



# Mixed Gas Blending

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- AIM** To introduce divers, compressor operators and dive equipment technicians to the skills and requirements needed to blend a variety of diving gases in a safe and controlled manner.
- DURATION** One day.
- ENTRY GRADE** No qualification required
- INSTRUCTORS** This course must be provided through BSAC approved gas blending centres and led by an Approved Gas Blending Instructor, assisted either by other Approved Gas Blending Instructors or NQIs seeking such approval - see Note 4. A register of Approved Gas Blending Centres and Instructors is maintained by the Chief Examiner/BSAC HQ.
- FACILITIES** As an approved BSAC centre the facilities will include a suitable classroom with teaching aids for formal presentations, a fully equipped gas blending workshop and equipment to the specifications laid down in the instructor's gas blending manual.
- APPROVAL** Skill Development Course Approval Procedure applies.
- QUALIFICATION** Course Certification will be issued by BSAC HQ after the event.

### SYLLABUS

Instructor Briefing

Assemble, Introductions, Administration, Course Aim 10 minutes

1 Theory Lesson **Dividing Gases and their uses** 45 minutes

- Oxygen, Nitrogen and Helium
- Argon, Neon and Hydrogen
- Air, Nitrox and Trimix
- Heliox and Heliar

2 Theory Lesson **Gas Laws** 30 minutes

- Kinetic Theory of gases
- Pressure
- Boyles' Law
- Dalton's Law

3 Theory Lesson **Methods of Blending & Gas Analysing** 45 minutes

- Pre-mix decanting
- Continuous Blending
- Gas Separation
- Partial Pressure
- Air Testing Methodology
- Gas Analysing

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4	Theory Lesson	<b>Systems Equipment</b> <ul style="list-style-type: none"> <li>• Oxygen Service</li> <li>• The Fire Triangle</li> <li>• The Compressor system</li> <li>• The Filtration system</li> <li>• HP Pipework and Hoses</li> <li>• Gauges</li> <li>• Oxygen Booster Pump</li> </ul>	30 minutes
5	Theory Lesson	<b>Safe Storage and handling of cylinders &amp; Workshop procedures</b> <ul style="list-style-type: none"> <li>• Hazardous properties of Oxygen</li> <li>• Storage gas cylinders</li> <li>• Handling &amp; use of gas cylinders</li> <li>• Storage facilities</li> <li>• Transportation of cylinders</li> <li>• Gas Log sheets</li> </ul>	30 minutes
6	Theory Lesson	<b>Mixed Gas Diving Cylinder Requirements</b> <ul style="list-style-type: none"> <li>• Diving Equipment</li> <li>• Air Diving cylinders</li> <li>• Nitrox Diving cylinders</li> <li>• Trimix Diving cylinders</li> <li>• VIP label</li> <li>• Qualification of diver</li> </ul>	20 minutes
7	Theory Lesson	<b>Gas Mixing Calculations</b> <ul style="list-style-type: none"> <li>• Nitrox Calculations</li> <li>• Nitrox Look-up Table</li> <li>• BSAC Gas Calculator use for <ul style="list-style-type: none"> <li>* Nitrox</li> <li>* Trimix</li> <li>* Heliair</li> <li>* Air Tops</li> </ul> </li> </ul>	30 minutes
8	Practical Lesson	<b>Practical Gas Blending and assessment</b> <ul style="list-style-type: none"> <li>• Nitrox blending</li> <li>• Trimix blending</li> <li>• Heliair Blending</li> <li>• Air Top recalculations</li> </ul>	180 minutes

## NOTES

1. The order in which the syllabus is listed represents the recommended sequence for this one-day course.
2. The contents of the course should emphasise practical gas blending but with sufficient explanatory theory to put the practice into its true context.
3. Instructors should base their teaching on the Instructor Notes, which will be provided. A set of PowerPoint presentations is provided on CD-ROM with the instructor manual and a copy of the 'BlenderCalcs' gas-calculating programme.
4. BSAC NQIs, who wish to gain Gas Blending Instructor status, should apply to the Technical Manager at BSAC HQ for the appropriate application form.