

Small-Box Respirator



DEFINITION

The **small-box respirator** is a type of gas mask used by British Empire forces. It protected soldiers' lungs, eyes, and faces from chemical weapons. Soldiers carried their **small-box respirators** at all times when in the forward trenches, where there was constant risk of gas attacks.

DID YOU KNOW?

After the first gas attack, British pharmaceutical research chemist E. F. Harrison transferred from an infantry battalion to the Royal Engineers to work on anti-gas equipment. Here, he developed the **small-box respirator**. In November 1918, Harrison died of pneumonia, a lung condition that was aggravated by his repeated exposure to deadly chemicals during respirator experiments.

HISTORICAL CONTEXT

Gas warfare as we know it began in April 1915, at the Second Battle of Ypres, in Belgium. Looking to break the stalemate of trench warfare, the German Army released large volumes of deadly chlorine gas. The wind carried the chlorine clouds across the positions of French, British and Canadian troops, none of whom were outfitted with anti-gas equipment. From 1915 onwards, both sides used deadly gases as wartime weapons. While the early gas attacks had relied on compressed-air tanks, chemical agents such as chlorine gas, phosgene and mustard gas were later packed into artillery shells so that they could be used on more specific targets.

By the end of the war, some 124,000 tons of chemical weapons were released by all sides. In 1918, approximately 30 per cent of the artillery shells fired by Canadian artillery were packed with gas. Although gas was a common element in most operations during the second half of the war, its impact was increasingly limited by protective masks, such as the **small-box respirator**. Gas made the battlefield even more horrific than it had been, but never proved to be a decisive weapon.

EVOLUTION/DEVELOPMENT

Within weeks of the gas attack at the Second Battle of Ypres, the Allies issued goggles and simple cotton face masks soaked with an anti-gas solution to the troops. These masks, which were hand-sewn by civilian volunteers, offered only limited protection to the lungs.

By mid-1915, a more effective anti-gas hood was mass-produced for the British Empire forces. It was a cloth sack with eyepieces that was pulled over the head like a pillowcase. The cloth was treated with an anti-gas solution that filtered the air as the soldier inhaled.

The **small-box respirator**, which was introduced in 1916, was much more sophisticated than earlier anti-gas equipment. It consisted of a face piece and a filter box, connected by a corrugated tube. The **small-box respirator** was carried in a canvas haversack, normally on the soldier's chest. In the event of a gas alarm, the soldier fastened the respirator against his face, leaving the filter box

in the haversack. When the soldier inhaled, he drew air through the filter box, where it was decontaminated before passing through the corrugated tube and into the facemask.

The **small-box respirator** was ineffective if the delicate corrugated tube was damaged, which could allow contaminated air to enter the face piece without passing through the filter. To ensure that the equipment functioned properly, soldiers went to mobile testing stations for respirator inspection and repair.

Although improvements were made to the materials and construction of the **small-box respirator** after the war, its basic design remained unchanged until 1942–1943, when a more compact model with a directly-mounted filter was introduced on a limited scale in the British and Commonwealth armies.

VOCABULARY LIST

Artillery:	Weapons that use mechanical or explosive (chemical) energy to project munitions over distances ranging from hundreds of meters to dozens of kilometers. Generally speaking, any device that fires a projectile with a calibre (diameter) of 2 cm or greater is considered an artillery weapon.
Chlorine gas:	A chemical weapon widely employed during the First World War in gaseous form. It affects the lung tissue, and can be deadly when inhaled in sufficient quantities. Lower doses cause extreme discomfort to the eyes, nose, throat and lungs.
Decisive weapon:	A weapon that significantly shapes or even decides the outcome of a battle or conflict, usually by virtue of its revolutionary capabilities.
Forward trenches:	The trenches that were situated closest to the enemy on the battlefield. These would be the starting points for attacks against enemy positions, and the first lines of defence in the event of an enemy attack.
Haversack:	A compact shoulder bag or backpack, normally made of canvas, that soldiers used to carry essential items such as respirators, emergency rations, eating utensils, spare ammunition, or warm clothing.
Mustard gas:	A chemical weapon employed during the First World War in aerosol and liquid form. It seriously burns any exposed skin, as well as the lungs, if the aerosol is inhaled.
Phosgene:	A chemical weapon employed during the First World War in gaseous form. When inhaled, it attacks the surface of the lungs. It is several times more toxic than chlorine gas; unlike chlorine, its effects were often delayed by several hours.