

CBRN SOLUTIONS FOR YOUR TACTICAL OPERATIONS

Dräger is a global provider of CBRN detection and protective equipment for the US military, first responders and agencies worldwide.



Our Philosophy

“

Dräger has a long heritage of helping firefighters, military, and mine rescue teams — whom miners have called Drägermen since the early 1900s. The 21st century Drägerman works in tough, dangerous jobs and rely on Dräger to keep them safe while they work hard to make our lives better. That is why Dräger supports the Drägerman and will continue to provide the support and equipment to get the job done.

”

So what is CBRN?

It stands for chemical, biological, radioactive, and nuclear weapons - also commonly referred to as weapons of mass destruction.

So what are Chemical Weapons?



CHEMICAL WEAPONS

According to the Organization For the Prohibition of Chemical Weapons a chemical weapon is "A toxic chemical contained in a delivery system, such as a bomb or shell...applied to any toxic chemical or its precursor that can cause death, injury,

temporary incapacitation or sensory irritation through its chemical action. Munitions or other delivery devices designed to deliver chemical weapons, whether filled or unfilled, are also considered weapons themselves."

CHARACTERISTICS AND EFFECTS OF CHEMICAL WARFARE AGENTS

	Description	Toxic Effects
Nerve Agents	Tabun <i>GA</i>	<p>Vegetative Nervous System: Constriction of pupils (miosis), headache, runny nose, hypersalivation, vomiting, abdominal cramps, bronchospasm, diarrhea</p> <p>Peripheral Nervous System: twitching of muscle groups, respiratory paralysis</p> <p>Central Nervous System: convulsion, severe breathing difficulty or respiratory failure</p>
	Sarin <i>GB</i>	
	Soman <i>GD</i>	
	VX <i>VX</i>	
Blister Agents (Vesicants)	S-Mustard <i>HD</i>	<p>Damaging Effects to the Skin: Mustard: Latent period 6-8 hrs., then redness, itchiness, pearl-like blisters, necrotic lesions, secondary infections Lewisite: no latent period, itchiness, blisters, lung edema, eyes/respiratory damage, systematic long-term damage</p>
	N-Mustard <i>HN1-3</i>	
	Lewisite <i>L</i>	
Choking Agents	Phosgene <i>CG</i>	<p>Toxic Pulmonary Edema: Latent period (6-8 hrs.), free of symptoms, then coughing, breathlessness, unrest, chest pain, choking, high concentration immediately deadly</p>
	Chloropicrin <i>PS</i>	
Blood Agents	Hydrogen Cyanide <i>AC</i>	<p>Cyanide is thought to act by combining with the enzyme cytochrome oxidase. Impairment of cellular oxygen use. Dizziness, increasingly dyspneic, healthy skin color, headache, cramps, respiratory standstill</p>
	Cyanogen Chloride <i>CK</i>	
Psychedelic Agent	BZ <i>BZ</i>	Wide pupils, dry mouth, angst, dizziness, hallucination, worst case unconsciousness

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3148621/>

So what are Biological Weapons?



BIOLOGICAL WEAPONS

A **biological agent** - also called **bio-agent**, **biological threat agent**, **biological warfare agent**, **biological weapon**, or **bioweapon** - is a bacterium, virus,

protozoan, parasite, or fungus that can be used as a weapon in bioterrorism or biological warfare (BW).

AGENT CHARACTERISTICS

Disease	Transit Man to Man	Infective Dose (Aerosol)	Incubation Period	Duration of Illness	Lethality (approx. case fatality rates)	Persistence of Organism	Vaccine Efficacy (aerosol exposure)
Inhalation anthrax	No	8,000-50,000 spores	1-6 days	3-5 days (usually fatal if untreated)	High	Very stable - spores remain viable for > 40 years in soil	2 dose efficacy against up to 1,000 LD ₅₀ in monkeys
Brucellosis	No	10-100 organisms	5-60 days (usually 1-2 months)	Weeks to months	<5% untreated	Very stable	No vaccine
Cholera	Rare	10-500 organisms	4 hours-5 days (usually 2-3 days)	≥1 week	Low with treatment, high without	Unstable in aerosols & fresh water; stable in salt water	No data on aerosol
Glanders	Low	Assumed low	10-14 days via aerosol	Death in 7-10 days in septicemic form	>50%	Very stable	No vaccine
Pneumonic Plague	High	100-500 organisms	2-3 days	1-6 days (usually fatal)	High unless treated within 12-24 hours	For up to 1 year in soil; 270 days in live tissue	3 doses not protective against 118 efficacy against LD ₅₀ in monkeys
Tularemia	No	10-50 organisms	2-10 days (average 3-5)	≥2 weeks	Moderate if untreated	For months in moist soil and other media	80% protection against 1-10 LD ₅₀
Q Fever	Rare	1-10 organisms	10-40 days	2-14 days	Very low	For months on wood and sand	94% protection 3,500 LD ₅₀ in guinea pigs
Smallpox	High	Assumed low (10-100 organisms)	7-17 days (average 12)	4 weeks	High to moderate	Very stable	Vaccine protects against large doses in primates
Venezuelan Equine Encephalitis	Low	10-100 organisms	2-6 days	Days to weeks	Low	Relatively unstable	TC 83 protects against 30-500 LD ₅₀ in hamsters
Viral Hemorrhagic Fevers	Moderate	1-10 organisms	4-21 days	Death between 7-16 days	High for Zaire strain, moderate with Sudan	Relatively unstable - depends on agent	No vaccine
Botulism	No	0.001 µg/kg is LD ₅₀ for type A	1-5 days	Death in 24-72 hours; lasts months if not lethal	High without respiratory support	For weeks in non-moving water and food	3 dose efficacy 100% against 25-250 LD ₅₀ in primates
Staph Enterotoxin B	No	0.03 µg/person incapacitation	3-12 hours after inhalation	Hours	<1%	Resistant to freezing	No vaccine
Ricin	No	3-5 µg/kg is LD ₅₀ in mice	18-24 hours	Days; death within 10-12 days of ingestion	High	Stable	No vaccine
T - 2 Mycotoxins	No	Moderate	2-4 hours	Days to months	Moderate	For years at room temperature	No vaccine

Source: Blue Books: Free download at <http://usamriid.detrack.army.mil> under the Education Section reference material.

Radiological Warfare & Nuclear Weapons



RADIOLOGICAL

Radiological warfare is any form of warfare involving deliberate radiation poisoning or contamination of an area with radiological sources.

NUCLEAR

A nuclear weapon is an explosive device that derives its destructive force from nuclear reactions, either fission (fission bomb) or from a combination of fission and fusion reactions (thermonuclear bomb).

Civil Defense Set

Simultaneous Testset



THE CIVIL DEFENSE SIMULTANEOUS TESTSET

The Civil Defense Simultaneous Testset (p) Kit is a special set of Dräger-Tubes developed especially for first responders who handle possible terrorist activities. To speed up analysis time and increase the ease of operation, five Dräger-Tubes are put into one set that can measure 5 gases or vapors at once. Two different Simultaneous Testset Kits enable the first responder to identify and measure 8 different chemical warfare agents at the scene in less than 5 minutes, including:

- Organic basic nitrogen compounds (nitrogen mustard)
- Hydrogen cyanide
- Organic arsenic compounds and arsine
- Phosgene
- Thioether (sulphur mustard)
- Cyanogen chloride
- Phosphoric acid ester
- Chlorine

Testing at the US Army's Soldier Biological Chemical Command (SBCCOM) in Aberdeen, Maryland showed that Dräger-Tubes produced more accurate and repeatable results than PID or FID detection devices. The Dräger-Tubes showed no cross sensitivity to substances such as gasoline or exhaust gases, which may also be present at the scene. In addition, the "Chloropicrin 0.1/a (measurement range 0.1-2 ppm), Arsine 0.05/a (measurement range 0.05-3 ppm or 1-60 ppm) and Ammonia (measurement 0.5-100 ppm) Dräger-Tubes are recommended.



Gas Detection Devices



RELIABILITY YOU CAN DEPEND ON

Dräger has some of the longest lasting and most reliable sensors for detecting a broad range of explosive and toxic gases. Dräger has excellent

solutions to address sensor performance in highly humid, extreme temperature, or otherwise challenging environments.

MULTI-GAS DETECTION DEVICES

- Ergonomic mobile-phone-like design
- Flexible sensor exchange
- Area monitoring
- Poison-resistant EX sensor
- Optimum solutions for function or bump tests and calibrations
- Durable sensor technology
- Flexible power supply
- Robust and watertight



D-23637-2009

Dräger X-am® 5000/5600

SINGLE-GAS DETECTION DEVICES

- Strong performance for maximum safety
- 360° alarm with various functions
- Easy to use with clear user guidance
- Robust design – even in the toughest conditions
- Economical operational costs
- User-friendly display with all important information
- Fast function test saves time and money



D-5046-2017

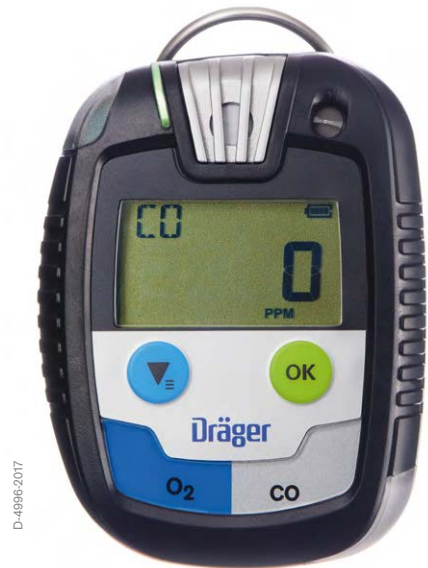
Dräger Pac® 6000 SO₂

Dräger makes a number of electronic gas detection devices that can monitor for known agents of concern, including:

Dräger Pac® 8000

The Pac® 8000, is a single gas detector that can be fitted with sensors for carbon dioxide (CO₂), chlorine gas (Cl₂), hydrogen cyanide (HCN), ammonia (NH₃), nitrogen dioxide (NO₂), phosgene (COCl₂) phosphine (PH₃) and organic vapors (OV or OV-A).

The Dräger Pac® 8000 performs especially well when detecting special gases. It can detect ozone (O₃) from concentrations as low as 0.02 ppm, phosgene (COCl₂) from 0.01 ppm, and detects nitrogen dioxide (NO₂) from concentrations as low as 0.04 ppm.



	Dräger Pac® 6000	Dräger Pac® 6500	Dräger Pac® 8000	Dräger Pac® 8500
Service light indicator	•	(•) ¹	(•) ¹	(•) ¹
Temperature to -40°F	•	•		
Battery capacity indicator	•	•	•	•
Replaceable sensor grid	•	•	• ²	•
Peak	•	•	•	•
TWV-TLV ³		•	•	•
STEL ⁴		•	•	•
Event logger	•	•	•	•
Data logger	•	•	•	•
Standard gases	•	•		
Special gases			•	
Duel sensor				•

1) Configurable 2) Does not apply to ozone or phosgene 3) TWA-TLV® = Time Weighted Average Threshold Limit Value 4) STEL = Short Term Exposure Limit

Dräger X-am® 8000

Switches easily between pump and diffusion mode

Impact detection alert you to severe mechanical stress

Assistants for clearance measurement, leak detection, and benzene-specific testing with the PID (pre-tube)

Optional Bluetooth® module to connect with the CSE Connect app for Android



Glowing green D-light (configurable) indicates tested and ready for use

Five slots for DrägerSensors® measure up to seven gases; two new high-performance PID sensors

Easy-to-read color display with zoom function

Inductive charging

Features	Dräger X-am® 3500	Dräger X-am® 8000
Number of measuring gases	1 to 4	1 to 7
Internal pump, activation with pump adapter	Yes	Yes, optional
Inductive charging	Yes	Yes
Customer-specific settings when ordering	No	Yes
Shoulder strap included as standard	No	Yes
Catalytic bead sensor DrägerSensor® CatEx 125 PR	Yes	Yes, configurable
Electrochemical (EC) DrägerSensors®: XXS O ₂ , XXS CO LC, XXS H ₂ S LC, XXS NO ₂ , XXS SO ₂	Yes	Yes, configurable
Electrochemical (EC) DrägerSensors®: other sensors/special gases	No	Yes, configurable
Infrared (IR) DrägerSensors® Dual IR Ex/CO ₂ IR-Ex, IR-CO ₂	No	Yes, configurable
Photoionization detector (PID) DrägerSensors®: PID HC, PID LC ppb	No	Yes, only when a pump is installed
Automatic measurement range switching for the catalytic bead sensor, catalytic bead sensor, measuring gas: methane	No	Yes
Assistant: Confined Space, Leak Search, Benzene/Pre-Tube	No	Yes, configurable
Event report (incl. impact detection)	Yes	Yes
Bluetooth® ¹	No	Yes

1) Bluetooth® is a registered trademark of Bluetooth SIG, Inc.

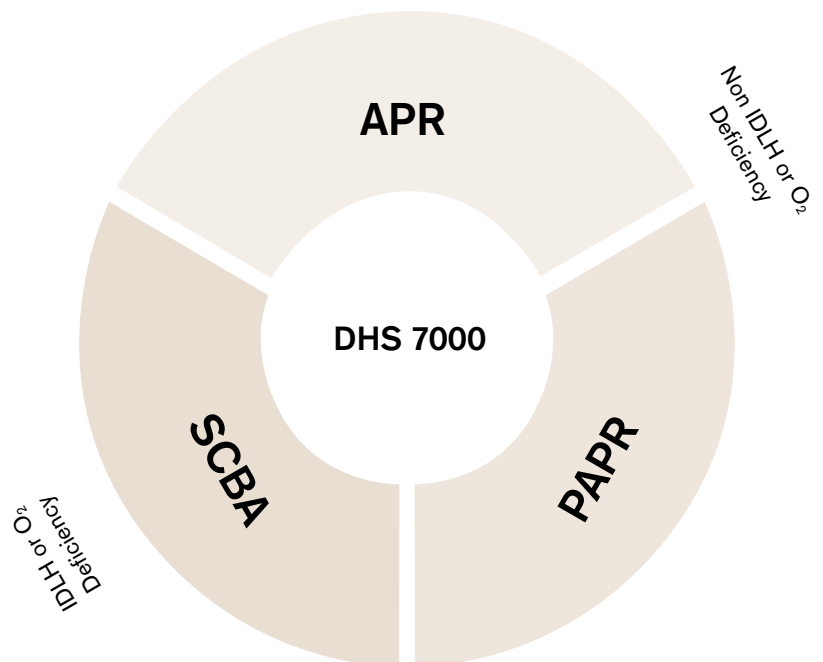
Hybrid Breathing Systems



WHAT IS A HYBRID BREATHING SYSTEM?

The Dräger DHS 7000 hybrid full-face mask is a modular system that provides three modes in a single mask – APR/canister, PAPR and SCBA – to adapt to changing operational conditions. It can be operated in positive and negative pressure, making it well suited for:

- Multiple task CBRN operations
- Operational CBRN scenarios with indefinite threats
- Long-duration missions
- Law enforcement and military applications



SYSTEM COMPONENTS



THE DHR 7000 FACEPIECE

- Single FFM for positive and negative pressure
- Mode switch
- Mode indicator
- Completely black, non-reflective design
- Communication system
- Hydration device
- Compatible with existing equipment (PSS 100 / PSS 7000)
- Available in 3 sizes (S,M,L)



*Tested and meets NIOSH-CBRN standard: 42 CFR Parts 84.60(b) and 84.63(c).

CBRN Full-face Masks & CBRN Filters



FOR INCIDENTS, DECONTAMINATION AND CWA DISPOSAL

Dräger's breathing protection equipment is some of the most well-fitting and most comfortable in the world. This highly reliable and durable line of CBRN protective equipment can provide protection across a broad range of potentially hazardous environments. Because the least effective breathing protection is the breathing protection not worn, comfort is an important attribute of a respiratory protection system.

The range of Dräger CBRN full-face masks and filters offer you an effective and comfortable personal protection system of the highest quality for maximum freedom of movement.

CIVIL DEFENSE PROTECTION

The CDR 4500 full-face mask provides proven protection from harmful gases and particles in the ambient air for civil defense and is NIOSH approved.

It is equipped with a centrally located and standard NATO canister connection and can be used with our CBRNe Cap 1 canister.

APPROVED IN ACCORDANCE WITH NIOSH CBRN

The full-face mask has an approval in accordance with the NIOSH-CBRN standard* in combination with the CBRN Cap 1 canister.

AVAILABLE IN VARIOUS SIZES

The full face mask is available in different versions and sizes to optimize fit and comfort. The components are designed in flat black for tactical operations to reduce reflections to a minimum.

LARGE FIELD OF VIEW AND ANTI-SCRATCH COATING

The high quality lens with anti-scratch fix wrap coating ensures a large undistorted field of view and offers improved mechanical and chemical resistance.

GOOD VOICE COMMUNICATION

The integrated speech diaphragm supports clear voice communication.

STANDARDIZED ROUND THREAD CONNECTION

The canister connects via a centrally located standard NATO 40mm connection.



ST-502-2008

Dräger CDR 4500

*NIOSH-CBRN Standard: 42 CFR Parts 84.60(b) and 84.63(c).

Air Purifying Respirator (APR)



CBRN CAP. 1 CANISTER

- NIOSH CBRN approved
- 12-year shelf life
- Shock and vibration resistant
- Resistant to temperature, humidity, and corrosives
- Ingress of water or other liquids must be avoided

D-44979-2015



Dräger CBRN Cap 1 Filter

Biological & Particulate Protection Masks



SAFE RESPIRATORY PROTECTION

- VarioFLEX™ head harness with EasyStop
- CoolMAX™ exhalation valve (optional)
- Formed mask body: proven, ergonomic, stable
- Flexible nose clip
- COOLSAFE™ filter material
- Nose seal
- Hypoallergenic inner layer



ST-451-2008

* N95 is available in TAA compliant countries

Dräger X-plore® 1700 N95 Respirator*

Self Contained Breathing Apparatus (SCBA)



HIGHEST STANDARDS FOR LONG-TERM PERFORMANCE

At Dräger, we believe that safety technology should help you do your job more quickly, safely, and effectively. That's why we make equipment that's lightweight and comfortable, so you can cover more ground with less effort.

Dräger's Self-Contained Breathing Apparatus (SCBA) components lets you choose the particular combination of features that is right for your mission – all designed to the highest standards for long-term performance—Dräger has the technology, functionality, and price to protect you while you protect others.

Designed for situations where minutes could be the difference between life and death, the Dräger Hybrid System offers the versatility to adapt to and overcome any operational environment.


HYBRID BREATHING SYSTEM

- Integrated hoses
- Flat black cylinder (4500 psi only)
- 30, 45 or 60 minutes
- CBRN LDV with >500 l/m air flow
- CGA or QC Reducer
- Comes with HUD
- Adjustable 3-position ergonomic backplate and harness
- Lightweight carbon composite backplate
- Vulcanized chloroprene rubber harness
- Swivel and pivot waist belt



ST-6147-2007

Dräger PSS® 7000



We can make the
difference
for you



“

Dräger salutes all Drägermen in the military who put their lives on the line for people at home and abroad. We stand ready with quality equipment and services to help them stay safe and successfully complete their missions.

”

Not all products, features, or services are for sale in all countries.

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www.draeger.com/CBRN