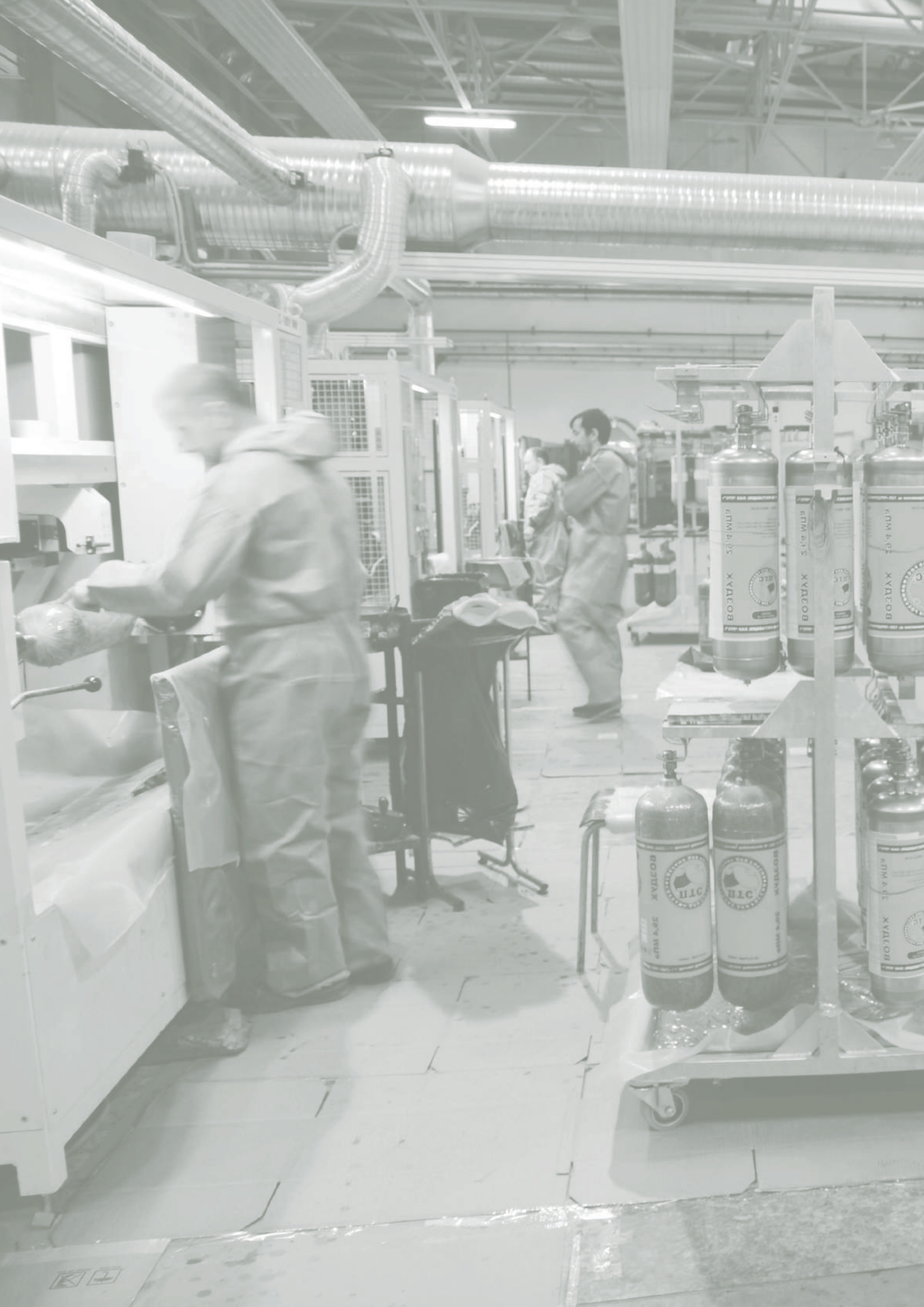




PRODUCT CATALOGUE

HIGH PRESSURE COMPOSITE CYLINDERS



About us

ARMOTECH is a company, rendering services in the field of design, development and process engineering of high quality products combining all benefits of modern composite materials and stainless steels.

Priority areas of the company's activities are:

- Engineering , development and certification of new polymer composites products designs.
- Development and modernization of technology for manufacturing of composite cylinders and vessels of new design for various applications.
- Engineering and manufacturing of special-purpose equipment for composite cylinders manufacturing.
- Implementation of production lines and plants for high-volume manufacturing of cylinders and vessels for various applications.
- Development of technology for composite materials products combined with the technology of sheet stain less steel processing for new applications.

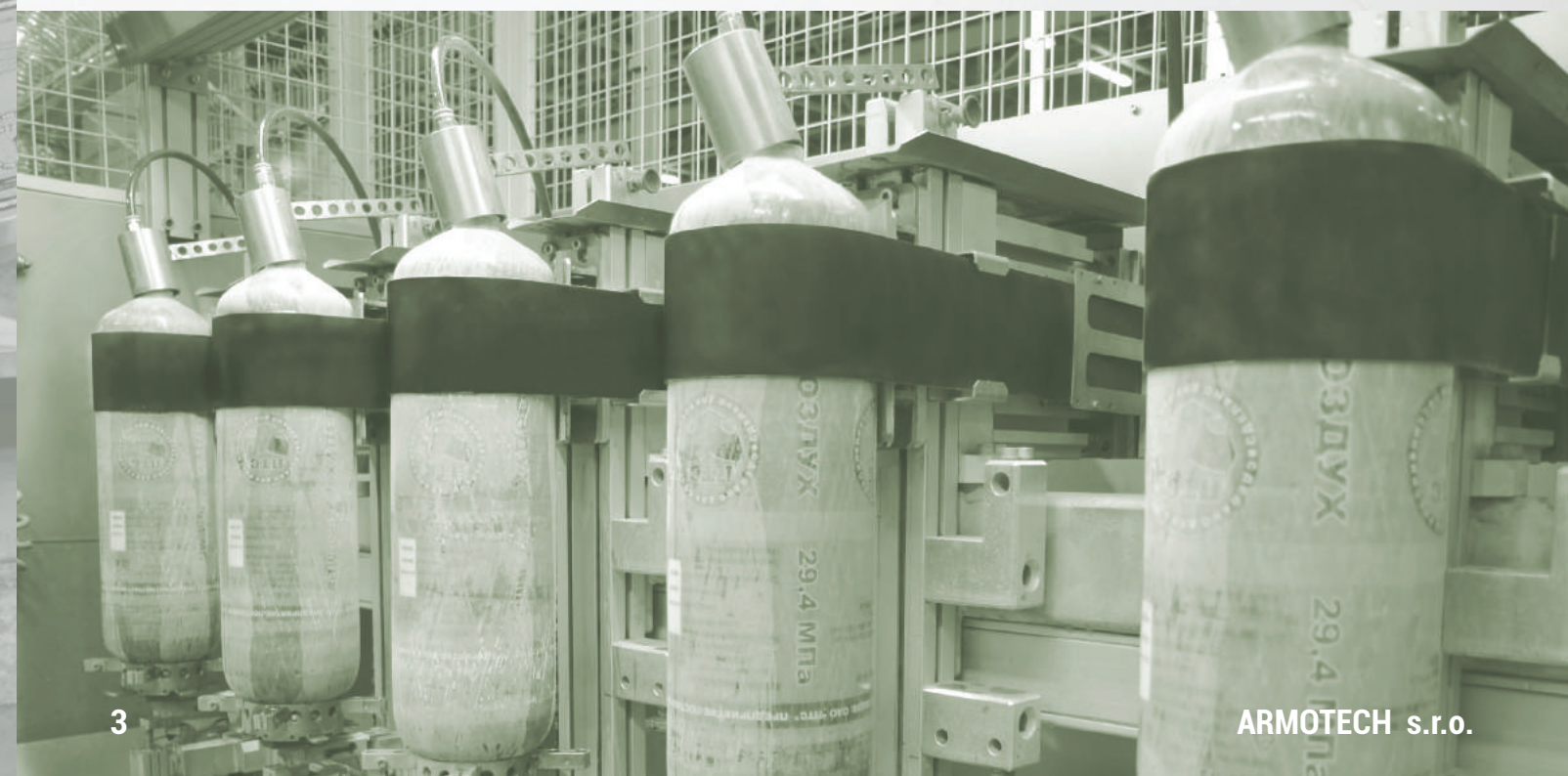
The company's team consists of experts having long-term experience and ready to focus on the tasks and problems of our clients, offering competent and efficient solutions in the composites products design and technologies. Strong partnership and personal relations between our company and a number of industries, research and educational institutions as well as scientists from the Czech Republic, Russia and other countries, help us to provide breakthrough solutions and high quality of innovative products and process equipment. Our commitment to innovation, accumulated scientific and technological capabilities and staff competence coupled with advanced computational methods, engineering and processing procedures used both for composite materials and stainless steels, allow us to implement the Higher quality at lower cost concept.

Strategy

The strategy of growth based on the large scale products diversification, market position strengthening and expansion is the concept of Armotech's development.

We put it into practice by

- Priority target-oriented programmes creation and carrying them out in order to produce composite material goods at the price of competitive products made of traditional materials.
- Sales and services market expansion, products and services competitiveness improvement as well as marketing activities enhancement.
- Effective high-tech equipment development for process lines of high-volume production.



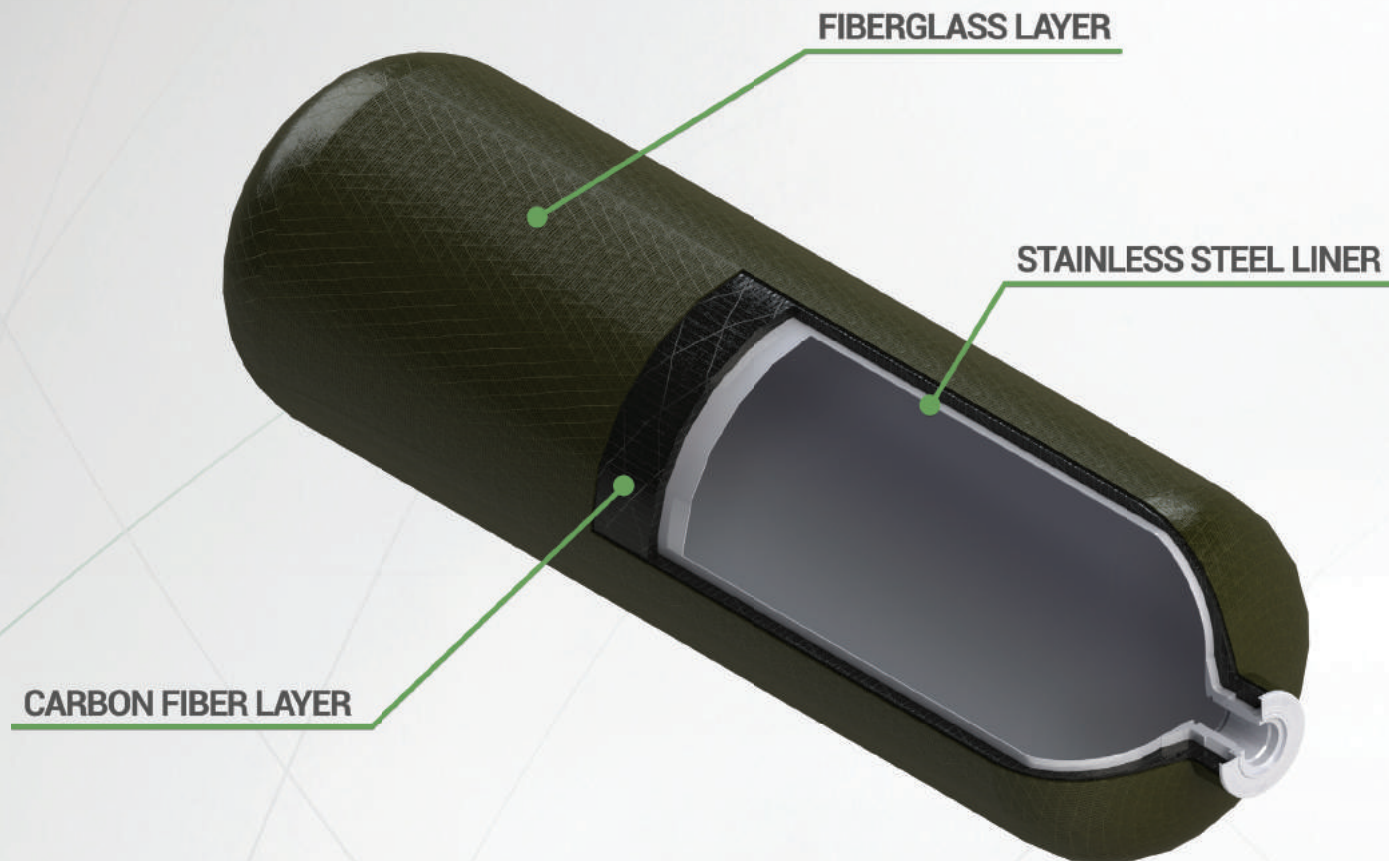
Products

Armotech produces high-pressure cylinders designed to store and transport all types of gases up to the world standards. The design concept is loss of tightness at the end of assigned life time without loss of strength. Thin stainless steel liner with high strain capacity is the main design feature which differentiates our products from the other types of composite cylinders.

Advantages:

- Minimum weight
- High and stable tightness
- Lack of corrosion when filled up with any of currently existing liquefied and compressed gases
- Safe and easy connection with any type of valve
- Safety operation
- Appearance design at customers' option
- Information integrity during the whole life time
- Filling with all types of gases as per ADR/RID classification
- Fire and explosion safety when exposed to fire and shock
- Shatterproof breakage in emergency situations
- Unlimited life span as per EN12245, EN14427 and other standards requirements
- Possibility to be recharged at any filling station.

Our products are able to meet competition of generally used counterparts due to our high-tech efficient equipment as well as new design and technology concepts applied.
Our clients are consumers across the world.



High-pressure cylinders for breathing systems

Armotech composite cylinders gained widespread acceptance in self-contained breathing apparatus and life support systems of various producers. Armotech offers a wide selection of ultra-lightweight cylinders for this application.



High-pressure cylinders for commercial gases

Armotech products are used in various applications, including welding, medical purposes, research laboratories, food and beverage manufacturing, fire protection systems and many others. Our cylinders are ideal for CO2, mixed and pure gases storage and transportation. We are able to provide for the inner surface cleanliness of all parameters required without using any additional coating.



Aerospace

Armotech offers lightweight cylinders which are the critical components of sophisticated compressed air systems applied in marine vessels and aircrafts, transport vehicles, aerospace engineering and special-purpose machinery. Armotech experts develop, test and produce lightweight cylinders of special geometrical pattern necessary to be used in each individual application. Safety, quality and reliability are the key elements of each of our products used for these applications.



Paintball cylinders

Our cylinders provide both serious professionals as well as usual players with the comfort they need to be bound to win. Having been developed and tested to guarantee the highest safety, strength and reliability standards our cylinders enable the players to concentrate on the game not on the equipment issues.



Airbags

Armotech airbag cartridges surpass all currently existing high-pressure vessels used for this application due to their low weight and small size and provide for the maximum comfort in use. At our customers' option we are able to produce the required appearance design vessels taking into account their special requirements.

Safety

Typical design features

Design concept

The concept used for cylinders designing comprises a set of engineering design principles, in particular:

- acceptably low probability of structural breakup without previous leakage
- predictable resistance of liner structure material to cracking
- feedback providing for termination of the product use in case of through thickness crack leakage

Basic design arrangement

The cylinder basic design arrangement comprises a welded thin liner made of yielding stainless steel and composite overwrap which covers the whole surface of the liner. Use of corrosion-resistant stainless steel types 304, 304L 316, 316L and so on permits the use of cylinders to store and transport all types of gases and media as per ADR/RID classification.

Standart types of product testing:

- Limit-load test to evaluate true margins of safety.
- Cyclic loading test (at test pressure Ph) to evaluate the period of safe operation.
- Cyclic temperatures test (-60 to +70°C) to evaluate safe operating temperature range.
- Long term sustained load tests (at internal test pressure Ph) at maximum temperature (+80°C).
- Drop test in working conditions from different heights in several versions.
- Test of composite overwrap surface local damage impact on safe operation of the device.
- High-speed impact test with a given energy (gunfire test).
- Test of the cylinder behaviour under fire loading.
- Cyclic pneumatic pressure loading test to evaluate the maximum (minimum) filling levels.
- Permeation test to determine leak tolerance of the gases stored.
- Test of environment impact on safety operation in a specified time interval.

Quality policy

We regard our products quality as the decisive factor in our market development and the main prerequisite of our current level upgrading and further development. The main objective of the company's activity is to provide the goods and services which to the maximum extent possible correspond to the regulatory documents and contractual requirements in order to satisfy the expectations of our clients.

The company's quality policy is pursued by the following:

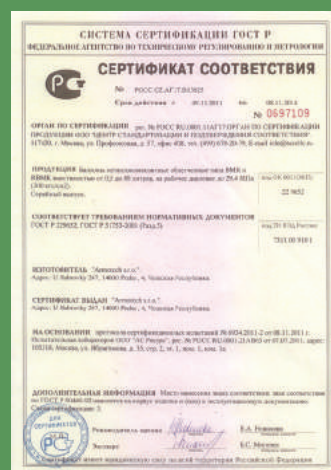
- Implementation of quality management system in terms of ISO-9000 international family of standards and its certification;
- Systematic study of clients' needs dynamics and global trends in safety promotion as well as taking proactive measures to prepare the company to meet the above-mentioned challenges;
- Prevention of possible issues not only stating them and sorting out after detection;
- Strict compliance and constant improvement of production technology, control and testing procedures;
- Enlargement of network and quality improvement of warranty and maintenance service;
- Constant professional training of the company's employees;
- Striving to hard-line quality policy in terms of produces goods.

Our main priorities are safety and quality. We provide for low risks of our consumers by means of strict testing of each production unit to evaluate its fatigue endurance limit, lifetime, safety and stability. Due to our long-time experience in composite structures production we have a clear idea of all normative standards and regulations applicable to any of our product in the global market.

We regard the quality as the material base of production development and improvement.

We regard the quality as the conscious purpose in each employee's activities.

We regard the quality as the main strategic factor of our competitiveness and stability.



Technology

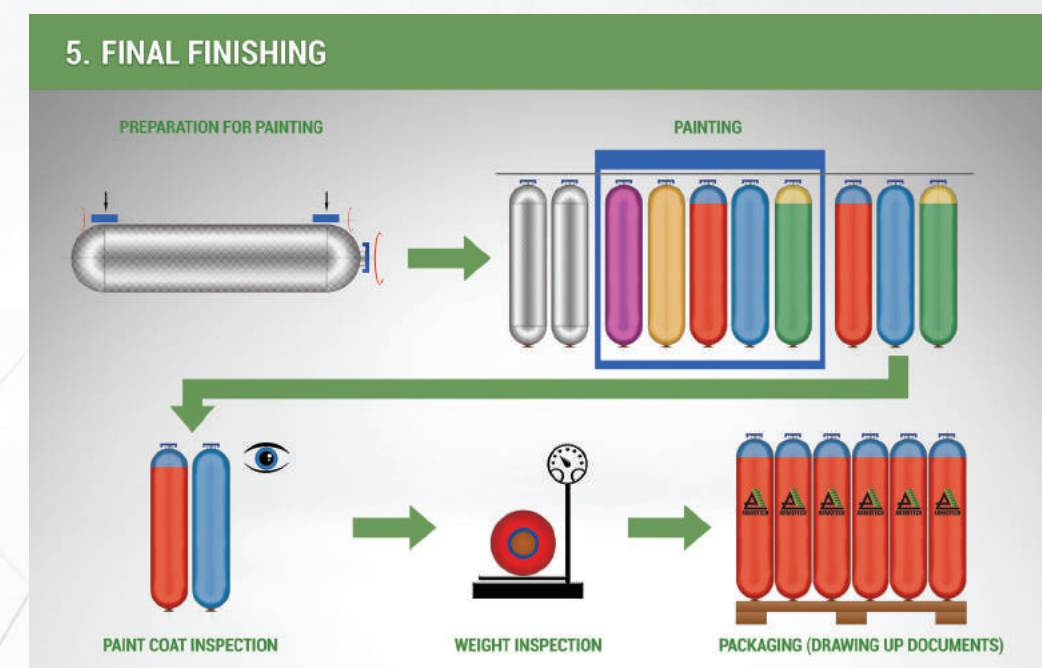
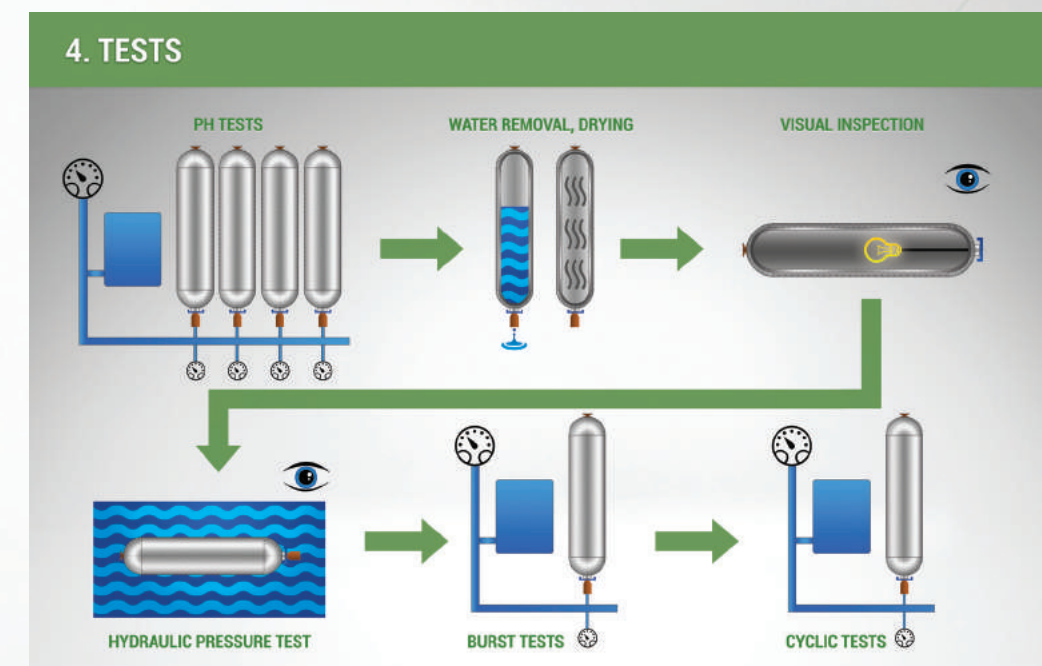
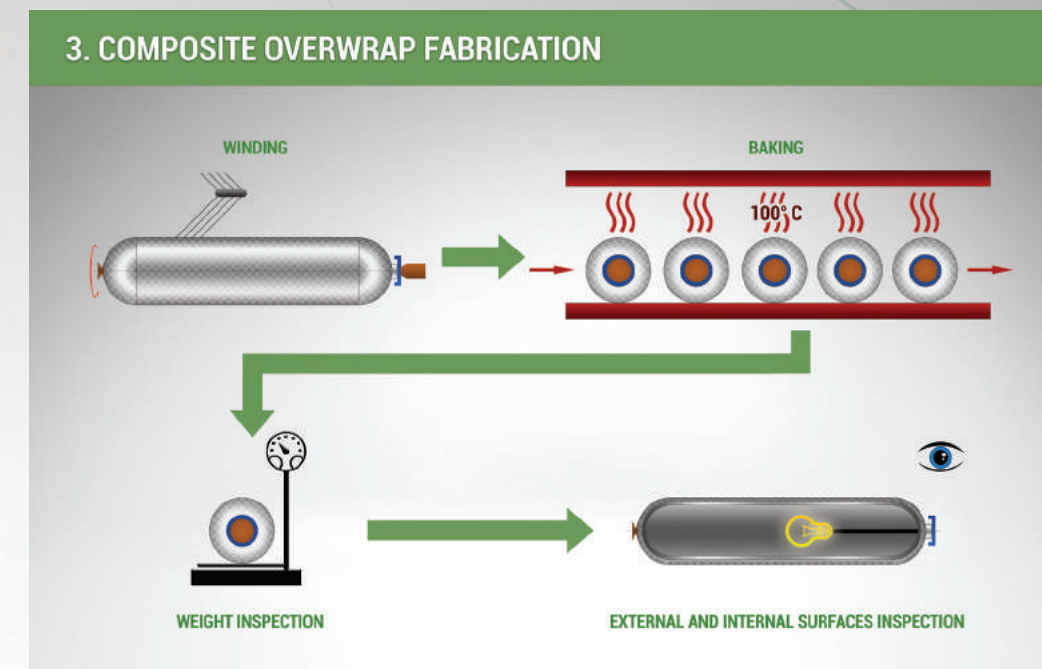
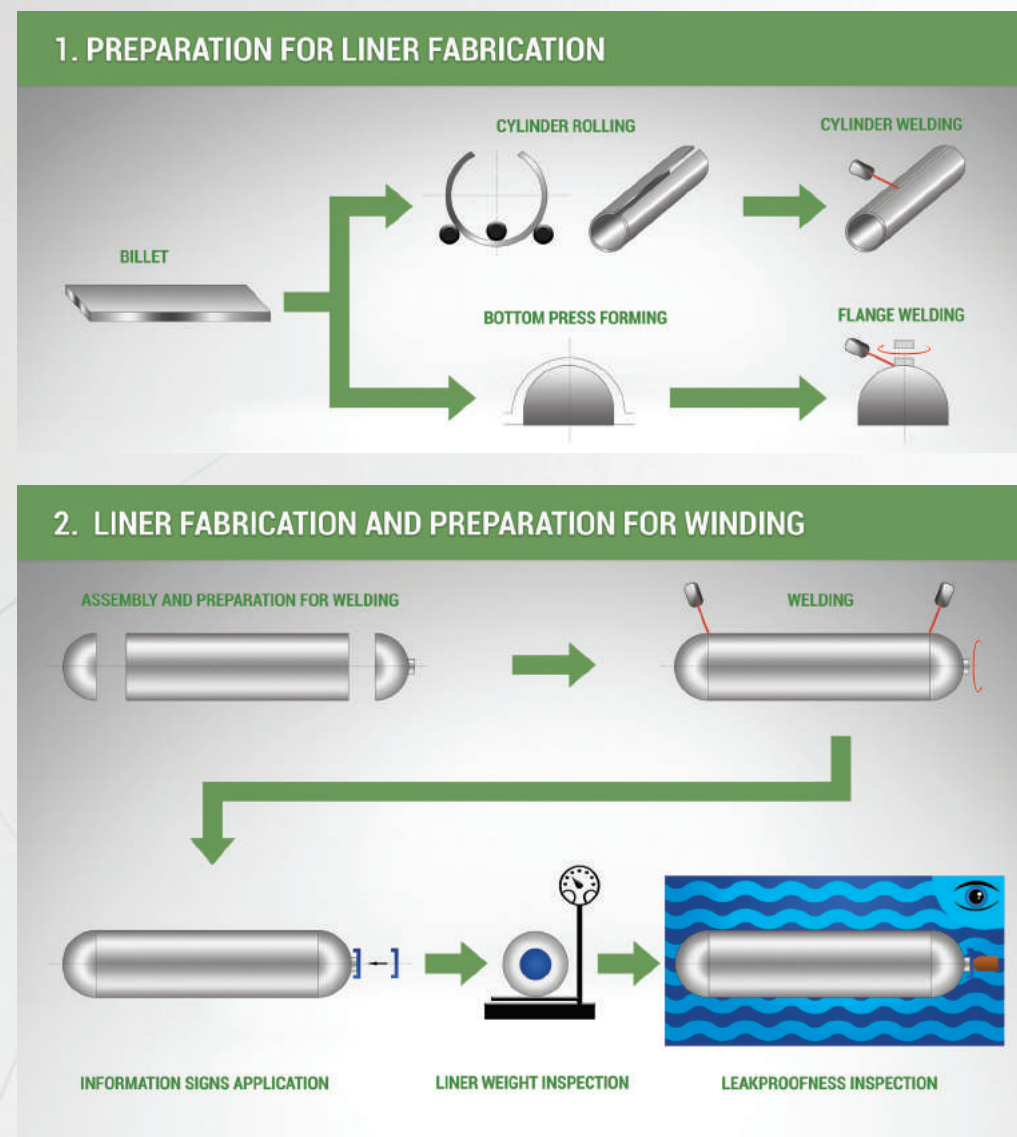
The key elements of Armotech technology are the design excellence and the special-purpose machinery used for production.

Creation of a new cylinder design using the stainless steel enabled us to:

- Make the best use of strength and physical properties of composite in the power overwrap.
- Guarantee the cylinder tightness due to the minimum liner gas permeability and its properties stability all along operation.
- Provide for simple and reliable fill neck connection.
- Guarantee optimum parameters of heat and mass exchange in the cylinder.

Engineering solutions used as the design basis provide for:

- Liner reliability operation.
- Improved efficiency compared to current equipment.
- Highest quality of the load-carrying structure of the produces goodd.
- Considerable cut of precursor loss.
- Fully automated production process.



Product range

Type	Water capacity, l	Diameter, mm	Length, mm	Weight, kg	Filling pressure, bar	Test pressure, bar	Bursting pressure, bar	Life period, years	Standard	Comment
BMK2-99-200	2	108	305	1,15	200	300	>750	15	EN 12245	b, f, g
BMK2-100-200	2	110	305	1,15	200	300	>750	15	EN 12245	a, b, f, g
BMK6,8-139-200	6,8	154	520	3,5	200	300	>750	unlimited	EN 12245	a, b, f, g
BMK2,5-125-250	2,5	134	266	1,2	250	375	>800	10	GOST R 53258	f, g
BMK0,25-45-300	0,25	50	210	0,24	300	450	>1000	15	ISO 11119-3	c
BMK1-79-300	1	87	247	0,75	300	450	>1000	20	EN 12245	c, d, e, f, g
BMK1-88-300	1	97	222	1,12	300	450	>1000	15	EN 12245	c, f, g
RBMK1-88-300	1	97	222	1	300	450	>800	12	GOST R 53258	f, g
RBMK2-88-300	2	97	390	1,15	300	450	>800	15	GOST R 53258	f, g
RBMK2,3-88-300	3	97	440	1,3	300	450	>800	15	GOST R 53258	f, g
ULC1,1-90-300	1,1	100	225	0,65	300	450	>1000	10	ISO 11119-3	c
BMK0,8-99-300	0,8	111	155	0,7	300	450	>1000	15	EN 12245	c, f, g
BMK1,1-99-300	1,1	111	195	0,8	300	450	>1000	15	EN 12246	c, f, g
BMK1,5-99-300	1,5	111	248	1,01	300	450	>1000	15	EN 12247	c, f, g
BMK2-99-300	2	111	317	1,15	300	450	>1000	15	EN 12248	c, f, g
RBMK2-99-300	2	108	318	1,15	300	450	>750	10	GOST R 53258	f, g
BMK2-100-300	2	114	308	1,65	300	450	>1000	15	EN 12245	c, f, g
BMK3-100-300	3	114	438	1,9	300	450	>1000	15	EN 12246	c, f, g
BMK4-100-300	4	114	567	2,2	300	450	>1000	15	EN 12247	c, f, g
RBMK2-100-300	2	110	302	1,1	300	450	>1000	11	GOST R 53258	f, g
RBMK3-100-300	3	110	431	1,7	300	450	>1000	11	GOST R 53258	f, g
RBMK4-100-300	4	110	559	2,2	300	450	>1000	11	GOST R 53258	f, g
BMK4-110-300	4	122	475	2,2	300	450	>1000	15	EN 12245	c, f, g
RBMK4-110-300	4	120	475	2,2	300	450	>1000	10	GOST R 53258	f, g
BMK4,7-125-300	4,7	137	438	2,4	300	450	>750	10	GOST R 53258	f, g
BMK6,8-139-300(EU)	6,8	154	520	3,55	300	450	>1000	15	EN 12245	c, f, g
BMK6-139-300(R)	6	154	467	3,3	300	450	>1000	15	GOST R 53258	f, g
BMK6,8-139-300(R)	6,8	154	520	3,55	300	450	>1000	15	GOST R 53258	f, g
BMK4-165-300	4	187	260	2,2	300	450	>1000	15	EN 12245	c, f, g
BMK8-165-300	8	187	450	4,5	300	450	>1000	15	EN 12246	c, f, g
BMK9-165-300	9	187	497	5	300	450	>1000	15	EN 12247	c, f, g
BMK10-165-300	10	187	544	5,5	300	450	>1000	15	EN 12248	c, f, g
RBMK4-165-300	4	182	260	1,8	300	450	>1000	11	GOST R 53258	f, g
RBMK8-165-300	8	182	450	3,8	300	450	>1000	11	GOST R 53259	f, g
RBMK9-165-300	9	182	497	4,2	300	450	>1000	11	GOST R 53260	f, g
RBMK10-165-300	10	182	544	4,6	300	450	>1000	11	GOST R 53261	f, g
RBMK11-165-300	11	182	591	5	300	450	>1000	11	GOST R 53262	f, g

Thread sizes available: M18x1,5; 17E(W19,8); 25E; 3/4"-16 UNF; 5/8"-18 UNF; M12x1 and other.

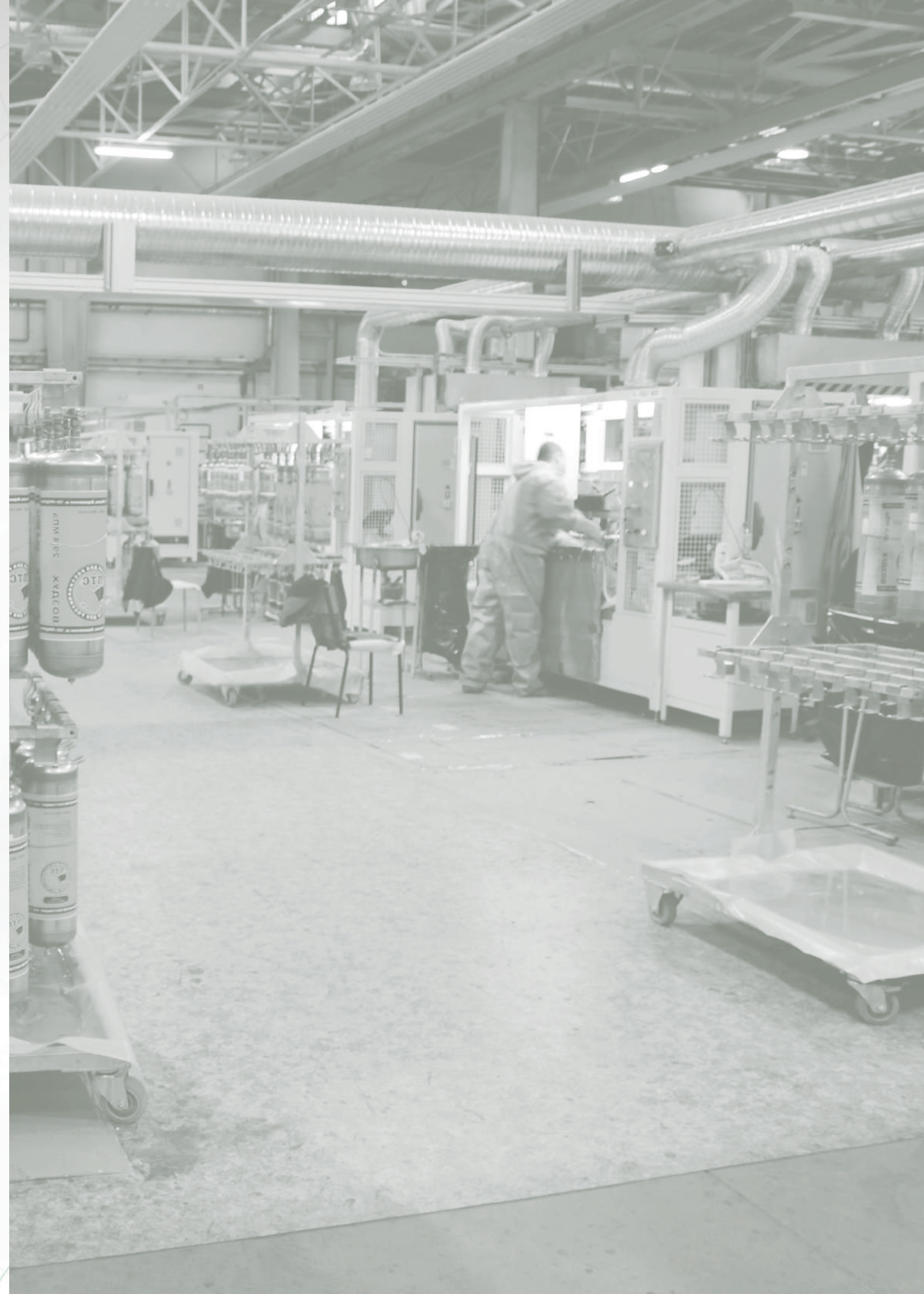
At our customers' option we are able to produce the required appearance design vessels taking into account their special requirements.

Comments:
a - Approved TPED 99/36/EC
d - Approved ADR 08/68/EC
g - Approved GOST R 51753

b - Approved PED 97/23/EC
e - Approved Directive 12/45/EU

c - Approved TPED 10/35/EU
f - Approved GOST R 229652

Notes

[illegible]

BUSINESS:

RINGHOFFEROVA 115/1, 155 21,
PRAGUE, CZECH REPUBLIC

POST:

U HABROVKY 247/11, 140 00,
PRAGUE 4, CZECH REPUBLIC

INFO@ARMOTECH.CZ
WWW.ARMOTECH.CZ