

# Oxygen and Nitrogen Gas Production.



## Industrial Gas Plant



*India industrial gases market  
forecast to grow at a CAGR of over  
11%*



# Introduction

## Oxygen Gas

**Oxygen and nitrogen are the most important industrial gases finding its application in large quantities in metal fabrication and cutting industries. It is used in electric arc steel furnaces for decarburization and scrap matting.**

**Oxygen is also used in medical treatment and for breathing at high altitude flying. Some quantities of liquid oxygen are used in explosives, chemicals and petrochemicals industries as an oxidizing and catalytic agent.**



**As the quantity of oxygen required in integrated steel plants is huge, the excess of oxygen is compressed and bottled in steel cylinders and supplied to engineering industries such as manufacture of machine tools, industrial machinery, automobiles and component manufacturers, fabricators of chemical plants, storage tanks, and furniture and building elements.**



# Nitrogen Gas

**Nitrogen is a colorless, odorless, inert and non-flammable gas. Although it is inert in nature, it reacts with other compounds under specific conditions. Industrial Nitrogen has a varied range of application in different industries. Nitrogen gas is used in the production of ammonia which in turn is used for the manufacture of urea and ammonium phosphate, which are fertilizers of great use. Nitrogen gas is used for blanketing hazardous chemicals which is an inert atmosphere.**



**Nitrogen gas is used for purging purposes. Nitrogen gas is used for the purification of other gases with extremely low boiling points, such as hydrogen scrubbing. High purity nitrogen is used in strip steel annealing prior to tin plating.**

**Human blood and cattle sperm cells are pressured by using nitrogen liquid freezing method. Large quantities of liquid nitrogen are employed in the preservation of food by rapid freezing. Liquid nitrogen is also used to maintain low temperatures during the transportation of frozen food. The demand of oxygen and nitrogen gas will increase in future**



## Uses:

# Oxygen Gas

- Oxygen is also used in many industrial, commercial, medical, and scientific applications. It is used in blast furnaces to make steel, and is an important component in the production of many synthetic chemicals, including ammonia, alcohols, and various plastics.
- The steel industry also uses oxygen gas in an oxy-acetylene flame, for scale removal from billets, and in oxygen lances, for cutting out imperfect ions.
- The continuous gasification of coal or other solid fuel, oxygen gas admixed with steam is passed into the fuel bed and maintains a sufficiently high temperature to allow the water-gas reaction to proceed smoothly.

- **Oxygen gas is used in hospitals (to enrich air in respirators and to mix with anesthetics), aviation (for pilots' air supply), and pollution control. The space program was a major user of oxygen,**
- **In the chemical and petrochemical industries, as well as in the oil and gas sector oxygen is used in commercial volumes as an oxidizer in chemical reactions. The use of oxygen in gas-flame operations, such as metal welding, cutting and brazing is one of the most significant and common applications of this gas.**



# Nitrogen Gas

- Nitrogen is used primarily as a freezing agent and a blanketing agent. About 21% of nitrogen produced is used for freezing
- Other freezing applications include cryogenic size reduction of plastics, rubber, spices, and pharmaceuticals. About 33% of all nitrogen produced is used for blanketing, mostly in chemical processing and the electronics industry (14% each), with some application in the primary metals industry (5%).
- Demand for nitrogen has been growing steadily in the liquefied industrial gases market and the chemical industry. In the aluminum industry, nitrogen has been replacing inert gas generators. The enhanced -oil products industry also requires fairly large quantities of gaseous nitrogen.



- **Nitrogen requirements for steel manufacture are modest and seldom exceed a small fraction of the oxygen flow. Some nitrogen~lso is used as the principal refrigerant in air separation cycles and as clean-up gas (to remove unwanted carbon dioxide and water).**
- **Chemical Plants – Nitrogen is used to displace oxygen and prevent explosions in highly dangerous atmospheres, such as chemical plants and manufacturing facilities. Tire Inflation – Nitrogen offers many benefits when used to fill tires, such as giving them a longer life by reducing oxidation**



- **Food Packaging** – Nitrogen is used to displace oxygen in food packaging. By eliminating the oxygen, the food can last longer. It can also add a cushion around the food to keep it safe from breaking in transport.
- **Light Bulb Production** – In incandescent light bulbs, nitrogen gas is often used as a cheaper alternative to argon.
- **Chemical Plants** – Nitrogen is used to displace oxygen and prevent explosions in highly dangerous atmospheres, such as chemical plants and manufacturing facilities.
- **Tire Inflation** – Nitrogen offers many benefits when used to fill tires, such as giving them a longer life by reducing oxidation. It also improves tire pressure retention to give drivers better gas mileage.

- **Electronics** – When electronics are being assembled, nitrogen gas is used for soldering. Using nitrogen reduces the surface tension to provide a cleaner breakaway from the solder site.
- **Stainless Steel Manufacturing** – By electroplating the stainless steel with nitrogen, the finished product is stronger and resistant to corrosion.
- **Pollution Control** – Nitrogen gas can be used to remove the VOCs in liquids before they are discarded.
- **Pharmaceuticals** – Almost every major drug class contains some nitrogen, even antibiotics. Nitrogen, in the form of nitrous oxide, is also used as an anesthetic.

- **Mining** – In the mining industry, nitrogen gas is used to quickly extinguish fires by eliminating the oxygen from the air. And when an area is going to be abandoned, they use nitrogen to ensure the area will not explode.
- **Mild steel & carbon steel annealing**
- **Electronic industries like semiconductors etc.**
- **Blanketing during chemical reactions**
- **Auto industries for Sintering, Brazing & Soldering**
- **Food packaging**
- **Tire filling**
- **Metal powder formation**

# **Market Outlook**

**The medical gases market size in India, in volume terms, is forecast to witness a two folds increase by 2019, exhibiting a CAGR of about 15% during 2014-19.**

**The medical gases market in India is highly dominated by region-specific players, which are offering a stiff competition to multinational companies. India's specialization in cardiology, orthopedic surgery, etc., is expected to drive healthcare demand, particularly for medical oxygen and nitrous oxide, which are vital requirements of any healthcare setup. Currently, the northern region, followed by the southern region, is the leading demand generators for medical gases, particularly medical oxygen gas.**

# Oxygen

## Demand : Past and Future

Year	(In Million m <sup>3</sup> )
1990-91	450
2000-01	1335
2001-02	1525
2002-03	1725
2003-04	1975
2004-05	2315
2005-06	2760
2006-07	3360
2007-08	3730
2008-09	4910
2009-10	5400
2010-11	6250
2011-12	7210
2012-13	8200
2013-14	9165
2014-15	10000
2015-16	11250
2016-17	12800
2017-18	13950
2018-19	15700
2019-20	17230
2024-25	27125

## **Global Oxygen Market: Overview**

**Oxygen is a colorless gas which is a paramount factor to sustain life. Oxygen is available in cylinders, containers, and cans. They are mostly used for industrial, medical, and scientific applications. Oxygen is used as an oxidizing agent and as a catalyst in various scientific and industrial processes. The oxygen market is growing at a significant pace and the growth in the oxygen market has resulted in an increase in the related markets such as medical oxygen generators, air-oxygen blenders, and stationary and portable oxygen concentrators.**



**The global oxygen market is divided into its form, application, end-users, and geography. On the basis of a form of oxygen, the market is segregated into solid, liquid, and gaseous. Based on application, the market is classified into cosmetics, pharmaceutical, automobiles, and mining and mineral processing applications. On the basis of end-users, the market is categorized into industrial, medical, and scientific sectors. Diversification of the market on the basis of the region is seen into Asia Pacific, North America, Europe, Latin America, and the Middle East and Africa.**



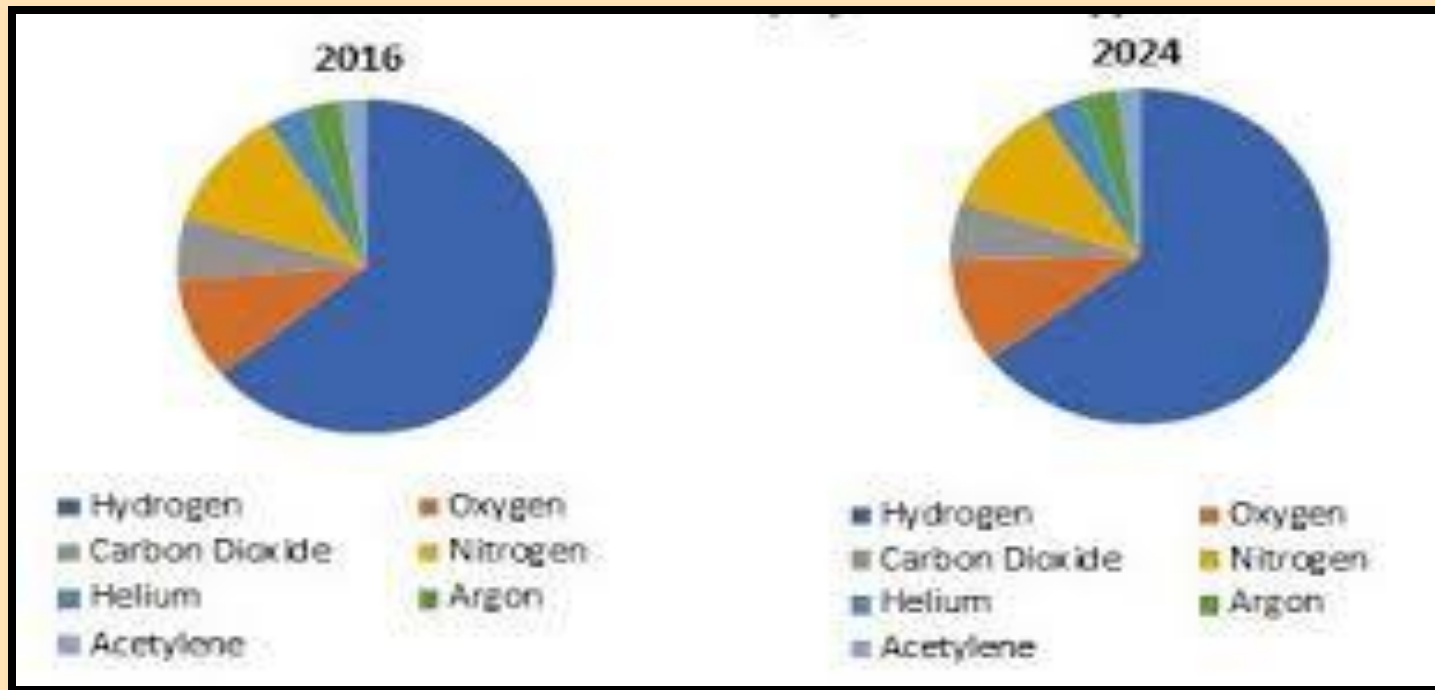


## Global Oxygen Market: Regional Analysis

The largest share in the oxygen market is held by the Asia Pacific region. This growth can be attributed to reasons such as the growth of manufacturing sector and healthcare. Also, growth in the mineral and mining processing, where oxygen is a key catalyst, helps in the expansion of oxygen market in the region. Regions such as China, Japan, India, Australia, and New Zealand are showing major contribution in the Asia Pacific market.



# Global Oxygen Market



# ***Key Players***

- ❖ **Hale Hamilton**
- ❖ **Maximator GmbH**
- ❖ **Hydrotechnik UK Ltd**
- ❖ **HyDAC**
- ❖ **Hydraulics International Inc**
- ❖ **Accudyne Industries**
- ❖ **Semmco Limited**
- ❖ **Air Liquide India Holding Pvt. Ltd.**
- ❖ **Arrow Oxygen Ltd.**
- ❖ **Bellary Oxygen Co. Pvt. Ltd.**

- ❖ **Bhagawati Oxygen Ltd.**
- ❖ **Bhilai Oxygen Ltd.**
- ❖ **Ellenbarrie Industrial Gases Ltd.**
- ❖ **Govind Poy Oxygen Ltd.**
- ❖ **Howrah Gases Ltd.**
- ❖ **Linde India Ltd.**
- ❖ **Madhav Industrial Gases Pvt. Ltd.**
- ❖ **Niket Udyog Ltd.**
- ❖ **Praxair India Pvt. Ltd.**
- ❖ **Pushya Industrial Gases Ltd.**
- ❖ **Saraogi Oxygen Ltd.**
- ❖ **Shivam Gases Ltd.**
- ❖ **Sicgilsol Gases Pvt. Ltd.**
- ❖ **Southern Gas Ltd.**
- ❖ **Travancore Oxygen Ltd.**

## **Industrial Nitrogen Gas Market**

**The market is witnessing a rise in demand from the food and beverages market. Its freezing property has expanded its use in blood banks, cryogenic treatments and plastic and rubber industries. Demand from end-users such as metal manufacturers, chemical and transportation industries are also propelling the industry to grow.**

**Application wise its use can be segmented into metal manufacturing, oil and gas sector, petrochemical, pharmaceutical and healthcare, chemical, food and beverage industry and electronics. Food packaging - to displace the Oxygen from packaging that helps the food product to last long, used as fertilizer when combined with Ammonia to form Nitrates, Tire Inflation - by improving life of the tire and getting better mileage.**

**The demand for industrial gases also continued to remain strongly driven by an increase in investments in infrastructure development and petroleum reserves in emerging markets. In fact, metal fabrication and production sector are expected to remain the second major sector for industrial gases, next to petroleum refining.**

**Over the longer term to 2022, the annual growth rate in the industrial gas market is expected to significantly exceed the rate of industrial production driven by multitude of factors including opening of new startups, rapid industrialization of emerging economies, increasing demand for energy, environment regulations, improving healthcare sector, and advancements in industrial technology.**

# Machinery Photographs



**Air Compressor**



**Cooler**





**Moisture Separator**



**Ceramic Filter**



# Project at a Glance

COST OF PROJECT				MEANS OF FINANCE			
Particulars	Existin g	Propose d	Total	Particulars	Existin g	Propos ed	Total
Land & Site							
Development Exp.	0.00	55.00	55.00	Capital	0.00	160.76	160.76
Buildings	0.00	49.50	49.50	Share Premium	0.00	0.00	0.00
				Other Type Share			
Plant & Machineries	0.00	305.50	305.50	Capital	0.00	0.00	0.00
Motor Vehicles	0.00	12.00	12.00	Reserves & Surplus	0.00	0.00	0.00
Office Automation							
Equipments	0.00	140.00	140.00	Cash Subsidy	0.00	0.00	0.00
Technical Knowhow				Internal Cash			
Fees & Exp.	0.00	20.00	20.00	Accruals	0.00	0.00	0.00
Franchise & Other				Long/Medium Term			
Deposits	0.00	0.00	0.00	Borrowings	0.00	482.27	482.27
Preliminary& Pre-				Debentures /			
operative Exp	0.00	2.00	2.00	Bonds	0.00	0.00	0.00
Provision for				Unsecured			
Contingencies	0.00	30.00	30.00	Loans/Deposits	0.00	0.00	0.00
Margin Money -							
Working Capital	0.00	29.02	29.02				
TOTAL	0.00	643.02	643.02	TOTAL	0.00	643.02	643.02

# Project at a Glance

Year	Annualised		Book Value	Debt	Dividend	Retained Earnings		Payout	Probable Market Price	P/E Ratio	Yield Price/Book Value
	EPS	CEPS	Per Share		Per Share	Per Share				No.of Times	
	`	`	`	`	`	%	`	%	`	s	%
1-2	4.40	8.93	14.40	24.00	0.00	100.00	4.40	0.00	4.40	1.00	0.00
2-3	7.51	11.43	21.92	18.00	0.00	100.00	7.51	0.00	7.51	1.00	0.00
3-4	10.58	13.99	32.50	12.00	0.00	100.00	10.58	0.00	10.58	1.00	0.00
4-5	13.58	16.54	46.07	6.00	0.00	100.00	13.58	0.00	13.58	1.00	0.00
5-6	16.48	19.06	62.55	0.00	0.00	100.00	16.48	0.00	16.48	1.00	0.00

# Project at a Glance

Year	D. S. C. R.			Debt / - Deposits Debt	Equity as-Equity	Total Net Worth	Return on Net Worth	Profitability Ratio					Assets Turnover Ratio	Current Ratio
	Individual	Cumulative	Overall					GPM	PBT	PAT	Net Contribution	P/V Ratio		
	(Number of times)			(Number of times)		%	%	%	%	%		%		
Initial				3.00	3.00									
1-2	1.31	1.31		1.67	1.67	1.87		25.03 %	13.50 %	10.36 %	663.60	97.10%	1.06	0.86
2-3	1.63	1.47		0.82	0.82	0.97		31.22 %	22.46 %	15.14 %	774.05	97.08%	1.17	1.45
3-4	2.01	1.63	2.01	0.37	0.37	0.48		35.49 %	28.81 %	18.66 %	884.63	97.08%	1.20	2.26
4-5	2.47	1.81		0.13	0.13	0.22		38.49 %	33.41 %	21.29 %	995.21	97.08%	1.15	3.27
5-6	3.02	2.01		0.00	0.00	0.07		40.58 %	36.76 %	23.26 %	1105.78	97.08%	1.07	10.58

# Project at a Glance

## BEP

BEP - Maximum Utilisation Year	5
Cash BEP (% of Installed Capacity)	58.39%
Total BEP (% of Installed Capacity)	62.14%
IRR, PAYBACK and FACR	
Internal Rate of Return .. ( In %age )	26.28%
Payback Period of the Project is ( In Years )	2 Years 3 Months
Fixed Assets Coverage Ratio ( No. of times )	3.310

# **Major Queries/Questions Answered in the Report?**

- 1. What is Oxygen and Nitrogen Gas Manufacturing industry ?**
- 2. How has the Oxygen and Nitrogen Gas Manufacturing industry performed so far and how will it perform in the coming years ?**
- 3. What is the Project Feasibility of Oxygen and Nitrogen Gas Manufacturing Plant ?**
- 4. What are the requirements of Working Capital for setting up Oxygen and Nitrogen Gas Manufacturing plant ?**

- 5. What is the structure of the Oxygen and Nitrogen Gas Manufacturing Business and who are the key/major players ?**
- 6. What is the total project cost for setting up Oxygen and Nitrogen Gas Manufacturing Business?**
- 7. What are the operating costs for setting up Oxygen and Nitrogen Gas Manufacturing plant ?**
- 8. What are the machinery and equipment requirements for setting up Oxygen and Nitrogen Gas Manufacturing plant ?**

- 9. Who are the Suppliers and Manufacturers of Plant & Machinery for setting up Oxygen and Nitrogen Gas Manufacturing plant ?**
- 10. What are the requirements of raw material for setting up Oxygen and Nitrogen Gas Manufacturing plant ?**
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- 12. What is the Manufacturing Process of Oxygen and Nitrogen Gas?**

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- **Annexure 32 :: Depreciation Charges - as per IT Act WDV (P & M)**
- **Annexure 33 :: Interest and Repayment - Term Loans**
- **Annexure 34 :: Tax on Profits**
- **Annexure 35 :: Projected Pay-Back Period and IRR**



# **Scope of the Report**

**The report titled “Market Survey cum Detailed Techno Economic Feasibility Report on Oxygen and Nitrogen Gas.” provides an insight into Oxygen and Nitrogen Gas market in India with focus on uses and applications, Manufacturing Process, Process Flow Sheets, Plant Layout and Project Financials of Oxygen and Nitrogen Gas project. The report assesses the market sizing and growth of the Indian Oxygen and Nitrogen Gas Industry. While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line. And before diversifying/venturing into any product, they wish to study the following aspects of the identified product:**

- **Good Present/Future Demand**
- **Export-Import Market Potential**
- **Raw Material & Manpower Availability**
- **Project Costs and Payback Period**

**We at NPCS, through our reliable expertise in the project consultancy and market research field, have demystified the situation by putting forward the emerging business opportunity in the Oxygen and Nitrogen Gas sector in India along with its business prospects. Through this report we have identified Oxygen and Nitrogen Gas project as a lucrative investment avenue.**

# Tags

Oxygen\_and\_Nitrogen\_Gas\_Plant, #Production\_of\_Oxygen\_Gas, How Oxygen is Made, Producing Oxygen Gas, Oxygen Plant, Nitrogen Plants, #Oxygen\_Plant, Industrial Oxygen Plant, #Industrial\_Gases, Making of Oxygen Gas, Oxygen Production, Manufacturing Process of Oxygen Gas Plant, Oxygen Plant Manufacturing Process, Oxygen Plant in India, Oxygen Gas Production Plant, Oxygen Gas Manufacturing Plant, Manufacturing of Oxygen Gas, Project Report on Oxygen Gas Plant, Oxygen Gas Manufacture in India, Manufacturing of Medical Gases, Oxygen Gas Manufacturing Unit, Nitrogen Gas Plant, Oxygen Gas Plant Project Cost, #Oxygen\_&\_Nitrogen\_Gas\_Plant, Oxygen and Nitrogen Gas Plant Manufacturing Plant, Industrial Gas Plants, Uses and Applications of Nitrogen Gas, Nitrogen Gas Production, Nitrogen Gas Manufacturing Process, #Production\_of\_Nitrogen, Manufacturing Process of Nitrogen Gas,

Manufacturing Process of Oxygen Nitrogen Gas Plant, Setting up Oxygen and Nitrogen Gas Plant, #Industrial\_&\_Medical\_Oxygen\_and\_Nitrogen\_Gases, Industrial Oxygen Gas Filling Plant, Medical Gases, #Oxygen\_Gas\_Plant\_Project Cost, Industrial Oxygen Plant Project Report Pdf, Medical Oxygen Plant Setup Cost in India, Oxygen Gas Business, #How\_to\_Start\_Oxygen\_Plant, Project Report on Oxygen & Nitrogen Gas Industry, Detailed Project Report on Oxygen & Nitrogen Gas Plant, #Project\_Report\_on\_Oxygen\_&\_Nitrogen\_Gas\_Plant, Pre-Investment Feasibility Study on Oxygen & Nitrogen Gas Plant, Techno-Economic feasibility study on Oxygen & Nitrogen Gas Plant, Feasibility report on Oxygen & Nitrogen Gas Plant, Free Project Profile on Oxygen & Nitrogen Gas Plant, Project profile on Oxygen & Nitrogen Gas Plant, Download free project profile on Oxygen & Nitrogen Gas Plant

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**And before diversifying/venturing into any product, they wish to study the following aspects of the identified product:**

- **Good Present/Future Demand**
- **Export-Import Market Potential**
- **Raw Material & Manpower Availability**
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# **Contact us**

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# Who are we?

- *One of the leading reliable names in industrial world for providing the most comprehensive technical consulting services*
- *We adopt a systematic approach to provide the strong fundamental support needed for the effective delivery of services to our Clients' in India & abroad*

*We at NPCS want to grow with you by providing solutions scale to suit your new operations and help you reduce risk and give a high return on application investments. We have successfully achieved top-notch quality standards with a high level of customer appreciation resulting in long lasting relation and large amount of referral work through technological breakthrough and innovative concepts. A large number of our Indian, Overseas and NRI Clients have appreciated our expertise for excellence which speaks volumes about our commitment and dedication to every client's success.*





*We bring deep, functional expertise, but are known for our holistic perspective: we capture value across boundaries and between the silos of any organization. We have proven a multiplier effect from optimizing the sum of the parts, not just the individual pieces. We actively encourage a culture of innovation, which facilitates the development of new technologies and ensures a high quality product.*

# What do we offer?

- *Project Identification*
- *Detailed Project Reports/Pre-feasibility Reports*
- *Market Research Reports*
- *Business Plan*
- *Technology Books and Directory*
- *Industry Trend*
- *Databases on CD-ROM*
- *Laboratory Testing Services*
- *Turnkey Project Consultancy/Solutions*
- *Entrepreneur India (An Industrial Monthly Journal)*

## How are we different ?

- *We have two decades long experience in project consultancy and market research field*
- *We empower our customers with the prerequisite know-how to take sound business decisions*
- *We help catalyze business growth by providing distinctive and profound market analysis*
- *We serve a wide array of customers , from individual entrepreneurs to Corporations and Foreign Investors*
- *We use authentic & reliable sources to ensure business precision*

# Our Approach

**Requirement collection**

**Thorough analysis of the project**

**Economic feasibility study of the Project**

**Market potential survey/research**

**Report Compilation**

# Contact us

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