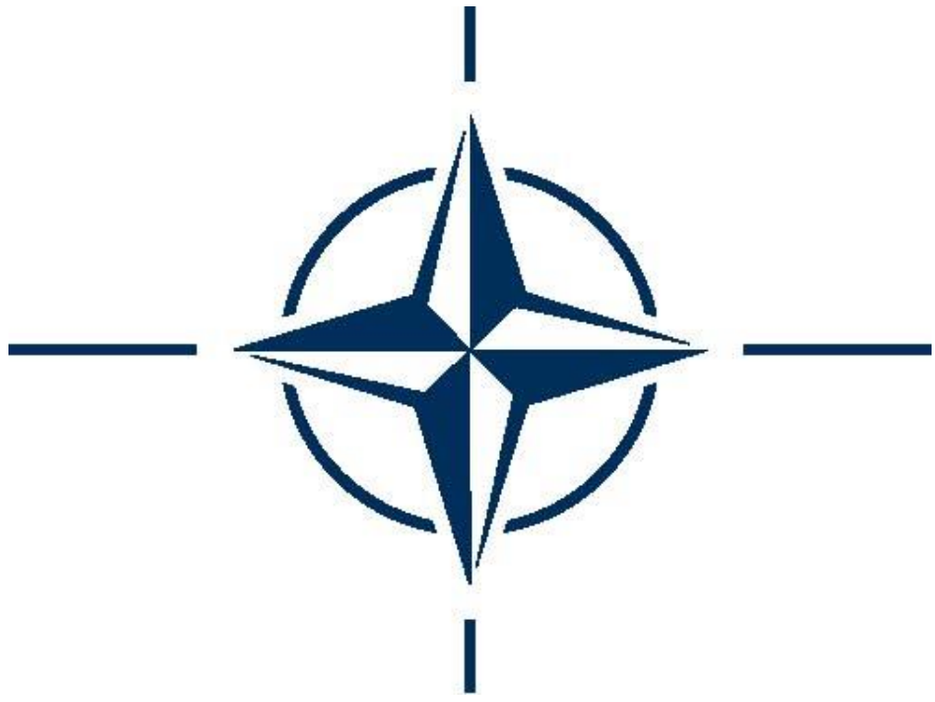
NATO STANDARD

AAMedP-1.22

PERFORMANCE OF PORTABLE FILTER-BLOWERS FOR AIRCREW CBRN RESPIRATORS

Edition A, Version 2

APRIL 2025



NORTH ATLANTIC TREATY ORGANIZATION

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NORTH ATLANTIC TREATY ORGANIZATION (NATO)

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NATO LETTER OF PROMULGATION

3 April 2025

1. The enclosed Allied Aeromedical Publication AAMedP-1.22, Edition A, Version 2, PERFORMANCE OF PORTABLE FILTER-BLOWERS FOR AIRCREW CBRN RESPIRATORS, which has been approved by the nations in the MILITARY COMMITTEE AIR STANDARDIZATION BOARD (MCASB), is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 3501.

2. AAMedP-1.22, Edition A, Version 2, is effective upon receipt and supersedes AAMedP-1.22, Edition A, Version 1 which shall be destroyed in accordance with the local procedure for the destruction of documents.

3. This NATO standardization document is issued by NATO. In case of reproduction, NATO is to be acknowledged. NATO does not charge any fee for its standardization documents at any stage, which are not intended to be sold. They can be retrieved from the NATO Standardization Document Database (https://nso.nato.int/nso/) or through your national standardization authorities.

4. This publication shall be handled in accordance with C-M(2002)60.

Thierry POULETTE
Major General, FRA (A)
Director, NATO Standardization Office

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RECORD OF RESERVATIONS

CHAPTER	RECORD OF RESERVATION BY NATIONS

Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Documents Database for the complete list of existing reservations.

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RECORD OF SPECIFIC RESERVATIONS

[nation]	[detail of reservation]
CZE	At present CZE does not dispose of portable filter-blowers for aircrew CBRN respirators.
FRA	French subject-matter experts do not agree with the replacement of the term “protection factor” by the term “filtration efficiency”: the definition given in paragraph 1.2.1 becomes erroneous because the filtration efficiency is only about the filter paper layer. In addition, the word “gases” introduces a mistake. If the term “filtration efficiency” is to be maintained, the filter performance should also be defined against the charcoal filter layer, and a filtration performance value should be added for CBRN vapours.
GRC	Lack of logistics infrastructure due to the current economic situation
PRT	Portuguese Army and Air Force do not have the capability to verify all requisites and specifications required by this STANAG.
SVN	Slovenian Armed Forces are not equipped with the presented portable filters-blowers and the purchase is not planned according to the medium-term defence program.
TUR	Turkey is not going to implement the STANAG until the procurement process ends up with having the CBRN defence assemblies.
USA	For the USA, please note U.S. Air Force (USAF) use of CBRN Filters-Blowers will not comply with STANAG 3501 interoperability requirements. Per Paragraph 1.1., current USAF blowers may not interface with other participating nations; however, the current C2A1 Canisters do have NATO Standard 40mm threads. Per Paragraph 2.2., USAF does not employ rechargeable battery/power supplies. Furthermore, the Joint Service Aircrew Mask (JSAM) Strategic (SA) does not incorporate a blower in the system design. Per paragraph 2.3., this reservation relates to the interoperability of U.S. blowers with other NATO aircrew respirators when the U.S. is receiving NATO aircraft. USAF aircrew blower assemblies have specialized connections and batteries that would not allow them to be physically and/or logistically used on a number of NATO aircrew ensembles/aircraft. Per paragraph 3.1.2., this reservation relates to the requirement for filters-blowers to be resistant to chemicals used in cleaning and disinfection. U.S. filter/blower specifications do not call for this requirement nor are tested against those requirements.

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CHAPTER 1 INTRODUCTION

1.1. AIM

The aim of this standard is to ensure that the performance of portable filter-blowers for the positive ventilation of aircrew CBRN respirators used by one participating nation allows these portable filter-blowers to be used on the ground to supply similar aircrew CBRN respirators of other participating nations.

1.2. DEFINITIONS

The following terms and definitions are employed for the purpose of this agreement only.

1.2.1. Filtration efficiency

The ability of a filter to remove contaminants from the outside environment during respiration through a mask. The efficiency is the ratio of gases (and vapours), particles or both (aerosol) trapped by the filter over the total number of particles upstream from the filter. Specific particle sizes or the total number of particles of all sizes may be used in the calculation.
For the canister characteristics for protection against CBRN refer to 2.1 of STANREC 4727 AEP-73. For the sealing between the canister and the portable filter-blowers, use the STANAG 4155 AEP-4155.
The portable filter-blowers should be tested from recommendations of STANREC 4725 AEP-71 to be sure of the sealing.

1.2.2. Ambient Temperature and Pressure Dry (ATPD)

Volume of gas expressed as dry gas at the prevailing atmospheric pressure and temperature. In the context of this standard the atmospheric pressure is the absolute pressure of the gas within the respiratory compartment of the respirator assembly and the temperature is constant at 15 °C.

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CHAPTER 2 GENERAL

2.1. TYPES OF AIRCREW RESPIRATORS

Many aircrew CBRN respirators provide protection to the respiratory tract and the eyes by ventilating either the hood compartment or both the respiratory and hood compartments of the respirator with air free of harmful agents and particles. The air free of harmful agents and particles is delivered at a pressure greater than that of the environment and flows through the compartment(s) at ambient pressure. The flow of filtered air to the hood and respiratory compartments must be adequate to maintain a positive pressure, both to maintain the required protection factor and to avoid excessive resistance to breathing. The filtered air can be responsible for ocular dryness/drying. The aircrew using this device should test it on the ground before flight use to assess the presence of the ocular drying. This may require artificial tear prescription.

2.2. PORTABLE FILTER-BLOWER UNITS

Portable filter-blower units are used to supply filtered air to an aircrew respirator when the wearer is on the ground outside the aircraft, and during cockpit entry and exit procedures. In some aircraft, portable filter-blower units may also be used to supply air free of harmful agents and particles to an aircrew respirator in flight, the portable unit being stowed at a suitable site within the cabin. The aircrew should wear this equipment during walk inside the aircraft.

A portable filter-blower unit comprises one or more (usually 2 or 3) standard CBRN filter canisters, a fan and electric fan motor fitted with an on/off facility (switch or other means), a battery and a filtered air delivery hose. Air free of harmful agents and particles air is provided at the desired pressure by drawing or forcing ambient air through suitable CBRN filters. The electrical power is provided by batteries, which may be rechargeable, and once in the cockpit may be derived from the aircraft supplies.

The portable unit is fitted with a handle or strap, enabling it to be carried or worn by the user. A means of replacing the CBRN filter canisters and, where appropriate, a spare battery, must be provided.

2.3. INTEROPERABILITY

On landing at a base of another participating nation a portable filter-blower unit will be required to ventilate the aircrew CBRN respirator to allow the wearer to leave his aircraft and transit to and from collective protection. This standard is designed to ensure that a portable filter-blower of the nation receiving the aircraft will be compatible with the aircrew member's respirator and allow him to transit safely to and from collective protection.

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CHAPTER 3 DETAILS OF THE NATO STANDARD

3.1. GENERAL REQUIREMENTS

3.1.1. The filters shall be combined gas/vapour filters and particle filters.

3.1.2. The portable filter-blower and mask assembly units shall be resistant to chemicals to the extent that air free of harmful agents and particles is delivered to a positively ventilated aircrew respirator under all conditions of use.

CBRN filter blower units shall be resistant to chemicals used in cleaning and disinfection and exposure to these shall not impair performance.

3.2. SPECIFIC PERFORMANCE REQUIREMENTS

The minimum performance of a portable filter-blower unit used, to supply an aircrew CBRN respirator shall meet the following standards as measured at the coupling (or at the outlet) of an adaptor by which the hose from the unit is connected to the aircrew CBRN respirator:

3.2.1. Filter Efficiency. The filter efficiency shall be at least 10^4 at all operating instant flow rates.

3.2.2. Portable Blower-Filter Unit Supplying Eye Compartment Only

3.2.2.1. **Delivery Pressure-Flow Characteristics**. The pressure at which filtered air is delivered at a flow of 1.0 litre (ATPD) sec^{-1} at ground level shall be within the limits +0.25 to +1.0 kPa (+1.0 to +4.0 inch water gauge).

3.2.3. Portable Blower-Filter Unit Supplying Respiratory and Eye Compartments

3.2.3.1. **Delivery Pressure-Flow Characteristics with Blower Operating**. The pressure at which filtered air is delivered when the blower is operating shall be within the following limits:

Flow Demanded	Delivery Pressure
(litre (ATPD sec $^{-1}$))	(kPa (Inch water gauge))
0 - <1.0	+0.25 (+1.0) to +1.2 (4.8)
1.0 - <1.6	+0.25 (+1.0) to +0.88 (+3.5)
1.6 to max flow capacity	Positive pressure

3.2.3.2. **Delivery Pressure-Flow Characteristics with Blower Inoperative**. The suction required to draw a flow of 1.6 litre (ATPD) sec^{-1} of air from the unit when the blower is inoperative shall not exceed 1.0 kPa (4.0 inch water gauge).

3.2.4 Coupling / Adapters

The filtered air is to be delivered through a flexible hose which is fitted with a half coupling which will form a gas-tight connection to the air inlet of the aircrew respirator. Whenever possible this coupling is to be used universally on portable blower-filter units and man-mounted respirators. In the absence of such standardization, gas-tight adaptors are to be provided; the visiting nation shall be responsible for developing and providing any portable blower-filter units and adaptors it intends to use while at a host nation's airbase.

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