

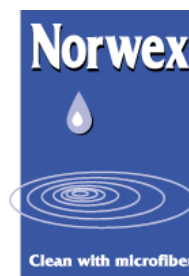
# Feiringklinikken



PROJECT

# ”Ren klinikk”

March 2004



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## **Purpose**

The purpose of this project is to conduct a study on the long-term development of microbiological particles when you clean with microfiber the surfaces and areas that are in daily use in a hospital. The study is done using daily regular sanitary and cleaning routines, using only microfiber cleaning products and water on floors and other surfaces at Feiringklinikken in Eidsvoll Norway.

To benchmark the cleaning effectiveness we have used the Nordic standard NS-INSTA800.

The project is a corporation between:

- Eidsvoll Miljøprodukter as,
- Nilfisk Advance
- Feiringklinikken AS.

The measurements started on the 16th of September 2003 and was ended on the 20<sup>th</sup> of January 2004. The first 3 weeks of the project was used as a pilot study.

The project group consisted of

Project manager	Managment at Eidsvoll Miljøprodukter as / Norwex Holding as
Nilfisk-Advance Contact	Ørjan Carlsson, Nilfisk-Advance in Stockholm
Director of cleaning services	Unni Klingenberg, Feiringklinikken AS
Hygiene nurse	Sissel Berg Larsen, Feiringklinikken AS
Chef Sindre Bårdseng,	Chef, Feiringklinikken AS

## **What is the Feiring Clinic?**

The clinic is specializing in consulting, treating and rehabilitation of adult heart patients. With a capacity of 1100 open-heart surgeries per year it conducts about 25 % of all open hart surgeries in Norway. The total number of infections as a result of surgery at the hospital is only 2.7 % as compared to the nations standard of 5.4 %.

Today there are 245 employees at the clinic, and of these, 140 are medical staff. The clinic was opened in 1989 by the association for heart and lung decease in Norway (LHL)

## **Kick off**

The project was kicked off with a general information session and training of the cleaning staff at the hospital. It was emphasized that the goal of the project was not to benchmark each individual employee, but rather to determine the long-term effect of using microfiber combined with water as the single method of cleaning and sanitation at the hospital.

## **Products and Routines**

Bacteria samples were taken inside the surgery ward and in the cafeteria before and after cleaning. In the surgery ward the measurements ware taken on the floor and on two different counter tops. 2 measurements were taken in the sterilizing room. In the cafeteria samples from the floor and on 2 different counter tops in the kitchen were collected.

To quantify the results, the number of Colony Forming Units (CFU) on the sample was counted after a 72 hours incubation period at 37°C.

The kitchen staff used products from a stock of dry microfiber cloths that was dampened and wringed using clean tap water. Each cloths is replaced once it is visibly dirty

Combined mop Super 60cm from Nilfisk-Advance is used to clean all floors. All other areas were cleaned with the Super microfiber cloth 35x35cm from Nilfisk-Advance.

All products were laundered at 90°C and then dried in a dryer. All products were used within 4 hours after they were cleaned. The products were separately contained in a sealed plastic bag on each trolley or in a clean box after cleaning. The detergent used for cleaning was Clara Mopwash from Nilfisk-Advance.

After completing the centrifugation cycle each product weighed:

- Microfiber Terry Cloth 290g/m<sup>2</sup> 95 grams, and its weight dry is 45 grams
- Microfiber Wet mop Super 225 grams, and its weight dry is 145 grams

The importance if this is to indicate the humidity level in the products when they are “dried and clean”. Hence the Terry cloth has just over 100% humidity when it is “dried and clean” while the mop has about 65% humidity.

Only microfiber products that are in daily use at the clinic were used during the project. All products that were used are documented in this report.

In addition to measure the number of CFU, or bacteria cultures, after cleaning a surface, each product was also tested to see how many CFU were contained in the cloth or mop.



**Table 1 Products and routines**

Surface type	Product used	Routine	Time of cleaning	Time when sample was taken
Forbo 5156 Colorex Vinyl flooring in operation theater 2,	Combi Wet/Dry mop Super 60cm from Nilfisk-Advance	Used initially with clean water, then a "dried and clean" mop is used to remove excess moisture.	Immediately after each surgery.	Immediately after cleaning, but not before the surface is visually dry.
Uneven plastic counter top in the sterilizing room.	Microfiber Terry cloth Super 35x35cm green from Nilfisk-Advance	"Dried and clean" cloth combined with clean water.	Daily cleaning before noon each day.	Immediately after cleaning, but not before the surface is visually dry.
Smooth "Respatex" countertop in the sterilizing room	Microfiber Terry cloth Super 35x35cm green from Nilfisk-Advance	"Dried and clean" cloth combined with clean water.	Daily cleaning before noon each day.	Immediately after cleaning, but not before the surface is visually dry.
Countertop in stainless steel in the kitchen.	Microfiber Terry cloth Super 35x35cm blue from Nilfisk-Advance soaked in clean water and then wringed.	The kitchen staff uses a supply of clean and dry cloths throughout the day. Each cloth is soaked in clean water and wringed before use. Each cloth is replaced when it is visibly dirty.	As needed throughout the day and at closing time.	Immediately after cleaning, but not before the surface is visually dry.
Uneven countertop in plastic in the kitchen.	Microfiber Terry cloth Super 35x35cm blue from Nilfisk-Advance soaked in clean water and then wringed.	The kitchen staff uses a supply of clean and dry cloths throughout the day. Each cloth is soaked in clean water and wringed before use. Each cloth is replaced when it is visibly dirty.	Daily cleaning as needed throughout the day and at closing time.	Immediately after cleaning, but not before the surface is visually dry.
Forbo linoleum flooring in the kitchen. The floor is treaded with Nilfisk-Advance's S-Shine floor-maintainer.	Combi Wet/Dry Mop Super 60cm from Nilfisk-Advance.	Dry cleaning is first used to remove dust and dirt particles; thereafter the floor is mopped with a wet mop. An increasing amount of water is used as the amount of dirt increases.	Cleaned each morning at 7:30AM.	Immediately after cleaning, but not before the surface is visually dry.  At some instances the sample was taken up to 1 hour after cleaning.
"Dried and clean" Microfiber terry cloth Super 35x35cm from Nilfisk-Advance.				At random throughout the day from any trolley.
"Dried and clean" Combi wet/Dry mop Super 60cm from Nilfisk-Advance.				At random throughout the day from any trolley.

## Test method

A sample was taken once per week from each of the surfaces mentioned in Table 1. The sample was taken with 3M Petrifilm™ to count the total number of aerobe microorganisms.

The result of the microbiological samples is given in CFU/cm<sup>2</sup> (Colony Forming Units per square Centimeter). Each sample is put in a heating cupboard for 72 hours at 37 °C. Sissel Berg Larsen, the nurse responsible for the hygiene at the clinic, conducted all the analysis of samples during the project.

## What is INSTA 800?

INSTA 800 is Nordic standard for the evaluation of cleaning efficiency, and was adopted by the Nordic countries in 2000. INSTA 800 standardizes quantitative methods for measuring:

- Dust on a surface
- The hygienical quality indoors
- Friction
- Gloss
- Static Electricity
- Electric conduction

This project only considers the measurement of indoor hygienical conditions.

There exist no official standard that discusses the hygienical requirements for Operating rooms in Norway according to the “Senter for Medisinsk Metodevurdering”, SMM in Norway and Sintef’s report #9/2003.

We choose to use SMM’s hygienical requirements since a hygienical standard for operation rooms does not exist. In Sintef’s report #9/2003, a requirement of less than 20 CFU/20 cm<sup>2</sup> is recommended as an allowable maximum in an operating room. This can be compared directly with our tests. In Table 3, you can see that most of the samples taken contains less than 20 CFU/20 cm<sup>2</sup>

**INSTA 800** uses a grading scale from the Norwegian Food Inspection agency’s guidelines. A lower score is the better grade.

Table 2 INSTA 800 grading

Quality Level	Grade	Total CFU
Grade 1	Excellent	<25
Grade 2	Good	25-50
Grade 3	Acceptable	50-100
Grade 4	Mediocre	100-200
Grade 5	Poor	200-300
Grade 6	Very Poor	>300

## Project "Ren klinikk" test results

Table 3 Measurements of CFU before and after cleaning

Week	Cafeteria Kitchen						Surgical ward						G Mop	H Cloth	Blind- Test
	A (Floor)	A1 (Floor)	B (Steel bench)	B1 (Steel bench)	C (Uneven bench)	C1 (Uneven bench)	D (Uneven bench)	D1 (Uneven bench)	E (Smooth counter top)	E1 (Smooth counter top)	F (Floor)	F1 (Floor)			
1	90	32	62	~170	30	54	35	1	0	1	30	15	12	2	Neg.
2	113	16	63	11	~215	9	15	0	7	1	5	9	9	1	Neg.
3	44	9	94	32	~440	55	11	1	16	1	7	21	1	0	Neg.
4	38	0	~450	69	31	16	9	14	7	4	9	17	2	0	Neg.
5	48	114	8	47	13	40	5	0	7	0	8	15	2	0	Neg.
6	21	66	141	49	123	18	10	2	3	0	2	0	16	8	Neg.
7	57	150	67	74	162	40	22	2	1	1	2	51	5	7	Neg.
8	62	9	8	2	Overgrown	19	9	0	5	0	3	1	2	0	Neg.
9	74	26	98	17	182	9	8	1	5	5	8	13	6	0	Neg.
10	108	75	140	20	49	19	3	2	2	0	12	4	11	0	Neg.

- A** before cleaning the kitchen floor  
**A1** after cleaning  
**B** before cleaning the steel countertop in the kitchen  
**B1** after cleaning  
**C** before cleaning the uneven plastic countertop in the kitchen  
**C1** after cleaning  


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**D** before cleaning the uneven counter top in the sterilizing room in the surgical ward  
**D1** after cleaning  
**E** before cleaning the smooth countertop in the sterilizing room in the surgical ward  
**E1** after cleaning  
**F** before cleaning the floor in the operating room  
**F1** after cleaning  


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**G** clean wet/dry mop Super 60cm (chosen at random)  
**H** clean microfiber terry cloth Super 35x35cm (chosen at random)

### **Comments from the Cleaning Manager**

The clinic has 27 employees in the cleaning department. 7 employees have a formal diploma in the cleaning profession. Most of the staff is part time ranging from 50 to 92%.

The department has used microfiber terry cloths since 1993, and started using microfiber mops in 1998. There is a minimal use of chemicals in the daily cleaning routines, and the department is consciously trying to adhere to “Clean Without Chemicals” concept. The exception is to some extent bathtubs and toilettes. Microfiber is used in combination with a disinfection chemical when there is a biohazard present.

Most of the staff has been participating in the project and have cleaned the areas where the samples were taken. The Feiring Clinic has a very high cleaning standard based on commonly known adhered-to daily and periodical cleaning standards.

Unni Klingenberg  
Cleaning Manager  
Feiringklinikken

### **Comments from the Chef**

The use of microfiber cleaning products combined with only water to clean the staff cafeteria kitchen was a new experience for the kitchen staff. The a priori knowledge was mostly limited to personal experiences gained from cleaning our private households. Most of the kitchen staff was not familiar with the “Clean Without Chemicals” concept. Detailed instructions in the use of the concept were needed.

Chemicals, water and foam spray is used in the main kitchen whilst chemicals and water was used daily in the staff cafeteria kitchen. This is traditionally well known, commonly understood, to be good cleaning methods for a commercial kitchen.

The experiences gained during the project are first and foremost positive. The test data shows a good and satisfactory hygienical level that is just as good as traditional cleaning methods and products. The challenge was foremost related to the introduction of new cleaning routines, new methods and the correct usage of microfiber cleaning products.

The general feeling is positive, and we have experienced that microfiber cleaning products are well suited for cleaning a cafeteria kitchen.

Sindre Bårdseng  
Chef  
Feiringklinikken

### **Conclusion from the Head Hygiene Nurse:**

On an ordinary hospital it is important to have effective cleaning routines as well as good hygiene. Most routines are design to address 2 main concerns: Protection against biohazards and hygiene. The visual effect of good hygiene is also of great importance. A clean looking environment creates trust and safety.

It looks like the operating room has a higher hygienical level compared to the kitchen by studying table 3 in the report. This is obvious for many reasons. We see that the “before” samples are relative high, but the kitchen is a place were food is prepared. All foods contain bacteria, but this is a harmless bacterium as long as the food has not gone bad. It would be unrealistic, and not wanted, to have a CFU/cm<sup>2</sup> count as low as in the operating room.

There is only one sample taken after the cleaning is done that is relatively high (Week 1, Sample B1). The most likely explanation out of many is that moisture has been present while the sample was taken. This would give a wrong result, as the bacteria would have a different environment to in which to grow. The results after cleaning is done are absolutely acceptable, even on the floor where there are very different conditions present than those in the operating room.

In the operating room, conditions for ultra clean surgery are met. Very different requirements for ventilation, requirements on what and how the staff dresses (especially designed clothing, hats, moth cover and shoes that are only used inside the surgery ward) are upheld at any time. Even how the staff ”behaves” is regulated.

Only if a patient has a blood decease (hepatitis etc.) is his/hers blood contaminated, otherwise the blood is free of any bacteria. Thus even if there is blood spilt on the floor will there be any higher number of CFU on it.

The samples in column F1, after cleaning on the floor in operating room 2, are there a larger number of CFU before cleaning than after. This can be explained with the fact that it is still moisture present at the time the sample was taken. This is due to the time limitation between two surgeries, and the fact that the sample had to be taken immediately after cleaning. In addition, the floor was cleaned 3 to 4 times a day.

The counter tops in the operating room is only used to keep clean equipment both before and after the samples were taken. It is therefore not a noticeable difference in the before and after data.

***The final conclusion, both in the kitchen and in the surgery ward, is that the microfiber cleaning products and the cleaning routines are of excellent quality. This is comforting for the patients as well as for the staff at the clinic.***

Sissel Berg Larsen  
Head Hygiene Nurse  
Feiringklinikken