

# CMAS

CONFÉDÉRATION MONDIALE  
DES ACTIVITÉS SUBAQUATIQUES

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WORLD UNDERWATER FEDERATION

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# **ALL CMAS NITROX DIVER AND NITROX INSTRUCTOR STANDARDS**

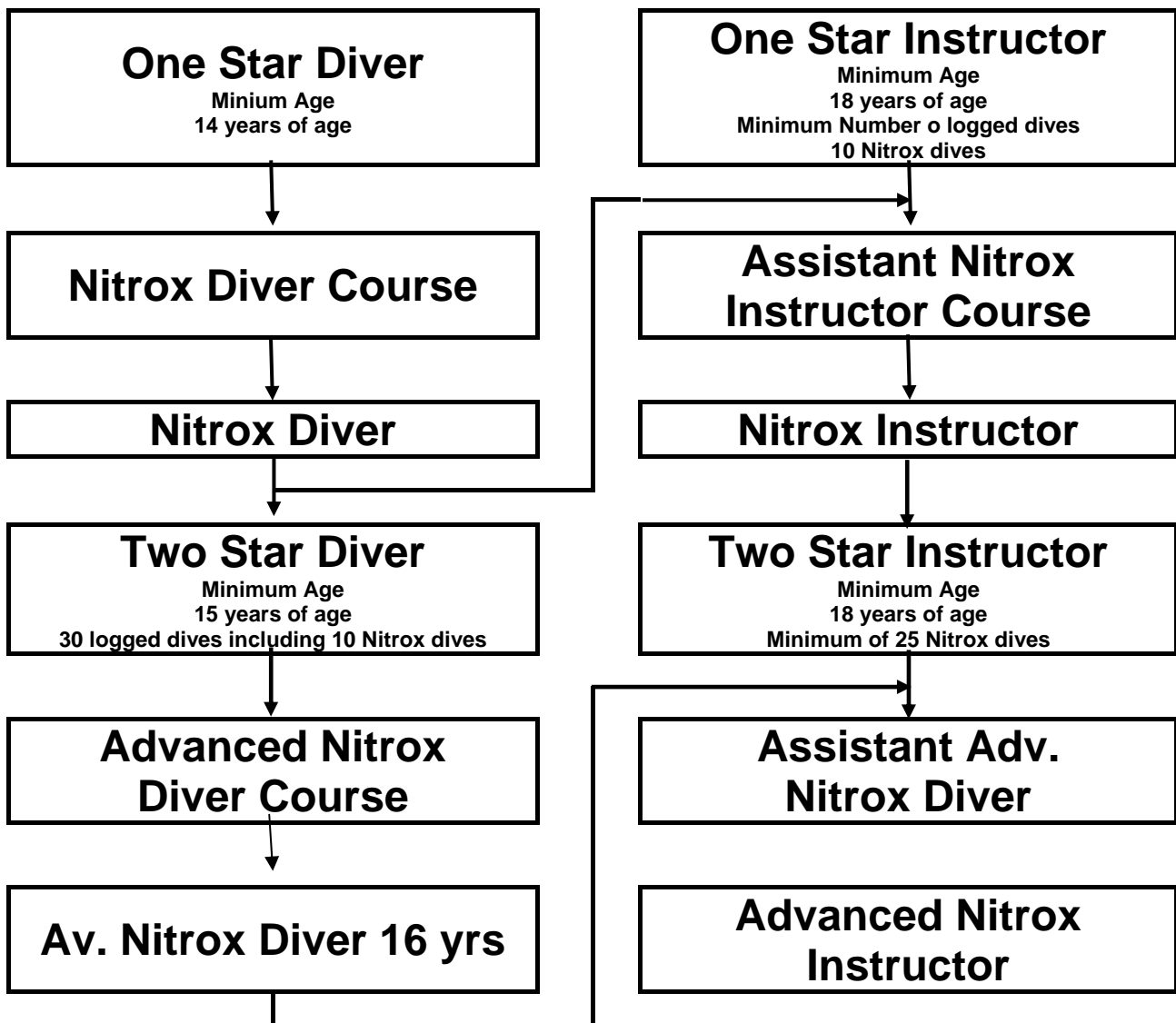
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# Table of Contents

<b>CMAS Nitrox Training Scheme Overview .....</b>	<b>3</b>
<b>CMAS Nitrox Diver Standard .....</b>	<b>4</b>
1. Course Goals .....	4
2. Course Pre-requisites .....	4
3. Course Duration .....	4
4. Course Objectives .....	4
5. Theory Lectures .....	4
6. Practical Skills .....	4
7. Qualifying Requirements .....	4
8. Certification .....	4
<b>CMAS Advanced Nitrox Diver Standard .....</b>	<b>5</b>
1. Course Goals .....	5
2. Course Pre-requisites .....	5
3. Course Duration .....	5
4. Practical Open Water Limitations.....	5
5. Course Objective.....	5
6. Classroom Lecture.....	5
7. Practical Skills.....	6
8. Qualifying as an Advanced Nitrox Diver .....	6
9. Certification .....	6
<b>CMAS Nitrox Instructor Standard .....</b>	<b>7</b>
1. Course Goals .....	7
2. Course Pre-requisites .....	7
3. Course Duration .....	7
4. Practical Open Water Limitations.....	7
5. Competence Assessment.....	7
6. Certification .....	7
<b>CMAS Advanced Nitrox Instructor Standard .....</b>	<b>8</b>
1. Course Goals .....	8
2. Course Pre-requisites .....	8
3. Course Duration .....	8
4. Practical Open Water Limitations.....	8
5. Competence Assessment.....	8
6. Certification .....	8
<b>CMAS Nitrox Instructor*** Standard .....</b>	<b>9</b>
1. Course Goals – Instructor Profile .....	9
2. Appointment Pre-requisites .....	9
3. Certification .....	9

## CMAS Nitrox Training Scheme Overview



**Note:** For Gas Blending see the CMAS Blending Standards. It is not a CMAS pre-requisite for Nitrox Blenders to be a qualified diver of any type.

# CMAS Nitrox Diver Standard

## 1. Course Goals:

To teach candidates to dive safely using Nitrox such so they:

- 1.1. have the competence to dive with Nitrox mixtures with an oxygen content up to and including 40%.
- 1.2. are aware of the additional risks of diving with Nitrox.
- 1.3. are aware of the necessity of dive planning when using on Nitrox dives.
- 1.4. are able to select the correct Nitrox mix for the plan maximum operating depth (MOD).
- 1.5. can demonstrate an understanding of the need for dive depth discipline when using Nitrox as the breathing mixture.
- 1.6. Can demonstrate an understanding of "Oxygen Clean" and Oxygen Compatibility"

## 2. Course Pre-requisites:

Minimum age:	14-years
Entry Qualifications:	CMAS One Star Diver or this programme may be included to into the CMAS One Star Diver Course.
Minimum Number of dives:	The candidate must at lease be at the appropriate point in the CMAS One Star Diver for air diving.
Fitness to dive:	A valid medical assessment according to National Standards.

## 3. Course Duration

Minimum Course Duration	One day.
Number of teaching sessions	Sufficient to complete the listed course material.
Duration of sessions	Sufficient to complete the listed course material.
Minimum number of dives	Qualified Divers or as part of a One Star Diver Course.

## 4. Course Objectives:

On completion of this course the successful candidate will be able to:

- 4.1. identify the advantages and disadvantages of diving with Nitrox.
- 4.2. demonstrate their knowledge on the physiology related to this level of Nitrox diving.
- 4.3. demonstrate an understanding of the safe use of Nitrox diving equipment.

## 5. Theory Lectures:

- 5.1. Basic oxygen physiology related to Nitrox diving; including Central Nervous System (CNS) toxicity, with a brief overview on Pulmonary Oxygen Toxicity.
- 5.2. The avoidance of oxygen toxicity of all types, including depth limitations.
- 5.3. Symptoms and Signs of oxygen toxicity.
- 5.4. Nitrogen Narcosis related to the use of Nitrox.
- 5.5. Diving procedures for Sport Diving using Nitrox mixtures up to and including 40%.
- 5.6. Nitrox dive planning.
- 5.7. Procedures for altitudes above sea-level. This is not compulsory but subject to each Federations needs.
- 5.8. The use of the Equivalent Air Depth (EAD) system with Air Decompression Tables.
- 5.9. The use of Nitrox with Air Tables (Not corrected for EAD).
- 5.10. The use of personal decompression computers (PDCs):
  - a. In Nitrox mode.
  - b. In Air mode.
- 5.11. Nitrox safety measures and limits.
- 5.12. The suitability of dive equipment for use with Nitrox.
- 5.13. Dive cylinder marking and tagging according to National requirements.
- 5.14. Nitrox gas analysis (ie testing the mix.).
- 5.15. An introduction to Nitrox blending.

## 6. Practical Skills:

- 6.1. Selecting the correct Nitrox mix for the planned maximum operating depth (MOD).
- 6.2. The preparation of Nitrox Dive plans and back-up plan. This includes gas selection for the planned MOD.
- 6.3. Testing the percentage oxygen content of any Nitrox mix.
- 6.4. Functionally check of diving equipment.

## 7. Qualifying Requirements:

In order to qualify as a Nitrox Diver, candidates must achieve at least 80% in the written theory examination and satisfy the Course Instruction with regard to their practical and in-water skills.

## 8. Certification:

CMAS Nitrox Diver C-card (This card may double-sided ie CMAS/Federation card).

Diving Limitations:

- 8.1. The maximum permitted ppO<sub>2</sub> for diving is 1.4bar.
- 8.2. Depth limit is subject to the diver's qualification i.e. Diver One Star, Diver Two Diver etc.

# CMAS Advanced Nitrox Diver Standard

## 1. Course Goals:

To teach candidates to dive safely using Nitrox such that they:

- 1.1. Widen all aspects of their Nitrox diving to include the use of stage-decompression and pure oxygen.
- 1.2. are aware of the additional risks stage-stop diving and the use of pure oxygen.
- 1.3. can operate at altitudes above sea-level. This element is subject to National Federations needs and not is compulsory.
- 1.4. are aware of the necessity of dive planning when using Nitrox and pure oxygen on dives.
- 1.5. are able to select the correct breathing mix for all levels of the planned dive.
- 1.6. can demonstrate an understanding of the need for depth discipline when using Nitrox and pure oxygen as the breathing mixture.
- 1.7. can demonstrate an understanding of the potent for dangers of oxygen rich blending and the absolute need for oxygen compatible equipment.

## 2. Course Pre-requisites

Minimum age:	16-years
Entry Qualifications:	CMAS Nitrox Diver or equivalent
Minimum Number of dives:	30 including a minimum of 10 logged Nitrox dives.
Fitness to dive:	A valid medical assessment according to National Standards.

## 3. Course Duration

Minimum Course Duration	Two days.
Number of teaching sessions	Sufficient to complete the listed course material.
Duration of sessions	Sufficient to complete the listed course material.
Minimum number of dives	Three, one of which the candidate decompresses with simulated pure oxygen. Candidates must demonstrate the ability to hold all stops within $\pm 0.5$ -metre.

## 4. Practical Open Water Limitations:

- 4.1. The permitted depth is limited to maximum ppO<sub>2</sub> for diving of 1.4bar.
- 4.2. The maximum permitted pO<sub>2</sub> for Stage-Stops is 1.6bar.

## 5. Course Objective:

On completion of this course the successful candidate will be able to:

- 5.1. identify the advantages and disadvantages of diving with Nitrox and pure oxygen.
- 5.2. demonstrate their knowledge on the physiology related to this level of Nitrox and pure oxygen diving.
- 5.3. Specify equip that can safely used with 40%= Nitrox and pure oxygen.
- 5.4. Prepare dive plans and back-up plans for dives using 40% + Nitrox and pure oxygen.
- 5.5. demonstrate an understanding of the safe use of Nitrox and pure oxygen diving equipment.

## 6. Classroom Lecture

- 6.1. In-depth study of the inherent physiological consequences of oxygen and of oxygen toxicity. Calculation method for omitting neurological oxygen toxicity (CNS%) and pulmonary oxygen toxicity (OTU).
- 6.2. Basic oxygen physiology revision and update to include physiological consequences and manifestation of oxygen toxicity.
- 6.3. Calculations for determining the oxygen CNS and OTU limits of Nitrox and pure oxygen for any planned dive.
- 6.4. Best mix gas selection.
- 6.5. Depth limit is subject to the diver's qualification i.e. Diver One Star, Diver Two Diver etc.
- 6.6. Nitrogen Narcosis:
  - a. Symptoms and Signs.
  - b. Causes.
  - c. Reducing the symptoms.
- 6.7. The procedures for dives down to 50-metres {40m can be reached on EAN28 and is within the basic Nitrox Diver Course} with Stage-Stop decompression using breathing mixtures up to and including pure oxygen.
- 6.8. Procedures for altitudes above sea-level. This is not compulsory but subject to each Federations needs.
- 6.9. Oxygen safety, including the suitability of dive equipment.
- 6.10. Dive cylinder marking and tagging according to National requirements.
- 6.11. Nitrox gas analysis (ie testing the mix.).
- 6.12. An introduction to Nitrox blending.
- 6.13. Gas planning and gas management
- 6.14. The concept of taking "air-breaks" during pure oxygen decompression.

- 6.15. Decompression Illness (DCI):
- a. Symptoms and Signs.
  - b. Causes.
  - c. Diver denial: Discuss the problems related to diver/Diving Officer/Dive Master denial and how to avoid and cope with this problem.
  - d. Emergency planning for dealing with DCI.
  - e. Emergency DCI treatment:
    - (1) Recognition of DCI.
    - (2) Diver denial
    - (3) Resources:
      - oxygen.
      - drinking water.
      - communications.
      - Emergency plan.

## **7. Practical Skills:**

- 7.1. Selecting the correct Nitrox mix for the planned maximum operating depth (MOD).
- 7.2. The preparation of Nitrox Dive plans and back-up. This includes gas selection for the planned MOD and decompression.
- 7.3. Equipment configuration for Stage-Stop diving.
- 7.4. The accurate execution of a prepared dive plan.
- 7.5. Testing the percentage oxygen content of all gas mixtures.
- 7.6. Functionally check of diving equipment and pre-dive buddy checks etc.
- 7.7. Competing stage-stops, within time limits, within  $\pm 0.5$ -metres and any required Air-breaks.
- 7.8. Gas shutdown in the event of a free flow
- 7.9. Demonstrate gas switching
- 7.10. Deployment of a Delayed Surface Marker Buoy (DSMB) of the correct colour.
- 7.11. Dealing with a simulated out-gas emergency situation; calling for additional gas by deploying an appropriate coloured DSMB.
- 7.12. Carry out a correct pre-dive briefing.
- 7.13. Carry out a correct debriefing after the dive (including the evaluation of the dive itself).

## **8. Qualifying as an Advanced Nitrox Diver:**

- 8.1. Candidate must display a good mental attitude towards this type of diving during all dives.
- 8.2. In order to qualify as an Advanced Nitrox Diver, candidates must achieve at least 80% in the written theory examination,
- 8.3. and, satisfy the Course Instructor with regard to their practical and in-water skills.

## **9. Certification:**

CMAS Nitrox Diver C-card (This card may double-sided ie CMAS/Federation card).

# CMAS Nitrox Instructor Standard

## 1. Course Goals:

Following the successful assessment outlined in this section CMAS qualified Nitrox Instructor may instruct or act as course director on Nitrox course authorised by the national Federation. Such Instructors are able to assess and evaluate course student's knowledge and skills. Further, they are authorised to sign Nitrox Qualifying Certificates, subject to National procedures.

## 2. Course Pre-requisites:

Minimum age:	18-years
Entry Qualifications:	CMAS One Star Instructor in active teaching or equivalent.
Minimum Number of dives:	10 logged Nitrox dives.
Fitness to dive:	A valid medical assessment according to National Standards.

## 3. Course Duration

Minimum Course Duration	Two days.
Number of teaching sessions	Sufficient to complete the listed course material.
Duration of sessions	Sufficient to complete the listed course material.
Minimum number of dives	Three, one of which the candidate decompresses with simulated pure oxygen. Candidates must demonstrate the ability to hold all stops within $\pm 0.5$ -metre.

## 4. Practical Open Water Limitations:

- 4.1. The maximum permitted pO<sub>2</sub> for diving is 1.4bar.
- 4.2. The maximum permitted pO<sub>2</sub> for Stage-Stops is 1.6bar.

## 5. Competence Assessment:

The candidate will demonstrate competence to organise a course, instruct effectively at this level both in the classroom and in open water and manage (direct) the progress of the course. During this time, the candidate will be supervised and evaluated by a CMAS Nitrox Instructor Trainer.

## 6. Certification:

CMAS Nitrox Instructor C-card (This card may double-sided ie CMAS/Federation card).

# CMAS Advanced Nitrox Instructor Standard

## 1. Course Goals

Following the successful assessment outlined in this section CMAS qualified Advanced Nitrox Instructors may instruct or act as course director on Nitrox course authorised by the national Federation. Such Instructors are able to assess and evaluate course student's knowledge and skills. Further, they are authorised to sign Nitrox Qualifying Certificates, subject to National procedures.

## 2. Course Pre-requisites:

Minimum age:	18-years
Entry Qualifications:	CMAS Two Star Instructor in active service for National Federation.
Minimum Number of dives:	12 logged Nitrox dives.
Fitness to dive:	A valid medical assessment according to National Standards.

## 3. Course Duration:

Minimum Course Duration	Two days.
Number of teaching sessions	Sufficient to complete the listed course material.
Duration of sessions	Sufficient to complete the listed course material.
Minimum number of dives	Three, one of which the candidate decompresses with simulated pure oxygen. Candidates must demonstrate the ability to hold all stops within $\pm 0.5$ -metre.

## 4. Practical Open Water Limitations:

4.1. The maximum permitted pO<sub>2</sub> for diving is 1.4bar.

4.2. The maximum permitted pO<sub>2</sub> for Stage-Stops is 1.6bar, without accelerating decompression.

## 5. Competence Assessment:

The candidate will demonstrate competence to organise a course, instruct effectively at this level both in the classroom and in open water and manage (direct) the progress of the course. During this time, the candidate will be supervised and evaluated by a CMAS Nitrox Instructor Trainer.

## 6. Certification:

CMAS Advanced Nitrox Instructor C-card (This card may double-sided ie CMAS/Federation card).



# CMAS Nitrox Instructor\*\*\* Standard

## 1. Course Goals – Instructor Profile

The CMAS Nitrox Instructor\*\*\* is qualified to assess and evaluate CMAS Nitrox Instructors and CMAS Advanced Nitrox Instructors, who also has knowledge of Nitrox Blending.

## 2. Appointment Pre-requisites:

Minimum age:	18-years
Entry Qualifications:	CMAS Three Star Instructor in active service teaching these topics. Provided that each National Federation approves each individual in this discipline.
Minimum Number of dives:	12 logged Advanced Nitrox dives.
Fitness to dive:	A valid medical assessment according to National Standards.

## 3. Certification:

Recognition will be given by each National Federation as appropriate.