STANDARD NF T 72-281

Determination of bactericidal, fungicidal, sporicidal activity

for

aerial surface disinfection processes
Introduction

The need

Observation of the loss of efficiency between soaking or spraying application and aerial diffusion
**Principle of the suspension-test**

Germ inoculum

Disinfectant solution

**Parameters:**
- Inoculum concentration
- Disinfectant concentration
- Contact time
- Temperature
- Hardness of disinfectant solution
- Interfering materials in disinfectant solution

Count of revivified microorganisms

Efficiency result (decimal logarithm)
Limits of interest for the user:

Extrapolation of results possible in the field only for soaking disinfection

Extrapolation impossible for C.I.P., spray, foam, fumigation or nebulization disinfectants

Application possible only for disinfectants perfectly mixable with water
Standard NF T 72-281

An application standard
reproducing the aerial diffusion of the disinfectant

French standard published in 1986

To date no international equivalent
Principle of the NF T 72-281 test in the case of automatic or autonomous process

Parameters:
- Airtight room
- Representative volume
- Temperature
- Hygrometry
- Height (h)
- Distance (d)
- Contact time
  - Germ-carrier:
  - Surface
  - Preparation of inoculum
  - Minimal initial population on GC (S)
  - Arrangement of GC (E)

P : emission point of disinfectant
GC(E) : germ-carrier (exposed)
GC(S) : germ-carrier (specimen)

Count of revivified microorganisms on GC(E) and GC(S)

Efficiency result (decimal logarithm)
Specifications

A disinfectant can be recognized in accordance with:

- The standard
- The requirements of the Ministry for approval

<table>
<thead>
<tr>
<th>Germ Strains</th>
<th>Spectrum</th>
<th>Bactericide</th>
<th>Fungicide</th>
<th>Sporicide</th>
</tr>
</thead>
</table>
| Compulsory   | Pseudomonas aeruginosa CIP A 22  
               Staphylococcus aureus CIP 53154  
               Enterococcus hirae CIP5855 | Penicillium verrucosum CIP1186-79  
               Candida albicans CIP 1180-79 | Bacillus subtilis CIP 5262 |
| Optional     | Mycobacterium smegmatis CIP7326  
               Escherichia coli CIP 54127 | - | - |
| Required for Ministry of Agriculture approval | Pseudomonas aeruginosa CIP A 22  
               Staphylococcus aureus CIP53154  
               Enterococcus hirae CIP5855  
               Escherichia coli CIP 54127 | Absidia corymbifera CIP 1129-75  
               Aspergillus versicolor CIP1187-79  
               Cladosporium cladosporoides CIP 1232-80  
               Aspergillus niger ATCC 16404 | Bacillus subtilis CIP 5262 |
| Germ strain preparation and culture | Specifications detailed in the standard |
# Specifications

## Test Conditions

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Automatic or autonomous process</th>
<th>Directed Manual process</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Volume</strong></td>
<td>Free (to be specified in the test report)</td>
<td>• Not specified</td>
</tr>
<tr>
<td><strong>Temperature</strong></td>
<td>21° C ± 1° C</td>
<td>• Free (to be specified in the test report)</td>
</tr>
<tr>
<td><strong>Humidity</strong></td>
<td>60 % ± 10 %</td>
<td>• Free (to be specified in the test report)</td>
</tr>
<tr>
<td><strong>Distance between point of emission of disinfectant and germ carrier</strong></td>
<td>25 % of the greatest diagonal of the room</td>
<td>• A few dozen centimeters (to be specified in the test report)</td>
</tr>
<tr>
<td><strong>Positioning of germ carrier</strong></td>
<td>Horizontal, inoculum oriented downwards At the same height as the point of emission of the disinfectant</td>
<td>• Vertical, inoculum oriented towards the emission source</td>
</tr>
<tr>
<td><strong>Germ population of initial suspension</strong></td>
<td>10⁸ to 10⁹ per ml</td>
<td>• 10⁸ to 10⁹ per ml</td>
</tr>
<tr>
<td><strong>Germ population of specimen germ carrier after test</strong></td>
<td>10⁶ at least</td>
<td>• 10⁶ at least</td>
</tr>
<tr>
<td><strong>Contact time and action</strong></td>
<td>Less than or equal to 12 hours (to be specified in the test report)</td>
<td>• Free (to be specified in the test report)</td>
</tr>
</tbody>
</table>
Results required

<table>
<thead>
<tr>
<th>Bactericide activity</th>
<th>Fungicide activity</th>
<th>Sporicide activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>$r \geq 5 \log$</td>
<td>$r \geq 4 \log$</td>
<td>$r \geq 3 \log$</td>
</tr>
</tbody>
</table>
Conclusion

standard NF T 72-281

application standard the closest to the practical conditions of use of disinfectants.

implementation transposable in the field (factories, hospitals, livestock) in order to assess the actual efficiency of the aerial disinfection system in a specific location.

germs carriers used adaptable to real situations in the field (choice of materials identical to those existing in the field).

qualification and established practice of the operator required.

uncontested high-performance tool available to formulators and users of aerial disinfectant systems to judiciously integrate this technology in a global hygiene plan.

great interest to be examined by the international standardization committees (CEN and ISO).