

**NATO
SMERWG**

Submarine Escape & Rescue Working Group

**INDUSTRY SUPPORT
2021**

Since 2005 Industry have supported the SMERWG meetings; from Brussels to Cape Town – nothing stopped them turning up and renewing relationships, showcasing new products/services and treating delegates to a delightful evening.

COVID19 put and end to the consecutive run of Industry Receptions for two years but it is hoped that the situation will improve in time for 2022.

Please have a look at this brochure and re-discover the companies who have always been part of the SMERWG meetings – plus a few new ones.

**Hope to see you in Amsterdam
January 2022!**

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The emergency breathing system, is suitable for use in confined spaces, e.g. in submarines. It provides a breathing air supply using a fixed ringed air pipeline system fitted with outlet points. This protects the user's respiratory tract from the influence of pollutants.

MORE INFORMATION: WWW.DRAEGER.COM

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Forum Energy Technologies (FET) are a world leading designer and manufacturer of subsea vehicles and tooling and have been reliably supporting military organisations and naval forces for more than 45 years. Encompassing two of the leading brands in the design and build of remote intervention vehicles - Perry Slingsby Systems and Sub-Atlantic, FET have supplied over 800 manned and unmanned underwater vehicles.

We have pioneered the development of manned submersibles since 1975. Previously delivered systems include NSRS (NATO Submarine Rescue System) which entered service in 2008 and "remains the benchmark" according to many of her team – NSRS is on constant standby for rescue operation in any part of the world and is specifically packaged for rapid deployment by air transport with all other surface elements of NSRS.

The latest SRV system (named LR11) was delivered in 2020 for the Vietnamese Navy and was built to the latest Lloyds design codes to facilitate full class certification. LR11 has increased power and an advanced auxiliary thruster control system that allows for speeds of up to four knots, enabling it to operate in high currents. The vehicle can mate to submarines at highly precarious angles, above 40 degrees. The system was also supplied with a Launch & Recovery System and a complete training & aftersales support package as well as an ROV System, Simulator, ELSS Pod Skid & Mating Target.

FET also has a long history of supplying ROV's to the global military market including Intervention ROV's which are designed to be deployed rapidly to minimize the time taken until first Intervention – these incorporate the latest technologies to facilitate advanced 'AUTO' functionalities.

FET's operational base in Kirkbymoorside, Yorkshire (UK) operates Europe's most advanced subsea design, manufacturing and vehicle testing facility. Secure and confidential, it boasts one of the world's largest horizontal pressure test tanks for hyperbaric pressure testing, and a deep tank for full ROV and rescue submersible systems certification.

We have successfully supplied defence equipment/services to NATO, the United Kingdom, the United States, Australia, Ireland, Norway, German, Spain, China, Vietnam, Malaysia, Singapore and South Korea navies and we are proud to deliver cutting-edge technologies which are at the forefront of the subsea industry and remain the systems of choice by many of the world's military and naval forces.

Whatever the mission, Forum Subsea Vehicles has the solution

www.f-e-t.com

Check out FET's LR Class Rescue Submarine video: <https://youtu.be/yWqk0P7cwO4>



SMERWG 2021

GENERAL: Twenty plus years ago Micropore Inc. developed solid sheet absorbents based on their patented ExtendAir® process that encapsulates reactive absorbent powders in a stable sheet. The CO₂ absorbent powder is extremely fine, similar in particle size to talcum powder. Micropore offers lithium hydroxide and calcium hydroxide absorbents for fan powered and unpowered/emergency use in removing carbon dioxide in a wide range of applications such as routine and emergency carbon dioxide control for submarines, diving rebreathers, mine refuge/CBRN shelters, personal protection escape devices, spacecraft and anesthesia machines in hospitals or field operating rooms.

EMERGENCY CO₂ CONTROL: CO₂ control curtains made from lithium hydroxide have been tested by multiple NATO (Europe and North America) and Pac Rim Navies. These independent tests have demonstrated Micropore's superior performance at low temperatures or high pressures (optimized for DISSUB conditions). ExtendAir® curtains offer greater density (liters of CO₂ per cubic meter of storage volume) than all alternative products and are currently installed on 15 nations' submarine fleets. For example, ExtendAir® curtains have 59% more absorbent than granules and eliminate the toxic dust associated with granules.



Rolled ExtendAir® Curtain
NSN 6810-01-560-3015



Folded Curtains in Ammo Box
NSN 4240-01-543-3287



Hanging Curtains for Dutch Shipboard Trials

FAN POWERED ABSORBENT: Micropore's PowerCubes® are used on diesel electric submarines for non-regenerative CO₂ control. For AIP and nuclear submarines PowerCube® scrubbers can be used for localized CO₂ control. PowerCube® is a replacement for granules in submarine scrubbers. PowerCube® adsorbent stores in the same volume as the granular cans with 33% more mass thus allowing longer submerged durations or larger crews. PowerCubes® were successfully tested by the Canadian MOD, the Royal Dutch Navy/Royal Norwegian Navies and the UKRN. As reported at SAMAP 2017 the Royal Dutch Navy has retrofitted their fleet for ExtendAir® calcium hydroxide PowerCube® adsorbent. Lithium hydroxide PowerCubes® have been operated on UKRN submarines and in manned space flight.



PowerCube® Adsorbent
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PowerCube® Canister / Adapter



Torpedo Room Scrubber Modified for PowerCubes®

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Neoprene wrist seal & diver's glove

Raft storage

Waist, knee, ankle & torso adjustment straps



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- Inflatable canopy with face shield
- Bailer
- Sea anchor
- Inflation system
- Contains ballast bags
- Boarding handles and inflation sleeve



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Connecting What's Needed with What's Next™

A dark, sleek, and futuristic submarine rescue vehicle is shown in a dark blue, underwater-like environment. The vehicle has a conical nose and several thin, horizontal protrusions. The background is a gradient of dark blue with some light rays or bubbles, suggesting an underwater setting.

RAPID RESPONSE
SUBMARINE RESCUE
SOLUTION PROVIDER

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We design, build, operate, and maintain the world's largest fleet of commercial subsea vehicles and innovative diving systems for the most extreme subsea environments. Our experience and expertise was why the U.S. Navy trusted us to develop the requirements and specifications for the U.S. Submarine rescue system in 1995.

Over 20 years later, Oceaneering still integrates our advanced subsea technologies—strategically located around the world. We are certified to conduct subsafe boundary installations and repairs, and have an unparalleled understanding of the full spectrum of submarine rescue requirements.

■ Connect with what's next at [Oceaneering.com/OTECH](https://www.oceaneering.com/OTECH)