

SYSTEM AGENT TESTING

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- ◆ **Types of Chemical Warfare Agents that have been used in testing**
- ◆ **Purpose of current Chemical Warfare Agent testing**
- ◆ **Test conditions used in testing**
- ◆ **Brief description of testing equipment**

Material Tested

Agents

Absorbent Canister System Components

Class - Blood

SA - Arsine	X	X		
CK - Cyanogen Chloride	X	X		
AC - Hydrogen Cyanide	X	X		

Class - Choking, Asphyxiant, Irritant

CG- Phosgene	X	X		
PS - Chloropicrin	X	X		

Class - Nerve Agents

GB - Sarin		X	X	X
DMMP - Simulant	X	X		

Class - Blister

HD - Mustard			X	X
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TEST DESCRIPTION/PURPOSE



Test Item	Agent	Purpose
Canisters		
Constant Flow Breather Flow	GB, CK	Capacity of adsorbent, g/mL Activity of adsorbent
Components (facepiece, lens, etc.)	HD, GB	Resistance to Permeation
System	HD, GB	Resistance to Permeation/ Penetration

Canister Test Conditions

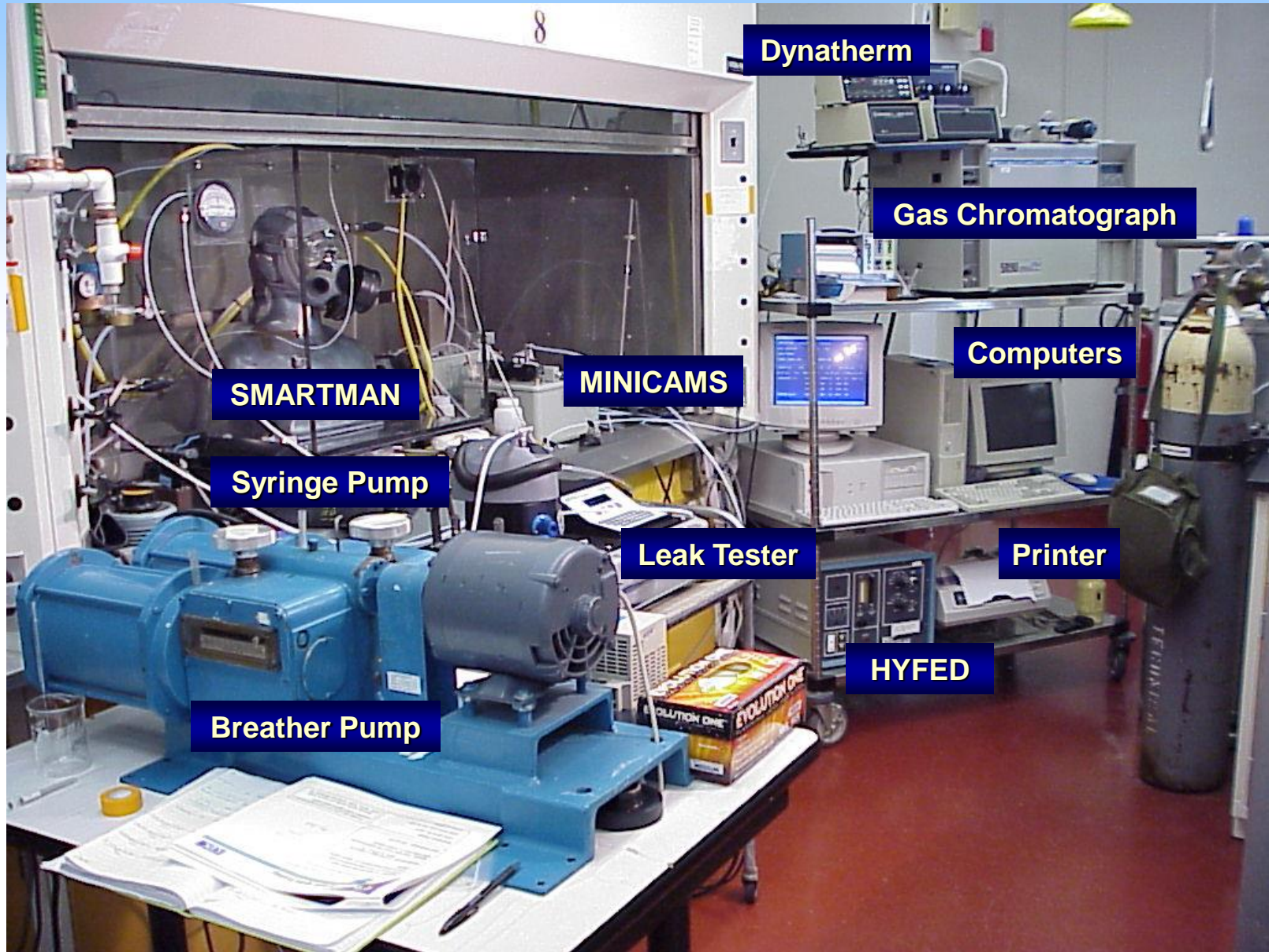
Agent	Flow	Challenge	Break Concentration
GB	Constant Flow 32 L/min	4000 mg/m ³	0.04 mg/m ³
DMMP	Constant Flow 32 L/min	3000 mg/m ³	0.04 mg/m ³
CK	Breather Flow 50 L/min (155 peak)	4000 mg/m ³	8; 5 mg/m ³

System Testing

Breather Flow (Sinusoidal)	10, 20 25, 50 L/min
Challenge concentration	Various: 1000, 500, mg/m³ 300, 200, 20, 25, 6200 to 1, etc.
Duration of Test	1 Hour, 2 Hour, 24 Hour, 36 Hour, 72 Hour
Break Point	GB 0.0001 mg/m³ HD 0.003 mg/m³

- ◆ **SMARTMAN (SiMulant Agent Resistant Test MANikin)**
- ◆ **Syringe pump to generate agent vapors**
- ◆ **Air Controller**
- ◆ **Breather Pump, Sinusoidal**
- ◆ **Mixing Chamber**
- ◆ **MINICAMS or Gas Chromatograph - Dynatherm**
- ◆ **HYFED (Hydrogen Flame Emission Detector)**
- ◆ **Computer**

EQUIPMENT SETUP



Dynatherm

Gas Chromatograph

Computers

Printer

HYFED

Leak Tester

Syringe Pump

MINICAMS

SMARTMAN

Breather Pump



Test Item	Agent	Challenge	Breakpoint	Flow Rate	Test Duration	Primary Issues
Canisters Cartridges	GB	1000 mg/m ³	.0001	64 l/min	1 Hr	Challenge Conc
	CK	1000 mg/m ³	5; 8			Breakpoint (WPLs or AEGLs) Flow rates 50-100 l/min
Components (permeation)	GB	10 gm/m ²	.0001	NA	1 Hr	Challenge Conc
	HD	10 gm/m ²	.003			Breakpoint (WPLs or AEGLs)
System ASRs	GB	1000 mg/m ³	.0001	64 l/min	1Hr	Challenge Conc
	HD	200 mg/m ³	.003			Breakpoint Flow rates 50-100 l/min
APRs	GB	100 mg/m ³	.0001	64 l/min	1Hr	Challenge Conc
	HD	50 mg/m ³	.003			Breakpoint Flow rates 50-100 l/min