ARMOR CERAMICS

# Armor Ceramics: A Transparent Business

## Whitepaper

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# Introduction

Ukraine has one of the 5 largest reserves of iron ore in the world. It is also one of the top 10 metal producers globally, and one of the world's largest cement producers. As such, Ukraine possesses vast supplies of the raw inputs needed to create industrial refractory materials. The above-mentioned facts form a great demand for refractory[1] products. Unfortunately, Ukraine does not produce a quantity and quality of refractory products proportional to its potential as a raw material. Despite the opportunity for local production, 30% of refractory materials in general and 60% of refractory ceramics are imported, along with 20% of all molded products.

The demand for local substitutes to import products is very high due to the high cost of imported products.

The majority of refractory material consumers strive to substitute imports, since using products manufactured locally in Ukraine would allow:

- to reduce the cost,
- to eliminate foreign exchange risks,
- to streamline working capital thanks to short-haul delivery
- to encourage just in time manufacturing and shorter lead times.

Armor Ceramics aims at creating an innovative industrial enterprise, which is capable of replacing imports in the relevant market segment.

High-tech refractories (refractory ceramics, concrete) are very sensitive to the quality of the raw materials and production technologies employed. Some materials are seasonal. It is critically important for the consumer to obtain reliable and timely information on the parameters and tolerances of products, including physical and chemical properties. Armor Ceramics strives to develop SupChain, a distributed storage and information access system based on blockchain technology aimed at the needs of the industrial sector.

Absolutely transparent in terms of quality and technology, Armor Ceramics aims at providing consumers with high-tech products manufactured in Ukraine.

[1]Refractories are materials characterized by the ability to maintain integrity when exposed to high temperatures. They are used as protective shells in technological processes like firing, melting, and calcining. They are mainly used in the metallurgical market, as well as in mining, foundry, ceramic, cement, food industries, etc.

# Armor Ceramics. High-Tech Production And Digital Technologies

**Armor Ceramics is an innovative industrial enterprise, which is aimed at replacing imported products in the molded and unmolded refractory material market of Ukraine.**

## Overview of the Refractory Market

As of today the market of refractory materials in Ukraine is as follows:

Total market:

- 1.5 mln tons
- 450 thousand tons imported

Molded products:

- 650 thousand tons
- 125 thousand tons imported.

Refractory ceramics:

- 25 thousand tons
- 15 thousand tons imported.

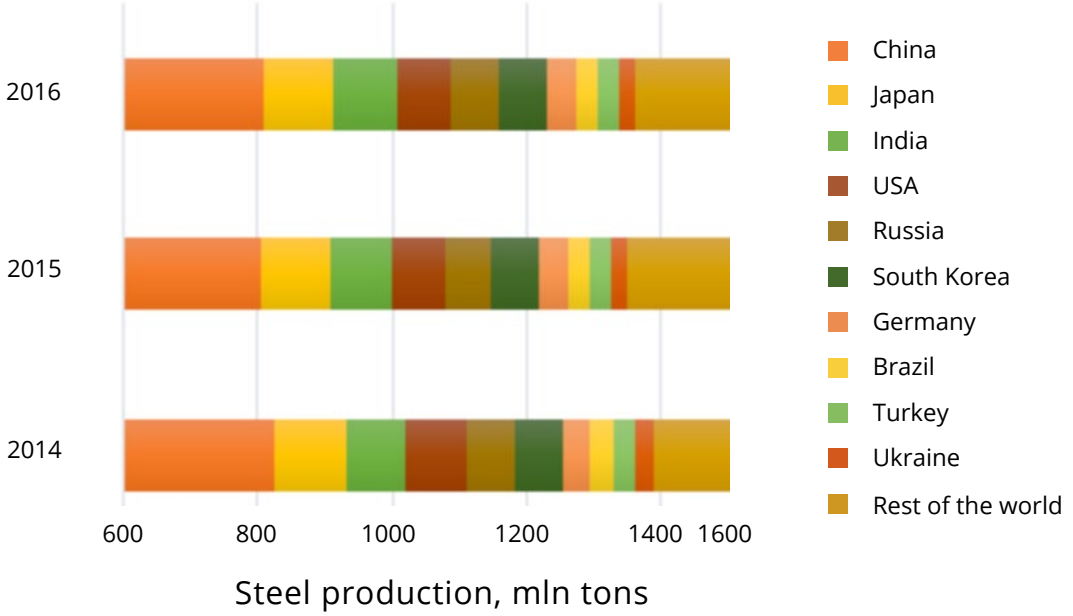
According to statistics for the Q3-4 2016, Ukraine is among the world's top 10 steel producers. The following factors determine Ukraine's strong position in this market:

- Favorable location: Better access to the European market comparing to China
- Easy and duty free trade with Europe
- Cheap energy resources and labor

[2]Molded refractories are products that have a finite shape (bricks, blocks, pipes, lids, glasses, tuyeres, etc.).

[3]Unmolded refractories include loose materials, mixtures, concretes, etc.

- Raw materials for the production of cast iron, metal, steel, and refractories
- A closed production cycle in metallurgy (ore-iron-metal-steel-rolling-finished product). At each stage, different kinds of refractories are used.




The favorable geographical location, the large number of metallurgical enterprises and modern methods of cast iron and steel production make Ukraine an excellent place for the construction of a refractory enterprise. Armor Ceramics will be constructed in the city of Dnepr, Ukraine, in the heart of the country's industrial region. The regional production base offers the talent, tools, and training required for such an enterprise to truly thrive.

Armor Ceramic's target core market includes:

- cast iron factories
- steel mills
- rolled products manufacturers

The company's project capacity is sufficient to cover additional industries including:

- machine-building
- foundry
- ferroalloy
- ore-dressing plants
- cement
- glass
- producers

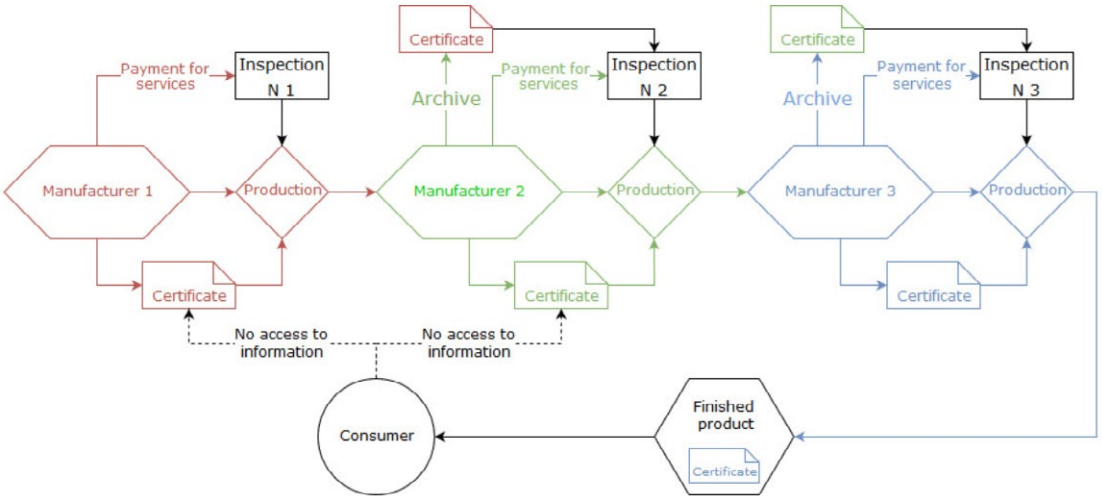
For consumers of the metallurgical industry, it is planned to obtain and supply isostatic refractories of ultra-high density: the most high-tech products, which are not currently produced in Ukraine. This will make it possible to offer affordable and flexible solutions in this market while significantly reducing expenses.

# SupChain: Production Information Storage

**SupChain is a distributed ledger technology, featuring cryptographic accounting and information access. It is an optimization of blockchain technology for the metallurgical and refractory materials sectors. Armor Ceramics is the first Ukrainian implementation of a blockchain solution in the industrial materials manufacturing sector.**

When choosing a refractory material, it is critical to have accurate and reliable information about the physical and chemical properties, the method of production, the quality of raw components, as well as the conditions and manufacturing technology. Some products have a number of usage limits (corrosive environments, seasonality, quality, water quantity requirements, different periods of material strength generation). Thus, the required information should be accessible to all consumers

**Current Scheme of Information Transfer Between Manufacturers**



Today, the manufacturing sector often fails to provide detailed information about the delivered products or the raw materials it is made from. When using the supply chain, the initial information about the product or raw materials (N-2 and N-3 on the supply chain) regularly gets lost in suppliers' archives, as the Enterprise Resource Planning software often used in these industries (Oracle, SAP) costs millions of US dollars to implement. The supplier does provide the buyer with a certificate of quality, which includes the key parameters of the product. The certificate of quality, however, does not provide data on the material properties of the product, the raw materials used, or the characteristics of its production. All these factors can greatly affect the performance of the product. To verify the reliability of this information and prove its compliance with production standards, the manufacturer (or the buyer) requests an additional independent inspection. The largest inspection companies (TUV, Bureau Veritas, Bureau Franke, IRIS, etc.) have cornered the market, and their services are very expensive. These inspections directly affect the final price of the product. However, despite the involvement of independent inspectors, the archive still usually only contains the initial information provided. When shipping a product, the manufacturer issues its own certificate of quality, including product information. The end consumer receives only the characteristics of the product provided by the last supplier and misses information from previous supply stages.

Independent inspection can serve as a guarantor of the reliability of information, and the manufacturer can trust the certificate of quality that accompanies the product. However, the use of independent inspections leads to a rise in the cost of products, while the information learned is still minimal. Besides, the end consumer still does not have data for a more detailed analysis of the purchased material.

The above-mentioned problem is exacerbated when a participant in the supply chain forms a complaint (a claim to the delivered product). In the case of a defect or breakdown of the product, the buyer does not have the tools or information necessary to investigate the cause of the malfunction. To receive information about the product, the buyer has to make an official request to several manufacturers at different stages of production. This can greatly complicate and slow down the entire process.

The solution is SupChain. By combining the reliability of blockchain technology directly into the production supply chain, the information provided is guaranteed and access can be cryptographically protected (see the block diagram "The General Algorithm for Recording Information in the Network"). Information is made available to everybody up the production chain as it is added at every step in the form in which it was added by the antecedent supplier/manufacturer. When using this system, it is absolutely impossible to distort the initially stored data, or to conceal poor-quality and improper raw materials in the production process.

No vendor will be able to hide information as goods move through the value chain. At the same time, the consumer will not have to rely on expensive independent inspections or slow and potentially inaccurate manufacturer's responses.
During the operation of SupChain, some of the main performance parameters of a refractory material or raw input - pressure, temperature, moisture - will be written directly in the blockchain. The technology allows SupChain to read digital data from the measurement equipment adding them to the smart contract without any staff involvement.

SupChain provides the manufacturer with a simple and reliable method of delivering information to the end consumer, equiping that consumer with the ability to verify if the product genuinely meets the requirements. SupChain is a Certificate of Product Origin that will be available in the public domain, where the required information is accessible to anybody.

Armor Ceramics has a full-fledged working team specialized in supporting the implementation and adaptation of the SupChain technology.

# Expert Support of Savex Minerals

**Armor Ceramics will be run by a team of Savex Minerals executives with key experience in refractories material production - www.savexminerals.com**

Savex Minerals is a long standing supplier to metallurgical and ore-dressing plants. They operate production facilities, possess a large supplier base, and long-term working contracts with key clients in the industry. Savex Minerals produces a wide range of additional technological materials for metallurgy, casting, and glass production.

As an experienced market player, Savex Minerals will support Armor Ceramic to manage the timeframe for new product development, market introduction, and implementation, bolstering return on investments.

Starting from the first stage (see the Road Map), Savex Minerals will cover a significant portion of expenses, and will provide territory for equipment, as well as a qualified staff and technical support. The participation of Savex Minerals is as follows:

| | | | |
|---|---|---|---|
| Savex Minerals provides experienced knowledge, suppliers and customers, as well as points of entry | The first stage of investment in the production and support equipment. The company Savex Minerals takes over everything aside from equipment installation. | The second stage of investment in production and support equipment. Everything else will be fully supported by the Savex Minerals. | The third stage of investment in manufacturing equipment. Territory. Expansion of the team of specialists, trainings. Expansion into new markets. |

# Swot-Analysis of the Project

The symbiosis of production and digital technologies will make it possible to:

- Minimize investment risks thanks to the fact that investments will be capitalized in the production enterprise and its assets.
- Get an opportunity to apply blockchain technology in advanced manufacturing.
- Receive dividends from the income of Armor Ceramics.
- Allow SupChain to establish itself as a leader in supply chain distributed ledgers.

**Swot-Analysis of the Project Armor Ceramics**

| Strengths | Weaknesses |
|---|---|
| Support from Savex Minerals.<br>Rapid construction and development of new products.Quick access to the market. Competitive price offer. | Long construction process - 12 months<br>Long turnaround for initial investor dividends - 22 months |
| Provide guarantees to investors during the technology implementation phase.<br>Strategic support in technology development from business leaders. The ability to create return on investments at any stage of implementation.<br>Attracting additional investments from the revenues of Armor Ceramics. | Increased implementation timeframe.<br>Physical complexity of the project. |
| **Opportunities** | **Threats** |

The Savex Minerals team has decided to conduct ICO of Armor Ceramics, enabling anybody to join in the Armor Ceramics project. This high-tech enterprise uses an innovative infrastructure with the use of a blockchain system as a transparent system of tracking material properties and tolerances.

# The Structure of ICO

**In the course of ICO, Armor Ceramics is raising funds for technology and infrastructure development, including tracking and information access system SupChain.**

**Name of the Token: ACR**

ACR is the Armor Ceramics token based on Ethereum, which grants the right to participate in the company's profits. All the holders of tokens have the right to receive dividends in accordance with their shares.

Starting from the 22nd month of work, 100% of Armor Ceramics' profit will be distributed monthly among all the tokens sold at ICO. After the return on investments on production asset is realized, current estimates place this at 37 months from inception, Armor Ceramics will pay out 50% of the capital used in the production asset ($1.3 million) to all investor tokens in the form of an interest for the use of investments (see business plan below).

Starting from the 38th month of work, after making all the above-mentioned payments, the company will adopt a quarterly dividend policy. However, the token does not give anybody the right to vote in the company's management.

**Issuer: Armor Ceramics, Cyprus.**

**Payment procedure:** Payments are made starting from the 22nd month, when the company already has a positive cash flow (see the business plan).
Number of tokens: 40,000,000. Everything left after the sale and distribution between the token holders will be destroyed. All the tokens sold will be equal to 50% of the company's profits.
The number of tokens distributed among other participants will be calculated according to the above-mentioned indicator.

**Initial value of one ACR: $1.**

**Distribution of tokens:**
Investors – 50%
Co-founders and core team – 36% (A lock-up period of 36 months)
Advisers and contributors – 10%
Bounty and others – up to 4%

**Bonuses:**

pre-ICO – 35%, 150 000 ACR, 2 weeks. Together with the investment amount of more than $20,000, an additional bonus (in the form of 10% above the main amount) is paid to investors.

1st hour of ICO - 20%

week 1 - 15%

week 2 - 10%

week 3 - 5%

week 4 - 0%

# Choice of Jurisdiction

**Jurisdiction for the incorporation of the company is the Marshall Islands.**

The choice of this jurisdiction was made due to the following reasons:

- The legislation of the Marshall Islands permits the issue of bearer shares.
- There is no requirement for the order and method of keeping the register of company shareholders (it is allowed in any acceptable form).
- This is a jurisdiction with zero taxes.

A bearer share is an equity share, the holder of which is a full-fledged shareholder of the company. At the same time, the shareholder's data is not indicated in the certificate, and the ownership of the shares to bearer is approved by the certificate: to establish ownership of the share, it is sufficient to present it. According to the legal regulations, there is no obligation to investigate under what circumstances this specific share was transferred to the new owner.

The Marshall Islands is perhaps the only jurisdiction that legally authorises the issuance of bearer shares expressed in the form of ACR tokens, and allows keeping records of related transactions using Ethereum network smart contract.

This will ensure the legally significant management of the shareholder register in the Ethereum network smart contract, where all changes of ownership of the company shares will be recorded. Such principles and methods of keeping the shareholders register will be reflected in the company's constitutional documents, which guarantees the legal protection of shareholders who purchased Ethereum-based Armor Ceramics token.

# The Road Map of Armor Ceramics

Six stages of development have been planned for Armor Ceramics. The first three stages directly concern the creation of a refractory materials plant, while the following three stages are devoted to the development of the SupChain system:

(S1) Organization of manufacturing unmolded refractory products (dry concrete mixtures for the production of the monolithic lining of metallurgical aggregates).

(S2) Organization of manufacturing molded refractory products by the method of vibro-casting (various molded ceramic products for installation in linking areas of different zones of thermal units).

(S3) Organization of manufacturing ultra-dense molded refractory products made by isostatic pressing technology.

**Table 1. Calculations for the Production Stages of the Project**

| Investment stage | Investment amount, thousand dollars | Cost of finished products, $/ton | Planned sales, ton/month | Margin, $/ton | Gross margin, $/month |
|---|---|---|---|---|---|
| First, S1 | 525 | 1,000 | 200 | 300 | 60,000 |
| Second, S2 | 1,075 | 3,000 | 100 | 1,000 | 100,000 |
| Third, S3 | 1,000 | 5,000 | 50 | 2,000 | 100,000 |
| Total investment in production | 2,600 | | 350 | | 260,000 |

Terms for manufacturing the finished products are 30 calendar days.

The average delay in payment for the delivered products is 60 calendar days.

**Table 2. Terms of Project Implementation**

| Investment stage | Starting the stage a month after ICO | Terms for manufacturing equipment, month | Installation and commissioning, month | Terms for achieving planned sales of products, month | Terms for reaching project targets, month |
|---|---|---|---|---|---|
| First, S1 | 0 | 4 | 1 | 9 | 14 |
| Second, S2 | 1 | 6 | 1 | 8 | 16 |
| Third, S3 | 5 | 6 | 2 | 6 | 18 |
| Total investment in production | | | | Total | 18 |

After the successful completion of the production stages (S1-S3), the SupChain system will be developed, which will make it possible to maintain a distributed registry of raw materials and products:

- (S4) Development of SupChain as a centralized system.
- (S5) Implementation and testing of SupChain using Ethereum Blockchain. Connecting the suppliers and partners of Armor Ceramics to SupChain. Expansion of SupChain to the regional metallurgical market among consumers of refractory products.
- (S6) Extending the implementation of SupChain to work with any product.

# SupChain as a Universal Solution for Product Tracking

**SupChain is a system of accounting and mutual settlements between all participants of the production chain. The system is based on blockchain technology and will allow all participants of the supply chain to track the step by origin of the product throughout the supply chain and its compliance with the established quality indicators (storage conditions, composition, etc.).**

The SupChain system is designed to allow enterprises to exchange information, perform arbitrage functions, collect marketing information about clients and markets, as well as implement protection of property rights. The global result of the system expansion to all product manufacturers will enable the MANUFACTURER to work directly with the CONSUMER under profitable, flexible and reliable conditions.

## Stage 1 (S4).

## SupChain as a Centralized Application

For each technological redistribution, information is added and complemented by commercial and technical services as needed. The consumer can see all the information about the purchased product and modification history. In addition, all \information is accessible to any employee of enterprises within the supply chain. This means they can access information about a product, obtain data on the manufacturer and production of the product, leave feedback or recommendations for any manufacturer, etc. Information records are confirmed in the database by the cryptographic signature of each participant.

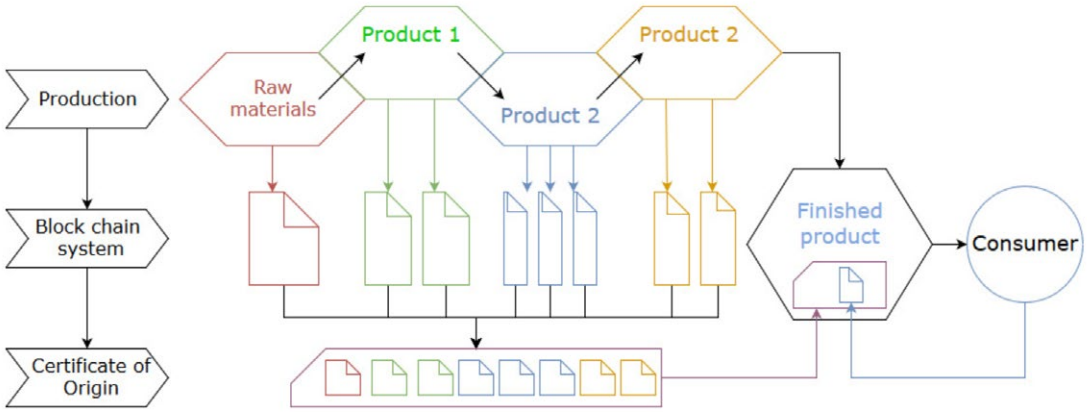
Each participant, from the supplier of materials to the consumer, has a private key to sign information regarding performed transactions. When sending material, the supplier enters the required information and signs it with their own key. The receiving participant checks the received material and uses their own key to sign the same information if they find everything appropriate. The process is repeated for all participants. Signatures are sent to a centralized application, accessible to all involved. It is absolutely impossible to forge the signatures of other members of the application.

If any member discovers a discrepancy, they can attest to the actual information received. Even if they do not, it will be possible to easily detect a discrepancy (the received material will not be correlated with the manufactured product) in retrospect. In practice, each participant will have the ability to quickly and conveniently fill out and verify information about arrivals and shipments. The format of these records will be standardized and the Signature feature will only be accessible through a physical device. To prevent unauthorized signing (key duplication), it is absolutely impossible to extract private keys from the device.

# Step 2 (S5). Implementation and Testing of SupChain with the Use of Blockchain

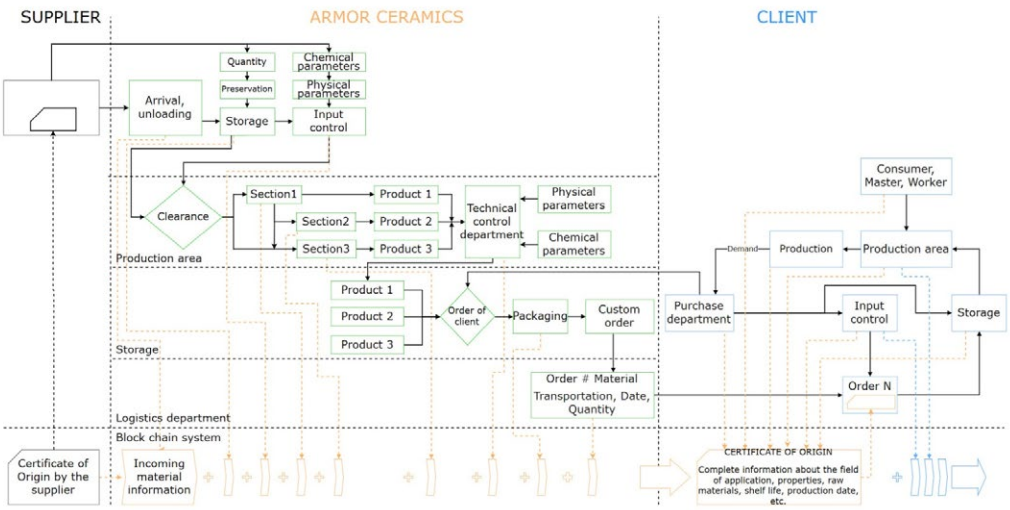
After implementing and debugging the first stage of the SupChain development, the system will be transferred to Ethereum Blockchain with the use of smart contracts. In case of similar functionality, pure data on arrivals and shipments is recorded in the IPFS blockchain system instead of the centralized system, while the signatures of participants and links to data are recorded in the Ethereum smart contract. This makes it possible to prevent data loss and makes shifting participant keys autonomous and secure.

**General Algorithm for Recording Information in the Network**



Savex Minerals and Armor Ceramics are partnered with blockchain development experts at Ambisafe. The latter are responsible for testing the beta versions of the products and adapting the system to the requirements of manufacturing businesses and the needs of the end consumers. At the moment, there is an agreement with the Interpipe - http://www.interpipe.biz/en/ - an internationally renowned manufacturer of pipe and wheel products to cooperate in the development, adjustment, and integration of SupChain in their production supply chain.

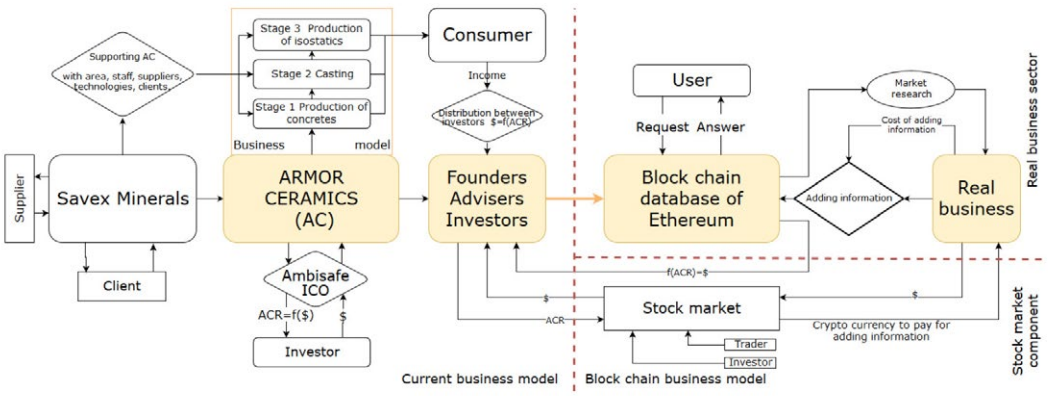
**Algorithm for Recording the Block Chain System of Armor Ceramics**




**Scheme of Armor Ceramics Operation after the Introduction of SupChain and Its Integration**

In the initial stage of developing the technology, the Ethereum platform will most likely be used to support SupChain. The possibility of eventually transferring the entire system to a separate blockchain platform is being considered in order to reduce expenses and optimize the system.

In the initial stage, architecture of SupChain will look as follows:



# Business Development Model of Armor Ceramics

**As described earlier, the Armor Ceramics project is divided into 6 stages. The first three stages concern the production capacity. The next three stages focus on the implementation of infrastructure based on the blockchain technology.**

## Calculation of Key Financial Indicators

**Conventional Symbols**

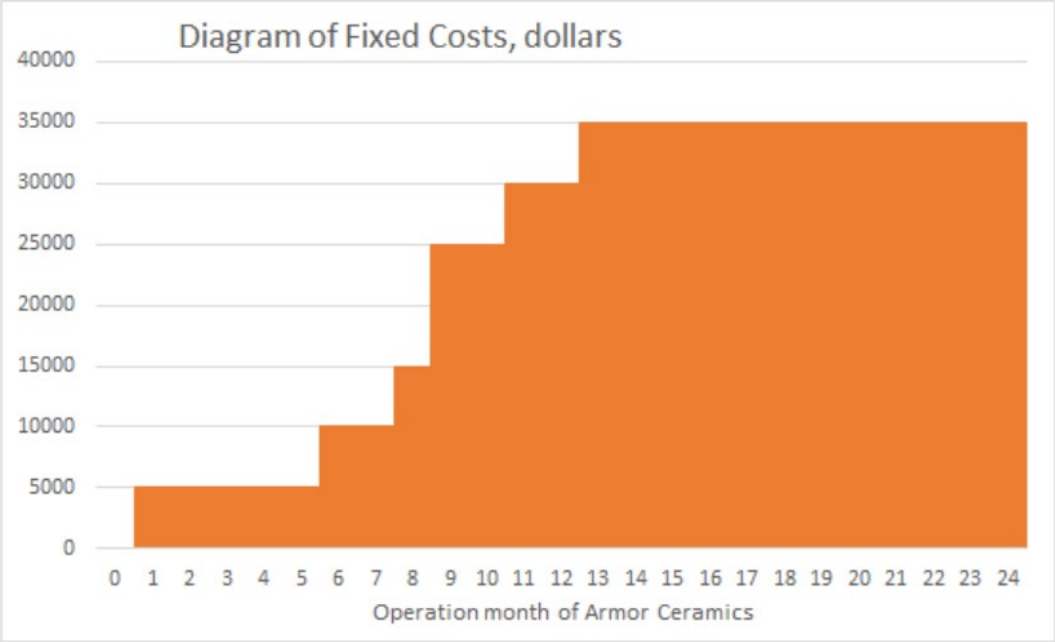
| | **Stage 1 (S1)** | **Stage 2 (S2)** | **Stage 3 (S3)** |
|---|---|---|---|
| **Amount of investments, Thousand dollars,** Inv=2 600 | Inv1=525 | nv2=1,075 | Inv3=1,000 |
| **Cost of finished products,** P=$/ton | P1=1,000 | P2=3,000 | P3=5,000 |
| **Variable costs per unit** VCu=$/ton | VCu1=700 | VCu2=2,000 | VCu3=3,000 |
| **Marginal profit,** CMu=USD | CMu1=300 | CMu2=1,000 | CMu3=2,000 |
| **Planned sales,** S= 350 ton | S1=200 | S2=100 | S3=50 |
| **Investments in equipment, thousand dollars** | K1=264 | K2=585 | K3=800 |
| **Terms for the implementation of the project stages** | | | |
| **Start after ICO, month** | $t_{0S1}$=0 | $t_{0S2}$=1 | $t_{0S1}$=5 |
| **Terms for manufacturing equipment, month** | $t_{1S1}$=4 | $t_{1S2}$=6 | $t_{1S1}$=6 |
| **Terms for installation and adjustment of equipment, month.** | $t_{2S1}$=1 | $t_{2S2}$=1 | $t_{2S1}$=2 |
| **Terms for reaching project indicators, month** | $t_{3S1}$=9 | $t_{3S2}$=8 | $t_{3S1}$=6 |
| **Terms for manufacturing finished products, month** | $t_{4S1}$=1 | $t_{4S2}$=1 | $t_{4S3}$=1 |
| **Delay in delivery of products, month** | $t_{5S1}$=1 | $t_{5S2}$=1 | $t_{5S3}$=1 |

**Table of Incremental Costs in the Stages of Project Implementation**

| № | Stage description | Expenditure | Amount of fixed costs per month |
|---|---|---|---|
| 1 | Selection and ordering of equipment; conducting initial negotiations on deliverie | WF (Wage Fund) of the Head, Foreign Economic Activity Manager, Purchaser, CFO. | $ 5,000 |
| 2 | Installation of the first production site; launching sales of unmolded refractory materials | WF of the Head of production, workers, laboratory technicians, sales managers, logistics managers, technologist. | $ 5,000 |
| 3 | Installation of the second production site; start of sales | WF of the Head of the sector, workers, storekeeper, sales managers. | $ 5,000 |
| 4 | Preparation of technical documentation; development of technology and physical infrastructure for the production of isostatics | Creation of a technical department and a quality control department, training of the staff. | $ 10,000 |
| 5 | Installation of the third production sector | WF of service engineers, who accompany materials to metallurgical plants, creation of a repair service, expansion of the staff. | $ 5,000 |
| 6 | Extension of working capacity, expansion of sales geography | Expansion of the staff of foreign economic activity, increasing leased territories. | $ 5,000 |

The calculation of the fixed costs of Armor Ceramics (FC) is presented in the table above. The graph of the increase in fixed costs is shown in Diagram 1.

**Diagram of Fixed Costs, thousand dollars**




To minimize the expenses of Armor Ceramics, the first two stages will be implemented in the selected sites and fully supported by Savex Minerals. All overage expenses of the business plan will be covered by Savex Minerals, thereby directing external investment in the manufacturing of equipment and other key expenditure items.

Calculation of the margin income of Armor Ceramics (CM):

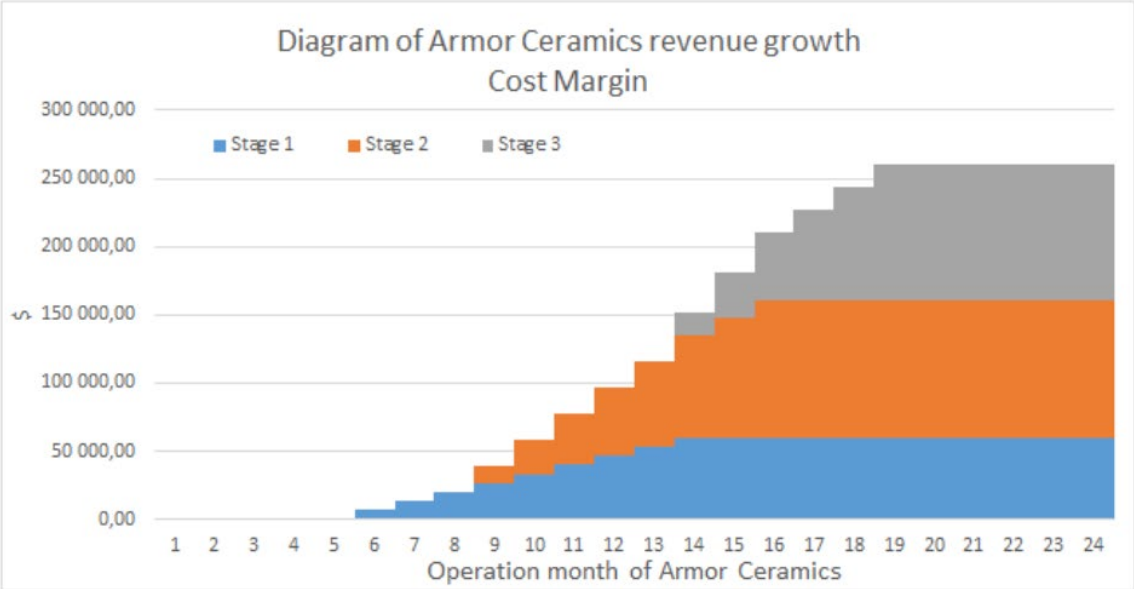
$$CM(t) = \sum_1^3 CM_n\,(t)$$

t, month – operation time of Armor Ceramics from the end date of ICO;
CMn (t) - the margins of the first, second and third stages respectively;

$$CM_n(t) = \begin{cases} 0, if\ t < t_{0Sn} + t_{1Sn} + t_{2Sn} \\ CMu_n \times \frac{S_n}{t_{3Sn}} \times \left(t - (t_{0Sn} + t_{1Sn} + t_{2Sn})\right), if\ t_{0Sn} + t_{1Sn} + t_{2Sn} \geq t \leq t_{0Sn} + t_{1Sn} + t_{2Sn} + t_{3Sn} \\ S_n \times CMu_{Sn}, if\ t > t_{0Sn} + t_{1Sn} + t_{2Sn} + t_{3Sn} \end{cases}$$

where n={1;3}

With full implementation of the project (S1+S2+S3) and considerations for installation time, setup and technology development, the diagram of Armor Ceramics revenue growth will be as follows (see the calculations in Appendix 1):




To achieve the planned profit, it will be necessary to attract working capital with a consideration of the specific behavior of the main consumers in the market. Taking into account delivery of required components, an average of one month turnaround time is planned for product manufacturing. Clients will have to pay for products within 30 calendar days. Therefore, the working capital cycle is 60 days. With such turnover, the following amount of monthly working capital is required to maintain plant operations.

The calculation of the working capital of Armor Ceramics (WC):

$$WC(t) = \sum_1^3 WC_n(t)$$

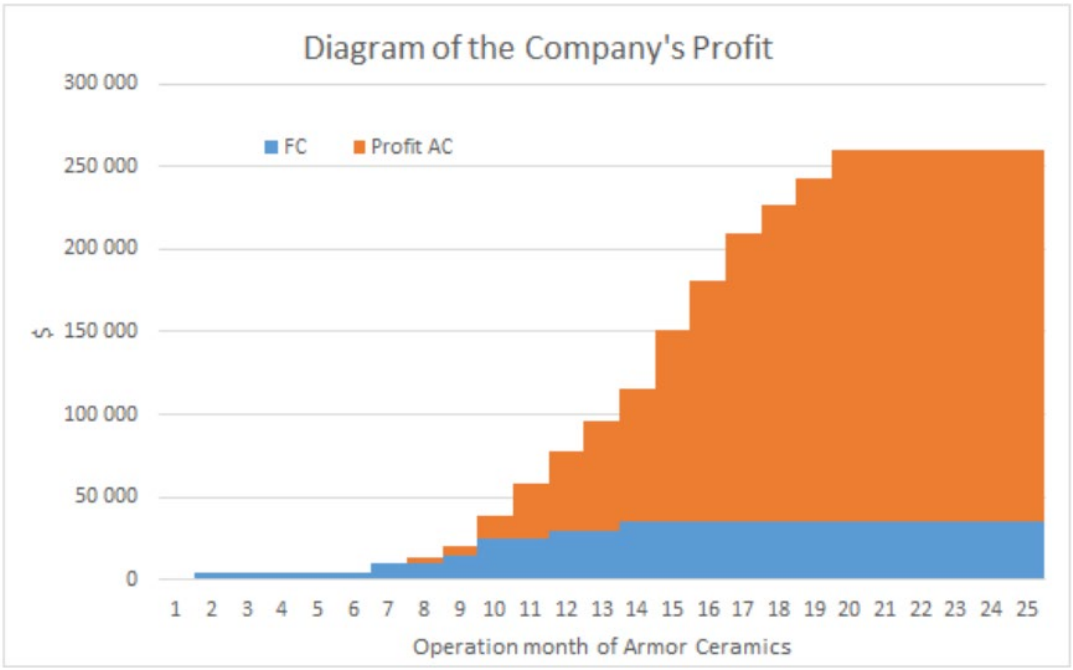
t, month – operation time of Armor Ceramics work time from the end date of ICO.

WCn(t) – working capital required for the first, second and third stages respectively.

$$WC_n(t) = \begin{cases} 0, if\ t < t_{0Sn} + t_{1Sn} + t_{2Sn} - t_{4Sn} \\ \frac{CM_n(t - t_{4Sn})}{P_n} \times VCu_n, if\ t_{0Sn} + t_{1Sn} + t_{2Sn} - t_{4Sn} \geq t \leq t_{0Sn} + t_{1Sn} + t_{2Sn} + t_{3Sn} - t_{4Sn} \\ S_n \times VCu_n, \quad if\ t > t_{0Sn} + t_{1Sn} + t_{2Sn} + t_{3Sn} - t_{4Sn} \end{cases}$$

where n = {1; 3}.

**Diagram of the Company's Profit with a Consideration of the Schedule of Fixed Costs (see the calculations in Appendix 1):**



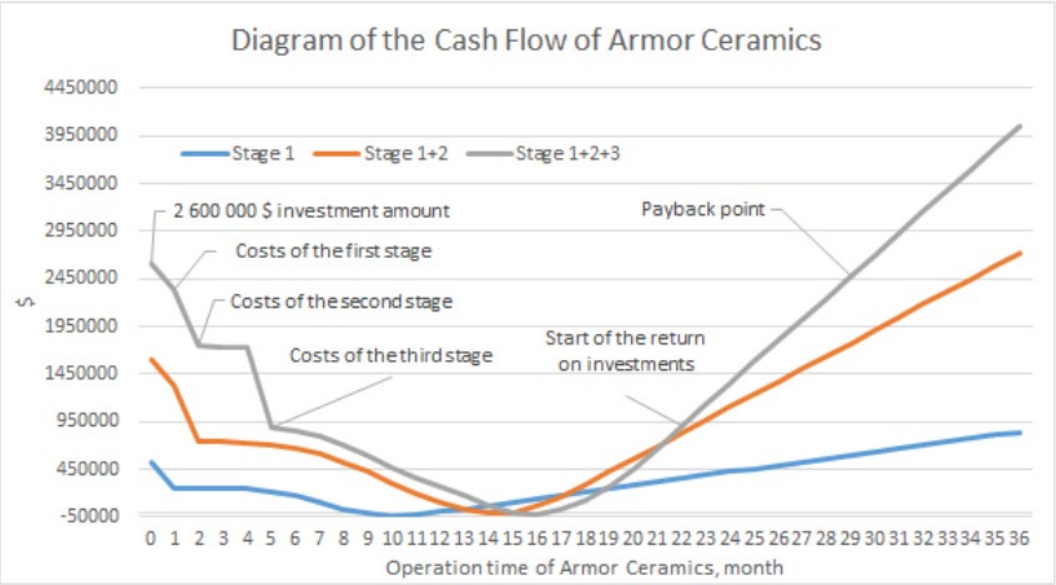

Since Armor Ceramics is meant to be a vertically integrated company, each production stage is based on the results of the previous one. To demonstrate the full picture of the need to implement the entire project, the following graph shows the results of the plant's operation in different stages of the project implementation.

Calculation of the cash flow of Armor Ceramics (CF):

$$CF(t) = \sum_{n=1}^{3} Inv_n(t) + \sum_{n=1}^{3} P_n \times S_n(t - t_{5Sn}) - \sum_{n=1}^{3} K(t_{0Sn} + t_{1Sn})_n - \sum_{n=1}^{3} VC_n(t) - FC(t)$$

**Diagram of the Cash Flow of Armor Ceramics for Different Stages**

(see the calculations in Appendix 1)




Based on the plant's target cash flow (CF), the project team decided to start the return on from 22 months after the project start and perform full return on investments for S1, S2 and S3 by the 38th month.

The calculation of the return on investments (V):

$$V(t) = \begin{cases} 0, if\ t < 22 \\ 0{,}5 \times \sum_{t=17}^{22} Pr(t), if\ t = 22 \\ 0{,}5 \times Pr(t), if\ 22 < t < 38 \end{cases}$$

**Cumulative Diagram of Planned Return on Investment** (see the calculations in Appendix 1)

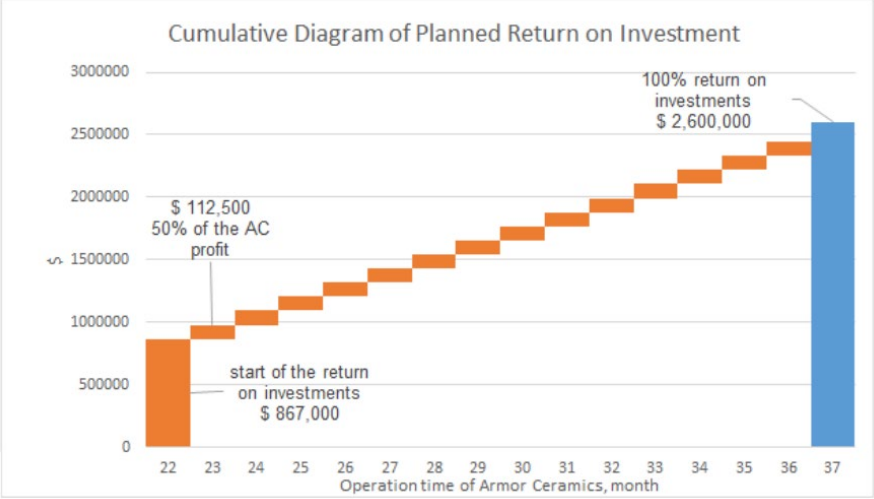
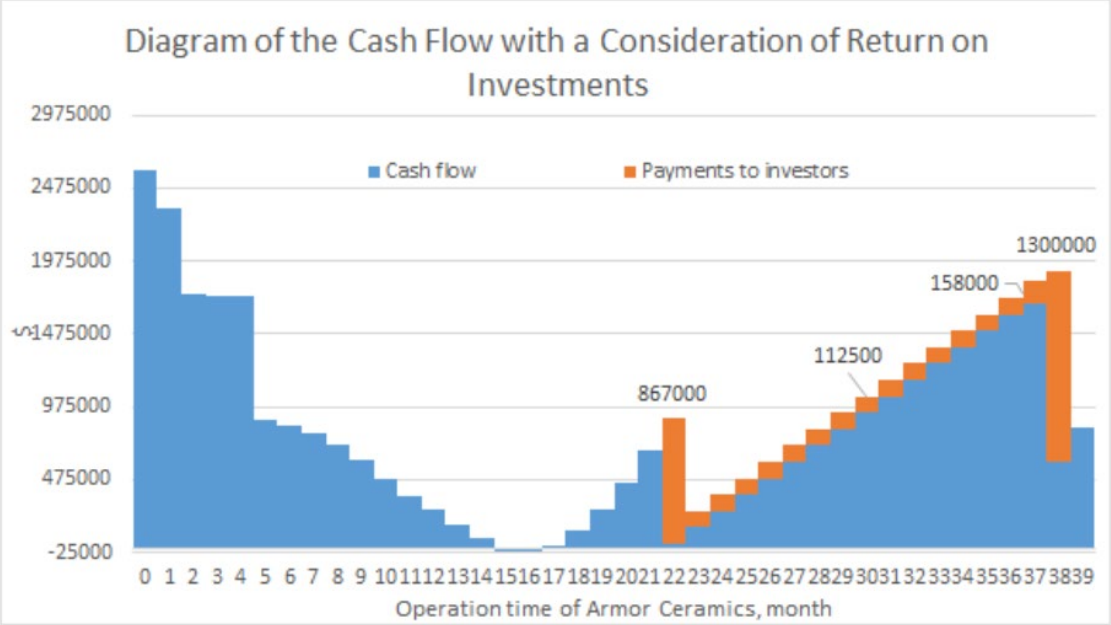


**Diagram of the Cash Flow with a Consideration of Return on Investments and Interest Payment for the Use of Borrowed Capital (14.5% per annum).**




Over the first 37 months, total payments are planned to be 3.9 million dollars, with 2.6 million in production asset investment and 1.3 million as interest paid to investors. The entire amount will be paid to investors in accordance with their shares of ACR (Armor Ceramic) tokens.

For $1 of investment, the resulting production stage is as follows:

- 50 cents for the whole period, from the 1st to the 38th month of work (the average rate is 14.5% per annum);
- 51.9 cents a year, from the 39th month onward (see the calculations in Appendix 1).

# Production Stages

The production stages of the project are divided into three parts. Their complexity and cost will be increasing. So will be the manufacturability of the products that they will produce.

**Table of Investment Allocation in the First Stage (S1)**

| Name | Quantity | Cost, thousand dollars | Amount of investments, thousand dollars |
|---|---|---|---|
| Production site for equipment installation (provided by Savex Minerals) | 1 | 0 | 0 |
| Wage fund | 1 | 40 | 40 |
| Storage bins for raw materials | 10 | 1 | 10 |
| Dispensers for the automatic dosing of raw materials | 5 | 3 | 15 |
| Site for mixer, footing and metal construction | 1 | 2 | 2 |
| High-intensity mixer EIRICH RV12 | 1 | 147 | 147 |
| Cabinet for mixer control | 1 | 48 | 48 |
| Ventilation system for the production site | 1 | 4 | 4 |
| Laboratory vibro-table for the quality control of finished products | 2 | 3 | 6 |
| Laboratory press for the quality control of finished products | 1 | 15 | 15 |
| Material, raw materials, components (working capital) | 350 | 0.70 | 245 |
| | | | 532 |

* All additional quality control equipment for the laboratory will be provided by Savex Minerals.

**Table of Investment Allocation in the Second Stage (S2)**

| Name | Quantity | Cost, thousand dollars | Amount of investment, thousand dollars |
|---|---|---|---|
| Production site for equipment installation (provided by Savex Minerals) | 1 | 0 | 0 |
| Wage fund | 1 | 90 | 90 |
| Climatic room for the production of vibration products | 1 | 75 | 75 |
| Drying room for 110°C | 1 | 100 | 100 |
| Drying oven for 450°C | 1 | 40 | 40 |
| Firing furnace for 1300°C | 1 | 60 | 60 |
| Vibration table 1.5 * 1.5 m, load 0.5 ton | 2 | 20 | 40 |
| Vibration table 1 * 2m, load 0,1 ton | 2 | 10 | 20 |
| Manipulator | 1 | 30 | 30 |
| Production molds | 50 | 1 | 50 |
| Laboratory muffle for 1700°C | 1 | 25 | 25 |
| Laboratory apparatus for chemical analysis | 1 | 25 | 25 |
| Technical consulting for the development of technology and equipment | 1 | 60 | 60 |
| Staff training in similar European enterprises | 20 | 3 | 60 |
| Material, raw materials, components (working capital) | 200 | 2.00 | 400 |
| | | | 1,075 |
| * All excessive expenses will be covered by Savex Minerals. | | | |

**Table of Investment Allocation in the Third Stage (S3)**

| Name | Quantity | Cost, thousand dollars | Amount of investments, thousand dollars |
|---|---|---|---|
| Production site for equipment installation | 6 | 1 | 6 |
| Wage fund | 1 | 24 | 24 |
| High-pressure hydrostatic press 200 MPa | 1 | 650 | 650 |
| Two-stage vacuum installation | 1 | 50 | 50 |
| Glazing chamber | 1 | 20 | 20 |
| Mechanical processing of finished products | 5 | 6 | 30 |
| Hydraulic press molds | 1 | 5 | 5 |
| Technical consulting for the development of technology and equipment | 1 | 50 | 50 |
| Staff training in similar European enterprises | 5 | 3 | 15 |
| Material, raw materials, components (working capital) | 50 | 3.00 | 150 |
| | | | 1,000 |
| * At this stage, the company Armor Ceramics adops a complete self-support policy | | | |

Financial performance indicators depending on investments and time. We recommend getting acquainted with the planned financial indicators of the project to assess the performance of each investment stage and the entire project of Armor Ceramics.

**Table of Armor Ceramics Indicators for a 36-Month Period**

| | S1 | | | S1 + S2 | | | S1+S2+S3 | | |
|---|---|---|---|---|---|---|---|---|---|
| | month 12 | month 24 | month 36 | month 12 | month 24 | month 36 | month 12 | month 24 | month 36 |
| Sales | 742,222 | 2,542,222 | 4,342,222 | 997,222 | 6,750,000 | 12,750,000 | 997,222 | 8,875,000 | 17,875,000 |
| EBITA | 147,666 | 567 666 | 987 666 | 151,666 | 1 690 000 | 3,310,000 | 141,666 | 2,410,000 | 5,110,000 |
| ROS | 0.20 | 0.22 | 0.23 | 0.15 | 0.25 | 0.26 | 0.14 | 0.27 | 0.29 |
| ROI | 0.28 | 1.08 | 1.88 | 0.14 | 1.57 | 3.08 | 0.14 | 2.41 | 5.11 |
| BEP | 250,000 | 650,000 | 1,050,000 | 500,000 | 1,437,500 | 2,375,000 | 490,384 | 1,701,923 | 2,913,461 |

Financial performance indicators depending on investments and time. We recommend getting acquainted with the planned financial indicators of the project to assess the performance of each investment stage and the entire project of Armor Ceramics.

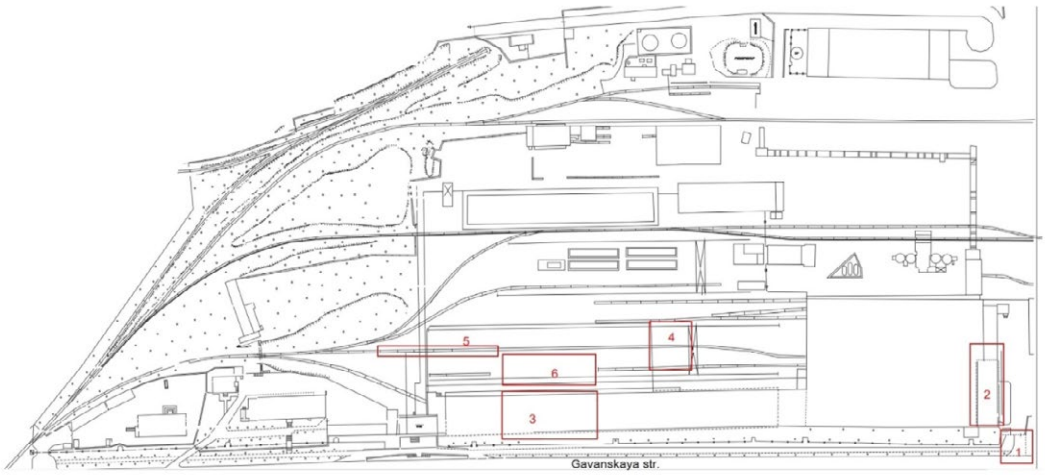
**SWOT-Analysis of Armor Ceramics Production**

| **Strengths** | **Weaknesses** |
|---|---|
| Speed of delivery and production<br>Competitive product cost<br>Innovative enterprise solutions | Necessity to buy and instal new production equipment. Quality of local raw materials (in comparison with European producers). |
| Supply high-quality refractory materials<br>Become a leader in high-tech refractories (isostatics)<br>Complex product supply | Iron ore raw material extraction market.<br>Metal production market<br>Refractory market |
| **Opportunities** | **Threats** |

# Plant Location and Production

The Armor Ceramics plant will be built on the grounds of an existing factory, which was previously engaged in the production of reinforced concrete products. This decision was made based on the particular features of this manufacturing facility and the location of the site. The height of the crane space will provide the necessary distance for the installation of the production equipment and storage bins. The availability of a crane-beam (2 units) will ensure fast and high-quality transportation within the manufactory. The railways will significantly reduce logistics costs for the delivery of components and finished products.

**Plan of the Site, where The Armor Ceramics Plant is to Be Constructed**




1 - Main entrance to the site

2 - Office premises, location of the express laboratory

3 - The current location of Savex Minerals and the planned territory for the construction of Armor Ceramics production facilities

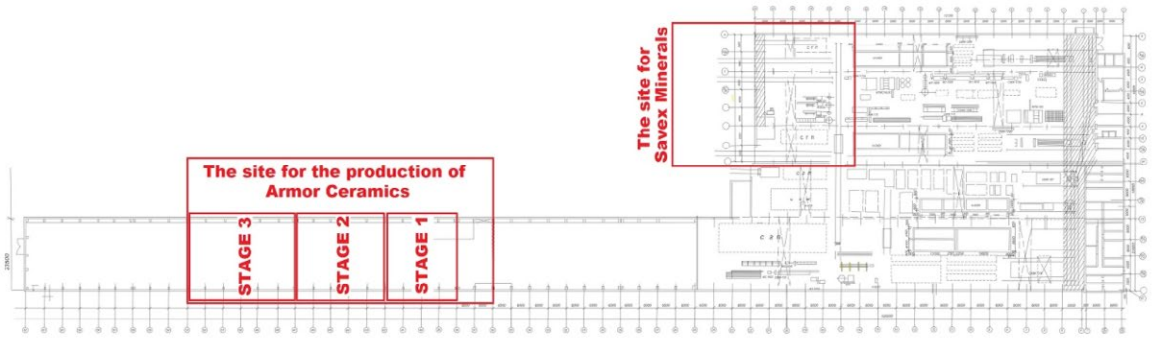
4 - The space that Savex Minerals will accommodate in the third stage of the plant construction.

5 - Railway access to facilitate raw material delivery and finished product shipment

6 - Open territory in front of the factory that can be potentially used as storage, buffer zone, or make it a canopy for street warehousing.

All the equipment must be in close proximity to facilitate movement between sites, to save staff time and optimize the use of the equipment involved in various stages of the production process. All three sections are supported by one production laboratory, located in the center of the facility.

**Equipment Layout**




The project will be launched on the territory of the Savex Minerals base, which will make it possible to optimize warehousing, logistics, and production costs.

In Stage 3, the layout described above will optimize transportation, and enable quick access to various sections of the plant. In addition, the control laboratory will have direct and quick access to raw materials, finished products and equipment.

**Conclusion**

Supply chains have always been one of the most significant bottlenecks in manufacturing. Companies like WalMart have virtually taken over their respective industries with innovations in supply chain. Armor Ceramics is the next evolutionary step in supply chain management infrastructure. The SupChain token creates an infrastructure with unprecedented transparency and reliability.

The Ukraine is a perfect place to begin testing such an infrastructure. The unrealized potential of the raw refractory material inputs such as iron ore and cement are self evident to anyone involved in industrial production. The local economy is ripe for disruptive technology, its supply hungry for more transparency, and desperate for reliability.

The authors believe blockchain technology is perhaps the most promising innovation of the new century, and are passionate about seeing this potential realized in the places that need it most. However, SupChain has applications all over the world, and this ICO represents a first mover advantage in the global market for logistics and supply chain.

**Appendix 1. The Performance of Armor Ceramics in Three Years**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| First year of operation | Operation time, month | Project start | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| | Fixed costs, thousand dollars | 0.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 10.0 | 10.0 | 15.0 | 25.0 | 25.0 | 30.0 | 30.0 |
| | Marginal revenue, thousand dollars | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.7 | 13.3 | 20.0 | 39.2 | 58.3 | 77.5 | 96.7 |
| | Working capital, thousand dollars | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15.6 | 31.1 | 46.7 | 87.2 | 127.8 | 168.3 | 208.9 | 249.4 |
| | Profit, thousand dollars | 0,0 | -5.0 | -5.0 | -5.0 | -5.0 | -5.0 | -3.3 | 3.3 | 5.0 | 14.2 | 33.3 | 47.5 | 66.7 |
| | Cash flow, thousand dollars | 2,600 | 2,330 | 1,740 | 1,735 | 1,730 | 890.0 | 848.9 | 792.3 | 712.3 | 603.9 | 477.3 | 364.8 | 271.4 |
| | Payments to share-holders, thousand dollars | | | | | | | | | | | | | |
| Second year of operation | Operation time, month | | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| | Fixed costs, thousand dollars | | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 |
| | Marginal revenue, thousand dollars | | 115.8 | 151.7 | 180.8 | 210.0 | 226.7 | 243.3 | 260.0 | 260.0 | 260.0 | 260.0 | 260.0 | 260.0 |
| | Working capital, thousand dollars | | 315.0 | 365.0 | 415.0 | 440.0 | 465.0 | 490.0 | 490.0 | 490.0 | 490.0 | 490.0 | 490.0 | 490.0 |
| | Profit, thousand dollars | | 80.8 | 116.7 | 145.8 | 175.0 | 191.7 | 208.3 | 225.0 | 225.0 | 225.0 | 225.0 | 225.0 | 225.0 |
| | Cash flow, thousand dollars | | 167.3 | 72.8 | -11.9 | -20.2 | 25.6 | 125.6 | 267.3 | 450.6 | 675.6 | 900.6 | 1,125 | 1,350 |
| | Payments to shareholders, thousand dollars | | | | | | | | | | | 867.0 | 112.5 | 112.5 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Third year of operation | Operation time, month | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
| | Fixed costs, thousand dollars | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 |
| | Marginal revenue, thousand dollars | 260.0 | 260.0 | 260.0 | 260.0 | 260.0 | 260.0 | 260.0 | 260.0 | 260.0 | 260.0 | 260.0 | 260.0 |
| | Working capital, thousand dollars | 490.0 | 490.0 | 490.0 | 490.0 | 490.0 | 490.0 | 490.0 | 490.0 | 490.0 | 490.0 | 490.0 | 490.0 |
| | Profit, thousand dollars | 225.0 | 225.0 | 225.0 | 225.0 | 225.0 | 225.0 | 225.0 | 225.0 | 225.0 | 225.0 | 225.0 | 225.0 |
| | Cash flow, thousand dollars | 1,575 | 1,800 | 2,025 | 2,250 | 2,475 | 2,700 | 2,925 | 3,150 | 3,375 | 3,600 | 3,825 | 4,050 |
| | Payments to shareholders, thousand dollars | 112.5 | 112.5 | 112.5 | 112.5 | 112.5 | 112.5 | 112.5 | 112.5 | 112.5 | 112.5 | 112.5 | 112.5 |

ARMOR CERAMICS