

BASIS

Expansion of **BASIS** composites production
through the issue of blockchain tokens

2017

1. Introduction

The modern construction industry is rapidly developing. A lot of companies around the world are building a huge number of residential buildings, shopping centers, industrial facilities. At the same time innovative methods of construction are not implemented as quickly as it happens, for example, in electronics or medicine. This is due to the fact that the construction industry is very traditional, new materials face disbelief, and experience has been accumulated for a long time. In addition, for each region of the world there are standards and rules that can differ significantly from the standards of other regions.

At the same time, there are new materials that are widely used by builders of one region, they help to make construction deeper and faster, but are not yet known to the majority of companies on the global market. We have developed and successfully produce one of these materials - the **BASIS** composite mesh.

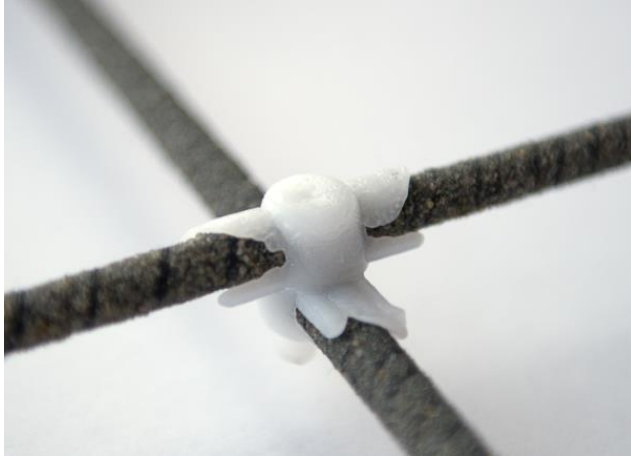
The **BASIS** composite mesh is a unique building material that appeared about a year ago and has already gained popularity among builders in Russia. The **BASIS** mesh allows speeding up construction work several times, significantly save the costs and increase the strength of the building constructions.

We are organizing a crowdfunding company to attract investments by means of blockchain tokens issue and are planning to bring our product to the world's construction markets. Due to the unique properties of the material and the low base effect, the company can grow dozens of times.

2 BASIS composite mesh

The **BASIS** composite mesh is a new building material that has no analogues and which makes construction cheaper and faster. It is rods made of fiberglass or basalt plastic compound and connected at the intersections with special thermoplastic material.

The mesh is designed to reinforce concrete instead of traditional metal reinforcing



mesh. It has significant advantages over metal:

- 9 times lighter
- 3 times stronger at break
- 25% cheaper
- Corrosion-resistant
- Significantly speeds up the reinforcement process (no need to fix at the construction site)
- No need to put bar chair spacers forming a protective layer of concrete
- Low thermal conductivity
- Dielectricity

The connection of the composite rods to the mesh is made according to the patented technology (**BASIS** composite mesh construction patent No. 156998, the design of equipment for mesh production patent No. 158113). Thermoplastic material, which joins the rods together, is also a bar chair (spacer), which forms a protective layer of concrete.

2.1 Physico-mechanical characteristics of the composite rod (in comparison with metal)

Characteristics	Metal reinforcing mesh Type A-III (A-400S) (A-III (A400C))	Fiberglass reinforcing mesh (ACII)	Basalt plastic reinforcing mesh (ABII)
Material	Steel 35GS, 25G2S, etc. (35ГC, 25Г2C)	Glass fibers Ø13-16 microns polymer connected	Basalt fibers Ø10-16 microns polymer connected
Ultimate tensile strength, MPa	360	1200	1300
Modulus of elasticity, MPa	200000	55000	71000
Percentage elongation, %	25	2,2	2,2
Endurance behavior (stress-strain relationship)	Curve line with yield plateau under load	Straight line with elastically linear dependence under load before failure	Straight line with elastically linear dependence under load before failure
Density, t/m ³	7	1,9	1,9
Aggressive medium corrosive resistance	Corrodes with the release of rust products	Stainless material of the first group of chemical resistance, including alkaline medium of the concrete.	Stainless material of the first group of chemical resistance, including alkaline medium of the concrete.
Thermal conductivity Вт/м*гр.С W/m°C	54	0,3	0,3
Electrical conduction	Electrically conductive	Dielectric	Dielectric

2.2 BASIS Mesh Performance

The BASIS composite mesh is manufactured in cards measuring 2200x6000 mm, with the possibility of producing cards of any size with a width not exceeding 2400 mm and a length of no more than 12000 mm. The standard diameters of the rod from which the mesh is made are listed in the sizes table. According to the customer's request, a grid with intermediate dimensions can be manufactured.

Sizes table

Thickness, mm	Cell size, mm	Card size, mm	Card weight, kg
4	150x150	2200x6000	6
4	200x200	2200x6000	4,5
6	150x150	2200x6000	12,4
6	200x200	2200x6000	8,5
8	150x150	2200x6000	18,5
8	200x200	2200x6000	13
10	150x150	2200x6000	34
10	200x200	2200x6000	24

On the perimeter of the cards, there are extra amounts with a standard length of 200 mm for overlapping at the junction with neighboring cards. At customer's request, overlapping parts can be increased to 400 mm or reduced to 10 mm within the width of the card (2400 mm). The binding of cards to each other is made with a binding wire, similar to the fastening of metal reinforcement to each other. The layout of the cards is determined by the project and in most cases is carried out in a "runaway".

Unloading, moving around the object and laying the mesh is performed manually, without any additional equipment.

Cutting cards can be carried out with an electric saw (grinder) by means of a stone-cutting diamond disc.

The **BASIS** composite mesh is made of materials which are environmentally friendly and do not emit harmful substances.

Composite-metal substitution table for strength

BASIS Composite	AIII Metal
4	8
6	10
8	12
10	14

2.3 Application Area

Up to now, the **BASIS** composite mesh has revealed the following limitations: low heat resistance (up to 150°C), low modulus of elasticity. Considering these limitations, we do not recommend using the **BASIS** mesh for reinforcing structures that must meet special fire requirements: building intermediate concrete slabs, bridge columns, monolithic structures pylons over 3 floors. With these exceptions it is recommended to use the **BASIS** mesh in a wide range of constructions:

- decking of bridges
- foundations
- concrete roads
- bank protection
- concrete floors
- concrete chemical storages
- reinforced concrete products
- monolith up to 3 floors
- concrete baths
- swimming pools
- fountain bowls
- squares
- wells
- sewage
- treatment facilities
- road plates
- piers
- port facilities
- foundation grills
- underground parking lots
- helipads
- concrete parking lots

2.4 A New Market Segment

In fact, the **BASIS** composite mesh opens a new market segment. Since the mesh is made of a rod with a thickness of up to 10 mm, it is suitable for reinforcing heavy structures, for example bridge decks, road slabs, and concrete floors with high loads. Traditionally, such structures use metal rods with a diameter of 10 or 12 mm. Ready-made mesh from such rods practically is not manufactured due to the fact that it turns out to be very heavy and inconvenient in installation and transportation. Therefore, builders tie a mesh of metal reinforcement directly on site, using long and back-breaking labour.



The **BASIS** mesh is not necessary to tie, it is ready for installation, which saves installation time and cuts costs.



The **BASIS** composite mesh was invented and patented in Russia in 2014 by "Composite Materials Complex" LLC and launched in production in late 2016. The summer season of 2017 showed a high demand for products, its high profitability and the need for a significant increase in production capacity to meet demand. To raise funds for the expansion of production, it was decided to issue the BASIS tokens (BSS), the circulation of which will be based on blockchain technology. The cost of the tokens will depend on company's operations results. Also, tokens will serve as markers for distributing part of the company's profits from the BASIS composite mesh sales.

2.5 Scientific novelty of the proposed solutions

In 2015, the "Composite Materials Complex" team carried out a number of research and development work in the field of supply and distribution of thermoplastic materials of various fluidity in different temperature ranges at low pressures (up to 10 MPa). The aim of the research was to study the behavior of a thermoplastic material when flowing through channels with a cross section of up to 1 mm². As a result, it was shown that the thermoplastic can be fed into channels of the required thickness under low pressure (up to 10 MPa), which does not require expensive clamping and injection equipment.

On the basis of the data obtained, a low-pressure molding method was developed using a pneumatic cylinder piston as a drive. The method is completely different from the traditional Low-Pressure Injection Molding where low pressure is achieved through proper control of the mixing screw speed and back pressure of the plastication to control the temperature profile of the melt in the injection dose, and also by accurately adjusting the injection rate and pressure.

In the developed method, plastic injection is carried out directly by the piston of the pneumatic cylinder, which greatly simplifies the feeding system. At the same time, the following problems had to be solved:

- 1) The piston must press on the column of unmelted pellets, and the height of the column should be constant, but over time the temperature of the melt warms up the body more strongly, and the melt comes up to the piston. As a result, a different amount of plastic is produced through the nozzle at the same pressure of the piston, which is inadmissible. Similarly, when the melt is strongly exiting the piston, its melt-bonding takes place, and work becomes impossible. This problem was solved by using two zones: hot and cold in the nozzle of the plastic supply as it is made in the 3D printing, and a sealed material with low thermal conductivity is established between the zones. As a result, with constant cyclic operation, the temperature balance was established, and the supply of plastic was always the same.

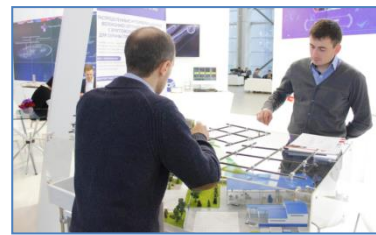
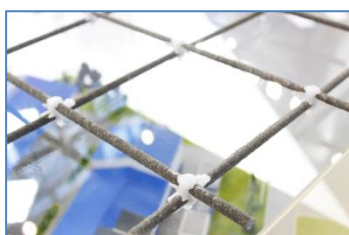
2.6 Available patents and other IPR-documents concerning the project

The "Composite Materials Complex" LLC invented and patented the **BASIS** composite mesh construction (Utility model patent No. 156998), as well as the equipment design for its production (Utility model patent No. 158113).

2.7 What is already done

Up to now (September 11, 2017) the following work has been done to implement the project:

1. In 2013, patents for the BASIS composite mesh construction were received, as well as for the equipment design for its production.
2. In 2015, the research and developmental works on the production line creation were completely accomplished. A trial facility was established where a wide range of materials for soldering the rods into the mesh was tested. Suitable materials that meet the technical characteristics of the created equipment were defined.
3. In 2016 draft design documentation for the composite mesh production machine was developed. Production area for placement of equipment and finished goods warehouse was prepared. Prototype models of different sizes were made. A series of tests using prototypes were performed: on the strength of the rods connection, on resistance to transportation, on easy loading and unloading, on temperature resistance.
4. In 2017 the first production line of the BASIS composite mesh with capacity up to 400 sqm per shift was assembled and its debugging began. It took part in several exhibitions where the BASIS technology was presented: "Russia-Belarus Expo", "Open innovation", "OSM-2016", "MosBuild".



5. In March 2017 the first batch of the BASIS composite mesh was manufactured.
6. In September 2017 more than 40 000 sq. m of the BASIS composite mesh were produced and sold. The equipment operates seven days a week, in July the equipment was working daily around the clock. The main consumers are oil refineries, newly built shopping malls, logistics centers, and industrial enterprises.

There are such well-known companies as JSC "RZD", JSC "LUKOIL", OJSC "Rosneft" among our customers.



2.8 What is to be done

Due to the high demand for our products and lack of competition, in 2018 the company plans to increase 3-5 times the **BASIS** composite mesh production capacity depending on the amount of funds raised and to expand the range of products as well. In addition, it plans to broaden the sales area, both within Russia and abroad. In 2017, delivery of products to Poland, Kazakhstan and Ukraine was carried out in addition to the internal Russian market. The CIS countries, Eastern Europe and the countries of South-East Asia are considered to be the most promising markets for future sales.

Due to the high profitability of the BASIS composite mesh production and the complete lack of competition, as well as easy scalability, the company plans to establish similar productions in different regions of the world. In 2019 seems to be possible to set new plants in such countries as Poland, Latvia, Czech Republic, Kazakhstan. In 2020 in Singapore and South Korea.

Given the above, the plans for the coming year are as follows:

1. December 2017 – attraction of investments by means of Basis (BSS) token issue, the beginning of the equipment assembly. Depending on the amount of funds raised from one to three production lines for the BASIS composite mesh production will be assembled and commissioned.
2. January-April 2018 – active participation in construction exhibitions and fairs, hiring of new sales managers, new sales offices openings in Moscow and Krasnodar.
3. May 2018 – active production, sales and commissioning of equipment
4. 2019 – active promotion of the **BASIS** technology in Eastern Europe and Asia.
5. 2020 –The **BASIS** technology promotion in North America.

3. Basis token (BSS)

The blockchain tokens issue is the most modern and advanced method of interaction between an investor and a goods manufacturer. We issue BASIS tokens to attract investments, to increase production capacity, as well as to market and promote our products.

3.1 Distributed Profit Fund

The tokens will be issued by "Fund for Investing in BASIS Technology" LLC. The issuer assumes that it attracts funds of private and institutional investors and acts for their benefit. For this purpose "Fund for Investing in BASIS Technology" LLC will enter into a loan agreement with the manufacturer - Composite Materials Complex LLC, under which the manufacturer will pay to the issuer at least 50% of its quarterly profit. The issuer will quarterly convert the received funds into Ethereum cryptocurrency and allocate in equal shares among all Basis token holders. The distributed profit fund will be allocated at least quarterly. It is to be established and allocated for investors' benefit.

3.2 Repurchase

Composite Materials Complex LLC as a goods manufacturer can repurchase the Bss tokens. The tokens repurchase will be carried out on the public address so that investors were aware of the amounts and quantities of tokens repurchased by the manufacturer. The publication of the manufacturer public address, as well as the issuer public address will be made within one month after the completion of the ICO.

4. Legal grounds

The holder of the **BASIS** composite mesh patent, as well as its manufacturer is a legal entity registered in Russia in 2012 - Composite Materials Complex LLC, TIN 1327016201.

The issuer of tokens will be "Fund for Investing in BASIS Technology" LLC.

"Composite Materials Complex" LLC undertakes to conclude an agreement with the issuer for a quarterly transfer of at least 50% of the net profit from the sale of **BASIS** composite mesh.

The issuer undertakes to establish a distributed profit fund of the money transferred from the manufacturer through the redemption of BSS tokens and to distribute it among the holders.

Not more than 7% of the funds transferred to the issuer will be spent on its operating activities.

Between "Fund for Investing in BASIS Technology" LLC and the investor who wished to remain anonymous, a public offer contract will be in effect, which can be downloaded from the official website of the project after logging in.

Between "Fund for Investing in BASIS Technology" LLC and the investor wishing to open the data, a separate agreement can be concluded, in which all the rights and obligations of the parties will be indicated.

Composite Materials Complex LLC as a manufacturer undertakes to promote the products, as well to conduct active information policy. At least once a month, it undertakes to report on its website and social media pages the results of the work done, agreements with large buyers, as well as other materials that can positively affect the value of the BSS tokens.

Once a quarter Composite Materials Complex LLC undertakes to publish a profit and loss statement, as well as to announce the amount to be transferred to the issuer under the agreement. In addition, at least once a quarter the manufacturer undertakes to disclose plans for the redemption of BSS tokens to its public account in accordance with p. 3.2.

5. Conclusion

Composite materials are increasingly used in the construction industry every year. Today its share in the market is not more than 2%, but it increases with enormous speed. This growth is due to the unique properties of composites - low weight, high strength, corrosion resistance.

Not many years will pass by when the world sees incredible constructions worthy of the pen of the most courageous science fiction writer. Maybe it will be a floating city drifting between the continents, or a flying citadel floating endlessly in the clouds, but in any case these buildings will be made of composite materials. **BASIS** composites are still far from such incarnations, but we know that big dreams begin with small cases.