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Product testing announcement of 5 scrubber canisters in the ISC Megalodon at a 75 RMV at 50 and 100 meters.

InnerSpace Systems Corp on 17-01-06 contracted the British Government Health Safety Executive Health Safety Lab to conduct an independent third party CO₂ duration testing as per EN 14143:2003 Respiratory Equipment-Self-Contained Re-breathing Diving Apparatus on 5 CO₂ scrubber canisters. Who is the HSE? The Health Safety Executive is responsible for the health and safety regulations in Great Britain and the enforcement authority for the UK and beyond. Go to www.hse.gov.uk

The purpose of the test is to evaluate the performance of 5 canisters in the ISC Megalodon at various RMV. Presented here is only the 75 RMV which is the worst case for a diver breathing at an extremely high elevated level. The canisters tested are the Cis Lunar 5.5 lb radial, ISC 5.5 lb axial, the 7.5 lb ISC radial, Micropore 5.5 lb RPC, and the Prism radial.

The testing criteria for a charged carbon dioxide absorbent canister in water are (4±1) °C (39.2 °F) test depth is 50 and 100 meters. EN 14143 stipulates the test depth of 40 meters. ISC elects to use the deeper depth to demonstrate the better breathing of the product. Diluent gases used are air and 10/90 heliox.

One test each was conducted by the HSE/HSL on an ANSTI breathing simulator. Each canister was packed and loaded by Leon Scamahorn under the supervision of the HSL investigator. The absorbent used was Molecular Products 8-12 Sofnolime. Each canister was packed tight as possible for maximum granular compacting to induce the highest WOB as possible. Granular weight was recorded before and after each test run on each canister. The only exception to granular packing is the Extend Air RPC.

Testing shall be done in accordance with EN 14143:2003. Maximum WOB for 75 RMV is 2.75 J/l. The scrubber canister is tested at a breathing simulator setting ventilating at a 75 RMV, breathing rate of 25 bpm, and tidal volume of 3.0 liters. Test depth is 50 meters (165 fsw) and 100 meters as per ISC test requirements. Air and 10/90 heliox is used for the diluent at the appropriate depths.

Results: The 5 canisters all performed below the EN 14143 maximum of 2.75 J/l. The highest at 50 meter test depth air diluent, was the Cis Lunar Radial at 2.57 J/l. The second

highest was the ISC axial at 2.50 J/l, 3rd highest Extend Air RPC at 2.28 J/l, 4th highest the 7.5 lb ISC radial at 2.22 J/l, and the 5th was the Prism radial at 2.09 J/l. The Prism was the lowest of the group.

50 Meter Test:

Ventilation Rate 75 RMV @25 bpm, Tidal Vol 3.0 Liters

UNIT	Scrubber Weight - lbs(kg)	WOB lpm
CisLunar Radial	5.5(2.49)	2.57
ISC Axial	5.5(2.49)	2.50
Extend Air RPC	5.5(2.49)	2.28
ISC Radial	7.5(3.40)	2.22
Prism Radial	6(2.72)	2.09

At the 100 meter test depth at the same test ventilation rate the canisters were measured at the following: The Cis Lunar radial was the highest at 1.91J/l, the ISC axial was the second highest at 1.76 J/l, the Extend Air was not measured, the 3rd highest was ISC 7.5 lb radial at 1.69 J/l, and the Prism was 4th at the lowest WOB with a 1.56 WOB.

100 Meter Test:

Ventilation Rate 75 RMV @25 bpm, Tidal Vol 3.0 Liters

UNIT	Scrubber Weight - lbs(kg)	WOB lpm
CisLunar Radial	5.5(2.49)	1.91
ISC Axial	5.5(2.49)	1.76
ISC Radial	7.5(3.40)	1.69
Prism Radial	6(2.72)	1.56

In comparison to the AP valve Inspiration that ISC contracted out the HSE/HSL to test on two different dates of 11/01/06 and 30/11/07 the WOB at a test depth of 50 meters using air diluent at a **lower ventilation rate of 40 RMV, Tidal volume of 2.0 liters, and breathing rate of 20 bpm the outcome was 2.11 J/l, and 2.09 J/l respectively.**

50 Meter Test:

Ventilation Rate 40 RMV @20bpm, Tidal Vol 2.0 Liters

DATE	Scrubber Weight - lbs(kg)	WOB lpm
11/1/2006	5.40(2.45)	2.11
30/11/2006	5.40(2.45)	2.09

ISC will post at a later date the 40 RMV test data for apples to apples comparison, but uses the data above for the reader to understand that the AP valve Inspiration would breathe considerably higher at the 75 RMV than the Megalodon system using any one of the 5 canisters.

See test results on the ISC website for the 75 RMV.

In comparison to Delta P's data posted comparing various rebreathers to each other the data is inaccurate in regards to the Megalodon. Delta P states on their comparison chart that the Meg exceeds the CE bench mark of 2.75 J/l. On the contrary, the Meg beats the Sentinel in WOB. According to Delta P, the sentinel has a 2.4 J/l WOB. 3 out of 5 canisters tested in the Meg beat the Sentinel. The remaining two are close enough to the Sentinel WOB that the diver would not notice the difference except in price.

The Sentinel test depth was 40 meters as the Meg with the 5 canisters was tested at 50 meters. Hypothetically, the two canisters that are above the Sentinel in WOB may very well match the Sentinel if tested at 40 meters.