

## Bactericidal and fungicidal efficacy of dry steam

Study sponsored by



### Objective

Evaluation of the efficacy of dry steam treatment realised by menikini machines in order to clean surfaces contaminated by bacteria and fungi.

### Reference

Trials were based on the European Regulation related to chemical disinfectants and antiseptics with the aim to evaluate the ability of dry steam to decrease bacterial and fungi contamination of surfaces.

List of EU rules:

EN 1040:2005

EN 1275:2006

EN 1276:2000

EN 1650:2000

### Methods

One billion of colony forming units of each microorganism were uniformly distributed on a polymeric surface (as used in food industry), previously cleaned to remove any contamination. After the distribution of the test microorganism, the surface was treated with saturated dry steam. At the end of the treatment, bacteria on the surface and in the residual condensation liquid were sampled and lab analysed by sterile pads.

### Results

**In vitro trials demonstrated that the treatment with saturated dry steam was effective in the reduction of bacterial and fungal contamination of surfaces**

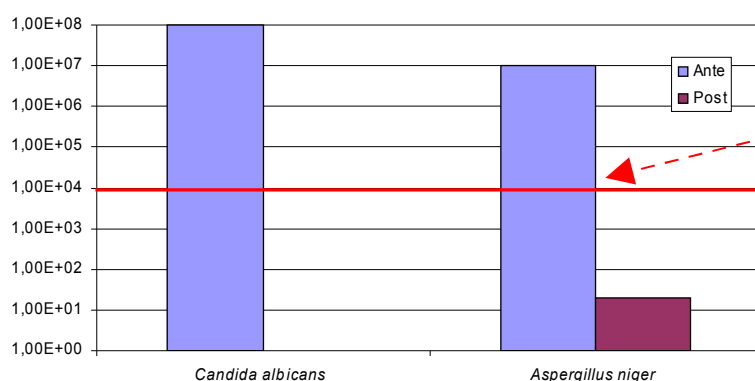
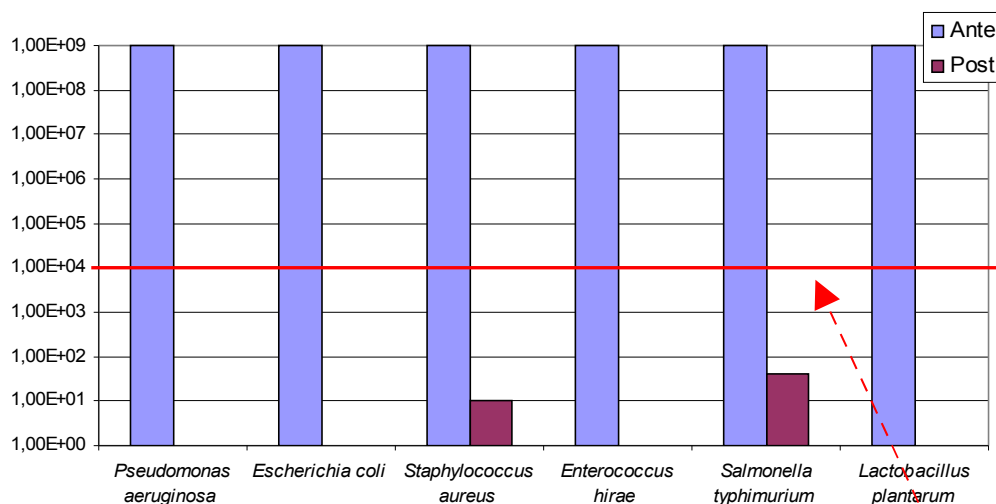
The analytical values of bacterial and fungal contamination after treatment were always below the levels indicated by the EU rules that refer to a decrease of  $10^4$  UFC for fungicides and  $10^5$  UFC for bactericides.

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Results and graphs at sh. 2 →

## Results

| Code     | Microbial species                     | Strain     | Sampling     | Pre-treatment count (CFU/4.000cmq) | Post-treatment count (CFU/4.000cmq) | Quantification |
|----------|---------------------------------------|------------|--------------|------------------------------------|-------------------------------------|----------------|
| 08F09712 | <i>Surface check before treatment</i> |            |              |                                    | < LQ (#)                            | 0,00E+00       |
| 08F09719 | <i>Pseudomonas aeruginosa</i>         | ATCC 15442 | surface      | 1,00E+09                           | < LQ                                | 0,00E+00       |
| 08F09720 | <i>Pseudomonas aeruginosa</i>         | ATCC 15442 | surface      | 1,00E+09                           | 2,00E+01                            | 2,00E+01       |
| 08F09715 | <i>Escherichia coli</i>               | ATCC 10536 | surface      | 1,00E+09                           | < LQ                                | 0,00E+00       |
| 08F09713 | <i>Staphylococcus aureus</i>          | ATCC 6538  | condensation | 1,00E+09                           | < LQ                                | 0,00E+00       |
| 08F09714 | <i>Staphylococcus aureus</i>          | ATCC 6538  | surface      | 1,00E+09                           | 1,00E+01                            | 1,00E+01       |
| 08F09716 | <i>Enterococcus hirae</i>             | ATCC 10541 | surface      | 1,00E+09                           | 2,00E+01                            | 2,00E+01       |
| 08F09724 | <i>Enterococcus hirae</i>             | ATCC 10541 | surface      | 1,00E+09                           | < LQ                                | 0,00E+00       |
| 08F09725 | <i>Enterococcus hirae</i>             | ATCC 10541 | surface      | 1,00E+09                           | < LQ                                | 0,00E+00       |
| 08F09717 | <i>Salmonella typhimurium</i>         | ATCC 13311 | surface      | 1,00E+09                           | 4,00E+01                            | 4,00E+01       |
| 08F09718 | <i>Lactobacillus plantarum</i> (*)    | DSM 6235   | surface      | 1,00E+09                           | < LQ                                | 0,00E+00       |
| 08F09721 | <i>Candida albicans</i>               | ATCC 10231 | surface      | 1,00E+08                           | < LQ                                | 0,00E+00       |
| 08F09722 | <i>Aspergillus niger</i>              | ATCC 16404 | surface      | 1,00E+07                           | 2,00E+01                            | 2,00E+01       |
| 08F09723 | <i>Aspergillus niger</i>              | ATCC 16404 | condensation | 1,00E+07                           | < LQ                                | 0,00E+00       |



Reference values for EU regulation

Complete results and reports are available Menikini S.r.l. and can be supplied to the customer following request