

MICROBIOLOGICAL RESULTS

PERFORMANCE BY TYPE OF PACKAGING
(FRAUNHOFER INSTITUT / CLARANOR)



Pulsed Light Sterilization

BEVERAGES AND LIQUID FOOD MARKETS

CAP STERILIZATION



Tethered cap 28 mm

- Spray inoculation - *A. brasiliensis* DSM 1988 surface in contact with the product
- Initial contamination: 4.6×10^3
- 1 lamp reflector

Flash N°	1
Mean log-reduction	>3.7



Flat cap Bericap 28 mm

- Spray inoculation - *A. brasiliensis* DSM 1988 surface in contact with the product
- Initial contamination: 1.8×10^5
- 1 lamp reflector

Flash N°	1	2
Mean log-reduction	4	4.4



Flat cap Silgan 38 mm with foil

- Spray inoculation - *A. brasiliensis* DSM 1988 surface in contact with the product
- Initial contamination: $10^{4.9}$
- 1 lamp reflector

Flash N°	1	2
Mean log-reduction	4.9	> 4.9



Sport cap Bericap 30 mm

- Spray inoculation - *B. subtilis* DSM 675 surface in contact with the product
- Initial contamination: 2.2×10^5
- 2 lamps reflector

Flash N°	1	2
Mean log-reduction	5.1	> 5.3



Sport cap Aptar Uno 38 mm

- Puls'Full Cap : internal / external sterilization
- Spray inoculation *A. brasiliensis* DSM 1988 all surfaces
- Initial contamination: 5×10^4
- 2 lamps reflector for inside, surface in contact with the product, seal and thread
- 2 lamps reflector for surfaces under the cover « dead volume »

Flash N°	1
Mean log-reduction	> 4.6



Flat cap 43 mm with an aluminium foil

- Puls'Full Cap : internal / external sterilization
- Spray inoculation *B. subtilis* spores SC 204-2
- Initial contamination: 1.2×10^3
- 2 lamps reflector for internal surface
- 1 lamp reflector for external surface

Flash N°	1 int	1 ext
Mean log-reduction	> 4	> 3.8



Crown Cap

- Spray inoculation - *A. brasiliensis* DSM 1988 surface in contact with the product
- Initial contamination: 3.6×10^5
- 1 lamp reflector

Flash N°	1
Mean log-reduction	>4,9

BEVERAGES AND LIQUID FOOD MARKETS

PREFORM STERILIZATION

Preform neck



- Multi dots inoculation - *A. brasiliensis* DSM 1988
- Initial contamination:
 - inner surface: 2.7×10^4
 - outer surface: 1.4×10^4
- 2 lamps reflector
- Interior preform 1-2log depending on size and color, for sizes up to 2L.

Inner surface

Flash N°	1
Mean log-reduction	4.4

Outer surface

Flash N°	1
Mean log-reduction	4.0

METAL CAN AND LID STERILIZATION

Can 568 ml ø 55 mm x 190 mm



- Inoculation by spray whole internal surface
- Initial contamination:
 - A. brasiliensis* DSM 1988 : 2×10^3
- 2 lamps reflector

Flash N°	3
Mean log-reduction	3.4

Lid 500 ml ø 202



- Inoculation by spot – both sides of the lid
- Initial contamination
 - A. brasiliensis* DSM 1988 : 8.7×10^3
 - B. subtilis* : 3.1×10^4
- 2 lamps reflector

Flash N°1	<i>A. brasiliensis</i>	<i>B. subtilis</i>
Mean log-reduction Internal surface	>3.9	>4.3