

Detailed Project Report

Industrial Gases Manufacturing Plant

By

INOX AIR PRODUCTS PVT LTD.



Air Separation Plant- Capacity 200 MT/Day

At

Village: Yusufpur Isapur , Tehsil: Modinagar,

Dist :Ghaziabad, Uttar-Pradesh

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

Table of Contents

Company profile	1
Current performance of INOXA Air Products Pvt Limited	2
About the proposed project:	3
Products and its applications:	4
Key Advantages of the Project:.....	5
Equipment/Plant & Machinery/Investment estimate.....	6
Employment generation potential.....	7
Objectives of the proposed project.....	8
Project implementation schedule	9
Project contribution towards sustainable development	10
Social well-being.....	10.1
Economic well being	10.2
Environmental well being	10.3
Cost of Project	11
Project Description.....	12
Prologue.....	12.1
Project Location:	12.2
Area details:.....	12.3
Manufacturing process description	13
Basic requirements of the project	14
Product details.....	14.1
Land requirement.....	14.2
Raw material requirement	14.3
Fuel requirement	14.4
Water requirement	14.5
Energy requirement	14.6
Manpower requirement	14.7
Environmental aspects:	15
Energy conservation measures.....	16
Safety provisions.....	17

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

List of Annexures:-

Annexure 1 - MAP

Annexure 2 - GOOGLE IMAGE

Annexure 3 - SITE PLAN / PLOT PLAN

Annexure 4 - PROCESS FLOW DIAGRAM FOR ASU

Annexure 5 - FINANCIALS FOR THE NEW PROJECT

- 5.1** Previous 3 Years Financial Performance of INOXAP
- 5.2** Projected Profit & Loss Account of the proposed project
- 5.3** Projected Cash Flow Statement of the proposed project
- 5.4** Projected Balance Sheet of the proposed project

Annexure 6 - LIST OF UNITS OF THE COMPANY

Annexure 7 - LIST OF DIRECTORS

**Annexure 8 - AUDITED BALANCE SHEET OF INOX AIR PRODUCTS FOR PRECEDING
3 (THREE YEARS)**

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com



INTRODUCTION

1. Company profile

INOX Air Products Pvt. Limited is a joint venture company in which the Jain family (former owners of the Industrial Oxygen Company) and Air Products and Chemicals, Inc. USA (APD) hold an equal stake.

Head-quartered in Mumbai, INOX Air Products Pvt. Ltd is one of the largest manufacturers of industrial gases in India with 38 plants spread throughout the country. The company has a workforce of approximately 1200 and has turnover of in excess of \$ 100 Million.

INOX Air Products Pvt. Ltd manufactures and supplies industrial gases including Oxygen, Nitrogen, Argon, Helium, Carbon- Dioxide, Hydrogen, and specialty gas mixtures throughout India. The company specializes in providing products, technologies and services to a vast cross-section of industries including the chemical, pharmaceutical, metals, steel, food, waste water treatment, cement, glass, textiles, paint, medical and pulp and paper sectors, to name but a few.

Air Products (NYSE:APD) serves customers in technology, energy, healthcare and industrial markets worldwide with a unique portfolio of products, services and solutions, providing atmospheric gases, process and specialty gases, performance materials and chemical intermediates. Founded in 1940, Air Products has built leading positions in key growth markets and is recognized for its innovative culture, operational excellence and commitment to safety and the environment. With annual revenues of \$9 billion and operations in over 40 countries, the company's 18,300 employees build lasting relationships with their customers and communities based on understanding, integrity and passion.

2. Current performance of INOX Air Products Pvt. Limited

INOX Air Products has revenue of 1487 Crores which has grown at 6.4% CAGR over past five years.

	2014-15	2015-16	2016-17	2017-18	2018-19	CAGR
Revenue	Rs. Lacs	Rs. Lacs	Rs. Lacs	Rs. Lacs	Rs. Lacs	%
	-----	-----	-----	-----	-----	
	115,834	123,555	149,335	145,669	148,729	6.4%
	-----	-----	-----	-----	-----	

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

3. About the proposed project:

INOX AIR PRODUCTS are proposing to set up a Greenfield project for production of Industrial Gases at Vill: Yusufpur-Isapur, Tehsil; Modinagar, Distt:Ghaziabad, Uttar-Pradesh with an investment of around ₹105.00 crores. INOX Air Products project consists of a 200 TPD Air Separation Plant. Oxygen, Nitrogen and Argon produced from this Air Separation Plant are supplied to the customers through specially designed cryogenic road tankers.

The products manufactured in this unit would tremendously help the growth of infrastructure sector like Iron & Steel, Chemicals, and Petrochemicals, Healthcare (Hospitals), Animal Husbandry sector, clean fuel endeavors, Auto Industry, Glass Industry, Electronic Industry, and a number of other industrial sectors in and around the state of UP.

Production Rate:

Products	Unit	Quantity
Liquid Oxygen	MT/ Day	149
Liquid Nitrogen	MT/ Day	54
Liquid Argon	MT/ Day	6.0

Production Process:

Manufacturing process in ASU involves the separation of the gases in air through fractional distillation using cryogenic technology. In this process, the temperature of atmospheric air is reduced to sub-zero level, where the air turns into liquid and the constituent gases are separated, in the distillation column at their respective boiling points.

Market:

Industrial gas industry remains the backbone of the industrial sector as the industrial gases are used in the manufacturing process of virtually all major industries today. The growth rate of industrial gas industry is directly proportional to the growth of the economy. Normally industrial gases requirements especially in developing economies is expected to grow at more than the “Index of Industrial Production” rate of the country.

The main driving factors for growth of industrial gases are demand for improving quality, productivity and efficiency as well as environmental compliance.

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com



In India, merchant gas industry has grown over past five years at a brisk pace outshining the global growth rate. This growth is largely activated by paradigm shift in the philosophy of producing gas versus outsourcing from dedicated suppliers.

New technologies of low-pressure air separation have become order of the day replacing smaller high pressure gas manufacturing process. With this it has brought new benchmarks of reliability and efficiency specifically the power efficiency.

The Indian market is largely (approx.. 70%) divided amongst four participants viz. INOX Air Products, Praxair, Linde and Air Liquide and the remaining with large number of smaller players having regional presence.

4. The Products and its Applications:

The proposed project is being set up to produce Oxygen, Nitrogen and Argon. A brief introduction to these gases and its application in various industries are as follows:

OXYGEN:-

Oxygen, which is a gaseous element at atmospheric condition, is the most important constituent gas of air (21.6%). Oxygen is produced industrially by two types of Air Separation processes. First one is by Liquefying Air in a Cryogenic process and then separating Oxygen from Liquefied air by Distillation. The Second one is by Vacuum Swing Adsorption (VSA) which is a Non Cryogenic Adsorption based air separation process.

Oxygen can be stored and shipped as either a gas or a cryogenic liquid. When cooled to its boiling point of (-183°C), Oxygen becomes a transparent, pale blue liquid. While the Oxygen we breathe is "light as air," Liquid Oxygen is heavier than water – 9.5 lbs./gal vs. 8.3 lbs./gal for water.

Although oxygen itself is non-flammable, more than 21% of oxygen in air helps materials to burn (oxidize) better and faster and, coupled with the fact that the gas has neither odor nor color, makes an excess of oxygen in air very dangerous. The principal uses of oxygen stem from its strong oxidizing and life-sustaining properties.

Medical Oxygen:

Medical Oxygen is supplied to hospitals through Bulk Liquid Oxygen tank installations or Larger Cylinder banks. A modern hospital is unthinkable without medicinal oxygen and its constant and reliable supply. Adequate oxygenation is vital for maintaining human life. If insufficient oxygenation (Hypoxia) occurs, oxygen supplementation of the inhaled air is essential. Oxygen supplementation today is a fundamental part of medicine to treat patients with severe asthma and COPD (Chronic obstructive pulmonary disease) etc.

Metals Production:

Modern day metals manufacturing (iron, steel, copper) uses oxygen in very large quantities. Iron and steel production in particular are the single largest consumers of oxygen. Oxygen is used in various stages of steel

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com



manufacturing [Electric Arc furnace (EAF), Basic Oxygen Furnace (BOF) and in Argon Oxygen Decarburization (AOD) process] to aid the combustion process either by enriching the combustion air with oxygen, oxygen boosting using oxy-fuel burners to increase the furnace temperature or by using 100% oxygen as a supersonic jet (lance) to provide chemical energy for the steel manufacturing process. The advantages of using oxygen in metals production include faster production, reduced energy consumption, increased production and reduced emissions from the combustion process. Oxygen is also used with acetylene gas to make oxyacetylene flame to cut metal sheets.

Petroleum Refinery & Petrochemicals:

Refineries process crude oil and refine it into various petroleum products as diesel, petrol and Kerosene. Since crude oil feedstock to refineries is becoming increasingly heavy in sulphur content, Oxygen is being increasingly utilized in sulphur recovery units (SRU) across the refineries worldwide as a reliable, economic and safe method of increasing the capacities of SRU for sulphur removal which is a bottleneck for increasing production capacity of existing refineries. Oxygen enrichment in Fluidized Catalytic Cracking Unit (FCCU) is a reliable low-cost option for achieving up to 40% increased production capacity while avoiding unit modifications and huge investment for increasing FCCU capacity. Oxygen is also used for applications for producing synthesis gas ($\text{CO} + \text{H}_2$) to make chemicals, fuels, electricity, hydrogen or steam. Oxygen is used as a raw material in manufacturing process of various petrochemicals as Purified Terephthalic Acid (PTA), Vinyl Acetate Monomer etc.

Paper:

Paper is made from pulp which in turn is produced from wood by chemically treating wood with alkali and chlorine (bleach). Due to environmental pollution arising from the use of chlorine as bleach and also due to its inherent toxicity, chlorine is being replaced by oxygen as a bleaching agent in Oxygen Delignification process in pulp mills. Oxygen is also used in wastewater treatment and for generating ozone which has got very strong oxidizing and disinfection properties.

NITROGEN:-

Elemental Nitrogen (N) is a colorless, odorless, tasteless and mostly inert diatomic gas at standard conditions, constituting 78.03% of the air, has a gaseous specific gravity of 0.967, and has a boiling point of -195.8°C at atmospheric pressure. Nitrogen is produced by a variety of air separation processes, including cryogenic liquefaction and distillation, pressure swing adsorption, and membrane separation. Liquid Nitrogen, a fluid resembling water, but with 88% of the density, is a common cryogen. Liquid Nitrogen boils at low temperature and can freeze water at room temperature.

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

Chemicals Industry:

- Nitrogen can be used for blanketing, as well as for Storage for protecting raw materials or finished products in liquid form from the formation of peroxides and/or gum, and from contamination by oxygenated components.
- Preparation of catalysts and transportation of polymer powders.
- Medium for the exhaust of emitted heat in fluid bed reactors.
- Temperature Control in reactors.

Pharmaceuticals Industry:

- Nitrogen is used for inerting reactors & tanks storing hazardous products, cryogenic cooling of reactors which release heat during chemical reactions, cryogenic-grinding of polymers, freeze drying for preservation of bio-technology products by moisture removal with Liquid Nitrogen, environmental protection by recovering organic compound with liquid nitrogen in the emissions from the plant.

Food and Beverage Industry:

- Liquid nitrogen: It is used for IQF (Individual Quick Freezing) of variety of food products.
- Gaseous nitrogen: N₂ is very commonly used in contact with foodstuffs to avoid oxidation or micro-organism growth by inerting of liquids.
- Modified Atmosphere Packaging (MAP) preserves and protects foods (pure nitrogen or mixed with CO₂).
- Nitrogen gas help to preserve tea leaves in packs.

Health Care Industry:

- Low-temperature preservation of living tissues and cells.

Petroleum Industry:

- As inert gas medium and blanketing.
- It is used for cleaning cross country pipe lines also.

Laboratories and Analysis:

- Nitrogen is used as a carrier gas in gas chromatography for various industrial and hospital analyses and quality control.
- Nitrogen is the balance gas of the calibration gas mixtures for environmental monitoring systems and industrial hygiene gas mixtures.

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com



- Nitrogen is largely used as purge, dryer or blanket gas for analyzers or chemical reactors (under gaseous state or at low temperature liquid state).

Glass Industry:

- Nitrogen is used as an inert gas, in combination with hydrogen, to produce a reducing atmosphere over the molten tin bath in the float line.

Metal Industry:

- Inert medium inside Heat treatment furnace for ferrous and non-ferrous metals.

Electronics:

- Nitrogen is used as carrier gas for overall protection against impurities and oxidation in semiconductor and soldering processes. In its cold and liquid form, N₂ is used as a cooling medium in the environmental testing of electronic devices.

Tyre Industry:

- Gas Assisted Injection Moulding requires pressures between 10 bar (145 psi) and 200 bar (2900 psi) and a nitrogen content of between 98.0% and 99.9 %.
- Tyres filling with nitrogen increases their lifetime and therefore decreases the recycling or treatment of this waste.

ARGON

The atmosphere contains about 0.9 % Argon (Ar). It is colorless, odorless, tasteless, noncorrosive, nonflammable, and nontoxic. Argon is chemically inert and stable under heat and pressure. This unique stability makes it an ideal gas for applications which require an inert and a stable environment. If Argon is released

in a closed environment, it may reduce the local oxygen concentrations which may cause asphyxiation. Hence, argon should ideally not be released in a closed environment.

Food and Beverage Industry:

- Argon can be used in a controlled atmosphere to replace nitrogen in most applications. Its solubility (twice that of nitrogen) and certain molecular characteristics give it special properties for use with vegetables. Under certain conditions, it slows down metabolic reactions and significantly reduces breathing.

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

Glass Cement and Lime Industry:

- Argon is used for the filling of double glazing enclosures for high performance thermal isolation.

Metal Industry:

- Argon is used to prevent contact, hence interaction, between liquid metal and the surrounding atmosphere. Applications include melt stirring, tundish purging to prevent steel re-oxidation and secondary steel refining in vacuum degassers, such as the VOD, RH, RH-OB.
- However, the largest quantities of argon are consumed in the AOD process for de-carburizing raw high-chromium steels while minimizing the chromium oxidation.

Laboratories and Analysis:

- Used pure and in mixtures for industrial and hospital analyses and quality control.
- More particularly, argon is used as plasma gas in inductive coupled plasma emission spectrometry (ICP), blanket gas in graphite furnace atomic absorption spectrometry (GFAAS) and as carrier gas in gas chromatography for various detectors.
- In mixture with methane, argon is used in Geiger counter and in the detector of X Ray Fluorescence (XRF) as quenching gas.

Welding, Cutting and Coating:

- Argon is a shield gas used in arc welding, root shielding and plasma cutting.
- Argon protects welds against oxidation as well as reduces fume emissions during welding.

Electronics:

- Ultra-pure argon is used as carrier gas for reactive molecules, as inert gas to protect semiconductors against impurities (e.g. Argon provides the atmosphere for growing crystals of silicon and germanium).
- Under ionic state, argon is used for sputtering, ion implantation, annealing and etching processes in semiconductor or high performance material manufacturing.

Automotive and transportation:

- Packaged pressurized argon is used to inflate car airbags.

Others:

- Argon is used as inert atmosphere in incandescent light bulb. Argon filling avoids the corrosion of the tungsten filament and consequently the blackening of the bulb.

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com



- In mixture with some hydrocarbons, argon is used in radio tubes and Geiger counters.

5. Key Advantages of the Project:

- Meet the Gas requirement in the subject area, which presently is supplied from adjoining States.
- This Project will support as growth engine in form of industries like Glass, Automotive Ancillaries, Electronics, Stainless Steel, Petroleum, and Food Processing along with Packaging etc.
- Make available locally the critical utility Gas requirement for industries being set up in UP which otherwise would have haul the product from long distance and thereby saving in shortage on product loss and transportation cost.
- Sector which would be directly and immediately benefitted are:-

Healthcare / Hospital -

INOX AIR PRODUCTS is the leading supplier of Oxygen Gas to the Hospital / healthcare across the country. The most prestigious and the most advanced healthcare center in the country, All India Institute of Medical Sciences at New Delhi has been serviced by us since the 1980s. We have replicated the success there in the supplies and usage of this product at a large number of hospitals across the country. All large hospital chains including, Fortis-Escort hospitals, Apollo Chain of hospitals, Max Group of Hospitals, Columbia Asia chain of hospitals, AIIMS, PGI CARE hospitals and a large number of other healthcare centres have chosen INOXAP to modernize themselves with usage of this product.

Revolutionize the way of usage of Oxygen in the Hospital. Liquid Oxygen will replace the usage of Gas Cylinders to a large extent by supplying supplies to hospitals through Bulk Liquid Oxygen Tank transportation and installation. A modern hospital is unthinkable without medical oxygen and is constant and reliable supply. In other words, the Healthcare Centres in UP is expected to get modernized through liquid medical oxygen delivery system.

The additional investment needed for installation of liquid oxygen tanks and its delivery system within the Hospital would be an additionally made by INOXAP, to facilitate Oxygen dispensation modernization.

Animal Husbandry -

The state livestock development boards regularly require Liquid Nitrogen for preserving semen. This is a critical item helping the farmers and research agencies. INOXAP is one of the leading supplier to various Animal Husbandry Board across the country. The proposed project would supply the desired quantities of liquid Nitrogen to UP Livestock Development Board centers as per their requirement.

Auto Industry -

The proposed plant would be manufacturing Liquid Argon, Liquid Oxygen and Liquid Nitrogen which are critical input to the auto industry. Availability of these liquefied gases in the vicinity would ensure consistent supply and save cost due to proximity to auto industry in this area.

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

- The proposed unit would help generate long term sustainable Employment opportunity in UP.
- The proposed unit would help to renewable energy (viz. solar)
- The manufacturing process used is ‘Non-Polluting’ and thereby environmental friendly.
- The project would generate substantial tax revenue for the State on a continuous basis.

6. Equipment/Plant & Machinery/Investment estimate:

As per the present estimates, investments for the proposed plant will be in the range of ₹ 125.00 Crores.

7. Employment generation potential:

The direct employment generation due to the proposed expansion of the plant would be additional 30 persons in the first 3 years.

8. Objectives of the proposed project:

The objectives of the project are as follows:

- Setting up of state of the art industrial gases plant in UP, India.
- Meeting the growing demand of industrial gases in India.
- Direct and Indirect employment generation.
- Fulfilling of INOXAP’s commitment to the Indian market to produce and sell best quality industrial gases.

9. Project implementation schedule:

The project implement schedule is approximately 24 to 36 months from the date of site possession.

10. Project contribution towards sustainable development:

INOX Air Products Pvt. Limited is opting for state-of-the-art industrial gases manufacturing facility with eco-friendly and contemporary technology towards sustainable development. The same has been addressed based on the following pillars of sustainable development.

10.1 Social well-being

The project activity would result in generation of employment opportunities for professional, skilled and unskilled labour for management, operation and maintenance of the new activities. The development of project specific infrastructure has also resulted in employment and income generation sources.

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com



The direct employment generation from this manufacturing facility will be to the tune of 30 persons in the first 3 years. However, the indirect employment will be approximately 100 persons including personnel at distributors, suppliers, logistics partners etc.

In addition various kinds of electro-mechanical works would generate employment opportunities for local contractor on regular and permanent basis. The project would contribute towards capacity building in terms of technical knowledge and managerial skills.

10.2 Economic well being

Successful implementation of the project activity will attract capacity enhancement by the allied industries and suppliers. It is estimated that for every year, the contribution to the exchequer at the prevailing tax structure will be approximately about ₹ 8.5 crores in the form of GST.

10.3 Environmental well being

The plant is typically designed to have “Zero Discharge” and all the treated waste water will be reused in process as well as for gardening. All the air emission sources will be provided with adequate stack heights as per the Central Pollution Control Board guidelines. This industry is totally POLLUTION FREE and as such contribute substantially to maintain eco balance in the atmosphere.

11. Cost of Project

The total estimated cost of the proposed expansion project is 105.00 Crores (Approx.). Break-up of total project cost has been given below:

Break-up of Project Cost

S. No.	Particulars	Amount (₹ Crores)
1.	Land & Site Development	5.25
2.	Building / Interiors & Civil Work	10.00
3.	Plant & Machinery	89.75
Total (Approx.)		₹105.00

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

12. Project Description

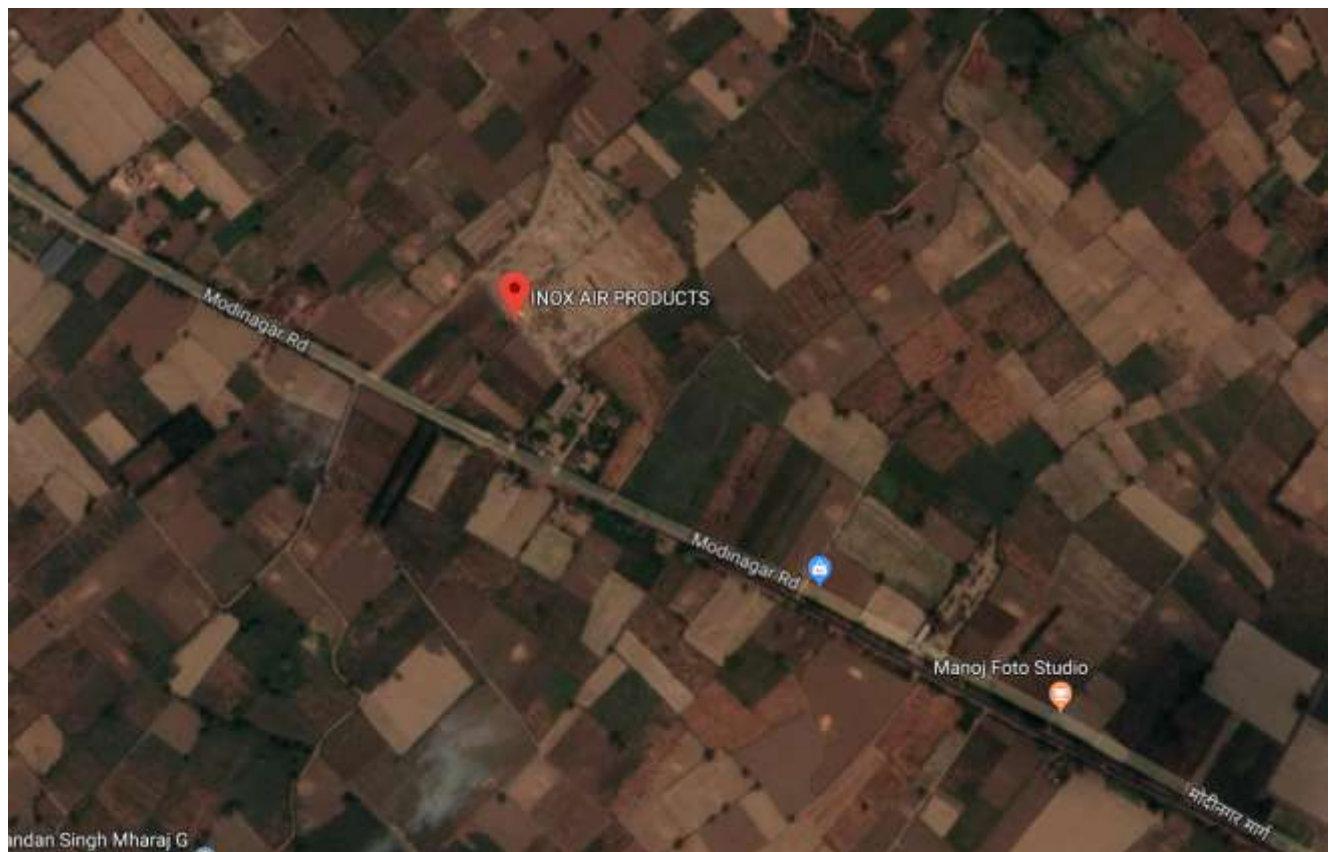
12.1 Prologue

In view of the positive outlook of the Indian economy and Uttar Pradesh growing demand for industrial gases like oxygen, nitrogen, Argon, INOX Air Products Pvt. Ltd is proposing new manufacturing facility as stated at Vill: Yusufpur-Isapur, Tehsil; Modinagar, Distt: Ghaziabad, Uttar-Pradesh.

12.2 Project Location:

INOX Air Products is proposing to take a plot from former for industrial gases manufacturing facility purpose. The proposed project will fall in the notified industrial area, which is situated at Vill: Yusufpur-Isapur, Tehsil; Modinagar, Dist : Ghaziabad, Uttar-Pradesh.

- I. Yusufpur Isapur village is located in Modinagar Tehsil of Ghaziabad district in Uttar Pradesh, India. It is situated 12km away from sub-district headquarter Modinagar and 33km away from district headquarter Ghaziabad.
- II. Google Map : <https://goo.gl/maps/uwtYHdi2YWY5UJq47>



INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

Surrounding Area Profile

Latitude	28° 46'51.3"N
Longitude	77° 39'34.3"E
Nearest National Highway	NH-58 & NH-24
Nearest Railway Station	Modinagar/ Hapur
Nearest Airport	Meerut/ Delhi
Vill:Yusufpur-Isapur	Vill:Yusufpur-Isapur
Nearest State Boundary	Delhi

- ◆ Site elevation with respect to mean sea level **219.16 m (719.03 ft)** from MSL .
- ◆ Ambient Temperature :-
 - High Temp(Avg): Max 40 Deg. C,
 - Low Temp(Avg): Min 10 Deg. C,
- ◆ Relative Humidity
 - Between 40% to 70%
- ◆ Rainfall
 - Annual Mean: **810 mm**
- ◆ Seismic zone / earthquake zone
 - Seismic Zone IV
- ◆ Wind Speed - Overall mean: **6.28 m/s**

12.3 Area details:

In the proposed project the total ground area required around **5.10 Acres** the site plan / plot plan is enclosed for reference.

13. Manufacturing process description:

13.1 PROCESS DESCRIPTION FOR AIR SEPERATION PLANT

Production of Oxygen along with Nitrogen and Argon (which are all inorganic chemicals)

ASU manufacturing process involves mainly compression of atmospheric air, cooling, liquefaction and then separation in to oxygen, nitrogen and argon by maintaining temperature and pressure in the distillation column. The air separation unit (ASU) produces liquid products using a cryogenic distillation process.

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com



The atmospheric air is cleaned, compressed and then liquefied. The Liquid Air is then distilled in a fractional distillation column to separate it in to its constituents such as Oxygen.

This process involves following multiple unit operations.

- Filtration, Compression, and Removal of Heat and Condensate from Ambient Air
- Air Purification
- Heat Exchange
- Distillation of Air
- Refrigeration
- Product Delivery

The plant has a main double distillation column, crude and pure argon columns, a main heat exchanger, and other process vessels and mechanical equipment (such as a compressor, expander and pumps) that work together to produce a continuous stream of product. A brief description of the major unit operations in the plant as follows.

Process Description

Air compression and pre-cooling system:

The incoming air is first cleaned from dust and other particles in an air filter S1146 and then compressed to the required process pressure to about 23.1 bar(a) by multistage inter-cooled turbo-type air compressors C1161.

The pre-cooling section contains of one MAC after cooler E1121 followed by two columns, the evaporation cooler (EVC) for cooling part of the cooling water and single stage direct contact air cooler (DCAC). The compressed air enters the direct contact air cooler E2416 at the bottom and is cooled as well as washed in counter-flow with chilled water from the evaporation cooler E2417 injected at the top of the column.

The compressed air passes through the packed beds, is washed by the trickling water and cools down before it leaves the cooler at the top. The washing process removes harmful components such as SO₂, SO₃ and NH₃ from the process air.

The cooling water and condensed water out of the process air collects in the bottom of E2416 and it goes back to the cooling water system. By means of waste nitrogen the cooling water is further cooled in the evaporation cooler; waste nitrogen is fed into the bottom and streams through the EVC column (filled with packings). The counter current of cooling water will saturate the dry nitrogen and gets cooled. The cold water is pumped into the top section of the DCAC.

Molecular sieve station:

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com



Remaining contaminants in the process air such as water vapor, CO₂, N₂O and potentially hazardous hydrocarbons are adsorbed from the air by passing through one of the two molecular sieve adsorbers A2626 A/B. One adsorber is in operation while the other one is in a regeneration mode.

The regeneration cycle consists mainly of:

- Heating
- Cooling
- Pressurising
- Depressurizing cycles

The regeneration gas is coming from the distillation unit as a waste gas (nitrogen). It is heated up in the electrical regeneration gas heater (E2618) during the heating period.

At cooling period the gas bypasses the heater and the heat is pushed out of the adsorber. At the end of the regeneration cycle the regenerated adsorber goes into operation, the other one begins with a new regeneration cycle. The cycles are automatically controlled by a process control computer in DCS.

Process Streams distribution and refrigeration:

The dry and purified process air after the molecular sieve unit A2626A/B is further compressed by the booster stages (C3450 and C3420) of the expansion turbines (X3472 and X3471) and then cooled down in the main heat exchanger. A part of the stream is fed to the rectification column T3211. The other part of the boosted air expands in the turbo expander X3471 to approximately 5.8 bar(a). A part of the expanded air is fed to the bottom of the pressure column, whereas the each expansion turbine shall have manual isolation valves.

Refrigeration:

The refrigeration requirements of the plant are due to insulation losses, heat exchange losses and removal of cold liquids out of the low temperature section. These losses are met by isentropic expansion of air in the expansion turbines (X3471 and X3472). The expansion turbines are booster loaded.

Rectification, pressure column T3211:

In the pressure column T3211 the process air separates into pure nitrogen, yielding at the top, and into rich liquid at the bottom. A part of gaseous nitrogen is withdrawn from the high pressure column, warmed up in the main heat exchanger E3116 and send out as Seal gas. The required reflux for rectification is provided by condensing the gaseous nitrogen against boiling oxygen in the condenser/Reboiler E3216. A part of the liquid nitrogen is used as reflux for the pressure column T3211. Liquid withdrawn from the HP column at intermediate stage is subcooled in E3316, throttled in a valve to about 1.35 bar (a) and given to the top of the low-pressure column.

Oxygen enriched liquid is taken from the bottom of the pressure column, fed through the sub-cooler (E3316) to the middle section of the low-pressure column (T3212).

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

Rectification, low pressure column T3212:

In the low pressure column T3212 the final separation into a pure oxygen fraction in the bottom and waste nitrogen fraction at the top takes place. Oxygen enriched liquid is taken from the bottom of the low pressure column T3212, partially subcooled in heat exchanger E3316 and then fed to the LOX storage tank.

A part of the liquid nitrogen from the bottom of the LIN separator (D3231) present at top of the low pressure column T3212, is fed to the liquid nitrogen storage tanks. The rest covers the reflux needed for the low pressure rectification.

Argon Extraction:

The argon recovery is achieved in the argon column T4111. Argon column T4111 is equipped with structured packings. Oxygen and nitrogen are removed by means of cryogenic rectification.

Oxygen enriched liquid from the bottom of the pressure column T3211 is cooled in the sub-cooler E3316 and is expanded into the argon condense E4116 is fed back to the low pressure column T3212 as oxygen feed.

The argon enriched gas from the low pressure column T3212 is used as a feed gas for the crude argon system and fed in to the bottom of the T4111. Reflux for the argon system is provided by condensing the main part of the pure argon in heat exchanger E4116 in the top condenser against rich liquid from the bottom of the pressure column T3211.

Pure liquid argon (LAR) from the upper third of T4111 can be withdrawn and transferred to the storage tank.

Liquid Storage System:

ASU produces oxygen, nitrogen and argon in liquid form and they are stored in adjacent cryogenic storage tanks.

Following storage tanks are planned to store liquid products from ASU.

- a) One 1000MT Flat Bottom LOX Tank along with PBU
- b) Two 250kL Vacuum Insulated Vertical LIN Tanks along with PBU
- c) One 30kL Vacuum Insulated Vertical LAR Tank along with PBU
- d) One 20KL Vacuum Insulated Vertical LMO Tank along with PBU
- e) One 10KL LIN Seal Gas Tank along with PBU

All tanks have provision to fill road tankers by tanker filling pumps. 2X100% pumps are provided for each tank. LOX & LIN pumps will have dual filling arrangement.

Following are instrumentation/controls provided with storage tanks and pumps:

LOX FBT Tank:

- 1. Inner Tank Level Measurement:
 - Multiple layers of overfill protections are provided. Two independent liquid level measurement, and low temperature detection in overflow line will ensure tank from being overfilled.

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

- Hardwired emergency shutdown based on above liquid level measurements and low temperature overflow protection.
 - Inner tank local level gauge.
2. Inner tank pressure control:
- Local and remote pressure indication with alarms.
 - Automatic vent control valve and PBU for protection against pressure/vacuum respectively.
 - Over pressure protection by two independent in service pressure relief valves.
3. Outer Tank Pressure/Vacuum control:
- A combination overpressure/vacuum relief device is provided for outer tank pressure and vacuum control
 - Local pressure gauge
4. Tanker filling pumps standard high pressure and cavitation protection, cold leakage protections, remote DCS start/stop.

LIN, LAR and MLOX VIST Tanks:

1. Inner Tank Level Measurement:
- Local level gauge
 - Level transmitter for remote level indication, alarms, and trips.
 - Low temperature detection in overflow line.
2. Inner tank pressure control:
- Local and remote pressure indication with alarms.
 - Manual vent valve and PBU for protection against pressure/vacuum respectively.
 - Over pressure protection by two independent in service pressure relief valves.

LIN Seal Gas Tank:

LIN from 2X250KL storage tanks is pumped to high pressure 10KL seal gas tank. LIN at high pressure from seal gas tank is vaporized and used for seal gas, purge gas and back up instrument air purposes.

Instrumentation and controls associated with seal gas tank:

- Instrumentation for level and pressure measurement and indication at local and remote DCS also.
- Safety and thermal relief valves.
- LIN vaporizer outlet temperature measurement and indication at DCS.
- Pressure regulating valves with downstream safety valves in each consumption lines.

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

Oxygen Storage:

The Oxygen produced through fractional distillation is in liquid form and in cryogenic temperature (approx. minus 183 Deg C). Product Oxygen is stored in specially designed Cryogenic storage tanks which are vacuum & perlite insulated. The storage tanks have an inner container made of stainless steel to withstand the cryogenic temperatures (approx. minus 200 Deg C). The outer wall is made up of carbon steel and the intermediate space (annular space) is maintained at vacuum level and filled with insulating material such as perlite to prevent external heat leak in to the storage tanks.

The purpose of Product Oxygen Storage are-

- As mandated by FDA (Food and Drug Administrator), Medical Grade Oxygen is produced and stored in a separate storage tank to maintain separate identification such as Batch Number.
- Separate storage space is required to store the cryogenic temperature (approx. minus 200 Deg C) produced from the plant through cryogenic distillation. Product is tested for purity and impurity after production as well as while filling into road tankers.
- One such storage tank is not adequate for storage as a Buffer Process Storage is also required to continue production process due to testing, inspection and dispatches on a continuous basis.
- All the above are integral part of the plant installation and part of the production process
- The above Storage System is built and operated as per the requirements of SMPV (Static and Mobile Pressure Vessel Rules 1981).

Liquid Storage Systems:

ASU produces Oxygen, Nitrogen and Argon in liquid form and they are stored in adjacent cryogenic storage tanks.

Following storage tanks are planned to store liquid products from ASU.

1. One 1000 MT Flat Bottom LOX Tank & 20 KL LMO Tank
2. Two 250 KL Vacuum Insulated Vertical LIN Tanks and 10 KL Seal Gas Tank
3. One 30 KL Vacuum Insulated Vertical LAR Tank

All tanks have provision to fill road tankers by tanker filling pumps.

14. Basic requirements of the project

Proposed project is intended to produce industrial gases like Oxygen, Nitrogen Argon. The requirements of the project are depicted below.

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

14.1 Product details

The proposed project intended to produce 54437 Tons of Oxygen, 19710 Tons of Liquid Nitrogen, 2190 Tons of Argon per year.

14.2 Land requirement

The proposed project requires approx. 20639 sq. mts of Land. (5.10 acres)

14.3 Raw material requirement

The raw material for producing Industrial Oxygen, Nitrogen and Argon in the air separation plant is only atmospheric air. Air Quantity should be mentioned

14.4 Fuel requirement

No fuel requirement for the operation of the plant and equipment. The fuel which would be used is the diesel for diesel generator only. This is only on emergency standby. Not a continuous usage.

14.5 Water requirement

The water requirement in the proposed plant will be mainly for industrial operations (cooling tower, chiller, etc.) and for domestic applications (cafeteria, hand wash, toilet flushing, floor cleaning etc.). In addition to that water will also be required for development of greenbelt within the industry premises, firefighting and other miscellaneous activities.

In the proposed facility, about 303 KLD fresh water will be required. This requirement of water will be met from Borewell. Recycling and reuse of water will be insured in the proposed plant to reduce the load on groundwater aquifer. The complete water management in the proposed plant is based on “Zero Discharge Concept”. All the wastewater generated from domestic applications, cooling towers, compressors intercoolers, will be neutrilised and thesame will then be reused for gardening purposes.

Water Balance:

INOX Air Products Pvt Ltd

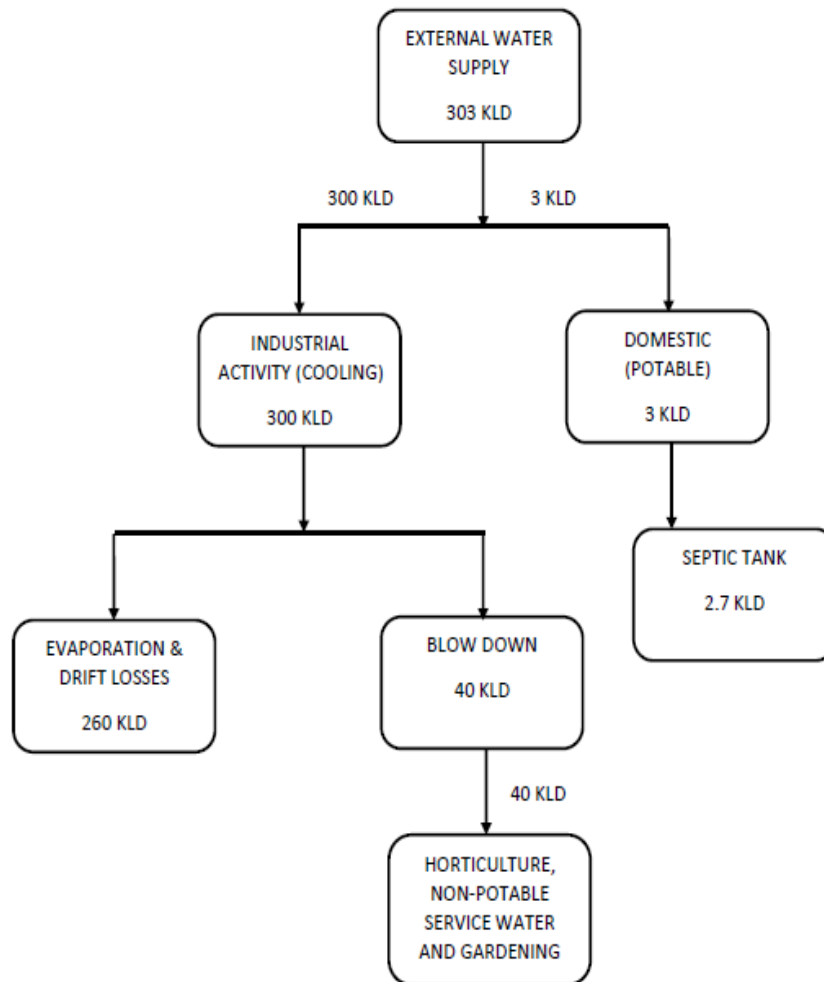
An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com



14.6 Energy requirement

The electrical energy consumption will be about **6.5 MVA - 10 MVA**. The energy requirement will be met through the power supply from UPSEB sub-station. No power backup facility for production purpose is in the proposal except DG set for essential emergency purpose.

14.7 Manpower requirement

Total manpower requirement for the proposed project will be about 30 personnel directly.

15. Environmental aspects:

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com



We are non-polluting industry

a) Air pollution: *We do not generate any waste gases which contribute to air pollution.*

b) Water pollution: *We consume only cooling water for cooling compressed air in the process, there is no requirement of process water.*

c) Hazardous waste management: *We do not generate any hazardous waste.*

16. Energy conservation measures

- During the operation phase of the project, energy resources will be required for operating of various industrial processes, area lighting, pumping etc. The following options will be used for energy conservation.
- Energy efficient machineries shall be used during operation phase.
- Sufficient care shall be taken to prevent/ minimize energy losses at each stage of development.

17. Safety provisions

It is INOX Air Products' policy to conduct all company activities with a maximum concern for the safety, health and environment of our employees our customers, the communities in which we operate and the general public. Strong safety performance, like other company objectives, is attained by setting specific goals and by managing our sales, engineering, production, and distribution activities to achieve the goals. Strong safety performance is a management objective at INOX Air Products, and it is our goal to be recognized as a leader among all corporations in the industrial gases industry. INOX Air Products' management views safety as an ongoing process which must be successfully managed every day to provide both humanitarian rewards and economic savings.

The plants are designed, installed and operated as per the best safety practices in the industry. Plants are adequately equipped with all safety interlocks, alarms and trips, and undergo various safety reviews like P&ID review, HAZOP, Operations Readiness Inspections etc.

All required Safety systems are implemented in an operating plant based on the best practices in the industry such as -

- Fall Protection
- Safety Work Permit
- Lock out / Tag out
- Permit Required Confined Space Entry
- Requirements for Confined Space Entry in to ILDH Atmospheres

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com



- Energy Isolation
- Management of Change
- Incident Notification, Investigation and Reporting
- Relief Device Testing and Inspection

Necessary permissions and approvals are obtained from various statutory bodies such as-

- Approvals from Department of Industrial Safety and Health (Approval of Layout and Drawings, Factory License etc.)
- Approvals from Pollution Control Board (e.g., Consent to Establish, Consent to Operate)
- License from Petroleum & Explosives Safety Organization (PESO) as per Static and Mobile Pressure Vessels (SMPV) rules for product storage as applicable.
- FDA license for Medical Oxygen.
- Any other approvals required as per statutes.

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

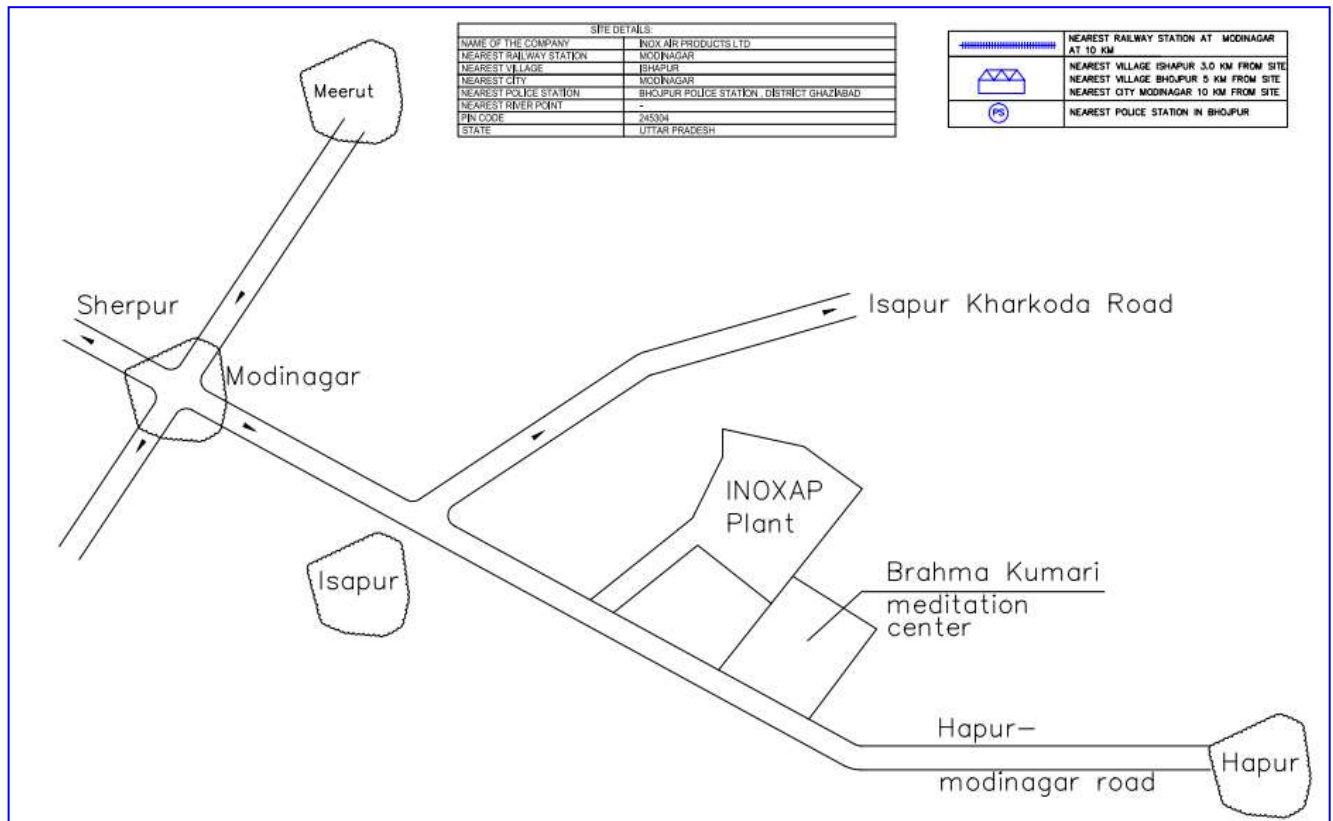
Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

ANNEXURE 1



INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
 CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
 Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

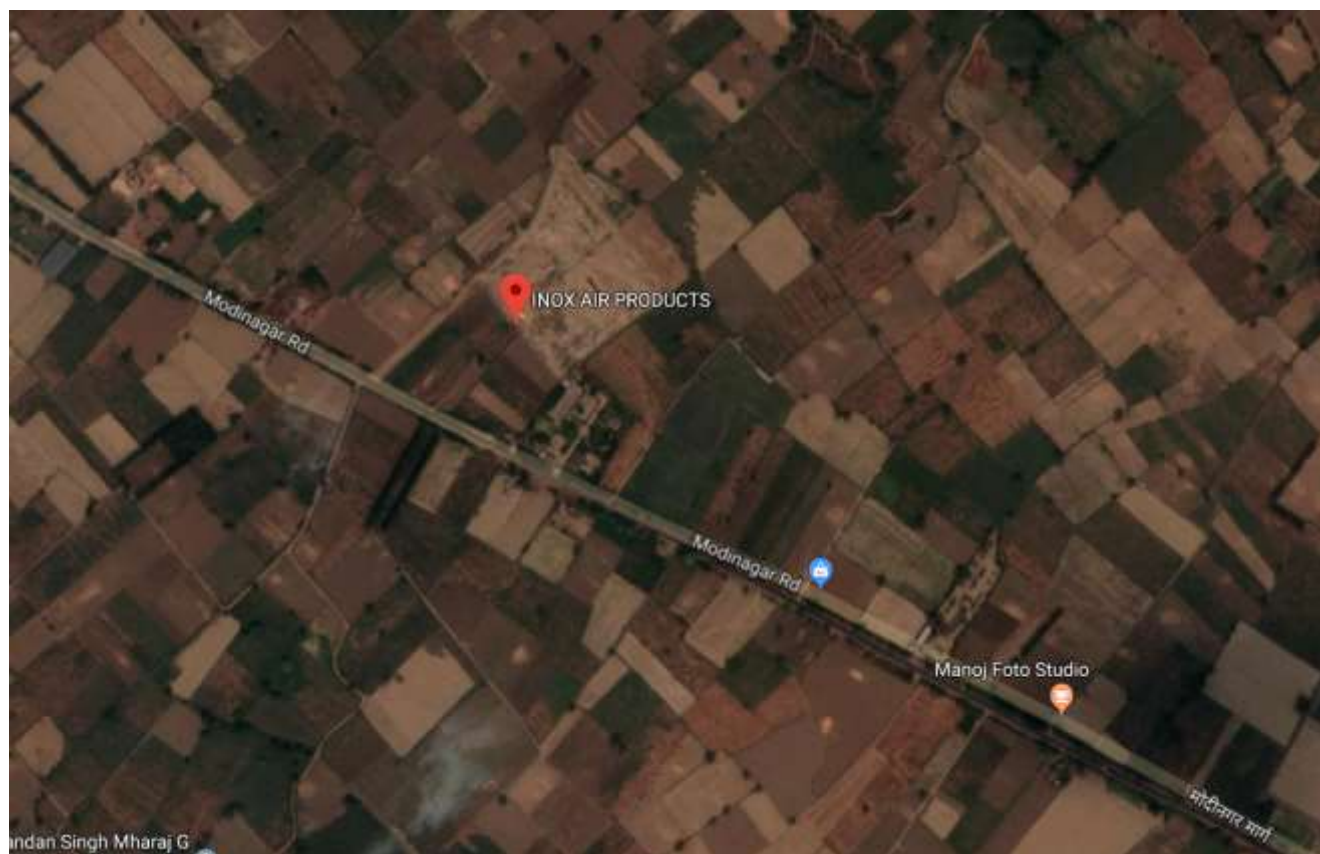
7th Floor, Ceejay House,
 Dr. Annie Besant Road, Worli,
 Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
 6, Hungerford Street, Fax: +91 33 2287 1160
 Kolkata - 700 017 Email: info@inoxap.com

ANNEXURE 2

GOOGLE IMAGE



INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

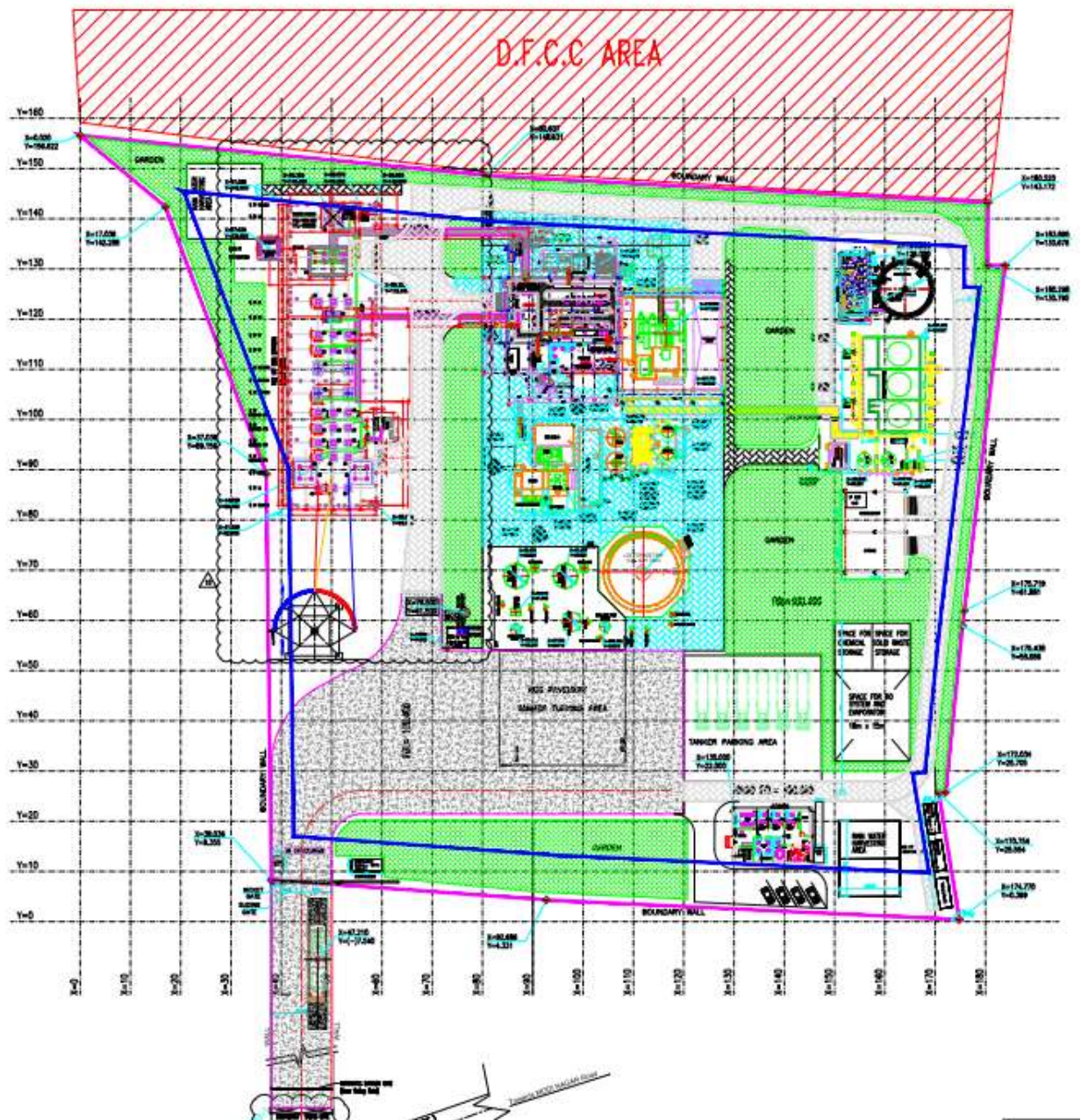
7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

ANNEXURE 3

SITE PLAN/PLOT PLAN

**INOX Air Products Pvt Ltd**

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

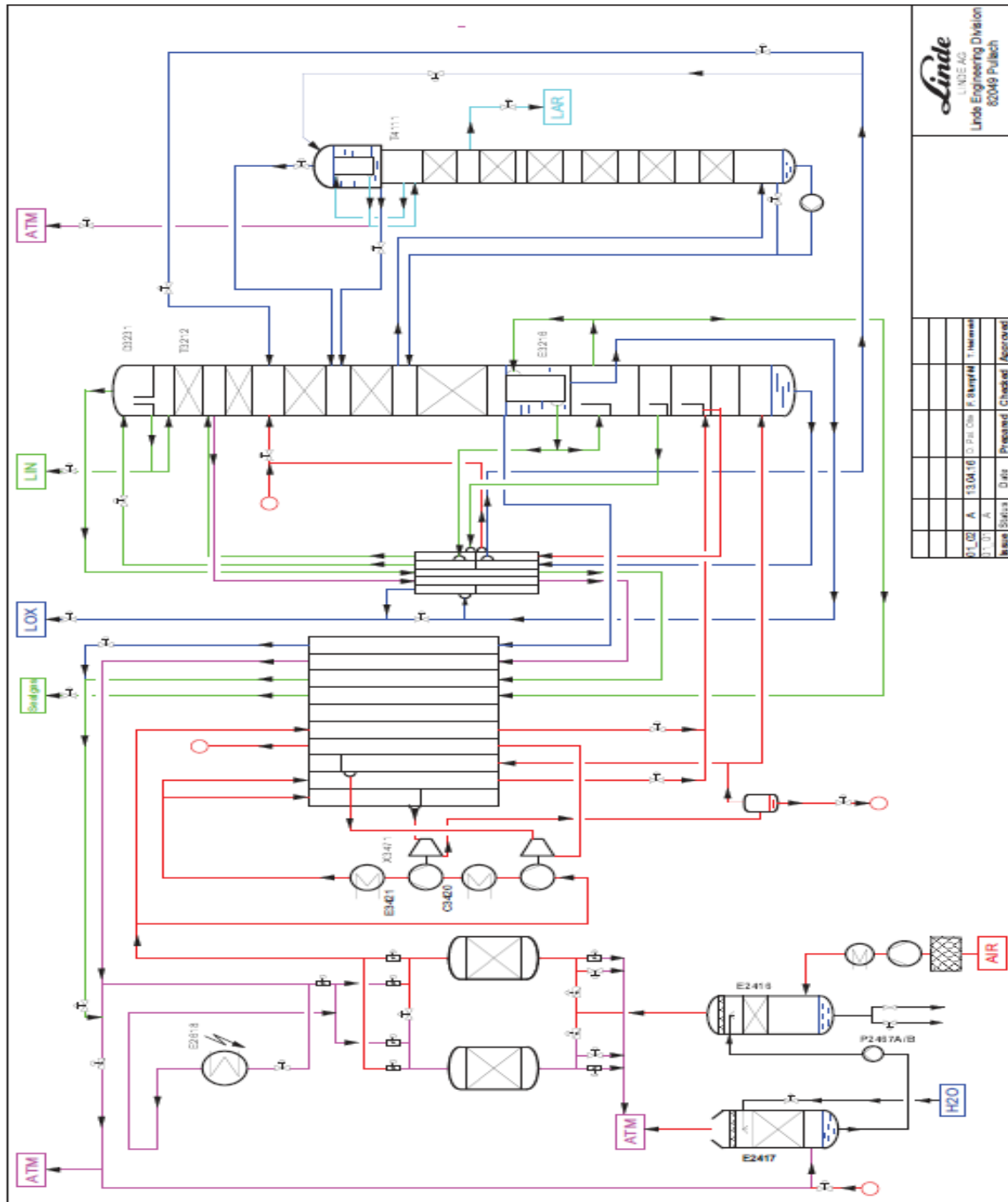
7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email:info@inoxap.com

ANNEXURE 4

PROCESS FLOW DIAGRAM FOR AIR SEPERATION UNIT (ASU)



INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
 CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
 Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
 Dr. Annie Besant Road, Worli,
 Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
 6, Hungerford Street, Fax: +91 33 2287 1160
 Kolkata - 700 017 Email: info@inoxap.com

ANNEXURE 5.1

Company's own performance (Last 3 years)			
(Rs. in lacs)			
Particulars	31.03.2019	31.03.2018	31.03.2017
Share Capital	1,034.07	1,034.07	1,034.07
Reserve & Surplus	240,698.20	210,243.80	184,646.03
Net worth	241,732.27	211,277.87	185,680.10
Unsecured Loans	2,720.14	2,748.15	2,787.05
Term Loans	45,328.04	54,751.86	55,212.91
Bank Borrowings	2,216.65	--	4.89
Non-Current Liabilities	39,101.75	35,969.56	33,954.23
Other Current Liabilities	35,102.00	28,705.97	19,089.13
Gross Fixed Assets	298,376.32	259,065.26	232,045.18
Net Fixed Assets	244,343.91	219,607.32	208,296.26
Non-Current Assets	75,280.54	65,144.12	14,238.92
Current Assets	46,576.40	48,701.97	74,193.13
Turnover	148,728.69	145,668.59	149,335.09
P B I D T	66,937.22	61,597.95	58,305.19
P B T	45,712.47	39,116.75	37,600.26
P A T	31,077.71	26,220.06	24,882.02

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
 CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
 Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
 Dr. Annie Besant Road, Worli,
 Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
 6, Hungerford Street, Fax: +91 33 2287 1160
 Kolkata - 700 017 Email: info@inoxap.com

ANNEXURE - 5.2

PROJECTED PROFIT AND LOSS ACCOUNT												Rs - Lacs
INCOME :	Yr - (1)	Yr - 0	Yr - 1	Yr - 2	Yr - 3	Yr - 4	Yr - 5	Yr - 6	Yr - 7	Yr - 8	Yr - 9	Yr - 10
TOTAL SALES			<u>2,916</u>	<u>4,374</u>	<u>5,832</u>	<u>5,832</u>	<u>5,832</u>	<u>5,832</u>	<u>5,832</u>	<u>5,832</u>	<u>5,832</u>	<u>5,832</u>
EXPENDITURE :												
Power			1,721	2,582	3,443	3,443	3,443	3,443	3,443	3,443	3,443	3,443
Insurance			20	20	21	21	21	21	21	21	21	21
Repairs & maintenance			110	110	110	110	110	110	110	110	110	110
Employees cost			202	218	236	254	275	297	321	346	374	404
Consumables & spares			43	43	43	43	43	43	43	43	43	43
Operating overheads			80	80	80	80	80	80	80	80	80	80
Facility charges for Land			9	9	9	9	9	9	9	9	9	9
Depreciation			<u>665</u>	<u>665</u>	<u>665</u>	<u>665</u>	<u>665</u>	<u>665</u>	<u>665</u>	<u>665</u>	<u>665</u>	<u>665</u>
COST OF SALES			<u>2,850</u>	<u>3,727</u>	<u>4,606</u>	<u>4,625</u>	<u>4,646</u>	<u>4,668</u>	<u>4,691</u>	<u>4,717</u>	<u>4,745</u>	<u>4,775</u>
GROSS PROFIT			65	647	1,225	1,206	1,186	1,164	1,140	1,115	1,087	1,057
Selling, general & administration exp.			<u>125</u>	<u>188</u>	<u>251</u>	<u>251</u>	<u>251</u>	<u>251</u>	<u>251</u>	<u>251</u>	<u>251</u>	<u>251</u>
P B I T			(60)	458	974	956	935	913	890	864	836	806
Interest (for working capital borrowing)			<u>72</u>	<u>72</u>	<u>72</u>	<u>72</u>	<u>72</u>	<u>72</u>	<u>72</u>	<u>72</u>	<u>72</u>	<u>72</u>
P B T			(131)	387	903	884	864	842	818	792	765	735
Income tax			-	-	-	-	-	222	364	377	387	393
Deferred tax			<u>(45)</u>	<u>134</u>	<u>313</u>	<u>306</u>	<u>299</u>	<u>70</u>	<u>(81)</u>	<u>(103)</u>	<u>(122)</u>	<u>(138)</u>
NET PROFIT / P A T			(86)	253	590	578	565	550	535	518	500	481

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

PROJECTED CASH FLOW STATEMENT

SOURCES	<u>Yr - (1)</u>	<u>Yr - 0</u>	<u>Yr - 1</u>	<u>Yr - 2</u>	<u>Yr - 3</u>	<u>Yr - 4</u>	<u>Yr - 5</u>	<u>Yr - 6</u>	<u>Yr - 7</u>	<u>Yr - 8</u>	<u>Yr - 9</u>	<u>Yr - 10</u>
PROFIT BEFORE TAX	-	-	(131)	387	903	884	864	842	818	792	765	735
ADD : DEPRECIATION	-	-	<u>665</u>	<u>665</u>	<u>665</u>	<u>665</u>	<u>665</u>	<u>665</u>	<u>665</u>	<u>665</u>	<u>665</u>	<u>665</u>
	-	-	534	1,052	1,568	1,549	1,529	1,507	1,483	1,457	1,430	1,400
INOXAP - HO	4,200	6,300	-	-	-	-	-	-	-	-	-	-
WORKING CAPITAL	-	-	<u>908</u>	-	-	-	-	-	-	-	-	-
	<u>4,200</u>	<u>6,300</u>	<u>1,442</u>	<u>1,052</u>	<u>1,568</u>	<u>1,549</u>	<u>1,529</u>	<u>1,507</u>	<u>1,483</u>	<u>1,457</u>	<u>1,430</u>	<u>1,400</u>
APPLICATION												
FIXED ASSETS	4,200	6,300	-	-	-	-	-	-	-	-	-	-
CURRENT ASSETS	-	-	908	-	-	-	-	-	-	-	-	-
INCOME TAX	-	-	-	-	-	-	-	222	364	377	387	393
TRFD TO INOXAP - HO	-	-	<u>534</u>	<u>1,052</u>	<u>1,568</u>	<u>1,549</u>	<u>1,529</u>	<u>1,285</u>	<u>1,119</u>	<u>1,080</u>	<u>1,043</u>	<u>1,007</u>
	<u>4,200</u>	<u>6,300</u>	<u>1,442</u>	<u>1,052</u>	<u>1,568</u>	<u>1,549</u>	<u>1,529</u>	<u>1,507</u>	<u>1,483</u>	<u>1,457</u>	<u>1,430</u>	<u>1,400</u>

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

PROJECTED BALANCE SHEET

Rs -
Lacs

LIABILITES	<u>Yr - (1)</u>	<u>Yr - 0</u>	<u>Yr - 1</u>	<u>Yr - 2</u>	<u>Yr - 3</u>	<u>Yr - 4</u>	<u>Yr - 5</u>	<u>Yr - 6</u>	<u>Yr - 7</u>	<u>Yr - 8</u>	<u>Yr - 9</u>	<u>Yr - 10</u>
INOXAP - HO	4,200	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500
PROFIT & LOSS A/C	-	-	(86)	167	758	1,336	1,901	2,451	2,986	3,504	4,004	4,485
WORKING CAPITAL	-	-	908	908	908	908	908	908	908	908	908	908
DEFERRED TAX	-	-	(45)	88	401	707	1,006	1,076	995	892	769	631
	<u>4,200</u>	<u>10,500</u>	<u>11,277</u>	<u>11,663</u>	<u>12,566</u>	<u>13,451</u>	<u>14,314</u>	<u>14,935</u>	<u>15,389</u>	<u>15,804</u>	<u>16,182</u>	<u>16,524</u>

ASSETS

FIXED ASSETS	4,200	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500
LESS: DEPRECIATION	-	-	665	1,330	1,995	2,660	3,325	3,990	4,655	5,320	5,985	6,650
NET FIXED ASSETS	4,200	10,500	9,835	9,170	8,505	7,840	7,175	6,510	5,845	5,180	4,515	3,850
CURRENT ASSET	-	-	908	908	908	908	908	908	908	908	908	908
INOXAP - H O	-	-	534	1,585	3,153	4,703	6,231	7,517	8,636	9,716	10,759	11,766
	<u>4,200</u>	<u>10,500</u>	<u>11,277</u>	<u>11,663</u>	<u>12,566</u>	<u>13,451</u>	<u>14,314</u>	<u>14,935</u>	<u>15,389</u>	<u>15,804</u>	<u>16,182</u>	<u>16,524</u>

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

ANNEXURE 6

LIST OF UNITS' LOCATIONS

ANDAMAN & NICOBAR ISLANDS

1 PORT BLAIR

ANDHRA PRADESH

2 HYDERABAD

3 TADIPATRI

4 VIZAG

5 HYDERABAD - Regional Office

GUJARAT

6 BARODA - Regional Office

7 AHMEDABAD

8 DAHEJ

9 HAZIRA

10 KARJAN

11 HAZIRA - 5100 TPD

12 HALOL

13 JHAGADIA

14 SIMEJ

HIMACHAL PRADESH

15 BAROTIWALA

JHARKHAND

16 BOKARO

17 KASHIJHARIA

KARNATAKA

18 BANGALORE - Regional Office

19 BELLARY (Trading Location)

20 HOSPET

KERALA

21 PALAKKAD

MADHYA PRADESH

22 BHOPAL

23 INDORE

ODISHA

24 ANGUL (trading location)

MAHARASHTRA

25 BHANDARA

26 DOLVI

27 MANGAON

28 BUTIBORI

29 WARDHA

30 PATALGANGA

31 BHOSARI

32 JEJURI

33 SKF

34 THANE

35 VASHIND

36 VILLE BHAGAD (MANGAON)

37 WORLI, MUMBAI - Corporate

38 CHAKAN (PUNE)

39 PUNE (ENGINEERING OFFICE)

40 MUMBAI (HO)

PONDICHERRY

41 PONDICHERRY

PUNJAB

42 MANDIGOBINDGARH

RAJASTAN

43 BHIWADI

TAMIL NADU

44 MANALI

45 SALEM

46 SRIPERUMBUDUR

47 CHENNAI - REGIONAL OFFICE

UTTAR PRADESH

48 SURAJPUR - UNIT NO. 1

49 SURAJPUR - UNIT NO. II

WEST BANGAL

50 KOLKATA - Regional Office

51 BARJORA

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com

ANNEXURE 7

LIST OF DIRECTORS

Sr.No	Name	Designation	Address
1	PAVAN KUMAR JAIN (DIN NO.00030098)	Managing Director	Inox Air Products Pvt. Ltd., 7th floor, Ceejay House, Dr. Annie Besant Road, Worli, Mumbai 400 018
2	VIVEK KUMAR JAIN (DIN NO. 00029968)	Director	612-618, Narain Manzil, 6th floor, 23, Barakhamba Road, New Delhi 110 001
3	RICHARD JOHN BOOCOCK (DIN NO. 07404093)	Director	Air Products and Chemicals Inc., 7201 Hamilton Boulevard- A 33F2, Allentown, Pennsylvania 18195-1501
4	DAVID JOHN LENEY (DIN NO.07546881)	Director	Air Products PLC, Hersham Technology Park, Molessey Road, Walton on Thames, United Kingdom, KT124RZ
5	SUBODH KUMAR JAIN, (DIN NO. 00031010)	Director	A-6 Connaught Place, New Delhi - 110001
6	SIDDHARTH JAIN (DIN NO. 00030202)	Whole time, Director	Inox Air Products Pvt.Ltd., 7th floor, Ceejay House, Dr. Annie Besant Road, Worli, Mumbai 400 018

INOX Air Products Pvt Ltd

An affiliate of Air Products and Chemicals, Inc., USA
CIN: U24999MH1963PTC0126252625 | inoxairproducts.com
Tel. +91 22 4032-3960 FAX : +91 22 4032 3191

Registered Office

7th Floor, Ceejay House,
Dr. Annie Besant Road, Worli,
Mumbai - 400 017. India

Regional Office

The Regency, 2nd Floor Tel: +91 33 2289 5091
6, Hungerford Street, Fax: +91 33 2287 1160
Kolkata - 700 017 Email: info@inoxap.com