



**aska**<sup>®</sup>



# SAFER<sup>®</sup>

## Ultra Light Composite Cylinder

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Innovation of SAFER<sup>®</sup> cylinder is based to reduce the weight of the cylinder by 65% compared to the steel cylinder. The lightness effect was achieved by using PET liner and high-quality carbon and aramid (Kevlar) fibers. The PET liner characterized a high barrier and does not react with gases, preventing corrosion, so that the gas stored inside the container is clean and completely safe for the user of the cylinder.

Ultralight SAFER<sup>®</sup> cylinders are ideal to be used for SCBA sets, life support cylinders for fire fighters, first responders and also for watermist technology. Lightweight SAFER<sup>®</sup> cylinder allows fast and comfortable movement in hazardous areas, and excellent insulation protect against electric shock. Gases do not heat inside the cylinder because all used materials are non – conductive.

Trusted by all major SCBA OEMs already.



PESO Approved  
G.3 (42) 710  
Dt : 25.09.2017

[www.askagroup.com](http://www.askagroup.com)

# PRODUCT – DESIGN AND FEATURES

Ultralight SAFER® composite gas cylinders feature a PET liner reinforced with carbon and Kevlar® aramid fibres.

The cylinders provide high mechanical strength and resistance to high pressure and impact.

An external protective epoxy resin layer provides protection against extrinsic factors and easy cleaning.

Use of both the PET liner and the Kevlar® fibres has allowed Techplast to greatly reduce the cylinder weight - even by 65% compared to commonly used standard steel cylinders. Improved cylinder strength is an additional advantage.

PET features high barrier properties to guarantee safe gas storage (e.g. oxygen) in SAFER® gas cylinders. The liner protects the cylinder against reaction with gas thus preventing corrosion.

The gases stored in the cylinders are kept clean and user safe. The cylinders are the perfect solution for rescue teams, medical rescue teams and divers.



## PRODUCT FEATURES

Use of the highest quality materials (e.g. Kevlar fibers and PET liners) provides the following SAFER cylinder properties :

- **Comfort** – significant reduction of cylinder weight for easy use in rescue operations for fast and comfortable movement in hazardous areas.
- **Lightweight** – SAFER® cylinders are more than three times lighter than the steel cylinders which is a major advantage for storage of industrial gases. It allows gas cylinder handling without the use of heavy lifting equipment.
- **High resistance to gas temperature changes** inside the cylinder (gas does not heat since the materials used are non-conductive).
- **Gas purity inside the cylinder** – no hazard to user health
- **Electrical insulation** ensures the fire fighters' safety.
- **Resistance to impact and abrasion** (transport, storage and delivery).
- **Good gas barrier properties** (e.g. oxygen)
- **Smooth and easy to maintain surfaces.**



**Lightweight SAFER®** gas cylinders can be used in rescue operations where reduced equipment weight is of an advantage. Verified effective back and neck protection.



**PET liner** is an excellent thermal insulator. The gas inside the cylinder does not heat and the rescuers do not breathe warm air.



**PET liner** the cylinder against reaction with gas thus preventing corrosion. The gases stored in the cylinders are kept clean and user safe.



Made with the highest quality materials, SAFER gas cylinders provide excellent electrical insulation and protection against electric shock.



## KEVLAR® INNOVATION AWARD

DuPont™ oraz Kevlar® są zastrzeżonymi znakami handlowymi lub znakami handlowymi firmy DuPont bądź jej spółek

The company has been awarded the Kevlar® Innovation Award 2012 by DuPont™ for its high quality and innovative products.

### LEADING TECHNOLOGY

SAFER® cylinder are manufactured and tested using automated, computer controller processes. Continuous reinvestment in the plant and the equipment ensures that our cylinders are manufactured and tested in accordance with the most technologically advanced processes available.

Automatic data acquisition allows full traceability of materials used and the effective monitoring of critical process parameters.

The cylinders are manufactured to PN-EN 12245:2009 and meet all the requirements and specifications for use in breathing apparatus, storage of different gases : air, oxygen, nitrogen and carbon dioxide.



### WIDE RANGE OF PRODUCTS

Techplast offers full range of 300 bar composite gas cylinders. The cylinders are available in 1.2L to 9L sizes. The technology and the research works allowed the development of products with the service life of 15, 20 and 30 years. 6.8L and 9.0L size cylinders are also available in NLL version.

PRODUCT	WEIGHT	DIAMETER	LENGTH	WORKING PRESSURE	SCREW THREAD	SERVICE LIFE 20 YRS	WARRANTY (months)
2.0L	1.10 kg	116 mm	321 mm	300 bar	M18 x 1.5	✓	12
3.0L	1.60 kg	116 mm	445 mm	300 bar	M18 x 1.5	✓	12
4.7L	2.70 kg	158 mm	400 mm	300 bar	M18 x 1.5	✓	12
6.0L	2.90 kg	158 mm	476 mm	300 bar	M18 x 1.5	✓	12
6.8L	3.20 kg	158 mm	526 mm	300 bar	M18 x 1.5	✓	12
9.0L	4.20 kg	174 mm	576 mm	300 bar	M18 x 1.5	✓	12

**i** All models approved by PESO, Government Of India. Specifications subject to change

**Note:** These are final weights of cylinders with the caps and the last layer / finishing layer.

### PERMEABILITY

CONDITIONS: TEMPERATURE 25°C  
PRESSURE: 1 BAR  
PERMEABILITY: 100%

GAS	[m³stp/m³] x [m²/s]			
	PET (POLYETHYLENE TEREPHTHALATE -100% AROMATIQUE)	HDPE (HIGH DENSITY POLYETHYLENE)	LDPE (LOW DENSITY POLYETHYLENE)	PVC (POLYVINYL CHLORIDE)
CO2	80 * 10 <sup>-15</sup>	3500 * 10 <sup>-15</sup>	9400 * 10 <sup>-15</sup>	120 * 10 <sup>-15</sup>
O2	51 * 10 <sup>-15</sup>	780 * 10 <sup>-15</sup>	2300 * 10 <sup>-15</sup>	35 * 10 <sup>-15</sup>
N2	3.6 * 10 <sup>-15</sup>	230 * 10 <sup>-15</sup>	640 * 10 <sup>-15</sup>	8.7 * 10 <sup>-15</sup>
H2	640 * 10 <sup>-15</sup>	1900 * 10 <sup>-15</sup>	7600 * 10 <sup>-15</sup>	1300 * 10 <sup>-15</sup>
CO2	200 * 10 <sup>-12</sup>	6800 * 10 <sup>-12</sup>	18000 * 10 <sup>-12</sup>	240 * 10 <sup>-12</sup>
O2	72 * 10 <sup>-12</sup>	1100 * 10 <sup>-12</sup>	3200 * 10 <sup>-12</sup>	49 * 10 <sup>-12</sup>
N2	4.4 * 10 <sup>-12</sup>	280 * 10 <sup>-12</sup>	790 * 10 <sup>-12</sup>	11 * 10 <sup>-12</sup>
H2	57 * 10 <sup>-12</sup>	170 * 10 <sup>-12</sup>	680 * 10 <sup>-12</sup>	120 * 10 <sup>-12</sup>

# Care About The Environment

We also strive to care about the natural environment by eliminating from the production process furnaces, presses or other equipment that may have adverse effects on it. Furthermore, thanks to the low weight of our products, the costs of transport can be lowered, thus, reducing the consumption of non-renewable sources of energy.

## Technical Differences Between Type 3 & Type 4 Composite Cylinders

The main difference between type 3 and type 4 cylinder is the material of liner. Type 3 have aluminum liner and Type 4 have plastic liner. SAFER cylinders have PET liner.

Generally there is chemical reaction between stored gas and the liner. In this way chemical compounds are formed in the middle of the tank. In SAFER cylinders there is no reaction inside the cylinder, therefore storage gas is pure all the time.

Further Type 4 cylinders have high resistance to gas temperature changes. At high temperature, the firefighter has all the time gas inside the cylinder with the comfortable temperature for breathing.

### TECHNICAL SPECIFICATIONS

Capacity	Weight	Type of Liner	Life as per PESO
2 L	1.1 Kg	PET	20 Yrs
3 L	1.6 Kg	PET	20 Yrs
4.7 L	2.7 Kg	PET	20 Yrs
6.0 L	2.9 Kg	PET	20 Yrs
6.8 L	3.2 Kg	PET	20 Yrs
9 L	4.2 Kg	PET	20 Yrs

**Note :** These are final weights of cylinders with the caps and the last layer / finishing layer.



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PET Liner : The basis for the construction of each container



Braid layer making containers very durable.



The cover makes the cylinder resistant to damage.

