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Wet Wipe Triamin Disinfection

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In case of questions, you are welcome to contact Wet Wipe A/S on support@wetwipe.eu

Best regards,

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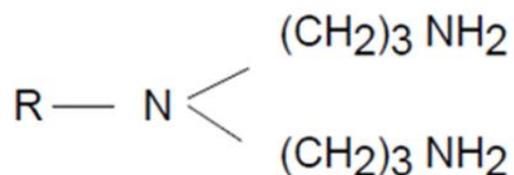
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1. Active substance informations

The Triamin Disinfection wipes (Wet Wipe Triamin Disinfection) from Wet Wipe A/S contain 0,25 g/l of the biocidal substance: Laurylamine Dipropylendiamine (CAS-no.: 2372-82-9, EINECS-No.: 219-145-8), known to be an effective disinfection agent against vegetative bacteria, yeast fungus, non-enveloped viruses and mycobacteria under certain use conditions.

Laurylamine Dipropylendiamine, also known as alkyl-triamin (abbreviated Triamin), is a non-ionic molecule with unique surface properties. It is less foamy and sticky to surfaces than cationic disinfectants and is compatible with viscose and cellulose non-woven. Due to a low molecular weight and non-ionic nature, it is effective at low temperature "10 °C" and maintain its effectiveness under dirty conditions.

Laurylamine Dipropylendiamine is registered in the EU Article 95 list by the supplier of Wet



Triamin

Wipe as an active substance for product type 2. Product type 2 covers disinfectants used for surfaces disinfection in the health care sector.

Wet Wipe is therefore allowed to continue our supply of Triamin Disinfection products to customers in the health care sector from September 1st 2015.

<http://echa.europa.eu/da/information-on-chemicals/active-substance-suppliers>

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2. Efficacy against bacteria and yeast

Wet Wipe Triamin Disinfection Wipes consist of a structured cleaning-cloth impregnated with a disinfection liquid containing the active biocidal substance: Laurylamine Dipropylendiamine (CAS-no.: 2372-82-9). The disinfection efficacy of the disinfection-liquid was tested by Dr. Brill + Partner at 50% and 80% of its use concentration in Wet Wipe's Triamin Disinfection Wipes, as summarized in the table.

Microorganism	EN test standard	Test conditions	Exposure Time [min]	Result [Log cfu]	Pass criteria
Bacteria: <i>Staphylococcus aureus</i> , (MRSA)	EN13727	Dirty	1	>5,1	>5
	EN13697	Dirty	2 5	>4,1 >6,8	>4
Bacteria: <i>Enterococcus hirae</i> , (VRE)	EN13727	Dirty	5	>6,7	>5
	EN13697	Dirty	2 5	>4,12 >6,7	>4
Bacteria: <i>Escherichia coli</i> (ESBL)	EN13727	Dirty	1	>5,1	>5
	EN13697	Dirty	2 5	>3,0 >5,9	>4
Bacteria: <i>Pseudomonas aeruginosa</i>	EN13727	Dirty	1	>5,1	>5
	EN13697	Dirty	2 5	>5,3 >5,3	>4
*Yeast fungus: <i>Candida albicans</i>	EN13624	Dirty	1	>4,5	>4
	EN13697	Dirty	5	>5,4	>3
EN 13697 test results from Dr. Brill + Partner. Test Report NO L14/0156.17. EN 13727 test results from Dr. Brill + Partner. Test Report NO L14/0156.6. EN 13624 test results from Dr. Brill + Partner. Test Report NO L14/0156.5. *The obligatory exposure time is 5 min for bacteria and 15 min for yeast fungus.					

Conclusion: Maximum required exposure time of Wet Wipe Triamin Disinfection liquid against bacteria and yeast fungus 5 minutes.

However, the exact minimum required exposure time for Wet Wipe Triamin Disinfection Wipes cannot be extrapolated from the test results, as the obligatory test standards for disinfection liquids "used without mechanical action" does not take into account the mechanical non-biocidal bacterial reducing effect of Wet Wipe's structured cleaning-cloth.

The mechanical non-biocidal bacterial reducing effect of Wet Wipe's structured cleaning-cloth, has been proven > Log 3 cfu, in independent tests.

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3. Efficacy against blood borne viruses

The efficacy of disinfectants against the so-called blood borne viruses HIV and Hepatitis is substantiated in laboratory test with the surrogate virus BVDV. An efficacy against this virus will according to a guideline of the Robert Koch Institute (RKI) deliver a broad claim "efficacy against blood borne viruses including HIV; HBV and HCV.

The RKI guideline include testing with 10% feral calf serum in contrast to the low amount of bovine serum albumin in the standard conditions for virus testing according to EN 14476.

Dr. Brill + Partner has tested the disinfection liquid used in Wet Wipe Triamin Disinfection. The test report (W15LO157B), showed that the disinfection liquid is effective against BVDV virus at an exposure time of 5 minutes under clean and dirty conditions.

The test report from Dr. Brill + Partner also indicated that the efficacy of the disinfection liquid is almost identical under clean and dirty conditions, which support our claim that Wet Wipe Triamin Disinfection can be used in a combined 1-step disinfection and cleaning procedure.

Test report is available to competent authorities.

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4. Efficacy under dirty conditions and low temperature

The Triamin Disinfection wipes from Wet Wipe A/S contain a combined disinfection and cleaning liquid with the active biocide: Laurylamine Dipropylendiamine (CAS-no.: 2372-82-9).

The disinfection liquid was tested at Dr. Brill + Partner according the obligatory standards for testing of surface disinfection products used in the Veterinary field as summarized in Table 1, and the result compared to the efficacy of 1400 Active Chlorine respectively, generated in situ from Sodium Dichloroisocyanurate dihydrate granules.

Table 1 summarises test results for the Triamin Disinfection liquid and Active Chlorine.

Table 1					
Product	Microorganism	Temp	Time	Pass criteria	Test result
1400 ppm Active Chlorine	<i>Staphylococcus aureus</i>	10 °C	30 min	4 log/30 min	> 7,8 log/30 min
1400 ppm Active Chlorine	<i>Enterococcus hirae</i>	10 °C	30 min	4 log/30 min	> 7,8 log/30 min
1400 ppm Active Chlorine	<i>Proteus vulgaris</i>	10 °C	30 min	4 log/30 min	> 7,7 log/30 min
1400 ppm Active Chlorine	<i>Pseudomonas aeruginosa</i>	10 °C	30 min	4 log/30 min	> 7,9 log/30 min
Triamin Disinfection	<i>Staphylococcus aureus</i>	10 °C	30 min	4 log/30 min	> 7,9 log/30 min
Triamin Disinfection	<i>Enterococcus hirae</i>	10 °C	30 min	4 log/30 min	> 7,7 log/30 min
Triamin Disinfection	<i>Proteus vulgaris</i>	10 °C	30 min	4 log/30 min	> 7,4 log/30 min
Triamin Disinfection	<i>Pseudomonas aeruginosa</i>	10 °C	30 min	4 log/30 min	> 7,4 log/30 min
EN14349 test results of ¹ Wet Wipe Triamin Disinfection batch jha-35 and ² Chlorine Disinfection batch hl-11. Dr. Brill + Partner. ¹ Test Report NO L14/0156.12. ² Test Report NO L14-0216-2					

It can be concluded that the Triamin Disinfection liquid is at least as effective as 1400 ppm Active Chlorine against vegetative bacteria under an organic load of 1% yeast extract + 1% albumin at an incubation temperature of 10° C.

The detailed test results also indicate that Triamin product is also less sensitive to organic substances than Active Chlorine.

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5. Mechanical non biocidal disinfection effect of the Triamin cleaning cloth by EN16615

Unlike traditional surface disinfection wipes currently available in the market. The wipe in used in Wet Wipe Triamin is a regular cleaning cloth made from high performing viscose-polyester fibre material, so that during wiping of a surface, the cloth releases a certain amount of liquid, which is mostly reabsorbed into the cloth during wiping such that dirt, cells, e.g. blood cells, tissue cells from humans, are absorbed into the cloth with the reabsorbed liquid.

The ability of Wet Wipe's cleaning cloth to adsorb and retain *Staphylococcus aureus* bacteria during wiping of surfaces was tested according to the newest European test standar: EN16615, developed by German microbiologists in VAH (Verbund für angewandte hygiene)

Table 1	Log reduction
Wet Wipe's Triamin cleaning cloth	3.9
EN16615 Test results of Wet Wipe structured cloth.	

During testing it was found that Wet Wipe's cleaning cloth impregnated with soap and water reduced the bacterial cells with 3.9 log (99,99%), which was 10 times better than the high quality cleaning cloth used as reference cloth in EN16615.

So unlike synthetic wipes, there is a mechanical non-biocidal reduction of bacteria by using Wet Wipe Triamin disinfection, which is due to our high-viscose wipes acting as an "active" bacterial reducing device.

Main advantages of Wet Wipes cleaning cloth are

- An immediate log reduction of 99,99 %
- Improves the disinfection efficacy of any disinfection products tested compatible with the cloth

Generally, the distinction process by using Wet Wipes Triamin product can be described as a biphasic process:

Phase 1: 99,99 % bacterial reduction during the initial wiping created mechanically by the wipe.

Step 2: a delayed disinfection of remaining bacteria on the wiped surface reaching 99,9999% reduction within 5 minutes.

100% Synthetic wipes like the one used for hydrogen peroxide wipes does not create anything close to an immediatly 99,99 % reduction of bacteria, because they don't not perform a mechanical reduction of bacteria on surfaces.

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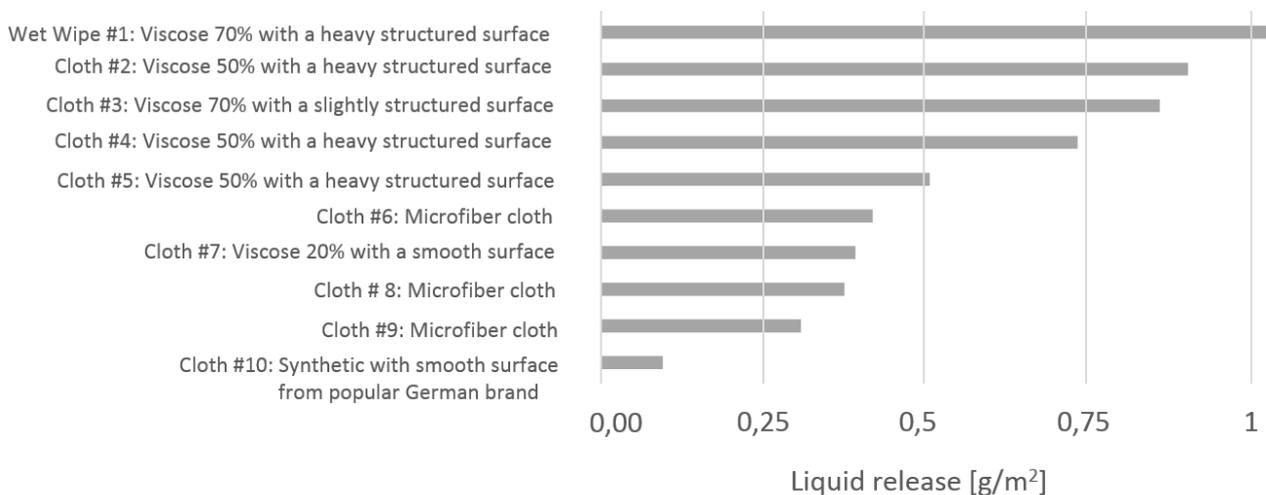
6. Developed for an efficient release of disinfection liquid to smooth water repellent surfaces.

Besides of a high viscose content Wet Wipes Triamin disinfection cloth, also has small perforations across the entire surface as shown in the photo, such that during wiping the friction generated between the irregular surface of the cloth and the wiped surface provokes the release of disinfection liquid from the cloth.



A benchmark comparison of Wet Wipe's cleaning cloth (Wet Wipe #1) shown below, was performed at an impregnation degree of 150 % (liquid to wipe ratio), to simulate the situation where the end users feel the wipes are to dry and will throw the wipe away. This test proves that some structure is needed in a wipe to release liquid, and that wipes with a smooth surface release a very small amount of disinfection liquid during wiping of smooth surfaces, which can have a drastic negative effect on the disinfection effect.

**Liquid release from wipes on smooth water repellent surface
150 % impregnation**



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7. Surface disinfection efficacy of liquid and cleaning cloth EN16615 compared to ethanol

Biocidal surface log reduction of Triamin wipes according to EN16615

The ability of Wet Wipe's Wipes to kill and remove *Staphylococcus aureus* bacteria from a smooth water repellent surface without spreading bacteria during wiping of surfaces was tested according to EN16615 at the Danish Institute of Technology in Aarhus Denmark (Analyserapport nr. 690719/683318.5).

The test was performed at the actual impregnation level of 250%, which is the impregnation level in the wipes delivered to our customers, and not under the standard conditions of 500 % impregnation level described in the EN16615 standard. The impregnation level refers to the ratio of the weight of the disinfection liquid in one wipe divided by the the weight of a cloth:

500 % impregnation level = dripping wet wipes

250 % impregnation level = damp moist wipes

150 % impregnation level = half-dry wipes

Table 1	Impregnation level	Log reduction	Spreading cfu/25 cm ²	Results
Wet Wipe's Triamin Disinfection wipes	250 %	5.9	6	Passed
Ethanol 70% + Cleaning cloth	300 %	2.7	4	Failed
Cleaning cloth + soap and water	250 %	n.d.	342	
Wet Wipe's Triamin Disinfection wipes	150 %	5.9	9	Passed
Ethanol 70% + Cleaning cloth	150 %	2.7	19	Failed
Cleaning cloth + soap and water	150 %	n.d.	1320	

It was found that Wet Wipe's Triamin disinfection wipes reduced the bacterial cells with 5.9 log (99,9999 %) at an impregnation degree of 250 % (damp moist) and an impregnation degree of 150% (half dry). Which is more than a 3xlog improvement compared to the performance of the same cleaning cloth impregnated with Ethanol 70%. Ethanol 70% was used as the standard because independent tests performed by CEI, showed ethanol 70 % to be more effective than Ethanol 80%.

The spreading of bacteria from the Triamin wipes was at the same time below the pass criteria: less than 2,5 cfu/cm², at both 250 and 150 percent impregnation. Whereas for the cleaning cloth impregnated with soap there was an elevated spreading when wipes were half-dry (150% impregnation).

Test report is available to competent authorities.