

Islamic Republic of Iran  
Organization for Investment, Economic and Technical Assistance of Iran

## Technical-Economic Pre-Feasibility Summary

Plan Name:  
Poly-Stal Production Plant

Sector: productive

Sub-sector: chemical industry

ISIC code: 2431412348

The owner of:  
Industry, Mine and Trade

Counselor plan:  
Razi University

Plan Address:  
Economic Zone of Islamabad-e-Gharb

P.F.S Preparation Date:  
23/10/2024

National Investment Opportunities Database  
Management of Iran  
Shahrig Engineering Group  
[www.shahrig.com](http://www.shahrig.com)



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## 1- Abstract:

### PROJECT PROFILE - SUMMARY SHEET

Project Introduction
<b>1- Project title: Polysteel production</b>
<b>1- Sector :</b> Industrial chemicals and chemical products <b>Sub sector:</b> Plastic materials in primary form and manufacturing synthetic rubber and polyesters
<b>3- Products / Services:</b> The target product of the project is from the group of manufacturing chemical materials and chemical products (24) from the sub-group of manufacturing plastic materials in primary form and manufacturing synthetic rubber (2413), polyesters (2431412348). The target products of the project are under tariff subchapters (3907) of Iran's customs regulations under the title "polyesters, other polyethers and epoxy resins, in primary forms; polycarbonates, alkyd resins, allylic polyesters and others" Polyesters, in primary forms, are imported and exported under the tariff (39071000).
<b>4- location (address):</b> Kermanshah, West Islamabad city, Zagros special economic zone

**5- Project description:**

According to the existing standards of polyester production, to build a polyester production unit with a capacity of 40,000 tons per year, 100,000 square meters of land is needed, of which 28,000 square meters of covered space and 72,000 square meters of unroofed space and the rest is needed for the open area of the industrial unit. For this set, a power supply and transformer have been selected, which will be provided from the electricity of the West Islamabad Special Economic Zone. Also, the concession of water from the special economic zone of West Islamabad is considered for the complex. The plumbing of the area, inside the sheds and other parts of the production unit will be done by the qualified contractor. 140 skilled workers, 200 unskilled workers, 360 experts and 24 people are needed in other departments as direct workers.

**6- Annual production capacity:** 40,000 tons per year

<b>Project Status</b>																		
<p><b>7- Local / internal raw material access :</b> yes</p> <p><b>8- Sale:</b>  - Anticipated local market: 50%  - Anticipated export market :50%</p> <p><b>9 – Total time required to build the project:</b> The implementation of the project until its operation is planned for 29 months.</p> <p><b>10- Project status:</b></p> <table> <tr> <td>- Feasibility study available?</td> <td>Yes</td> </tr> <tr> <td>- Required land provided?</td> <td>No</td> </tr> <tr> <td>- Legal permissions (establishment license, foreign currency quota, environment, etc) taken?</td> <td>No</td> </tr> <tr> <td>- Partnership agreement concluding with local /foreign investor?</td> <td>No</td> </tr> <tr> <td>- Financing agreement concluding?</td> <td>No</td> </tr> <tr> <td>- Agreement with local /foreign contractor(s) concluding?</td> <td>No</td> </tr> <tr> <td>- Infrastructural utilities (electricity water supply, telecommunication, fuel, road, etc) procured?</td> <td>yes</td> </tr> <tr> <td>- List of know- how, machinery, equipment, as well as seller /builder companies defined?</td> <td>yes</td> </tr> <tr> <td>- Purchases agreement machinery, equipment and know-how concluded?</td> <td>No</td> </tr> </table>	- Feasibility study available?	Yes	- Required land provided?	No	- Legal permissions (establishment license, foreign currency quota, environment, etc) taken?	No	- Partnership agreement concluding with local /foreign investor?	No	- Financing agreement concluding?	No	- Agreement with local /foreign contractor(s) concluding?	No	- Infrastructural utilities (electricity water supply, telecommunication, fuel, road, etc) procured?	yes	- List of know- how, machinery, equipment, as well as seller /builder companies defined?	yes	- Purchases agreement machinery, equipment and know-how concluded?	No
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<b>Financial Table</b>																		

## 11- Financial structure:

Descriptions	Local Currency Required			Foreign Currency Required Million Euro	Total Million Euro
	Million Rials	Rate Euro	Equivalent in Million Euro		
Fix Capital	43420020	700000	62		62
Current Capital	8684004	700000	12.40		12.40
Total Investment	52104024	700000	74.43		74.43

- Value of foreign equipment / machinery .....0..... Million Euro
- Value of local equipment / machinery .....51.47..... Million Euro
- Value of foreign technical know-how.....0..... Million Euro
- Value of local technical know-how.....0..... Million Euro
- Net present value (NPV): .....157.98..... Million Euro
- Internal Rate of Return (IRR): ..51.95..... %
- Capital Rate of Return: ...20.00..... %
- Payback Period 4 years & 5 months

## General Information

12 - Project type : Establishment ☒

Expansion and completion ☐

### 13- Company Profile

- Name (Legal/Natural persons): 1. Dr. Yosef Mohamadifar 2. Dr. Bijan Rezaee

- Company's current activities: Razi University

- Address: Razi University, Taq-e Bostan, Kermanshah, Iran.

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Fax: +988334277605-6

E-mail: [info@razi.ac.ir](mailto:info@razi.ac.ir)

Web Site: <https://en.razi.ac.ir>

- Company's legal structure :

Government ☒

Non-Governmental ☐

Public non-governmental ☐

## 2- Plan Location:

### 2-1- Province:

Kermanshah Province encompasses an area of 25,009 square kilometers, making it the seventeenth largest province in the Islamic Republic of Iran. The provincial capital is the city of Kermanshah. Geographically situated in the

(Province Location Map Within the Country)



western region of the country, the province extends between the coordinates of 33°40' to 35°18' North latitude and 45°24' to 48°07' East longitude. It shares borders with Kurdistan Province to the north, Lorestan and Ilam Provinces to the south, Hamedan Province to the east, and it has a 371-kilometer border with Iraq to the west. The average elevation of Kermanshah Province is approximately 1,200 meters above sea level, which accounts for 1.5% of the total land area of Iran. In terms of administrative divisions, Kermanshah Province is divided into 14 counties, comprising 31 cities, 86 districts, and a total of 2,793 inhabited villages. According to the latest census conducted by the Statistical Center of Iran in 2016, the province's population is recorded at 1,952,434, resulting in a population density of 78 individuals per square kilometer. The city of Kermanshah holds the distinction of being the most populous, with a resident count of 946,651. Regarding infrastructure, Kermanshah ranks eleventh in the nation for total road length, excluding rural roads, seventeenth in the length of highways and freeways per 1,000 kilometers of road, and eighteenth in the length of main roads. The majority of the province's road network is concentrated in Kermanshah County, reflecting its expansive land area.

The extensive network of intercity and rural roads in Kermanshah Province presents significant opportunities for the enhancement of many roadways into highways through ongoing infrastructure development plans. The province features six border markets—Khosravi, Parviz Khan, Somar, Shushme, Sheikh Saleh, and Tileh Kuh—which, in conjunction with its tourism potential, could substantially contribute to the generation of foreign exchange and the augmentation of national revenue. A pivotal strategy in realizing this objective includes the development of roads and transportation infrastructure. Additionally, Kermanshah International Airport is regarded as one of the leading airports in the country in terms of flight volume, with future plans for a railway plan intended to connect the Khosravi border to Iraq. Kermanshah province is a mountainous and elevated region, with 70.8% of its area consisting of mountainous terrain. The remaining area of the province includes 22.1% flatlands and 7.1% foothill areas. In terms of elevation classification, 76.5% of the province lies within the elevation range of 1000 to 2200 meters, with the 1400–1800 meter range being the most prevalent. If we divide Kermanshah into two major elevation classes, one below 1400 meters and one above 1400 meters, about 58.2% of the province's area falls above 1400 meters, while the remaining 41.8% is situated at elevations lower than 1400 meters. Thus, Kermanshah is not only a mountainous region but also has significant elevation. Kermanshah province has a temperate mountainous climate. In the 4th century AD, Kermanshah, which was then a village with pleasant weather, was chosen as the second royal residence of the Sassanids. During the Sassanid period, large gardens were built in this region, and it remained a recreational place for Sassanid kings for a long time. In the Islamic period, the city of Kermanshah was repeatedly described as a city with a mild climate, flowing waters, abundant trees and fruits, and inexpensive goods. Ibn Faqih, in his book "Al-Buldan," written in 290 AH,

mentions Kermanshah as follows: The Kurds are the indigenous inhabitants of Kermanshah province. Kermanshah is the homeland of some of the largest Kurdish tribes, clans, and nomadic groups, such as Zangeneh, Kallar, Goran, Jaf, Sanjabi, Qolkhani, Keliayi, Bajalan, Zola, Jameer, and the Lak tribes, including Jalalvand, Kakavand, Osmanvand, Payarvand, and Balavand. Although in official statistics, the Laks are considered part of the Kurdish ethnic group, the Turkish-speaking people of Kermanshah, along with the Keliayi Kurds, live in the city of Sonqor and speak the Sonqori Turkish dialect. Sonqori is a variant of Azerbaijani Turkish, often referred to as a transitional form between Azerbaijani Turkish and Khorasani Turkish. Additionally, a group of Lur people live in the city of Kangavar. These people primarily speak the Thulathi Luri dialect. Over the past two centuries, people from other provinces of Iran, especially from Hamedan, Markazi, Isfahan, Semnan, and others, have migrated to the city of Kermanshah. Several non-Kurdish families, including the Al-Aqa, Nojumi, Meybudi, Fayz Mahdavi, Shahrestani, Sedoughi, Mohammadi Iraqi, Kazazi, Jabari, Dezfuli families, and others, have migrated to Kermanshah for religious purposes and to promote the Shiite faith. The impact of these migrations can be observed in the development of the Kermanshahi Persian accent.

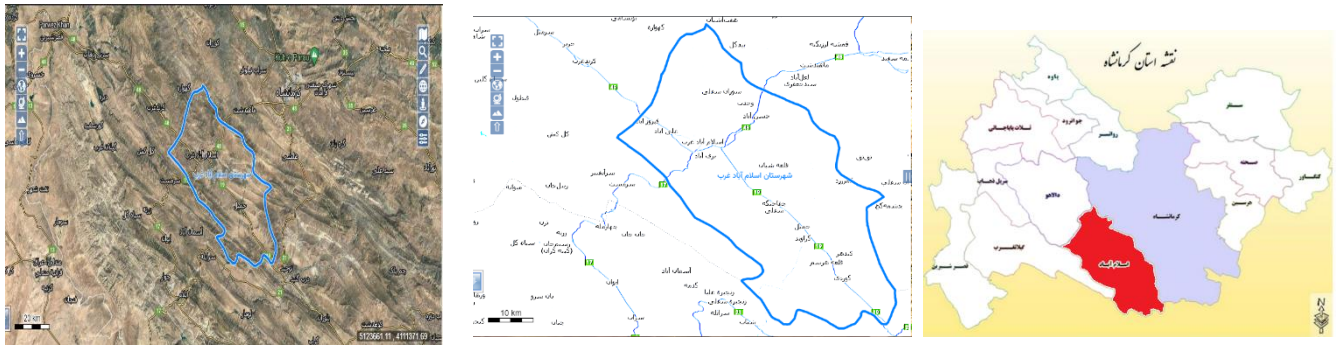
## **2-2. County:**

Islamabad-e-Gharb County, with an area of approximately 2,125.05 square kilometers, accounts for 8.5% of the total area of Kermanshah province. Located in the southern part of the province, this county is bordered by the following regions: to the north, it borders Dalahoo County; to the south, it borders the Lorestan province; to the east, it borders Kermanshah County; and to the west, it borders Gilan-e-Gharb County. The county has two urban centers, two districts, seven rural



districts, and 172 inhabited villages. The county has a history dating back 6,000 to 7,000 years. Geographically, this county is a key point of connection for four provinces: Kermanshah, Ilam, Lorestan, and Khuzestan. Its location on the route to Karbala further enhances the strategic importance of the area.

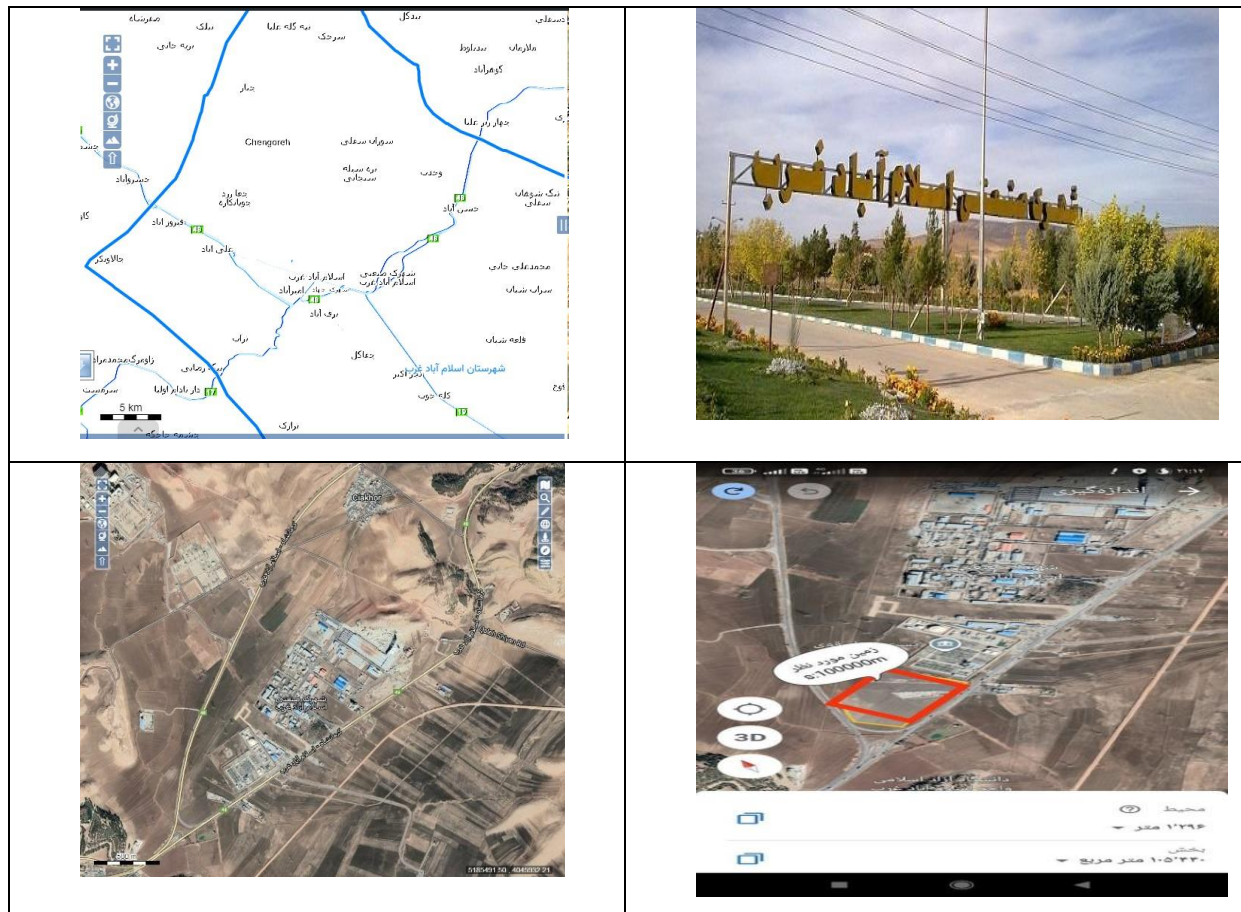
(County Location Map Within the Province)



### 2-3. Project Location:

Islamabad-e-Gharb is a special economic zone located in the county of Islamabad West in Kermanshah province, Iran. During the first provincial visit of the government delegation to Kermanshah on December 30, 2006, the establishment of the Islamabad-e-Gharb Special Economic Zone was approved. It was later ratified by the Iranian Parliament on October 4, 2010. On November 11, 2010, the law to create the special economic zone was issued by the President of Iran. Initially, the Municipalities Assistance Organization of Kermanshah Province was designated as the executing body for the special zone. From August 12, 2011, the responsibilities were transferred to the Zagros Special Economic Zone Organization. The Zagros Special Economic Zone was created with the aim of regional growth and development, executing regional development policies, establishing economic and industrial hubs, fostering economic growth in the province, utilizing the potential capabilities of Kermanshah, attracting foreign and domestic investments, creating job opportunities, acquiring knowledge and transferring technology, upgrading

technological standards, and using advanced and modern economic technologies through scientific and industrial cooperation with international companies. The zone also supports industries and industrialists by providing necessary facilities, processes local raw materials, converts them into final goods for export, reduces production costs to compete in global markets, and pursues several other strategic objectives.



**Table 1- Infrastructure Accessibility:**

No.	Required Infrastructure	Distance to Project Location	Infrastructure Source	Available Infrastructure Capacity
1	Water	0	Special Economic Zone	676.45 liters per second
2	Electricity	0	Special Economic Zone	21.45 kWh per hectare
3	Gas	0	Special Economic Zone	187,902 cubic meters per hour
4	Telecommunications	0	Special Economic Zone	--

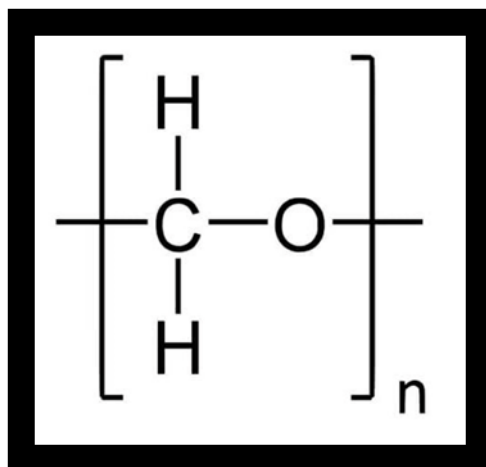
5	Main Road	0.4 kilometers	Islam Abad-e Gharb Highway	---
6	Secondary Road	0	Special Economic Zone	---
7	Airport	103.5 kilometers	Shahid Ashrafi Airport	---
8	Port	-	-	---
9	Railway Station	101.9 kilometers	Kermanshah Railway	---

#### **Explanation for the Chosen Project Site:**

Poly Stal, also known as polyacetal, is a specialty-level product in the petrochemical industry. Based on the first phase of studies, the potential for implementing this plan exists in all counties of Kermanshah province. Further investigations, considering important factors such as raw material supply, infrastructure facilities, access to communication routes, availability of human resources, environmental considerations, government exemptions, and the location of other competitors, show that the Islamabad-e-Gharb Special Economic Zone is well-suited for the proposed plan. It is worth mentioning that the Islamabad-e-Gharb Petrochemical Company, located within the economic zone, is the largest producer of methanol in the country, and methanol is the primary feedstock for producing Poly Stal. Some advantages of implementing the Poly Stal production plan in this zone include easy access to feedstock, ancillary facilities, proximity to export markets, and various other infrastructure. These factors will help reduce costs and create significant synergy among the companies operating in the area, leading to economic growth in the private sector and foreign currency earnings. Further collaboration between national academic institutions and the industries in these zones could play a vital role in overcoming technological barriers. Additionally, the availability of inexpensive labor and access to diverse gaseous and liquid feedstocks, when combined with effective and timely regulation, will pave the way for attracting both domestic and foreign investments.

### 3- History of Poly Stal Production:

Formaldehyde was first recognized as an important chemical in the 1920s. During this period, early research on formaldehyde polymerization and resin production began. In 1952, German scientists Georg Schutz and Helmut Gertner successfully synthesized Poly Stal (POM). This polymer gained significant attention due to its outstanding mechanical and chemical properties. In the 1960s, the mass production of Poly Stal began, and various companies started manufacturing this material. One of the first major producers was Celanese, which named its Poly Stal product "Delrin." In the 1970s and 1980s, as the demand for engineering materials with specific properties increased, the use of Poly Stal expanded across various industries. It was recognized as a suitable alternative to metals and other plastics. Since the 1990s, further research has been conducted to improve the properties of Poly Stal. The addition of additives, such as glass fibers and other compounds, to enhance its strength and thermal resistance became common. Additionally, the use of Poly Stal in industries such as electronics, automotive, and medical fields significantly increased. With the ongoing technological advancements and research, it is expected that new applications and properties for this polymer will continue to be developed.

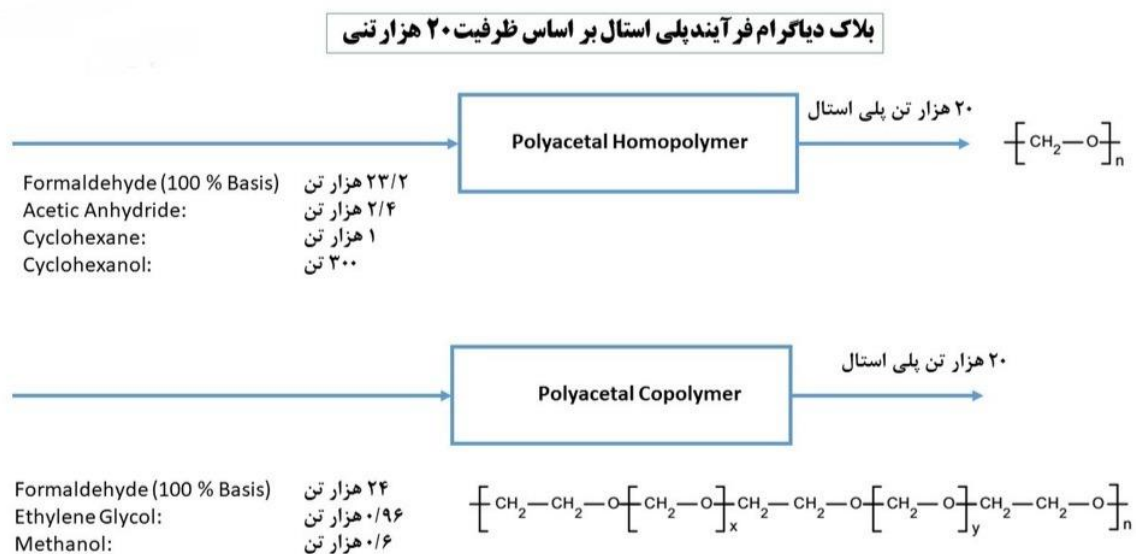


### 4- Technical Specifications of the Plan:

The product under consideration in the plan belongs to the category of chemical materials and chemical products (24), specifically in the subcategory of the production of plastic materials in their primary form and synthetic rubber manufacturing (2413), Poly Stals (2431412348). The products are

categorized under the tariff subheading (3907) of Iran's Customs Regulations, titled "Poly Stals, Other Polyethers, and Epoxy Resins, in Primary Forms; Polycarbonates, Alkyd Resins, Acrylic Polyesters, and Other Polyesters, in Primary Forms," and are imported and exported under the tariff code (39071000). Poly Stal, or Polyoxymethylene, abbreviated as POM, is part of the thermoplastic family and polymer products. It has thermoplastic properties. Poly Stal is a new and widely used chemical compound in various industries, as shown in the image of this chemical compound. Other names given to this material include Hostaform, Delrin, Duracon, Celcon, and Ultraform. "Stal" refers to Poly Stal, which is an engineering plastic with stalling groups. Stal is formed by protonating the hydroxyl group of hemi-stal and losing water. The resulting oxonium ion quickly attacks an alcohol molecule, which loses a proton, and the stalling group attaches to it. Although stals are more stable than hemi-stals, their formation is reversible due to the presence of esters. Poly Stal is produced and supplied in two types: homopolymer and copolymer. The manufacturing process for each of these is different. To make homopolymer Poly Stal, anhydrous formaldehyde must be produced. The primary method involves reacting aqueous formaldehyde with an alcohol to create a hemi-formal, dehydrating the hemi-formal/water mixture (through extraction or vacuum distillation), and releasing formaldehyde by heating the hemi-formal. Formaldehyde then undergoes anionic polymerization, and the resulting polymer is stabilized with acetic anhydride. Due to the manufacturing process, large diameter sections of the homopolymer may have central voids. In general, to create copolymer Poly Stal, formaldehyde needs to be converted into trioxane. This is done with an acid catalyst (such as sulfuric acid or acid ion-exchange resins) followed by purifying the trioxane through distillation or extraction to remove water and other hydrogen-containing impurities. In the

copolymer, 1 to 5 percent of CH<sub>2</sub>O is replaced by CH<sub>2</sub>CH<sub>2</sub>O. The production of copolymer Poly Stal requires converting formaldehyde into trioxane (especially 1,3,5-trioxane, also known as trioxane). This process is made possible using an acid catalyst (sulfuric acid or acid ion-exchange resins). The produced trioxane is dehydrated through distillation or extraction, and its hydrocarbon impurities are removed. Typically, di-oxalan is used as a copolymer, but ethylene oxide can also be used. Copolymer Poly Stals have better long-term mechanical properties, chemical resistance, and wear resistance compared to homopolymers, and they also show significant heat stability. To prevent thermal oxidation and enhance the internal strength of Poly Stal, special additives are used along with these materials.



**Table 2: Poly Stal Production Diagram**  
**Source: Value Chain Study Center**

This chemical material is resistant to compression and impact, which is why it is sometimes used as a substitute for non-ferrous metals. POM (Polyoxymethylene) is produced through the polymerization of formaldehyde,

assisted by an anionic catalyst such as triphenylphosphine, and has a high crystallinity. Additionally, this material can be reinforced with glass fibers to increase its creep resistance. Ultimately, with its high strength and resistance to chemical solvents, it has become a popular material among chemical engineers. Poly Stal exhibits good stability at high temperatures and under various environmental conditions. This polymer is easily machinable and formable. Due to its unique molecular structure, Poly Stal has excellent sliding properties, making it ideal for moving applications. Poly Stal is used in various industries including automotive, mechanical component production, home appliances manufacturing, and the production of electrical and electronic parts. Its molecular structure consists of repeating formaldehyde units, which provide a linear, compact, and closely packed molecular arrangement. This structure contributes to its crystalline nature and high mechanical strength, making it suitable for a wide range of engineering applications. The unique properties of Hostaform make it suitable for precise components, gears, bearings, conveyor belt parts, and fuel system components in automotive, industrial, and consumer product applications. The unique composition of this material allows it to resist harsh operational conditions such as high mechanical stress, frequent impacts, and exposure to chemicals. This material is often used in applications that require high precision, low friction, good dimensional stability, and resistance to wear. Poly Stal's ability to maintain these properties under diverse environmental conditions has made it a favored material in engineering and manufacturing industries. In general, Poly Stal has a wide range of applications, which can be classified into the following categories:

- Mechanical Parts: Gear wheels, sliding parts, springs, chains, screws, fan wheels, pump parts, valve bodies;

- Electrical Engineering: Insulators, bushings, connectors, electronic device parts such as televisions, telephones, etc.;
- Automotive and Vehicle: Fuel delivery units, internal control switches (including switches for light, turn signals, etc.), electric windows, door locking systems;
- Model and Mockup Making: Large rail parts and manual rails;
- Entertainment and Gaming: Main gears for radio-controlled helicopters, landing gears, yoyos;
- Medical: Inhaler insulin pens with dose measurement (MDI);
- Food Industry: The Food and Drug Administration has approved some POM grades for packaging milk, coffee, filter housings, and other food items, such as POM AH and POM C;
- Building Interior Fixtures: Locks, handles, hinges;
- Construction: Structural glass – casing holder;
- Packaging: Aerosol cans, vehicle tanks;
- Sports: Paintball accessories, often used for machined parts from paintball markers that require durability. Also used in airsoft guns to reduce piston noise;
- Clothing: Zippers;
- Kitchen Appliances: Fully automatic coffee machines, knife handles (especially for folding knives);
- Computer and Laptop Keyboards: Polyoxymethylene is used for

The key properties of this engineering thermoplastic include:

- The melting temperature of polyoxymethylene (POM) is between 165 and 175 degrees Celsius, and if exposed to higher temperatures, it decomposes into its constituent polymers and releases toxic gases.



- POM is difficult to ignite, with a blue flame that is usually not visible.
- Polyoxymethylene has a low coefficient of friction and high resistance.
- POM is highly flexible.
- Polyoxymethylene has very low water absorption.
- POM shows good resistance to chemical agents.

The various grades of polyoxymethylene produced are as follows:

- POM 300K
- POM N109Id
- POM Fm090
- POM SB35
- POM Po20nlmb
- POM M90
- POM Mc90
- POM 511DP-BK 402
- POM 500PNC010
- POM 100PNC010
- POM 501Snc010

**Table 3 - Chemical and Physical Properties of Polyoxymethylene (POM) - Computationally Estimated**

Property	Unit	Range of Changes	Value
Molecular Weight of Repeat Unit	$\text{g mol}^{-1}$	03.30	-
Van der Waals Volume	$\text{mL mol}^{-1}$	25.12	-
Molar Volume	$\text{mL mol}^{-1}$	22.26 - 0.4	7.23
Density	$\text{g mL}^{-1}$	1.36 - 1.1	27.1
Solubility Parameter	$\text{MPa}^{1/2}$	9.22 - 9.19	3.21
Molar Adhesion Energy	$\text{J mol}^{-1}$	10,100 - 11,500	10,700
Glass Transition Temperature (T <sub>g</sub> )	K	226 - 207	216
Molar Heat Capacity	$\text{J (mol K)}^{-1}$	66-62	63
Entanglement	$\text{g mol}^{-1}$	3,700 - 2,000	2,900

Molecular Weight			
Refractive Index	None	48.1 - 44.1	47.1

The saturated mixture of methanol and air is first heated and then introduced into reactors containing silver meshes. There are six reactors arranged in parallel to facilitate the easier reduction of the catalysts. The decomposition reaction of methanol into hydrogen and formaldehyde is an endothermic reaction. Air is also introduced into the reactor so that the oxygen in the air reacts with the hydrogen generated from the methanol decomposition reaction, producing water. This is an exothermic reaction and provides the necessary heat for the main reaction. Additionally, the water produced helps prevent side reactions. The gases exiting the reactor are rapidly cooled, and the heat from these gases is used to preheat the incoming feedstock. These gases then enter absorption towers where the remaining methanol, along with formaldehyde, is absorbed in an aqueous solution of methanol and formaldehyde. This solution is then fed into a distillation column, and the recovered methanol is reintroduced into the reactor. The impurities in the formaldehyde output are separated after cooling by an anion-cation exchanger. Finally, the produced formaldehyde is diluted with water to the desired concentration.

#### **Required Equipment for Polyoxymethylene Production**

- Complete polyacetal production line (heat exchangers, condensers, coolers, reactors, decomposers, tanks, etc.)
- Extrusion line;
- Mixer;
- Automatic bagging scale;
- Conveyor belt;

## 5- Plan Requirements:

### 5-1- Space and Infrastructure Requirements:

This project is designed with a capacity of 40,000 tons per year. After obtaining the necessary licenses, the construction process will begin, followed by the acquisition of an operational license, and then the commencement of activities. Therefore, from its annual income, which comes from the sale of Poly Stal, it will be able to cover its expenses and generate annual revenue. According to existing standards, producing Poly Stal requires 100,000 square meters of land for the construction of a production unit with a capacity of 40,000 tons per year. Of this area, 28,000 square meters will be covered space, 72,000 square meters will be uncovered space, and the remainder will be allocated for the open yard of the industrial unit. The land area allocated for this plan is 10 hectares, with the excess land designated for green spaces and open yards. For this facility, the necessary power supply and transformer capacity will be provided, with electricity sourced from the special economic zone of Islamabad-e-Gharb. Additionally, the water supply will be provided from the special economic zone of Islamabad-e-Gharb. The piping for the area, inside the warehouses, and other parts of the production unit will be installed by a qualified contractor.

**Table 4 - Plan Investment in Land, Landscaping, and Buildings**

Land	Description/Name of Facility	Details	Plan Required Investment		Total Cost (Million Rial)
			Required Quantity/Area	Unit Purchase/Construction Price (Million Rial)	
1	Land	Kermanshah – Special Economic Zone, Islamabad	100,000 m <sup>2</sup>	9	900,000

		West			
2	Landscaping Operations	As per calculations	72,000 m²	12	864,000
3	Construction	10 production and storage halls (6-meter height, including internal storage)	28,000 m²	197	5,516,000
		Administrative and central management building			
		Worker and support building (locker rooms, prayer hall, restaurant, and restroom)			
		Laboratory building			
		Guardhouse			
		Green space (10% of the land area)			
		Road construction, sidewalks, parking, and asphalt (20% of the land area)			
Total			-	-	7,280,000

### 5-2- Equipment and Machinery:

The complete production line for Poly Stal production, capable of producing 40,000 tons of POM, includes (heat exchangers, condensers, coolers, reactors,

shredders, tanks, extruding lines, mixers, automatic bagging scales, conveyors, etc.).

**Table 5 - Main Machinery and Equipment Required for Production Line**

No.	Machine Title	Quantity	Unit Price (Million Rial)	Total Costs (Million Rial)
1	Complete Poly Stal Production Line (including heat exchangers, condensers, coolers, reactors, shredders, tanks, etc.)	1	36,029,700	36,029,700
	<b>Total Production Line</b>	-	-	36,029,700

No.	Machine Title	Quantity	Unit Price (Million Rial)	Total Costs (Million Rial)
1	Heat Exchanger	5	1188386	5941930
2	Condenser	3	1836596	5509788
3	Cooler	4	1053342	4213368
4	Reactor	2	3187035	6374070
5	Analyzer	1	1998649	1998649
6	Storage Tanks	3	783254	2349762
7	Extruding Line	1	4429438	4429438
8	Mixer	2	702228	1404456
9	Automatic Bagging Scale	1	1053342	1053342
10	Conveyor Belt	2	486157	972314
11	Other Auxiliary Equipment	-	-	1782583
12	<b>Total</b>			36029700

### 5-3- Raw Materials and Auxiliary Equipment:

The raw and auxiliary materials required for the production of 40,000 tons of Poly Stal include: Methanol, Ethylene Oxide, Benzene, BF<sub>3</sub> Ester (Catalyst), Triethylamine, Antioxidants, and Cationic Catalysts. Their total cost is provided in the table below:

**Table 6 - Raw Material Costs for Product Production**

No.	Raw Material Name	Annual Consumption After Completion (Tons)	Unit Cost (Rial)	Total Cost (Million Rial)
1	Total Raw Materials	50.435	244	12,306,189
	Waste	Equivalent to 1% of raw materials		

Total	12,306,189
-------	------------

**Table 7 - Raw Material Quantities for Poly Stal Production**

Raw Material	Amount Per Ton of Product (Tons)	Source
Methanol	154.1	Domestic
Ethylene Oxide	0244.0	Domestic
Benzene	07842.0	Domestic
BF3 Ester Catalyst	00011.0	Foreign
Triethylamine	00005 .0	Foreign
Antioxidant	0015.0	Foreign
Cationic Catalyst	0024.0	Foreign

#### **5-4- Management and Human Resources:**

For the production of Poly Stal, a total of 724 employees are required in production, management, and sales as detailed in the table below. The total cost for salaries and wages amounts to 1,712,160 million rial.

**Table 8 - Management and Human Resources**

No.	Job Title	Quantity	Field of Work	Monthly Salary (Million Rial)	Total Monthly Salary (Million Rial)	Annual Salary (Million Rial)
1	CEO	1	Management	400	547	6,560
2	Production Manager	2	Production	300	820	9,840
3	Internal Manager	1	Management	200	273	3,280
4	Marketing, Sales & Advertising	20	Sales	150	4,100	49,200
5	Specialized Worker	140	Production	180	34,440	413,280
6	Skilled Worker	200	Production	150	41,000	492,000
7	Unskilled Worker	360	Production	125	61,500	738,000
	Total	724		1,505	1,426,800	1,712,160

## **6- Ownership and Legal Licenses:**

### **6-1- Land Ownership:**

According to the executive regulations of the law for the formation and administration of special economic zones in the Islamic Republic of Iran, the registration of companies or representative offices intending to operate within the special economic zone, regardless of the proportion of domestic or foreign shares, and the registration of material and intellectual property within the zone, is the responsibility of the relevant property registration office, in accordance with the rules of company and industrial and intellectual property registration in the Free Trade-Industrial Zones of the Islamic Republic of Iran (as per Decree No. 21453/T15011K dated 30/02/1374, and its subsequent amendments). The division of real estate and the issuance of property documents within the zone will be done only at the request of the zone organization by the relevant property registration office. The transfer of real estate between natural and legal persons within the zone, at any stage, will be done with the knowledge of the organization and in compliance with the relevant regulations. Additionally, the issuance of property documents is conditional upon the submission of the completion certificate issued by the zone organization.

### **6-2- Intellectual Property and Rights:**

Intellectual property (IP) for the production of polyoxymethylene (POM) includes the legal rights and obligations to protect the innovations, technologies, and technical know-how used in the production process of this material. Various aspects of intellectual property can be leveraged for the POM production project:

#### **1) Patents (Inventions):**

- Registering innovative processes for producing POM, including chemical techniques, process optimizations, or specialized equipment.

- Protecting any proprietary technology that enhances production efficiency or reduces energy and raw material consumption.
- Securing formulations of POM that provide superior technical properties compared to competitors.

#### **٢) Trademarks:**

- Developing a brand name and logo associated with the POM product and the manufacturing company.
- Creating distinctive packaging and product design for differentiation in the market.

#### **٣) Licensing Agreements:**

- For production technologies acquired from foreign companies or other domestic entities, defining the rights and obligations related to licensing agreements.
- Establishing restrictions on the use of the technology and the rights to transfer it to other companies.

### **6-3- Legal Licenses:**

Economic actors, both natural and legal persons, require an industrial establishment license for any type of production or industrial activity. In special economic and free trade zones, this license is issued under the supervision of the regional organization. Obtaining the industrial establishment license is a prerequisite for all investment activities in the production and industrial sectors. After the establishment of an industrial unit and the completion of trial production, if the conditions and requirements specified in the establishment license are met, an operating license will be issued for the industrial unit. Having the establishment license is a prerequisite for issuing the operating license.



A commission composed of representatives from the Ministry of Industries and Mines, the Ministry of Commerce, the Ministry of Agriculture, the Central Bank, the Customs of the Islamic Republic of Iran, the Secretariat of the Supreme Council, and the regional representative is responsible for determining the permissible percentage (the amount of goods produced in the industrial unit that can be imported into the mainland as domestic goods without registration orders) and determining the percentage of added value (the amount of discount on customs duties). These percentages are based on the feasibility study of the production unit and the internal and external raw materials required. Each industrial and production unit must obtain a production certificate for each part of its product, which includes the report on the manufactured product and the listed domestic and foreign raw materials. The products of industrial units in free and special economic zones have four potential destinations:

- Consumption within the zone
- Dispatch to the mainland
- Export to foreign countries
- Delivery to other zones

In this context, economic actors must specify the final destination of their goods. Generally, the licenses required for the Poly Stal production plan can be displayed in the table below.

**Table 9 - In this context, economic actors must specify the final destination of their goods.**

No	License Name	Issuing Organization	License Type	Stage	Description
1	Establishment License	Ministry of Industry and Trade (Mol)	Mandatory	Planned	All economic operators, whether individuals or legal entities, require an industrial

					unit establishment license for any production and industrial activity. In Free and Special Economic Zones, this license is issued under the supervision of the zone authority. Obtaining the establishment license is the first step for all investment activities in the production and industrial sector.
2	Operating License	Ministry of Industry and Trade (Mol)	Mandatory	Planned	After the industrial unit is established and the trial production phase is completed, an operating license is issued if the conditions mentioned in the establishment license are met. The pre-requisite for the issuance of this license is obtaining the establishment license.
3	Production Certificate	Zone Management Authority	Mandatory	Planned	Each industrial and production unit needs to obtain a production certificate for each part of its product. This certificate includes a report of the produced product, detailing both domestic and imported raw materials used.

## **7- Market Analysis and Competition:**

Poly Stal, or Polyoxymethylene, is an advanced engineering plastic with a low friction coefficient and high resistance to wear. It was developed to bridge the gap between engineering polymers and metals. Poly Stal, scientifically known as Polyoxymethylene, is produced through the polymerization of formaldehyde monomer, which is why it is also referred to as Poly Stal. Poly Stal is produced and supplied in two types: homopolymer and copolymer, and the manufacturing process for each is different:

**Homopolymer Production:** To produce homopolymer Poly Stal, anhydrous formaldehyde must first be produced. The main method involves the reaction of aqueous formaldehyde with an alcohol to create a hemi-formal. The mixture of hemi-formal and water is dehydrated (through extraction or vacuum distillation), and formaldehyde is released by heating the hemi-formal. The resulting formaldehyde is polymerized using an anionic catalyst, and the polymer formed is stabilized using acetic anhydride. Due to the manufacturing process, larger diameter homopolymer sections may exhibit central porosity.

**Copolymer Production:** For copolymer Poly Stal, formaldehyde is converted into trioxane. This is achieved with the use of an acidic catalyst (such as sulfuric acid or acidic ion-exchange resins). The trioxane is then purified by distillation or extraction to remove water and other hydrogen-containing impurities. Di-oxalane is typically used as a co-monomer, although ethylene oxide can also be employed.

**Key Properties of Poly Stal:**

- Melting Temperature:** The melting point of Poly Stal is between 165°C and 175°C. If exposed to higher temperatures, it decomposes into its constituent polymers and releases toxic gases.
- Flame Resistance:** Poly Stal is hard to ignite, and its flame color is blue and generally not visible.
- Low Friction:** It has a low friction coefficient and high wear resistance.
- Flexibility:** Poly Stal exhibits excellent flexibility.
- Low Water Absorption:** Poly Stal has very

low water absorption. Chemical Resistance: Poly Stal shows good resistance to chemical agents. Recyclability: Poly Stal is recyclable. Applications of Poly Stal: Automotive Industry: Used in manufacturing various components such as springs, gears, bolts, latches, and fuel tank door hinges. Electrical Components: Used in the production of electrical parts. Medical Industry: Used in producing extruded products like prosthetic feet and insulin pens. Industrial Machinery: Used in manufacturing various industrial machine components such as conveyor belts, handles, bearings, bushings, and pulleys. Pump Components: Used in the manufacture of certain pump parts. Home Appliances: Used in coffee machines, computer keyboards, zippers, eyeglass frames, and other household products. Insulation: Due to its water resistance, Poly Stal is used in the production of various types of insulation. Despite the widespread use of Poly Stal in various industries, only a few production units for this product have been established in the country. As a result, a significant quantity of this material is imported annually, leading to a considerable outflow of foreign currency. Therefore, establishing such production units domestically is necessary to reduce imports and develop downstream petrochemical industries. Additionally, with high-quality production, the country can benefit from exporting this product to neighboring countries that are undergoing industrial development. With the availability of cheap feedstock and global methanol price fluctuations, the National Petrochemical Company is working to encourage investment in methanol downstream units to create high added value. In this regard, methanol chain units like Poly Stal are prioritized.

#### **7-1- Poly Stal Production Status Analysis:**

Major Poly Stal Producers Worldwide:

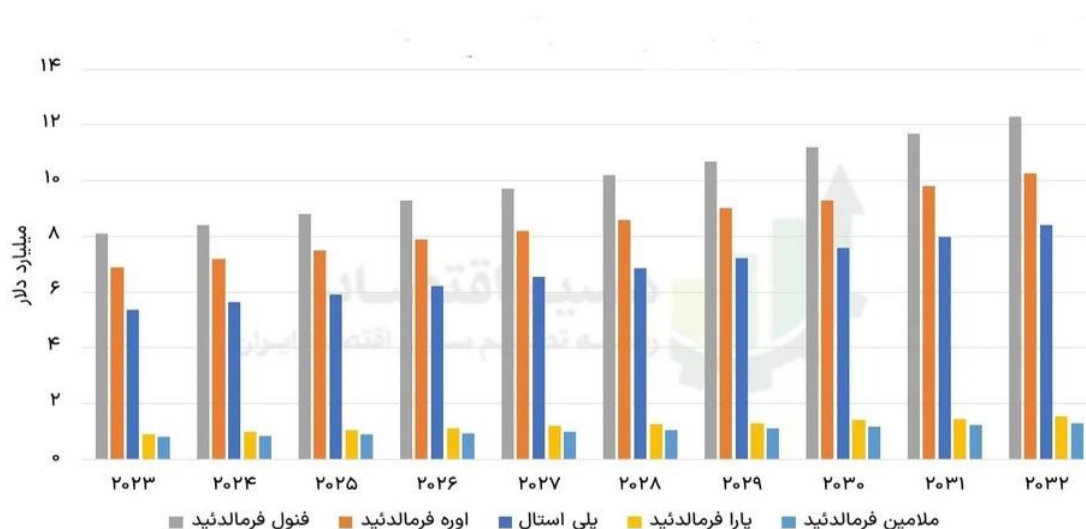
- BASF – Germany

- SABIC – Saudi Arabia
- Lanxess – Germany
- Dow Chemical – United States
- LyondellBasell – United States
- Formosa Plastics – Taiwan
- Mitsubishi Chemical – Japan
- Eastman Chemical – United States

These producers manufacture Plan Stal in various grades, each with its specific characteristics. Plan Stal grades are classified based on their mechanical, thermal, and chemical properties. Regarding Plan Stal production in Iran, according to official statistics from the Ministry of Petroleum, none of the petrochemical complexes in the country have produced Plan Stal up to this point. However, in the review of ongoing plans in the petrochemical industry (until the end of the seventh development plan), a plan titled "Technical and Engineering South Facilities in Mahshahr" was planned to produce ethanol with a capacity of 0.5 million tons per year (MTY) for the private sector. There is no available data on whether this plan has been implemented or not. Part of the Nakhle Asmari Petrochemical, which was commissioned on June 25, 2024, also includes Poly Stal production in its plans. For production forecasting, we can refer to the Vision Document of Iran's Oil and Gas Industry for 2025, which outlines achieving the region's first position in terms of the value of petrochemical products and goods to generate the highest added value from the country's hydrocarbon resources. Poly Stal is one of the petrochemical goods that can be expected to receive government support. According to an article published by Masir Eghtesad, the production of Poly Stal and other materials in its value chain is significantly increasing. Given the absence of Poly Stal production, to assess the status of Poly Stal production, we will review the production trend of its main raw material, methanol: Methanol is a key primary material in the production of Poly Stal, and its status has been under

review since 2017, with estimates made until 2028. As methanol is one of the essential materials in the Poly Stal value chain, analyzing its production status can provide some insights into the potential state of Poly Stal production. Methanol, a simple and crucial alcohol with the chemical formula  $\text{CH}_3\text{OH}$ , is one of the most important chemicals used in various industries. It is a one-carbon alcohol with unique properties that make it a key material in many industrial processes. Methanol is used not only as an alternative fuel for fossil fuels but also plays a vital role as a base product in the production and value chain of various chemicals. In 2023, the global demand for methanol reached 96 million tons, and this number is forecasted to exceed 108 million tons by 2027. The value of methanol exports has also increased from \$1.178 billion in 2017 to \$2.108 billion in 2023. China accounts for 60% of the global demand for methanol, which has led to China controlling the global methanol price (Price Maker). China's dominance in the methanol market has caused methanol prices to be lower than other petrochemical base products. Additionally, Iran faces challenges with sanctions and limited export markets, alongside the lower price of methanol. Methanol prices have fluctuated over the years. In 2017, the price per ton was \$265, and by 2018 it increased by approximately 12.5% to \$298 per ton. However, the price saw a downward trend until 2020, dropping to \$154 per ton. The price then increased again in 2021 to \$273 per ton and decreased to \$218 per ton by 2023. The average price of methanol from 2017 to 2023 has been \$234 per ton. The price in the first quarter of 2024 was \$239 per ton (prices are based on FOB Persian Gulf). The nominal methanol production capacity in Iran is 15.736 million tons per year. The largest methanol production complexes in the country are the Zagros Petrochemical (phases 1 and 2) with a nominal capacity of 3.3 million tons and Kavian Petrochemical with a capacity of 2.31 million tons per year. These two

are also among the largest methanol production complexes in the world. Following these, the Bushehr, Sabalan, Marjan, Kimia Pars Khavarmiyaneh, and Arin Methanol Petrochemicals in Assaluyeh with a nominal capacity of 1.65 million tons per year are significant production complexes in Iran. Arin Methanol is the latest methanol production facility in the country, which began operations in 2024. According to an article published by the Masir-Eqtasad website, the production of polyoxymethylene (POM) and other materials in its value chain is significantly increasing. Based on forecasts, the global production volume of each of these products is expected to grow substantially. As shown in the chart below, the market value of these products will continue to rise, increasing from \$16.7 billion in 2023 to \$25.7 billion by 2032.



## 8-Target Market Introduction:

The goal of implementing this plan is to meet the domestic demand for Plan Stal as well as to supply part of the demand from other countries for these polymer materials. With a consumption volume exceeding 0.5 million tons, Plan Stal is considered one of the most widely used engineering polymers in the world. The remarkable properties of Plan Stal have led to its replacement

of metal parts in various industries, including machinery, automotive, plumbing, electronics, and watchmaking. Some of these parts include gears, rollers, pump housings, bearings, air flow valves, fuel filters, fan cooling components, windshield wiper clips, window lift clips, gear shift assemblies, sunroofs, food processor parts, blenders, espresso machines and coffee makers, sprinkler nozzles, showerheads, furniture and drawer connectors, knives, and tool handles. The largest consumption of Poly Stal is in the automotive industry. Given the presence of two large automobile manufacturing plants and thousands of parts manufacturers in Iran, as well as the development of the domestic and Middle Eastern markets, the establishment of this production unit seems promising.

In general, the main consumption of Poly Stal can be divided into the following four categories:

- **Mechanical Parts:** Poly Stal is a popular choice for manufacturing mechanical components due to its high wear resistance and strength. This material is used in the production of gears, shafts, bearings, and other mechanical parts.
- **Home Appliances:** Due to its high resistance to moisture and chemicals, Poly Stal is a popular option for manufacturing home appliances. It is used in the production of kitchen appliances, sanitary products, and other household items.
- **Electronics:** Poly Stal is favored for making electronic devices because of its high resistance to wear and strength. It is used in the production of electronic components, covers, and other electronic devices.
- **Packaging:** Poly Stal is a popular material for packaging due to its high resistance to wear and strength. It is used in the production of containers, transport packages, and other packaging materials.



Pol Stal is a versatile material that can be used in a wide range of applications in the plastic industry. Due to its high wear resistance, strength, and resistance to moisture and chemicals, it is a suitable choice for many applications.

The polymer industry is one of the most important and strategic sectors of the chemical industry, playing a vital role in the global economy. This industry involves the production of plastic products through the processing of petrochemical materials and provides a wide range of raw materials for various industries. The polymer industry is of high economic importance due to its value-added creation and provision of raw materials for various industries. It contributes to job creation and the development of industrial infrastructure in many countries. The petrochemical industry, by supplying raw materials for many other industries, plays a key role in the economic and industrial development of countries. Due to the diversity of products and wide applications, this industry is of special significance, and its transformations can have widespread effects on the global economy. The most important export markets for Iranian polymer products are neighboring countries, some European countries, and both East and West Africa, all of which have good export potential. Today, plastic products and polymer materials have gained a special place in various industries and have replaced non-polymeric products due to their affordable price, cost-effectiveness, and high standard quality. The best commercial destinations for exporting various polymer materials include countries such as China, Pakistan, Turkey, Azerbaijan, Afghanistan, and other neighboring countries due to their geographic proximity and cultural similarities. The raw materials required for the production of this material can be sourced from active petrochemical plants within the country. Furthermore, in both our country and the Middle East region, there are no Poly Stal resin producers, and all regional and national needs are met through

imports from European countries and China. Therefore, due to the lack of competition in this product, it is possible to create an exclusive market.

## **9- Risk Management Overview for the Poly Stal Production Plan**

Risk is the product of the probability of an incident occurring and its consequences over a defined period. Any activity in the execution process faces the potential for risks, the outcomes of which can prevent the desired result or some part of it from being achieved. Below are some of the risks associated with the Poly Stal production plan, along with proposed risk mitigation strategies. In summary, regarding the strategies for handling the risks of this project, it can be stated that certain risks—those that are small, scattered, have a very low likelihood of occurrence, or cannot be transferred—will be accepted. For other risks, the strategy of "avoidance and distancing" will be employed. Some risks will be eliminated or reduced, while others will be transferred to other parties.

- 1) Business Idea Risk: Given the nature of the Poly Stal production plan and the availability of existing formulas, the risk associated with the business idea is not a threat to the plan, as the idea is not prone to exposure.
- 2) Plan Financial Risk: Financial risk is one of the most prominent risks in the plan. The calculations and studies related to the Poly Stal production plan show that to reach break even, the plan needs to generate a total revenue of 20,448,422.15 million rials, which constitutes 38.73% of the total sales at full capacity. This risk is considered low, but it is important to note that the estimated capacity utilization for the first, second, and third years is estimated to be 70%, 90%, and 100%, respectively. Therefore, a more detailed analysis of the risk level is required. Specifically, for the first three years of the project, the safety margins are 31.3%, 51.3%, and 61.3%, indicating medium risk in the first year,

low risk in the second year, and very low risk in the third year. Additionally, the sensitivity analysis of net profit due to changes in sales shows that for a 10% decrease in sales, the net profit decreases by 21.98%, 14.73%, and 13.49% in the first, second, and third years, respectively, indicating the plan's risk level. When analyzed alongside the safety margin, these factors provide more insightful data. The investment return period for the plan is 31 months, and an independent analysis of this indicator shows that the risk level is low. Furthermore, an examination of the company's credit sales, which reflects the risk of receivables, shows that the plan faces low risk. Regarding pricing risk, considering the nature of the products, the pricing risk for this plan is assessed as low.

3) Innovation and Technology Risk: Since the technology level in this business is between low and high, the project is evaluated to have a medium risk in this category. The risk in terms of innovation is moderate to low, as the product/service in question is almost standard, thus placing the project in the medium-to-low-risk category.

5) Project Completion Risk: Regarding capital sourcing, calculations indicate that the total required investment for the project is 57,543,322 million rials, of which 100% is covered by the investor and 0% by the bank. This shows that the risk of project completion is very low due to the unlikelihood of encountering difficulties in obtaining financial facilities, credit issues, complex banking processes, and other factors. However, risks related to construction such as land acquisition, construction delays, machinery procurement, and unforeseen events still exist.

- 6) Human Resources Risk: Given that 724 people will be employed in this project, potential risks related to human resources exist. To mitigate these risks, the company will provide practical training, social security insurance, accident insurance, and employer liability insurance. Additionally, risks related to human resource management, such as recruitment, motivation, and turnover, will be addressed through the application of human resource management principles to attract, retain, and develop skills.
- 7) Fixed Asset Threat Risk: To operate this plan, an investment of 52,104,024 million rials in fixed assets (such as buildings, machinery, equipment, etc.) will be made, which exposes these assets to various risks. To manage these risks, in addition to internal measures to reduce or eliminate risks, the company will acquire appropriate insurance coverage, such as theft, fire, and machinery breakdown.
- 8) Current Asset Threat Risk: An investment of 5,439,298 million rials will be made in current assets (such as inventories, raw materials, etc.), which are also exposed to multiple risks. Similar to fixed assets, the company will implement internal risk reduction strategies and procure insurance for risks like theft, fire, and equipment failure.
- 9) Operational Risk: One of the risks that could challenge the Poly Stal production plan is operational risk. Operational risk involves issues related to work processes and administrative procedures, such as challenges in selecting and utilizing technology, outdated information systems, weak supply chains, improper maintenance, human resource management problems, and internal coordination. These issues can jeopardize the business's potential profit and damage its reputation. Management mistakes, lack of experience, insufficient

knowledge in the business area, data processing problems, and other similar issues can contribute to operational risks. To address this, the company will continuously identify risk sources and implement appropriate control measures.

- 10) **Strategic Risk:** Another potential risk for the Poly Stal production plan is strategic risk. The business intends to achieve its objectives through specific strategies, some of which are outlined in this plan. Strategic risks occur when the company's strategies or business models fail to adequately meet market needs and growth demands. In such cases, the strategies may lose their effectiveness. The strategy to address this is 'strategic flexibility,' where the company will review its business model, revenue model, and other production and marketing strategies when necessary.
- 11) **Other Risks:** Other risks, such as market risk, economic risks, political-legal risks, and more, could threaten the project. The company has developed identification, response, and control programs within its management structure to effectively address these risks.

## **10- Impact of Competitive Forces on Profit Margins**

Competitive forces are of significant importance when analyzing the profit margins of an industry, as they determine its attractiveness. The strength of these forces must be examined and analyzed when preparing business plans. Below is an analysis of the competitive forces for the Poly Stal production plan based on the five competitive forces:

- 1) **Threat of New Entrants (Barriers to Entry):** The data from the Poly Stal production plan indicates that the threat from new entrants to this business is moderate. The score obtained for this threat is 562.5 out of

1000. Among the key factors contributing to this threat are the lack of dependency on a specific location for successful sales, the absence of proprietary technology in production, and the limited skills and experience of the existing companies in the field, which have collectively heightened this threat.

- 2) Competitive Power of Existing Rivals: Competition among businesses in the market is the key determinant of overall profitability and the attractiveness of an industry. In certain business sectors, competitors engage in aggressive rivalry, sometimes even lowering prices below the cost level, which results in losses across the entire industry. Competition is not always limited to price and can involve advertising, innovation, and other non-price factors. The intensity of competition between existing businesses depends on the diversity and number of competitors, as well as their reactions to competitive behavior. The analysis for the Poly Stal production plan indicates that this plan faces strong competitors in the market that produce similar products. These competitors form the strongest competitive force in an industry. Their actions to attract customers, recruit skilled personnel, secure raw materials, and control distribution networks create specific behavioral rules, making it essential to understand their current power and forecast their future position. The data for the Poly Stal production plan indicate that this plan faces a moderate score. The obtained score for this threat is 575 out of 1000. Among the variables under consideration, the lower cost of switching (transfer costs), limited brand loyalty to existing brands, and the limited annual growth of the industry are the most significant factors.

- 3) Bargaining Power of Suppliers: Suppliers are all companies, organizations, industries, and businesses that provide the necessary raw materials, equipment, and facilities for the production and supply of a product. Suppliers can exert their bargaining power on industry players by increasing prices or reducing the quality of inputs. The analysis of the bargaining power of suppliers in the Poly Stal production plan shows that the bargaining power of suppliers is moderate. The score obtained for this threat is 460 out of 1000. Key factors contributing to this threat include the number of suppliers, the lack of substitute raw materials, and the low cost of changing suppliers.
- 4) Threat of Substitute Products and Services: Suppliers are all companies, organizations, industries, and businesses that provide the necessary raw materials, equipment, and facilities for the production and supply of a product. Suppliers can exert their bargaining power on industry players by increasing prices or reducing the quality of inputs. The analysis of the bargaining power of suppliers in the Poly Stal production plan shows that the bargaining power of suppliers is moderate. The score obtained for this threat is 460 out of 1000. Key factors contributing to this threat include the number of suppliers, the lack of substitute raw materials, and the low cost of changing suppliers.
- 5) Threat of Substitute Products and Services: The threat of substitute products and services is another critical factor influencing the attractiveness of an industry. A substitute product is one that offers similar benefits to the current product (not products from direct competitors). The willingness of customers to purchase a new product and the price they are willing to pay for a product depend, to some extent, on the availability of substitute products. The absence of close

substitutes for a product means that competition in the market for similar products is less intense, and consumers are less sensitive to price changes. However, the presence of substitutes makes customers more likely to switch in response to price increases. The analysis of the threat from substitute products in the Poly Stal production plan reveals that this business faces a relatively low threat from substitutes. The score obtained for this threat is 300 out of 1000. Among the factors contributing to this threat are the aging product lifecycle curve, better conditions for substitute products, and the presence of substitute products.

**11- Physical Progress of the Plan to Date:**      **Yes**☐      **No**☒

This is a proposed and conceptual plan, designed to meet the domestic needs of the country. No progress has been made in the execution of this project so far.

**12- Operational Program and Plan Implementation Timeline:**

The plan implementation stages, including commissioning, are planned to take 30 months.

Table 10: Plan Implementation Timeline

		M th 2	M th 4	M th 6	M th 8	M th 10	M th 12	M th 14	M th 16	M th 18	M th 20	M th 22	M th 24	M th 26	M th 28	M th 30
<b>Poly Stal Production Plan</b>	Feasibility Study															
	Obtaining Licenses															
	Construction															
	Equipment Installation															
	Training															



	Commissioning																		
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### 13- Financial Plan for the Project:

#### 13-1. Cost Estimates:

In general, the investment in the plan is divided into two categories: fixed investment and initial working capital. The capital required before the start of operations and the creation of the plan is provided through fixed capital, while the capital required during the operational phase is provided through working capital. Fixed investment includes costs related to land acquisition, landscaping, construction of buildings, machinery and equipment, facilities, office equipment, and pre-production expenses. These expenses occur at the start of the plan, before operations begin, and are depreciated over the useful life of the assets. Working capital refers to the funds required for operating the plan. It includes the combination of resources, inventories, work-in-progress, and liquidity needed to utilize the fixed investments for maintaining, continuing, and sustaining the operations. The amount of inventory, work in progress, and receivables depend on the conditions of the supply processes, production, sales, and the business environment. This section provides the evaluation and estimation of the required investment for the Poly Stal production project (based on the base year price). The cost estimation for the Poly Stal production plan is presented in the table below:

**Table 11 - Estimated Costs**

<b>Title</b>	<b>Total Amount (Million IRR)</b>
Fixed Investment	<b>43,420,020</b>
Working Capital	<b>8,684,004</b>
Total	<b>52,104,024</b>

**Table 12 - Fixed Investment Estimates (Capital Expenditure)**

No.	Title	Total Investment (Million IRR)	Percentage of Total	Notes
1	Land	900,000.00	0.02	
2	Landscaping	864,000.00	0.02	
3	Building Construction	5,516,000.00	0.13	
4	Machinery and Equipment	36,029,700.00	0.83	
5	Facilities and Public Equipment	0.00	0.00	
6	Transportation Equipment	0.00	0.00	
7	Office Supplies and Others (Unforeseen)	110,320.00	0.00	Based on predefined assumptions, a percentage of building investment
8	Intangible Assets	0.00	0.00	

The cost of office supplies is calculated as 2% of the total building investment.

**Table 13 - Summary of Costs and Analysis of Fixed and Variable Costs**

Description	Total Cost (Million IRR)		Fixed Costs (Million IRR)		Variable Costs (Million IRR)	
	Amount (Million IRR)	Share	Amount (Million IRR)	Share	Amount (Million IRR)	Share
<b>Raw Materials and Packaging</b>	13,536,807.68	0.39	0.00	0.00	13,536,807.68	1.00
<b>Salaries and Wages</b>	1,712,160.00	0.05	684,864.00	0.40	1,027,296.00	0.60
<b>Energy Costs (Water, Electricity, Fuel)</b>	721,152	0.02	144,230.40	0.20	576,921.60	0.80
<b>Maintenance</b>	1,579,820.00	0.05	315,964.00	0.20	1,263,856.00	0.80
<b>Financial Facilities</b>	0.00	0.00	0.00	1.00	0.00	0.00
<b>Insurance</b>	2,171,001.00	0.06	2,062,450.95	0.95	108,550.05	0.05
<b>Depreciation</b>	4,376,812.10	0.13	4,376,812.10	1.00	0.00	0.00
<b>Administrative and Selling Expenses</b>	4,819,550.56	0.14	963,910.11	0.20	3,855,640.45	0.80
<b>Contingency</b>	5,783,460.67	0.17	2,891,730.33	0.50	2,891,730.33	0.50
<b>Total</b>	34,700,764.01	1	11,439,961.90	0.33	23,260,802.11	0.67

Breakeven Production Percentage	0.39	Amount of Production for Breakeven	20,592,000 IRR
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The basis for calculating the figures in this report is in million rials.

- The cost of raw materials is calculated as 100% variable costs.
- The labor costs are calculated as 40% fixed costs and 60% variable costs.
- The energy costs are calculated as 20% fixed costs and 80% variable costs.
- The maintenance costs are calculated as 20% fixed costs and 80% variable costs.
- The insurance cost (equivalent to 1% of the total investment value) is calculated as 95% fixed costs and 5% variable costs.
- The depreciation cost is calculated as 100% fixed costs (the depreciation rate for buildings is 2%, for machinery and equipment 4%, for installations 10%, for transportation vehicles 20%, and for office supplies 10%).
- Administrative and sales costs (equivalent to 20% of total costs) are calculated as 20% production-related and 80% non-production costs.
- The unforeseen costs (equivalent to 20% of total costs) are calculated as 50% fixed costs and 50% variable costs.

### **13-2. The main components in determining working capital include:**

- Raw Materials (Domestic and Foreign): To avoid production interruptions, factors such as the industry type, production volume, source and method of material procurement, time required from ordering to receiving materials, delivery and transportation time, and the required quantity of raw materials, auxiliary materials, and packaging are considered. For this plan, a 15-day coverage period for raw material inventory has been accounted for.
  - Finished Goods and Work-in-Progress Inventory: Considering production stages and methods, the time required for manufacturing products and storing them in inventory is analyzed. Related costs are included as working capital. For this plan, a 15-day coverage period for work-in-progress and finished goods inventory has been assumed.
  - Receivables: Expected receivables from sold goods that are collected in the short term must have a defined collection period. For this plan, due to market conditions in Iran, all transactions are assumed to be on a cash basis.
- Petty Cash for Operational Expenses: A reserve for ongoing operational expenses is calculated based on production costs (excluding raw material costs and depreciation). For this plan, a reserve equivalent to two months of operational expenses has been considered.

**Table 14 - Estimation of Working Capital (Production Costs)**

<b>Title</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>	<b>2032</b>	<b>2033</b>
Raw Materials	473,788.27	609,156.35	676,840.38	676,840.38	676,840.38	676,840.38	676,840.38	676,840.38	676,840.38	676,840.38
Personnel Salaries	99,876.00	128,412.00	142,680.00	142,680.00	142,680.00	142,680.00	142,680.00	142,680.00	142,680.00	142,680.00
Petty Cash - Other	84,134.40	108,172.80	120,192.00	120,192.00	120,192.00	120,192.00	120,192.00	120,192.00	120,192.00	120,192.00
Receivables	3,696.00	4,752.00	5,280.00	5,280.00	5,280.00	5,280.00	5,280.00	5,280.00	5,280.00	5,280.00
Finished Goods Inventory	1,085.49	1,372.05	1,691.03	1,920.91	2,175.66	2,468.63	2,805.54	3,192.99	3,638.56	4,150.96
<b>Total</b>	<b>5,439.26</b>	<b>6,961.49</b>	<b>7,910.68</b>	<b>8,140.65</b>	<b>8,395.83</b>	<b>8,686.00</b>	<b>9,028.94</b>	<b>9,418.81</b>	<b>9,856.17</b>	<b>10,376.63</b>
Increase or Decrease in Working Capital	5,439.26	1,530.49	940,950.43	229,882.97	254,754.58	292,967.77	336,912.94	387,449.88	445,567.36	512,402.46

All amounts are in million Iranian Rials (IRR).

### 13-3. Revenues Estimates:

**Table 15 - Project Revenues**

<b>No.</b>	<b>Product Name</b>	<b>Production Quantity After Completion (tons/cans)</b>	<b>Price (Rials)</b>	<b>Total Revenue (Million Rials)</b>
1	Polyoxymethylene (POM)	40,000	1320	52,800,000
<b>Total</b>				<b>52,800,000</b>

**Table 16 - Project Revenues Considering Inflation and Capacity Utilization Rate (Million IRR)**

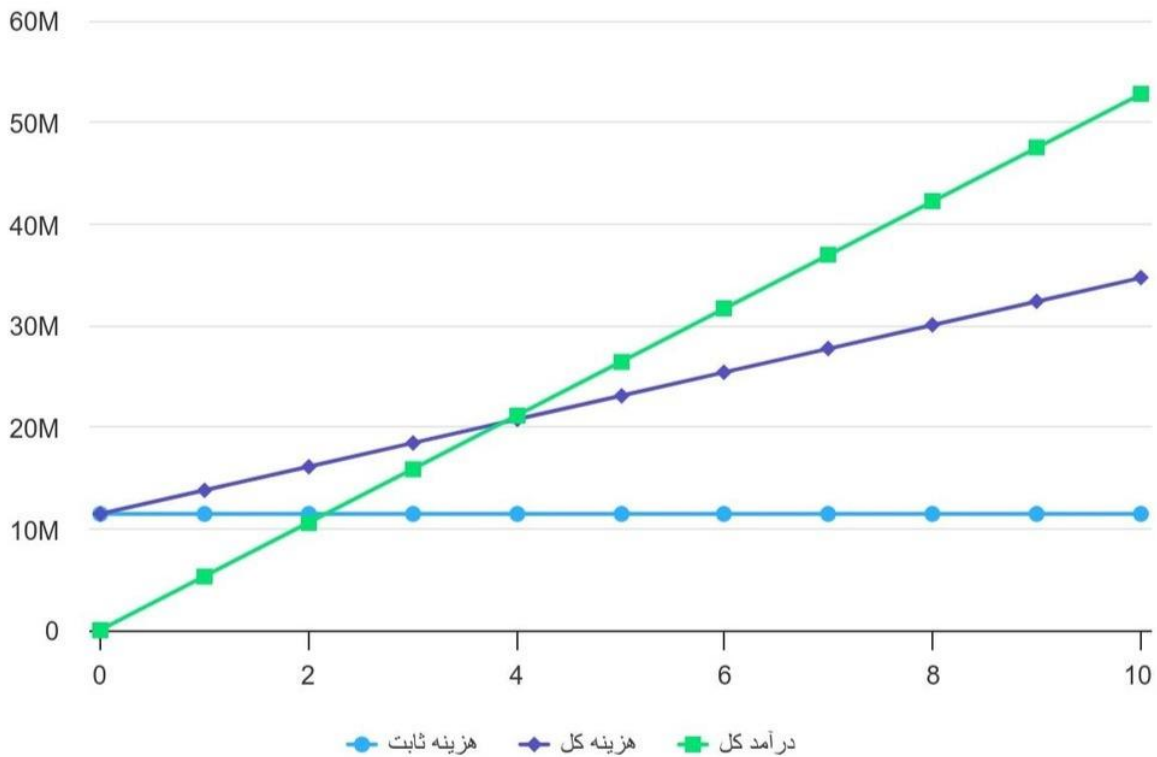
<b>Year</b>	<b>Inflation</b>	<b>Capacity Utilization (%)</b>	<b>Revenue Considering Inflation</b>	<b>Revenue Considering Capacity Utilization</b>
2024	0.15	70	60,720,000	35,420,000
2025	0.15	90	69,828,000	62,845,200
2026	0.15	100	80,302,200	80,302,200

2027	0.15	100	92,347,530	92,347,530
2028	0.15	100	106,199,659	106,199,659
2029	0.15	100	122,129,608	122,129,608
2030	0.15	100	140,449,049	140,449,049
2031	0.15	100	161,516,407	161,516,407
2032	0.15	100	185,743,868	185,743,868
2033	0.15	100	213,605,448	213,605,448

To produce the nominal capacity (40,000 tons), the initial required amount of Poly Stal for this project is approximately 50,435 tons. According to data obtained from websites related to the petrochemical industry, currently, the entire demand for Poly Stal in the country is met through imports. Therefore, except for the first and second years of the plan (when it will not operate at full capacity), from the third year onwards, the project can operate at full capacity and also sell the produced quantity.

#### **13-4. Break-Even Analysis:**

From an economic perspective, break-even analysis is an important technique used to study the relationships between costs, revenues, and profits. According to its definition, the break-even point is the point at which the operation of the plan neither generates a profit nor incurs a loss. In other words, break-even analysis determines the point where sales revenue equals production costs. It is used to analyze how changes in production volume will impact profit. The percentage of sales at the break-even point is 38.73%, meaning that to reach a point where there is neither profit nor loss, the project needs to utilize 38.73% of its nominal capacity.



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### 13-5. Cost-Benefit Analysis:

In project analysis, one of the most common methods is the Benefit-Cost Ratio (BCR), in which the ratio of the present value of expected benefits to the present value of costs is calculated. If this ratio is greater than one, the plan has economic justification for implementation. From this perspective, the plan meets the desired criteria. The Net Present Value (NPV) is another evaluation method, calculated using the following formula:

NPV = Present value of total costs during the implementation and operation phase - Present value of total revenues during the implementation and operation phase

NPV = Present value of the residual value of fixed assets + initial investment - Present value of future cash flows

The net present value of the plan, at a discount rate of 25%, amounts to 110,587,030 million rials. The positive value indicates the economic viability of

the plan. Another method for evaluating and analyzing investment plans is the Internal Rate of Return (IRR), or the rate of return. The internal rate of return is the rate of interest or discount rate at which the present value of all the benefits of the plan equals the present value of its costs. According to the calculations, the internal rate of return of the plan is estimated to be 51.95%, which is considered favorable when compared to the minimum attractive rate of return (MARR).

Present Value of Total Costs (Implementation and Operation Period)	٥٢١٠٤٠٣٤
Present Value of Total Revenues (Implementation and Operation Period)	٥٢٨٠٠٠٠
Net Present Value (NPV)	١١٠٥٨٧٠٣٠
Benefit-Cost Ratio (B/C)	١.٠١
Internal Rate of Return (IRR)	٥١.٩٥

**Table 17 - Calculation of Some Financial Ratios**

	<b>Ratio Type</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>	<b>2032</b>	<b>2033</b>
Liquidity Ratios	Current Ratio	6.53	6.13	7.57	9.41	10.81	12.02	13.03	13.89	14.62	15.23
	Quick Ratio	5.98	5.85	7.33	9.18	10.59	11.81	12.84	13.71	14.44	15.06
	Current Assets to Total Assets	0.28	0.50	0.65	0.75	0.83	0.88	0.92	0.94	0.97	0.98
Leverage Ratios	Long-term Debt to Equity Ratio	0.04	0.08	0.09	0.08	0.08	0.07	0.07	0.07	0.07	0.06
	Short-term Debt to Equity Ratio	0.04	0.09	0.09	0.09	0.08	0.08	0.08	0.07	0.07	0.07
	Debt to Equity Ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Activity Ratios	Total Asset Turnover Ratio	0.53	0.71	0.70	0.65	0.61	0.57	0.54	0.52	0.50	0.48
	Fixed Asset Turnover Ratio	0.73	1.43	2.03	2.64	3.47	4.67	6.48	9.37	14.53	25.62
Profitability Ratios	Gross Profit Margin	0.51	0.57	0.58	0.58	0.59	0.60	0.60	0.61	0.61	0.61
	Operating Profit Margin	0.27	0.39	0.41	0.41	0.42	0.43	0.43	0.44	0.44	0.45
	Return on Assets (ROA)	0.14	0.27	0.29	0.27	0.25	0.24	0.23	0.23	0.22	0.21
	Return on Equity (ROE)	0.15	0.30	0.31	0.29	0.28	0.26	0.25	0.24	0.24	0.23

The Profitability Index indicates how much economic profit will be generated throughout the life of the plan for every unit of money invested.

The Payback Period refers to the time it takes to recover the initial investment from the project's revenues. In other words, it represents the time needed for the initial investment to be paid back. This metric shows the speed of capital recovery and the plan's ability to withstand risk. The simple payback period of the plan, based on calculations, is estimated at 31 months.

### **13-6. Sensitivity Analysis of the Project:**

In the sensitivity analysis of plans, the percentage change in the Internal Rate of Return (IRR) is evaluated in relation to changes in key plan parameters and variables. In this analysis, the evaluation is based on major variables such as sales revenue, fixed costs, and operating costs of the plan. The table below presents the results of the sensitivity analysis concerning the Degree of

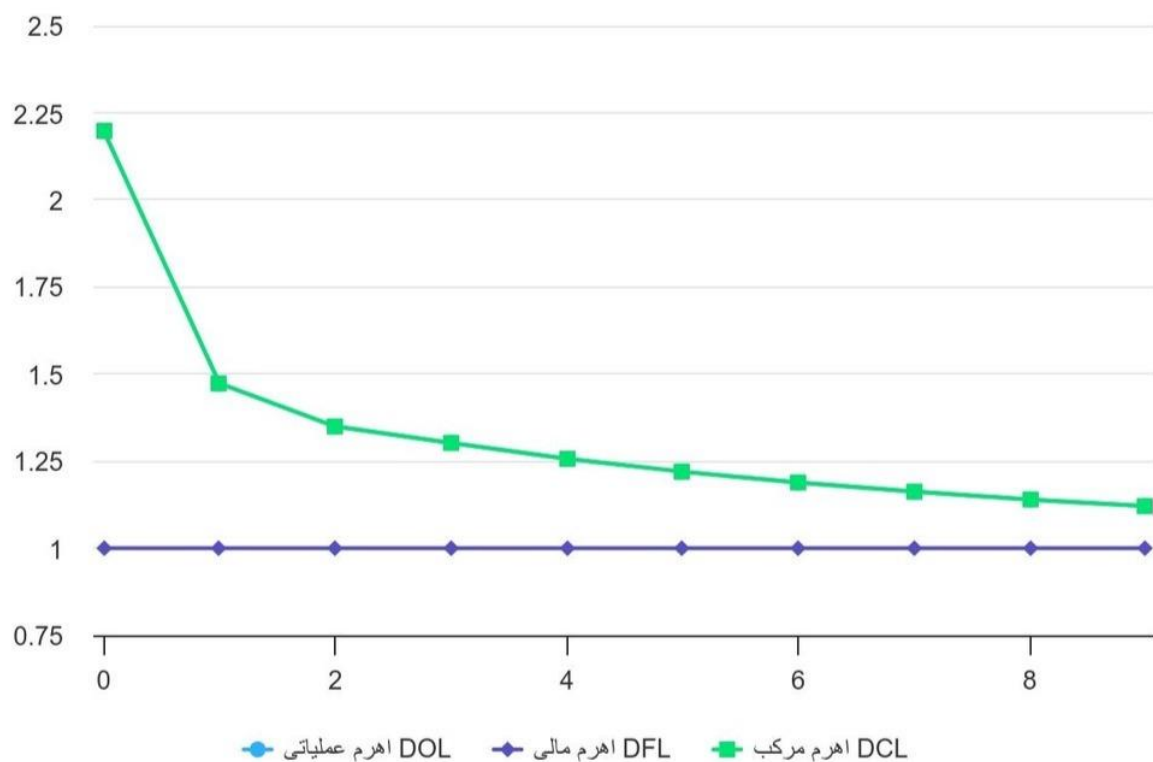


Operating Leverage (DOL), Degree of Financial Leverage (DFL), and Degree of Combined Leverage (DCL).

The levels of operating leverage and combined leverage (overall company risk) have consistently decreased from the first to the tenth year, indicating a reduction in risks. This trend is also clearly visible in the chart below.

**Table 18 - Sensitivity Analysis**

<b>Leverage Type</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>	<b>2032</b>	<b>2033</b>
Operating Leverage (DOL)	2.20	1.47	1.35	1.30	1.26	1.22	1.19	1.16	1.14	1.12
Financial Leverage (DFL)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Combined Leverage (DCL)	2.20	1.47	1.35	1.30	1.26	1.22	1.19	1.16	1.14	1.12



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#### 14- Summary:

The implementation of the plan involves acquiring a land area of 100,000 square meters, where the construction and landscaping are planned to cover a total built-up area of 28,000 and 72,000 square meters, respectively. The total investment in land, buildings, and landscaping is estimated to be 7,280,000 million rials. The total investment before operation is estimated to be 8,684,004 million rials. Accordingly, the total required fixed capital is estimated at 43,420,020 million rials, and the total required working capital for the plan is 5,439,297 million rials. The overall plan investment, amounting to 48,859,317 million Rials, is expected to be funded from the shareholders' equity. The Internal Rate of Return (IRR) of the project has been estimated at 51.95%, and the Payback Period (PBP) is expected to be a maximum of 4 Years & 5 months. The project's liquidity position and its ability to pay dividends to shareholders from the company's funds are also favorable. Therefore, assuming that the

assumptions and forecasts are realized, the plan under review is expected to be profitable. Based on the financial results obtained, its implementation is recommended. The key economic aspects of the plan are summarized as follows.

**Table 19 - Summary of the Project's Economic Aspects**

<b>Activity Type</b>	<b>Exact Activity Title (ISIC Code)</b>	<b>Product Name</b>	<b>Nominal Capacity &amp; Unit</b>
Production	2431412348	Poly-Stal	40,000 tons
<b>Execution Period (Months)</b>	<b>Total Fixed Investment (Million IRR)</b>	<b>Annual Working Capital (Million Rials)</b>	<b>Required Human Resources</b>
30	43,420,020	5,439,297	724
<b>Internal Rate of Return (IRR)</b>	<b>Net Present Value (NPV) (Million IRR)</b>	<b>Investor's Contribution (Million IRR)</b>	<b>Benefit-Cost Ratio (B/C)</b>
51.95%	110,587,030	----	1.1

Based on the expected return rate and the net present value of the plan, it is recommended to invest in this plan. Furthermore, with an Internal Rate of Return (IRR) of 51.95%, compared to the investor's expected return rate of 30%, the plan appears to be in a favorable position. Therefore, based on this financial indicator, investing in this plan is recommended.

### **Economic and Strategic Analysis**

- Internal Rate of Return (IRR): The 51.95% IRR signifies very high profitability for the project. This return is significantly higher than bank interest rates and annual inflation, indicating a quick return on investment and favorable profitability in both the short and long term.
- Net Present Value (NPV): The net present value of 110,587,030 million Rials clearly shows that the project will not only cover its initial investment costs but will also generate substantial profits. This number reflects the project's strong profitability and investment attractiveness.

- **Benefit-Cost Ratio (B/C):** The benefit-cost ratio of 1.1 indicates that for every unit of cost, 3.12 units of profit are generated. This economic indicator confirms that the investment in this project is highly rational and profitable, providing a substantial return.
- **Payback Period:** The short payback period of 4 years & 5 months means that investors will recover their initial investment in a very short time, after which the project will solely generate profit. This feature reduces investment risk and increases investor confidence
- **Working Capital and Human Resources:** The need for 5,439,297 million Rials in annual working capital and 724 employees indicates the project's high potential for creating jobs and having a positive impact on the local economy. This can also attract government and social support.

### 15- Estimation of Exchange Rate Fluctuations During Project Implementation

The exchange rates considered during the evaluation are as follows. Regarding the procurement of machinery and equipment for the project, since part of the required equipment and raw materials are sourced from abroad, any increase in exchange rates will lead to an increase in the initial investment cost. Conversely, a decrease in exchange rates will reduce the initial investment cost. However, since all raw materials for the plan are extracted from local mines in Kermanshah, changes in exchange rates will not affect the cost of the finished product. For sales, since part of the revenue from the plan is expected to come from exports, an increase in exchange rates will boost revenue, and a decrease in exchange rates will shift the focus to domestic markets.

**Table 20 - Exchange Rate**

Currency	Unit Price	Unit of Measurement
USD	682,300	IRR (Iranian Rial)
EUR	745,100	IRR (Iranian Rial)

Source: Gold, Coin, and Currency Information Network, as of November 2, 2024

## **16- Capital Requirements, Funding Methods, and Collateral:**

### **16-1. Required Foreign Capital:**

The plan does not require foreign currency, and the entire fixed capital is in Rials (Table 17).

**Table 21 - Required Foreign Capital**

<b>No.</b>	<b>Year</b>	<b>Amount of Foreign Currency Required</b>
1	First	0
2	Second	0
3	Third	0
4	Fourth	0
5	Fifth	0

### **16-2. Participation and Funding Methods:**

The participation in the plan and its financing are planned through the establishment of a company within the country. All financial resources required for the plan are expected to come from investor contributions, and no internal bank loans have been considered for its execution.

### **16-3. Return on Investment Period:**

The return on investment period is the time taken for the plan's initial investment to be recovered from the plan's annual cash flows. The simple payback period for the plan, based on calculations, is estimated to be 2 yrs & 7 months.

## **17- Incentives, Features, and Benefits of the Plan:**

A single Poly Stal production unit, given the role of industrial activities and the use of supportive mechanisms, aligns with the government's policies to further develop production units. For those producers who are unable to establish a Poly Stal production unit using their own financial resources, they can apply for bank loans. However, this option also comes with specific conditions and

regulations, which must be met in order to qualify for the loan. One of the key conditions is the economic feasibility of the production plan. If costs exceed revenue and profits, the plan will lack economic viability and may lead the producer into significant losses. The Ministry of Industry, Mine, and Trade grants loans and financial support in accordance with "Clause A of Note 18 of the Industry, Mine, and Trade" and "Clause A of Article 52 of the Accession Law." This ministry has made efforts to offer loans with relatively reasonable interest rates to create fairness among individuals who wish to start a business in the industrial, mining, and trade sectors. What is clear is that both "Clause A of Note 18 of the Industry, Mine, and Trade" and "Clause A of Article 52 of the Accession Law" are regulations designed to provide financial support to investors in the industrial, mining, and trade sectors.

#### **18- Packaging and Storage Tactics for Polyoxymethylene (POM):**

Generally, no specific packaging is considered for the production of Poly Stal, but special conditions are required for its storage. These conditions include:

- 1) Dry Environment: Poly Stal should be stored in a dry environment to prevent moisture absorption, as moisture can affect the properties and processing characteristics of the material.
- 2) Temperature Control: The temperature for storing Poly Stal should ideally be maintained between 15-30°C (59-86°F).
- 3) Protection from Sunlight: Polyoxymethylene should be protected from direct sunlight and exposure to UV rays to avoid degradation, discoloration, and potential changes in material properties.
- 4) Ventilation: Ensure adequate ventilation in the storage area to prevent the accumulation of smoke or gases that might interact with the material.

- 5) **Avoid Contaminants:** Poly Stal should be stored away from contaminants such as dust, dirt, chemicals, or other substances that could affect its purity or properties.
- 6) **Stacking:** When stacking raw Poly Stal material, ensure that the weight is evenly distributed to prevent deformation or warping of the material.
- 7) **Moisture Protection:** If the storage area is prone to humidity, use moisture-resistant packaging or containers to protect the polyoxymethylene from moisture exposure.
- 8) **FIFO (First-In, First-Out):** Adhere to the FIFO principle when storing POM materials to ensure that older stock is used first, minimizing the risk of degradation over time.

#### **19- Poly Stal Supply Chain:**

The supply chain in the production of poly stal consists of several key stages that span from the supply of raw materials to the final distribution of the product. The stages are outlined below:

- 1) **Raw Material Supply:** Poly Stal is primarily produced from specific monomers like dimethylformamide and formaldehyde. These raw materials must be sourced from reliable suppliers.
- 2) **Production Process:**
  - **Polymerization:** In this stage, the monomers react under specific conditions (temperature and pressure) to form polymer chains.
  - **Quality Control:** During the production process, the quality of the materials and final products should be continuously checked to ensure compliance with required standards.
- 3) **Post-Production Packaging:** Poly Stals are usually packaged in special bags or barrels to protect it from damage and contamination.

- 4) Storage: The packaged products must be stored in appropriate warehouses to protect them from environmental conditions.
- 5) Distribution: Transportation: The products must be transported to customers or distributors. This stage involves selecting suitable transportation methods (land, sea, or air).
- 6) Delivery: Finally, the products are delivered to the end customers.
- 7) After-Sales Services: Some producers offer after-sales services, including technical consulting and support. Collecting customer feedback is crucial for improving the quality and efficiency of the supply chain. This supply chain may vary depending on the type of company and market.



## 20- Core Business Values in Human Capital:

Every organization considers itself bound by certain principles, beliefs, and values that influence its programs and operations. These values typically stem from the vision and thoughts of its founders. Some of the proposed core values for the Poly Stal production plan include:

- Continuous Development and Learning
- Teamwork and Collaboration
- Responsibility and Accountability
- Safety and Health
- Innovation and Creativity
- Quality and Continuous Improvement

## 21- Business Model Canvas



## 22- Executive Summary of the Poly Stal Production Business Plan

The following is the executive summary of the Poly Stal production business plan for the economic zone in Islamabad West: The findings of this study indicate that a total of 43,420,020 million rials will be invested in various fixed capital items for the plan, and 8,684,004 million rials will be spent on obtaining licenses, preparing plans, and test operations. With this amount considered, the total investment for the plan will reach

52,104,024 million rials. On the other hand, in the first year of operation, the required working capital will be 5,439,298 million rials, which will increase to 6,969,793 million rials and 7,910,743 million rials in the second and third years, respectively. It should be noted that the utilization rate of the nominal capacity in the first, second, and third years will be 70%, 90%, and 100%, respectively. Additionally, the total estimated revenue from the full nominal capacity is 52,800,000 million rials. In total, the plan will create 724 jobs in various positions. Furthermore, this plan requires 1 million rials in bank loans, which constitutes 0% of the total investment required (both fixed and working capital). The profit in the first year of the plan will be 9,548,881 million rials, and in the tenth year, considering the residual value and inflation accounted for in the assumptions, it will reach 99,318,263 million rials. Based on the calculations, the internal rate of return (IRR) for this plan is 51.95%, which is significantly higher than the investor's expected return of 20%. Therefore, based on this financial indicator, investment in this plan is recommended. Additionally, the plan will achieve a return on investment (ROI) in 4 yrs & 5 months and break-even at 38.73% of the nominal capacity. Below is a summary of the key financial data:

No.	Title	Amount	Interpretation
1	Payback Period	53 months	This means that after 53 months ( 4yers & 5months), the net profit of the project will cover the initial investment.
2	Break-even Sales Percentage	39%	To reach a point where neither profit nor loss is made, 39% of the nominal capacity must be utilized.
3	Debt Ratio in the First Year	4.3%	This means that a total of 4.3% of the total assets are financed by debt.
4	Debt to Equity Ratio in the First Year	0.0%	This means that the company's current and long-term debt is 0.0% of its equity.
5	Total Asset Turnover Ratio in the First Year	52.8 times	This means that sales are 52.8 times the value of total assets.
6	Net Profit Margin in the First Year	51.5%	This means that 51.5% of sales or revenue is net profit.
7	Net Profit Margin in the Last Year	61.4%	This means that 61.4% of sales or revenue is net profit.
8	Current Ratio	6.5	Current assets are 6.5 times the current liabilities.

	in the First Year		
9	Current Ratio in the Last Year	15.2	Current assets are 15.2 times the current liabilities.
10	Financial Leverage	2.2	This means that for every 1% change in revenue, net profit will change by 2.2%. .
11	Investment per Employee	71.967 million IRR	For each job created in this plan, an investment of 71,967 million rials will be made.
12	Financing per Job	0	For creating jobs, no financial facilities are used per person.
13	Profitability Index	3.1	
14	Share of the Largest Investment Item	83.0%	83.0% of the fixed investment in the plan is allocated to machinery and equipment, which constitutes the largest portion of the investment items.