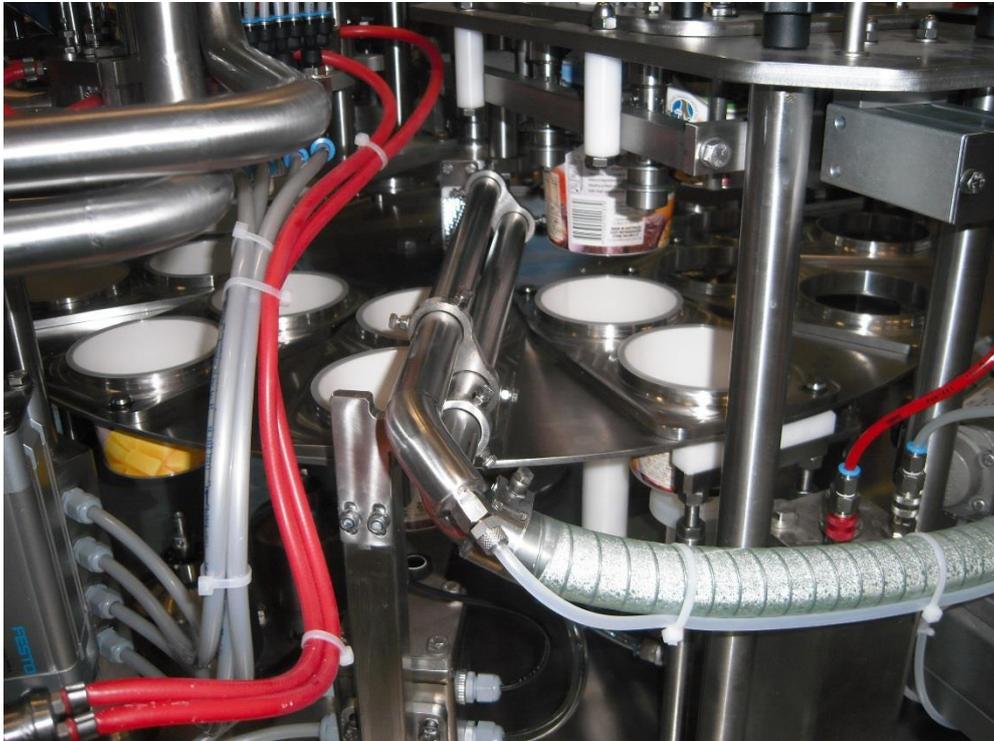




Case Study AirSolution de-germination technology for dairy products



Case study de-germination on Filling systems for dairy products

1. Table of Contents

1. Table of Contents.....	2
2. Introduction	3
3. Installation for hygienic implementation	3
4. Results of product testing for a yoghurt product.....	4
5. Maximum allowable concentration (MAC) (measured by the Employer's Liability Insurance Association):	5
6. Conclusion	6

2. Introduction

To stabilize the hygienic status in the white line of dairy products the process step of filling in the final packages and closing of this package has a significant impact on the product hygiene. To stabilize them, production factories were equipped with the AirSolution hygiene technology. There was an analytical support to show transparent results.

To ensure the impact of the AirSolution technology there must be the following requirements guaranteed:

- It is necessary to ensure a germ free product at the filler valve
- A closed full automatic filling system
- No manual intervention during production
- The filling system should be completely closed / housed in
- The AirSolution system must be interlocked with the filling system

3. Installation for hygienic implementation

The installation of 2 AirSolution de-germination modules in the filling and sealing process of yogurt was executed at the following positions:

- De-germination station for the empty cup before filling
- De-germination station for headspace and sealing foil after filling



Empty cups and headspace de-germination/sealing foil de-germination



Installation of fogging unit under filling table inside of the machine

The control of the 2 de-germination modules is adjusted via a central control panel of AirSolution with a dosing station (de-germination agent-tank and -pump).

At this control cabinet the following connections are required:

- Power connection : 230 V / 50 Hz
- Oil- and water-free compressed air: at least 7 bar
- Internet connection for remote control

The de-germination system is running with the de-germination agent Air Solution L.O.G. four.

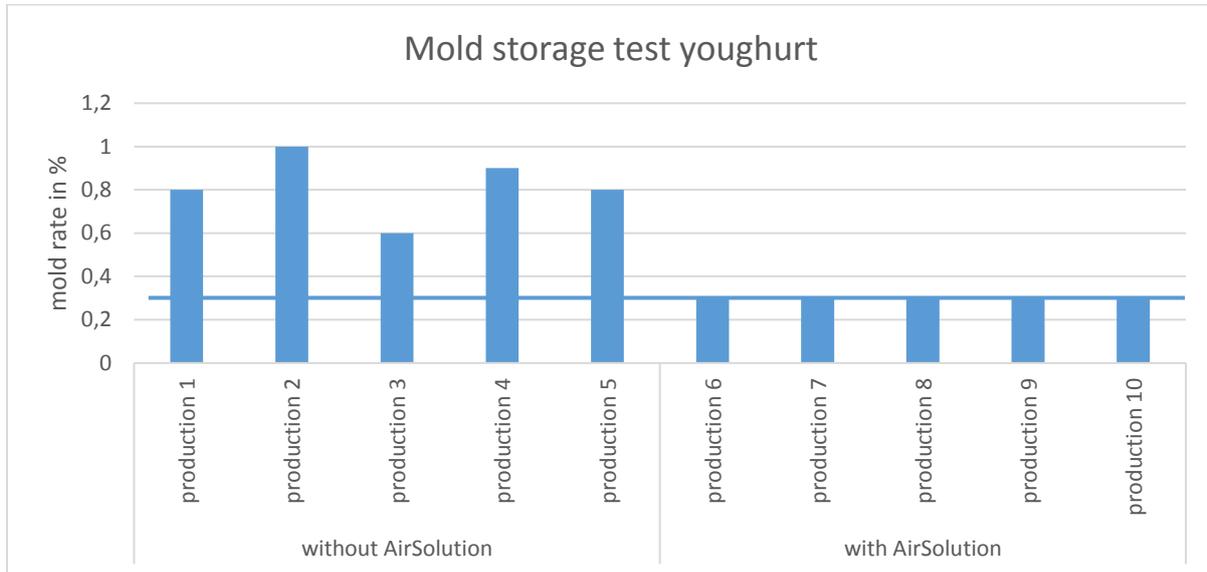
The system was operated with the following settings (application rate per nebulizer per hour):

Position	Value	Unit
Empty cup de-germination	150	ml / h
Headspace de-germination	100	ml / h
Total	250	ml / h

4. Results of product testing for a yoghurt product

For this case study 200 samples were taken as representative for the individual productions. These samples were inspected for mold growth. There was performed a comparison of results with not using the AirSolution technology and during use of the AirSolution technology in the filling system.

The lower measurable limit value was at 0.3 % mold.



Sampling	There were taken 200 samples/production		
Temperature (filling area)	25,5 °C		
Rel. humidity (filling area)	50 %		
Outdoor parameters	21 °C; 67 % rel. h.		
Consumption in production	250 ml/h	8 h	2000 ml

There was a significant reduction of mold failure rate to less than 0.3% permanent mold.

Long-term studies have confirmed the stable values persistently.

5. Maximum allowable concentration (MAC) (measured by the Employer's Liability Insurance Association):

In order to prove the safety of the procedure for the employees in the production, there have been done measurements by the Employer's Liability Insurance Association of the content of hydrogen peroxide in the air, measured next to the fogging units. The measured values have been significantly below the maximum allowable workplace exposure limit.

For this measurement, it must be taken into account that in the same process environment used detergents and disinfectants have also an impact on the concentration of hydrogen peroxide in the air, which have not undergone any detailed recording here.

AB-Nr. Arbeitsbereiche	Probenbezeichnung	MP	Datum / Uhrzeit Probenahmestart	PD /h	p/ o	k	M	S/ K	Stoffe	AGW, AKC, TKC, K/ mg/m ³	BG/ mg/m ³	Konz./ mg/m ³	I
610115 Molkereien u. Käseereien, Abpacken / Abfüllen, Becherabfüllung	391/Br01/01 Einlauf Abfüllanlage, Nachlegen der Becher	1	09:48	0,83	o	-	1	-	Wasserstoffperoxid	0,71; I(1)	0,05	0,43	-
610115 Molkereien u. Käseereien, Abpacken / Abfüllen, Becherabfüllung	391/Br01/02 Einlauf Abfüllanlage, Nachlegen der Becher	B1	09:46	0,85	p	-	1	-	Wasserstoffperoxid	0,71; I(1)	0,05	0,45	-
610115 Molkereien u. Käseereien, Abpacken / Abfüllen, Becherabfüllung	391/Br01/03 Nachlegen der Deckel und Siegelrollen	2	10:04	0,70	o	-	1	-	Wasserstoffperoxid	0,71; I(1)	0,06	0,43	-
610115 Molkereien u. Käseereien, Abpacken / Abfüllen, Becherabfüllung	391/Br01/04 Nachlegen der Deckel und Siegelrollen	B2	10:08	0,62	p	-	1	-	Wasserstoffperoxid	0,71; I(1)	0,07	0,30	-
610115 Molkereien u. Käseereien, Abpacken / Abfüllen, Becherabfüllung	391/Br01/05 Einlauf Abfüllanlage, Nachlegen der Becher	1	11:22	1,00	o	-	1	-	Wasserstoffperoxid	0,71; I(1)	0,07	0,33	-
610115 Molkereien u. Käseereien, Abpacken / Abfüllen, Becherabfüllung	385/Br01/06 Nachlegen der Deckel und Siegelrollen	2	11:20	1,00	o	-	1	-	Wasserstoffperoxid	0,71; I(1)	0,04	0,42	-
610115 Molkereien u. Käseereien, Abpacken / Abfüllen, Becherabfüllung	385/Br01/07 Öffnung der Scheibe zum Entstören	3	11:29	0,25	o	-	1	-	Wasserstoffperoxid	0,71; I(1)	0,16	0,44	-

6. Conclusion

Through the influence of the AirSolution hygiene technology in continuous use in the filling- and sealing system during processing a significant reduction of molds was achieved and maintained permanently at several customer applications, resulting in sustainable hygiene protection results, which safeguards and extends also the shelf life of the final product significantly.