

CoVid-19 Action

A facility to test PPE according to the European Standards

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Abstract

Triggered by the covid-19 emergency the demand for Personal Protective Equipment, PPE for medical personnel and for common people has grown impressively and is not satisfied by the present production. For this reason, a number of new producers are presenting on the market their “novel” products. In this confusing situation it is of paramount importance to be able to discriminate between “good” and “bad” products before they are distributed. INRIM is setting up a facility for the characterization of PPE (face masks and filters) according to the European Standards.

Background and needs

At present, there is not a specific European Standard to set the requirement for protecting from covid-19. On the other hand, face masks used to protect against particulate matter (dust) are regulated by European Standards. The European Accreditation recommends to adopt the European Standard EN 149:2001 + A1:2009 “Respiratory protective devices” [1]. Unfortunately, in Italy there are no laboratories able to perform the tests prescribed by this standard. This obliges the Italian institutions to import already certified PPEs or, alternatively, to trust on self-certification made by importers and producers. With this in mind INRIM decided to tackle the problem and to build a facility able to perform the tests required in the EN-140 (face masks), EN-143 (filters for face masks) and EN-149 (filtering face masks).

The project

The objective of the project is the realization and the validation of a series of apparatus to test the efficacy of the filters (penetration test), the sealing of the face mask, the breathability, the portability, the CO₂ concentration and more. In particular:

- A facility to test the filtering efficacy of filters and filtering face masks including aerosol generators, aerosol meters and a sealed chamber (EN-149, EN-143)
- A facility to test the sealing of the face masks including a test room filled with aerosol and aerosol meters (EN-140, EN-149)
- A facility to test the breathability of the filters and of the filtering masks including flow meters and pressure meters (EN-149, EN-143)
- A facility to test the CO₂ concentration including an artificial lung, a CO₂ generator and CO₂ sensors (EN-140, EN-149)

The laboratories will be realized at the premises of an R&D company specialized in mechanical prototyping and injection moulding [2]. The contribution of INRIM personnel is in the design of the apparatus, in the metrological support and preliminary testing. All the relevant sensors used in the experiments will be calibrated at INRIM.

This project has been submitted to the Call for Action "Innova per l'Italia" supported by Italian Government (application #2407).

Further objectives

Once the facility will be ready it will serve as a reliable tool to test any innovative product invented to protect against the covid-19, including the widespread DIY face masks. Also, as soon as a new standard for the protection from covid-19 will be assessed, the laboratory will be promptly adapted to the new needs.

[1]<https://european-accreditation.org/wp-content/uploads/2020/03/EA-Communication-coronavirus-outbreak-and-face-mask-testing-26March2020.pdf>

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