Rebreather Forum yields CCR market data and consensus statements

Valletta, Malta, 05 May 2023 — Rebreather Forum 4, the preeminent closed-circuit rebreather (CCR) industry symposium and scientific meeting, produced the most comprehensive data analysis of rebreather market to date, and a series of consensus statements to guide change and set safety priorities for the industry.

The three-day meeting from 20-22 April gathered 294 diving professionals from around the globe to advance and consolidate the diving community's knowledge of rebreather technology and its use by technical, government and scientific divers, with the goal of improving rebreather diving safety and performance. "RF4 was eye-opening," organizer Michael Menduno said. "We not only had the most comprehensive data on rebreather adoption and training to date, but it's changed a lot of people's perspective on where we are at with regards to the technology. We still have more work to do with regards to diver safety."


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Market, demographic, and safety data

Dr. Frauke Tillmans, Divers Alert Network (DAN) research director, revealed insights from an analysis of data from DAN, public surveys, and information supplied by CCR manufacturers to give attendees the best look yet at market, demographic and safety data.

- Tillmans estimated rebreather divers are dying at a rate of two to four per 100,000 dives, which is not substantially different from the analysis made by Dr. Andrew Fock at RF3. Fock estimated that the risk of dying on a rebreather was 5-10X the risk of open-circuit scuba. (Fock AW Analysis of recreational closed-circuit rebreather deaths. 1998-2010. Diving Hyperb Med 2013 Jun;43(2):78-85)
- More than 241 rebreather divers have died since RF3 (2012)
- Based on information from 20 of 24 recreational CCR manufacturers, Tillmans estimated between 25,000 to 35,000 rebreather units are on the market today.
- Using data from the DAN hotline, RF4 participants, and a related survey, Tillmans estimated the mean age of CCR divers is 42-46 years, the CCR diving population is between 84% and 95% male, and certified for an average of six years.

An analysis from DP Research Solutions using data found agency rebreather certifications issued annually ranged from about 3,500 to 5,200 per year between 2012 and 2023, with 2023 being the strongest year for certifications. The data includes certifications from entry-level to advanced, submitted by training agencies BSAC, Global Underwater Explorers, SDI/TDI, FFESSM, SSI, PADI, IANTD, and Dive RAID.

Consensus statements

RF4 produced consensus statements addressing issues related to safety, research, education and training, engineering and operational considerations. The statements, which will be published at a later date, are intended to set priorities for the community.

Rebreather Forum 3 attendees, for example, reached a consensus regarding pre-dive checklists, specifically recommending “rebreather manufacturers produce carefully designed checklists” and “training agencies and their instructors embrace the crucial leadership role in fostering a safety culture in which the use of checklists by rebreather divers becomes second nature.” Since then, pre-dive checklists have been widely adopted. In a pre-RF4 survey, 73% of attendees indicated they “always” use checklists.



Presentations

The conference included 22 presentations from experts including Dr. Richard “Harry” Harris, who this year completed the first reported CCR dive with hydrogen as a diluent, and prominent dive-science researchers. See RF4 schedule below. Note that speakers bios are on the RF4 website.

RF4 by the numbers

RF4 convened 294 attendees including CCR manufacturers, training agency personnel, hyperbaric and diving science researchers including:

- 83 vendor representatives
- 9 external press representatives
- 29 exhibitors
- 17 sponsors
- Five media partners.
- Attendees represented more than 28 countries
- Vendors conducted 111 rebreather try-dives at Malta’s National Pool Complex in the days leading up to the conference. Rebreathers included the Divesoft Liberty back-mount and side-mount units, the Lungfish with both the standard loop and the Alliance full face mask, Fathom MK III, iQSub’s XCCR, rEvo and Mares Horizon, and the M3S Triton, along with Garmin computers and Shearwater and Sonardyne navigation unit.

Rebreather Forum 4 is the fifth such trade and scientific meeting held by the diving community.

- The original Rebreather Forum was held in May 1994, in Key West, Florida.
- Rebreather Forum 2.0 was held in September 1996 in Redondo Beach, California.

- Rebreather Forum 3.0 was held May 2012, in Orlando, Florida.
- A related event, Rebreathers and Scientific Diving, was held in February 2015 on Catalina Island, California.

The RF4 schedule is shown **here**.

For images, logos, and other press assets go here: **RF4 Press Resources**

For more information see: **rebreatherforum.tech**

For more details about the presentations, see **DAN Europe daily RF4 summaries.**

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