

MICROBIOLOGICAL RESULTS

PERFORMANCE BY TYPE OF PACKAGING
(FRAUNHOFER INSTITUT / CLARANOR)



Pulsed Light Sterilization

DAIRY, PLANT-BASED, MILK, FOOD

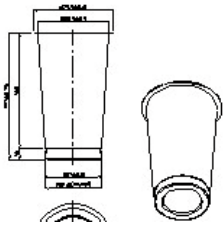
CUP STERILIZATION



PS cup 200 ml

- Spray inoculation - *A. brasiliensis* DSM 1988 surface in contact with the product
- Initial contamination: 2.4×10^4
- 2 lamps reflector

Flash N°	2	3
Mean log-reduction	4.3	4.4



PS cup 300 ml

- Spray inoculation - *B. atrophaeus* surface in contact with the product
- Initial contamination: 4.3×10^5
- 1 lamp reflector

Flash N°	2	3
Mean log-reduction	4.2	5.4



Cardboard cup Seda Packaging 500 ml

- Spray inoculation - *A. brasiliensis* DSM 1988 surface in contact with the product
- Initial contamination: 5.2×10^3
- 2 lamps reflector

Flash N°	2	3
Mean log-reduction	3.4	>3.6



Double chamber PS cup

- Spray inoculation - *A. brasiliensis* DSM 1988 surface in contact with the product
- Initial contamination: 9.9×10^4
- 2 lamps reflector

Flash N°	2	3
Mean log-reduction	4.8	> 5.0



PS rectangular cup 1 kg

- Spray inoculation - *A. brasiliensis* DSM 1988 surface in contact with the product
- Initial contamination: 6.6×10^4
- 2 lamps reflector

Flash N°	1	2
Mean log-reduction	3.3	4.2



PP bucket 10.7 L (height 265 mm x up diameter 245 mm)

- Multi-dots deposition - *A. brasiliensis* DSM 1988 surface in contact with the product
- Initial contamination: 3×10^3
- 3 lamps reflector

Investigated area	Flash N°	5
Bottom	Mean log-reduction	3.47
Angle		
Wall		

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FILM STERILIZATION



PET + PE film (width 244 mm x thickness 0.07 mm)

- Spray inoculation internal and external surfaces
- *A. brasiliensis* DSM 1988 initial contamination : 1.7×10^4
- *B. atrophaeus* DSM 675 initial contamination : 4.5×10^4
- 1 lamp reflector

Flash N°: 1	<i>A. brasiliensis</i> DSM 1988	<i>B. atrophaeus</i> DSM 675
Mean log-reduction	> 4.2	3.8

LID STERILIZATION

Aluminum Lid 95 mm



- Multi-dots deposition surface in contact with the product
- *A. brasiliensis* DSM 1988 Initial contamination : 3.1×10^4
- 2 lamps reflector

Flash N°: 1	<i>A. brasiliensis</i> DSM 1988
Mean log-reduction	> 4.5

SWEET CONDENSED MILK

TIN CAN STERILIZATION

Can 300 ml ø internal 73 mm x 80 mm



- Inoculation by spots, internal surface
- Initial contamination: *Bacillus pumillus* spores DSM 492
- 1 lamp reflector

Flash N°: 3	<i>B. pumillus</i>
Mean log-reduction	>4

LID STERILIZATION

Alu Lid Ø 99 mm



- Inoculation by spots internal and external surfaces
- *A. brasiliensis* DSM 1988 - Initial contamination 6.7×10^3
- 1 lamp reflector

Flash N°: 2	<i>A. brasiliensis</i> DSM 1988
Mean log-reduction	3.7