



## LIQUID/VAPOR PERMEATION TESTING

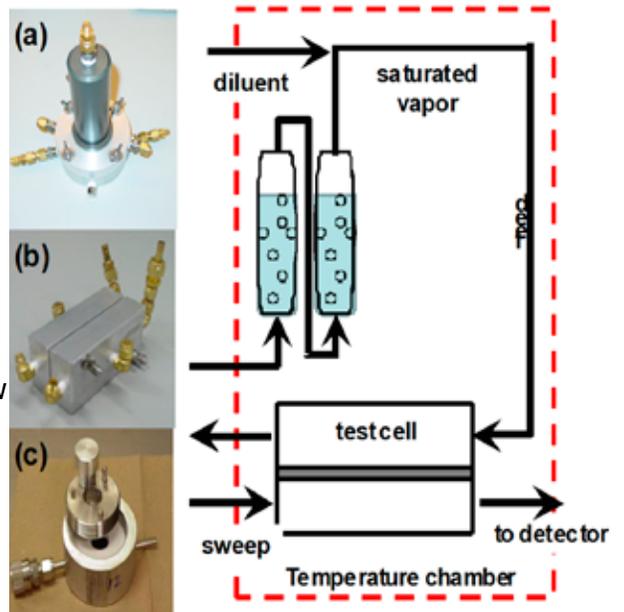
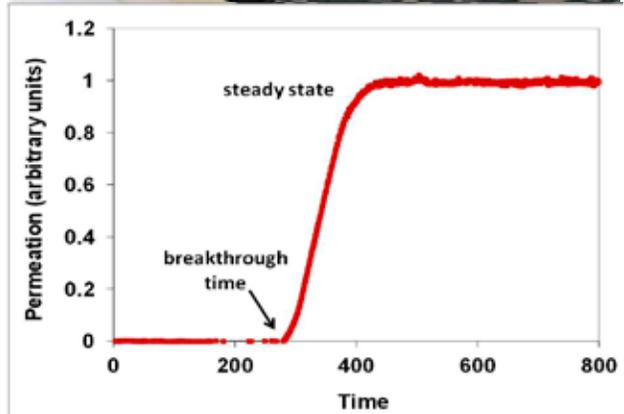
### WHAT IT IS:

The capabilities at the NSRDEC for testing barrier materials are comprised of a variety of test cells, detectors, chemical simulants, and challenge stream conditions to support the general R&D effort towards making more robust and lightweight chemical protective wear with decreased thermal burden. The test systems are designed to characterize the barrier properties of fabrics, polymer films and other composites and hybrids by measuring breakthrough times and quantifying the amount of permeant which has passed through.

### DESCRIPTION:

In the AVLAG (Aerosol Vapor Liquid Assessment Group) test cell (a), liquid droplets of the chemical simulant are placed on the sample surface while a flow on the challenge side provides an atmosphere of dry or wet nitrogen. In the vapor test cell (b), the simulant flows towards the sample as a vapor with a controlled concentration. In the flooded liquid cell (c), the sample is completely covered with liquid. In all the test cells, a sweep stream of either dry or wet nitrogen carries the simulant which has permeated through to the detector.

Many detectors (Micro GC, TCD, FID, FPD, PID, GC-MS) are used to characterize the performance of the swatches towards a wide variety of mustard simulants, nerve agent simulants, and water. Isothermal chambers allow the testing to be done with strict temperature control while saturated vapor generators enable the user to tailor the humidity and simulant concentration of the flow.



### POINT OF CONTACT:

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