

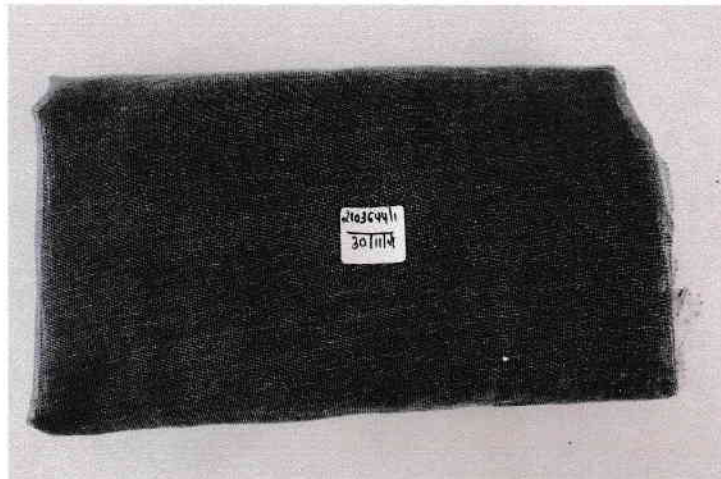
## TEST REPORT

LAB NO.: 2103644/ 1

DATE: 20/12/2021

**NAME OF CUSTOMER** : DELIUS GmbH & Co. KG  
**ADDRESS** : Goldstraße 16 - 18 | 33602 Bielefeld | Germany  
**REFERENCE** : Letter No. Nil dated August 31, 2021  
 Kind attention Angelika Schmidt-Koch  
**DATE OF RECEIPT** : 30/11/2021  
**DATE OF INITIATION** : 30/11/2021  
**DATE OF COMPLETION** : 20/12/2021  
**SAMPLE DESCRIPTION** : Sample labeled as-

Sr. No.	Description
1.	Leno printed Delicare
Untreated lab control	



• Samples are not drawn by the laboratory • Result relate only to the samples tested  
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**Test Method:**

ISO 18184: 2019; Determination of antiviral activity of textile products

**Scope:**

This International Standard specifies testing methods for the determination of the antiviral activity of the textile products. The textile products include woven and knitted fabrics, fibres, yarns, braids using Enveloped virus, an Influenza virus, which is an infective virus in humans that causes respiratory tract infection

**Determination of Infectious titre:**

TCID50 method

**Virus strains and host cells:**

Test Virus: Influenza A virus (H3N2): A/Hong Kong/8/68: ATCC VR-1679

Host Cell: MDCK cell ATCC CCL-34; Passage No.: Cells from PN 14

**Experimental Conditions:**

Test Fabric : 0.4 grams  
 Control Fabric : Untreated Fabric  
 Test procedure : Triplicates  
 Virus inoculum volume : 0.2 ml  
 Viral titre :  $1.80 \times 10^7$  PFU/ ml  
 Contact time : 2 hours  
 Wash out Medium : SCDLP  
 TCID50 method : 96 Well plate  
 Medium of Cell culture : Eagle's minimal essential medium (EMEM), supplemented with inactivated FBS & antibiotics  
 Incubation : 37<sup>o</sup> C in CO<sub>2</sub> incubator/ 7 days

**Verification of cytotoxicity by cell sensitivity to virus and the inactivation of antiviral activity:**

1. Sterile Control and Test fabric were added with 20 ml wash out solution, SCDLP medium. These were agitated by vortexing for 5 seconds, 5 times. The washing out solution was inoculated with virus suspension and incubated at 25<sup>o</sup>C for 30 minutes.
2. Infective titre of this solution was determined by TCID50 Method.
3. Log of TCID50/ ml of Control fabric - Log of TCID50/ ml of Test Fabric  $\leq 0.5$ .

**Observations:**

Log of TCID50/ ml of Control fabric	Log of TCID50/ ml of Test Fabric	Log of TCID50/ ml of Control fabric - Log of TCID50/ ml of Test Fabric	Acceptable Criteria
3.82	3.50	0.32	$\leq 0.5$

\*Method modified wrt contact time

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**Test Procedure:**

1. Test Fabrics and Control Fabrics were inoculated with 0.2 ml of virus suspension in triplicate sets. One triplicate set of Control fabric was terminated immediately after adding virus suspension. Remaining sets were incubated at 37°C for 2 hours in CO<sub>2</sub> incubator.
2. After the contact duration, test and Control fabrics were terminated using wash out solution. Virus titre of wash out solution was determinate using TCID<sub>50</sub> Method.

**Results:**

**Test Virus:** Influenza A Virus (H3N2): A/Hong Kong/8/68: ATCC VR-1679

**1: Test Sample:** Leno printed Delicare

Virus	Replicates	Log of Infectivity titre value Log (Va) (Immediately after Inoculation of Control)	Log of Infectivity titre value Log (Vb) (After 2 hours of contact with Control)	Log of Infectivity titre value Log (Vc) (After 2 hours of contact with Test Specimen)
Influenza virus suspension: (1.82 × 10 <sup>8</sup> PFU / ml)	Set I	5.90	5.86	3.15
	Set II	5.85	5.82	3.12
	Set III	5.88	5.86	3.15
lgTCID <sub>50</sub> / Average		5.88	5.85	3.14
Reduction value <b>M = Log (Va – Vb)</b>		0.03		
Log of <b>Antiviral Efficacy Value Mv</b>		2.71		
Percentage <b>Antiviral Efficacy Value Mv</b>		99.80		

**Antiviral activity Mv = Log Va – Log Vc**

**Where:**

**Mv** = antiviral activity value

**Log (Va)** = Average of Infectivity titre value immediate after inoculation of Control fabric

**Log (Vb)** = Average of Infectivity titre value after contact time of Control fabric

**Log (Vc)** = Average of Infectivity titre value after contact time of Test fabric

**Antiviral performance standard:**

Item	Antiviral efficacy value Mv	Standard
Tested Textile Sample	3,0 > Mv ≥ 2,0	Good effect
	Mv ≥ 3,0	Excellent effect



**For BIOTECH TESTING SERVICES**



Dr Shilpa U. Nair  
Quality Manager  
(Authorized Signatory)

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