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MEER EG

Maritime Emergency Egress Rescue



User's Manual

15 August 2022 Rev. 5

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MEER EG User's Manual PN AP5318EG

MEER-EG 0.25L, 25" Hose, YEL PN EB002006

MEER-EG 0.25L, 25" Hose, BLK PN EB002008

Please read the instructions in this manual carefully before using this product.

If you have questions regarding the use of this product, please contact Aqualung Military Professional via our website at www.milproaqualung.com

Warnings, Cautions and Notes

Pay special attention to information provided in Warnings, Cautions and Notes that are accompanied by one of these symbols.



A WARNING indicates a procedure or situation that, if not avoided, could result in serious injury or death to the user.



A CAUTION indicates any situation or technique that could cause damage to the product and could subsequently result in injury to the user.



A NOTE is used to emphasize important points, tips and reminders.

Manufacturer

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GENERAL PRECAUTIONS AND WARNINGS



WARNING: MEER (Maritime Emergency Egress Rescue) is specifically designed for use on a variety of vests and harnesses typically used in maritime environments and may also be considered for egress from rotorcraft in a ditching emergency. Due to its limited air volume, it is not intended for use while SCUBA diving or egressing from depths greater than 4m.



WARNING: Before using MEER, it is important to receive in-water survival training which simulates an emergency egress situation. You must also learn the basic principles and techniques for breathing compressed air underwater. Use of MEER without proper training is dangerous and can result in serious injury or death.



WARNING: It is imperative that manufacturer prescribed service on MEER is performed by a manufacturer trained service technician according to the procedures outlined in our Technical Maintenance Manual once every two years under normal prescribed use OR once a year if operating in an environment where harsh / heavy / in-water or training use may exist.



WARNING: DO NOT attempt to overfill MEER beyond its maximum fill pressure at any temperature.



WARNING: DO NOT fill or use MEER if it has been exposed to extreme heat exceeding 121°C or open flame. Instead, discharge the cylinder completely and return it to a manufacturer trained service technician for inspection.



WARNING: MEER is designated to be compatible for use only with normal, atmospheric, compressed air (21% oxygen and 79% nitrogen by volume). DO NOT attempt to fill with other gases, including pure oxygen or air which has been enriched with oxygen exceeding 21% in content. Failure to observe this warning may result in serious injury or death due to fire and explosion or the serious deterioration and failure of the equipment.



WARNING: DO NOT apply any type of aerosol spray to MEER. Doing so may cause permanent damage to certain plastic components.



WARNING: Due to the materials used in the construction of MEER it is essential that the care and maintenance procedures laid out in this manual are adhered to. Failure to do so may cause permanent damage. Any damage to the protective coatings will cause premature corrosion of critical safety components. As part of the care and maintenance, regular and frequent inspections for corrosion must take place.



WARNING: DO NOT apply any type of petroleum based lubricant, such as household oil or motor oil to any part of MEER. Lubrication is not required under normal circumstances, except during service performed by a manufacturer trained service technician.



WARNING: It is important to ensure that MEER is always pressurized whenever it is submerged in order to prevent the ingress of water into the system. If MEER has been completely emptied of air underwater, it is important to return it as soon as possible to a manufacturer trained service technician for visual inspection and any necessary service before attempting to refill it.



WARNING: It is important to fill MEER only with dry, filtered air with a water vapor content that does not exceed -53°C dew point. Excess water vapor in the air can cause ice to form inside the system and interfere with the operation of MEER at colder temperatures.



WARNING: Periodic inspection of dial indicator readings shall take place to prevent over pressurization of MEER. Systems shall be deemed over pressurized at 5% above working pressure. Should MEER be over pressurized, a manual purging of the system via the second stage is necessary to reduce the pressure in the cylinder. It is especially important to inspect the indicator when transitioning from cold to hot environments, due to thermal expansion of the gas.



NOTE: When instructed to **remove, unscrew or loosen** a part, turn the part counter-clockwise.

When instructed to **install, screw, or tighten** a part, turn the part clockwise.



NOTE: When instructed to **“OPEN”** the handwheel, turn the handwheel counter clockwise. The **red indicator ring will not be visible** in the handwheel window, this indicates MEER is in the **“ON”** position.

When instructed to **“CLOSE”** the handwheel, turn the handwheel clockwise. The **red indicator ring will be visible** in the handwheel window, this indicates MEER is in the **“OFF”** position.



NOTE: When instructed to depressurize MEER, close the handwheel and depress the second stage purge button for 5 seconds and release for 5 seconds. Repeat this procedure until MEER is depressurized.

PRODUCT DESCRIPTION

MEER (Maritime Emergency Egress Rescue) is specifically designed for use on a variety of vests and harnesses typically used in maritime environments and may also be considered for egress from rotorcraft in a ditching emergency.

A lightweight cylinder with integrated regulator provides a source of emergency breathing air to allow crew members or passengers to safely egress from an underwater environment.

RISK IDENTIFICATION

MEER is designed to mitigate against the risk of drowning when egressing from a underwater environment in an emergency situation.

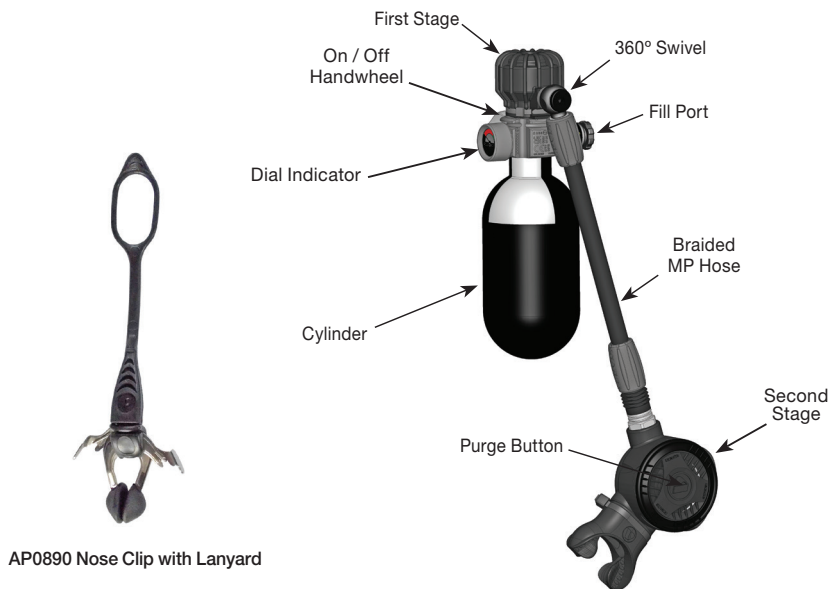


Figure 1

Aqualung MEER have been tested in accordance with PPE regulation (EU) 2016/425, BS EN 4856 and BS EN 250. They are type approved by SGS Fimko Oy, Takomotie 8, FI-00380 Helsinki, Finland, Notified Body Number 0598 and are examined by DNV GL, Brooktorkai 18, 20457 Hamburg, Germany, as notified body for PPE identification number 0098 for sale in Europe. Aqualung MEER have been tested in accordance with UK Legislation Personal Protective Equipment (Enforcement) Regulations 2018 UK Statutory Instruments 2018 No.390 by Approved body SGS United Kingdom Ltd, Inward Way, Rossmore Business Park, Ellesmere Port, Cheshire, CH65 3EN, United Kingdom approved body 0120, and are conformity assessed by SGS United Kingdom Ltd, Inward Way, Rossmore Business Park, Ellesmere Port, Cheshire, CH65 3EN, United Kingdom approved body 0120.



WARNING: For MEER to be compliant with BS EN4856, the nose clip must be fitted on the second stage. The nose clip is not included with MEER, but can be purchased separately. Instructions for installation are included with the nose clip.

PREPARATION AND SETUP

MEER is packaged fully assembled and ready to use after it has been filled with air. Before using, it is very important to carefully read and understand the procedures outlined in this manual.

GENERAL FILLING PROCEDURES



NOTE: The average duration of air supply listed in the **Technical Specifications section of this manual** is based upon the maximum fill pressure as marked on the cylinder. It is strongly recommended that the cylinder be filled to its maximum fill pressure (cold fill), in order to provide maximum breathing volume.



WARNING: Only use compressed gas that is in accordance with EN12021.

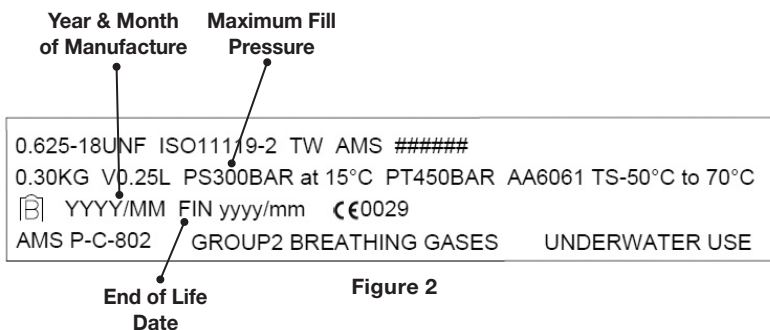
1. Before attempting to fill MEER, ensure that the fill adapter and first stage are completely dry – especially in the area surrounding the fill port.
2. MEER is configured with a 300 bar cylinder. Examine the cylinder markings to determine the maximum fill pressure. Cylinders must have a current visual inspection and hydrostatic test date (**Fig. 2**).



NOTE: Ensure hydrostatic retesting and visual inspection of cylinders is carried out in accordance with local regulatory requirements (**Fig. 2**).



NOTE: Cylinders have a service life of 15 years. This is indicated by the end of life date marked on the cylinder label (**Fig. 2**).



WARNING: DO NOT attempt to fill MEER if the cylinder markings indicate that it is assembled with a non standard cylinder rated for a different fill pressure. Doing so may result in rupture or explosion in the event of fire or overfilling. Instead, immediately return MEER to a manufacturer trained service technician and do not use under any circumstances.



WARNING: DO NOT attempt to loosen or remove any components of MEER other than instructed. Doing so could cause a dangerous malfunction which could result in serious injury or death.

3. Check to ensure the handwheel is closed and MEER is depressurized (**Fig. 3**).

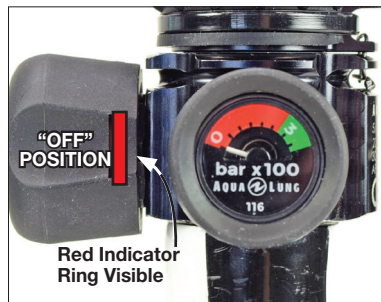


Figure 3

4. Unscrew the fill port cap from the fill port (**Fig. 4**).

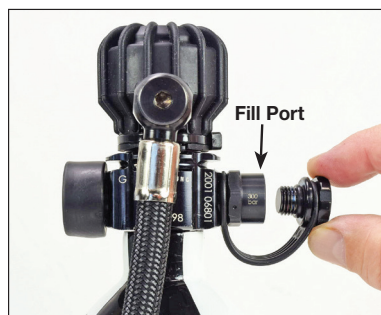


Figure 4

5. Closely inspect the fill port opening to ensure that no debris, residue or moisture is present.



CAUTION: If moisture is found to be present inside the fill port opening, this indicates that water may have entered the first stage and cylinder. DO NOT fill or attempt to use MEER until it has received complete inspection and any required service by a manufacturer trained service technician.

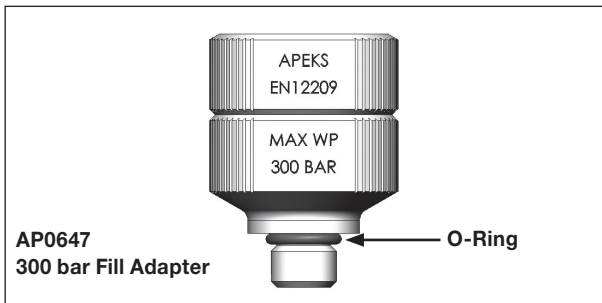



Figure 5

 **NOTE:** MEER does not include a HP fill adapter. The 300 bar fill adapter is available to be purchased separately. (Fig. 5).



CAUTION: Ensure that the pressure rating on the HP fill adapter matches the fill port and cylinder pressure rating.



CAUTION: Do not attempt to fill MEER directly from a compressed air filling station unless you have received the necessary training and authorization to do so. If done incorrectly, this procedure poses certain hazards which may cause severe injury or death.



CAUTION: The dial indicator is for reference only. Use the fill system gauge to indicate accurate cylinder filling pressure.



WARNING: DO NOT attempt to use the HP fill adapter to fill MEER from a compressor or air supply where the regulated pressure exceeds the cylinders maximum fill pressure. Doing so could cause a dangerous malfunction to the fill adapter, resulting in serious injury or death.

6. Inspect the fill adapter to ensure that the o-ring is present, not damaged and seated evenly at the base of the threads. Check the threads of the male fitting, making sure they are clean and not damaged.

7. Insert the threaded male fitting of the fill adapter into the fill port on the first stage. Screw the adapter into the fill port until finger-tight. DO NOT apply a wrench or otherwise overtighten the fill adapter (Fig. 6).

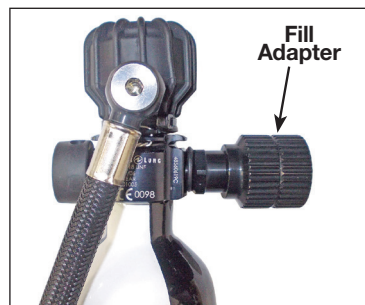


Figure 6

8. Connect to air supply fill whip (**Fig. 7**).

9. Open the handwheel to allow the dial indicator to register.



Figure 7



NOTE: MEER will fill with the handwheel in the “OFF” position (**red indicator ring visible**). In this position the dial indicator will not register pressure. **This is not recommended.**

10. While supporting the cylinder with one hand, **very slowly** open the air supply valve to begin filling (**do not exceed a fill rate of 30 bar per minute**). Make sure the dial indicator shows that the cylinder is filling properly.

11. When air can no longer be heard flowing from the air supply fill whip into MEER, completely open the air supply valve.

12. While holding the cylinder secure, close the handwheel on the air supply valve. Close the handwheel on MEER and depressurize the system.

13. Open the bleed valve screw on the air supply fill whip to relieve the line pressure.

14. While supporting the cylinder with one hand, disconnect the air supply fill whip from the fill adapter. Remove the fill adapter from the fill port.

15. Check that the o-ring on the fill port cap is present, not damaged and seated evenly at the base of the cap. Thread the fill port cap back into the fill port until finger-tight.

16. Verify the cylinder has been filled to its maximum capacity as marked. This can be seen when the dial indicator reads in the green zone.



NOTE: Always fill the cylinder as slowly as possible (**do not exceed 30 bar per minute**) by turning the handwheel of the supply valve slowly to control the rate of fill. Rapid filling will generate heat and will result in an incomplete fill after the cylinder cools. If the cylinder is warm to the touch afterward, the fill rate was too rapid.



NOTE: These steps may vary due to the type of HP compressor.

SECOND STAGE

The EG second stage is a pneumatically balanced, lever operated poppet-valve second stage regulator.

Due to the unique layout of the exhaust and diaphragm, the EG can be used either way up, and routed from any side.

The low profile design ensures a lower profile when in stowed position.

The large purge button ensures easy operation, even with thick gloves on (**Fig. 8**).



Figure 8

OPERATING INSTRUCTIONS

Ensure EG second stage is securely attached to a first stage via the hose, and that there is an adequate supply of high pressure air in the cylinder.

To breathe from the MEER EG second stage, simply place the mouthpiece into mouth and then, inhale and exhale.

The recommended way of fitting the MEER EG second stage as follows.

1. Insert mouth piece into mouth.
2. Take nose clip between forefinger and thumb as shown (**Fig. 9**).
3. Apply pressure onto the nose clip via the forefinger and thumb. The nasal pads will now be open (**Fig. 10**).
4. Place onto nose and release the pressure.



Figure 9



Figure 10

When using the EG second stage in an emergency underwater, firstly, expel any water from the EG second stage by purging or exhaling into the regulator, and then begin breathing as normal. Further exhaling will clear any other small amounts of water trapped inside the regulator.

To purge the EG second stage, simply depress the large front cover. This will discharge large quantities of air expelling any water trapped inside the regulator.



WARNING: Improper stowage of the hose may lead to a snag hazard being created.

PRE-USE INSPECTION

Before each use, MEER must be given a thorough visual inspection and functional test. NEVER use a MEER which shows signs of damage, leakage or substandard performance until it has received inspection and service from a manufacturer trained service technician.

1. Carefully inspect the first stage to make sure all external components (dial indicator, swivel port plug, etc.) are properly secured. Ensure the safety wire is firmly attached and in good condition (**Fig. 11**).



Figure 11



WARNING: DO NOT use MEER if the safety wire is missing or damaged. An inspection must be performed and the safety wire replaced prior to issue.

2. Ensure the medium pressure hose is securely connected to the second stage. Inspect the hose and hose fittings to ensure that there is no blistering, cuts, or corrosion present.

3. Visually inspect the entire system for any external damage, such as dents, gouges, cracks or external corrosion.

4. Confirm the handwheel is closed and MEER is depressurized. Inspect the dial indicator to ensure that it reads “0 bar” (**Fig. 12**).



Figure 12



CAUTION: The dial indicator should read “0 bar” when the handwheel is in the closed position and MEER is depressurized. DO NOT attempt to use MEER if the dial indicator indicates pressure until it has received inspection and service from a manufacturer trained service technician.




CAUTION: DO NOT attempt to pressurize MEER without first checking to ensure all components are securely fastened to the first and second stages.

5. Open the handwheel to pressurize MEER. Closely examine the dial indicator to ensure the cylinder is filled to its maximum capacity as marked (**Fig. 13**).



Figure 13

 **NOTE:** MEER utilizes a “GO” / “NO-GO” system of RED and GREEN segmented dial indicators based on usable gas volumes in accordance with EN 4856. The “GO” GREEN ZONES are set as follows:

0.25 L 300 bar system has an indicated GREEN ZONE FROM 270 - 300 bar.
Cylinders are primarily measured in their floodable volume and secondly by their expanded volume as follows:

0.25 L 300 bar = 62 L usable gas volume (real gas)

Usable gas is defined as: “Volume of breathable air available to the user while the demand regulator is operating within the specified breathing performance”. As stated in EN 4856 paragraph 3.22 usable volume of air.

6. Remove any mouthpiece covers from the second stage. Immerse MEER in water to check for any signs of leakage coming from the first or second stages. If any leakage is found, do not attempt to use MEER until it has received a thorough visual inspection and functional test by a manufacturer trained service technician. Upon completion of the immersion test, remove MEER from the water.

7. Briefly depress the purge button to ensure that sufficient airflow is provided to clear the second stage of water. Immediately after releasing the purge button, listen closely to ensure that the second stage does not continue to allow any airflow.

8. Close the handwheel and depressurize MEER, refill the cylinder to its maximum capacity as marked.

Provided that these Pre-Use Inspection requirements have all been met, MEER is now ready for use.

POST-USE INSPECTION

1. After use, close the handwheel and completely depressurize MEER. Check for signs of damage and contamination. Report any discrepancies to maintenance personnel.

CARE AND MAINTENANCE

It is important to provide the proper preventative maintenance in order to ensure the best possible performance and reliability of MEER. The following maintenance procedures should be performed routinely after each use of the equipment.



WARNING: Never use solvents to clean breathing equipment or components.



CAUTION: Disinfection of products for multi-use applications such as training equipment must be carefully considered. Do not use bleach based disinfectants or disinfectants known to be corrosive, as these can prematurely age or corrode the product being used. Only use the recommended disinfectant solutions as shown in the table below.



NOTE: Always follow the guidelines of use, cleaning procedures and safety data sheets published by the cleaning and disinfectant solution manufactures. Methods, temperatures, dilution ratios and times can vary. These cleaning solutions and disinfectants have been developed and are intended for use with compressed air diving and life support systems and are accompanied with detailed information.

Always follow your local regulations and cleaning solutions guidelines regarding disposal.



NOTE: Due to the light weight aluminum first stage, MEER is susceptible to galvanic corrosion and needs to be rinsed thoroughly after use in salt water.

Disinfectant Solutions	Applications	Source
Liquid dishwashing detergent (diluted with warm water) *Soapy water is defined as "household" grade liquid dishwashing detergent diluted in warm water.	General low risk disinfecting	"Household Grade"
Chemgene HLD4L breathing apparatus surface disinfectant solution. Follow manufacturer's dilution recommendations.	All around non-corrosive disinfecting for all plastic and metallic parts. Shared training and rental equipment	MediMark Scientific www.medi-mark.co.uk

When MEER has been subjected to an aquatic environment but not used in a breathing capacity please follow points 1 – 9 in full.

- 1.** After each in-water use, MEER must be cleaned, inspected, and prepared for the next use or storage.
- 2.** As soon as possible after use in water, MEER should be soaked thoroughly. MEER is to be pressurized before being submerged in warm tap water for at least one hour (water temp should not exceed 49°C). Soaking allows any salt and minerals to dissolve. Before soaking, remove the mouthpiece cover to allow water into the second stage and spring chamber.
- 3.** After MEER has been properly soaked, it is important to thoroughly rinse the first and second stages utilizing a pressurized stream of water. This will remove the salt and mineral deposits that were loosened during soaking.
- 4.** To dry MEER after use for storage, the demand valve shall be purged with the breathing gas on while the demand valve is inverted and tipped downwards towards the mouthpiece. This is to ensure that all residual water has been drained from inside the demand valve if any had entered during the cleaning process. Store in a dry and clean environment with circulating air.
- 5.** Close the handwheel and completely depressurize MEER before storing or transporting.
- 6.** Due to the possibility of fire and exposure to extreme heat, MEER must be stored according to the cylinder manufacturers recommended guidelines.
- 7.** Store MEER completely dry, in a clean equipment box or sealed inside a plastic bag. When possible, avoid storing it where it may be exposed to extreme heat or an electric motor, which produces ozone. Prolonged exposure to extreme heat, ozone, chlorine and ultraviolet rays can cause premature degradation to certain parts and must be prevented.
- 8.** When transporting MEER, take the necessary precautions to ensure that it is surrounded by a protective cushion to prevent undue shock or impact.
- 9.** Do not use any type of solvent or petroleum based substances to clean or lubricate any part of MEER. Do not expose MEER to aerosol spray, as some aerosol propellants attack or degrade rubber and plastic.

INSPECTION AND SERVICE

1. It cannot be assumed that MEER is in good working order on the basis that it has received little use since it was last serviced. Remember that prolonged or improper storage can still result in internal corrosion and/or deterioration of o-ring seals and valve springs.
2. It is imperative that manufacturer prescribed service on MEER is performed by a manufacturer trained service technician according to the procedures outlined in our Technical Maintenance Manual once every two years under normal prescribed use OR once a year if operating in an environment where harsh / heavy / in-water or training use may exist. Manufacturer prescribed service consists of:
 - Complete overhaul of the first and second stage regulator.
 - Visual inspection of the cylinder in accordance with local regulatory requirements.
 - Verification of current hydrostatic test date on cylinder. Re-test of cylinder in accordance with local regulatory requirements.
 - Verification of cylinder end of life date. Cylinder must be replaced upon expiration of this date.
3. DO NOT attempt to perform any disassembly or service to MEER. Doing so may cause MEER to dangerously malfunction. All service must be performed by a manufacturer trained service technician.

CYLINDER ADVICE

- 1. Maintenance:** After each use, check for cylinder damage. Clean the cylinder and components. If water is used to clean, make sure you allow enough time for all components to dry. Don't reassemble until all components are thoroughly dried. Do not apply heat higher than the temperature of steam 100°C in order to dry a wet cylinder.
- 2. Storage:** Tightly close the cylinder valve. Leave some pressure in the cylinder (2-3 bar). Secure the cylinder and assembly from rolling, tipping over or falling. Store the cylinder at room temperature, in a dry place, keep away from chemicals, artificial heat sources and corrosive environments.
- 3. Handling:** Cylinders should never be dragged, or dropped. When transporting cylinders, make sure that the valve is well protected and that the cylinder is well secured.
- 4. Painting:** Retouch damaged paint areas with air drying paint, but if damage has been done to the cylinder metal or composite materials, have it visually inspected first by a manufacturer trained service technician. Never use corrosive, caustic, or acid paint strippers, burning techniques, or solvents, in order to remove paints from aluminum or composite surfaces.
- 5. Chemical Exposure:** Composite materials can be attacked by chemicals or treated water. If the cylinder has been exposed to chemicals or aggressive fluids, the external composite surfaces must be checked for any visible signs of damage.
- 6. REJECT** composite cylinders known to have been covered, splashed or left standing (soaked) in unknown chemicals.
- 7. REJECT** composite cylinders if the composite surface is blotchy or the paint and/or resin shows signs of chemical attachment (e.g., paint or resin has softened, smeared, bubbled, etc.).
- 8. HOLD** composite cylinders if the composite portion has come into contact with a type of chemical that is not listed below and if you are unsure of its effects on the composite material. Contact Aqualung for advice.
Any cylinder composite material coming into prolonged contact with these types of chemicals and materials must be rejected:
- 9. Solvents:** Paint thinners, kerosene, turpentine, paint solvents, paint cleaners, epoxy solvents, resin removers, organic solvents, etc.
- 10. Vehicle Fluids:** Materials that contain benzene, glycol (anti-freeze), battery acids/alkalis, window washer fluids, oils containing solvents, flammable materials, organic volatile materials, gasoline and oil additives, fuels (gasoline, gasohol, methanol, etc).
- 11. Strong Bases:** Materials that contain medium to high concentrations of: sodium hydroxide, potassium or hydroxides, materials that contain strong soap solutions, cleaning (soap) solutions, etc.
- 12. Acids:** Materials that contain any concentration of acids like hydrochloric, sulphuric, nitric, phosphoric, etc.
- 13. Corrosives:** Materials that contain corrosive components or that are corrosive themselves, such as the chemicals mentioned above and: cleaners, glass cleaners, metal cleaners, resin cleaners/removers, drain openers/cleaners, glues, rubber and other chemical cements, and atmospheres containing corrosive gases.

TECHNICAL SPECIFICATIONS

Cylinder Length with Regulator	21.5 cm / 8.5 in for 0.25 L Cylinder
Cylinder Material	Carbon Fiber Composite (Aluminum Liner)
Rated Cylinder Pressure	300 bar / 4500 psi
Regulator First Stage	Balanced Diaphragm
Pressure Indicator	Dial Indicator 0–345 bar / 0-5000 psi
First Stage Hose Connection	360 Degree Swivel
Regulator Second Stage	Pneumatically Balanced Second Stage
MP Hose Length	63.5 cm / 25 in Braided
System Weight	820 g / 1.8 lb Empty w / 0.25 L Cylinder
MEER tested and approved operating performance in accordance with EN 4856	
Depth Rating	8 m / 26 ft
Extreme Cold Water Rating	1° C / 34° F
Cylinder Volume*	0.25 L Floodable Volume 67.5 L Total Real Gas Volume
Duration of Air Supply**	2.9 minutes or 29 Breaths using 0.25 L Cylinder at 4 m / 12 ft
<p>*Cylinder volume specifications are based upon the cylinder being filled to its maximum fill capacity as marked on the cylinder.</p> <p>**Based on an average breath volume of 1.5 liters at a breathing rate of 10 bpm, with a starting supply pressure of 300 bar.</p>	

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