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Copy No.: 1
Issue No.: 1

Test report No. 2094-2095/2012

**DETERMINATION OF BACTERICIDAL AND FUNGICIDAL ACTIVITY
OF THE PRODUCT DETOXY COLOR ON CARRIERS**

Sample ID: 2094-2095/2012
Sample name: **DETOXY COLOR**
Client: ROKOSPOL a.s., Krakovská 1346/15, Praha 1
Producer: ROKOSPOL a.s., provoz Kaňovice, 763 41 Biskupice u Luhačovice
Sampling point: ROKOSPOL a.s., provoz Kaňovice, 763 41 Biskupice u Luhačovice

Page: 1
From pages: 8

Incoming date:
20.9.2012

Delivery date:
24.1.2013

Hodonín, 24.1.2013



Zuzana Matušková, Head of Laboratory

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Description: *Testing the efficacy of chemical disinfectants and antiseptics*

Sample ID: 2094-2095/2012

Rep No: 111

Sample name: **DETOXY COLOR**

Sampled: by client

Sampling point: ROKOSPOL a.s., Biskupice u Luhačovice

Client: ROKOSPOL a.s., Krakovská 1346/15, Praha 1

Sampling date: 20.9.2012

Sample delivered: 20.9.2012

Testing date: 22.10.-10.12.2012

Delivered amount: 0.5 kg + 0.5 kg

Batch No: 2700410, laboratory sample

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Subject of testing:

Determination of bactericidal and fungicidal activity of the product on carriers.

Identification of the sample:

Sample ID:

2094/2012

Name of the product:

DETOXY COLOR (paint with nano TiO₂)

Batch number:

2700410

Date of manufacture:

13.8.2012

Expiry date:

One year in a perfectly closed containers at temperatures from +5 to +25 ° C

Manufacturer:

ROKOSPOL a.s., provoz Kaňovice, 763 41 Biskupice u Luhačovice

Incoming date:

20.9.2012

Storage conditions:

+5 – +25 °C

Active compounds and concentrations: nano TiO₂

Sample ID:

2094/2012

Name of the product:

DETOXY COLOR (paint without nano TiO₂)

Batch number:

laboratory sample

Date of manufacture:

16.8.2012

Expiry date:

not available

Manufacturer:

ROKOSPOL a.s., provoz Kaňovice, 763 41 Biskupice u Luhačovice

Incoming date:

20.9.2012

Storage conditions:

+5 – +25 °C

Active compounds and concentrations: without active compounds

5. Incubation and calculation

5.1. Expression and interpretation of results

Note:

Bactericidal activity - the capability of a product to produce a reduction in the number of viable bacterial cells of relevant organisms on carriers under defined conditions by at least 4 orders (10⁴). Drying of the suspension with microorganisms on the carrier without paint: 30 - 35 min. Drying of the suspension with microorganisms on the carrier with paint: 24 hours.

* The test was modified according to the general testing scope flexibility type I.

The standard

CEN EN 13697 Chemical disinfectants and antiseptics - Quantitative microorganism reduction test for the evaluation of bactericidal and/or fungicidal activity of chemical disinfectants used in food, industrial, domestic and institutional areas. Test method and requirements without mechanical action (phase 2-step 27 March 2002).
R-09-06 Flexible scope of accreditation at laboratory ČSÚ, I. S.

Description: *Testing the efficacy of chemical disinfectants and antiseptics*

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Rep No: 111

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Sampled: by client

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Sample delivered: 20.9.2012

Testing date: 22.10.-10.12.2012

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Batch No: 2700410, laboratory sample

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Experimental conditions:

Quantitative test on carriers for the evaluation of bactericidal activity SOP-M-19-00-C (ČSN EN 13697)

Period of analysis:

22. 10. - 23. 10. 2012 paint application

22. 10. - 6. 11. 2012 conditioning of the coating on carriers at temperature $23.5\text{ °C} \pm 1.9\text{ °C}$ and humidity $58.4\text{ °H} \pm 4.7\text{ °H}$

6. 11. - 21. 11. 2012 test on carriers

Test temperature:

$23\text{ °C} \pm 2\text{ °C}$

Test method:

dilution neutralization method

Neutralization medium:

Dey-Engley Neutralizing Broth M 1062

Appearance of the products:

white liquid

Test concentration:

100% (concentrated, application of the product on carriers – paint, 12 hours drying, new paint, another 12 hours drying)

Contact time:

2 hours, 24 hours, 1 week and 2 weeks

Interfering substances:

according to the customer's request without interfering substances

Test organisms:

Pseudomonas aeruginosa ATCC 15442

Incubation conditions:

$37\text{ °C} \pm 1\text{ °C}$, 24 hours

Test procedure:

1. Preparation of the test suspension
2. Preparation of product test solutions
3. Carrier surface treatment - paint, 12 hours drying, new paint, another 12 hours drying
4. Quantitative carrier test (carriers for testing were used as required in the standard, first part of carriers was used without treatment, according to the customer's request the second part of carriers was painted with colour with the active substance* and the third part of carriers the paint without the active substance, After that the microorganisms were applied on carriers, which were maintained in the constant environment at temperature $23.3\text{ °C} \pm 0.2\text{ °C}$ and humidity $40.8\text{ °H} \pm 5.4\text{ °H}$ and under the light with intensity $841 \pm 34\text{ lm}$). The density of microorganisms was monitored after 2 hours, 24 hours, 1 week and 2 weeks.
5. Incubation and calculation
6. Expression and interpretation of results

Note:

Bactericidal activity – the capability of a product to produce a reduction in the number of viable bacterial cells of relevant organisms on carriers under defined conditions by at least 4 orders (10^4). Drying of the suspension with microorganisms on the carrier without paint: 30 – 35 min. Drying of the suspension with microorganisms on the carrier with paint: 24 hours.

* The test was modified according to the granted testing scope flexibility type I.

The standard:

ČSN EN 13697 Chemical disinfectants and antiseptics – Quantitative non-porous surface test for the evaluation of bactericidal and/or fungicidal activity of chemical disinfectants used in food, industrial, domestic and institutional areas - Test method and requirements without mechanical action (phase 2/step 2) March 2002
R-09-06 Flexible scope of accreditation in laboratory Chemila, Ltd.

Description: Testing the efficacy of chemical disinfectants and antiseptics

Sample ID: 2094-2095/2012

Rep No: 111

Sample name: **DETOXY COLOR**

Sampled: by client

Sampling point: ROKOSPOL a.s., Biskupice u Luhačovice

Client: ROKOSPOL a.s., Krakovská 1346/15, Praha 1

Sampling date: 20.9.2012

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Delivered amount: 0.5 kg + 0.5 kg

Batch No: 2700410, laboratory sample

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C.1 Testing the efficacy of chemical disinfectant **DETOXY COLOR** on carriers

Tab No. 1.1 Testing – bactericidal activity of the product **DETOXY COLOR**

Time	Test organism	Bacterial test suspension N	Water control Nc carriers without paint	Water control Nc carriers with paint without TiO2	Test procedure Nd carriers with paint with TiO2
0	<i>Pseudomonas aeruginosa</i> ATCC 15442	10 ⁻⁶ : >300, >300 10 ⁻⁷ : 48, 56 N: 7.41	10 ⁻³ : >300, >300 10 ⁻⁴ : >300, >300 10 ⁻⁵ : 38, 39 10 ⁻⁶ : 4, 4 Nc: 7.59	-	-
2 hours	<i>Pseudomonas aeruginosa</i> ATCC 15442	-	10 ⁻³ : >300, >300 10 ⁻⁴ : >300, >300 10 ⁻⁵ : 31, 33 10 ⁻⁶ : 2, 4 Nc: 7.51	10 ⁻³ : >300, >300 10 ⁻⁴ : >300, >300 10 ⁻⁵ : >300, >300 10 ⁻⁶ : 33, 32 Nc: 8.51	10 ⁻⁴ : >300, >300 10 ⁻⁵ : >300, >300 10 ⁻⁶ : 33, 30 Nd: 8.50 ME: 0
24 hours	<i>Pseudomonas aeruginosa</i> ATCC 15442	-	10 ⁻³ : >300, >300 10 ⁻⁴ : 84, 80 10 ⁻⁵ : 8, 9 10 ⁻⁶ : 0, 2 Nc: 6.91	10 ⁻³ : >300, >300 10 ⁻⁴ : >300, >300 10 ⁻⁵ : 151, 157 10 ⁻⁶ : 15, 16 Nc: 8.19	10 ⁰ : 0, 0 10 ⁻¹ : 0, 0 10 ⁻² : 0, 0 Nd: < 0.10 ME: > 6.81
1 week	<i>Pseudomonas aeruginosa</i> ATCC 15442	-	10 ⁰ : 0, 0 10 ⁻¹ : 0, 0 10 ⁻² : 0, 0	10 ⁰ : 0, 0 10 ⁻¹ : 0, 0 10 ⁻² : 0, 0	10 ⁰ : 0, 0 10 ⁻¹ : 0, 0 10 ⁻² : 0, 0
2 weeks	<i>Pseudomonas aeruginosa</i> ATCC 15442	-	10 ⁰ : 0, 0 10 ⁻¹ : 0, 0 10 ⁻² : 0, 0	10 ⁰ : 0, 0 10 ⁻¹ : 0, 0 10 ⁻² : 0, 0	10 ⁰ : 0, 0 10 ⁻¹ : 0, 0 10 ⁻² : 0, 0

$$N = \log_{10} [\{0.05 \cdot (x + x')\} / 2 \cdot d]$$

where x and x' are paired values for which the mean of the value falls between 50 and 300 colonies, d is the dilution factor for the dilution taken into account

$$NC \text{ or } NT = \log_{10} [\{10 \cdot (y + y')\} / 2 \cdot d]$$

where y and y' are paired values for which the mean of the value falls between 50 and 300 colonies, d is the dilution factor for the dilution taken into account

Fungicidal activity – the capability of a product to produce a reduction in the number of viable fungi belonging to reference strains on carriers under defined conditions by at least 3 orders (10³). Drying of the suspension with microorganisms on the carrier without paint, 40 – 55 min. Drying of the suspension with microorganisms on the carrier with paint 24 hours.

* The test was modified according to the guided testing scope flexibility type I.

The standard:

CEN EN 13697 Chemical disinfectants and antiseptics – Quantitative microbiological test for the evaluation of bactericidal and/or fungicidal activity of chemical disinfectants used in food, industrial, domestic and institutional areas – Test method and requirements without mechanical action (Phase 2) May 2002
E-09-05 Flexible scope of accreditation in laboratory Chemika, Ltd.

Description: Testing the efficacy of chemical disinfectants and antiseptics

Sample ID: 2094-2095/2012

Rep No: 111

Sample name: **DETOXY COLOR**

Sampled: by client

Sampling point: ROKOSPOL a.s., Biskupice u Luhačovice

Client: ROKOSPOL a.s., Krakovská 1346/15, Praha 1

Sampling date: 20.9.2012

Sample delivered: 20.9.2012

Testing date: 22.10.-10.12.2012

Delivered amount: 0.5 kg + 0.5 kg

Batch No: 2700410, laboratory sample

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Experimental conditions:

Period of analysis:

Test temperature:

Test method:

Neutralization medium:

Appearance of the products:

Test concentration:

Contact time:

Interfering substances:

Test organisms:

Incubation conditions:

Quantitative test on carriers for the evaluation of fungicidal activity SOP-M-19-00-C (ČSN EN 13697)

22. 10. - 23. 10. 2012 paint application

22. 10. - 6. 11. 2012 conditioning of the coating on carriers at temperature $23.5\text{ °C} \pm 1.9\text{ °C}$ and humidity $58.4\text{ °H} \pm 4.7\text{ °H}$

6. 11. - 21. 11. 2012 test on carriers

$23\text{ °C} \pm 2\text{ °C}$

dilution neutralization method

Dey-Engley Neutralizing Broth M 1062

white liquid

100% (concentrated, application of the product on carriers – paint, 12 hours drying, new paint, another 12 hours drying)

2 hours, 24 hours, 1 week, 2 weeks, 1 month

according to the customer's request without interfering substances

Aspergillus niger ATCC 16 404

$30\text{ °C} \pm 1\text{ °C}$, 48 hours and additional period of 24 or 48 hours

Test procedure:

1. Preparation of test suspension
2. Preparation of product test solutions
3. Carriers surface treatment - paint, color drying 12 hours, new paint, color drying 12 hours
4. Quantitative carrier test (carriers for testing were used as required in the standard, first part of carriers was used without treatment, according to the customer's request the second part of carriers was painted with colour with the active substance* and the third part of carriers the paint without the active substance, After that the microorganisms were applied on carriers, which were maintained in the constant environment at temperature $23.3\text{ °C} \pm 0.2\text{ °C}$ and humidity $40.8\text{ °H} \pm 5.4\text{ °H}$ and under the light with intensity $841 \pm 34\text{ lm}$). The density of microorganisms was monitored after 2 hours, 24 hours, 1 week, 2 weeks and 1 month.
5. Incubation and calculation
6. Expression and interpretation of results

Note:

Fungicidal activity – the capability of a product to produce a reduction in the number of viable fungi belonging to reference strains on carriers under defined conditions by at least 3 orders (10^3). Drying of the suspension with microorganisms on the carrier without paint: 30 – 35 min. Drying of the suspension with microorganisms on the carrier with paint: 24 hours.

* The test was modified according to the granted testing scope flexibility type I.

The standard:

ČSN EN 13697 Chemical disinfectants and antiseptics – Quantitative non-porous surface test for the evaluation of bactericidal and/or fungicidal activity of chemical disinfectants used in food, industrial, domestic and institutional areas - Test method and requirements without mechanical action (phase 2/step 2) March 2002
R-09-06 Flexible scope of accreditation in laboratory Chemila, Ltd.

Description: Testing the efficacy of chemical disinfectants and antiseptics

Sample ID: 2094-2095/2012

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Sample name: **DETOXY COLOR**

Sampled: by client

Sampling point: ROKOSPOL a.s., Biskupice u Luhačovice

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C.2 Testing the efficacy of chemical disinfectant **DETOXY COLOR** on carriers

Tab No. 2.1 Testing – fungicidal activity of the product **DETOXY COLOR**

Time	Test organism	Fungicidal test suspension N	Water control Nc carriers without paint	Water control Nc carriers with paint without TiO2	Test procedure Nd carriers with paint with TiO2
0	<i>Aspergillus niger</i> ATCC 16 404	10 ⁻⁵ : 235, 241 10 ⁻⁶ : 24, 23 N : 6.08	10 ⁻² : >300, >300 10 ⁻³ : >300, >300 10 ⁻⁴ : 51, 48 10 ⁻⁵ : 4, 5 Nc : 6.69	-	-
2 hours	<i>Aspergillus niger</i> ATCC 16 404	-	10 ⁻² : >300, >300 10 ⁻³ : >300, >300 10 ⁻⁴ : 41, 45 10 ⁻⁵ : 4, 2 Nc : 6.63	10 ⁻² : >300, >300 10 ⁻³ : 282, 269 10 ⁻⁴ : 27, 28 10 ⁻⁵ : 3, 2 Nc : 6.44	10 ⁻² : >300, >300 10 ⁻³ : >300, >300 10 ⁻⁴ : 31, 30 Nd : 6.48 ME : 0.15
24 hours	<i>Aspergillus niger</i> ATCC 16 404	-	10 ⁻² : >300, >300 10 ⁻³ : 308, 290 10 ⁻⁴ : 30, 28 10 ⁻⁵ : 2, 2 Nc : 6.48	10 ⁻² : >300, >300 10 ⁻³ : >300, >300 10 ⁻⁴ : 32, 34 10 ⁻⁵ : 3, 3 Nc : 6.52	10 ⁻² : >300, >300 10 ⁻³ : 27, 29 10 ⁻⁴ : 3, 3 Nd : 5.45 ME : 1.03
1 week	<i>Aspergillus niger</i> ATCC 16 404	-	10 ⁻² : >300, >300 10 ⁻³ : >300, >300 10 ⁻⁴ : 43, 47 10 ⁻⁵ : 5, 5 Nc : 6.65	10 ⁻² : >300, >300 10 ⁻³ : >300, >300 10 ⁻⁴ : 45, 40 10 ⁻⁵ : 4, 5 Nc : 6.63	10 ⁻¹ : 13, 15 10 ⁻² : 2, 0 10 ⁻³ : 0, 0 Nd : 3.15 ME : 3.50
2 weeks	<i>Aspergillus niger</i> ATCC 16 404	-	10 ⁻² : >300, >300 10 ⁻³ : >300, >300 10 ⁻⁴ : 35, 31 10 ⁻⁵ : 2, 3 Nc : 6.52	10 ⁻² : >300, >300 10 ⁻³ : 235, 247 10 ⁻⁴ : 24, 22 10 ⁻⁵ : 2, 2 Nc : 6.38	10 ⁻¹ : 16, 15 10 ⁻² : 2, 2 10 ⁻³ : 0, 0 Nd : 3.19 ME : 3.34
1 month	<i>Aspergillus niger</i> ATCC 16 404	-	10 ⁻² : >300, >300 10 ⁻³ : 213, 230 10 ⁻⁴ : 22, 20 10 ⁻⁵ : 0, 2 Nc : 6.35	10 ⁻² : >300, >300 10 ⁻³ : 142, 152 10 ⁻⁴ : 14, 16 10 ⁻⁵ : 2, 2 Nc : 6.17	10 ⁻¹ : 6, 5 10 ⁻² : 0, 2 10 ⁻³ : 0, 0 Nd : 2.74 ME : 3.61

$$N = \log_{10} [\{ 0.05 \cdot (x + x') \} / 2 \cdot d]$$

where x and x' are paired values for which the mean of the value falls between 50 and 300 colonies, d is the dilution factor for the dilution taken into account

$$NC \text{ or } NT = \log_{10} [\{ 10 \cdot (y + y') \} / 2 \cdot d]$$

where y and y' are paired values for which the mean of the value falls between 50 and 300 colonies, d is the dilution factor for the dilution taken into account

Description: Testing the efficacy of chemical disinfectants and antiseptics

Sample ID: 2094-2095/2012
Rep No: 111
Sample name: **DETOXY COLOR**
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Delivered amount: 0.5 kg + 0.5 kg
Batch No: 2700410, laboratory sample
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C.3 Evaluation of bactericidal and fungicidal activity of the product **DETOXY COLOR** on carriers

Tab No. 3.1 The efficacy of chemical disinfectant **DETOXY COLOR** on test strains – bactericidal and fungicidal activity on carriers

Bactericidal and fungicidal activity of the product on carriers (ČSN EN 13697)						
Strain	Test temperature [°C]	Contact time [min]	Product test concentrations [%]	Interfering substances - conditions	Ig R ČSN EN 13697	Ig R
<i>Pseudomonas aeruginosa</i> ATCC 15442	23	2 hours	100	-	> 4	< 4
<i>Aspergillus niger</i> ATCC 16 404	23	2 hours	100	-	> 3	< 3
<i>Pseudomonas aeruginosa</i> ATCC 15442	23	24 hours	100	-	> 4	> 4
<i>Aspergillus niger</i> ATCC 16 404	23	24 hours	100	-	> 3	< 3
<i>Pseudomonas aeruginosa</i> ATCC 15442	23	1 week	100	-	> 4	-
<i>Aspergillus niger</i> ATCC 16 404	23	1 week	100	-	> 3	> 3
<i>Pseudomonas aeruginosa</i> ATCC 15442	23	2 weeks	100	-	> 4	-
<i>Aspergillus niger</i> ATCC 16 404	23	2 weeks	100	-	> 3	> 3
<i>Aspergillus niger</i> ATCC 16 404	23	1 month	100	-	> 3	> 3

Mikrobicidal effect of ME = Nc - Nd

Prepared by: Hana Konevalíková, Lab Technician

Description: Testing the efficacy of chemical disinfectants and antiseptics

Sample ID: 2094-2095/2012
Rep No: 111
Sample name: **DETOXY COLOR**
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Interpretation:

Results of tests are in Tabs.

The tested concentrated product **DETOXY COLOR**, batch No. 2700410, in the contact time 24 hours, under no interfering substances, at temperature $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$, by the dilution neutralization method, **decreased** on carriers* treated by the product according to the manufacturer's requirements the number of alive microbes *Pseudomonas aeruginosa* ATCC 15442 by 4 (lg) orders (EN 13697).

The tested concentrated product **DETOXY COLOR**, batch No. 2700410, in contact times 1 week, 2 weeks and 1 month, under no interfering substances, at temperature $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$, by the dilution neutralization method, **decreased** on carriers* treated by the product according to the manufacturer's requirements the number of alive microbes *Aspergillus niger* ATCC 16404 by 4 (lg) orders (EN 13697).

* The test was modified according to the granted testing scope flexibility type I.

Conclusion:

The product **DETOXY COLOR** is capable of reducing the number of viable *Pseudomonas aeruginosa* cells under defined conditions to the declared values.

The product **DETOXY COLOR** is capable of reducing the number of viable *Aspergillus niger* cells under defined conditions to the declared values.

24.1.2013, Hodonín

Ing. Jana Šlitrová: Leader of Study

