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Summary

This document summarizes a seminar given on 29th of March 2022. The seminar „Fighting pathogens – sterilization, disinfection and biocide approaches" gave an overview about several sterilization and disinfection technologies, regulatory requirements and industrial examples of related products.

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1 Introduction

Within WP5 of the Inno4Cov-19 project a seminar was given on March 29th with the title „Fighting pathogens – sterilization, disinfection and biocide approaches". Due to safety reasons a hybrid model was chosen to allow attendance of the seminar in person or virtually. The seminar gave an overview over several sterilization and disinfection technologies and regulatory requirements. Additionally, examples from an industrial point of view were presented.

2 Agenda

The following table shows the agenda for the seminar.

#	Talk title	Presenter
1	Introduction on IVDR and MDR	Sandra Ferretti
2	Presentation on sterilization requirements - a regulatory view	Jan Havel
3	Hygenization with UV radiation	Linda Steinhäußer
4	Sterilization and disinfection by electron beam irradiation	Steffen Günther
5	Natural antimicrobial additives for paints and inks	Gonçalo Costa
6	ALD coated bactericide/virucide stickers	Jacques Kools
7	Novel Materials on the battle against Nosocomial infections	George Kiriakidis
8	Natural, safe, and cost-effective virucidal technology for single use facemasks	Marcelo Milani
9	Sanitization by UV-light – Protecting the environment over last two years	Carlo D'Alesio

The event was divided into three parts. First part (#1 - #2) relates to regulatory insights. Second part (#3 - #4) presented details of different sterilization and disinfection technologies. The third part (#5 - #9) was highlighting commercial products with respect to the overall topic of the seminar „Fighting pathogens".

3 Talks in detail

3.1 Introduction on IVDR and MDR

Sandra Ferretti gave an overview about regulations regarding medical devices (MDR) and in vitro diagnostic devices (IVDR). The term 'medical device' in view of regulation was explained and defined. The classification of medical devices (MDR and IVDR) was shown with detailed information about the different classes ranging from low to high risk devices. In view of sterile

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devices respective rules and regulations were explained including technical documentation needs and labelling requirements.

3.2 Presentation on sterilization requirements - a regulatory view

Jan Havel presented information about bioburden estimation according to EN ISO 11737-1 and contamination control. Several disinfection and sterilization methods were categorized and its effects to bio-contaminants were shown. The concept of sterile assurance level was explained for different sterilization methods and documentation requirements were illustrated.

3.3 Hygenization with UV radiation

Linda Steinhäußer presented detailed information about UV sterilization methods. The different regions of wavelengths and its properties were explained. The effect of UV irradiation to RNA and DNA was shown at high scientific level. Newest developments were presented for instance to sterilize inner surface of siphons in hospitals.

3.4 Sterilization and disinfection by electron beam irradiation

Steffen Günther gave a talk about electron beam sterilization. He presented the scientific basics of electron beams and compared the method to other sterilization methods like UV or ethylene oxide in view of timing effort, costs and compatibility with different materials or goods. Several examples of electron beam sterilization were shown. The roll-to-roll sterilization of fabrics were presented in detail, showing the results achieved within the Inno4Cov-19 project.

3.5 Natural antimicrobial additives for paints and inks

Unfortunately, talk #5 was cancelled the day before the seminar due to personal reasons.

3.6 ALD coated bactericide/virucide stickers

Jacques Kools presented sticker like products to apply a biocide surface to different kinds of heavenly touched surfaces. He pointed out the production technology including ALD processes and results of real life testing at airport 'Aeroports de la Cote d'Azur'.

3.7 Novel Materials on the battle against Nosocomial infections

George Kiriakidis presented new developments using photocatalytic effects to destroy bio-contaminants on different kinds of surfaces. He explained influence of different dopants in view of photocatalytic activity and inactivation capability regarding different bacteria and viruses. Potential market areas were shown and newest results from different projects were presented.

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3.8 Natural, safe, and cost-effective virucidal technology for single use facemasks

Marcelo Milani presented a plasma based technology to tailor the surface properties of different materials. Beside other effects a remarkable virucide reduction using citric acid as pre cursor was explained in detail. The results of biocompatibility tests, breathability behaviour and stability were shown proven the effectiveness of the technology. Further examples were given to highlight the broad applicability of the technology.

3.9 Sanitization by UV-light – Protecting the environment over last two years

Carlo D'Alesio presented activities from last years to protect public spaces by sanitizing them via UV light. Further examples were pointing out to activities beside sanitization to proof the broad applicability of UV irradiation for instance in bio-refineries and green houses.

4 Dissemination

The seminar was followed online by 15 to 20 participants.

All the talks were recorded. In case of permission by the authors the recordings are available through the seminar web page https://www.fep.fraunhofer.de/de/events/rueckblick_2022/fighting-pathogens.html. The presentation may be found also there as PDF. A link to all the companies was also installed to widen the dissemination effect.

Up to now there are more than 100 unique page visits at the web site from different European countries.

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