



Whole System Test

CBRN clothing systems are designed to protect human beings against the threat of chemical warfare agents. The applied materials and components are usually thoroughly tested in order to make sure that these can withstand exposure to most relevant chemicals. Unfortunately, this does not guarantee that the system as a whole will offer a sufficient degree of protection. After all, a single, small leak may defeat the entire ensemble.

Proof of reliability.

The need for Whole System Testing

The fact that only testing materials and components is insufficient has been well established, and is now generally accepted. Standards and guidelines, such as the NATO clothing triptych, now explicitly call for whole-system testing. Also, whole-system testing is commonly prescribed in procurement procedures and tender documents. Perhaps even more importantly, a lot can be learned from Whole System Tests that cannot be learned otherwise - knowledge that can be used to improve your product.

Results from a Whole System Test

A Proqares Whole System Test report will tell you whether your system offers the intended degree of protection. But also: which parts form the weakest link of the system and which parts show room for improvement. You will be advised

regarding the effects of certain details of your design on the overall degree of protection, and on how (sometimes small) changes might affect this.

Our test setup

The Proqares Whole System Test was designed with one clear goal: producing consistent, reliable results. The test was extensively and carefully validated, and has been applied numerous times with every conceivable type of clothing system. We use a custom-built wind tunnel in which the concentration of the chemical vapour challenge (a simulant representing a chemical warfare agent) is kept within tightly controlled margins. Samplers, filled with an adsorbent material, are used to quantitatively determine the presence of vapour underneath the clothing system.

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Different Whole System Test options

Depending on what test specifications are prescribed and what you aim to learn from the test, different options for the Whole System Test may be chosen. First of all, a decision needs to be made whether to use a manikin or work with human volunteers. In most cases, volunteers are recommended; mannikins are limited in the variety of movements that can be carried out, whereas volunteer-based tests can be adjusted to any kind of movement protocol. Proqares uses a pool of experienced volunteers, balanced in terms of gender and sizes. Our protocols comply with all relevant health and safety codes, as well as guidelines for responsible human subject testing.

Proqares can either carry out the test according to a specific protocol (such as specified in the ASTM F2588-06 standard), recommend a tailor-made protocol for your purposes, or implement a protocol of your own design. Test design choices concern the movement protocol, choice of sampler positions and

the number of repeat measurements in order to obtain the desired level of accuracy. Our experienced staff will carefully execute the test programme according to the test plan discussed with you beforehand.

Report

A detailed report is provided which includes data for individual sampler positions and overall conclusions regarding the performance of your system.



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Many professionals worldwide trust their lives to protective equipment against chemical and biological hazards. Proqares is an internationally leading provider of testing, evaluation and certification services targeted at such personal protective equipment. Proqares has an extensive track record in testing CBRN (Chemical, Biological, Radiological and Nuclear) protection devices for military personnel and first responders; commonly tested devices include respirators, CBRN protective clothing, boots and gloves. Also, Proqares provides a range of services targeted at personal protective equipment for the Chemical, Medical en Pharmaceutical industry. Within its High-Tox facility, Proqares is capable of working with the most toxic chemicals known to man, providing the fastest and most reliable results in the industry. Any test specified in all commonly cited standards is offered - national and international standards, military and civil. Integrity, flexibility, speed and reliability are core values of Proqares and its employees.

Proof of reliability.