



# Hypobaric chamber

## Preparing military aircrew for the effects of hypoxia

### Executive summary

Regulations require military aircrew to undergo exposure to reduced pressure to better understand the effects of altitude hypoxia – a lack of oxygen. Our hypobaric chamber facility at MOD Boscombe Down is one of the largest in Europe that provides this capability. It enables aircrew to appreciate effects on their individual performance at altitude, and can test oxygen life support systems and equipment.

### The brief

New aircraft provide enhanced capabilities in terms of speed, agility and altitude; as such aircrew training must match these capabilities. Failures in life support systems can lead to hypoxia, making the aircrew dizzy, confused and potentially incapable of flying the aircraft.

Therefore, the Military Aviation Authority requires all aircrew to undergo exposure to reduced pressure in a hypobaric chamber. The aircrew need to know:

- the causes and effects of altitude hypoxia
- personal symptoms and signs
- times of useful consciousness
- factors influencing severity of hypoxia
- how to prevent and manage hypoxia during flight, including the use of oxygen



## Our solution

Our hypobaric (low pressure) chamber facility, located at MOD Boscombe Down, provides the physiological challenges of high altitude and hypoxia to human subjects in a safe and repeatable environment.

One of the largest of its type in Europe, the facility enables safe and repeatable human testing of aircrew life support equipment, combined with physiological and medical monitoring and the ability to collect experimental data during studies. This information is then used to assist learning and enhance subject training to ensure safety during flight.

## Outcomes and benefits

Everyone reacts differently to a lack of oxygen, and effects can change due

to stress, illness, age or medication. Using the hypobaric chamber provides a safe experience under professional supervision to increase aircrew's ability to recognise hypoxia. This prepares them for what to expect and how to react in the more critical real-life situation.

Using our hypobaric chamber, aircrew can learn to identify hypoxia symptoms before safety is compromised in an aircraft. The effects of changing ambient pressure on the gas-containing cavities in the human body, especially the ears and sinuses, are also demonstrated. Guided by our experts, aircrew receive personalised experience of the effects of hypoxia in a representative but safe training environment.

The hypobaric chamber facility serves additional research, test and

evaluation functions, such as assessing how life support equipment responds to depressurisation, whether that is explosive, rapid or steady, and may be used as part of a wider range of services that explore the human impact of hypoxia.



The hypobaric chamber can simulate cabin altitudes of all types of military and commercial aircraft

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