General Department of
Economic and Financial Affairs of Khuzestan

Preparation and Compilation of Investment Opportunities in The Province

Investment opportunity studies report

«Polymer Alloy Production Plan»

(Attachment Number 1)

Date: 2023/05/11

V2

In the name of God

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Tables and Figures

1) Location of the project

1-1- Province

Khuzestan province is located in the southwest of Iran (in 47° 42′ to 50° 39′ east of the Greenwich meridian and 29° 58′ to 32° 58′ north of the equator). The area of Khuzestan province is 63,238square kilometers. With a population of 4,994 thousand people in 1400SH, it is the fifth most populous province in Iran (after Tehran, Khorasan Razavi, Isfahan and Fars provinces). **Ahvaz** is the capital of Khuzestan province and is located in the 880km of Tehran. This province is bordered by ILAM province from the northwest, Lorestan province from the north, CHAHARMAHAL and BAKHTIARI, KOHGILUYEH and BOYERAHMAD provinces from the northeast and east, the Persian Gulf (330km long) from the south and Iraq (330km long) from the west. The location of Khuzestan is in the west of Zagros mountains. Due to the vastness of its plains, the border with Iraq and the Persian Gulf, and the distance from other provincial centers have placed this province in a strategic position.

Figure (1): The Province Location In Iran


Figure (2): Ahvaz Location in Khuzestan Province

Figure (3): Political Divisions of Khuzestan Province

1-2- County

According to the latest national divisions of 1401 of the Ministry of Interior, this province has 29 counties, 70 districts, 145 villages, 90 cities and 3 special governorates. The latest political divisions of the province are described in Figure (3).

Ahvaz is one of the cities of Khuzestan province, centered in Ahvaz city. Ahvaz has a population of 1,420 thousand people, 28% of the population of the province. This city has a common border with SHUSHTAR, BAVI and RAMSHIR cities from the east, HAMIDIEH and HOIZEH cities from the west, KARKHE city from the north and Khorramshahr, Karun and Bandar Mahshahr cities from the south. After passing through DEZFUL, it enters Ahvaz and connects to Karun River at BANDGIR, which after the confluence of two Dez rivers, Karun forms the great Karun River, and after passing Ahvaz, it enters Abadan and Khorramshahr. A total of 185 km from the Karun River, 61 km from the Karkheh River and 5 km from the Dez River are located in Ahvaz .

From the industrial point of view, Ahvaz is considered the vital artery of Khuzestan province where large factories of food, mineral, metal, and chemical industries have been established there. In the industry sector, there are five industrial towns (Ahvaz 1 to 5) .

Critical industrial centers including National Iran Drilling Company, Steel Complex, National Steel Industrial Group, Pipeline Company, Oil and Gas Companies, Northeast Agriculture and Industries, DEHKHODA and sugarcane ancillary industries are located in Ahvaz. In addition, sandstone and wind (industrial) mines and rich oil and gas resources are being exploited in the area of Ahvaz and many utilization units and management facilities in the southern oil-bearing areas, including exploration, drilling and oil and gas production facilities are settled in Ahvaz. The prosperity of agriculture and industries in the region has led to the prosperity of commerce and all kinds of industrial products such as steel, iron sheets, pipes, profiles, industrial parts, artificial leather, pressure vessels and heat exchangers, all kinds of iron, oil and all kinds of petroleum products, sanitary products and detergents, food, agricultural products such as wheat, barley, tares, dates and fishery products are among the most important products exported from this region locally and internationally.

2) Project Status

The location of the land in Ahvaz Industrial Town 5 is proposed with the following specifications and an area of about 12,000 square meters.

Acquiring industrial land in this place requires approval from ministry of industry, mining and trade, industrial estates company and environment protection agency.

One of the reasons for choosing this location is its proximity to important steel producing companies in the province. The distance between this industrial town and Ahvaz city is about 17 kilometers

2-1- Access to infrastructures

Currently water, gas and electricity infrastructures are available in this estate. It is also well-located in terms of access to transportation. The distance of the chosen place to the Ahvaz-Imam Khomeini Port freeway is 1.2 km and its distance to Imam Khomeini Port is 107 km. Ahvaz airport is also located 15.7 kilometers away from this place. Based on this, raw materials will be supplied from Imam Khomeini port.

Figure (4): The Province location in Iran

Figure (5): The Province location in Iran

Table (1): access to infrastructures

No.	Required Infrastructure	Distance From Project Status	Location Of Infrastructure Provision
1	Water	0.8	Ahvaz industrial Estate no 5
2	Electricity	0.8	Ahvaz industrial Estate no 5
3	Gas	0.8	Ahvaz industrial Estate no 5
4	Telecommunication	0.8	Ahvaz industrial Estate no 5
5	Main road	2	Ahvaz – Imam Khomeini port highway
6	Side road	0	Industrial Estate transportation
7	Airport	15.9	Ahvaz airport
8	Port	108	Imam Khomeini Port
9	Railway Station	19	Ahvaz Railway

Figure (6): Access routes to the project

3) Technical specifications of the project

3-1- Product

Polymer alloys are a combination of various polymers with the aim of creating desirable properties. It is also an easy and cost-effective way to develop polymers for commercial applications. Polymers are used in a wide range of plastic products, household appliances, automobiles, aerospace, etc. due to their low weight, reasonable price, good toughness, corrosion resistance, etc., and are of special importance.

Alloying in polymers has many advantages: alloying does not require the production of a new polymer and the desired properties can be achieved by using the combination of existing materials. Alloying does not have the problem of high cost and research and development time. Alloying penetrates the complexity in the synthesis of new materials and is considered a simple and easy method from the point of view of technology. Also, by changing the composition percentage of the materials in the alloy, a wide range of properties and applications are obtained. Polymer alloys obtained by mixing polymers achieve a wide range of properties that cannot be obtained from each polymer component in the alloy alone.

Polymer alloys are divided into miscible and immiscible groups. Miscible alloys are usually made from a mixture of polymers with similar chemical structures, which results in a polymer compound with a single-phase structure. Also, when two polymers are not compatible with each other and form two separate phases, they are called immiscible alloys. Compatibilizers are used to improve the properties of immiscible polymer alloys. Therefore, at the common boundary or the interface between polymer phases in an alloy, as the surface tension decreases and becomes close to zero, the mixing goes towards miscibility. Generally; Compatibility between phases leads to a decrease in the size of dispersed particles, an increase in phase stability and an increase in mechanical properties.

Advanced polymer alloys are also the best type of recombination alloys, in cases such as automobile and machinery industries, industries related to household appliances, electronic and electrical appliances industries, pharmaceutical and therapeutic industries, health industries, textile industries, agricultural industries, packaging industries and ... are being used.

Figure (7): Polymer Alloys

The packaging of soft drinks and oil, the manufacture of all kinds of plastic bottles and lids is one of the uses of polymer materials in packaging, which, in addition to increasing hygiene and reducing costs, has caused prosperity and increased consumption in these industries.

The use of polyethylene pipes and films is also one of the advantages of using polymer products in the agricultural industry to optimize water consumption.

The use of polymer materials in the public transportation industry, rail, air, etc., has made these devices more economical, lighter and safer. One of the applications of polymer materials in the medical industry is their use in the manufacture of various medical and hospital equipment, such as imaging equipment and operating rooms. Also, the use of polymer materials in pharmaceutical containers has made the production of these containers easier than plastic containers and saves energy. Different polymer materials are also used in the production of some electrical and electronic parts and appliances.

Today, more than 50% of the parts of the automotive industry are made of polymer materials, and these materials have created a huge change in this industry. Among the advantages of using these materials, we

can mention lower costs, more integrated connections, easier assembly, etc. Another industry that has been affected by the use of polymers today is the construction industry. Among the applications of polymer materials in the construction industry, we can mention thermal and moisture insulation, plastic pipes, windows and other parts. The use of polymers in the production of fibers with characteristics such as high heat resistance, high strength, etc. has made it possible in the textile industry. The advanced formulation of polymer materials has caused their use in military industries to expand as well. The wide applications of these materials, such as the construction of military vehicles, the construction of military equipment, and the construction of operational stations, have been expanded due to the reasons of being affordable, much safer, and lighter, and their use, like many other industries, has made this industry It has faced a tremendous transformation. Children's toys and home appliance manufacturing industry are also other industries in which polymer materials are used.

3-2- Project Requirement

3-2-1- Land And Required Infrastructure

To produce Polymer Alloy, a land with an area of 12,000 square meters and construction infrastructure for production (Production building and other buildings) amounting to 4,000 square meters is required. The specifications of the land, main buildings and other required side buildings along with the amount of investment are described in the table below.

Table (2): Amount of investment in land, landscaping and building

No.	Requirements	Description	Investment Required		Total Cost (Million Rials)
			Required Area m^2	Unit Price (Rial)	
1	Land purchase 104 m * 115 m	Khuzestan, Ahvaz city, Ahvaz Industrial Estate No 5	12,000	6,700,000	80,400
2	Site preparation and development	According to relative calculations	7,500	3,680,000	27,600
3	Civil works, structures and buildings	Production building	2,520	100,000,000	252,000
		Office and management building	300	80,000,000	24,000
		Labor and support building (restaurant, dressing room, prayer room, shower and restroom)	300	70,000,000	21,000
		Water, electricity and gas facilities building	40	50,000,000	2,000
		guard and janitor building	50	60,000,000	3,000
		Other buildings (warehouse, etc.)	790	80,000,000	31,600
Total			-	-	441,600

3-2-2- Plant Machinery and Equipment

The technology and production process of polymer alloys is done with three mechanical, latex and chemical methods. In the mechanical method, mixers, grinders and extruders are used to mix and combine two or more polymers and produce the final alloy. In the latex method, the polymers are first formed into latex and the latexes are mixed with each other, and then by evaporation of the solvent, the alloy obtained from the combination of two polymers is obtained.

In the chemical method, a chemical reaction occurs between the constituent components of the alloy. This method is mostly used in situations where it is not possible to physically mix and obtain an alloy with desirable properties due to the incompatibility of the alloy components.

Alloy production by mechanical method: In this project, due to the flexibility, costs and less time of production and the possibility of obtaining product quality and variety, the mechanical method based on the use of a DC extruder of two colliding rams is used for the production of polymer alloy. In this process, the required raw materials such as main polymer components and additives (such as improvers, fillers, masterbatch and stabilizers) are stored in related tanks. The stored raw materials and masterbatch after physical preparation and pre-mixing by means of a suction device, are controlled with a flow rate and according to the formulation of the compound, they enter into the funnel of the extruder which has an engineered temperature profile and a variable speed gear. In order to control the production process, part of the raw materials is entered into the extruder from special points; Therefore, the used extruder must be equipped with several separate feeding inputs to produce product grades of glass and carbon fibers in order to strengthen the polymer, and its cylinder is also equipped with heating elements, which at the end can also gasify the vapors and gases produced due to the mixing process. have the polymer melt as well. The output flow from the two extruder is directed to the granulator system by the forming die in the form of parallel and thin wires. The removed bar profiles are first cooled in a water bath, then crushed and granulated by the cutters of the granulation system. The produced granules are dried and placed in the production product storage tanks and finally packed in 25 or 50 kg bags.

According to the selected processes and technology, the required machines and equipment are as follows:

Table (3): Plant Machinery and Equipment

No.	Equipment/Machinery	Required investment			Total cost (Million Rials)
		Amount	Unit Price	Currency	
1	Compound Production and Mixing Line - Rubber	1	10,000	(Million Rials)	10,000
2	Material Weighing Line - Rubber	1	40,000	(Million Rials)	40,000
3	Rubber Sheeting System (Packaging Device).	1	50,000	(Million Rials)	50,000
4	Two-Roll Mix (Including Chamber, Thermal Zones, Extruder and Granulator)	1	60,000	(Million Rials)	60,000
5	Material Weighing Line (Load Cells and Dividers) - Thermoplastic	1	20,000	(Million Rials)	20,000
6	Bag Packaging System	1	40,000	(Million Rials)	40,000
7	Reactor/Mixer With 3 Ton Stirrer	1	20,000	(Million Rials)	20,000
8	Weighing System	1	5,000	(Million Rials)	5,000
9	Other Main Equipment - Domestic	1	13,000	(Million Rials)	13,000
Total		-	-	-	**258,000**

Table (4): Auxiliary and service plant Equipment

No.	Equipment/Machinery	Unit of measurement	Type of equipment	Required investment		Total cost (Million Rials)
				Amount	Unit Price (Million Rials)	
1	Distribution Of Electricity / Demand Price	Kw	Facility	120	6	720
2	Several Electrical Cables	M	Facility	300	4.0	1,200
3	Electrical Equipment of The Greenhouse Lighting System	Amount	Facility	100	40	4,000
4	The Cost of Panel Boards and Related Electrical Equipment	Amount	Facility	17	320	5,440
5	Water Branch	-	Facility	1	2,000	2,000
6	Other Water Conveyance Equipment	Amount	Facility	1	2,000	2,000
7	Firefighting, Safety and Health Equipment, etc.	Capsule	Facility	30	30	900
8	Gas Piping	M	Facility	400	5	2,000
9	Gas Branching	-	Facility	1	2,000	2,000
10	Water Heater and Heater	Machine	Facility	3	350	1,050
11	Ventilation Systems for Toilets and Bathrooms	Fan	Facility	6	36	216
12	Air Conditioner	Set	Facility	5	1,000	5,000
14	Gas Heater	Ton	Facility	4	150	600
15	Industrial Heater	Machine	Facility	1	250	250
16	2.5 Ton Pallet Jack with Scale	Machine	Vehicle	5	360	1,800
17	3 Ton Forklift	Machine	Vehicle	1	17,500	17,500
18	ZAMYAD Diesel Van	Machine	Vehicle	1	6,000	6,000
19	SAMAND Soren Car	Machine	Vehicle	1	5,000	5,000
20	Workshop and laboratory tools	Machine	Workshop and laboratory tools	1	5,000	5,000
21	CCTV System	Set	Facility	1	1,500	1,500
22	Office Stuff	Set	Office Equipment	10	700	7,000
23	Restaurant Equipment	Set	Office Equipment	22	30	645
24	Medical Equipment	Set	Office Equipment	1	1,500	1,500
25	Other Facilities	-		1	1,679	1,679
Total				-	-	**75,000**

3-2-3- Raw Materials and Intermediate Parts

In the present plan, the main raw material is polymer materials (PP, PE, PVC, etc.) which will be supplied from the domestic market. In the current situation, these materials are bought and sold in the commodity exchange and the transaction price is determined there. The specifications of raw materials and packaging for the production of polymer alloys are as described in the following table.

Table (5): Costs of Raw Material for Production

No.	Title	the product	Production quantity at maximum capacity	Unit	Average price (Rials)	Purchase unit	Consumption per product unit	consumption coefficient unit	Amount of consumption in nominal capacity	The cost at the maximum nominal capacity (Million Rials)
1	Polymer materials including (PP, PVC, PE, ...)	Resin polymer alloys	810,000	kg	2,000,000	Ton	100%	Percent	810,000	1,620,000
2	Polymer materials including (PP, PVC, PE, ...)	Rubber polymer alloys	270,000	kg	1,500,000	Ton	50%	Percent	135,000	202,500
3	Stabilizing, strengthening, cheap additives according to customer needs	Rubber polymer alloys	270,000	kg	1,500,000	Ton	50%	Percent	135,000	202,500
4	Polymer materials including (PP, PVC, PE, ...)	Thermoplastic polymer alloys	270,000	kg	2,500,000	Ton	80%	Percent	216,000	540,000
5	Stabilizing, strengthening, cheap additives according to customer needs	Thermoplastic polymer alloys	270,000	kg	2,800,000	Ton	20%	Percent	54,000	151,200
6	Product packaging materials are resin polymer alloys including 20 kg metal barrels + wooden pallets	Resin polymer alloys	810,000	kg	50,000	Pallet	0.0056	number	4,536	227
7	Product packaging materials are rubber polymer alloys, including nylon - sheeting belts and wooden pallets	Rubber polymer alloys	270,000	kg	3,150,000	Pallet	0.0004	number	108	340
8	Product packaging materials are thermoplastic polymer alloys, including 50 kg bags + pallets	Thermoplastic polymer alloys	270,000	kg	7,800,000	Pallet	0.0006	number	169	1,316
9	Costs of printing, labeling and...	All products	1,350,000		350,000	number	0.0004	number	540	189
Total			–	–	–	–	–	–	–	2,718,272

3-2-4- Management and human resource

For Polymer Alloy production, 43 human resources will be required in the production, management and support department as described in table (6).

Table (6): Management and Human Resource

No	Level of skill	Number of staff	Average basic salary
1	Senior	12	160,000,000
2	Mid-level	3	120,000,000
3	Junior	28	88,750,000

Number Of Direct Mid-Level Staff Required	3	Person
Number Of Direct Junior Staff Required	28	Person
Number Of Direct Senior Staff Required	12	Person
Total	43	person

4) Ownership and legal permissions

4-1- land ownership

The suitable location for this project is One of the industrial towns in Ahvaz (Ahvaz Industrial Town 5). The legal right for exploiting the land is 6,700,000 Rials. This estate is subject to the rules and regulations of Less developed industrial towns. Having legal permits which are mentioned in 3.4 section are required to obtain a land in this estate. If the construction phase in this estate gets rejected, it should be established in Imam Port Economic Special Zone.

4-2- Intellectual Property and Concessions

Polymer alloys do not require relatively high technical knowledge. It is considered that the technical knowledge exists in the country and the production must be according to national standards.

4-3- Legal permissions

In order to produce this product, we need legal permits such as (establishment permit and operating permit) from the Khuzestan Province Industry and Mining Organization, and environmental permit.

5) market research and competition

5-1- Target market introduction

The production of various types of polymer alloys is considered important in various industries due to their practical properties such as corrosion resistance, optimal toughness, high strength and stability, flexibility, etc. During the last two decades, the production of alloys has grown rapidly and it is predicted that in the next decade, the consumption of these materials will face an 8-10% growth. The main uses of alloys are in automotive, packaging and household appliances industries.

According to official statistics, 9 active units in the field of polymer alloy production with ISIC code 2413412403 have been reported as described in the table below. Tehran Dynamic Polymer Company is the largest producer of polymer alloys in Iran with a nominal capacity of 8 thousand tons per year. With the production of more than 11 thousand tons of polymer alloys, Tehran province is responsible for 64% of the total production of these products in the country.

Table (7): Active units producing polymeric alloys

province	Unit Name	year of license	Nominal capacity (tons)
Tehran	POYA POLYMER TEHRAN	1396	8,020
	BASPAR GOSTAR ARYA ENGINEERING	1396	3,000
Lorestan	ARTIN ZIGGURAT STRUCTURE	1399	2,000
Alborz	PISHROU ARVIN POLYMER	1398	1,500
Kerman	BASAR SHARQ SPECIALS	1400	1,500
Qom	SAMAN POLYMER	1386	1,000
Esfahan	KIMIA POLYMER BONDING	1398	480
CHAHARMAHAL and BAKHTIARI	RONAK CHEMI	1400	360
Qazvin	KIMIA NISHAN SAMA	1395	48
Total			17,908

The statistics of units with plans in the field of polymer alloys production are given in the following table.

Table (8): Units with plans to produce polymer alloys

province	Unit Name	year of license	Physical progress (٪)	Nominal capacity (tons)
Ardabil	Ardabil Petrochemical	1385	22.45	20,000
Special Economic Zone	Building And Installation of The Petrochemical Industry	1400	0	20,000
	PARDISAN Economic Development Company	1400	0	20,000
Alborz	PISHROU ARVIN POLYMER	1398	71.45	12,000
Qom	MAASOM PRODUCTION	1398	61.18	12,000
		1400	0	10,000
Tehran	Anahita Holding	1400	0	5,500
Alborz	BASPAR Development YARAN	1399	0	4,000
	Solar Polymer No ANDISH	1399	1	3,500
Mazandaran	Kimia Polymer HIRAD	1399	0	2,500
Alborz	POYAPOLIMER, TEHRAN	1399	1	2,000
Qazvin	ALMAS FANAVARAN GITTY	1399	57.86	1,500
Lorestan	RADIN Polymer Babak	1400	61.95	1,200
East AZARBAIJAN	SABZE ANDISH Innovative Petro Polymer Cooperative	1398	70.44	1,000
Tehran	BITA Polymer PASARGAD	1400	0	1,000
	Expansion Of Anahita Petrochemical	1400	0	1,000
Fars	FARA PAZHOHAN BASPAR Chemistry Edris	1400	0	1,000
Kurdistan	ASO KIMIYA DAHATO	1400	0	1,000
Qazvin	Mahan Iranian Smart Cars	1397	75.53	500
Tehran	MAJID PIRZADI	1400	0	200
Esfahan	ZARLIF ARYA	1399	0	100
Total				120,000

Table (9): Summary of the status and physical progress of units with plans to produce polymeric alloys

75–100		50–74		25–49		0–24		Physical progress (٪)
Nominal capacity (tons)	Number of units	Nominal capacity (tons)	Number of units	Nominal capacity (tons)	Number of units	Nominal capacity (tons)	Number of units	province
0	0	1,000	1	0	0	0	0	East AZARBAIJAN
0	0	0	0	0	0	20,000	1	Ardabil
0	0	0		0	0	100	1	Esfahan
0	0	12,000	1	0	0	9,500	3	Alborz
0	0	0	0	0	0	7,700	4	Tehran
0	0	0	0	0	0	1,000	1	Fars
500	1	1,500	1	0	0	0	0	Qazvin
0	0	12,000	1	0	0	10,000	1	Qom
0	0	0	0	0	0	1,000	1	Kurdistan
0	0	1,200	1	0	0	0	0	Lorestan
0	0	0	0	0	0	2,500	1	Mazandaran
0	0	0	0	0	0	40,000	2	Special Economic Zone
500	1	27,700	5			91,800	15	Total

By searching the customs information, a specific customs tariff is not assigned to polymer alloys; Therefore, the amount of its import and export is uncertain.

6) Physical progress of the project

■ No ☐ Yes

This plan is a new project and has been defined to cover the needs of steel industry of Khuzestan province. The stages of its construction phase have not made physical progress.

7) Operational plan and implementation scheduling

The time between implementation and utilization is estimated to be 24 months. Project production phase is expected at 1405 SH. The project scheduling is described in Table (*10*).

Table (10): Project Scheduling

year	1402				1403				1404				1405			
Operations/Season	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Pre investment studies																
Fundraising and starting																
Obtain legal permissions																
Providing engineering services																
Land purchase and preparation																
Selecting contractor																
Equipping site																
Construction and landscaping																
Order, purchase and transportation of machinery																
Machinery installation																
Facilities																
Hiring and onboarding of staff																
Unexpected delays																
Trial production																
production phase																

8) Financial Plan

8-1- Cost Estimation

Generally, there are two ways to fundraise for this project, fixed capital and initial working capital. The required investment before utilization is provided through fixed capital. Initial working capital will be used during utilization. Fixed capital includes, purchasing land, construction and landscaping, machinery and equipment, facilities, office stuff and pre-production costs. These types of costs are incurred at the beginning and before operation and are consumed during the life of the project according to their service life. Working capital includes the capital required during the operation of the project. The working capital of a production unit is the set of facilities, inventories and work in progress, as well as the liquidity required for the exploitation of fixed capital in order to maintain the operation.

Determining the basic amount for inventories, work in progress and claims depends on the supply, production and sales capacity and business environment. In this section, the evaluation and estimation of the required investment (based on the price of the base year 1401 SH) is proposed.

Table (11): Cost Estimations

No.	Subject	Amount (Million Rials)
1	Total Fixed Investment Costs	849,400
2	Total Net Working Capital Requirements	585,010
3	Total Production Costs (Annual)	2,946,842
4	Depreciation	75,472
5	Total Investment	1,434,410
6	Unit Cost (By Product Type)	-
7	Resin polymer alloys (Rials/number)	2,168,012
8	Rubber polymer alloys (Rials/number)	1,623,025
9	Thermoplastic polymer alloys (Rials/item)	2,782,459

Table (12): Fixed Capital Estimations (Capital Costs)

No.	Subject		Cost (Million Rials)
1	Purchasing land		24,000
2	Landscaping and land improvement		27,600
3	Civil operations and construction of buildings		390,000
4	Production machinery and equipment		258,000
5	Service equipment		75,000
6	Protection and environmental equipment		0
7	Overhead costs		0
8	Pre-Production Expenditure (As described in Table (14))	Prior to investment studies	1,220
		Project management	32,033
		Obtaining technology	2,747
9	Unexpected costs		379,600
Total			**849,400**

The primary items included in working capital are:

- Raw materials (local and foreign): To prevent any interruptions in production process, production capacity, source and method of supplying materials, length of time during ordering and receiving materials, time of delivery and transportation, the amount of required raw materials, auxiliary materials and packaging are determined as one of the working capital items for one period. In this project, the material inventory coverage period is equal to 90.
- Finished product and work in progress: Considering the steps and methods of production, the required time for production and storage has been determined and the related costs are considered as working capital. In the present plan, there is no coverage period for goods under construction and manufactured goods.
- Claims of expected funds from sold products that are collected in a short period of time. The duration for expected funds must be determined. According to the economic condition of Iran, cash is preferred.
- Revolving fund to finance the company's current expenses is considered as cash balance or revolving fund for a period of time in working capital based on production costs (without considering the cost of raw material production and depreciation). 30 days is considered in this plan.

Table (13): Total Net Working Capital Requirements (Production Costs)

No.	Subject	Amount (Million Rials)
1	Raw Materials Inventory	570,327
2	Work In Progress	0
3	Finished Product	0
4	Accounts Receivable	0
5	Cash-In-Hand	14,683
6	(Commercial Accounts Payable)	1
Total Net Working Capital Requirements		**585,012**

Table (14): Pre-Production Expenditure

No.	Subject		Description	Total (million Rials)
1	Incorporation		-	70
2	Obtaining Licenses / Production License		-	200
3	Studying, Consulting, Research and Development, Traveling, Visiting and Participating in Local Exhibitions, etc.		1.5 thousandth of the investment costs of the project	1,220
4	Property Insurance		2 thousandth of depreciable fixed assets	1,630
5	Survey Fee, Financing, Contract and So On		Survey fee 0.5 thousandth, other 2.5 thousandth	1,950
6	Cartography, Supervising		2 thousandth of contract expenses	1,350
7	Other's	Staff Training	Equivalent to 7days of Staff salary	1,397
		Wages And Salaries During the Construction	Equivalent to the salary of 7 personnel in 24 months	25,574
		Other Expenses	%4.3	1,479
Total				**34,870**

8-2- Sales Revenue

According to the production plan, the total sales amount of the project in 1405 at the constant prices of 1402 is estimated to be 2,430 billion Rials. This figure will increase in the following years due to the increase in production capacity and will increase to a maximum of 40,050 billion Rials.

Table (15): Project Revenue in The First 5 Years of Production Phase (Billion Rials)

No.	Subject	Q_1	Q_2	Q_3	Q_4	Total 1st Year	Total 2nd Year	Total 3rd Year	Total 4Th Year	Total 5th Year
1	Resin polymer alloys	365	365	365	365	1,458	1,701	2,187	2,430	2,430
2	Rubber polymer alloys	81	81	81	81	324	378	486	540	540
3	Thermoplastic polymer alloys	162	162	162	162	648	756	972	1,080	1,080
Total		**608**	**608**	**608**	**608**	**2,430**	**2,835**	**3,645**	**4,050**	**4,050**

8-3- Length of Production Phase

The construction period of the plan is equal to 24 months and it is considered to start from the beginning of 1402. Based on this, the operation of the project is expected from April 1405. The duration of the project is considered to be 5 years.

Table (16): Planning Horizon

Title	Month	-	year
Project identification	1	/	1402
Beginning of construction phase	1	/	1403
Beginning of production phase	1	/	1405
End of production phase	12	/	1409

Length of construction phase (months)	Start of phase (months)	Length of production phase (years)
24	12	5

8-4- Break-Even Analysis

From an economic point of view, break-even point analysis is an important technique that is used to study the relationship between costs, income and profit. The break-even point is the point at which total cost and total revenue are equal. In other words, it is used to analyze the effect of product volume change on the profit. The break-even point is calculated for 100% of practical capacity (year 1408SH onwards) below.

$$\text{Break-even sales value (Rials)} = \frac{\text{Total Fixed Costs}}{1 - \frac{\text{Total Variable Costs}}{\text{Sales Value}}}$$

$$\text{The number of sales at the break-even point} = \frac{F_C}{S - V_C}$$

FC = Total Costs VC= Average Variable Costs Q = Quantity of Sales S = Unit Price

$$\text{Break-even sales value} = \frac{141{,}795}{1 - \frac{2{,}806{,}805}{4{,}050{,}000}} = 461{,}931 \text{ (Million Rials)}$$

$$\text{The number of sales at the break-even point} = \frac{141{,}795{,}150{,}000}{5{,}357{,}143 - 3{,}712{,}705} \approx 86{,}227$$

$$\text{Break-even ratio (\%)} = \frac{461{,}931}{4{,}050{,}000} = 11.2\%$$

Table (17: Project break-even point estimation

Title	Production 1405	Production 1406	Production 1407	Production 1408	Production 1409
Sales revenue	2,430,000	2,835,000	3,645,000	4,050,000	4,050,000
Variable costs	1,696,170	1,973,829	2,529,146	2,806,805	2,806,805
Variable margin	733,830	861,171	1,115,854	1,243,195	1,243,195
Variable margin ratio (%)	30	30	31	31	31
Fixed costs	129,222	132,365	138,652	138,765	133,306
Break-even sales value	427,903	435,749	452,914	452,060	434,275
Break-even ratio (%)	17.6	15.4	12.4	11.2	10.7

- According to COMFAR Results

Based on the calculations of COMFAR software, the break-even point including operating and non-operating costs, is 452 billion Rials and it will be achieved in the 11.2 % of the practical capacity.

In the mentioned formula, the break-even point is determined by the relationship between fixed costs and the difference between unit sales price and unit variable costs. Therefore, three practical results are obtained from it:

- The higher the fixed costs, the higher the break-even point.
- The greater the difference between unit sales price and variable operating costs, the lower the break-even point. In this case, fixed costs are absorbed faster through the difference between unit sales price and unit variable costs.
- One of the break-even points is disproportionate. Since it makes the company vulnerable to changes in production (sales) levels.

8-5- Cost-Benefit Analysis

In project analysis, one of the most common methods is the **Benefit-Cost Ratio**. In this method, the ratio of the current value of possible benefits to the current value of costs is obtained. If this ratio is greater than one, the plan has economic justification for implementation. In terms of this index, the plan has favorable conditions.

Net Present Value is one of the other evaluation methods which is calculated according to the following relationship:

NPV= The Present Value of The Total Cost of The Period of Construction Phase and Production Phase - The Present Value of The Total Income of Construction Phase and Production Phase

NPV= The Present Value of The Fixed Assets Depreciation + Initial Investment - The Present Value of The Future Cash Flows

The **net current value** of the project at a discount rate of 30% is over 484billion Rials, which shows that the project is economically feasible.

One of the other methods of evaluating investment plans **internal rate of return**. In fact, the internal rate of return is the interest rate or the discount rate in which the current value of all the plan benefits is equal to the current value of its expenses.

According to the calculations, the internal rate of return of the project is estimated at 48.3 % and compared to the Minimum Attractive Rate of Return, it is favorable.

Table (18): Project Return Index

Index	Amount	Unit of measurement
The Present Value of The Total Cost of The Period of Construction Phase and Production Phase	5,991,907	Million Rials
The Present Value of The Total Income of Construction Phase and Production Phase	6,476,152	Million Rials
NET PRESENT VALUE (NPV)	484,245	Million Rials
Cost-benefit RATIO (B/C)	1.08	-
INTERNAL RATE OF RETURN (IRR)	٪48.3	Percent
NPV RATIO (PI)	0.45	Rial per Rial of investment
NORMAL PAYBACK	2.27	Year

Profitability Index (PI) indicates how much economic profit will be obtained for each unit of money invested during the lifetime of the project

Project Investment payback is the period of time required to recover the project investment from net income, measured in years. In other words, it shows the length of time taken for the initial investment to be returned. This index shows the speed of investment return and the amount of project risk coverage. The ROR (simple) of the plan is estimated to be 2.27 years (equal to the year 1407) according to the calculations.

8-6- Sensitive Analysis

In the sensitivity analysis of the plans, the percentage of changes in the internal rate of return (IRR) is measured in relation to the change in some basic parameters and variables. In this plan, the analysis has been carried out by major variables such as sales, fixed and operating costs. Table (19) shows the results of the sensitivity analysis regarding the variables of sales income, fixed assets and operating costs.

8-7-1- Sales Revenue

Changes in sales revenue are mainly caused by alteration in two variables: planned sales amount and product sales price. The results of the sensitivity analysis regarding sales income show; 4% increase in sales revenue of the plan, the internal rate of return will increase from 48.3 % to 55%. On the contrary, in the case of a 4% decrease in sales revenue, the internal rate of return of the project will decrease to 42%.

Table (19): Sensitivity Analysis (Percentage of IRR changes caused by sales revenue, fixed assets and operating costs alteration)

Variation (%)	Sales revenue	Increase in fixed assets	Operating costs
-20%	13%	57%	70%
-4%	42%	50%	53%
0%	48%	48%	48%
4%	55%	47%	44%
20%	78%	42%	24%

8-7-2- Fixed Assets

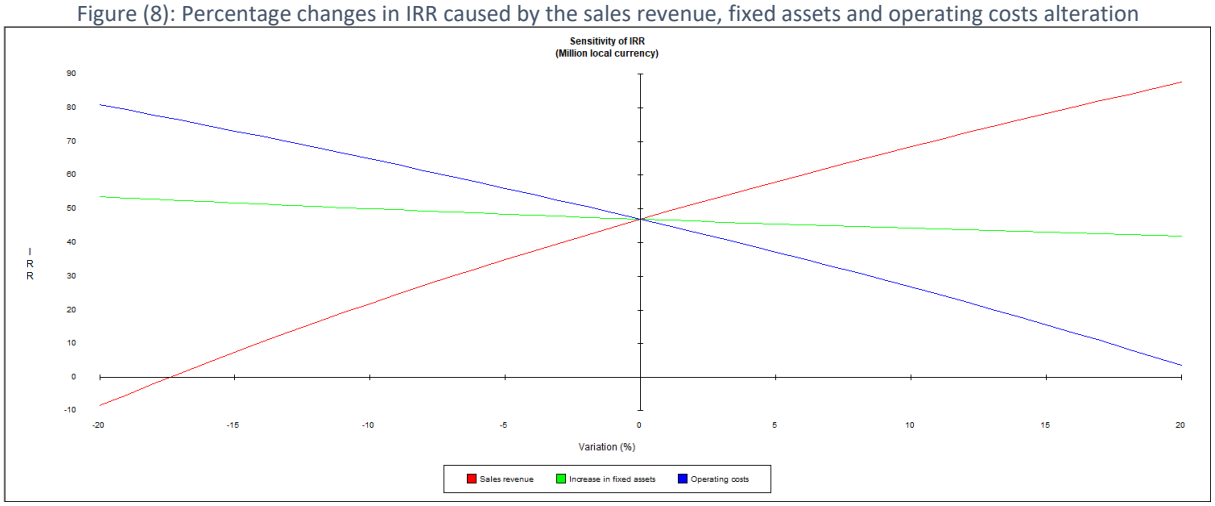
The change in the fixed assets is due to the fixed costs of the initial investment alterations. The results of the sensitivity analysis according to the fixed costs of the plan have been done and it shows that in case of an unexpected 20% increase in the fixed capital costs of the project, the internal rate of return will decrease from 48.3 % to 42%. Conversely, if there is a 20% reduction in the fixed capital costs, the internal rate of return will increase and reach 57%.

8-7-3- Operating Costs

The operating costs of the plan is one of the crucial items in terms of sensitivity analysis regarding its changes. Therefore, unexpected and possible changes should be investigated.

The change in project operating costs is mainly caused by changes in raw material, supply, human resource and finally changes in other overhead costs of projects. If these parameters change, it can be as a result of the change in the technical coefficients of product production or the change in their purchase price. The sensitivity analysis indicates that in case of a 4% increase in the operating costs, the efficiency rate of the plan will decrease to 44%. On the contrary, if the total operating costs of the project are reduced by 4%, the internal rate of return will increase to 53%. Finally, the results of the sensitivity analysis show that the current project has a very high sensitivity to changes in sales revenue (changes in sales amount or sales price) and more considerations should be taken in this regard.

Figure (8): Percentage changes in IRR caused by the sales revenue, fixed assets and operating costs alteration



As you can see, the slope of the IRR change curve is higher relative to the changes in sales revenue compared to other items while the slope of the IRR change curve is lower relative to the changes in fixed assets, which indicates the greater sensitivity of the plan's internal rate of return to sales revenue and its lower sensitivity relative to operating costs and fixed assets.

8-7- Conclusion

The implementation of the project is planned by acquiring a land with an area of 12,000 square meters and carrying out construction in the substructure of 4,000 square meters. The total investment in land and building is estimated at 442 billion Rials and the total investment in main and auxiliary equipment is estimated at 372 billion Rials. The total pre-operational costs are estimated at 36 billion Rials, including the total required fixed capital of 849 billion Rials and the total working capital required for the project is 585 billion Rials. The total investment of the project is expected to come from the resources of the company's shareholders.

The sale of the plan in 1405 is predicted at fixed prices equal to 2,430 billion Rials. This figure will increase in the following years due to the increase in production capacity and will increase to a maximum of 4,050 billion Rials. The net profit of the plan has been positive in all years. The profit figure in 1405 is equivalent to 453 billion. The profit will increase in the following years and will reach a maximum of 832 billion Rials. The average annual profit of the plan is 687 billion Rials and the average profit margin is expected to be 19.7%. The internal rate of return (IRR) of the plan is also estimated at 48.3% and the investment return period (PBP) is estimated at a maximum of 2.27 years. Also, the net present value of the project's cash flows (NPV) is positive and, taking into account the expected interest rate of 30%, is equal to 484 billion Rials. The internal rate of return (IRR) of the plan is also estimated at 51% and the investment return period (PBP) is estimated at a maximum of 5.24 years. Also, the net present value of the project's cash flows (NPV) is positive and, considering the expected interest rate of 30%, is equal to 2,506 billion Rials.

The liquidity status of the plan and the payment of dividends to the shareholders from the company's funds are also acceptable. Therefore, if the assumptions and predictions are fulfilled, this plan has favorable profitability and according to the financial results obtained, its implementation is recommended. The economic features of the plan are summarized as follows.

Table (20): Summary of Economic Features

Nominal Capacity and Unit of Measurement	Product Name	Title Of the Project with ISIC Code	Title Of the Project
2100 tons	All kinds of alloys and polymer masterbatch	All kinds of alloys and polymer masterbatch (2413312507)	Production of polymer alloys
Required Human Resource (Person)	Equity Shares (Million Rials)	Total Fixed Capital (Million Rials)	Project Duration
43	585,010	849,400	24
B/C	Applicant Available Cash (Million Rials)	Net Present Value (NPV) (Million Rials)	IRR (%)
1.1	1,434,410	484,245	48.3%
ROI (%)	NPV Ratio / Profitability Index (Rial per Rial invested)	Dynamic Payback Period (Year)	Normal Payback Period (Year)
46	0.45	3.76	2.27
Average Assets Turnover Ratio	Average Net Profit Margin (%)	Average Annual Profit (Million Rials)	Maximum Annual Sales (Million Rials)
1.41	19.7%	653,465	4,050,000

8-8- Estimation of currency rate fluctuation during the project implementation

The exchange rate at the time of evaluation is included as described in Table (18. The purchase and sale prices are under the energy exchange transactions and are adjusted to a large extent under the influence of the exchange rate increase. Therefore, exchange rate fluctuations regarding the purchase of foreign equipment will be compensated to some extent by the income from sales, and exchange rate fluctuations will have little effect on the evaluation results. Therefore, in the construction and implementation phase, if the financing of the project is through foreign currency sources of finance, the amount of financial resources required will not change much.

Table (21): Currencies exchange Rate

Unit of Measurement	Unit Price	Currency
Rials	413,204	USD
Rials	451,531	EURO

Exchange rate of Central Bank, Exchange Trading System (ETS) dated 05/25/1402

9) Investment Required, method of fundraising and guarantees

9-1- Foreign Currency Required

Although some of the equipment used in the plan may be made abroad, fixed capital in foreign currency is not included in this plan and all the fixed investment costs of the plan are considered in Rials.

Table (22): Foreign (Fixed) Currency Required

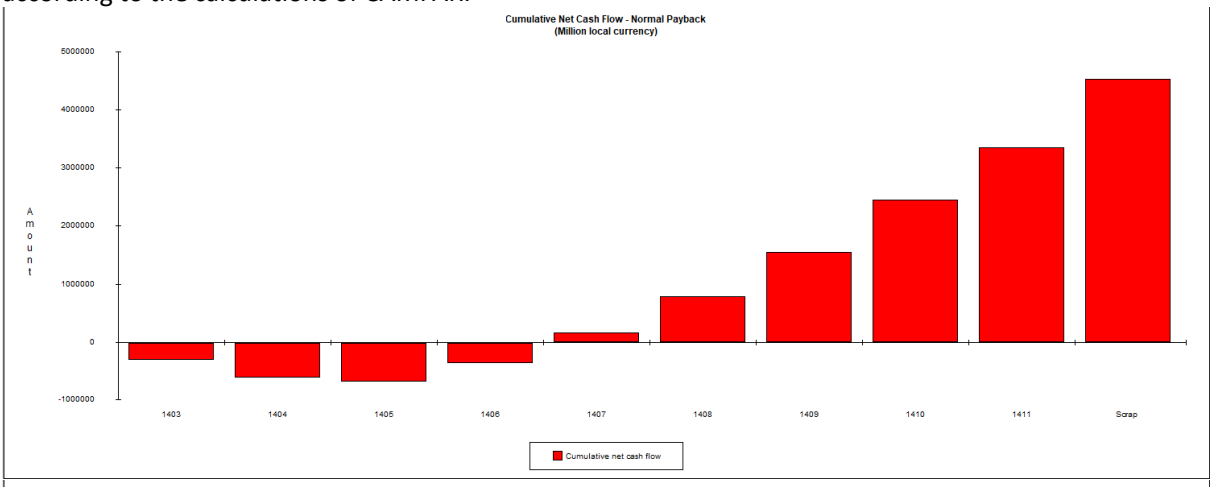
No.	Year	Required Investment
1	Year 1	0
2	Year 2	0
3	Year 3	0
4	Year 4	0
5	Year 5	0

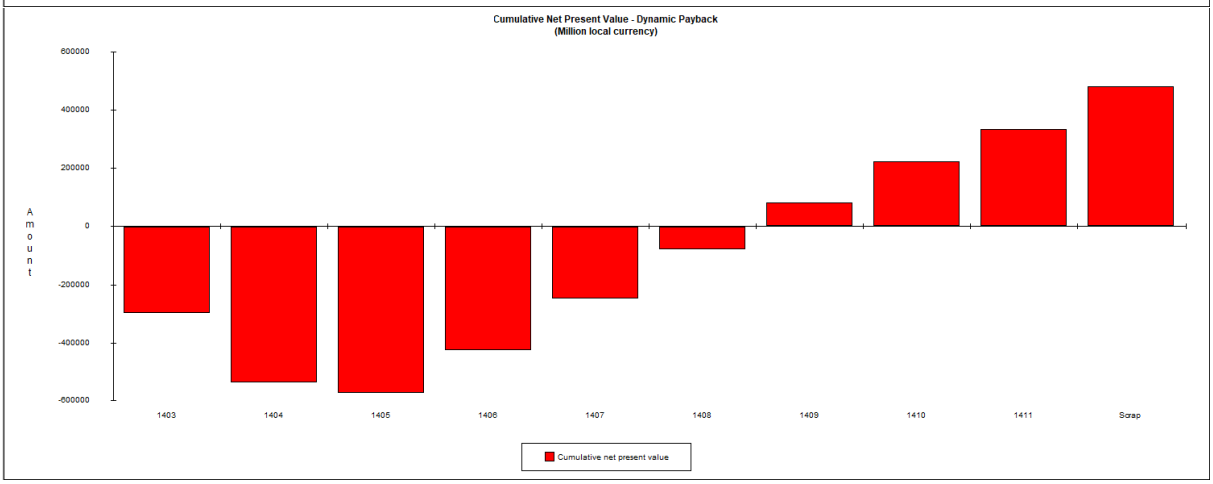
9-2- Model Of Partnership and Fundraising

Participation in the present project and its fundraising process is predicted to be in the form of establishing a company inside Iran. The total required investment is predicted through the investor's contribution. Financing through local banks has not been included in the fundraising process.

9-3- Payback Period

The payback period is the period of time when the initial investment of the plan is compensated from the annual cash funds. The payback period (normal) of the plan is estimated to be 2.27 years (equal to 1408) according to the calculations of CAMFAR.





Dynamic Payback Period of the plan is also estimated at 3.76years.

10) Incentives, features and benefits of the plan

Some of the financial supports for production companies are loans and bank facilities and tax exemptions which can facilitate the project implementation and provide the favorable condition for investment. In the following, some of these supports will be discussed.

One of the important bank facilities for production units is the long-time repayment period loans up to 70% of fixed capital by the Iran's state banks. This amount can be increased up to 90% for deprived areas if foreign machinery is used. The interest rate of long-term facilities in the industry sector is 23%, which in case of financial prudence, only a part of the interest can be repaid. The repayment period of long-term bank facilities is up to 8 years according to the production plan, the type of technology and the possibility of product exportation.

Another important bank facility is short-term bank loans (6 to 12 months) to use as working capital needed to carry out production processes, which will be provided up to 70% by bank communities. Obtaining short-term facilities to this extent depends on gaining the trust of the operating banks and having an acceptable financial history.

Tax exemption is another incentive for investors to establish factories. To name a few;

- Tax exemption for up to 10 years for implementation in deprived areas
- Tax exemption for up to 4 years for implementation in industrial towns

Investments in the project during implementation is of the investments in developed towns with industrial and mining activities. Since it is located within 30 kilometers of cities with more than 300,000 people, it doesn't have any tax exemption. But if it establishes in another industrial town within a range of more than 30 kilometers from cities with a population of more than 300 thousand people, it can get exempted from Article 132 of the Direct Taxes Law and up to 80% until four years after the date of operation from Article 105 (Direct Taxes Law)1.

So, the effective performance tax rate (annual profit) can be reduced to 4% in the first 4 years, and then it will be considered on the basis of 20%. Obviously; If the project location is in one of the deprived areas, it will be subject to 10 years of 100% exemption.

If the manufactured products (provided that it is in excess of the local market) can be exported to foreign markets, it can be exempted from Article 141 and 100% of the income from exports is exempt from taxes.

Obviously, If the legal personality of the partnership is defined as a public company accepted in the stock exchange market during its operation (in such a way that its shares can be traded with stock brokers), this type of company is subject to Article 143 of the Direct Taxes Law and up to 10% of the company's tax will be exempted.

1 - The exemptions of this article will not include the income of production and mining units located within a radius of 120 kilometers from the center of Tehran and 50 kilometers from the center of Isfahan, 30 kilometers from the centers of provinces and cities with more than 300 thousand people (according to the latest census).

(Attachment Number 2)

Summery Sheet

Project introduction
1. **Project Title**: Polymer Alloy Production Plan
2. **Sector:** Production sub-sector: Industry
3. **Products/services:** All kinds of alloys and polymer masterbatch
4. **Location:** Khuzestan, Ahvaz city, Ahvaz Industrial Estate No 5
5. **Project description:** The implementation of the project is planned by acquiring a land with an area of 12,000 square meters and carrying out construction in the substructure of 4,310 square meters. The total investment in land and building is estimated at 442 billion Rials and the total investment in main and auxiliary equipment is estimated at 372 billion Rials. The total pre-operational costs are estimated at 36 billion Rials, including the total required fixed capital of 849 billion Rials and the total working capital required for the project is 585 billion Rials. The total investment of the project is expected to come from the resources of the company's shareholders. The sale of the plan in 1405 is predicted at fixed prices equal to 2,430 billion Rials. This figure will increase in the following years due to the increase in production capacity and will increase to a maximum of 4,050 billion Rials. The net profit of the plan has been positive in all years. The profit figure in 1405 is equivalent to 453 billion. The profit will increase in the following years and will reach a maximum of 832 billion Rials. The average annual profit of the plan is 687 billion Rials and the average profit margin is expected to be 19.7%. The internal rate of return (IRR) of the plan is also estimated at 48.3% and the investment return period (PBP) is estimated at a maximum of 2.27 years. Also, the net present value of the project's cash flows (NPV) is positive and, taking into account the expected interest rate of 30%, is equal to 484 billion Rials.
6. **Annual Capacity:** 2100 ton

Project Status
7. **Local/internal raw material access**: 100%
8. **Sales:** 4,050 (Billion Rials) **Anticipated local market:** 80% **Anticipated export market:** 20%
9. **construction period:** 24 months
10. **project status:** - Feasibility study available? Yes. The feasibility of the project has been evaluated from different aspects and the results of the feasibility study are favorable in terms of market, engineering, financial and economic indicators. - Required land provided? Yes. Currently, there is industrial land in Ahvaz Industrial Town 5, and it has been selected based on geospatial criteria for the implementation of the project. - Legal permission (establishment license, foreign currency quota, environment) taken? Yes. It is possible to obtain legal permits for this plan. In order to settle in the industrial town, the project must obtain legal permits from the organization of industry, mining, trade and environment of Ahvaz city. - Partnership agreement concluded with local/foreign investor? So far, no partnership agreement has been prepared for the implementation of the project. This plan has the necessary features to attract shareholders' financial resources. - Agreement with local/foreign contractor(s) concluded? So far, no agreement or contract has been concluded for the purpose of manufacturing domestic and foreign machinery. - Infrastructural utilities procured? If the project is established in industrial towns (such as Ahvaz Industrial Town 5), infrastructure facilities such as water and electricity, roads, etc. are available. - List of know-how, machinery and equipment concluded? The technical knowledge of making polymer alloy and machines in question currently exists in the country and should be in accordance with the domestic standard. - Financing agreement for machinery, equipment and know-how concluded? No

Financial structure

11. Financial table:

Description	Local Currency Required			Foreign Currency Required	Total Euro
	Million Rial	Exchange Rate	Euro		
Total Fixed Investment Costs	849,400	451,531	1,881,155	0	1,881,155
Total Net Working Capital Requirements	585,010	451,531	1,295,615	0	1,295,615
Total Investment	1,434,410	-	3,176,771	0	3,176,771

- Value Of Foreign Equipment/Machinery: 0 Euro
- Value Of Local Equipment/Machinery: 737,491 Euro
- Value Of Foreign Technical Know-How: 0 Euro
- Value Of Local Technical Know-How: 0 Euro
- Net Present Value (NPV): 483,058 Euro Net present values discounted to: 1403
- Internal Rate of Return (IRR): %48.3 ٪
- Normal Payback: 2.27 year Equivalent to 27.24 months
- Minimum Attractive Rate of Return: %30 ٪

General information

12. Project Type: new Project ☑ Explanation / Rehabilitation project ☐

Name / Company name: -

Address: Khuzestan, Ahvaz city, Ahvaz Industrial Estate No. 5

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Email: mh_rahimzade@yahoo.com Website:

Local entrepreneur: Private Sector ☑ government /public sector ☐