

# ITDA TRIMIX (MODULE2) COURSE

## INTRODUCTION

The ITDA Trimix (Module2) Course provides the training required to competently and safely utilize breathing gases containing helium for dives that require staged decompression, utilizing nitrox and/or oxygen mixtures during decompression to a maximum depth of 90 msw

## COURSE OBJECTIVES

The objective of this course is to train divers in the benefits, hazards and proper procedures of utilizing custom oxygen/helium/nitrogen mixtures as breathing gases

## QUALIFICATIONS OF GRADUATES

Upon successful completion of this course, graduates may engage in technical diving activities utilizing custom trimix mixtures without direct supervision so long as:

1. The diving activities approximate those of training
2. The area of activities approximate those of training
3. Environmental conditions approximate those of training

## WHO MAY TEACH

This course may be taught by any active ITDA Trimix (Mod2) Instructor

## STUDENT / INSTRUCTOR RATIO

1. CLASSROOM  
Unlimited, so long as adequate facility, supplies and additional time are provided to ensure comprehensive and complete training
2. OPEN-WATER  
A maximum of 4 students per active ITDA Instructor is allowed. The ratio should be reduced as required due to environmental and operational constraints. All dives must be carried out in accordance with the HSE ACOPS

## STUDENT PRE-REQUISITES

1. Minimum age of 18
2. Minimum certification as an Technical Nitrox Diver and Trimix (Mod1) Diver
3. Minimum of 150 logged dives of which 35 must be deeper than 30 msw, 25 must have been on Normoxic Trimix to depths of 45 meters or greater

## REQUIRED COURSE MINIMUMS

1. Classroom / briefing hours – 8
2. Open-water dives
  - a) 6 with a minimum accumulated bottom time of 150 minutes, with 4 dives deeper than 55 msw and 2 dives deeper than 75 msw. The first 2 dives should be made to a maximum depth of 40 metres and used as assessment dives. All dives must be made progressively deeper.

## REQUIRED EQUIPMENT

The following equipment is required for each student:

1. Bottom mix cylinder (s)
  - a) Cylinder volume appropriate for planned dive and student gas consumption
  - b) Dual outlet valve, double manifold or independent doubles

- c) Labelled in accordance with ITDA standards
- 2. Travel mix cylinder (s)
  - a) Cylinder volume appropriate for planned dive and student gas consumption
  - b) Labelled in accordance with ITDA standards
- 3. Decompression mix cylinder (s)
  - a) Cylinder volume appropriate for planned dive and student gas consumption
  - b) Labelled in accordance with ITDA standards
  - c) Suit inflation cylinder (required for drysuit divers only)
- 4. Regulators
  - a) Primary and primary redundant required on all bottom mix cylinder (s)
  - b) Submersible pressure gauges are required on all primary / bottom mix cylinders
  - c) A contingency use long hose second stage should be designated and appropriately rigged to facilitate air sharing at depth if necessary
  - d) **ALL** 4 required regulators be DIN or **ALL** 4 regulators be YOKE
- 5. Buoyancy compensator (s) adequate for equipment configuration
- 6. Redundant depth and timing devices
- 7. Redundant light system
- 8. Ascent reel with lift bag/surface marker buoy
  - a) Adequate for maximum planned depth
  - b) Minimum of 25kg lift bag (a dump valve highly recommended)
- 9. Exposure suit adequate for the open-water environment
- 10. Line cutting device
- 11. Underwater slate (for decompression/contingency tables)

## **REQUIRED SUBJECT AREAS**

The following topics must be covered during this course. The ITDA Trimix Manual is mandatory for use during this course but instructors may use any additional text or materials that they feel help present these topics.

- 1. PHYSICS
  - a) Pressure review
- 2. PHYSIOLOGY
  - a) Hypoxia
  - b) Oxygen toxicity
    - Central nervous system
  - c) Nitrogen narcosis
  - d) Nitrogen and helium absorption and elimination
  - e) Carbon dioxide toxicity
  - f) Carbon monoxide toxicity
  - g) Helium
    - HPNS
    - Effects on respiration
    - Effects as an insulator
  - h) Counter diffusion
  - i) Hyperthermia
  - j) Hypothermia
- 3. DECOMPRESSION OPTIONS
  - a) Air
  - b) Nitrox
  - b) Helium
- 4. EQUIPMENT CONSIDERATIONS
  - a) Cylinder options
  - b) Stage cylinder options
  - c) Suit inflation options
  - d) Regulator options
  - e) Harness/BC options
  - f) Computer/depth gauge/bottom timer options
  - g) Ascent and navigation reels

- h) Lift bags/surface marker buoys
  - i) Lights
  - j) Redundant mask and knife
  - k) Jon-line
5. DIVE TABLES
- a) Computer generated tables
  - b) other published tables
6. DIVE PLANNING
- a) Operational planning  
Support  
Teams
  - b) Team planning  
Gas requirements  
Oxygen limitations  
Inert gas limitations
  - c) Emergency planning  
Omitted decompression  
Oxygen toxicity  
Analysis and logging  
General
7. PROCEDURES
- a) Bottom, travel and decompression gas
  - b) Normal operations
  - c) Failure, loss or inadequate emergency procedures
  - d) Analysis and logging

## **REQUIRED OPEN-WATER SKILLS**

The following open-water skill must be completed by the student during open-water dives. It is recommended that all dives be conducted between 55 msw and 90 msw

1. Properly analyse all gas mixtures to be used
2. Demonstrate adequate pre-dive planning
  - a) Limits based on personal and team gas consumption
  - b) Limits based on oxygen exposure at planned depths for actual mixes
  - c) Limits based on inert gas absorption at planned depths with actual mixes
3. Properly execute the planned dive within all pre-determined limits
4. Demonstrate the proper navigational techniques for the specific dive
5. On 2 of the dives, demonstrate an ascent with ascent reel and lift bag and perform staged decompression
6. Demonstrate the proper procedures for switching and isolating a malfunctioning primary regulator (this exercise should not be practised deeper than 40 msw)
7. On one of the dives, tow a simulated unconscious diver while at depth, 9 meters to ascent line and simulate an emergency rescue ascent technique

## **GRADUATION REQUIREMENTS**

In order to complete this course students must:

1. Satisfactorily complete the ITDA Trimix Course written examination with a minimum mark of 90%
2. Complete all open-water requirements safely and efficiently
3. Demonstrate mature, sound judgement concerning dive planning and execution

## **SUPPORT MATERIALS**

1. ITDA Student Registration
2. ITDA Trimix Manual
3. ITDA Power Point Presentation