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SAFER®

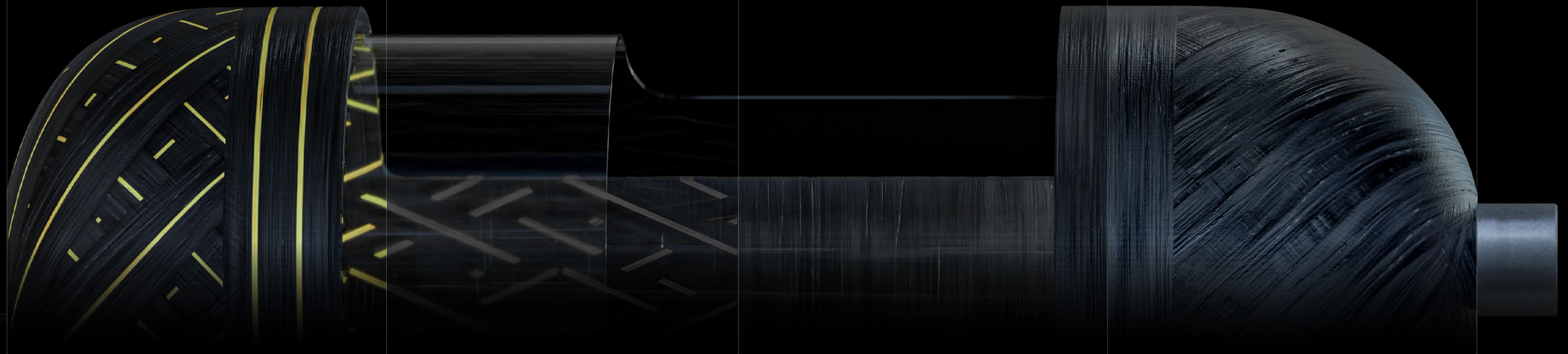
ULTRA LIGHT
COMPOSITE CYLINDERS

C/ARAMID

C/GLASS

CARBON

NANO



02_01

Company history

Techplast is the creator and owner of the brand SAFER®. The development of our own technology for the manufacturing of high-pressure cylinders was initiated in 2007 based on more than 20 years of experience and knowledge of materials engineering. The first commercial and certified high-pressure cylinders were developed in 2007 and appeared on the market in 2010, introducing a completely new standard in the field of high-pressure equipment thanks to a globally differentiated manufacturing technology, making them the lightest cylinders on the market.

SAFER®

2002

Founding of the company Techplast by Adam Saferna.

2010

Obtaining the first certificate authorizing production of the cylinder.

with a capacity of 6.8L / SAFER®

2012

Receiving of the prestigious award – DuPont™ Kevlar® Innovation Award 2012 for the innovative application of Kevlar fibers.

2016

Development of infrastructure for larger cylinders capacity 40L+.

02_02

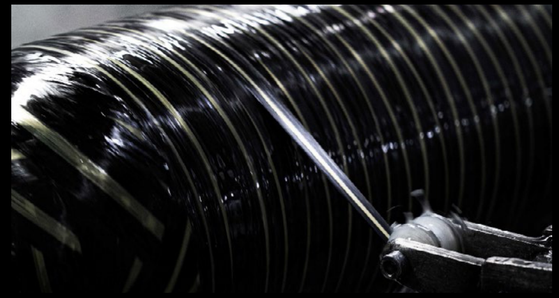
Technological development

The SAFER® brand has for many years been associated with the production of high-pressure composite cylinders.

This is evidenced both by the range of products offered, as well as participation in research and development projects aimed at the diversification and technological development of the products on offer. The entire range of products currently manufactured by the company is the result of research carried out by our in-house research unit.

Based on its own patents and know-how, the company implements the production of cylinders used for a wide range of applications.

The products are innovative due to their unique design and high technological advancement. The innovativeness of the products is based on combining the best features of individual components used in the cylinders into a unique whole.



2017

Research and development on nanotechnology.

2019

Receiving the prestigious NAUM World award 2019 for the pioneering application of nano – technology in the production of composite cylinders.

2020

Obtaining of the first certificate authorising for the production of the 6.8L cylinder with nanotechnology.

Commencing construction of new premises with production facility.

03_01

Kevlar® Award

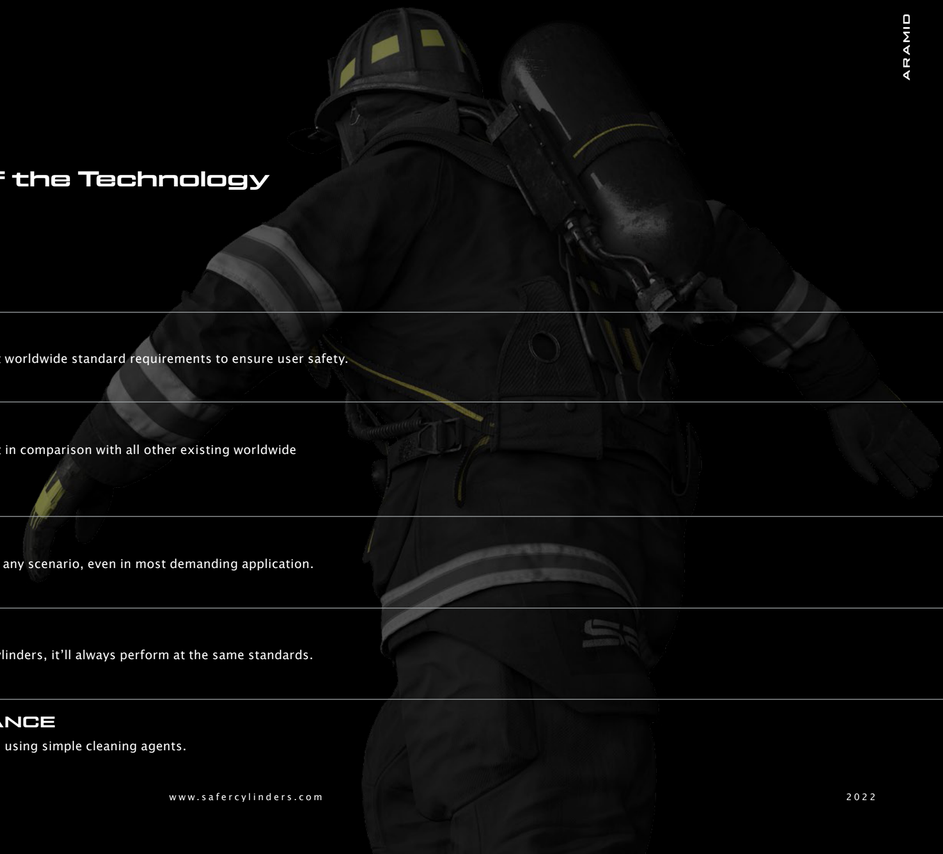
In 2012, the company was honoured by one of the world's largest chemical concerns, DuPont™, with the Kevlar® Innovation Award 2012,

for the innovative use of aramid fibre in the production of ultralight composite cylinders. The winner was selected by a prestigious panel of experts from the University of Reutlingen in Germany, Jane's International Defence Review magazine and a representative from DuPont™ Protection Technologies.

® DuPont and Kevlar are trademarks or registered trademarks of E.I. du Pont de Nemours and Companyused under license to Techplast Sp. z o.o.

03_02

Advantages of the Technology



1. SAFETY
All of our cylinders are designed to meet worldwide standard requirements to ensure user safety.

2. LIGHTNESS
SAFER cylinders are distinguishably light in comparison with all other existing worldwide compressed air storage solutions.

3. RELIABILITY
There's no excuse for cylinder failure in any scenario, even in most demanding application.

4. NON-LIMITED LIFE
No matter how long you are using our cylinders, it'll always perform at the same standards.

5. SIMPLE MAINTENANCE
Cleaning of cylinders is a simple process using simple cleaning agents.

01.

RESISTANCE
TO CORROSION

02.

VERY LOW GAS
PERMEABILITY

03

PURE GAS, PET DOES NOT
REACT WITH STORED GAS

04

EASE OF
MAINTANANCE

04_01

Polymer liner technology

Extremely thin polymer liner made of high quality materials, features high barrier properties, demonstrating compatibility with a wide range of storage options for various substances while maintaining their purity and complete safety for the user. Our liner manufacturing technology allows it to be used for storage of various types of gases such as air, hydrogen, carbon dioxide, nitrogen, noble gases and other technical gases used in a wide range of industries.

04_02

Cylinder construction

1. METAL MADE CYLINDER NECK

The connection neck made of aluminum is additional anodized to provide the cylinder with full corrosion resistance.

2. THIN-WALLED POLYMER LINER

Thanks to its excellent physical and chemical properties, it is ideal for the storage of a wide spectrum of substances from technical liquids to gases and other substances.

3. HIGH-PERFORMANCE FIBERS OVERWRAP IN EPOXY RESIN MATRIX

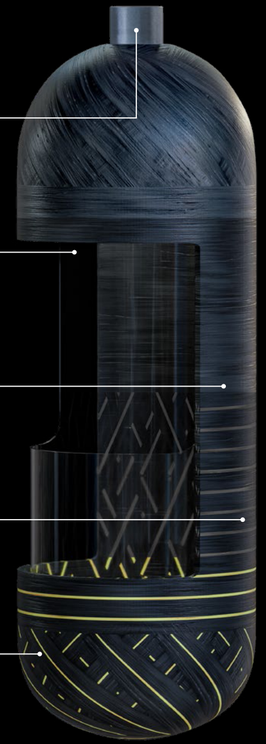
The use of the highest quality construction materials ensures user safety and unlimited lifetime of the cylinder.

4. EPOXY COLOUR LAYER

Depending on the customer's preferences, we can provide any colour of cylinder.

5. EXTERNAL LAYER MADE OF GLASSFIBER/ EPOXY MATRIX

Prevents potential damage to the label and allows for easy, convenient and fast cleaning of the cylinders surface.



Products

50 L CNG

Weight (kg)	~ 13.8
Diameter (mm)	388
Length (mm)	625
PW (bar)	250
PH (bar)	375
TS (C deg)	-40/+82

EN ISO 11439:2013 & ECE R No 110

Service life:

20 years	*
Warranty (mth)	24

80 L CNG

Weight (kg)	~ 20.4
Diameter (mm)	388
Length (mm)	870
PW (bar)	250
PH (bar)	375
TS (C deg)	-40/+82

EN ISO 11439:2013 & ECE R No 110

Service life:

20 years	*
Warranty (mth)	24

100 L CNG

Weight (kg)	~ 26.3
Diameter (mm)	388
Length (mm)	1105
PW (bar)	250
PH (bar)	375
TS (C deg)	-40/+82

EN ISO 11439:2013 & ECE R No 110

Service life:

20 years	*
Warranty (mth)	24

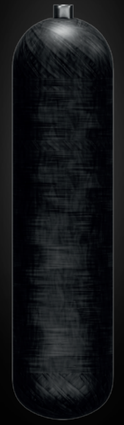
120 L CNG

Weight (kg)	~ 32.7
Diameter (mm)	388
Length (mm)	1340
PW (bar)	250
PH (bar)	375
TS (C deg)	-40/+82

EN ISO 11439:2013 & ECE R No 110

Service life:

20 years	*
Warranty (mth)	24



195 L CNG

Weight (kg)	~ 46.5
Diameter (mm)	439
Length (mm)	1670
PW (bar)	250
PH (bar)	375
TS (C deg)	-40/+82

EN ISO 11439:2013 & ECE R No 110

Service life:

20-30 years	*
Warranty (mth)	24

350 L CNG

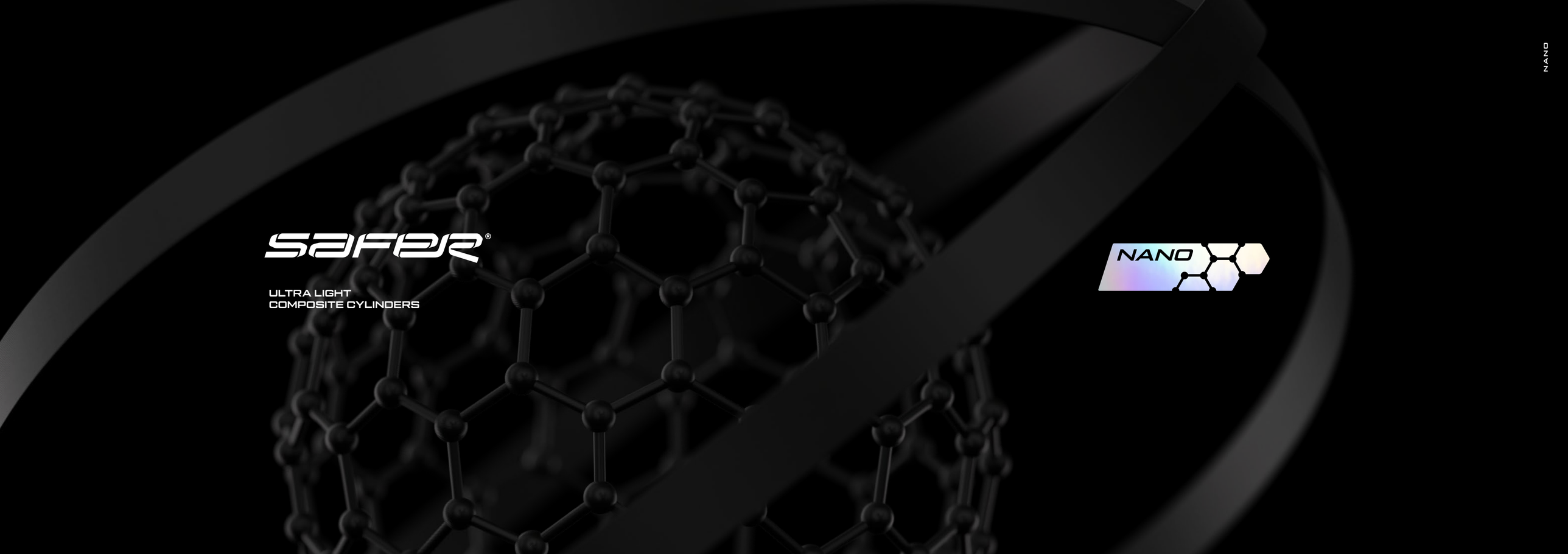
Weight (kg)	~94
Diameter (mm)	536
Length (mm)	2045
PW (bar)	250
PH (bar)	375
TS (C deg)	-40/+82

EN ISO 11439:2013 & ECE R No 110

Service life:

20-30 years	*
Warranty (mth)	24

* Weights and dimensions may vary slightly compared to the values shown in table.
The weight of the cylinder doesn't include the weight of covers and aesthetic coatings.


SAFER®
ULTRA LIGHT
COMPOSITE CYLINDERS
NANO

06_01

NANO Award

In November 2019, the company was awarded with the most innovative product „Industrial Breakthrough" at the NAUM'19 international conference in Japan. The award was global in nature.

Currently, there are no cylinders with similar characteristics in the world. The manufacturing methodology used has produced the world's lightest cylinder for breathing apparatus in the world, achieving a final weight in the range of 2.8 – 2.9 kg of 6.8L capacity cylinder, fulfilling all strength tests included in the European standard EN12245:2009+A1:2011 and ISO11119-3:2013.

06_02

Advantages of NANO

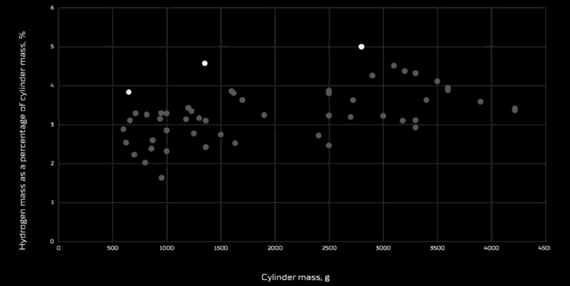
1. Weight reduction of up to 15% from type 4;
2. Patented technology;
3. World's lightest cylinders technology.

06_03

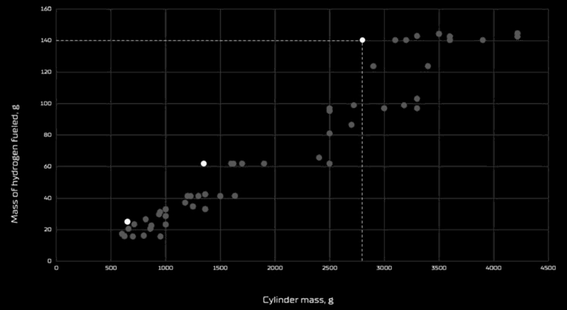
NANO Technology

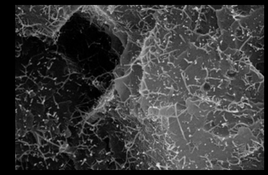
Between 2017 and 2019, Techplast's R&D department focused on developing new, ultralight composite cylinders involving nanotechnology. The innovative composite IV generation high-pressure cylinders, are made entirely of the highest quality plastics, using the latest generation of polymer materials and graphene nanotubes.

Graphene nanotubes are characterised by excellent mechanical properties. They exhibit a high value of Young's modulus, which makes them resistant to tensile and bending strength, inhibiting crack propagation in the composite, which is a fundamental problem in composite manufacturing technology. The manufacture of the cylinder's composite structure is made from the latest generation of materials, with the highest parameters available on the global market. It is a fully professional solution to the expectations of the target market and the most demanding applications.



- SAFER®
- OTHER CYLINDER MANUFACTURERS





The new generation of cylinders using nanotechnology achieves a reduction of up to 70% compared to Type I, 30% compared to Type III and 15% compared to of Type IV, making it the undisputed world leader among cylinders with a capacity range of 6.8 – 7L and an operating pressure of 300 bar.

07_01

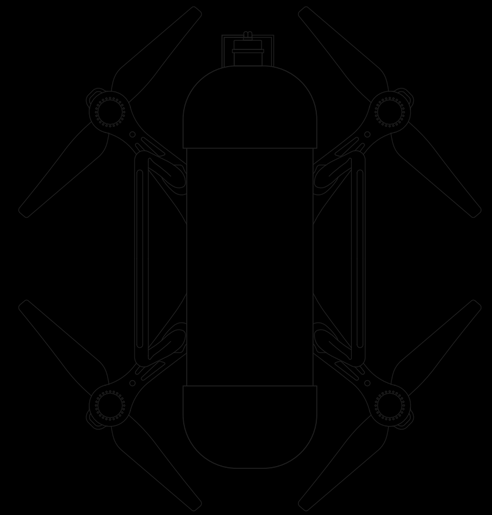
ISO 9001

Techplast has implemented a quality management system in accordance with ISO 9001 – a quality standard accepted and recognised worldwide.

The implemented quality system ensures stability and repeatability in the production processes of high pressure cylinders. All manufactured pressure cylinders are subjected to comprehensive tests under the supervision of the notified body.

07_02

Other applications



Hydrogen Drones

Paintball

Self-contained breathing apparatus (SCBA)

Self-Contained Underwater Breathing Apparatus (SCUBA diving)

Transportable gas storage

Stationary energy storage