
GAS BLENDER COURSE

AIM

To safely train divers and others involved in BSAC diving activities with little or no knowledge and experience of nitrox blending or mixed gas blending, paying particular attention to precautions required to safely manage and handle blending equipment.

COURSE OUTLINE

The Gas Blender courses consist of the one of the following dependant upon student entry level and requirements:

- Nitrox Module only
- Combined Nitrox and Mixed gas Module
- Mixed Gas Module only

For more detail of the syllabus content see below.

ENTRY REQUIREMENTS

In order to attend this course, students must comply with the following:

- Qualified as an Ocean Diver
- Minimum age of students, 18 years old.

EQUIPMENT CONFIGURATION

The following equipment and accessories are required for the nitrox blender module:

- Compressor or air bank supplying 'clean air'

If a compressor is to be used, a competent and confident compressor operator must be present, i.e., a person who is totally familiar with the safe operational practices and use of the compressor.

- Blending whip
- Diving cylinder in oxygen service
- Cylinder of diving grade oxygen
- Oxygen analyser

The following additional equipment and accessories are required for the mixed gas blender module:

- Cylinder of diving grade helium

Recommended optional equipment:

- Helium analyser

COURSE ARRANGEMENTS

The course may run using one of the following arrangements:

- Nitrox Blender Course
- Mixed Gas Blender Course
- A combined Nitrox and Mixed Gas Blender Course

Before proceeding onto the BSAC Mixed Gas Blender Course, the student must have successfully passed the BSAC Nitrox Blender practical assessment or otherwise hold a nitrox blending qualification issued by alternative training organisation that is recognised by the BSAC. Refer to the BSAC website (www.bsac.org) Technical Section to review approved gas blending courses.

For students holding an alternative agency qualification, prior to commencing the mixed gas blender course, the student should be requested to familiarise themselves with the content of the BSAC Nitrox Gas Blender course materials. The course instructor should review the materials and review the theory lesson on 'Safety Precautions' prior to commencing on the theory lesson 'Mixed Gas Blending'.

INSTRUCTOR REQUIREMENTS

The lead instructor must be an Approved Nitrox Blending instructor (NBI) or a Mixed Gas Blending instructor (MBI). Any Qualified Instructors (QI) with a minimum qualification of Open Water Instructor may qualify as an NBI or MBI by acting as an Assistant NBI or Assistant MBI to, and subsequently being recommended to the Technical group Leader by, an Approved NBI or MBI. All Instructors and Assistant Instructors must have practiced and updated their skills in gas blending within 12 months prior to the course. Where this period is exceeded the lead instructor should arrange for instructors to receive adequate practice before they instruct students.

Gas blending instructors may be assisted by NQIs as Assistant gas blending instructors who may only give instruction under the direct supervision of the gas blending instructor. No more than one Assistant gas blending instructor per gas blending instructor and no more than two Assistant gas blending instructors per course. Every instructor must be a qualified Open Water Instructor or higher.

STUDENT - INSTRUCTOR RATIO

Six students to one instructor for the practical sessions. The maximum number of students who can be accommodated on any course will be determined by the venue, equipment available and logistics for the practical session. It is unlikely that most venues would be suitable for more than 6 students, but there is no absolute maximum.

FACILITIES

A suitable classroom with teaching aids for the presentation of theory lessons and the running of the blending application workshop.

The practical lessons should be located in a separate safe and appropriately clean room or safe working area, if outdoors.

COURSE DOCUMENTATION

Approved Instructors must obtain course packs and documentation from the BSAC Shop in advance of the commencement of the course.

ASSESSMENT

There is no written assessment for this course. Performance standards for practical skills are defined in the practical lesson notes.

QUALIFICATION

Course certification will be issued by BSAC HQ after the event.

LESSON SYLLABII

Instructor briefing

Course Overview

- Aims of the course, content outline and timetable

Theory Lesson Introduction

- What is nitrox?
- Recap of partial pressures, Dalton's Law and Gay-Lussac's Law
- Effects of compression, ideal and real gas behaviour

Theory Lesson Equipment and Decompression Systems

- Where to blend?
- A simple blending system components
 - Storage cylinders
 - Filling whip and gauge

- Valve types
- Compressor s and filters
- Analysers
- A 'cascade' system
- Booster pumps
- Mixing panel
- Typical simple and more sophisticated systems

Theory Lesson Getting the desired mix

- The desired mix
- Starting mix, determining how much gas to add, obtaining the final mix
- Quality Control
- Simple blending flowchart
- Practical determination of mix requirements

Theory lesson - Safety precautions

- Oxygen
- The dangers
- Precautions
- What if there is an oxygen fire?

Theory lesson - Mixed Gas Blending

- Helium
- Mixed gases
- Blending mixed gases, the compressibility of helium, causes of blending errors
- Blending safely with helium
- Examples

Practical lesson - Blending System Overview

- The practicalities of the system to be used.

Practical lesson - Nitrox Blending

- Blending nitrox starting from an empty cylinder and a cylinder containing residual gas.

Practical lesson - Mixed Gas Blending

- Blending tri-mix starting from an empty cylinder and a cylinder containing residual gas.

Open forum and course debrief

Disperse

NOTES

1. The above lesson syllabii defines that for the combined nitrox and mixed gas blender course. For the nitrox blender only and mixed gas blender only courses only those lessons appropriate to the particular course are included.
2. Instructors should base their teaching on the Gas Blender Instructor manual. A set of MS Power-Point Visual aids should be delivered for this course, and they are issued with the Gas Blender Instructor pack.
3. Suitably qualified BSAC Instructors (or equivalent) who wish to gain the Gas Blender Instructor status should apply to the BSAC Technical Chief Examiner via BSAC HQ.