	13.95%
3	MMM Pies Ltd	Pie Packing	Conveyor	12.12%
4	MMM Pies Ltd	Food Prep line 1	FILLER THREE	11.36%
5	MMM Pies Ltd	Food Prep line 1	HOPPER THREE	9.76%
6	MMM Pies Ltd	Food Prep line 1	HOPPER ONE	9.30%
7	MMM Pies Ltd	Food Prep line 1	FILLER ONE	8.00%
8	MMM Pies Ltd	Food Prep line 1	FILLER TWO	6.00%
9	MMM Pies Ltd	Food Prep line 1	DEPOSIT NOZZLE	5.13%
10	MMM Pies Ltd	Food Prep line 1	MINCER TWO	4.76%
11	MMM Pies Ltd	Food Prep line 1	WASH TABLE	4.65%
12	MMM Pies Ltd	Food Prep line 1	HOPPER TWO	2.56%
13	MMM Pies Ltd	Food Prep line 1	PRE COOK MEAT	2.44%
14	MMM Pies Ltd	Food Prep line 1	CONVEYOR ONE	2.27%
15	MMM Pies Ltd	Food Prep line 1	PREP TABLE MEAT	2.22%

Monthly Hygiene Map.

Master Sanitation Schedule August 2009

Legend	A=Anticipated	O=Overdue
	Pass	Caution

Sample Plan: Food Prep line 1

Assigned To:	Test Point	Frequency	Sat 01	Sun 02	Mon 03	Tue 04	Wed 05	Thu 06	Fri 07	Sat 08	Sun 09	Mon 10	Tue 11	Wed 12	Thu 13	Fri 14	Sat 15	Sun 16	Mon 17	Tue 18	Wed 19	Thu 20	Fri 21	Sat 22	Sun 23	Mon 24	Tue 25	Wed 26	Thu 27	Fri 28	Sat 29	Sun 30	Mon 31
QA Hygiene	CONVEYOR ONE	1 day(s)	89	179	123	123	34	78	185	68	89	28	48	2317 34	178	12	24	7	121	148	143	23	91	121	124	45	56	89	128	262	149	143	148
QA Hygiene	CONVEYOR TWO	1 day(s)	102	234	65	178	3457 134	178	2799	197	45	267	374 256	34.2 k 56	27	245	167	1	164	184	198	358	734 45	199	178	78	37	56	72	45	78	21	45
QA Hygiene	COOKED PASTRY CONVEYOR	1 day(s)	89	65	23	12	29	84	89	78	68	27	27	287	98	16	167	8	25	49	74	38	82	31	45	23	65	91	63	76	29	56	57
QA Hygiene	DEPOSIT NOZZLE	1 day(s)	203	143	65	69	23	78	37	198	39	89	89	784 78	0	25	126	154	52	48	0	47	45	32	233	67	32	37	38	56	82	14	34
QA Hygiene	FILLER ONE	1 day(s)	56	156	23	56	45	48	25	45	25	24	89	168	56	45	69	7	45	78	78	478 49	78	71	72	47	56	56	34	23	56	67	56
QA Hygiene	FILLER THREE	1 day(s)	12.3 k 45	123	12	0	67	89	67	189	78	167	78	346	176	86	89	2	26	92	82	49	29	62	41	67	21	78	0	0	28	72	2315 67
QA Hygiene	FILLER TWO	1 day(s)	78	98	82	78	34	26	189	57	145	78	67	247	78	37	28	10	67	38	42	45	59	83	74	56	78	67	83	78	72	56	74
QA Hygiene	HOPPER ONE	1 day(s)	45	165	62	567 56	23	14	29	67	13	67	28	245	35	79	17	6	89	28	67	58	82	82	87	345 45	34	3456	28	23.2 k 35	47	51	65
QA Hygiene	HOPPER THREE	1 day(s)	345 45	132	43	78	34	21	49	43	0	69	92	321	13	15	25	9	87	27	85	93	37	29	81	67	21	89	32	67	28	73	56
QA Hygiene	HOPPER TWO	1 day(s)	56	120	72	34	78	38	0	97	0	89	79	4567	78	0	45	5	67	84	28	39	92	91	71	89	87	56	83	67	82	42	67
QA Hygiene	MINCER ONE	1 day(s)	89	123	45	267	187	123	98	78	59	127	56	31	68	68	23	79	78	69	78	82	81	25	78	89	28	83	34	65	71	143	154
QA Hygiene	MINCER TWO	1 day(s)	78	245	3421 45	25	289	321	2356 126	78	14	259	156	347	78	98	76	27	321	84	174	34	78	65	94	34	91	65	85	23	143	83	87
QA Hygiene	PRE COOK MEAT	1 day(s)	56	23	323	47	24	276	179	125	83	98	234	891 68	132	28	78	56	81	164	143	28	167	75	154	79	87	167	23	23	73	42	81
QA Hygiene	PREP TABLE MEAT	1 day(s)	78	123	14	67	56	23	28	89	69	176	35	789	67	78	34	0	56	48	38	46	67	56	81	56	52	34	32	56	48	72	82
QA Hygiene	WASH TABLE	1 day(s)	56	2347 78	65	98	45	67	25	23	28	89	79	213	78	87	65	1	84	69	38	83	34	72	21	45	28	67	82	35	72	3452 67	32

Review Results

Site ID :- Site ID 1

Sample Plan :- Misc

Date Time	Test Point	Short Name	P	F	RLU	Status	Retest	R.Status	Comments
2/20/2009 10:10:03 PM	Yeast Tank Elbow	Yeast001	500	1000	0	✓			
12/13/2009 9:41:33 AM	Yeast Tank Elbow	Yeast001	500	1000	1188	✗			
6/6/2009 11:25:42 AM	Yeast Tank Elbow	Yeast001	500	1000	0	✓			
5/21/2009 3:38:18 AM	Yeast Tank Elbow	Yeast001	500	1000	457	✓	3	✓	
5/18/2009 3:12:49 AM	Yeast Tank Elbow	Yeast001	500	1000	0	✓			
5/18/2009 3:13:53 AM	Yeast Tank Elbow	Yeast001	500	1000	8	✓	17	✓	
10/1/2008 9:45:00 AM	Yeast Tank Elbow	Yeast001	100	200	18908	✗	25532	✗	
9/3/2008 3:06:08 PM	Yeast Tank Elbow	Yeast001	100	200	317	✗			
9/3/2008 3:07:01 PM	Yeast Tank Elbow	Yeast001	100	200	462	✗			

Examples of typical Pass and Fail Levels found in the Food industry

Product Surface	Pass	Caution	Fail
Raw Meat			
Abattoirs	<1000	1001-1999	>2000
Butchery	<500	501-999	>1000
Cooked Meat Products (Meats, Pies, Pastry Products)			
Low Risk			
High Risk	<500	501-999	>1000
	<250	251-499	>500
White Fish Production	<300	301-599	>600
Shellfish eg. Prawns	<1000	1001-1999	>2000
Cheese Production	<250	251-499	>500
Convenience Foods/Ready Meals			
High Risk	<300	301-599	>600
Low Risk	<500	501-999	>1000
Vegetable/Fruit Processing			
High Risk	<250	251-499	>500
Low Risk	<500	501-999	>1000
Baked Desserts/Cakes			
Low Risk	<300	301-599	>600
High Risk	<200	201-399	>400

Note: For CIP cleaning regimes where more aggressive cleaning regimes are used then typically a 150 RLU – 300 RLU setting is used.

What to do with Pass, Caution, and Fail

Pass

- No action required – continue with production

Caution

- Low Risk area – continue with production, but monitor more closely in the future
- High Risk area – re-clean and re-test

Fail

- Re-Clean and Re-Test
- The Factory might have to examine the sanitation procedure

Note: Caution zone isn't necessary, just set one limit if preferred