

9.4 CMAS-ISA 2 STAR ADVANCED DIVER CERTIFICATE CMAS EQUIVALENT – 2 STAR DIVER

(Depth limit - 30 meters)

9.4.1 OBJECTIVE

To supply a framework for the training of One Star Divers enabling them to obtain the 2 Star Advanced Diver qualification.

The Two Star diver is a diver who has gained some open water diving experience and is considered ready to take part in dives partnered by a diver of at least the same or a higher grade. The Two Star diver does not have sufficient experience to lead One Star divers on open water dives.

9.4.2 SYLLABUS

Prescribed Manual: CMAS-ISA Two Star Diver Manual.

The candidates shall receive tuition in the theory of:

- a. Equipment:
 - i. Demand valve operation – Advanced knowledge.
 - ii. Pressure vessels and the law, compressors and cylinder filling.
 - iii. Ropes, lines and reels.
 - iv. Dive computers.
 - v. Equipment care / maintenance.
- b. Medical and Physiological aspects:
 - i. Barotrauma
 - ii. Decompression and Decompression sickness
 - iii. Nitrogen Narcosis
 - iv. Toxic Gases: Oxygen, Carbon Dioxide, and Carbon Monoxide
- c. Dive planning:
 - i. Dive planning for special dives – night, fresh water, low visibility and drift dives.
 - ii. Multiple dives.
 - iii. Emergency procedures.
 - iv. CMAS signals.
 - v. Rescue.
- d. The use of Decompression Tables.
 - i. Explain the different tables and their differences. (US Navy, Bühlmann).
 - ii. The use of the Bühlmann table. Explain altitude tables.
 - iii. Explain the effects of slower ascents.
- e. Seamanship:
 - i. Diving from a boat
 - ii. Duties and conduct of divers on a (dive) boat.

THEORY LESSONS:

T 1 Diving related illnesses

T 2 First aid and rescue procedures

- T 3 Nitrogen absorption
- T 4 Deeper diving Dives
- T 5 Calculating air requirements
- T 6 Decompression tables
- T 7 Dive planning and organisation

PRACTICAL LESSONS:

- P 1 Open water diving procedures
- P 2 Rescue skills
- P 3 SCUBA skills – open water practice

Knowledge Assessment

Skills Assessment

Practical Dives

9.4.3 PREREQUISITES

1. Must be at least 15 years old.
2. Prior to participating in any practical training, the student must submit a medical certificate clearing the holder fit to participate in the sport of underwater diving. A medical practitioner, using the CMAS-ISA Sport Diver medical examination form, must have carried out the medical examination not more than 12 months previously.
3. The candidate must hold a CMAS-ISA One Star Diver certificate or approved equivalent certificate.
4. The candidate must have logged at least 15 scuba dives to enrol on the course.
5. Must pass the theory evaluation as set by a panel of Instructors or by CMAS-ISA. A pass mark of 65% is compulsory.
6. Must pass the E, F & G practical evaluations.
7. The qualifying/practical dives are to be supervised by at least a qualified Two Star Advanced diver. The dives should be of duration not less than 15 minutes and to a depth of not less than 10m. All of the following types of qualifying dives must be included: Night dive, Boat dive, Freshwater dive, Seawater dive, Low visibility dive and a 30m dive. At least 5 dives must be to a depth exceeding 18m. A decompression chamber dive does not qualify.
8. Must apply for the certificate through the Instructor.

NOTE: Parts 5, 6 & 7 must be completed within 1 year of writing the theory exam. Failing which parts 5 and 6 must be re-done.

Dives exceeding 18m will only be taken as part of the qualifying prerequisites once the student has enrolled on the course.

The above mentioned prerequisites are the minimum required for the CMAS Two Star Advanced Diver Certificate.

9.4.4 TRAINING PROGRAMME

The course may be conducted by qualified instructors and supervised by at least an in-date CMAS-ISA Two Star Instructor. The early practical teaching sessions should take place in sheltered open water, following which the diver should gain experience in a broad range of varying water conditions.

These are guidelines to assist the instructor in planning the course.

CONTENT OF THEORETICAL LESSONS

T 1 - DIVING RELATED ILLNESSES

1. Revision of effects of pressure on the body, gas laws, partial pressures.

2. Ear and sinus disorders: causes, prevention, treatment
 3. Burst lung (Pneumothorax, Emphysema), symptoms, causes, first aid, treatment.
 4. Hypoxia: causes, treatment.
 5. Decompression sickness (basic introduction only).
 6. Nitrogen narcosis: causes, symptoms, treatment.
 7. Carbon monoxide poisoning: causes, symptoms, treatment.
 8. Carbon dioxide poisoning: causes, symptoms, treatment.
 9. Oxygen poisoning: causes, symptoms, treatment.
 10. Exhaustion, hypothermia, hyperthermia.
 11. Drowning: causes, first aid, treatment.
- (Time: 60 minutes)

T 2 - FIRST AID AND RESCUE PROCEDURES

1. Expand on One Star Theory Lesson 10, and prepare for Two Star Practical Lesson 2.
 2. Analysis of the accident.
 3. Whether to assist or rescue.
 4. Assess, plan, act
 5. Reaching the victim, recovering the victim.
 6. Towing methods.
 7. Landing the victim, on a beach, on a boat.
 8. Techniques to be employed and why.
 9. Expired air resuscitation
 10. External cardiac compression.
 11. Aftercare.
- (Time: 40 minutes)

T 3 - NITROGEN ABSORPTION

1. Absorption of gases in liquids, absorption of air into body tissues.
 2. Toxic effects of gases.
 3. Physiological problems; narcosis.
 4. Decompression sickness, mild forms, severe forms.
 5. First aid and treatment for decompression sickness.
 6. Avoidance of decompression sickness.
- (Time: 40 minutes)

THEORY LESSON 4 - DEEPER DIVING

1. The problems related to deeper diving.
 2. Reasons for and against deeper diving.
 3. Physiological problems, narcosis, decompression.
 4. Depth limitations.
 5. Physical problems, buoyancy, thermal isolation, air density and purity.
 6. Equipment considerations.
 7. Advanced knowledge of the first and second stage of the regulator.
 8. Planning requirements.
 9. Response to emergencies.
- (Time: 30 minutes)

T 5 - CALCULATING AIR REQUIREMENTS

1. Importance of pre-dive planning.
 2. Identifying stages of dive: descent, main dive, ascent, stops, reserve.
 3. Air consumption rates.
 4. Cylinder sizes, pressures and filling
 5. Calculating air available for the dive.
 6. Calculating air needed for the dive.
 7. Practice calculations.
- (Time: 40 minutes)

T 6 - DECOMPRESSION TABLES AND AIR CONSUMPTION

1. Used to avoid decompression sickness and related problems.
2. Principle of operation, review of nitrogen absorption.
3. The form and layout of the tables.
4. Single dives.
5. Multiple dives.
6. Diving at altitude.
7. Flying after diving.
8. Keeping records, log-books.
9. Instrumentation used.
10. Importance of planning.
11. Practice in decompression table use.

(Time: 90 minutes)

T 7 - DIVE PLANNING AND ORGANISATION

1. Planning is an essential element of diving safety.
2. Avoid the predictable problems.
3. Make allowance for all predictable needs and for emergencies.
4. Planning your own dives.
5. Boat diving and conduct on a boat.
6. Site selection, objectives, timing, personnel, weather, tides.
7. Pre-dive preparation.
8. On-site organisation.

(Time: 90 minutes)

CONTENT OF PRACTICAL LESSONS AND PRACTICAL DIVES

P 1 - OPEN WATER DIVING PROCEDURES

1. Practice snorkelling skills in open water, medium distance swim with surface dives.
2. Experience in dressing in all appropriate equipment for dive, equipment checks, buddy checks.
3. Water entry, buoyancy checks.
4. Leaving the surface.
5. Buddy diving, conduct during the dive.
6. Exchange signals.
7. Ascent and surfacing procedure.
8. Leaving the water.
9. Debriefing and equipment aftercare.

(Time: 120 minutes)

P 2 - RESCUE SKILLS

1. Following the theory lesson 2, the skills described should be practiced in an open water situation.
2. Towing victim on the surface, various methods.
3. In-water EAR.
4. Removing equipment.
5. Towing and landing to a beach, to a small boat.
6. Practice EAR and CPR on land.
7. Complete emergency exercise.

(Time: 90 minutes)

P 3 - SCUBA SKILLS: OPEN WATER REVIEW

1. Improve diver's confidence by repeating skills acquired in One Star course in the open water situation.
2. Various forms of water entry.

3. Buoyancy adjustment procedures, use of weight belt and buoyancy compensator.
 4. Review surface and underwater signals.
 5. Remove and refit mask at medium depth.
 6. Remove and replace mouthpiece at medium depth.
 7. Practices buddy breathing and use secondary air supply or octopus.
 8. Leaving the water on a beach, into a boat.
- (Time: 90 minutes)

PRACTICAL EVALUATIONS

NOTE: All practical evaluations to be conducted by at least an in-date 2 Star Instructor. Tests E & F are to be carried out during one session in the same swimming pool. The pool should be at least 3m deep. A rest period of one minute is allowed between tests unless otherwise stated.

E. To be carried out in the swimming pool wearing a swimsuit only or with neutralising weightbelt.

1. Swim 200m freestyle. No rest allowed during the swim. Crawl, breaststroke or butterfly style may be used.
2. Float on back for 5 minutes during which slight arm and leg movements are allowed. Alternatively use any other drown proof technique for 5 minutes.
3. Fin 25m underwater finishing in deep end. Surface, clear the snorkel and breathe through snorkel for 1 minute with head submerged.
4. Immediately thereafter, submerge completely and hold breath for 30 seconds while remaining submerged. Surface.

Wearing full scuba equipment, wetsuit, weight belt and BC.

5. Do the complete scuba pre-dive routine including the BC and fit diving equipment.
6. Perform at least one neat entry as prescribed by the examiner.
7. Submerge and demonstrate buoyancy control without the use of the BC.
8. At the deep end of the pool remove mask, place on pool bottom, fin 5m away, return, refit and clear mask.
9. Remove DV, drop over the shoulder, recover, replace and purge.
10. Perform 3 forward and 3 backward rolls. No surfacing is allowed between rolls.
11. Surface whilst exhaling. Remove scuba equipment, fit snorkel and tow scuba equipment for 100m, finishing in the deep end of the pool.
12. Refit all equipment, descend at the deep end of the pool, remove and refit scuba equipment without surfacing. Surface whilst exhaling, fully kitted.

F. To be carried out in the swimming pool wearing full scuba equipment, wetsuit, weight belt and BC.

1. Orally inflate the BC and demonstrate emptying of the air in the BC in order to submerge.
2. Demonstrate underwater the ability to increase buoyancy with the air in the BC.
3. Demonstrate the use of an additional air supply i.e. power inflator, as well as the emergency dumping of air.
4. Demonstrate the ability to cope with extra 10kg weight over a distance of 20m underwater.
5. Fin 200m on the surface wearing scuba equipment but breathing through the snorkel.
6. Submerge at the deep end of the pool, signal "I am out of air" and "I am going up". Remove mouthpiece, fit snorkel, ascend and surface whilst exhaling. Signal "I am OK" on surfacing.
7. At the deep end of the pool (preferably at 5m depth) react correctly to a minimum of 4 CMAS approved hand signals.

8. Share air with another diver for 50m while not exceeding 3m in depth. Execute 4 x 90° and 2 x 180° turns while sharing air. Interchange demand valves 4 times.
9. Submerge and fin 50m using a blacked out mask, either being led by another diver or following a rope. Surface.
10. Fin 25m underwater to the deep end where a buddy is simulating unconsciousness. Demonstrate rescue techniques and the use of your buddy's BC to surface. (Do not remove your buddy's demand valve).
11. Simulate lifesaving techniques and E.A.R in the water while towing a buddy for 50m. Remove the scuba equipment in the water and continue with resuscitation on dry land. (Do not lift buddy from the pool for fear of injuring his back).
12. Complete the post dive routine.

G. To be carried out in open water under controlled conditions wearing full scuba equipment and BC.

1. Do a complete pre-dive routine including the BC.
2. Enter water with mask in hand, fit, clear, and orally inflate the BC. Empty the air in the BC in order to submerge and descend to 20m depth.
3. Demonstrate the ability to increase and decrease buoyancy with the aid of the BC.
4. Demonstrate the use of an additional air supply, power inflator as well as the emergency dumping of air.
5. At 20m depth, remove mask, hold at arm's length, refit and clear.
6. At 20m depth remove demand valve, drop over shoulder, recover and purge DV.
7. React correctly to a minimum of 4 CMAS approved hand signals.
8. At 20m depth, share air with your buddy for 1 minute, change over to your buddy's scuba equipment and share air for a further 1 minute. (No surfacing allowed during this exercise).

9.4.5 ASSESSMENTS

KNOWLEDGE ASSESSMENT

Before granting the qualification, the instructor should ensure that the student has retained and understood the knowledge required being a safe Two Star diver.

The assessment will usually take the form of a prepared written evaluation using "multi-choice" questions that allow coverage of many topics in a short period. Weaknesses that are suggested by the result of this paper can then be investigated by further oral questioning if necessary.

The evaluation format shall be as follows:

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| Section A | |
| A compulsory pass question on the use of decompression tables. | 20 marks |
| Section B | |
| Short questions on equipment | 20 marks |
| Section C | |
| Short questions on medical/physiological aspects of diving | 30 marks |
| Section D | |

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| Short questions on dive planning and decompression diving | 30 marks |
| Section E | |
| Short questions on rescue and emergency procedures. | 20 marks |

Time allowed for the evaluation is 2 hours.

SKILLS ASSESSMENT

The diver's ability should be assessed by the instructor during the course of the dives being carried out. It will not normally be necessary to carry out a final assessment of all skills at the end of the course, but this can be done if the need exists. It is preferable to check one or two skills on each experience dive and to look for a steadily improving ability over this period.

It must be remembered that the Two Star diver is qualified to dive with divers of a similar grade and must therefore exhibit the qualities necessary to ensure safe diving in such circumstances.

PRACTICAL DIVES

The 20 dives which go to make up the experience and subsequent certification of the Two Star diver should cover a suitably wide range of different diving conditions and, as far as possible, include the following:

1. Night dives.
2. Seawater dives.
3. Fresh water dives.
4. Diving from small boats.
5. Limited visibility dives.
6. Dives to 25 - 30 metres.

It is appreciated that this combination of variety of dives will not always be available to the dive centre or club. However, the underlying principle is that the diver's experience should equip him for a variety of diving conditions, and should not represent a repeat of a similar experience on each occasion.

Each dive should be at least 15 minutes duration and should be in the 18 – 30 metres depth range.

Complete and record all qualifying dives as outlined in the above prerequisites (Refer to Section 9.4.3.7).

Apply for the certificate via the Instructor.