

14. Nitrox Gas Blender

14.1 Introduction

This course provides the training required to allow candidates to blend nitrox gas competently and safely. The objective of this course is to train candidates in the proper techniques, equipment requirements and hazards involved in blending nitrox gases for recreational scuba.

14.2 Qualifications of Graduates

Upon successful completion of this course, graduates may engage in the blending of nitrox gases, without direct supervision.

14.3 Who May Teach

Any active TDI Nitrox Gas Blender Instructor may teach this course.

14.4 Student to Instructor Ratio

Academic:

1. Unlimited, so long as adequate facility, supplies and time are provided to ensure comprehensive and complete training of subject matter.

Confined Water (swimming pool-like conditions):

1. N/A.

Open Water (ocean, lake, quarry, spring, river or estuary):

1. N/A.

14.5 Student Prerequisites

Minimum age 18.

14.6 Course Structure and Duration

Open Water Execution:

1. N/A.

Course Structure:

1. TDI allows instructors to structure courses according to the number of students participating and their skill level.

Duration:

1. The minimum number of classroom and briefing hours is 2.

14.7 Administrative Requirements

Administrative Tasks

1. Collect the course fees from all the students.
2. Ensure that the students have the required equipment.
3. Communicate the schedule to the students.
4. Have the students complete the:
 - a. *TDI Liability Release and Express Assumption of Risk* for non-SCUBA courses Form.
 - b. *TDI Medical Statement* Form.

Upon successful completion of the course the instructor must

1. Issue the appropriate TDI certification by submitting the *TDI Diver Registration Form* to TDI Headquarters or registering the students online through member's area of the TDI website.

14.8 Training Material

The following are required for this course:

1. *TDI Nitrox Gas Blending* Manual.
2. *TDI Nitrox Gas Blending* PowerPoint Presentation.
3. Oxygen (O₂) analyzer, instructor may provide.

14.9 Required Subject Areas

The TDI Nitrox Gas Blending Manual is mandatory for use during this course, but instructors may use any additional text or materials that they feel help present these topics.

The following topics must be covered during this course:

1. The Responsibility of the Gas Blender.

2. Gases of Diving:
 - a. Air.
 - b. Oxygen (O₂).
 - c. Nitrogen.
3. Oxygen Handling:
 - a. Oxygen (O₂) hazards.
 - b. Causes and prevention of oxygen (O₂) fire.
 - c. Oxygen system design.
 - d. Local regulations for gas blending and handling.
4. Gas Production Equipment:
 - a. Compressors.
 - b. Cylinders.
 - c. Filtration systems.
 - d. Analog gauges.
5. Mixing Techniques:
 - a. General considerations.
 - b. Continuous blending systems.
 - c. De-nitrogenated air systems.
 - d. Pre-mix systems.
 - e. Partial pressure blending mathematics.
6. Oxygen (O₂) Analysis:
 - a. Procedures.
 - b. Oxygen (O₂) analyzers.
7. Cylinder Handling and Sign Out.

14.10 Required Skill Performance and Graduation Requirements

In order to complete this course, students must:

1. Candidates must successfully blend and analyze 5 cylinders of nitrox gas; all cylinders must be +/- 1 percent of target amount of oxygen.

TDI Standards and Procedures

Part 2: Diver Standards

2. Candidate must satisfactorily complete a nitrox fill log to include MOD and oxygen percentage.
3. Satisfactorily complete the TDI Nitrox Gas Blender Course written examination.
4. Demonstrate understanding of nitrox blending and oxygen analysis.

6. Oxygen (O₂) Analysis:
 - a. Procedures.
 - b. Oxygen (O₂) analyzers.
7. Cylinder Handling and Sign Out.
8. Helium analyzer, recommended.

15.11 Required Skill Performance and Graduation Requirements

In order to complete this course, students must:

1. Candidates must successfully blend and analyze a minimum of 5 cylinders of nitrox and 3 cylinders of Trimix, all cylinders must be +/- 1 percent of target amount of oxygen and +/- 3 percent helium.
2. Candidate must satisfactorily complete a nitrox fill log to include MOD and oxygen percentage.
3. Satisfactorily completes the TDI Advanced Gas Blender Course written examination.
4. Demonstrate proficiency in blending and analysis of nitrox and trimix gases.