

ENGLISH TRANSLATION

VERIFICATION OF THE DISCHARGE- AIR MICROBIOLOGICAL CONTAMINATION LEVEL OF A MAGNUM MG88A WARM-AIR HAND DRYER

This study is designed and carried out with the purpose of verifying both the microbiological contamination level of the appliance's discharge air during normal operation and any residual contamination should the air contain potentially pathogenic faecal contaminants.

MATERIALS AND METHODS

Test appliance:

MAGNUM MG88A UVC warm-air hand dryer manufactured by Fumagalli Componenti S.p.A., via Edison 9 — Trezzano S.N. (MI) with the technical specifications described on the enclosed sheet.

Ambient air:

in order to perform microbiological testing of the appliance under normal operating conditions, ambient air from a washroom area was utilised, TEST 1.

Artificially-contaminated air:

In order to check the reduction of a microbial load of known value, we used artificially-contaminated air with a known quantity note of *Streptococcus faecalis* cells (strain ATCC 11700).

Streptococcus faecalis is the main species of the Enterococci group, so called because they develop exclusively in the intestinal tract of humans and animals. It is considered a microorganism indicative of faecal contamination and appears under the microscope as a gram-positive diplococcus. It possesses specific physiological characteristics: it has a wide growth temperature range (between 10° and 45°C), it develops at very high pH values (up to pH 9,6) and in the presence of high salt concentrations (NaCl up to 6,5%). Since it can also easily withstand pasteurisation temperatures (60°C for 30 min) it was chosen for performance of the tests described.

Atomisation was carried out using a pressure sprayer (with manual priming), TEST 2.

Recovery of cells from the air of was carried out using an SAS (Surface Air System) sampler manufactured by PBI International S.p.A. and contact plates containing special culture media.

Cell count:

the count method utilised contact plates containing the following agar culture media:

PLATE COUNT AGAR (PCA) - agar medium for total microbial count

FORMULA (g/l):

- Tryptone	5,0
- Yeast extract	2,5
- Glucose	1,0
- Agar	15,0

Sterilise in autoclave at 121°C for 15 min - final pH 7,0 +/- 0,2.

Incubate at 30°C for 72 hours

AZIDE MALTOSE AGAR (KF) - selective agar medium for faecal streptococci count.
 FORMULA (g/l):

- Peptocomplex 10
- Yeast extract 10
- Sodium chloride 5
- Sodium glycerophosphate 10
- Maltose 20
- Lactose 1
- Agar 15
- Sodium azide 400 mg
- Bromocresol purple 15 mg

ANALYTICAL TESTS

The tests were repeated five times and the results of each test for both ambient air (TEST 1) and artificially-contaminated air (TEST 2) are set out in the enclosed Test Report, our ref. No. 21043.

TEST 1: the ambient air was recovered using the SAS sampler before and after its passage through the MAGNUM MG88A UVC warm-air hand dryer.

TEST 2: the air was contaminated by spraying a cellular suspension of *Streptococcus faecalis*.

The suspension in Nutrient Broth, containing 4×10^8 CFU (colony-forming units) in 1 ml, was suitably diluted in Ringer Solution prior to use in order to obtain an amount of between 10 and 100 CFU per m^3 .

The artificially-contaminated air was then recovered using the SAS sampler before and after its passage through the MAGNUM MG88A UVC warm-air hand dryer.

Following the necessary incubation, the cells recovered on the special agar media, **PCA** for TEST 1 and **KF** for TEST 2 were then counted.

RESULTS

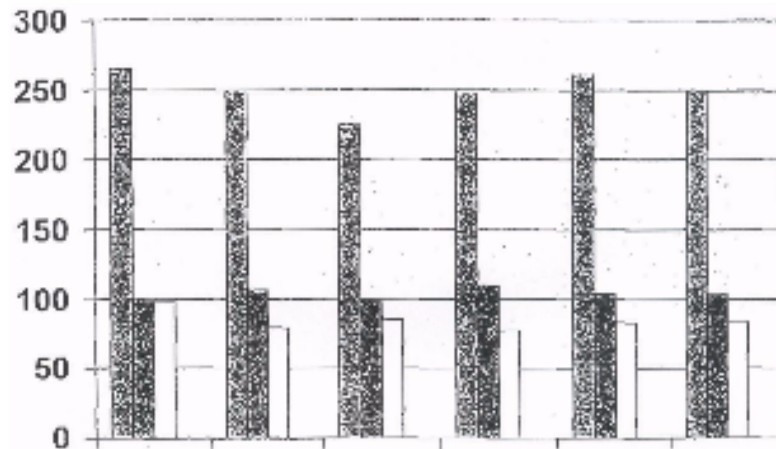
The count results for the tests performed using the above-mentioned methods are set out in the Table:

Table:

MAGNUM MG88A UVC						
AIR	1	2	3	4	5	AVERAGE
INTAKE AMBIENT TEST 1	265	250	225	248	261	250
DISCHARGE AMBIENT TEST 1	99	107	98	110	104	104
INTAKE CONTAMINATED WITH <i>Str. faecalis</i> - TEST 2	98	79	85	77	83	84
DISCHARGE CONTAMINATED WITH <i>Str. faecalis</i> - TEST 2	0	0	0	0	0	0

Values expressed in CFU (colony-forming units)/m³
NB contaminated-air counts are only selective for *Str. faecalis*

MODEL - MAGNUM MG88A UVC



PROVE
 MEDIA
 AMBIENTE INGRESSO
 AMBIENTE USCITA
 CONTAMINATA CON *Str. faecalis*
 INGRESSO
 CONTAMINATA CON *Str. faecalis* USCITA

TESTS
 AVERAGE
 INTAKE AMBIENT
 DISCHARGE AMBIENT
 INTAKE CONTAMINATED WITH *Str. faecalis*
 DISCHARGE CONTAMINATED WITH *Str. faecalis*

CONCLUSIONS

The results obtained indicate good reduction of microbial cells as regards both Total Microbial Load (TEST 1) and *Streptococcus faecalis* (TEST 2).

This can be noted in all tests performed and infers that the use of this warm-air appliance MG88A UVC **with additional discharge-air disinfection device** creates no microbial contamination problem for the hands whilst they are being dried.

Furthermore, as can be seen from the graph, the warm air discharged creates an area in which microbial contamination is much lower than that of the surrounding environment, also as regards any pathogenic microorganisms that may be present.

CENTRO DI MICROBIOLOGIA APPLICATA
 Dr. Miriam Magri
 Settimo Milanese, 16th December 2002.

CENTRO DI MICROBIOLOGIA APPLICATA

TEST REPORT No. 21043

Messrs
FUMAGALLI COMPONENTI S.p.A.
V.le Edison, 9
20090 TREZZANO s/N (MI)

PAGE 1 of 1

REGISTRATION DATE 17/10/2002

SPECIMEN Your Ref. WARM-AIR HAND DRYER: MODEL MAGNUM MG88A UVC,
SERIAL No. 88A000328
INTAKE AMBIENT AIR:

ANALYTICAL RESULTS

Total Microbial Load

5a	265 CFU/ m ³
5b	250 CFU/ m ³
5c	225 CFU/ m ³
5d	249 CFU/ m ³
5e	261 CFU/ m ³

The results refer solely to the test specimen. This test report may be reproduced "as is", but only in its entirety.

CHIEF TECHNICIAN

Settimo Milanese, 16th December 2002.

CENTRO DI MICROBIOLOGIA APPLICATA

TEST REPORT No. 21043

Messrs
FUMAGALLI COMPONENTI S.p.A.
V.le Edison, 9
20090 TREZZANO s/N (MI)

PAGE 1 of 1

REGISTRATION DATE 17/10/2002

SPECIMEN Your WARM-AIR HAND DRYER: MODEL MAGNUM MG88A UVC,
 Ref. SERIAL NO. 88A000328
 DISCHARGE AMBIENT AIR:

ANALYTICAL RESULTS

Total Microbial Load

6a	99 CFU/ m ³
6b	107 CFU/ m ³
6c	98 CFU/ m ³
6d	110 CFU/ m ³
6e	104 CFU/ m ³

The results refer solely to the test specimen. This test report may be reproduced "as is", but only in its entirety.

CHIEF TECHNICIAN

Settimo Milanese, 16th December 2002.

CENTRO DI MICROBIOLOGIA APPLICATA

TEST REPORT No. 21043

Messrs
FUMAGALLI COMPONENTI S.p.A.
V.le Edison, 9
20090 TREZZANO s/N (MI)

PAGE 1 of 1

REGISTRATION DATE 17/10/2002

SPECIMEN Your WARM-AIR HAND DRYER: MODEL MAGNUM MG88A UVC,
 Ref. SERIAL NO. 88A000328
 INTAKE AIR CONTAMINATED WITH *Str. faecalis*

ANALYTICAL RESULTS
STR. FAECALIS

7a	98 CFU/ m ³
7b	79 CFU/ m ³
7c	85 CFU/ m ³
7d	77 CFU/ m ³
7e	83 CFU/ m ³

The results refer solely to the test specimen. This test report may be reproduced "as is", but only in its entirety.

CHIEF TECHNICIAN

Settimo Milanese, 16th December 2002.

CENTRO DI MICROBIOLOGIA APPLICATA

TEST REPORT No. 21043

Messrs
FUMAGALLI COMPONENTI S.p.A.
V.le Edison, 9
20090 TREZZANO s/N (MI)

PAGE 1 of 1

REGISTRATION DATE 17/10/2002

SPECIMEN Your WARM-AIR HAND DRYER: MODEL MAGNUM MG88A UVC,
Ref. SERIAL NO. 88A000328
DISCHARGE AIR CONTAMINATED WITH *Str. faecalis*

ANALYTICAL RESULTS
STR. FAECALIS

8a	0 CFU/ m ³
8b	0 CFU/ m ³
8c	0 CFU/ m ³
8d	0 CFU/ m ³
8e	0 CFU/ m ³

The results refer solely to the test specimen. This test report may be reproduced "as is", but only in its entirety.

CHIEF TECHNICIAN

Settimo Milanese, 16th December 2002.